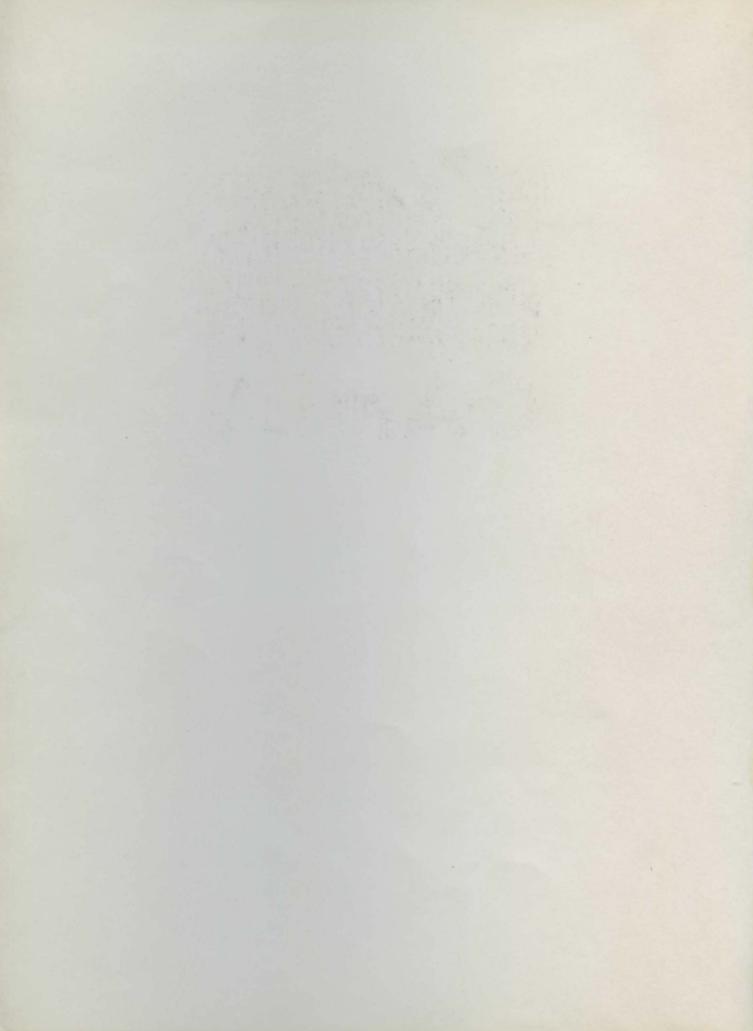
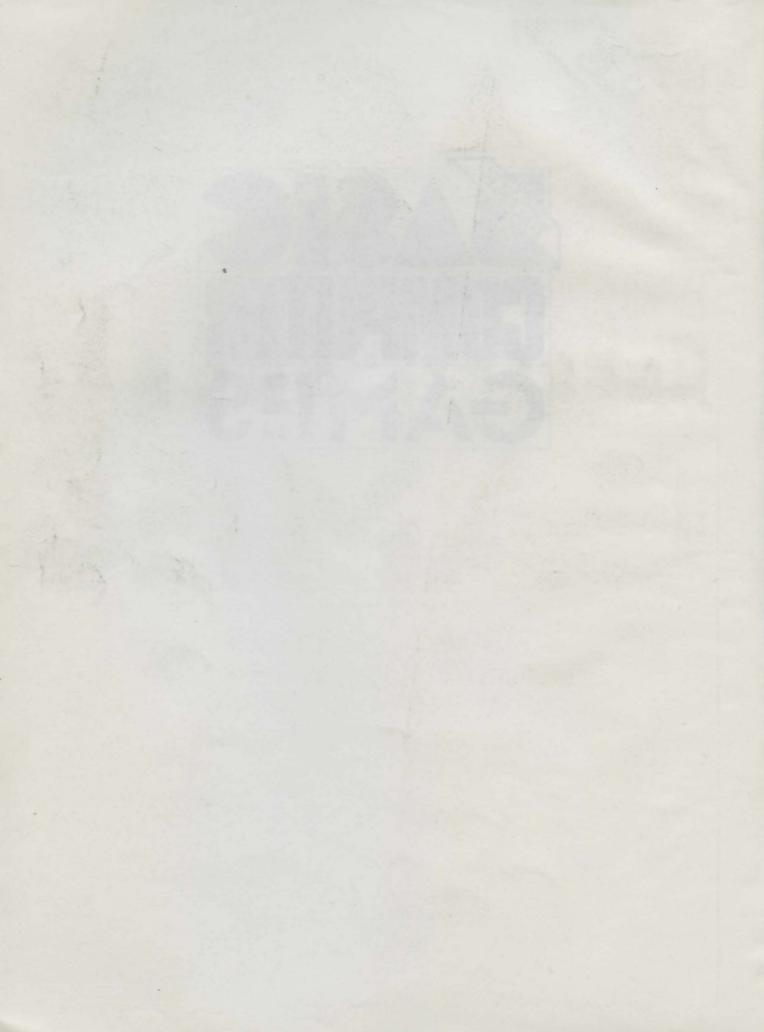


84 Challenging New Games To Play On Your Personal Computer. All in BASIC and complete with program listing and sample run. Edited by David H. Ahl











Edited by David H. Ahl Program Conversion by Steve North Illustrations by George Beker Introduction by Chris Cerf

> Workman Publishing New York

All of the programs listed here run, without error, in Microsoft Basic Version 3.0 or higher. While most users will encounter no problems in entering and running the games, some microcomputer Basics may require program conversion. If you are a newcomer to personal computing, do not attempt to enter the longest program first. This will only result in frustration and confusion. You must become familiar with your Basic's capabilities and limitations before attempting one of the longer programs.

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Manufactured in the United States of America First Printing June 1980 To people everywhere who look back and wonder how they ever got along without a personal computer...

## **ABOUT THE EDITOR**

David Ahl has a BEE from Cornell University, MBA from Carnegle-Mellon University and has done further work in educational psychology at the University of Pittsburgh.

Two years in the Army Security Agency were followed by four years with Management Science Associates working on computer models and analysis of new consumer products. He continued work in computer analysis (of vocational education graduates) with Educational Systems Research Institute.

He joined Digital Equipment Corporation in early 1970. As Education Product Line Manager he formulated the concept of an educational computer system consisting of hardware, software, and courseware (Edu-System) and helped guide DEC into a leading position in the education market.

Mr. Ahl joined AT&T in 1974 as Education Marketing Manager and was later promoted to Manager of Marketing Communications where he was responsible for the development of sales promotional strategies and materials for the Bell System. Concurrent with this move, he started Creative Computing as a hobby in late 1974.

As Creative Computing grew, Mr. Ahl left AT&T in 1978 to devote full time to it. Creative Computing magazine today is number 1 in software and applications for small computers.

Mr. Ahl is a frequent lecturer and workshop leader at colleges and professional conferences. He is a member of ACM, AEDS, AERA, COSMEP and NCTM.

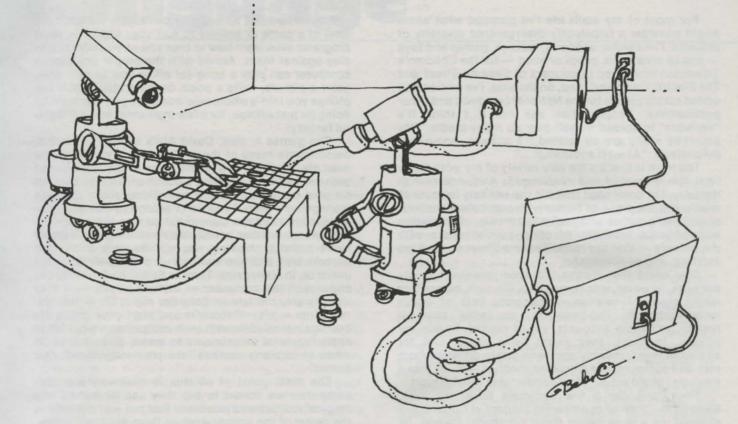
## ACKNOWLEDGEMENTS

So many people had a hand in bringing this book to fruition, it's difficult to know where to start with acknowledgements. Clearly the 70 some odd game authors deserve a great deal of credit. Taking each game in its own peculiar dialect of Basic and converting it to a "standard" Microsoft Basic was a huge task ably managed by Steve North. Thanks to the team of programmers involved in the conversion effort: Steven Neitz, Bruce Schaeffer, and Jeff Yuan.

## RESTRICTIONS

The programs in this book belong to **Creative Computing**. They are not in the public domain. Much as we like to be nice guys, we can not allow these programs to be distributed by non-profit user's groups, or sold in machinereadable format by other parties. You can do whatever you want with the games, but only for your own personal use.

# Contents



| Artillery-3      |  |
|------------------|--|
| Baccarat         |  |
| Bible Quiz       |  |
| Big 6            |  |
| Binary           |  |
| Blackbox         |  |
| Bobstones        |  |
| Bocce            |  |
| Bogall           |  |
| Bombrun          |  |
| Bridge-It        |  |
| Camel            |  |
| Chase            |  |
| Chuck-A-Luck     |  |
| Close Encounters |  |
| Column           |  |
| Concentration    |  |
| Condot           |  |
| Convoy           |  |
| Corral           |  |
| Countdown        |  |
| Cup              |  |
| Dealer X 5       |  |
| Deepspace        |  |
| Defuse           |  |
| Dodgem           |  |
| Doors            |  |
| Drag             |  |

 $\begin{array}{c} 2 \\ 4 \\ 6 \\ 7 \\ 9 \\ 10 \\ 12 \\ 14 \\ 16 \\ 18 \\ 24 \\ 26 \\ 29 \\ 30 \\ 32 \\ 34 \\ 38 \\ 40 \\ 43 \\ 44 \\ 48 \\ 49 \\ 52 \\ 53 \end{array}$ 

| Dr. Z             | 55  | 0  |
|-------------------|-----|----|
| Eliza             | 56  | 0  |
| Father            | 59  | Pa |
| Flip              | 61  | Pa |
| Four In A Row     | 63  | Pi |
| Geowar            | 64  | Ra |
| Grand Prix        | 66  | R  |
| Guess-It          | 69  | R  |
| ICBM              | 72  | Sa |
| Inkblot           | 73  | Sc |
| Joust             | 75  | Sc |
| Jumping Balls     | 77  | Se |
| Keno              | 78  | Se |
| LGame             | 80  | St |
| Life Expectancy   | 84  | Sr |
| Lissajous         | 88  | St |
| Magic Square      | 90  | Te |
| Man-Eating Rabbit | 92  | Ti |
| Maneuvers         | 94  | T١ |
| Mastermind ®      | 96  | Tv |
| Masterbagels      | 98  | Tv |
| Matpuzzle         | 99  | UF |
| Maze              | 101 | Ur |
| Millionaire       | 104 | Va |
| Minotaur          | 107 | W  |
| Motorcycle Jump   | 111 | W  |
| Nomad             | 112 | W  |
| Not One           | 115 | W  |
|                   |     |    |

| Obstacle           | 117 |
|--------------------|-----|
| Octrix             | 119 |
| Pasart             | 122 |
| Pasart 2           | 125 |
| Pinball            | 128 |
| Rabbit Chase       | 132 |
| Roadrace           | 133 |
| Rotate             | 135 |
| Safe               | 137 |
| Scales             | 139 |
| Schmoo             | 141 |
| Seabattle          | 143 |
| Seawar             | 150 |
| Shoot              | 153 |
| Smash              | 156 |
| Strike 9           | 158 |
| Tennis             | 160 |
| Tickertape         | 162 |
| TV Plot            | 163 |
| Twonky             | 164 |
| Two-to-Ten         | 167 |
| UFO                | 168 |
| Under & Over       | 170 |
| Van Gam            | 172 |
| Warfish            | 174 |
| Word Search Puzzle | 176 |
| Wumpus 1           | 178 |
| Wumpus 2           | 181 |

## Introduction

For most of my adult life I've pursued what some might consider a hopelessly disorganized diversity of projects. I've develor ad books, records, games and toys — and an occasiona. script or song — for the Children's Television Workshop (producers of Sesame Street and The Electric Company), and, on the side, I've written and edited satiric pieces for the National Lampoon and other publications. People often ask me if I think it's "sensible" to spread myself over so many media. "My activities really are all related," I answer, somewhat defensively. "At least somewhat..."

The truth is that it's the very variety of my work that's kept me interested and challenged. And, not coincidentally, I'm convinced that it's the unlikely mixture of media and people — of humor with curriculum content, of children's games with rock'n'roll music, of animation with phonics lessons; of child psychologists with puppeteers — that has made *Sesame Street* so vital, so exciting, and so successful.

One world that always *did* seem irrelevant to my pursuits, however, was computing. Oh sure, computers might store information, or generate lists of words recognizable to five-year-olds, or index research results, or handle accounts, or, of course, invade my privacy. In short, they might be a useful tool for *someone else* (probably someone pretty different from me). But computers as a *creative* medium—much less a medium I could actually feel comfortable with? Never!

Then, one day a few summers back, my wife, Genevieve—then an engineering student at Columbia showed me a book called *Basic Computer Games*, by David Ahl. To my amazement, it had funny pictures in it. It was full of *games* — many of them delightfully silly. And — wonder of wonders! — at least some of it (sample runs of the games, for example) was not hopelessly beyond my comprehension.

I was intrigued, and when, months later, I visited the Boston Children's Museum and actually got to play with a computer, I was hooked. The terminals at the museum played many of the games in David Ahl's book. What's more, they actually called me by name, and made humorous comments about my playing skill. After several hours of trying to land a capsule on the moon (only to be told that I'd created several hundred new craters, and that Neil Armstrong "did it right the first time"), I had to be dragged away from the keyboard — it was past closing time, the museum personnel insisted.

From that day on, the development of computer games — to entertain and to educate — has been a high priority activity for us at CTW. (As I write this, we're designing a prototype computer game center to open, near Philadelphia, in 1980 — a project in which David Ahl has taken a pioneering role). For the computer combines the possibility of fun, education, challenge, personalization, humor and — most important — *interaction*, in a way that no other medium can. Computers are infinitely patient, not minding (unless they're *programmed* to mind) if you take all day to respond to a question or move a game "piece". If there's something you don't understand, you don't have to be embarrassed to ask a computer for help. A computer can adjust the difficulty level of a game or activity to suit your ability — some programs even learn how to beat you as you continue to play against them. Armed with the proper software, a computer can play a song (or allow you to play one), paint a picture, write a poem or tell a story. Or it can plunge you into a whole new world, so you can learn by doing (or just escape, for a few moments, into a delightful fantasy).

The games in this, David Ahl's second collection, demonstrate many of these attributes. Try Camel, for example, in which you're left alone in the Gobi Desert with one guart of water and a bunch of Wild Berbers hot on your trail. (You'll learn something about resource management even if you don't escape to use your new knowledge.) Or type Concentration into the computer, and let your children perfect their matching and memory skills without showing you up. Become a starship captain and practice navigating a three-dimensional universe, in Maneuvers. Turn on Father so your kids can argue with the computer - instead of you - if they want to stay out late on Saturday night. Or - the ultimate trip - play Millionaire and start your whole life over again (complete with such decisions as what job to apply for, what investments to make, and what to do when an airplane crashes into your magnificent new home)!

The main point of all this is that whatever else computers are meant to be, they can be turned into magical multi-media machines that put *you* squarely in the center of the action. And, as Dave Ahl has continually demonstrated, they're an awful lot of fun.

Christopher Cerf

## The Basic Language

Be sure to read this section before entering any of the games in this book on your computer. It will save you time and minimize potential problems.

The games in this book were written by a wide cross section of people on a variety of computers over a tenyear period. Most of the games were originally written for time-sharing systems such as the DEC Timeshared 8 and RSTS-11, HP 2000, and CDC 3600.

The first edition of this book was originally published in the early 70's. All the programs were printed in their original dialect of Basic. One of the major functions of the book was to give computer users an opportunity to learn more about their own and other versions of Basic. For example, a dimensioned string variable such as A\$(I) had an entirely different meaning in DEC and HP Basics. The designers of each version of Basic had good reasons for doing what they did and it was (and is) very instructive to understand how different approaches work and their respective rationales.

In 1975, a small company in the telemetry business, M.I.T.S., introduced the first computer for hobbyists, the Altair 8800. This signaled the start of an immense new industry: personal computers. Ed Roberts, president of M.I.T.S., contracted with a small consulting company started by two bright young programmers to write a version of Basic for the Altair.

The name of the consulting company was Microsoft, and the Basic that Bill Gates and Paul Allen devised soon came to be known, appropriately enough, as Microsoft Basic. It was modeled on Basic-Plus, originally a creation of Nathan Teichholtz at Digital Equipment Corporation. Nathan is an unsung hero in the history of the Basic language and deserves a great deal of credit for this vastly improved version of the language. And in the kudos department, we must always remember to bow low to John Kemeny and Tom Kurtz of Dartmouth, the creators of the original Basic.

In any event, in 1977 it appeared that Microsoft Basic was fast becoming the standard Basic for microcomputers, and the programs in this book were all converted to Microsoft Basic, Revision 4.0. For about three years, this Basic truly was the standard.

However, three things conspired against it becoming the all-time standard. First, it was written for the 8080 (and Z80) microprocessor, and later mpu's had capabilities (and idiosyncrasies) that the 8080 did not have, hence, slight differences started creeping into Microsoft Basic on later computers.

Second, not all computer manufacturers wanted to contract with Microsoft to write Basic for their computers and so some wrote their own. This has led to some particularly interesting (and confusing) dialects of Basic.

Third, as computer hardware became more powerful

with 16-bit mpu's, special chips for graphics and sound, Winchester disk drives, modems, and other peripherals, various extensions and changes had to be made to the software. Some of these changes are in the operating system and are transparent to the user, but others affect the Basic language.

So, what you are holding is a book of thoroughly debugged programs that can be entered directly and will run perfectly on some computers, while on other computers they will not run at all. What can you do about it if you have a computer on which the programs will not run?

First, do not call or write us. You have paid less than a dime per program and, after everyone has taken his share, we have made less than 1 cent per program; for that, we can't afford to act as personal consultants.

Second, please keep in mind that every program runs perfectly in Microsoft Basic 4.0. The sample runs are not faked; they came off a real computer exactly as they appear. There are no typographical errors in the programs — misspellings maybe — but the functional code is absolutely correct.

Third, the early versions of the books had programs in 15 or 20 vastly different dialects of Basic, yet hundreds of thousands of purchasers managed to convert the programs to their machines and get them going.

The key to converting the programs is to understand how Microsoft Basic works compared with your Basic. While we cannot present an entire manual on Microsoft Basic, we have included in the next section information on the key elements of the language and those likely to be different in other implementations.

If direct conversion doesn't work, do some "reverse engineering," (as it known in the computer industry). This means taking apart a program and drawing a flowchart of the logic. With a flowchart in hand, you can then write your own program to do the same thing, but often faster and better.

Since many of the programs were originally written in what today would be considered a primitive version of Basic, there are many ways of substantially shortening and improving some of these programs.

You should also keep in mind that all of these programs were written on computers which used an ASR-33 Teletype terminal. These are massive clunkers with 72 (or 80) columns of output, upper case only, and no graphics capability whatsoever. Naturally, you will have to do a fair amount of reformatting if your computer has only 40 columns (Apple, etc.), 32 columns (Sinclair), 28 columns (TI), or 20 columns (Epson HX-20). It can be done; for another book, I converted Hammurabi, Lunar Lander, and Gunner, all of which use 72 columns, to all the computers mentioned above. The programs in this book use the following statements and functions in Microsoft Basic:

Statements DATA

DEF FNA(X)

DIM

END FOR..TO..(STEP)

GOSUB n GOTO n IF..THEN n

IF..THEN stmts

IF..THEN n ELSE m IF..THEN stmts ELSE stmts INPUT

LET

NEXT ON m GOSUB... ON m GOTO...

PRINT

READ

REM RESTORE

RETURN

STOP

Holds numeric or string data for a READ statement

Defines any function of X

Declares maximum size of string or numeric array. Array subscripting begins at 0 although many programs do not use the zero subscript.

Last statement in program

Executes a loop. The test for ending the loop is made after the loop has been executed. Upon exiting, the counter value equals the upper limit plus the step. For example,

10 FOR J=1 TO 3 20 PRINT "HI"

30 NEXT J

will print "HI" three times, and J will equal 4 when the loop is finished.

Branch to subroutine n

Branch to statement n

Branch to statement n if condition is true

Executes statements if condition is true. Drops to next numbered line if false.

Branch to n if true or to m if not true Does statements after THEN if true, stmts after ELSE if false

Requests data from keyboard. The prompt string is optional

Assigns value of expression to variable.

The word LET is optional Marks end of FOR loop

Branch to mth subroutine Branch to mth line no.

In these statements, m must be an integer starting at 1 and increasing by 1

Displays strings, constants and variables. Calculations can be done within a PRINT statement Moves values of DATA into variables

Remark. Does not execute Resets DATA pointer to first item in list Go to statement following last GOSUB

Terminate program

20 DATA 4,6,"AHL"

20 DEF FNA(X)=3\*X-2 20 DEF FNA(X)=SIN(X/57.3) 20 DIM A(50) 20 DIM A\$(25),B1\$(50)

9999 END 20 FOR I=1 TO 30 20 FOR J=2 TO N STEP 3

20 GOSUB 200 20 GOTO 50 20 IF A>1 THEN 50

20 IF Z<5 THEN A=1:PRINT B

20 IF X=Y THEN 50 ELSE 90 20 IF Z>R THEN X=1 ELSE X=2

20 INPUT N 20 INPUT "YES OR NO";Z\$ 20 LET A=1 20 Z\$="DRY"

20 NEXT J 20 ON X GOSUB 100,200 20 ON Y GOTO 50,80,120

20 PRINT "A=";A 20 PRINT Z\$,10\*A+B

20 READ N,X1,A\$

20 REMARKABLE PROGRAM 20 RESTORE

20 RETURN

20 STOP

| Functions      |  |
|----------------|--|
| ABS (X)        | Absolute value.  |
| ASC(X\$)       | Returns the ASCII value of the first<br>character in the string argument.<br>ASC("A") is 65,ASC("B") is 66, etc. |
| ATN(X)         | Arctangent   |
| CHR\$(X)       | Converts ASCII value to a char-<br>acter string. CHR\$(65) is "A", etc.<br>CHR\$(7) is a bell ring.              |
| COS(X)         | Cosine   |
| EXP(X)         | Value of e raised to the X power   |
| INT(X)         | Integer function   |
| LEFT\$(X\$,Y)  | The leftmost Y characters in X\$   |
| LEN(X\$)       | Number of characters in X\$  |
| LOG(X)         | Log of x to the base e   |
| MID\$(X\$,Y,Z) | Takes Z characters from X\$ start-<br>ing at position Y  |
| RND(1)         | Returns a random number be-<br>tween 0 and 1.  |
| RIGHT\$(X\$,Y) | The rightmost Y characters in X\$  |
| SGN(X)         | Sign function. Returns -1 if X is  |
|                | negative, 0 if x is zero, 1 if x is positive.  |
| SIN(X)         | Sine   |
| SQR(X)         | Square root  |
| STR\$(X)       | Converts X to a string of decimal digits, for example if X was 8.45 it would be converted to the string "8.45".  |
| TAB(X)         | Spaces over to position X on the terminal.   |
| TAN(X)         | Tangent  |
| VAL(X\$)       | Returns the numerical value of the string of digits in X\$. Opposite of STR\$(X).                                |
|                |  |

In Microsoft (Altair) BASIC, any expression may be evaluated as either true or false. A true condition will return a value of -1, and a false condition 0. Thus, if we say LET Q= -(X=Y), Q=1 if X=Y and Q=0 if X=Y. This logical evaluation of expressions is only used in the Hexapawn game in the user-defined function and with a little ingenuity could be replaced with a look-up table. A few other games use the logical AND and OR operators, which work in a straightforward manner.

The programs in this book were printed on a printer that uses a caret ( $\Lambda$ ) to indicate exponentiation. This is equivalent to an up arrow. Incidentally, exponentiation and taking roots are among the least accurate functions on small computers. For example, try this program.

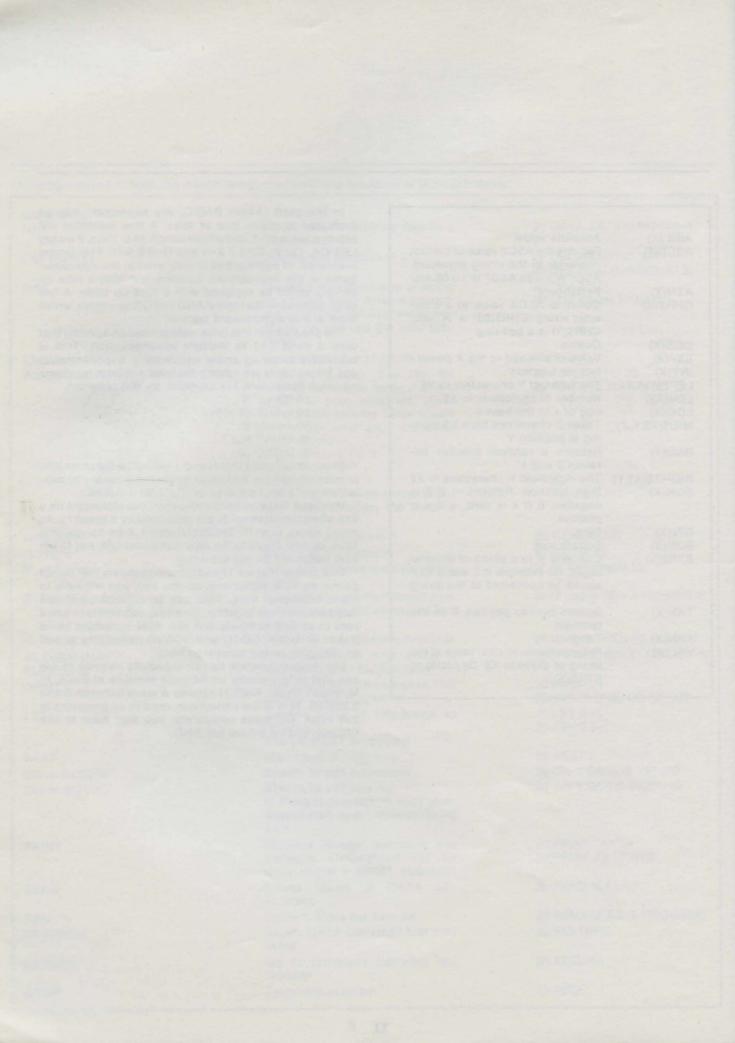
| 10 | INPUT N       |
|----|---------------|
| 20 | I=SQR(SQR(N)) |
| 30 | J=(112)12     |
| 40 | PRINT N,J     |
| 50 | GOTO 10       |

Chances are good that N and J will not be the same 25% or more of the time. You can improve the accuracy by substituting J\*J for J squared or J\*J\*J for J cubed.

Microsoft Basic permits more than one statement on a line when the statements are separated by a colon (:). As noted above, in an IF..THEN statement, if the condition is false, control drops to the next numbered line, not to the next statement on the same line.

This means that for TI and other computers that do not permit multiple statements on one line, you will have to insert additional lines. This may be difficult when line numbers are close together. One easy solution is to add a zero to all line numbers, but you must remember to do this in IF..THEN, GOTO and GOSUB statements as well as changing all the numbered lines.

The random function can be especially irksome as it is one that differs widely on different versions of Basic. In Microsoft Basic, RND(1) returns a value between 0 and 0.999999. This is the convention used in all programs in this book. On some computers, you may have to use RND(0), and on others just RND.





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In this game, two or three humans may play. Each one of them has an artillery piece and is firing at an opponent. The first person to destroy his opponent wins that round of the game. The parameters for distances and muzzle velocities of the artillery pieces are set at the beginning of the game. The shots are fired by giving a firing angle expressed in degrees from the horizontal.

In a three player game, you may elect which player you are firing at; hence player one and three could both be firing at player two. Once one of the players is eliminated, it becomes a two player game and the remaining two players fire at each other.

Personally, I would prefer to think of this game as lobbing mudpies or snowballs or custard cream pies or something non-destructive. However, it was originally written as shoot-'emup game so that's how it appears here.

This game was originally written by Mike Forman and further revised by N.E. Lyon and Brian West. It first appeared in *Creative Computing*, Jan/Feb 1976.

RUN

ARTILLERY 3 CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

WELCOME TO 'WAR3'. TWO OR THREE HUMANS MAY PLAY! Do you wish some assistance? Yes

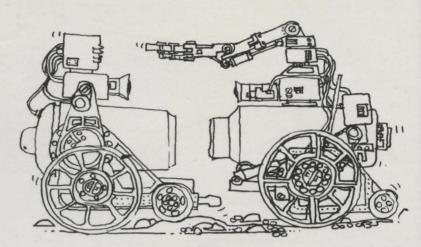
THIS IS A WAR GAME. TWO OR THREE PLAYERS ARE GIVEN (THEORETICAL) CANNONS WITH WHICH THEY ATTEMPT TO SHOOT EACH OTHER. THE PARAMETERS FOR DISTANCES AND MUZZLE VELOCITIES ARE SET AT THE BEGINNING OF THE GAME. THE SHOTS ARE FIRED BY GIVING A FIRING ANGLE, EXPRESSED IN DEGREES FROM HORIZONTAL

THE COMPUTER WILL KEEP TRACK OF THE GAME AND REPORT ALL MOVES. A 'HIT' IS SCORED BY FIRING A SHOT WITHIN 5% OF THE TOTAL DISTANCE FIRED OVER. GOOD LUCK

NO. OF PLAYERS? 3

| DISTANCE | (FT.) | 1 | TO | 2 | 7 | 1000 |  |
|----------|-------|---|----|---|---|------|--|
| DISTANCE | (FT.) | 2 | TO | 3 | ? | 2000 |  |
| DISTANCE | (FT.) | 3 | TO | 1 | ? | 2500 |  |

MUZZLE VELDCITY (FT./SEC.) DF 1 ? 300 MUZZLE VELDCITY (FT./SEC.) DF 2 ? 350 MUZZLE VELDCITY (FT./SEC.) DF 3 ? 400



ROUND 1

PLAYER 1 SHOOTING AT? 3 FIRING ANGLE? 68 YOU UNDERSHOT BY 545.227 FEET.

PLAYER 2 SHOOTING AT? 3 FIRING ANGLE? 79 YOU UNDERSHOT BY 566.253 FEET.

PLAYER 3 SHOOTING AT? 1 FIRING ANGLE? 80.5 YOU UNDERSHOT BY 872.861 FEET.

## ROUND 2

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 70 YOU OVERSHOT BY 808.207 FEET.

PLAYER 2 SHOOTING AT? 3 FIRING ANGLE? 84 YOU UNDERSHOT BY 1204.37 FEET.

PLAYER 3 SHOOTING AT? 1 FIRING ANGLE? 73 YOU OVERSHOT BY 294.324 FEET.

## ROUND 3

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 60 YOU OVERSHOT BY 1435.18 FEET.

PLAYER 2 SHOOTING AT? 3 FIRING ANGLE? 70 YOU OVERSHOT BY 460.307 FEET.

PLAYER 3 SHOOTING AT? 1 FIRING ANGLE? 76 YOU UNDERSHOT BY 153.305 FEET.

ROUND 4

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 74 YOU OVERSHOT BY 490.028 FEET.

PLAYER 2 SHOOTING AT? 3 FIRING ANGLE? 73 YOU OVERSHOT BY 140.66 FEET.

PLAYER 3 SHOOTING AT? 1 FIRING ANGLE? 72 YOU OVERSHOT BY 438.912 FEET.

## ROUND 5

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 76.5 YOU OVERSHOT BY 276.044 FEET.

PLAYER 2 SHOOTING AT? 3 FIRING ANGLE? 75 A HIT - 3 IS DEFUNCT.

## ROUND 6

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 78 YOU OVERSHOT BY 143.826 FEET.

PLAYER 2 SHOOTING AT? 1 FIRING ANGLE? 78 YOU OVERSHOT BY 557.79 FEET.

ROUND 7

PLAYER 1 SHOOTING AT? 2 FIRING ANGLE? 79.4 A HIT - 2 IS DEFUNCT.

8 PRINT TAB(22); "ARTILLERY 3"

GAME OVER. 1 WINS. OK

LIST

9 PRINT TAB(20); "CREATIVE COMPUTING" 10 PRINT TAB(18); "HORRISTOWN, NEW JERSEY" 11 PRINT:PRINT:PRINT 20 T=0 60 DIM V(3), X(3), P(3), R(3,3) 70 MAT V=ZER 80 MAT X=ZER 90 MAT P=ZER 100 MAT R=ZER 110 DATA 1,2,2,3,3,1,1,3,3,2,2,1,2,3,3,1,1,2,0 120 PRINT "WELCOME TO 'WAR3'. TWO OR THREE HUMANS MAY PLAY!" 130 PRINT "DO YOU WISH SOME ASSISTANCE": 140 INPUT AS 150 IF AS="YES" THEN 1310 160 PRINT "" 170 PRINT "NO. OF PLAYERS"; **180 INPUT N** 190 IF N=2 THEN 240 200 IF N=3 THEN 270 210 PRINT "ERROR--TWO OR THREE PLAYERS!" 220 PRINT 230 6010 140 240 N1=1 250 PRINT " 260 GOTO 290 270 N1=N 280 PRINT " 290 FOR J=1 TO N1 300 READ A,B 310 PRINT "DISTANCE (FT.) ";A;" TO ";B; 320 INPUT R(A,B) 330 R(B,A)=R(A,B) 340 NEXT J 350 PRINT "" 360 RESTORE 370 IF N=2 THEN 460 380 FOR J=1 TO N 390 READ A, B, C, D, E, F 400 IF R(A,B) <R(C,D)+R(E,F) THEN 440 410 PRINT "ERROR--ILLEGAL TRIANGLE. RE-ENTER RANGES." 420 RESTORE 430 GOTO 290 440 NEXT J 450 PRINT 460 FOR J=1 TO N 470 PRINT "HUZZLE VELOCITY (FT./SEC.) OF ";J; 480 INPUT V(J) 490 NEXT J 500 PRINT "" 510 FOR J=1 TO N

520 X(J)=V(J)^2/32 530 NEXT .I 540 FOR A=1 TO N 550 FOR B=1 TO N 560 IF X(A)>R(A,B) THEN 610 570 PRINT "ERROR--";A;" CANNOT REACH ";B 580 PRINT "WHAT IS THE MUZZLE VELOCITY OF ";A; 590 INPUT V(A) 600 GDTD 510 610 NEXT B 620 NEXT A 630 N1=N 640 PRINT "" 650 PRINT "" 660 PRINT "ROUND ":T+1 670 PRINT 680 FOR M=1 TO N 690 IF N=3 THEN 750 700 C=1 710 IF M<> 1 THEN 730 720 C=2 730 PRINT "PLAYER ";M;" SHODTING AT ";C 740 GOTO 890 750 IF P(H)=12 THEN 1280 760 PRINT "PLAYER "; M; "SHOOTING AT"; 770 INPUT C 780 ON C 60TO 830,830,830 810 PRINT "ERROR--PLAYERS DESIGNATED 1,2,3." 820 GOTO 760 830 IF C<> M THEN 860 840 PRINT "ERROR--CANNOT SHOOT SELF." 850 GOTO 760 860 IF P(C) <> 12 THEN 890 870 PRINT "ERROR-- ";C;" IS DEFUNCT" 880 GOTO 760 890 PRINT "FIRING ANGLE"; 900 INPUT A3 910 IF A3<0 THEN 940 920 IF A3>180 THEN 940 930 GOTO 970 940 PRINT "ERROR--FIRED INTO GROUND. ";M;" NOW DEFUNCT." 950 P(M)=12 960 GOTO 760 970 IF A3<90 THEN 1000 980 PRINT "ERROR--FIRED WRONG WAY, LOSE SHOT." 990 GOTO 760 1000 Z=SIN(A3\*3.49064E-02)\*V(M)^2/32 1010 X=(R(M,C)/1000\*RND(1))-(R(M,C)/1000\*RND(1)) 1020 D=X+Z 1030 D1=R(M,C)\*.05 1040 IF D<D1 THEN 1080 1050 IF ABS(D-R(H,C))<D1 THEN 1110 1060 IF D<R(H,C) THEN 1140 1070 IF D>R(H,C) THEN 1160 1080 PRINT " TOO CLOSE- ";M;" IS DEFUNCT." 1090 P(M)=12 1100 GOTO 1180 1110 PRINT " A HIT - ";C;" IS DEFUNCT." 1120 P(C)=12 1130 GOTO 1180 1140 PRINT " YOU UNDERSHOT BY ";ABS(D-R(M,C));" FEET." 1150 GOTO 1270 1160 PRINT " YOU OVERSHOT BY ";ABS(D-R(M,C));" FEET." 1170 GOTO 1270 1180 N1=N1-1 1190 IF N1>1 THEN 1270 1200 FOR M1=1 TO N 1210 IF P(M1)=12 THEN 1250 1220 PRINT 1230 PRINT "GAME OVER. ";M1;" WINS." 1240 GOTO 1430 1250 NEXT M1 1260 STOP 1270 PRINT "" 1280 NEXT M 1290 T=T+1 1300 GOTO 650 1310 PRINT 1320 PRINT "THIS IS A WAR GAME. TWO OR THREE PLAYERS ARE GIVEN" 1330 PRINT "(THEORETICAL) CANNONS WITH WHICH THEY ATTEMPT TO SHOOT EACH" 1340 PRINT "OTHER. THE PARAMETERS FOR DISTANCES AND MUZZLE VELOCITIES AR E\* 1350 PRINT "SET AT THE BEGINNING OF THE GAME. THE SHOTS ARE FIRED BY" 1360 PRINT "GIVING A FIRING ANGLE, EXPRESSED IN DEGREES FROM HORIZONTAL" 1370 PRINT 1380 PRINT "THE COMPUTER WILL KEEP TRACK OF THE GAME AND REPORT ALL" 1390 PRINT "HOVES. A 'HIT'IS SCORED BY FRING A SHOT WITHIN 5% OF THE" 1400 PRINT "TOTAL DISTANCE FIRED OVER. GOOD LUCK" 1410 PRINT "" 1420 GOTO 160 1430 END DK



Games of the baccarat and chemin de fer family originated in the baccarat that became popular in the French casinos in the 1830's. In the present century they have travelled from Europe to the United States, back to Europe, and to casinos throughout the world. This process has resulted in wide variations in playing rules and what is called "baccarat" in one casino may more nearly resemble the "chemin de fer" of another.

The computer game here is more nearly chemin de fer than it is baccarat. The rules, briefly, are as follows: Eight packs of cards are shuffled together and placed in a "shoe" from which the cards can be slid out one by one. Following this, the players make their bets. Any player may make any bet up to the amount of the bank. The player at the banker's right has the first choice to bet. Any part of the bank he does not take may be bet by the next player on his right, and so on in order until the entire bank is covered or until everyone has bet who wishes to. Any player may take the entire bank by saying, "Banco," but when two or more players wish to banco, the one nearest the banker's right has the privilege.

After the bets are placed, the banker deals two hands of two cards each, dealing one card at a time. The hand he deals first represents all the players betting against him; the other hand is the banker's. The player who has made the largest bet against the banker plays the opposition hand.

The object of the game is to hold two or three cards which count nine (9), or as nearly nine as possible. The values of the cards are: face cards and tens, zero; aces, one each; any other card, its number. Units of ten points are disregarded, so that nine plus seven count as six, not sixteen.

A player whose card is nine or eight in his first two cards shows his hand immediately. He has a natural and his hand wins (but a natural nine beats a natural eight). Naturals of the same number tie, and there is a new deal.

When the result is not decided by a natural, the banker must give a card to his opponent on request; or the opponent may stand. The opponent must stand on six or seven, must draw to a zero, one, two, three, or four, but has the option on five. The additional card, if given, is face up.

Then the banker decides whether to stand or take a card

| IF BANKER GIVES  | BANKER STANDS ON  | BANKER DRAWS TO     |
|------------------|-------------------|---------------------|
| Face card or ten | 4, 5, 6, 7        | 3, 2, 1, 0          |
| Nine             | 4, 5, 6, 7 (or 3) | 2, 1, 0 (or 3)      |
| Eight            | 3, 4, 5, 6, 7     | 2, 1, 0             |
| Seven or six     | 7                 | 6, 5, 4, 3, 2, 1, 0 |
| Five or four     | 6, 7              | 5, 4, 3, 2, 1, 0    |
| Three or two     | 5, 6, 7           | 4, 3, 2, 1, 0       |
| Ace              | 4, 5, 6, 7        | 3, 2, 1, 0          |
| Opponent stands  | 6, 7              | 5, 4, 3, 2, 1, 0    |

Neither player may have more than one additional card, giving him three cards at the most. When each player has exercised his option, the cards are shown. If the totals are the same, the bets are off and may be withdrawn and new bets are placed exactly as before for another deal. If the opponent has a higher number than the banker's, each

player collects such portion of the bank as he has covered.

In the game of chemin defer, the role of banker rotates among the players after each hand; in baccarat, it does not.

RIIN

BACRAT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

## BACCARAT -- CHEMIN DE FER

## DO YOU NEED INSTRUCTIONS? YES

BACCARAT IS A VERY POPULAR GAME IN LAS VEGAS. THE PLAYER AND BANKER EACH RECEIVE TWO CARDS FROM A 'SHOE' CONTAINING 8 DECKS ALL CARD COMBINATIONS TOTALING OF CARDS. TEN ARE NOT COUNTED. THE ONE THAT ENDS UP CLOSER TO NINE WINS. THE STAKES ARE HIGH, ALL OF THE PLAYERS START WITH TEN THOUSAND DOLLARS. YOU CAN BET ON THE DEALER OR THE PLAYER. A THIRD CARD IS GIVEN ONLY UNDER CERTAIN CONDITIONS, AS YOU WILL SEE. LET US BEGIN. GOOD LUCK!

HOW MANY PLAYERS? 1 WHAT IS THE NAME OF PLAYER 1 ? STEVE STEVE HAS \$ 10000 . BET? (1) BANKER OR (2) PLAYER? 1 BET7 500

BANKER PLAYER FOUR OF SPADES FOUR OF SPADES EIGHT OF HEARTS NINE OF DIAMONDS PLAYER MUST DRAW. ACE OF SPADES PLAYER CANNOT DRAW. PLAYERS TOTAL: 4

BANKER MUST DRAW. FIVE OF DIAMONDS BANKERS TOTAL: 7

BANKER WINS!! STEVE WINS \$ 500 , FOR A TOTAL OF \$ 10500 . STEVE HAS \$ 10500 . BET? 1000 (1) BANKER OR (2) PLAYER? 2

BANKER PLAYER FOUR OF CLUBS FOUR OF DIAMONDS KING OF HEARTS SEVEN OF SPADES PLAYER MUST DRAW. TWD OF HEARTS PLAYER CANNOT DRAW. PLAYERS TOTAL: 3

BANKER MUST DRAW. KING OF DIAMONDS BANKERS TOTAL: 4

BANKER WINS!! STEVE LOSES \$ 1000 , FOR A TOTAL OF \$ 9500 .

----- NEW GAME -----

STEVE HAS \$ 9500 . BET? 9400 (1) BANKER DR (2) PLAYER? 2

BANKER PLAYER TWO OF CLUBS JACK OF CLUBS JACK OF DIAMONDS FIVE OF CLUBS PLAYER MUST DRAW. JACK OF HEARTS PLAYER CANNOT DRAW. PLAYER TOTAL: 5

BANKER HUST DRAW. THREE OF DIAMONDS BANKERS TOTAL: 5

IT'S A TIE. THE HAND IS PLAYED OVER. STEVE HAS \$ 9500 . BET? 9400 (1) BANKER OR (2) PLAYER? 2

10 PRINT TAB(26);"BACRAT" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"HORRISTOWN, NEW JERSEY":PRINT:PRINT:PRINT 40 PRINT"BACCARAT -- CHEMIN DE FER" 50 PRINT 60 PRINT"DO YOU NEED INSTRUCTIONS"; 70 INPUT QS 80 IF Q\$<>"YES" THEN 210 BACCARAT IS A VERY POPULAR GAME IN LAS" 90 PRINT" 100 PRINT"VEGAS. THE PLAYER AND BANKER EACH RECEIVE" 110 PRINT"TWO CARDS FROM A 'SHOE' CONTAINING 8 DECKS" 120 PRINT"OF CARDS. ALL CARD COMBINATIONS TOTALING" 130 PRINT"TEN ARE NOT COUNTED. THE ONE THAT ENDS UP" 140 PRINT"CLOSER TO NINE WINS. THE STAKES ARE HIGH," 140 PRINT"CLOSER ID NINE WINS. THE STARES ARE HIGH," 150 PRINT"ALL OF THE PLAYERS START WITH TEN THOUSAND" 160 PRINT"DOLLARS. YOU CAN BET ON THE DEALER OR THE" 170 PRINT"PLAYER. A THIRD CARD IS GIVEN ONLY UNDER" 180 PRINT"CERTAIN CONDITIONS, AS YOU WILL SEE. LET" 190 PRINT"US BEGIN. GOOD LUCK!" 200 PRINT 210 DIM M(20), F1(20), F(20), B\$(13), V(13), G\$(20) 220 DIM Z(9,10),Q(4,13) 240 FOR X=3 TO 6 250 FOR Y=1 TO 10 260 READ Z(X,Y) 270 NEXT Y,X 280 FOR S1=1 TO 10:READ W(S1):NEXT 283 FOR S1=1 TO 4:READ A\$(S1):NEXT 285 FOR S1=1 TO 13:READ B\$(S1):NEXT 287 FOR S1=1 TO 13:READ V(S1):NEXT 290 PRINT 300 PRINT"HOW MANY PLAYERS": 310 INPUT P1 320 FOR J=1 TO P1 330 PRINT"WHAT IS THE NAME OF PLAYER"J; 340 INPUT G\$(J) 350 M(J)=10000 360 NEXT J 370 FOR S1=1 TO 4 373 FOR S2=1 TO 13 375 @(\$1,\$2)=0 377 NEXT S2 379 NEXT S1 380 FOR J=1 TO 6 390 C=INT(1+RND(1)\*4)

400 D=INT(1+RND(1)\*13) 410 Q(C,D)=Q(C,D)+1 420 IF Q(C,D)>=32 THEN 390 430 R(1)=U(D) 440 C\$(J)=B\$(D)+" OF "+A\$(C) 450 NEXT J 460 11=2 470 FOR J=1 TO P1 480 IF M(J)<1 THEN 580 490 PRINT G\$(J)" HAS \$"M(J)". BET"; 500 INPUT F(J) 510 IF F(J)>M(J) THEN 490 520 IF F(J) (>INT(F(J)) THEN 490 530 IF F(J)<1 THEN 490 540 PRINT"(1) BANKER OR (2) PLAYER"; 550 INPUT F1(J) 560 IF F1(J)>=1000 THEN 490 570 IF (F1(J)-1)\*(F1(J)-2) >0 THEN 540 580 NEXT J 590 .1=0 600 T1=B(1)+B(2) 610 T2=B(3)+B(4) 620 PRINT 630 PRINT"BANKER"TAB(20)"PLAYER" 640 PRINT C\$(3)TAB(20)C\$(1) 650 PRINT C\$(4)TAB(20)C\$(2) 660 IF T1<10 THEN 680 670 T1=T1-10 680 IF T2<10 THEN 700 690 T2=T2-10 700 IF W(T1+1)=0 THEN 770 710 PRINT"PLAYER MUST DRAW." 720 PRINT C\$(5) 730 T1=T1+B(5) 740 IF T1<10 THEN 770 750 T1=T1-10 760 GOTO 790 770 PRINT"PLAYER CANNOT DRAW." 780 J=11 790 PRINT"PLAYERS TOTAL:"T1 800 PRINT 810 IF T2<3 THEN 870 820 IF T2>6 THEN 930 830 IF J<>11 THEN 860 840 IF T2=6 THEN 930 850 GOTO 870 860 IF Z(T2,B(5)+1)=0 THEN 930 870 PRINT"BANKER MUST DRAW." 880 PRINT C\$(6) 890 T2=T2+B(6) 900 IF T2<10 THEN 920 910 T2=T2-10 920 GOTO 940 930 PRINT"BANKER CANNOT DRAW." 940 PRINT"BANKERS TOTAL:"T2 950 PRINT 960 IF T2<>T1 THEN 990 970 PRINT"IT'S A TIE. THE HAND IS PLAYED OVER." 980 GOTO 380 990 IF T2<T1 THEN 1030 1000 W1=1 1010 PRINT"BANKER WINS!!" 1020 GDTD 1040 1030 PRINT"PLAYER WINS!!" 1040 FOR J=1 TO P1 1050 IF M(J) <= 0 THEN 1130 1060 PRINT 6\$(J)" " 1070 IF F1(J)=W1 THEN 1110 1080 M(J)=M(J)-F(J) 1090 PRINT"LOSES \$"F(J)", FOR A TOTAL OF \$"H(J)"." 1100 GOTO 1130 1110 M(J)=M(J)+F(J) 1120 PRINT"WINS \$"F(J)", FOR A TOTAL OF \$"M(J)"." 1130 NEXT J 1140 FOR J=1 TO P1 1150 IF M(J)<>0 THEN 1190 1160 NEXT J 1170 PRINT"THANK YOU FOR YOUR MONEY, AND "; 1180 GOTO 1320 1190 PRINT 1200 PRINT"----- NEW GAME -----" 1210 PRINT 1220 FOR X=1 TO 4 1230 FOR Y=1 TO 13 1240 IF Q(X,Y)<>8 THEN 380 1250 NEXT Y,X 1260 GOTO 370 1270 DATA 1,1,1,1,1,1,1,1,0,1,0,0,1,1,1,1,1,1,0,0 1300 DATA CLUBS, ACE, TWO, THREE, FOUR, FIVE, SIX, SEVEN, EIGHT 1310 DATA NINE, TEN, JACK, QUEEN, KIN6, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, 0, 0, 0 1320 PRINT"THANK YOU FOR PLAYING."

1330 END

## **Bible Quiz**

BIBLE QUIZ is a program which administers up to 25 questions about the Bible to the user. If the answer given to a question is correct, the program proceeds to the next question. If an incorrect answer is given, the program gives the correct answer. In either case, the biblical reference is given.

Note that Statements 124 to 296 could serve as the basis for any type of CAI dialogue with instructions preceeding Statement 124 and the questions and answers in the data statements.

This program was written by Steve Wentworth of Muskingum College. It originally appeared in *Creative Computing*, Mar/Apr 1977.

> BIBLE QUIZ CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS GAME IS A QUIZ WHICH TESTS YOUR KNOWLEDGE OF BIBLICAL EVENTS, PLACES, AND PERSONS.

I WILL ASK YOU A QUESTION AND THEN WAIT FOR YOUR ANSWER. IF YOUR ANSWER IS CORRECT I WILL PROCEED TO THE MEXT QUESTION. IF YOUR ANSWER IS INCORRECT I WILL GIVE YOU THE CORRECT ANSWER AND THEN PROCEED TO THE NEXT QUESTION.

ALL ANSWERS ARE ONE WORD. ALL ANSWERS MUST BE CORRECTLY SPELLED. THERE IS A TOTAL OF 25 QUESTIONS. HOW MANY QUESTIONS DO YOU WISH TO TRY? 7

## QUESTION # 1

WHAT SONG-COMPOSER IS CREDITED WITH 1005 SONGS? SOLOHON CORRECT ANSWER--VERY GOOD! 1 KINGS 4:32

QUESTION # 2

WHAT BLIND MAN KILLED THREE THOUSAND AT A RELIGOUS FEAST? SAMSON CORRECT ANSWER--VERY GOOD! JUDGES 16:23-30

QUESTION # 3

WHO KILLED HIS BROTHER FOR HUMBLING HIS SISTER? ABSALOM CORRECT ANSWER--VERY GOOD! 2 SAM. 13

QUESTION # 4

WHAT BOY HAD A VARIEGATED COAT? JOSEPH CORRECT ANSWER--VERY GOOD! GEN. 37:3

## QUESTION # 5

WHO CLIMBED A TREE TO SEE JESUS? ZACCHAEUS CORRECT ANSWER--VERY GOOD! LUKE 19:4

## QUESTION # 6

WHO SET FIRE TO THREE HUNDRED FOXES TAILS? SAMSON CORRECT ANSWER--VERY GOOD! 1 JUDGES 15:4,5

QUESTION # 7

WHAT CITY IS CALLED THE CITY OF PALM TREES? BABEL INCORRECT ANSWER THE CORRECT ANSWER IS JERICHO. DUET. 34:3

OUT OF 7 QUESTIONS YOU ANSWERED 6 CORRECTLY. YOUR PERCENTAGE FOR CORRECT ANSWERS IS 86  $\chi$ 

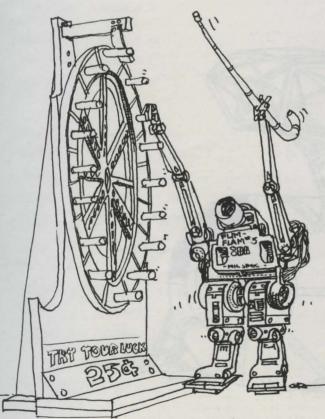
5 PRINT TAB(24);"BIBLE QUIZ" 6 PRINT TAB(20);"CREATIVE COMPUTING" 7 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 9 PRINT:PRINT:PRINT 10 PRINT "THIS GAME IS A QUIZ WHICH TESTS " 20 PRINT "YOUR KNOWLEDGE OF BIBLICAL EVENTS, PLACES, " 30 PRINT "AND PERSONS." 40 PRINT 50 PRINT "I WILL ASK YOU A QUESTION AND THEN WAIT " 60 PRINT "FOR YOUR ANSWER. IF YOUR ANSWER IS CORRECT " 70 PRINT "I WILL PROCEED TO THE NEXT QUESTION. IF YOUR " 80 PRINT "ANSWER IS INCORRECT I WILL GIVE YOU THE " 90 PRINT "CORRECT ANSWER AND THEM PROCEED TO THE 100 PRINT "NEXT QUESTION." 110 PRINT 118 PRINT "ALL ANSWERS ARE ONE WORD." 119 PRINT "ALL ANSWERS MUST BE CORRECTLY SPELLED." 120 PRINT "THERE IS A TOTAL OF 25 QUESTIONS." 122 PRINT "HOW MANY QUESTIONS DO YOU WISH TO TRY"; 124 INPUT N 130 PRINT 135 DIM S(25) 140 C=0 142 N1=0 145 RESTORE 150 IF C=N THEN 290 160 C=C+1 162 PRINT 170 PRINT "QUESTION #":C 180 PRINT 183 X=INT(RND(1)+25+1) 184 IF S(X)=1 THEN 183 185 S(X)=1 186 FOR G=1 TO X:READ D\$,A\$,V\$:NEXT Q 210 PRINT Q\$; 220 INPUT RS 230 IF RS=AS THEN 270 240 PRINT "INCORRECT ANSWER" 250 PRINT "THE CORRECT ANSWER IS ";A\*;". ";V\* 260 GOTO 145 270 PRINT "CORRECT ANSWER--VERY GOOD! ";V\$ 272 N1=N1+1 280 GOTO 145 290 PRINT 292 PRINT "OUT OF ";N;" QUESTIONS YOU ANSWERED";N1;" CORRECTLY." 294 P=INT((N1/N)+100+.5) 296 PRINT "YOUR PERCENTAGE FOR CORRECT ANSWERS IS";P;"%" 301 DATA "WHO SET FIRE TO THREE HUNDRED FOXES TAILS", "SAMSON" 302 DATA "1 JUDGES 15:4,5" 303 DATA "WHAT HEBREW SERVED A QUICK LUNCH UNDER A TREE" 304 DATA "ABRAHAM"," GEN. 18:6-8" 305 DATA "WHAT HUNGRY MAN CURSED A FRUITLESS FIG TREE", "JESUS" 306 DATA " MARK 11:12-14" 307 DATA "WHO KILLED HIS BROTHER FOR HUMBLING HIS SISTER" 308 DATA "ABSALON","2 SAN. 13" 309 DATA "WHO HAD THREE HUNDRED CONCUBINES","SOLOMON","1 KINGS 11:1-3" 310 DATA "WHAT BOY HAD A VARIEGATED COAT", "JOSEPH"," SEN. 37:3" 311 DATA "WHO HAD A SEAMLESS COAT", "JESUS"," JOHN 19:23" 312 DATA "WHO TOOK OFF HIS SHOE TO BIND A CONTRACT", "BOAZ", "RUTH 4:7-9 313 DATA "WHO SLEPT ON AN IRON BEDSTEAD OVER THIRTEEN FEET LONG" 314 DATA "06"," DUET. 3:11" 315 DATA "WHO WAS THE FIRST CITY-BUILDER", "CAIN"," GEN. 4:17" 316 DATA "WHAT PHYSICIAN WAS AN AUTHOR", "LUKE"," COL. 4:14" 317 DATA "WHAT SONG-COMPOSER IS CREDITED WITH 1005 SONGS", "SOLOHON" 318 DATA "1 KINGS 4:32" 319 DATA "WHO WAS THE FIRST PERSON KILLED", "ABEL"," GEN. 4:8" 320 DATA "WHO WAS BURIED IN A CAVE WITH HIS WIFE", "ABRAHAM" 321 DATA " GEN. 25:9-10" 322 DATA "WHO ACCIDENTLY HANGED HIMSELF IN A TREE", "ABSALOH" 323 DATA "2 SAM. 18:9" 324 DATA "WHAT BLIND HAN KILLED THREE THOUSAND AT A RELIGOUS FEAST" 325 DATA "SAMSON"," JUDGES 16:23-30" 325 DATA "SAASUM"," JUDGES 16:23-30" 326 DATA "WHAT WAS THE NAME OF THE FIRST CITY EVER BUILT" 327 DATA "ENOCH"," GEN. 4:17" 328 DATA "WHO WAS A MIGHTY HUNTER","NINROD"," GEN. 10:9-12" 329 DATA "WHO DROVE FURIOUSLY","JEHU","2 KINGS 9:20" 330 DATA "WHO DROVE FURIOUSLY","JEHU","2 KINGS 9:20" 330 DATA "WHO VAS THE FIRST CHRISTIAN MARTYR","STEPHEN"," ACTS 7" 331 DATA "WHO FELL ASLEEP DURING A LONG SERMON","EUTYCHUS" 332 DATA " ACTS 20:9" 333 DATA "WHAT CITY IS CALLED THE CITY OF PALM TREES", "JERICHO" 334 DATA " DUET. 34:3" 335 DATA "WHO CLIMBED A TREE TO SEE JESUS", "ZACCHAEUS", " LUKE 19:4" 336 DATA "WHO KILLED GOLIATH", DAVID", "1 SAN. 17:49" 337 DATA "WHO WAS CAST INTO A DEN OF LIONS", "DANIEL"," DAN. 6:16" 400 END



Big 6 is strictly an American invention from the casinos of Nevada. There is a very large wheel mounted vertically, generally four feet or more in diameter, that has the numbers one through six in a random arrangement around its periphery. Players place their bets on a roulette type of table in front of the wheel. The wheel is then spun and three numbers are declared the winners. These are the three numbers that appear at the top of the wheel. Most novice players looking at the wheel think that since there are three winners they have a very good chance of winning a large sum of money. Betting limits are generally up to \$500 and, as many players discover very quickly, the odds are very heavily in favor of the house.

If you feel that you must play Big 6, try it by computer first and then figure out how much you can afford to lose when you go to play it in Las Vegas or Atlantic City. The computer is a much better sport when you lose than the casino managers will be at either of those resort cities.

Big 6 was written by Steve Heywood and Dave Alvey.



BIG6 CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM IS A DICE WHEEL GAME IN WHICH YOU CAN BET OM ANY NUMBER BETWEEN OME AND SIX AND UP TO THREE NUMBERS. THE HOUSE LIMIT IS FROM \$1 TO \$500!! TO END THIS PROGRAM TYPE THE WORD 'STOP'. GOOD LUCK!

HOW MANY NUMBERS BO YOU WANT TO BET ON? 1 What Number? 4 Wader? 10 The Lucky Numbers are: 3 3 6 You Lose om: 4 You/Re Behind \$-10

HOW MANY NUMBERS DO YOU WANT TO BET ON? 2 WHAT TWO NUMBERS? 2,4 WAGER ON BOTH? 5,10 THE LUCKY NUMBERS ARE: 1 5 6 You Lose ON: 2 You Lose ON: 4 You're Behind 5-25

HOW MANY NUMBERS DO YOU WANT TO BET ONT 3 What Three Numberst 1,3,3 Wager on Each of The Three? 5,5,5 The Lucky Numbers Are: 1 & 6 You Win 1 Times On: 1 You Lose On: 3 You Lose On: 5 You're Behind \$-30

HOW MANY NUMBERS DO YOU WANT TO BET ON? 2 WHAT TWO NUMBERS? 1,3 WAGER ON BOTH? 10,10 THE LUCKY NUMBERS ARE: 1 4 6 You win 1 Times On: 1 You win 1 Times On: 1 You Lose DN: 3 You're behind \$-30

HOW MANY NUMBERS DO YOU WANT TO BET ON? 1 What Number? 4 Wader? 100 The Lucky Numbers Are: 4 5 6 You win 1 times on: 4 You gamma and 5 70

HOW MANY NUMBERS DO YOU WANT TO BET ON? 2 WHAT TWO NUMBERS? 2,4 WAGER ON BOTH? 23,25 The Lucky numbers are: 4 6 6 You Lose ON: 2 You U.Se ON: 2 You Win 1 TIMES ON: 4 YOU'RE AHEAD \$ 70

HOW MANY NUMBERS DO YOU WANT TO BET ON? 3 WHAT THREE NUMBERS? 1,2,3 WAGER ON EACH OF THE THREE? 10,10,20 THE LUCKY NUMBERS ARE: 3 4 6 YOU LOSE ON: 1 YOU LOSE ON: 2 YOU WIN 1 TIMES ON: 3 YOU'RE AMEAD \$ 70

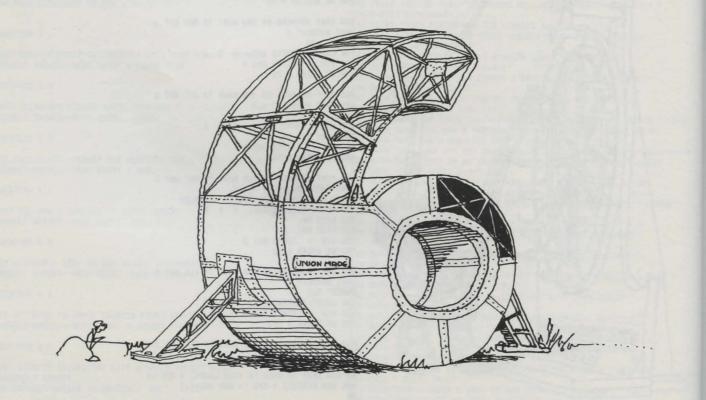
HOW MANY NUMBERS DO YOU WANT TO BET ON? 1 WHAT NUMBER? 4 WAGER? 500 The Lucky Numbers Are: 1 4 5 You Wim 1 Times ON: 4 You Yre Ahead \$ 570

HOW MANY NUMBERS DO YOU WANT TO BET ON? STOP

SO YOU WANT TO CASH IN YOUR CHIPS, I SEE!!! YOU WON EXACTLY \$ 570 !! NOT BAD !!! Ok

```
LIST
1 PRINT TAB(27);"BIG6"
2 PRINT TAB(20); "CREATIVE COMPUTING"
3 PRINT TAB(18); "MORRISTOWN, NEW JERSEY"
4 PRINT:PRINT:PRINT
10 PRINT " THIS PROGRAM IS A DICE WHEEL GAME IN WHICH"
20 PRINT "YOU CAN BET ON ANY NUMBER BETWEEN ONE AND SIX"
30 PRINT "AND UP TO THREE NUMBERS."
40 PRINT " THE HOUSE LIMIT IS FROM $1 TO $500!!"
50 PRINT "TO END THIS PROGRAM TYPE THE WORD 'STOP'."
60 PRINT "GOOD LUCK!"
65 PRINT:PRINT
67 DIM S(3)
70 GOTO 90
80 PRINT "YOU CANNOT BET ON LESS THAN ONE OR MORE THAN THREE NUMBERS."
90 PRINT "HOW MANY NUMBERS DO YOU WANT TO BET ON";
100 INPUT NS: IF NS="STOP" THEN 3360
110 N=VAL(N$)
120 IF N=2 THEN 370
130 IF N=3 THEN 600
140 IF N>3 OR N<1 THEN 80
190 PRINT "WHAT NUMBER";
200 INPUT V
210 IF V<=6 OR V>=1 THEN 260
240 PRINT "YOU CAN ONLY BET ON AN INTEGER FROM ONE TO SIX."
250 GOTO 190
260 PRINT "WAGER":
270 INPUT F
280 IF F<=500 OR F >=1 THEN 330
310 PRINT "THE HOUSE LIMIT IS FROM $1 TO $500."
320 GOTO 260
330 GOSUB 1870
340 S2=V:S3=F:GOSUB 2060
360 GOTO 3260
370 PRINT "WHAT TWO NUMBERS";
380 INPUT V,P
390 IF V<=6 DR V>=1 DR P<=6 DR P>=1 THEN 460
440 PRINT "YOU CAN ONLY BET ON AN INTEGER FROM ONE TO SIX."
450 GOTO 370
460 PRINT "WAGER ON BOTH";
470 INPUT F,I
480 IF F<=500 DR F>=1 DR I<=500 DR I>=1 THEN 550
530 PRINT "THE HOUSE LIMIT IS FROM $1 TO $500."
540 GOTO 460
550 GOSUB 1870
560 S2=V:S3=F:60SUB 2060
570 S2=P:S3=1:GOSUB 2060
590 GOTO 3260
```

```
600 PRINT "WHAT THREE NUMBERS";
610 INPUT V,P,S
620 IF V<=6 OR V>=1 OR P<=6 OR P>=1 OR S<=6 OR S>=1 THEN 710
690 PRINT "YOU CAN ONLY BET ON AN INTEGER FROM ONE TO SIX."
700 BOTD 600
710 PRINT "WAGER ON EACH OF THE THREE":
720 INPUT F,I,J 730 IF F<=500 OR F>=1 DR I<=500 DR I>=1 DR J<=500 DR J>=1 THEN 820
800 PRINT "THE HOUSE LIMIT IS FROM $1 TO $500."
810 GOTO 710
820 GOSUB 1870
830 S2=V:S3=F:GOSUB 2060
840 S2=P:S3=I:GOSUB 2060
850 S2=S:S3=J:GOSUB 2060
870 GOTO 3260
1870 X=-1
1880 A=INT(6*RND(1)+1):B=INT(6*RND(1)+1):C=INT(6*RND(1)+1)
1890 S(1)=A:S(2)=B:S(3)=C
1900 FOR Y=1 TO 2
1910 FOR X=1 TO 3-Y
1920 IF S(X) <= S(X+1) THEN 1940
1930 TE=S(X):S(X)=S(X+1):S(X+1)=TE
1940 NEXT X:NEXT Y
1950 PRINT "THE LUCKY NUMBERS ARE: "S(1):S(2):S(3)
1960 RETURN
2060 C1=0
2070 IF S2=A THEN C1=C1+1
2080 IF S2=B THEN C1=C1+1
2090 IF S2=C THEN C1=C1+1
2100 IF C1>0 THEN 2130
2110 $3=$3*(-1)
2120 PRINT "YOU LOSE ON: ";$2:60T0 2150
2130 S3=S3*C1
2140 PRINT "YOU WIN ";C1;" TIMES ON: "S2
2150 #=#+$3
2160 RETURN
3260 IF W=0 THEN PRINT "YOU'RE EVEN!!":PRINT:GOTO 90
3270 IF W>O THEN PRINT "YOU'RE AHEAD $";W:PRINT:GOTO 90
3280 IF W<O THEN PRINT "YOU'RE BEHIND $";W:PRINT:GOTO 90
3350 REM
3360 PRINT:PRINT:PRINT "SO YOU WANT TO CASH IN YOUR CHIPS, I SEE!!!"
3370 IF W>0 THEN 3410
3380 PRINT "YOU DIDN'T WIN ANY MONEY, BUT I'M WILLING TO CALL IT EVEN!!"
3390 GOTO 3440
3410 PRINT "YOU WON EXACTLY $";W;"!! NOT BAD !!!"
3440 END
Ok
```





This game tests your skills in binaryto-decimal and decimal-to-binary conversion. You are given twenty conversion trials. Numbers are chosen randomly and your score is printed at the end. The answer to any conversion you miss is displayed; if the next conversion is presented, you may assume you got the previous one correct.

BINARY

There are several possible modifications for this program such as timing the response, allowing the user to specify the number range, checking for duplicate numbers, or extending it to other bases.

This program was written by Ted Park of Pacific Union College. It originally appeared in Creative Computing, Mar/Apr 1975.

"CREATIVE COMPUTING MORRISTOWN NEW JERSEY"

RUN

|              |         | BINARY                 | LIJI  |
|--------------|---------|------------------------|---|
|              | CREATIV | E COMPUTING MORRISTOWN | NEW JERSEY  |
|              |         |                        | 10 PRINT TAB(30); "BINARY"                          |
|              |         |                        | 20 PRINT TAB(15);"CREATIVE COMPUTING MORRISTOWN     |
| BINARY:1100  | O DECIM | AL:? 24                | 110 B\$="01"  |
|              |         |                        | 120 T0=20   |
| BINARY:1000  | 1 DECIM | AL:? 17                | 130 PRINT   |
|              |         |                        | 140 PRINT   |
| INARY:0101   | 1 DECIM | AL:? 11                | 150 FOR I=1 TO 10                                   |
|              |         |                        | 160 GDSUB 560                                       |
| INARY:0011   | 0 DECIM | AL:? 10                | 170 PRINT "BINARY:";                                |
| 6            |         |                        | 180 FOR J=1 TO 5                                    |
|              |         |                        | 190 PRINT MID\$(B\$,B(J)+1,1);                      |
| INARY:1010   | 0 DECIM | AL:? 12                | 200 NEXT J  |
| 20           |         |                        | 210 PRINT " DECIMAL:":                              |
|              |         |                        | 220 INPUT A   |
| INARY:0110   | 0 DECTM | AL:? 12                | 230 IF A=D THEN 260                                 |
|              | DEG11   |                        | 240 PRINT D   |
| INARY: 1000  | 1 DECIN | AL: 1 16               | 250 T0=T0-1   |
| 17           | DECIM   |                        | 260 PRINT   |
|              |         |                        | 270 NEXT I  |
| LNARY:01010  | 0 DECTH | AL:? 10                | 280 PRINT   |
| TRAKTSOLOTI  | 0 DECIM | ALT 10                 | 290 PRINT   |
|              |         |                        | 300 FOR I=1 TO 10                                   |
| INARY:0001   | 1 DECIM | AL:? 3                 | 310 GOSUB 560                                       |
|              |         |                        | 320 PRINT "DECIMAL: ";D;                            |
| INARY: 10110 | O DECIM | AL:? 21                | 330 PRINT " BINARY: ";                              |
| 22           |         |                        | 340 IS="00000"                                      |
|              |         |                        | 350 INPUT IS  |
|              |         |                        |   |
|              |         |                        | 360 IF LEN(1\$)> 10 THEN 420                        |
| CIMAL:       | 7 BINA  | RY: ? 111              | 370 I\$="00000"+I\$                                 |
|              |         |                        | 375 I\$=xIGHT\$(I\$,5)                              |
| ECIMAL:      | 15 BIN  | ARY: ? 1111            | 380 FDR J=1 TO 5                                    |
|              |         |                        | 390 IF MID\$(B\$,B(J)+1,1)(>MID\$(I\$,J,1) THEN 420 |
| ECIMAL:      | 1 BINA  | RY: ? 1                | 400 NEXT J  |
|              |         |                        | 410 GOTO 480  |
| CIMAL: 1     | 18 BINA | ARY: ? 10010           | 420 PRINT " ";                                      |
|              |         |                        | 430 FOR J=1 TO 5                                    |
| CIMAL: 9     | 9 BINA  | RY: ? 01000            | 440 PRINT HID\$(B\$,B(J)+1,1);                      |
| 1001         |         |                        | 450 NEXT J  |
|              |         |                        | 460 PRINT   |
| CIMAL: 1     | 11 BINA | ARY: ? 1011            | 470 T0=T0-1   |
|              |         |                        | 480 PRINT   |
| CIMAL: 1     | 15 BINA | ARY: ? 1111            | 490 NEXT I  |
| erner i      | 15 DIRE | inte i ffff            | 500 PRINT   |
| CIMAL: 1     | 12 BING | ARY: 7 1100            | 510 PRINT   |
| Grints 1     | 12 DIM  | ARY: 7 1100            | 520 PRINT "YOUR SCORE:";INT(T0/.2+.5);"%"           |
| CIMAL: 2     |         |                        | 530 PRINT   |
| CIMAL: 2     | 23 BING | ARY: ? 11001           | 540 PRINT   |
| -            |         |                        | 550 END   |
|              | 6 BINAR | RY: ? 01               | 560 D=0   |
| 0110         |         |                        |   |
|              |         |                        | 570 FOR J=1 TO 5                                    |
|              |         |                        | 580 B(J)=INT(RND(1)+.5)                             |

YOUR SCORE: 70 %

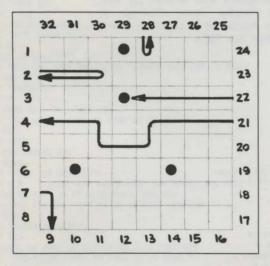
OK

590 D=D#2+B(J) 600 NEXT J

610 RETURN 620 END

LIST

## Blackbox



**Description:** Black Box is a computerized version of the game that appeared in the August 1977 issue of *Games and Puzzles.* The Black Box is an 8-by-8 square in which several atoms are hidden. The object of the game is to discover the positions of the atoms by projecting rays at them from the sides of the box and noticing how these rays are deflected, reflected, or absorbed. Rays enter the box across one of the four edges and travel horizontally or vertically. The entry points are numbered from 1 to 32, counterclockwise, starting at the top of the left edge.

To play the game, you first specify how many atoms to place in the Black Box. Then you type in the point at which you send the ray into the box, and you are told whether the ray was absorbed or where it emerged. Type a zero to end the game and print the board. The path of the ray is governed by the following rules:

(1) Rays that strike an atom directly are absorbed.

(2) Rays that come within one square of an atom in a diagonal direction (so that they would pass next to the atom if they continued) are deflected by 90 degrees.

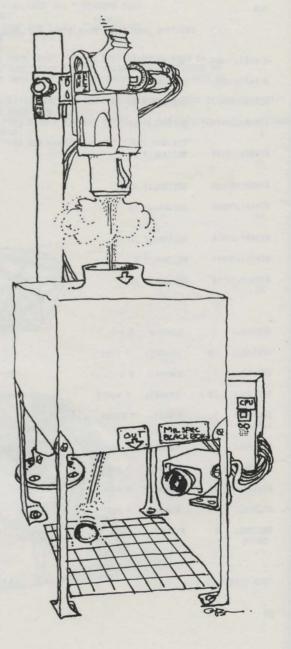
(3) Rays aimed between two atoms one square apart are reflected.

(4) Rays that enter on either side of an atom on the edge of the box are reflected.

(5) Rays otherwise travel in straight lines.

The game is pretty interesting with four or five atoms, but can get out of hand with too many more. Occasionally, an atom can be masked by others. This doesn't occur often, but sometimes the position is truly ambiguous (more often, there is only one place the atom can be). For competitive play, score one point for reflections and absorptions, two for rays which emerge from the box, and five points for each atom guessed incorrectly.

This program and description were written by Jeff Kenton. A previous version appeared in *Creative Computing*, May/Jun 1978.



BLACKBOX CREATIVE COMPUTING MORRISTOWN. NEW JERSEY LIST 100 PRINT TAB(25);"BLACKBOX" 110 PRINT TAB(20);"CREATIVE COMPUTING" 120 PRINT TAB(18);"HORRISTOWN, NEW JERSEY"

160 FOR J=0 TO 9: FOR I=0 TO 9: B(I,J)=0: NEXT I,J

290 IF U=0 THEN X2=X1-1: X3=X1+1: Y2=Y1: Y3=Y1: GOTO 310

460 IF Z=R THEN PRINT "REFLECTED":S=S+1: GOTO 210

490 PRINT "(IN ROW, COLUMN FORMAT PLEASE.)"

520 INPUT I,J 530 IF B(J,I)<>1 THEN S=S+5:60T0 540 532 B(J,I)=2

550 PRINT: FOR J=1 TO 8: FOR I=1 TO 8 560 IF B(I,J)=0 THEN PRINT " .";: GOTO 580 570 PRINT " \*";

610 INPUT "CARE TO TRY AGAIN";A\$ 620 IF LEFT\$(A\$,1)="Y" THEN PRINT:GOTO 150

580 NEXT I: PRINT: NEXT J: PRINT:

470 PRINT "TO";Z:S=S+2: GOTO 210 480 PRINT "NOW TELL ME, WHERE DO YOU THINK THE ATOMS ARE?"

590 PRINT "YOU GUESSED ";C;" OUT OF ";N;" ATOMS CORRECTLY!!" 600 PRINT "YOUR SCORE FOR THIS ROUND WAS ";S;" POINTS."

310 ON 8\*B(X1,Y1)+B(X2,Y2)+2\*B(X3,Y3)+1 GOTO 330,340,350,340

180 X=FNR(1): Y=FNR(1): IF B(X,Y) >0 THEN 180

210 PRINT "RAY";: INPUT R: IF R<1 THEN 480 220 DN (R-1)/8+1 GOTD 240,250,260,270

250 X=R-8: Y=9: U=0: V=-1: GOTO 280 260 X=9: Y=25-R: U=-1: V=0: GOTO 280

300 Y2=Y1-1: Y3=Y1+1: X2=X1: X3=X1

360 IF U=0 THEN U=Z: V=0: GOTO 380

380 ON (X+15)/8 GOTO 420.400.430

400 ON (Y+15)/8 GOTO 440,280,450

320 PRINT "ABSORBED":S=S+1: GOTO 210

130 PRINT: PRINT: PRINT 140 DEF FNR(Z)=INT(8\*RND(1)+1) 150 PRINT "NO. OF ATOMS";: INPUT N

170 FOR I=1 TO N

200 S=0:C=0

190 B(X,Y)=1: NEXT I

230 PRINT "ERROR": GOTO 210 240 X=0: Y=R: U=1: V=0: GOTO 280

270 X=33-R: Y=0: U=0: V=1

330 X=X1: Y=Y1: GOTO 380

280 X1=X+U: Y1=Y+V

340 Z=1: GOTO 360

420 Z=Y: GOTO 460 430 Z=25-Y: GOTO 460

440 Z=33-X: GOTO 460

500 FOR Q=1 TO N

510 PRINT "ATOM # ";Q;

350 Z=-1

390 STOP

410 STOP

450 Z=8+X

535 C=C+1 540 NEXT Q

Dk

370 U=0: V=Z

NO. OF ATOMS? 4 RAY? 1 ABSORBED RAY7 2 ARGURREN RAY? 3 TO 22 RAY? 31 REFLECTED RAY? 4 TO 32 RAY? 28 TO 13 RAY? 26 ABSORBED RAY7 7 ABSORBED RAY? 8 TO 15 RAY? O NOW TELL ME, WHERE DO YOU THINK THE ATOMS ARE? (IN ROW, COLUMN FORMAT PLEASE.) ATON # 1 ? 4,3 ATOM # 2 ? 1,1 ATON # 3 ? 2,7 ATOM # 4 7 7.8 ....... \* . . . . \* . . . . . . . . . . . . . . . . \* YOU GUESSED 1 OUT OF 4 ATOMS CORRECTLY !! YOUR SCORE FOR THIS ROUND WAS 28 POINTS. CARE TO TRY AGAIN? YES NO. OF ATOMS? 4 RAY? 4 TO 13 RAY? 25 ABSORBED RAY? 23 TO 26 RAY? 19 TO 6 RAY? 26 TO 23 RAY? 17 ABSORRED RAY? 31 TO 1 RAY? 3 TO 18 RAY? O NOW TELL ME, WHERE DO YOU THINK THE ATOMS ARE? (IN ROW, COLUMN FORMAT PLEASE.) ATON # 1 ? 8,1 ATON # 2 ? 2,3 ATON # 3 ? 4,7 ATOM # 4 ? 8,8 . . . . . . . ...... . . . . . \* . . . . . . . . . \* . . . . . . . . . . . . . . . . ...... YOU GUESSED 2 OUT OF 4 ATOMS CORRECTLY !! YOUR SCORE FOR THIS ROUND WAS 24 POINTS. CARE TO TRY AGAIN? NO Dk

## Bobstones

The idea for this number game was derived from a contest called "Bobstones" described in the novel *Watership Down*. The object of Bobstones is to guess three things about the roll of a pair of dice.

- 1. If the sum of the dice
- is odd or even..... 1 point
- 2. The sum of the dice ..... 2 points
- 3. The number on each
- of the two dice ..... 3 points

The winner is the first player to score eleven points. If a tie results, the winner is the first player to break the tie.

In this computer version of the game, you are playing against the computer. However, the computer makes its guess before the dice are "rolled." Hence, it has no real advantage over its human opponent.

This game was written by Dohn Addleman. It originally appeared in *Creative Computing* Mar/Apr 1976.

RUN

## BOBSTONES CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS A NUMBER GAME CALLED BOBSTOMES. THE OBJECT OF BOBSTOMES IS TO GUESS THREE THINGS ABOUT THE ROLL OF A PAIR OF DICE. ON EACH TURN, THE COMPUTER SIMULATES THE ROLL OF THE DICE. THEN, YOU OR THE COMPUTER (YOUR OPPONENT) GUESS

|                                      | SLUKE        |
|--------------------------------------|--------------|
| 1. IF THE SUM OF THE DICE IS ODD OR  | EVEN 1 POINT |
| 2. THE SUM OF THE DICE               | 2 POINTS     |
| 3. THE NUMBER ON EACH OF THE TWO DIC | E 3 POINTS   |

THE WINNER IS THE FIRST PLAYER TO SCORE 11 POINTS. IF A TIE RESULTS, THE WINNER IS THE FIRST PLAYER TO BREAK THE TIE. GOOD LUCK !

YOU FIRST OR ME? ME

YOUR TURN. IS THE SUM ODD OR EVEN? ODD SORRY, THE SUM IS 4 .

MY TURN. \*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 4 AND 4. \*\*\* THE SUM IS 8. MY GUESS IS THAT THE SUM IS EVEN. AM I RIGHT OR WRONG? RIGHT MY GUESS OF THE SUM IS 8 AM I RIGHT OR WRONG? RIGHT MY GUESS IS THAT THE NUMBERS ARE 3 AND 5. AM I RIGHT OR WRONG? WRONG

## THE SCORE IS ME 3 - YOU 0 .

YOUR TURN. IS THE SUM ODD OR EVEN? ODD SORRY, THE SUM IS 8 .

## MY TURN.

\*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 3 AND 3. \*\*\* THE SUM IS 6. MY GUESS IS THAT THE SUM IS EVEN. AM I RIGHT OR WRONG? RIGHT MY GUESS OF THE SUM IS 12 AM I RIGHT OR WRONG? WORONG /// TYPE THE WORD 'RIGHT' OR THE WORD 'WRONG'. AM I RIGHT OR WRONG? WRONG

THE SCORE IS ME 4 - YOU 0 .

YOUR TURN. IS THE SUM ODD OR EVEN? EVEN YOU ARE CORRECT. NOW, GUESS THE SUM? 12 SORRY, THE SUM IS 10.

MY TURN. \*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 2 AND 4 . \*\*\* THE SUM IS 6 . MY GUESS IS THAT THE SUM IS ODD. AM I RIGHT OR WRONG? WRONG

THE SCORE IS ME 4 - YOU 1 .

YOUR TURN. IS THE SUM ODD OR EVEN? ODD YOU ARE CORRECT. NOW, GUESS THE SUM? 3 SORRY, THE SUM IS 9.

MY TURN. \*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 1 AND 2. \*\*\* THE SUM IS 3. MY GUESS IS THAT THE SUM IS ODD. AN I RIGHT OR WRONG? RIGHT MY GUESS OF THE SUM IS 9 AM I RIGHT OR WRONG? WRONG

THE SCORE IS ME 5 - YOU 2 .

YOUR TURN. IS THE SUM ODD OR EVEN? ODD SORRY, THE SUM IS 6 .

MY TURN. \*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 6 AND 2. \*\*\* THE SUM IS 8. MY GUESS IS THAT THE SUM IS ODD. AM I RIGHT OR WRONG? WRONG

THE SCORE IS ME 5 - YOU 2 .

YOUR TURN. IS THE SUM ODD OR EVEN? EVEN YOU ARE CORRECT. NOW, GUESS THE SUM? 6 SORRY, THE SUM IS 4.

MY TURN. \*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS ARE 3 AND 4. \*\*\* THE SUM IS 7. MY GUESS IS THAT THE SUM IS ODD. AM I RIGHT OR WRONG? RIGHT MY GUESS OF THE SUM IS 11 AM I RIGHT OR WRONG? WRONG

THE SCORE IS ME 6 - YOU 3 .

LIST

10 PRINT TAB(24);"BOBSTONES" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 130 PRINT TRINT:PRINT 140 PRINT " THIS IS A NUMBER GAME CALLED BOBSTONES. THE OBJECT OF" 150 PRINT "BOBSTONES IS TO GUESS THREE THINGS ABOUT THE ROLL OF A PAIR" 160 PRINT "OF DICE. ON EACH TURN, THE COMPUTER SIMULATES THE ROLL OF" 170 PRINT "OF DICE. THEN, YOU OR THE COMPUTER (YOUR OPPONENT) GUESS" 180 PRINT 180 PRINT " 190 PRINT " 200 PRINT " 1. IF THE SUM OF THE DICE IS ODD OR EVEN 1 POINT"

```
210 PRINT " 2. THE SUM OF THE DICE
220 PRINT " 3. THE NUMBER ON EACH OF THE TWO DICE
                                                                       2 POINTS"
                                                                       3 POINTS"
 230 PRINT
 240 PRINT "
                THE WINNER IS THE FIRST PLAYER TO SCORE 11 POINTS. IF A"
 250 PRINT "TIE RESULTS, THE WINNER IS THE FIRST PLAYER TO BREAK THE TIE.
 260 PRINT "
                GOOD LUCK !"
 270 DEF FND(X)=INT(6*RND(1)+1)
 280 DIM A(2)
 290 LET A(1)=0
 300 LET A(2)=0
 310 LET Z1=-1
 320 LET Z2=-1
 330 LET Z3=-1
 340 LET Z4=-1
 350 LET 25=-1
 360 LET J1=0
 370 PRINT
 380 PRINT
 390 PRINT "YOU FIRST OR ME";
 400 INPUT Z$
 410 IF Z$="YOU" THEN 450
 420 IF Z$="ME" THEN 450
 430 "/// TYPE THE WORD 'YOU' OR THE WORD 'ME'."
 440 GOTO 390
 450 LET D1=FND(Z1)
 460 IF Z1=0 THEN 480
 470 LET Z1=0
 480 LET D2=FND(0)
 490 LET S=D1+D2
 500 IF J1=0 THEN 650
 510 IF Z$ >"HE" THEN 580
 520 IF J2<>0 THEN 1160
 530 PRINT
 540 PRINT "THE SCORE IS ME"; A(2);" - YOU"; A(1);"."
 550 IF A(1)>=11 THEN 1900
 560 IF A(2)>=11 THEN 1900
 570 GOTO 670
 580 IF Z$<>"YOU" THEN 2020
590 IF J2<>1 THEN 670
600 PRINT
610 PRINT "THE SCORE IS YOU";A(1);" - ME";A(2);"."
620 IF A(1)>=11 THEN 1900
630 IF A(2)>=11 THEN 1900
650 LET J1=-1
660 IF Z$="YOU" THEN 1160
670 PRINT
680 PRINT "YOUR TURN."
690 LET J2=1
 700 LET R=S-(INT(S/2)#2)
710 PRINT "IS THE SUM ODD OR EVEN";
 720 INPUT AS
730 IF A$="ODD" THEN 770
740 IF A$="EVEN" THEN 800
750 PRINT "/// TYPE THE WORD 'ODD' OR THE WORD 'EVEN'."
760 GOTO 710
770 IF R=1 THEN 820
780 PRINT "SORRY, THE SUM IS";S;"."
790 GOTO 450
800 IF R=0 THEN 820
810 GOTO 780
820 PRINT "YOU ARE CORRECT."
830 LET A(1)=A(1)+1
840 PRINT "NOW, GUESS THE SUM";
850 INPUT G1
860 IF G1<2 THEN 890
870 IF 61>12 THEN 890
880 GOTO 910
890 PRINT "/// THE SUM MUST BE BETWEEN 2 AND 12."
900 GOTO 840
910 IF G1=S THEN 940
920 PRINT "SORRY, THE SUM IS";S;"."
930 GOTO 450
940 PRINT "YOU ARE CORRECT."
950 LET A(1)=A(1)+2
960 PRINT "WHAT ARE THE TWO NUMBERS WHICH PRODUCED ";S;" ";
970 INPUT N1,N2
980 IF N1<1 THEN 1030
990 IF N2<1 THEN 1030
1000 IF N1>6 THEN 1030
1010 IF N2>6 THEN 1030
1020 GOTO 1050
1030 PRINT "/// THE NUMBERS MUST BE BETWEEN 1 AND 6."
1040 GOTO 960
1050 IF N1=D1 THEN 1090
1060 IF N2=D1 THEN 1110
1070 PRINT "SORRY, THE NUMBERS ARE"; D1;" AND"; D2;"."
1080 GOTO 450
1090 IF N2=D2 THEN 1130
1100 GOTO 1070
1110 IF N1=D2 THEN 1130
1120 GOTO 1070
1130 PRINT "YOU ARE CORRECT."
```

1140 LET A(1)=A(1)+3 1150 GOTO 450 1160 LET J2=0 1170 PRINT 1180 PRINT "MY TURN." 1190 PRINT "\*\*\* ON THIS ROLL OF THE DICE, THE TWO NUMBERS "; 1195 PRINT "ARE ";D1;" AND ";D2;"." 1200 PRINT "### THE SUM IS ";S;"." 1210 LET A1=INT(2\*RND(1)+1) 1220 IF Z2=0 THEN 1240 1230 LET Z2=0 1240 IF A1=1 THEN 1270 1250 PRINT "MY GUESS IS THAT THE SUM IS ODD." 1260 GOTO 1280 1270 PRINT "MY GUESS IS THAT THE SUM IS EVEN." 1280 PRINT "AM I RIGHT OR WRONG"; 1290 INPUT DS 1300 IF D\$="RIGHT" THEN 1340 1310 IF D\$="WRONG" THEN 450 1320 PRINT "/// TYPE THE WORD 'RIGHT' OR THE WORD 'WRONG'." 1330 GOTO 1280 1340 LET A(2)=A(2)+1 1350 IF A1=1 THEN 1410 1360 LET B1=INT(5\*RND(1)+1) 1370 IF Z3=0 THEN 1390 1380 LET Z3=0 1390 LET B2=B1+B1+1 1400 GOTO 1430 1410 LET B1=FND(0) 1420 LET B2=B1+B1 1430 PRINT "MY GUESS OF THE SUM IS ";B2 1440 PRINT "AM I RIGHT OR WRONG"; 1450 INPUT D\$ 1460 IF D\$="RIGHT" THEN 1500 1470 IF D\$="WRONG" THEN 450 1480 PRINT "/// TYPE THE WORD 'RIGHT' OR THE WORD 'WRONG'." 1490 GOTO 1440 1500 LET A(2)=A(2)+2 1510 IF B2<>2 THEN 1550 1520 LET C1=1 1530 LET C2=1 1540 GOTO 1810 1550 IF B2<>3 THEN 1590 1560 LET C1=1 1570 LET C2=2 1580 GOTO 1810 1590 IF B2<>11 THEN 1630 1600 LET C1=5 1610 LET C2=6 1620 GOTO 1810 1630 IF B2<>12 THEN 1670 1640 LET C1=6 1650 LET C2=6 1660 GOTO 1810 1670 IF B2>7 THEN 1740 1680 LET K1=B2-1 1690 LET C1=INT(K1\*RND(1)+1) 1700 IF Z4=0 THEN 1720 1710 LET Z4=0 1720 LET C2=B2-C1 1730 GOTO 1810 1740 LET K1=B2-6 1750 LET K3=K1-1 1760 LET K2=7-K1 1770 LET C1=(INT(K2\*RND(1)+1)+K3) 1780 IF Z5=0 THEN 1800 1790 LET Z5=0 1800 LET C2=B2-C1 1810 PRINT "MY GUESS IS THAT THE NUMBERS ARE ";C1;" AND ";C2;"." 1820 PRINT "AM I RIGHT OR WRONG"; 1830 INPUT D\$ 1840 IF D\$="RIGHT" THEN 1880 1850 IF D\$="WRONG" THEN 450 1860 PRINT "/// TYPE THE WORD 'RIGHT' OR THE WORD 'WRONG'." 1870 GOTO 1820 1880 LET A(2)=A(2)+3 1890 GOTO 450 1900 IF A(1)<>A(2) THEN 1930 1910 IF J2<>0 THEN 1160 1920 GOTO 670 1930 IF A(1)>A(2) THEN 2030 1940 PRINT 1950 PRINT "I WIN! ANOTHER GAME"; 1960 INPUT C\$ 1970 IF C\$="YES" THEN 290 1980 IF C\$="NO" THEN 2010 1990 PRINT "/// TYPE THE WORD 'YES' OR THE WORD 'NO'." 2000 GOTO 1960 2010 PRINT "SEE YOU LATER." 2020 END 2030 PRINT

2040 PRINT "YOU WIN! ANOTHER GAME";

2050 GOTO 1960



This program simulates the Italian game of Bocce also called "lawn bowls" or just "bowls."

The instructions starting at the line 1770 explain the game.

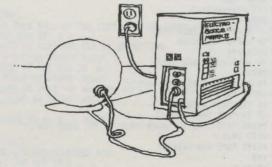
This is the four-ball version (Q=5). Allowing more balls in the game (raising Q) will increase central processing time since the chances of collision will rise and the resulting position of each ball has to be recomputed. However, the delay is short and we routinely play six to eight balls. Increasing Q beyond 9 will require redimensioning the arrays at line 1030.

When there is collision, the bell will sound (line 1500).

It is important to remember that the object is to get close to the jack and not to hit it. Upon collision, the jack will move off more quickly than a ball because it is smaller and lighter. A careless shot can turn a good game into a disaster.

It requires some imagination to play the game well. It goes best if you imagine that you are standing at coordinates 0,0 and are looking out along the X-axis.

This game and the description above were written by Victor Bendall of Eastern Kentucky University. It originally appeared in *Creative Computing*, Jul/Aug 1977.



RUN

## BOCCE CREATIVE COMPUTING MORRISTOWN NEW JERSEY

THIS GAME SINULATES THE GAME OF LAWN BOWLS DO YOU NEED INSTRUCTIONS? ENTER YES OR NO? YES

IN THIS GAME YOU ROLL 4 BALLS SUCCESSIVELY AT A TARGET BALL (CALLED A JACK). THE OBJECT IS TO GET THE BALLS AS CLOSE TO THE JACK AS POSSIBLE. THE BALLS ARE 10 CM IN DIAMETER AND ARE WEIGHTED SO THAT THEY ROLL IN A CURVE. YOU WILL HAVE TO ROLL THEM AT AN ANGLE TO THE LINE FROM YOU AT COORDINATES 0,0 TO THE JACK AT COORDINATES X,Y. A POSITIVE ANGLE WILL MAKE THE BALL CURVE CLOCKWISE. A MEGITIVE ANGLE WILL MAKE IT CURVE ANTI-CLOCKWISE. THE JACK IS A 4 CM WIDE AND WILL ROLL STRAIGHT IF YOU HIT IT. BALLS HIT BY YOUR THROWN BALL MAY CURVE IN EITHER DIRECTION.

HINT. TRY AN INITIAL VELOCHTY OF 500 AND AN ANGLE OF 10

THE JACK IS LOCATED AT 2171 77 BALL 1 VELOCITY? 500 ANGLE? 10

JACK AT COORDINATES 2171 77 BALL 1 AT COORDINATES 2434.63 -494.239 IT IS 622.137 FROM THE JACK

YECH! OVER 20 FEET AWAY! LONG AND TO THE RIGHT

BALL 2 VELOCITY? 480 ANGLE? 9

JACK AT COORDINATES 2171 77 BALL 1 AT COORDINATES 2434.63 -494.239 IT IS 622.137 FROM THE JACK BALL 2 AT COORDINATES 2243.71 -455.535 IT IS 530.476 FROM THE JACK

YECH! DVER 17 FEET AWAY! LONG AND TO THE RIGHT

BALL 3 VELOCITY? 600 ANGLE? 3

JACK AT COORDINATES 2171 77 BALL 1 AT COORDINATES 2434.63 -494.239 IT IS 622.137 FROM THE JACK BALL 2 AT COORDINATES 2243.71 -455.535 IT IS 530.476 FROM THE JACK BALL 3 AT COORDINATES 3506.13 -710.248 IT IS 1542.95 FROM THE JACK

YECH! OVER 50 FEET AWAY! LONG AND TO THE RIGHT

BALL 4 VELOCITY? 300 ANGLE? 5

JACK AT COORDINATES 2171 77 BALL 1 AT COORDINATES 2434.63 -494.239 IT IS 622.137 FROM THE JACK BALL 2 AT COORDINATES 2243.71 -455.535 IT IS 530.476 FROM THE JACK BALL 3 AT COORDINATES 3506.13 -710.248 IT IS 1542.95 FROM THE JACK BALL 4 AT COORDINATES 876.228 -178.163 IT IS 1312.67 FROM THE JACK

YECH! OVER 43 FEET AWAY! SHORT AND TO THE RIGHT

THE TOTAL DISTANCE OF ALL BALLS FROM THE JACK IS 4008.23 CM DON'T PLAY THIS GAME FOR MONEY!!

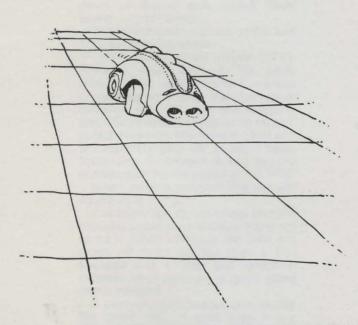
CARE TO TRY AGAIN? ENTER YES OR NO? NO

Ok

```
LIST
10 PRINT TAB(25);"BOCCE"
20 PRINT TAB(19);"CREATIVE COMPUTING"
30 PRINT TAB(17);"HORRISTOWN NEW JERSEY"
40 PRINT:PRINT:PRINT
1000 0=5
1010 PRINT "THIS GAME SIMULATES THE GAME OF LAWN BOWLS"
1020 INPUT "DO YOU NEED INSTRUCTIONS? ENTER YES OR NO";Z$
1030 DIM B(9), B1(9), D(9), V(9), X(9), Y(9)
1040 PRINT: IF ZS="YES" THEN GOSUB 1770
1045 P1=3, 14159
1050 S1=0:S2=0:A=-49.3
1070 X(1)=INT(2000+700*RND(1)): Y(1)=INT(200-400*RND(1))
1080 PRINT "THE JACK IS LOCATED AT ";X(1);Y(1)
1090 FOR P=2 TO 0
1100 J=P:60SUB 1570
1110 NEXT 8
1120 FOR J=2 TO 0
1130 D1=D1+D(J)
1140 NEXT J
1150 PRINT: PRINT "THE TOTAL DISTANCE OF ALL BALLS FROM THE JACK IS ";
1155 PRINT D1:" CH'
1160 IF D1 < 0"2 THEN PRINT "MAGNIFICENT BOWLING! WHAT AN EYE!!"
1165 IF D1 < 0^2 THEN 1230
1170 IF D1<2+0^2 THEN PRINT"EXCELLENT BUT COULD BE BETTER: ": GOTO 1230
1180 IF D1 < 3+0^2 THEN PRINT "GOOD BUT NEEDS SOME INPROVEMENT":GOTO1230 1190 IF D1 < 6+0^2 THEN PRINT "FAIR - YOU NEED MORE PRACTICE":GOTO 1230
1200 IF D1 < 10+0^2 THEN PRINT "POOR - TRY TO BE MORE CONSISTANT": GOTO 1230
1210 IF D1 < 20#0"2 THEN PRINT "YOUR GAME NEEDS LOTS OF WORK":GOTO 1230
1220 PRINT "DON'T PLAY THIS GAME FOR MONEY!
1230 FOR J=1 TO Q
1232 B(J)=0:B1(J)=0:D(J)=0
1240 V(J)=0:X(J)=0:Y(J)=0
1250 NEXT J
1260 PRINT: INPUT "CARE TO TRY AGAIN? ENTER YES OR NO"; YS
1270 PRINT: IF YS="YES" THEN 1050
1280 GOTO 1890
1290 K1=-20
1295 IF J=1 THEN K1=0
1300 A1=A*COS(B(J))+K1*COS((P1/2)+B(J))
1305 A2=A*SIN(B(J))+K1*SIN((P1/2)+B(J))
1310 S3=V(J)*COS(B(J))*.05+1.25E-03*A1
1315 S4=V(J)*SIN(B(J))*.05+1.25E-03*A2
1320 B(J)=ATN((V(J)*SIN(B(J))+A2*.05)/(V(J)*COS(B(J))+A1*.05))
1330 IF B1(J) < 0 THEN S4=-S4
1340 S5=S1+S3: S6=S2+S4
1350 IF J=1 THEN 1370
                                                                        1520 V(J)=ABS(V(J)*SIN(B(J)-B(K))):V(K)=ABS(V(J)*COS(B(J)-B(K)))
1360 IF ABS(S5-X(1))<7 AND ABS(S6-Y(1))<7 THEN K=1:60SUB 1550
                                                                        1530 B(J)=((P1/2)+B(K)): S5=S1: S6=S2
                                                                        1540 IF K=1 THEN V(K)=5*V(K)
1550 IF J=1 THEN V(J)=5*V(J)
1370 FOR K=2 TO Q
1380 IF K=J DR X(K)=0 THEN 1400
1390 IF ABS(S5-X(K)) < 10 AND ABS(S6-Y(K)) < 10 THEN GOSUB 1500
                                                                        1560 RETURN
                                                                        1570 PRINT "BALL ";(J-1)
1400 NEXT K
                                                                        1580 INPUT "VELOCITY";V(J):V(J)=ABS(V(J))
1410 IF V(J) (ABS(A*.05) THEN 1440
1420 V(J)=V(J)+(A*.05):S1=S5:S2=S6:GOTO 1290
                                                                        1590 IF V(J) > 1000 THEN PRINT "VELOCITY TOO HIGH": GOTO 1580
1430 GOTO 1290
                                                                        1600 INPUT "ANGLE"; B1(J)
1440 X(J)=X(J)+S5: Y(J)=Y(J)+S6:S1=0:S2=0:S5=0:S6=0
                                                                        1610 IF ABS(B1(J))> 89 THEN PRINT "ANGLE TO BIG":GOTO 1290
1450 FOR L=1 TO 0
                                                                        1620 PRINT : B(J)=ABS(B(J)+P1/180):GOTO 1290
1460 IF V(L)>ABS(A*.05) THEN J=L:GOTO 1290
                                                                        1630 PRINT "JACK AT COORDINATES ":X(1):Y(1)
1470 B(L)=0:V(L)=0
                                                                        1640 FOR M=2 TO P
1480 NEXT L
                                                                        1650 D=(SQR((Y(1)-Y(M))^2+(X(1)-X(M))^2))-7
1490 GOTO 1630
                                                                        1655 D(M)=D
1500 B(K)=ATN((Y(K)-S2)/(X(K)-S1)): PRINT CHR$(7):
                                                                        1660 IF D < 0 THEN D(M)=0
1510 IF J=1 THEN V(J)=V(J)/5
                                                                        1670 PRINT"BALL ";(M-1);" AT COORDINATES ";X(M);Y(M);" IT IS ";D(M);
                                                                        1675 PRINT "FROM THE JACK"
                                                                        1680 NEXT M
                                                                        1690 PRINT
                                                                        1700 IF D(P) < 10 THEN PRINT TAB(15);"EXCELLENT SHOT! "::GOTO 1740
                                                                        1710 IF D(P) < 20 THEN PRINT TAB(15);"GOOD SHOOTING! ";:GOTO 1740
                                                                        1720 IF D(P)< 30 THEN PRINT TAB(15);"NICE TRY !";:GOTO 1740
                                                                        1730 IF D(P)>500 THEN PRINT TAB(5); "YECH! OVER ";INT(D(P)/30.48);
                                                                        1735 IF D(P) > 500 THEN PRINT "FEET AWAY!"
                                                                        1740 IF X(P)>X(1) THEN PRINT "LONG AND ":
                                                                       1745 IF X(P)< X(1) THEN PRINT "SHORT AND ";
1750 IF Y(P)>Y(1) THEN PRINT "TO THE LEFT "
                                                                        1755 IF Y(P) < Y(1) THEN PRINT "TO THE RIGHT"
                                                                        1760 PRINT
                                                                        1765 RETURN
                                                                        1770 PRINT "IN THIS GAME YOU ROLL ";Q-1;"BALLS SUCCESSIVELY AT A TARG";
                                                                        1775 PRINT "ET"
                                                                        1780 PRINT "BALL (CALLED A JACK). THE OBJECT IS TO GET THE BALLS AS CLOSE"
                                                                        1790 PRINT "TO THE JACK AS POSSIBLE. THE BALLS ARE 10 CM IN DIAMETER AND"
                                                                        1800 PRINT "ARE WEIGHTED SO THAT THEY ROLL IN A CURVE. YOU WILL HAVE TO"
                                                                        1810 PRINT "ROLL THEM AT AN ANGLE TO THE LINE FROM YOU AT COORDINATES 0,0"
                                                                        1820 PRINT "TO THE JACK AT COORDINATES X,Y. A POSITIVE ANGLE WILL MAKE"
                                                                        1830 PRINT "THE BALL CURVE CLOCKWISE. A NEGITIVE ANGLE WILL MAKE IT CURVE"
                                                                        1840 PRINT "ANTI-CLOCKWISE. THE JACK IS A 4 CH WIDE AND WILL ROLL"
                                                                        1850 PRINT "STRAIGHT IF YOU HIT IT. BALLS HIT BY YOUR THROWN BALL MAY"
                                                                        1860 PRINT "CURVE IN EITHER DIRECTION."
                                                                        1870 PRINT: PRINT "HINT. TRY AN INITIAL VELOCHTY OF 500 AND AN ANGLE OF 10"
                                                                        1880 PRINT: PRINT: RETURN
                                                                        1890 END
```

**N**k





A Boga is a bogus animal or mythical beast in the Hurkle family. Like a Hurkle, the Boga hides on a grid with dimensions up to 20 by 20. It sends out / clues that tell you which direction to move from where you are to where it is. However, one major difference between a Boga and a Hurkle is the Boga is also seeking you out at the same time you are looking for it. You don't have to tell it which directions to go after each of its guesses to get closer to you. It apparently has a very good nose and can tell on its own. However, it plays fairly and gives you the first guess, and then it takes its guess. Guesses continue alternately until one or the other, human or boga, find the opposing player. At the beginning of the game, you may print out the grid if you wish to make your guessing job slightly easier. Remember, directions in this game correspond to the diagram; that is, north is up and east is to the right.

This game was created by David Strickler.

## N

S

E

W

RUN

BOGA II CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

DO YOU WANT INSTRUCTIONS? YES

THE BOGA IS HIDING ON A GRID (YOU SPECIFY THE LENGTH AND WIDTH). TRY TO GUESS HIS POSITION USING THE HINTS I GIVE YOU. EACH GUESS IS TWO NUMBERS SEPERATED BY A COMMA. PLEASE KEEP IN MIND THAT THE BOGA IS ALSO SEARCHING FOR YOU!!!!

HOW BIG SHOULD THE GRID BE(20 MAXIMUM)? 21

HOW BIG SHOULD THE GRID BE(20 MAXIMUM)? 15 WOULD YOU LIKE A SAMPLE GRID? YEWS

123456789012345 0 . . . \* \* . \* \* . \* \* \* \* \* \* . . . \* . . . . \* \* \* \* . . . 9 . . . . \* \* \* \* \* \* . :0 \* \* \* \* \* \* . . :1 \* \* \* \* 12 .... 13 . . . . 14 \* 15 \* \* \* \* \* \* \*

CHOOSE YOUR POSITION? -1.16

CHOOSE YOUR POSITION? 4,7 THE BOGA PICKS HIS POSITION! GUESS W 1 ? 7,7 YOU GUESSED 7 , 7

HE'S NORE TO THE SOUTHWEST

THE BOGA GUESSES 7 . 7

GUESS # 2 ? 12,4 YOU GUESSED 12 , 4

HE'S MORE TO THE SOUTHWEST

THE BOGA GUESSES 5 , 7

GUESS # 3 ? 14,1 YOU GUESSED 14 , 1

HE'S MORE TO THE WEST THE BOGA GUESSES 4 , 7

THE BOGA GUESSED YOUR POSITION IN 3 GUESS(ES)!

THE BOGA WAS AT 14 , 0

DO YOU WANT TO PLAY AGAIN? YES HOW BIG SHOULD THE GRID BE(20 MAXIMUM)? 4 WOULD YOU LIKE A SAMPLE GRID? YES 01234 0 \* 4 \* \* \* \* \* CHOOSE YOUR POSITION? 2.1 THE BOGA PICKS HIS POSITION! GUESS # 1 ? 2,2 YOU GUESSED 2 , 2 HE'S MORE TO THE SOUTH THE BOGA GUESSES 2 , 2 GUESS # 2 ? 4,2 YOU GUESSED 4 , 2 HE'S HORE TO THE NORTH THE BOGA GUESSES 2 . 1 THE BOGA GUESSED YOUR POSITION IN 2 GUESS(ES)! THE BOGA WAS AT 3 , 2 DO YOU WANT TO PLAY AGAIN? YES HOW BIG SHOULD THE GRID BE(20 MAXIMUM)? 4 WOULD YOU LIKE A SAMPLE GRID? NO CHOOSE YOUR POSITION? 0,4 THE BOGA PICKS HIS POSITION! GUESS # 1 ? 2,2 YOU GUESSED 2 , 2 HE'S NORE TO THE EAST THE BOGA GUESSES 2 , 2 GUESS # 2 ? 2,3 YOU GUESSED THE BOGA'S POSITION IN 2 GUESS(ES)! THE BOGA WAS AT 2 . 3 DO YOU WANT TO PLAY AGAIN? NO Ok LIST 10 PRINT TAB(26);"BOGA II" 14 PRINT TAB(20);"CREATIVE COMPUTING" 17 PRINT TAB(18);"HORRISTOWN, NEW JERSEY" 20 PRINT: PRINT: PRINT 30 INPUT "DO YOU WANT INSTRUCTIONS";0\$ 35 PRINT:PRINT 40 IF LEFT\$(Q\$,1)<>"Y" THEN 220 70 PRINT " THE BOGA IS HIDING ON A GRID (YOU SPECIFY THE LENGTH" 80 PRINT "AND WIDTH). TRY TO GUESS HIS POSITION USING THE HINTS" 90 PRINT "AND WIDTH). TRY TO GUESS HIS POSITION USING THE HINTS" 90 PRINT "I GIVE YOU. EACH GUESS IS TWO NUMBERS SEPERATED BY" 100 PRINT "A COMMA. PLEASE KEEP IN MIND THAT THE BOGA IS ALSO" 105 PRINT "SEARCHING FOR YOU!!!! 110 PRINT:PRINT 220 U=0 240 K=1 250 F=0 260 INPUT "HOW BIG SHOULD THE GRID BE(20 MAXIMUM)";G 275 IF G>20 OR G<1 THEN PRINT:GOTO 260 280 S=6 290 REM: PRINTS THE GRID 300 INPUT "WOULD YOU LIKE A SAMPLE GRID";2\$ 305 IF LEFT\$(Z\$,1)="N" THEN 380 310 PRINT 318 A\$="

320 IF 6<10 THEN 332

322 FOR X=10 TO G

324 X1 = INT(X/10)326 A\$=A\$+CHR\$(X1+48)+" " 328 NEXT X 330 PRINT TAB(25);A\$ 332 A\$="" 334 FOR X=0 TO G 336 X1=X-INT(X/10)\*10 338 A\$=A\$+CHR\$(X1+48)+" " 340 NEXT X 342 PRINT TAB(5);A\$ 344 A\$=" 346 FOR X=0 TO 6 348 A\$=A\$+"\* 350 NEXT X 352 FOR X=0 TO 6 354 PRINT X;TAB(5);A\$ 356 NEXT X 380 PRINT 390 H=1 400 INPUT "CHOOSE YOUR POSITION";X1,Y1 411 IF X1>6 OR X1<0 OR Y1>6 OR Y1<0 THEN PRINT:GOTO 400 420 PRINT "THE BOGA PICKS HIS POSITION!" 440 X2=INT(RND(1)\*6) 450 Y2=INT(RND(1)\*G) 460 PRINT "GUESS #"K; 470 INPUT X3, Y3 471 IF X3>6 OR X3<0 OR Y3>6 OR Y3<0 THEN PRINT:60TO 460 480 K=K+1 490 F=F+1 500 IF K=10 THEN 1040 510 IF ABS(X3-X2)+ABS(Y3-Y2)=0 THEN 1010 520 PRINT "YOU GUESSED"X3", "Y3 530 PRINT 540 PRINT "HE'S MORE TO THE ": 550 IF X2=X3 THEN 620 560 IF X2>X3 THEN 600 570 PRINT "NORTH"; 590 GOTO 620 600 PRINT "SOUTH": 620 IF Y2=Y3 THEN 700 630 IF Y2>Y3 THEN 670 640 PRINT "WEST" 660 GOTO 700 670 PRINT "EAST" 690 REM: LINES 700-970 AND 1110-1150-BOGAS GUESSING FORMULA 700 PRINT"": IF H=0 THEN 730 710 X4=INT(.5\*S) 720 Y4=INT(.5\*S) 730 PRINT "THE BOGA GUESSES"X4", "Y4 740 U=U+1 750 PRINT "" 760 Q=ABS(Y1-Y4)+ABS(X1-X4) 770 IF Q=0 THEN 980 780 H=0 290 IF Y4=Y1 THEN 880 800 A=1 810 IF ABS(Y4-Y1)<2 THEN 830 820 GOSUB 1140 830 IF Y4<Y1 THEN 860 840 Y4=INT(ABS(Y4-A)) 850 GOTO 880 860 Y4=INT(ABS(Y4+A)) 870 IF Y4>G THEN 1110 880 IF X4=X1 THEN 970 890 A=1 900 IF ABS(X4-X1)<2 THEN 920 910 GDSUB 1140 920 IF X4<X1 THEN 950 930 X4=INT(ABS(X4-A)) 940 GOTO 970 950 X4=INT(ABS(X4+A)) 960 IF X4>G THEN 1130 970 GOTO 460 980 PRINT "THE BOGA GUESSED YOUR POSITION IN"U"GUESS(ES)!" 990 PRINT 1000 GOTO 1050 1010 PRINT "YOU GUESSED THE BOGA'S POSITION IN"F"GUESS(ES)!" 1020 PRINT 1030 GOTO 1050 1040 PRINT "YOU USED UP ALL OF YOUR GUESSES." 1050 PRINT "THE BOGA WAS AT"X2", "Y2 1060 PRINT 1070 INPUT "DO YOU WANT TO PLAY AGAIN";0\$ 1080 IF LEFT\$(Q\$,1)="Y" THEN 220 1100 GOTO 1160 1110 Y4=.5\*6 1120 GOTO 880 1130 X4=.5\*G 1140 A=2 1150 RETURN 1160 END

```
17
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Dk



Bombrun is an extremely accurate simulation of an aircraft dropping a bomb on a very small target. You may specify whether the aircraft is climbing, diving, and the angle in degrees. You may specify speed in feet per second; you may also specify at what point you wish to drop the bomb. The program gives you four passes over the target.

A perfect hit is possible but extremely difficult to achieve. A hit within 300 feet of the target is considered "threatening" while hits outside of that range may be considered a negative commentary on your knowledge of physics.

This program was originally written by Jim Prelesnik.

RUN

BONBRUN CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM SIMULATES A BOMBING RUN. DO YOU NEED INSTRUCTIONS? YES

YOU HAVE THE OPTION OF MAKING FOUR PASSES OVER THE TARGET, WITH THE ABILITY TO DROP A BONB ONCE DURING EACH OF THESE PASSES. ALTITUDE CHANGES MAYBE MADE THROUGH THE 'CLINE/DIVE' COMMAND BY PRINTING 'CLINB' OR 'DIVE',FOL-LOWED BY A COMMA AND THE DESIRED ANGLE (IN DEGREES). NEW VELOCITIES (RANGING FROM 300 TO 900 FEET PER SECOND) MAY BE INPUT AFTER THE 'AIRSPEED' QUESTION MARK. 'CLIMB/DIVE' ANGLES, VARYING FROM 0 TO 15 DEGREES, WILL ADD AS SPEC-IFIED BY 'CLINB' OR'DIVE' COMMANDS TO YIELD A WET INCLIN-ATION/DECLINATION ANGLE BETWEEN 0 TO 60 DEGREES, CLINBING OR DIVING. A MINIHUM ALTITUDE OF 100 FEET MUST ALSO BE MAINTAINED. WILLFULLY EXCEEDING ANY OF THE MAX./MIN. SPECS WILL RESULT IN THE CRASH OF YOUR BOMBER. ALSO, A BOMB COMMAND OF 'DROP' DURING A DIVE WILL GIVE YOUR BOMB AN IN-ITIAL DOWNWARD VELOCITY, SHORTENING THE DROP TIME, AS A 'CLINB' COMMAND WILL LENGTHEN THIS TIME. THE BOMB WILL BE LAUNCHED IMMEDIATELY FOLLOWING THE MOST RECENT 'STATS' READ-OUT UPON 'DROP' COMMAND, AND WILL BE HELD FOR FURTHER POSITIONING INFORMATION UPON THE COMMAND 'STAND BY'. THE TARGET IS 1 FOOT IN DIAMETER. GOOD LUCK

## \*\*INITIAL\*\* \*\*\*STATS\*\*\*

ELAPSED TIME... O SECONDS PRESENT ANGLE COMMAND... O DEGREES RESULTANT ANGLE... O DEGREES PRESENT VEROCITY... 876.763 FEET PER SECOND ALTITUDE... 428.7 FEET DISTANCE FROM SITE... 4500 FEET ESTIMATED TIME OF ARRIVAL... 5.13252 SECONDS

BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 800

## \*\*\*STATS\*\*\*

ELAPSED TIME... 1 SECOND PRESENT ANGLE COMMAND... 0 DEGREES RESULTANT ANGLE... 0 DEGREES PRESENT VEROCITY... 800 FEET PER SECOND ALTITUDE... 428.7 FEET DISTANCE FROM SITE... 3700 FEET ESTIMATED TIME OF ARRIVAL... 4.625 SECONDS BONB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? NO

'CLIMB/DIVE' COMMAND? DIVE,10

AIRSPEED? 600

\*\*\*STATS\*\*\*

| ELAPSED TIME              | 2 SECONDS           |
|---------------------------|---------------------|
| PRESENT ANGLE COMMAND     | DIVE, 10 DEGREES    |
| RESULTANT ANGLE           | 10 DEGREES DIVING   |
| PRESENT VEROCITY          | 600 FEET PER SECOND |
| ALTITUDE                  | 324.511 FEET        |
| DISTANCE FROM SITE        | 3109.12 FEET        |
| ESTIMATED TIME OF ARRIVAL | 5.2618 SECONDS      |

BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 700

\*\*\*STATS\*\*\*

| ELAPSED TIM              | E 3 SECONDS           |
|--------------------------|-----------------------|
| PRESENT ANGLE COMMAN     | D O DEGREES           |
| RESULTANT ANGL           | E O DEGREES DIVING    |
| PRESENT VEROCIT          | Y 700 FEET PER SECOND |
| ALTITUD                  | E 202.958 FEET        |
| DISTANCE FROM SIT        | E 2419.75 FEET        |
| ESTIMATED TIME OF ARRIVA | L 3.51011 SECONDS     |

BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 700 IF YOUR ALTITUTE ISN'T INCREASED IMMEDIATELY TO A MIN-INUM OF 100 FEET, A CRASH IS IMMINENT.

'CLIMB/DIVE' COMMAND? CLIMB,20

YOUR BOMBER CANNOT TOLERATE THE STRESS CAUSED BY ANGLE INPUTS EXCEEDING 15 DEGREES. RECONSIDER YOUR CHOICE.

'CLIMB/DIVE' COMMAND? CLIMB, 12

AIRSPEEDT 500 YOUR BOMBER FAILED TO MAINTAIN THE LOW ALTITUTE YOU DE-SIRED AND SOON CRASHED. BETTER LUCK MEXT TIME.

DURING YOUR 1 -PASS BOMBRUN, YOU MANAGED TO STRIKE WITHIN O FEET OF THE TARGET.

WOULD YOU LIKE TO RELOAD AND PLAY AGAIN? ? YES

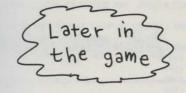
\*\*INITIAL\*\* \*\*\*STATS\*\*\*

ELAPSED TIME... 0 SECONDS PRESENT ANGLE COMMAND... 0 DEGREES RESULTANT ANGLE... 0 DEGREES PRESENT VEROCITY... 567.958 FEET PER SECOND ALTITUDE... 182.338 FEET DISTANCE FROM SITE... 4500 FEET ESTIMATED TIME OF ARRIVAL... 7.92312 SECONDS

BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 700



BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 750

### \*\*\*STATS\*\*\*

| ELAPSED TIME              | 2 SECONDS           |
|---------------------------|---------------------|
| PRESENT ANGLE COMMAND     | O DEGREES           |
| RESULTANT ANGLE           | O DEGREES           |
| PRESENT VEROCITY          | 750 FEET PER SECOND |
| ALTITUDE                  | 128.552 FEET        |
| DISTANCE FROM SITE        | 3000 FEET           |
| ESTIMATED TIME OF ARRIVAL | 4 SECONDS           |

BOMB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 750

```
***STATS***
```

ELAPSED TIME... 3 SECONDS PRESENT ANGLE COMMAND... 0 DEGREES RESULTANT ANGLE... 0 DEGREES PRESENT VEROCITY... 750 FEET PER SECOND ALTITUDE... 128.552 FEET DISTANCE FROM SITE... 2250 FEET ESTIMATED TIME OF ARRIVAL... 3 SECONDS

BONB COMMAND? STAND BY STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 750

\*\*\*STATS\*\*\*

```
ELAPSED TIME... 4 SECONDS

PRESENT ANGLE COMMAND... 0 DEGREES

RESULTANT ANGLE... 0 DEGREES

PRESENT VEROCITY... 750 FEET PER SECOND

ALTITUDE... 128.552 FEET

DISTANCE FROM SITE... 1500 FEET

ESTIMATED TIME OF ARRIVAL... 2 SECONDS
```

BORB COMMAND? STAND BY PLEASE UNRECOGNIZABLE COMMAND. REPLY 'STAND BY' OR 'DROP'. STANDING BY.

MAINTAIN PRESENT RESULTANT ANGLE? YES

AIRSPEED? 300

## \*\*\*STATS\*\*\*

```
ELAPSED TIHE... 5 SECONDS

PRESENT ANGLE COMMAND... 0 DEGREES

RESULTANT ANGLE... 0 DEGREES

PRESENT VEROCITY... 300 FEET PER SECOND

ALTITUDE... 128.552 FEET

DISTANCE FROM SITE... 1200 FEET

ESTIMATED TIME OF ARRIVAL... 4 SECONDS
```

BOHB CONHAND? DROP BOHB DROPPED. TINE TO EXPLOSION... 2.8257 SECONDS

THE BOMB LANDED 352.28 FEET IN FRONT OF THE TARGET'S CENTER.

DURING YOUR 4 -PASS BOMBRUN, YOU MANAGED TO STRIKE WITHIN 0 FEET OF THE TARGET.

WOULD YOU LIKE TO RELOAD AND PLAY AGAIN? ? NO LODK OVER THE PHYSICS LAWS GOVERNING FALLING BODIES, AND RETURN TO PLAY AGAIN SOON. Dk

```
LIST
10 PRINT TAB(27) "BOMBRUN"
13 PRINT TAB(20) "CREATIVE COMPUTING"
15 PRINT TAB(18) "MORRISTOWN, NEW JERSEY"
19 PRINT: PRINT
20 PRINT"THIS PROGRAM SIMULATES A BOMBING RUN. DO YOU NEED"
25 X5=3000
30 PRINT"INSTRUCTIONS":
40 INPUT IS
50 IF IS="YES" THEN 90
60 IF I$="NO" THEN 290
70 PRINT"ILLOGICAL RESPONSE. REPLY YES OR "NO"."
80 GDTD 40
90 PRINT"YOU HAVE THE OPTION OF MAKING FOUR PASSES OVER THE TARGET,"
100 PRINT"WITH THE ABILITY TO DROP A BOMB ONCE DURING EACH OF
110 PRINT"THESE PASSES. ALTITUDE CHANGES MAYBE MADE THROUGH THE"
120 PRINT "'CLIMB/DIVE' COMMAND BY PRINTING 'CLIMB' OR 'DIVE',FOL-"
130 PRINT"LOWED BY A COMMA AND THE DESIRED ANGLE (IN DEGREES). NEW"
140 PRINT"VELOCITIES (RANGING FROM 300 TO 900 FEET PER SECOND) MAY"
150 PRINT"BE INPUT AFTER THE 'AIRSPEED' DUESTION MARK. 'CLIMB/DIVE
                                                                          CLIMB/DIVE "
160 PRINT"ANGLES, VARYING FROM O TO 15 DEGREES, WILL ADD AS SPEC-"
170 PRINT"IFIED BY 'CLIMB' OR'DIVE' COMMANDS TO YIELD A NET INCLIM-"
190 PRINT "ATION/DECLINATION ANGLE BETWEEN O TO 60 DEGREES, CLIMBING"
190 PRINT "ATION/DECLINATION ANGLE BETWEEN O TO 60 DEGREES, CLIMBING"
190 PRINT "OR DIVING. A MINIMUM ALTITUDE OF 100 FEET MUST ALSO BE"
200 PRINT "MAINTAINED. WILLFULLY EXCEEDING ANY OF THE MAX./MIN. SPECS"
210 PRINT"WILL RESULT IN THE CRASH OF YOUR BOMBER. ALSO , A BOME"
220 PRINT"COMMAND OF 'DROP' DURING A DIVE WILL GIVE YOUR BOMB AN IN-"
230 PRINT"ITIAL DOWNWARD VELOCITY, SHORTENING THE DROP TIME, AS A"
240 PRINT"'CLIMB' COMMAND WILL LENGTHEN THIS TIME. THE BOMB WILL BE"
250 PRINT"LAUNCHED IMMEDIATELY FOLLOWING THE MOST RECENT 'STATS' READ-"
260 PRINT "OUT UPON 'DROP' COMMAND, AND WILL BE HELD FOR FURTHER"
270 PRINT"POSITIONING INFORMATION UPON THE COMMAND 'STAND BY'.
                                                                                    THE"
280 PRINT"TARGET IS 1 FOOT IN DIAMETER. GOOD LUCK"
290 71=1000
300 Z2=1000
310 Z3=1000
320 Z4=1000
330 R=R+1
340 W1=0
350 X2=0
360 W3=0
370 44=0
380 T=0
390 A1=0
400 A=0
410 V1=RND(1)
420 V=V1*1000
430 IF V<300 DR V>900 THEN 410
440 Y1=RND(1)
450 Y=Y1*500
460 IF Y<100 THEN440
470 X=4500
480 PRINT"
490 PRINT" "
500 E=X/V
510 PRINT TAB(30)"**INITIAL**"
520 PRINT TAB(30) "***STATS***"
530 GOT01430
540 W1=0
550 W2=0
560 W3=0
570 ₩4=0
580 PRINT" "
590 PRINT"BOMB COMMAND";
600 INPUT C$
610 IF CS="STAND BY" THEN 640
620 IF C$="DROP" THEN 1680
630 PRINT"UNRECOGNIZABLE COMMAND. REPLY 'STAND BY' OR 'DROP'."
640 PRINT"STANDING BY."
650 PRINT "
660 GOTO 700
670 A=A-A1
680 T=T-1
690 GOTD 770
700 PRINT"MAINTAIN PRESENT RESULTANT ANGLE";
710 INPUT P$
720 PRINT" "
730 IF P$="YES" THEN 1130
740 IF P$="NO" THEN 770
750 PRINT"REPLY 'YES' OR'NO'.":
760 GOTO 710
770 PRINT"'CLIMB/DIVE' COMMAND";
780 INPUT A$,A1
790 PRINT"
800 IF A1<0 THEN 830
810 IF A1>15 THEN 870
820 GOTO 930
```

830 PRINT"ANGLE INPUT MUST BE POSITVE. IF NECESSARY, CHANGE THE"

840 PRINT"'DIVE' COMMAND TO 'CLIMB', OR VICE VERSA.'

```
850 PRINT" "
860 GOT0770
870 W1=W1+1
880 IF W1=2 THEN 2120
890 PRINT"YOUR BOMBER CANNOT TOLERATE THE STRESS CAUSED BY ANGLE"
900 PRINT"INPUTS EXCEEDING 15 DEGREES. RECONSIDER YOUR CHOICE."
910 PRINT"
920 GOTO 770
930 IF AS="CLIMB" THEN 950
940 A1=-A1
950 A=A+A1
960 IF A<-60 THEN 990
970 IF A>60 THEN 1060
980 GOTO 1140
990 W2=W2+1
1000 IF W2=2 THEN 2170
1010 PRINT"YOUR PRESENT'DIVE' COMMAND WILL EXCEED THE MAXIMUN RE-"
1020 PRINT"SULTANT DIVE ANGLE OF 60 DEGREES, CAUSING AN IRREVERSIBLE"
1030 PRINT" NOSEDIVE. RECONSIDER YOUR CHOICE."
1040 PRINT"
1050 GOTO 670
1060 ₩3=₩3+1
1070 IF W3=2 THEN 2210
1080 PRINT"YOUR PRESENT 'CLIMB' COMMAND WILL EXCEED THE MAXIMUN RE-"
1090 PRINT"SULTANT CLIMB ANGLE OF 60 DEGREES, CAUSING YOUR"
1100 PRINT" ENGINES TO FAIL AND YOUR PLANE TO CRASH. RECONSIDER YOUR "
1105 PRINT"CHOICE"
1110 PRINT"
1120 GOTO 670
1130 REM
1140 PRINT"AIRSPEED";
1150 INPUT V
1160 IF V>900 THEN 1190
1170 IF V<300 THEN 1230
1180 GOTO 1290
1190 PRINT"YOUR BOMBER ISN'T CAPABLE OF ATTAINING THAT VELOCITY."
1200 PRINT"INPUT AN AIRSPEED LESS THAN 900 FEET PER SECOND."
1210 PRINT" "
1220 GOTO 1150
1230 W4=W4+1
1240 IF W4=2 THEN 2250
1250 PRINT"IF YOUR VELOCITY ISN'T INCREASED IMMEDIATELY, YOUR BOMBER"
1260 PRINT"WILL FALL TO EARTH AND BE DESTROYED."
1270 PRINT"
1280 GOTO 1140
1290 T=T+1
1300 B=A*3.14159/180
1310 Y=Y+V*SIN(B)
1320 IF Y>100 THEN 1390
1330 W5=W5+1
1340 IF W5=2 THEN 2290
1350 PRINT"IF YOUR ALTITUTE ISN'T INCREASED IMMEDIATELY TO A MIN-"
1360 PRINT"IMUN OF 100 FEET, A CRASH IS IMMINENT."
1370 PRINT"
1380 GOTO 670
1390 X=X-V*COS(B)
1400 IF X<=0 THEN 2350
1410 E=X/(V*COS(B))
1420 PRINT TAB(30)"***STATS***"
1430 PRINT" "
1440 IF NOT(T=1)THEN 1470
1450 PRINT TAB(20)"ELAPSED TIME... 1 SECOND"
1460 GOTO 1480
1470 PRINT TAB(20)"ELAPSED TIME...";T;"SECONDS"
1480 IF NOT(A1=0) THEN 1510
1490 PRINT TAB(11) "PRESENT ANGLE COMMAND... 0 DEGREES"
1500 GOTO 1550
1510 IF A$="CLIMB" THEN 1540
1520 PRINTTAB(11)"PRESENT ANGLE COMMAND... DIVE, ";-A1;"DEGREES"
1530 GOTO 1550
1540 PRINT TAB(11)"PRESENT ANGLE COMMAND... CLIMB, ";A1; "DEGREES"
1550 IF A<0 THEN 1590
1560 IF A>0 THEN 1610
1570 PRINT TAB(17)"RESULTANT ANGLE... 0 DEGREES"
1580 GOTO 1620
1590 PRINT TAB(17)"RESULTANT ANGLE...";-A1;"DEGREES DIVING"
1600 GOTO 1620
1610 PRINT TAB(17)"RESULTANT ANGLE...";A;"DEGREES CLIMBING"
1630 PRINT TAB(24)"ALTITUDE... ";Y;"FEET"
1640 PRINT TAB(24)"ALTITUDE... ";Y;"FEET"
1640 PRINT TAB(14)"DISTANCE FROM SITE... ";X;"FEET"
1650 PRINT TAB(7)"ESTIMATED TIME OF ARRIVAL... ";E;"SECONDS"
1660 PRINT
1670 GOTO 540
1680 PRINT"BOMB DROPPED."
1690 T3=(SQR((V*SIN(B))^2+64.4*Y)+V*SIN(B))/32.2
1700 PRINT"TINE TO EXPLOSION ... ";T3;"SECONDS"
1710 X=X-V*COS(B)*T3
1720 X=INT(X*100)/100
1725 IF X5>ABS(X5) THEN X5=ABS(X5)
1730 PRINT
1740 IF X<-.5 THEN 1780
1750 IF X>.5 THEN 1800
```

```
1760 PRINT"CONGRATULATIONS, YOU SCORED AS PERFECT HIT."
1770 GOTO 2030
1780 PRINT"THE BOMB LANDED";-X;"FEET BEYOND THE TARGET'S CENTER."
1790 GOTO 1810
1800 PRINT"THE BOMB LANDED"; X; "FEET IN FRONT OF THE TARGET'S CENTER
1810 IF R=1 THEN 1850
1820 IF R=2 THEN 1870
1830 IF R=3 THEN 1890
1840 IF R=4 THEN 1910
1850 Z1=ABS(X)
1860 GDTD 2400
1870 Z2=ABS(X)
1880 GOTO 2420
1890 Z3=ABS(X)
1900 GDT0 2440
1910 Z4=ABS(X)
1920 Z1=Z10(1):Z2=Z10(2):Z3=Z10(3):Z4=Z10(4)
1921 FOR M=1 TO 4
1922 FOR M1= 4 TO 1 STEP-1
1923 IF Z10(M) (Z10(M1) THEN Z10(M)=X5
1924 IF M=M1 AND M=1 THEN 1926
1925 NEXTM1
1926 NEXT M
1930 PRINT" "
1940 IF X5<= 300 THEN 2000
1950 PRINT"DURING YOUR";R;"-PASS BOMBRUN, YOU FAILED TO EVEN"
1960 PRINT"THREATEN THE TARGET WITH A HIT. BETTER LUCK NEXT TIME."
1970 IF R$="NO" THEN 2590
1980 GOTO 2040
1990 GOTO 2610
2000 PRINT"DURING YOUR";R;"-PASS BOMBRUN, YOU MANAGED TO STRIKE"
2010 PRINT"WITHIN"; X5; "FEET OF THE TARGET."
2020 PRINT" '
2030 IF R$="ND" THEN 2590
2040 PRINT"WOULD YOU LIKE TO RELOAD AND PLAY AGAIN?"
2050 INPUT AS
2060 IF A$="NO" THEN 2590
2070 IF AS="YES" THEN 2100
2080 PRINT"YOU MUST BE A LOUSY SPELLER. REPLY YYES' OR'NO'."
2090 GOTO 2050
2100 R=0
2110 GOTO 290
2120 PRINT"YOU TORE THE WINGS OFF OF YOUR BOMBER BY EXCEEDING THE"
2130 PRINT"MAXIMUN ANGLE INPUT OF 15 DEGREES. NEXT TIME TAKE MY AN
2150 H=1
2160 GOTO 1920
2170 PRINT"THE STEEP DIVE ANGLE DESIRED CAUSED AN IRREVERISIBLE NE
2180 PRINT"DIVE, RESULTING IN THE DESTRUCTION OF YOUR BOMBER."
2190 H=1
2200 GOTO 1920
2210 PRINT"THE ENGINES OF YOUR BOMBER FAILED WHILE CLIMBING THE"
2220 PRINT"STEEP ANGLE INPUT DURING YOUR ANGLE COMMAND OPPORTUNITY.
2230 H=1
2240 GOTO 1920
2250 PRINT"THE VEROCITY OF YOUR BOMBER WAS INSUFFICIENT TO SUPPORT
2260 PRINT"ITS WEIGHT, AND CONSEQUENTLY IT CRASHED."
2270 H=1
2280 GOTO 1920
2290 PRINT"YOUR BOMBER FAILED TO MAINTAIN THE LOW ALTITUTE YOU DE-
2300 PRINT"SIRED AND SOON CRASHED.
2310 PRINT"BETTER LUCK NEXT TIME."
2320 H=1
2330 GOTO 1920
2340 PRINT"YOUR BOMBER JUST PASSED UP THE TARGET, AND NEEDLESS TO
2350 PRINT"SAY, YOU NO LONGER THREATEN ITS EXISTANCE."
2360 PRINT" "
2370 IF R=2 THEN 2420
2380 IF R=3 THEN 2440
2390 IF R=4 THEN 1920
2400 Q$=" SECOND
2410 GOTO 2450
2420 Q$="THIRD"
2430 GOTO 2450
2440 QS="FOURTH AND FINAL"
2450 IF R>1 THEN 2490
2460 PRINT"YOU HAVE THUS FAR COMPLETED 1 RUN. WOULD YOU LIKE TO"
2470 PRINT"MAKE ANOTHER PASS";
2480 GOT02510
2490 PRINT"YOU HAVE THUS FAR COMPLETED ";R;"RUNS. WOULD YOU LIKE"
2500 PRINT"ANOTHER PASS";
2510 INPUT R$
2520 IF R$="YES" THEN 2560
2530 IF R$="NO" THEN 1920
2540 PRINT"SIMPLY REPLY YES' OR'NO'."
2550 GOTO 2510
2560 PRINT"YOUR PLANE HAS CIRCLED, AND IS NOW IN POSITION TO MAKE"
2570 PRINT"ITS";0$;"PASS."
2580 GOTO 330
2590 PRINT"LOOK OVER THE PHYSICS LAWS GOVERNING FALLING BODIES,"
2600 PRINT"AND RETURN TO PLAY AGAIN SOON."
2610 END
Ok
```



Bridge-it is a two-player pencil and paper logic game. One player is represented by X's, the other by O's. The X's and O's are arranged in an alternating grid pattern so that X's may be joined to one another by a line without crossing an O and O's may be joined to one another without crossing an X. The object of the game is for the X's to draw a line from the top to the bottom of the board. The O's must connect a continuous chain from the right to the left of the board. Players move alternately and may go any place on the grid. Any two of your symbols,

RUN

## BRIDGE-IT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

### DO YOU WANT INSTRUCTIONS? YES

THE OBJECT OF THIS GAME IS FOR YOU TO GO FROM THE LEFT COLUMN TO THE RIGHT COLUMN BY CONNECTING THE O'S. THE COM-PUTER MUST GO FROM THE TOP TO THE BOTTOM BY CONNECTING THE X'S.

YOU MAKE YOUR MOVES BY TYPING IN THE COORDINATES (X,Y) OP (COLUMN,ROW) OF THE 'D' YOU WISH TO HOVE FROM AFTER THE COMPUTER TYPES:

## YOUR MOVE FROM?

AND BY TYPING IN THE COORDINATES OF THE  $^{\prime}O^{\prime}$  You wish to move to after the computer types:

TO?

YOU CAN MOVE EITHER VERTICALLY OR HORIZONTALLY, BUT NOT DIAGONALLY. YOU CANNOT MOVE VERTICALLY IN EITHER THE FIRST COLUMN OR THE THIRTEENTH COLUMN. THE COMPUTER WILL MOVE FIRST.

TEAR ON LINE

YOU MAY USE THIS BOARD TO MARK THE MOVES ON, OR YOU CAN GET AN UPDATED BOARD AFTER YOU MAKE EACH MOVE.

1111 1234567890123 13 X X X X X X X 120000000 XXXXXX 100000000 XXXXXX 80000000 YXXXXX 60000000 XXXXXX 40000000 XXXXXX 0000000 YYXXXX 1234567891111 0123

TEAR ON LINE

either X's or O's, may be connected together on a given move.

In this particular version of the game, the computer is your opponent. The computer plays the X's and you play the O's. The computer moves first, which gives it a very slight advantage. If you find it is too formidable an opponent you may wish to modify the program to allow the player to move first. At any point during the game you may ask for a printout of the board and see how the play is progressing.

This program was written by Michael Kass, Miles Barel, and Alan Segal.

YOUR MOVE FROM? 1.4 TO? 3.4 BOARD (YES OR NO)? N I MOVE FROM 4 , 3 TO 4 , 5 YOUR MOVE FROM? 3.2 T0? 3.4 BOARD (YES OR NO)? N I MOVE FROM 4 , 1 TO 4 , 3 YOUR MOVE FROM? 3.3 T0? 5.3 INVALID MOVE -- TRY AGAIN YOUR MOVE FROM? 3.6 T0? 5.6 BOARD (YES OR NO)? N I MOVE FROM 6, 5 TO 6, 7 YOUR MOVE FROM? 5.4 T0? 5.6

I MOVE FROM 2.1 TO 2.3

BOARD (YES OR NO)? N

I MOVE FROM 6 . 3 TO 6 . 5

YOUR MOVE FROM? 5.8 TO? 7.8

BOARD (YES OR NO)? N

I MOVE FROM 8 , 7 TO 8 , 9

YOUR MOVE FROM? 7,10 T0? 9,10

```
BOARD (YES OR NO)? Y
                         1234557890123
                          XXXXXX
                      1200000000
                         XXXXXX
                      11
                      10 0 0 0 0-0 0 0
                          XXXXXX
                       0 0 0 0 - 0 ! 0 0 8
                         XXXXXX
                       6 0 0-010 0 0 0
                         XXIXXXX
                       4 0-01010 0 0 0
                       3 XIX X X X X
                       2 01010 0 0 0 0
                       1 X X X X X X
                        1234567891111
                                 0123
                     I MOVE FROM 10 . 9 TO 10 . 11
                     YOUR MOVE FROM? 9.8
                     T0? 9.10
                     BOARD (YES OR NO)? N
                     I MOVE FROM 10 , 7 TO 10 , 9
                     YOUR MOVE FROM? 7.6
                     107 7.8
                     BOARD (YES OR NO)? N
                     I MOVE FROM 8 . 5 TO 8 . 7
                     YOUR MOVE FROM? 9.12
                     TO? 11,12
                     BOARD (YES OR NO)? N
                     I MOVE FROM 12 , 11 TO 12 , 13
                     I WIN!!!!
                     BOARD (YES OR NO)? Y
                         1234567890123
                      13
                         XXXXXX
                      12 0 0 0 0 0-010
                         XXXXXXX
                      10 0 0 0 0-010 0
                         XXXXXIXX
                       8 0 0 0-01010 0
                         XXXIXXX
                       6 0 0-0!0!0 0 0
                       5 X X!X X X X
                       4 0-01010 0 0 0
                         XIXXXXXX
                       2 01010 0 0 0 0
                         XXXXXX
                         1234567891111
                                 0123
LIST
5 PRINT TAB(24);"BRIDGE-IT"
10 PRINT TAB(20); "CREATIVE COMPUTING"
20 PRINT TAB(18); "MORRISTOWN, NEW JERSEY"
30 I=I-2
42 PRINT
50 PRINT
70 PRINT"DO YOU WANT INSTRUCTIONS";
80 INPUT B4$
90 PRINT
100 IF LEFT$(B4$,1)="N" THEN 300
120 PRINT"THE OBJECT OF THIS GAME IS FOR YOU TO GO FROM THE LEFT "
130 PRINT"COLUMN TO THE RIGHT COLUMN BY CONNECTING THE O'S. THE COM-"
140 PRINT"PUTER MUST GO FROM THE TOP TO THE BOTTOM BY CONNECTING"
145 PRINT"THE X'S.
150 PRINT
160 PRINT"YOU MAKE YOUR MOVES BY TYPING IN THE COORDINATES (X,Y) OR"
170 PRINT"(COLUMN, ROW)"
171 PRINT"OF THE 'O' YOU WISH TO MOVE FROM AFTER THE COMPUTER"
172 PRINT" TYPES:"
180 PRINT
190 PRINT"YOUR MOVE FROM?"
200 PRINT
```

210 PRINT"AND BY TYPING IN THE COORDINATES OF THE OF YOU WISH TO MOVE" 220 PRINT"TO AFTER THE COMPUTER TYPES:"

230 PRINT 240 PRINT"TO?" 250 PRINT 260 PRINT"YOU CAN MOVE EITHER VERTICALLY OR HORIZONTALLY." 270 PRINT"BUT NOT DIAGONALLY. YOU CANNOT MOVE VERTICALLY IN EITHER 280 PRINT"THE FIRST COLUMN OR THE THIRTEENTH COLUMN. THE COMPUTER 4 281 PRINT"MOVE FIRST." 290 PRINT:PRINT 300 DIM X(20,20) 320 DIM0(20,20) 330 DIMT(20,20) 340 FOR X=1 TO 13 STEP 2 350 FOR Y=2 TO 12 STEP2 360 D(X,Y)=1 370 X(Y.X)=1 380 NEXT Y 390 NEXT X 400 6010480 410 PRINT 420 PRINT"BOARD (YES OR NO)"; 430 INPUTES 440 PRINT 450 IF LEFT\$(B\$,1)="N" THEN 490 480 GOSUB 990:REM PRINT BOARD SUBROUTINE 490 IF E<>5 THEN 510 500 GOTO 3010 510 GOSUB1640:REM COMPUTER MOVE 520 GOSUB 640:REM COMPUTER WIN SUBROUTINE 530 PRINT 540 IF E=5 THEN 420 550 GOSUB2710:REM PLAYER WIN SUBROUTINE 560 PRINT 570 PRINT"YOUR MOVE FROM": 580 INPUT F,G 590 PRINT"TO": 600 INPUT F1,61 610 PRINT 620 GOSUB 2220:REM ERROR AND CHANGE BOARD SUBROUTINE 630 GOTU 420 640 REM WIN SUBROUTINE \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* 650 REM FIRST TEST 660 FOR H=1 TO 11 STEP 2 670 J=12 680 IF 0(H, J)=3 THEN 710 690 NEXT H 700 GUT0 980 710 FOR I=1 TO 11 STEP 2 720 J=2 730 IF D(I, J)=3 THEN 760 740 NEXT I 750 GOTO 980 760 REM OTHER TESTS 770 J=J+2 780 IF J=12 THEN 960 790 IF 0(1, J)=3 THEN 870 800 IF 0(I+1, J+1)=2 THEN 890 810 IF I-1<0 THEN 840 820 IF 0(I-1, J-1)=2 THEN 920 830 IF X(I+1, J+1)=2 THEN 890 840 IF I-1<0 THEN980 850 IF X(I-1, J-1) THEN 890 860 GOTO 740 870 J=J+2 880 GOTO 780 1=L 098 900 I=I+2 910 GOTO 780 920 J=J 950 GOTO 980 960 PRINT"I WINIHH" 970 E=5 980 RETURN 990 REM PRINT BOARD SUBROUTINE \*\*\*\*\*\*\*\* 1000 R=R+1 1010 IF R>1 THEN 1150 1020 PRINT"TEAR ON LINE" 1030 PRINT"---1040 PRINT"YOU MAY USE THIS BOARD TO MARK THE MOVES ON, OR" 1050 PRINT"YOU CAN GET AN UPDATED BOARD AFTER YOU MAKE EACH MOVE." 1060 PRINT 1070 PRINT 1080 PRINT 1090 PRINT 1100 PRINT 1110 PRINT 1120 PRINT TAB(5); CHR\$(7); CHR\$(13); TAB(5); CHR\$(7) 1130 PRINT 1140 PRINT 1150 D=0 1160 PRINT TAB(13)"1111"

1170 PRINT TAB(4)"1234567890123"

2

1180 FOR Y=13 TO 1 STEP -1

```
1190 IF YC10 THEN 1220
1200 PRINT Y:
1220 PRINT" "Y:
1230 FOR X=1 TO 13 STEP1
1240 IF Y/2=INT(Y/2) THEN 1330
1250 IF X(X,Y)=0 THEN 1420
1260 DNX(X,Y) GOTO 1270,1290,1310
1270 PRINT"X ";
 1280 GOTO 1450
1290 PRINT"X-";
1300 6010 1450
1310 PRINT"X!":
1320 6010 1450
1340 IF D(X,Y)=0 THEN 1450
1350 DN D(X,Y) GUTO 1360,1380,1400
1360 PRINT "0 ";
1370 GOTO 1450
1380 PRINT"0-";
1390 GOTO 1450
1400 PRINT"0!";
1410 GOTO 1450
1420 D=D+1
1430 IFD>1 THEN 1450
1440 PRINT " ";
1450 NEXT X
1460 GOSUB 1620
1470 NEXT Y
1480 PRINT TAB(4)"1234567891111"
1490 PRINT TAB(13)"0123"
1500 R1=R1+1
1510 IF R1>1 THEN 1590
1520 PRINT
1530 PRINT
1540 PRINT"-
1550 PRINT"TEAR ON LINE"
1560 PRINT
1570 PRINT
1580 PRINT
1590 PRINT
1600 PRINT
1610 RETURN
1620 PRINT
1630 RETURN
1640 REM COMPUTER MOVE SUBROUTINE *********
1650 B=B+1
1660 IF B>1 THEN 1710
1670 0(1.2)=3
1680 PRINT "I MOVE FROM 2,1 TO 2,3"
1890 B1=B1+1
1700 IF B1>1 THEN 1890
1710 FOR C=3 TO 11 STEP 2
1720 T(C,C+1)=1
1730 T(C-2,C+1)=1
1740 SOTO 1790
1750 NEXT C
1760 T(2,3)=3
1770 1(7,12)=2
1780 GOTO 1890
1790 FOR 0=C+3 TO 12 STEP 2
1800 T(C-2,Q)=2
1810 1(0-1,0+1)=2
1820 T(C-1.9-1)=2
1830 NEXT 0
1840 FOR S=C TO 3 STEP -2
1850 T(C-1,S)=3
1860 T(C,S-1)=3
1870 NEXT S
1880 GOTO 1750
1890 IF F>F1 THEN 1950
1900 IF FOF1 THEN 1920
1910 IF 6>61 THEN 1950
1920 X=F
1930 Y=G
1940 GOTO 1970
1950 X=F1
1960 Y=G1
1970 IF T(X,Y)=0 THEN 2210
1980 IF FOF1 THEN 2000
1990 DN T(X-1,Y+1) GOTO 2010,2080,2150
2000 ON T(X,Y) GOTO 2010,2080,2150
2010 IF X=Y-1 THEN 2050
2020 D(X+2,Y)=3
2030 PRINT"I MOVE FROM ";X+3;",";Y-1;"TO ";X+3;",";Y+1
2040 GOTO 2210
2050 D(X-2,Y)=3
2060 PRINT"I MOVE FROM ";X-1;",";Y-1;"TO ";X-1;",";Y+1
2070 GOTD 2210
2080 IF X(X-1,Y+1)=3 THEN 2120
2090 X(X+1,Y-1)=2
2100 PRINT"I HOVE FROM "; X+1;", "; Y-1;"TO "; X+3;", "; Y-1
```

```
2110 GDT02210
2120 0(X-2,Y+2)=3
2130 PRINT"I MOVE FROM ";X-1",";Y+1;"TO ";X-1;",";Y+3
2140 GOTO 2210
2150 IF X(X-1,Y+1)=3 THEN 2190
2160 X(X-1,Y+1)=2
2170 PRINT"I MOVE FROM ":X-1:".":Y+1:"TO ":X+1:".":Y+1
2180 GOTO 2210
2190 D(X.Y)=3
2200 PRINT"I MOVE FROM ";X+1;",";Y-1;"TO ";X+1",";Y+1
2210 RETURN
2220 REM ERROR AND CHANGE BOARD SUBROUTINE*************
2230 IF F<>F1 THEN 2280
2240 IF F=1 THEN 2630
2250 IF F=13 THEN 2630
2260 IF F1=13 THEN 2630
2270 IF 6=61 THEN 2630
2280 IF F/2=INT(F/2) THEN 2630
2290 IF F>13 THEN 2630
2300 IF 6>12 THEN 2630
2310 IF 6/2(> INT(6/2) THEN 2630
2320 IF FOINT(F) THEN 2630
2330 IF F<1 THEN 2630
2340 IF 6<1 THEN 2630
2350 IF F1/2=INT(F1/2) THEN 2630
2360 IF F1>13 THEN 2630
2370 IF 61>12 THEN 2630
2380 IF 61/2 (>INT(61/2) THEN 2630
2390 IF F1 () INT (F1) THEN 2630
2400 IF 61<1 THEN 2630
2410 IF F=F1 THEN 2530
2420 IF 6<>61 THEN 2630
2430 IF ABS(F-F1)<>2 THEN 2630:REM PRINT ERROR
2440 IF F>F1 THEN 2490
2450 IF 0(F,G)=2 THEN 2630
2460 IF D(F,G)=3 THEN 2630
2470 D(F,6)=2
2480 5010 2700:REM RETURN
2490 IF 0(F1,G1)=2 THEN 2630
2500 IF 0(F1,G1)=3 THEN 2630
2510 0(F1,61)=2
2520 GOTO 2700: REM RETURN
2530 IF ABS(6-61) <> 2 THEN 2530:REM PRINT ERROR
2540 IF 6>61 THEN 2590
2550 IF X(F-1,G+1)=2 THEN 2630
2560 IF X(F-1,G+1)=3 THEN 2630
2570 X(F-1,G+1)=3
2580 GOTO 2700:REM RETURN
2590 IF X(F1-1,61+1)=2 THEN 2630
2600 IF X(F1-1, 61+1)=3 THEN 2630
2610 X(F1-1,61+1)=3
2620 GDTO 2700:REM RETURN
2630 PRINT"INVALID MOVE -- TRY AGAIN"
2640 PRINT
2650 PRINT"YOUR MOVE FROM";
2660 INPUT F,G
2670 PRINT"TO";
2680 INPUT F1,61
2690 GOTO 2220
2700 RETURN
2710 REM PLAYER WIN ROUTINE ***
2720 FOR H=1 TO11 STEP 2
2730 I=12
2740 IF X(I,H)=3 THEN 2770
2750 NEXT H
2760 6010 3000
2770 FOR J=1 TO 11 STEP 2
2780 I=2
2790 IF X(I, J)=3 THEN 2820
2800 NEXT J
2810 GOTO 3000
2820 I=I+2
2830 IF X(1,J)=3 THEN 2970
2840 IF X(1,J)=3 THEN 2910
2850 IF X(1+1,J+1)=2 THEN 2930
2860 IF J-1<0 THEN 2890
2870 IF X(I-1,J-1)=2 THEN 2950
2880 IFD(I+1,J+1)=2 THEN 2930
2890 IF J-1<0 THEN 3000
2900 GOTO 2808
2910 I=I+2
2920 GOTO 2830
2930 J=J+2
2940 GOTO 2830
2950 J=J-2
2960 GOTO 2830
2970 IF 0(1,2) >2 THEN 3000
2980 PRINT"YOU WIN !!! CONGRATULATIONS!!!"
2990 E=5
3000 RETURN
3010 END
```

**D**k



In this game of high adventure, your object is to travel 200 miles across the great Gobi Desert. You're being chased by a tribe of knock-kneed pygmies. You have one quart of water which will last you for six drinks; it may be renewed if you find an oasis or, if you are found by another traveller, you may get an additional half-quart of water. During your journey you encounter all types of hazards such as sand storms, wild Berbers and possible injuries to your camel.

Warning: this is a very hazardous and addictive game. It is also very difficult to win. In ten plays of the game, the maximum distance we were able to travel was 159 miles, and in many cases we managed to make only seven or eight miles before one of the hazards caused our demise.

This game was submitted by the Heath Users Group.

RUN

CAMEL CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

WOULD YOU LIKE INSTRUCTIONS? YES

WELCOME TO CAMEL. THE OBJEST IS TO TRAVEL 200 HILES ACROSS THE GREAT GOBI DESERT. A TRIBE OF KNOCKED KNEED PIGMIES WILL BE CHASING YOU. YOU WILL BE ASKED FOR COMMANDS EVERY SO OFTEN.

C D M M A N D S : #1 DRINK FROM YOUR CANTEEN #2 AHEAD MODERATE SPEED #3 AHEAD FULL SPEED #4 STOP FOR THE NIGHT #5 STATUS CHECK #6 HOPE FOR HELP

YOU HAVE ONE QUART OF WATER WHICH WILL LAST YOU SIX DRINKS. YOU MAVE RENEW YOUR WATER SUPPLY COMPLETELY AT AN OASES. YOU GET A HALF A QUART IF FOUND BY HELP. IF HELP DOES NOT FIND YOU AFTER COMMAND SIX, YOU LOSE. GOOD LUCK AND GOOD CAMELING !! YOU ARE IN THE HIDDLE OF THE DESERT AT AN OASIS. YOU HAVE TRAVELED 0 HILES ALLTOGETHER. WHAT IS YOUR COMMAND? 3 YOUR CAMEL IS BURNING ACROSS THE DESERT SANDS.

YOU HAVE TRAVELLED 6 HILES ALLTOGETHER. WHAT IS YOUR COMMAND? 3 YOUR CAMEL IS BURNING ACROSS THE DESERT SANDS.

YOU HAVE TRAVELLED 8 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 4 YOUR CAMEL THANKS YOU! THE PYGMIES HAVE CAPTURED YOU. CAMEL AND PEOPLE SOUP IS THEIR FAVORITE DISH !!!! WANT A NEW CAMEL AND A NEW GAME " Y GOOD LUCK AND GOOD CAMELING !! YOU ARE IN THE MIDDLE OF THE DESERT AT AN DASIS. YOU HAVE TRAVELLED O MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 3 YOUR CAMEL IS BURNING ACROSS THE DESERT SANDS. YOU HAVE TRAVELLED 6 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOUR CAMEL LIKES THIS PACE. ------ WARNIN G----- GET A DRINK YOU HAVE TRAVELLED 8 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 1 BETTER WATCH FOR AN DASES ! WHAT IS YOUR COMMAND? 2 YOU HAVE BEEN CAUGHT IN A SANDSTORM......GOOD LUCK! YOUR NEW POSITION IS 12 HILES SO FAR! YOUR CAMEL LIKES THIS PACE. YOUR CAMEL LIKES THIS PACE. THE PYGNIES ARE 10 MILES BEHIND YOU. YOU HAVE TRAVELLED 20 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 3 YOU DIRTY RAPSCALLION! YOU RAN YOUR POOR CAMEL TO DEATH !! YOU DIED IN THE DESERT. Your body was eaten by vultures and imported canningals !!! WANT A NEW CAMEL AND A NEW GAME ? Y GOOD LUCK AND GOOD CAMELING !! YOU ARE IN THE MIDDLE OF THE DESERT AT AN DASIS. YOU HAVE TRAVELLED C MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOU HAVE ARRIVED AT AN DASES------YOUR CAMEL IS FILLING YOUR CANTEEN AND EATING FIGS. YOUR CAMEL LIKES THIS PACE. YOU HAVE TRAVELLED 3 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOUR CAMEL LIKES THIS PACE. YOU HAVE TRAVELLED 11 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOUR CAMEL LIKES THIS PACE. THE PYGHIES ARE 7 MILES BEHIND YOU. YOU HAVE TRAVELLED 14 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 1 BETTER WATCH FOR AN DASES WHAT IS YOUR COMMAND? 2 YOUR CAMEL HURT HIS HUMP. LUCKILY THE PYGMIES WERE FOOTWEARY !!! YOUR CAMEL LIKES THIS PACE. THE PTOMIES ARE 11 MILES BEHIND YOU. YOU HAVE TRAVELLED 21 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOUR CAMEL LIKES THIS FACE. THE PYEMIES ARE 15 MILES BEHIND YOU. YOU HAVE TRAVELLED 28 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 YOU HAVE ARRIVED AT AN DASES -----YOUF CAMEL IS FILLING YOUR CANTEEN AND EATING FIGS. YOUR CAMEL LIKES THIS PACE. THE PYOHIES ARE 13 MILES BEMIND YOU. YOU HAVE TRAVELLED 37 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 2 WILD BERBERS HIDDEN IN THE SAND HAVE CAPTURED YOU. #7 ATTEMPT AN ESCAPE #8 WAIT FOR PAYMENT YOUR SUB-COMMAND ? 7 COMGRADULATIONS, YOU SUCCESSFULLY ESCAPED '''' THE PYGMIES ARE 4 MILES BEHIND YOU. YOU HAVE TRAVELLED 37 MILES ALLTOGETHER. WHAT IS YOUR COMMAND? 6 YOU DIED IN THE DESERT. THE LOCAL SHEIK NOW USES YOUR SKULL FOR A CHANGE PURSE !!! WANT A NEW CAMEL AND A NEW GAME ? NO CHICKEN DŁ

```
10 PRINT TAB(26);"CAMEL"
20 PRINT TAB(20); "CREATIVE COMPUTING"
30 PRINT TAB(18); "MORRISTOWN, NEW JERSEY"
35 PRINT: PRINT: PRINT
110 PRINT "WOULD YOU LIKE INSTRUCTIONS";
120 INPUT DS
130 IF LEFT$(D$,1)="N" THEN 320
140 PRINT:PRINT " WELCOME TO CAMEL. THE OBJEST IS TO TRAVEL"
 150 PRINT "200 MILES ACROSS THE GREAT GOBI DESERT."
160 PRINT "A TRIBE OF KNOCKED KNEED PIGMIES WILL BE CHASING YOU."
170 PRINT "YOU WILL BE ASKED FOR COMMANDS EVERY SO OFTEN."
180 PRINT
190 PRINT
200 PRINT
ZIO PRINT "C O M M A N D S :"
220 PRINT "#1 DRINK FROM YOUR CANTEEN"
230 PRINT "#2 AHEAD MODERATE SPEED"
240 PRINT "#3 AHEAD FULL SPEED"
250 PRINT "#4 STOP FOR THE NIGHT"
260 PRINT "#5 STATUS CHECK"
270 PRINT "#6 HOPE FOR HELP"
275 PRINT
276 PRINT
277 PRINT
278 PRINT
279 PRINT
280 PRINT "YOU HAVE ONE QUART OF WATER WHICH WILL LAST YOU SIX DRINKS."
290 PRINT "YOU MAVE RENEW YOUR WATER SUPPLY COMPLETELY AT AN DASES."
300 PRINT "YOU GET A HALF A QUART IF FOUND BY HELP."
310 PRINT "IF HELP DOES NOT FIND YOU AFTER COMMAND SIX, YOU LOSE."
320 PRINT "GOOD LUCK AND GOOD CAMELING !!!
330 PRINT "YOU ARE IN THE MIDDLE OF THE DESERT AT AN OASIS."
335 GOSUB 2000
340 IF C>199 THEN 1210
350 Z=Z-1
JS5 IF Z=1 THEN PRINT "------- W A R N I N G----- GET A DRINK"
360 IF Z<0 THEN 1630
370 P=P+1
380 X2=1NT(10*RND(1)+2.5)
390 IF 0>0 THEN 940
400 IF P(4 THEN 470
410 C1=C1+X2
420 IF CIKC THEN 460
430 PRINT "THE PYGMIES HAVE CAPTURED YOU. CAMEL AND PEOPLE SOUP IS"
440 PRINT "THEIR FAVORITE DISH !!!!!
450 GOTO 1560
460 PRINT "THE PYGHIES ARE "C-C1;" MILES BEHIND YOU."
470 PRINT "YOU HAVE TRAVELLED ";C;" MILES ALLTOGETHER."
480 PRINT "WHAT IS YOUR COMMAND";
490 INPUT Y
500 DN Y GUTO 830,610,680,760,790
550 1=INT(10*RND(1))
560 IF T()1 THEN 1200
570 PRINT "HELP HAS FOUND YOU IN A STATE OF UNCONSCIOUSNESS."
580 5=3
590 Z=4
600 GOTO 340
610 F=F+1
620 IF F=8 THEN 1190
630 GOSUB 880
640 X1=INT(10*RND(1))
650 C=C+X1
660 PRINT "YOUR CAMEL LIKES THIS PACE."
670 GBID 340
A80 F=F+3
690 IF F>7 THEN 1190
700 GOSUB 880
210 X1=2*INT(10*RND(1))
720 C=C+X1
730 PRINT "YOUR CAMEL IS BURNING ACROSS THE DESERT SANDS."
740 PRINT
250 GDT0 340
760 FRINT "YOUR CAMEL THANKS YOU!"
270 F=0
780 GOTO 350
790 PRINT "YOUR CAMEL HAS ";7-F;" GOOD DAYS LEFT."
800 PRINT "YOU HAVE ";S;" DRINKS LEFT IN YOUR CANTEEN."
BIO PRINT "YOU CAN GO ";Z;" COMMANDS WITHOUT DRINKING."
830 S=S-1
840 IF SKO THEN 1200
850 PRINT "BETTER WATCH FOR AN DASES !"
860 Z=4
870 GOTO 480
880 A=INT(100*RND(1))
890 IF A>5 THEN 1120
900 PRINT "WILD BERBERS HIDDEN IN THE SAND HAVE CAPTURED YOU."
910 PRINT "LUCKILY THE LOCAL SHEIK HAS AGREED TO THEIR RANSOM-"
                                                                                ()k
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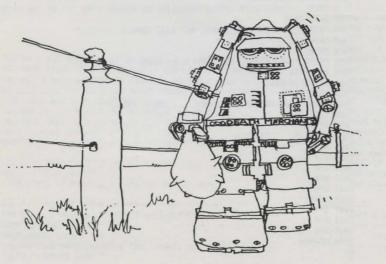
920 PRINT "DEMANDS......BUT......WATCH FOR THE PYGMIES !!!" 930 PRINT "YOU HAVE A NEW CHOICE OF SUB-COMMANDS:" 940 PRINT "#7 ATTEMPT AN ESCAPE" 950 PRINT "#8 WAIT FOR PAYMENT" 960 PRINT "YOUR SUB-COMMAND "; 970 INPUT X 980 IF X=8 THEN 1060 990 X1=INT(10 \* RND(1)) 1000 IF X1<5 THEN 1040 1010 PRINT "CONGRADULATIONS, YOU SUCCESSFULLY ESCAPED !!!!" 1020 0=0 1030 GOTO 340 1040 PRINT "YOU WERE MORTALLY WOUNDED BY A PIG STABBER WHILE ESCAPING." 1050 GOTO 1410 1060 X1=INT(100\*RND(1)) 1070 REM 1080 IF X1>24 THEN 1100 1090 PRINT "YOUR RANSOM HAS BEEN PAID AND YOU ARE FREE TO GO." 1095 D=0 1096 GOTO 340 1100 PRINT "THE LOCAL SULTAN IS COLLECTING.....JUST WAIT ....... 1110 GOTO 340 1120 A=INT(10\*RND(1)) 1130 IF A>2 THEN 1240 1140 PRINT "YOU HAVE ARRIVED AT AN DASES-----YOUR CAMEL IS" 1150 PRINT "FILLING YOUR CANTEEN AND EATING FIGS." 1160 Z=4 1170 S=6 1180 RETURN 1190 PRINT "YOU DIRTY RAPSCALLION! YOU RAN YOUR POOR CAMEL TO DEATH !!" 1200 GOTO 1410 1210 PRINT "YOU WIN, A PARTY IS BEING GIVEN IN YOUR HONDR....." 1220 PRINT ".....THE PYGHIES ARE PLANNING TO ATTEND......" 1230 GOTO 1560 1240 X1=INT(100\*RND(1)) 1250 IF X1>5 THEN 1350 1260 PRINT "YOU HAVE BEEN CAUGHT IN A SANDSTORM..... GOOD LUCK!" 1270 X5=INT(10\*RND(1)) 1280 X6=INT(10\*RND(1)) 1290 IF X6<5 THEN 1320 1300 C=C+X5 1310 GOTO 1330 1320 C=C-X5 1330 PRINT "YOUR NEW POSITION IS ";C;" MILES SO FAR!" 1340 RETURN 1350 X1=INT(100\*RND(1)) 1360 IF X1>5 THEN RETURN 1370 C1=C1+1 1380 PRINT "YOUR CAMEL HURT HIS HUMP." 1390 PRINT "LUCKILY THE PYGMIES WERE FOOTWEARY !!!" 1400 RETURN 1410 U=INT(10\*RND(1)) 1420 PRINT "YOU DIED IN THE DESERT." 1430 IF U>1 THEN 1460 1440 PRINT "THE NATIONAL CAMEL'S UNION IS NOT ATTENDING YOUR FUNERAL!!!" 1450 GOTO 1560 1460 IF U>3 THEN 1490 1470 PRINT "YOUR BODY WAS EATEN BY VULTURES AND IMPORTED CANNINBALS !!!" 1480 GDTO 1560 1490 IF U>5 THEN 1520 1500 PRINT "THE LOCAL SHEIK NOW USES YOUR SKULL FOR A CHANGE PURSE !!!" 1510 GOTO 1560 1520 IF U>7 THEN 1550 1530 PRINT "PEOPLE WITH LITTLE INTELLIGENCE SHOULD STAY OUT OF THE DESERT 1540 GOTO 1560 1550 PRINT "TURKEYS SHOULD FLY, NOT RIDE CAMELS !!!!!!! 1560 PRINT 1570 PRINT 1580 PRINT "WANT A NEW CAMEL AND A NEW GAME ": 1590 INPUT D\$ 1600 IF LEFT\$(D\$,1)="Y" THEN 320 1620 GOTO 1650 1630 PRINT "YOU RAN OUT OF WATER ..... SORRY CHUM!!!" 1640 GOTO 1410 1650 PRINT "--1655 PRINT " CHICKEN" 1657 PRINT 1660 END 2000 Z=4 2010 5=6 2020 C=0 2030 C1=0 2040 0=0 2050 F=0 2060 P=0 2070 RETURN



CHASE puts you in a maze made up of high-voltage fences and posts. This in itself isn't too unpleasant but there're also the five interceptor robots bent on just one thing-your destruction. If these robots touch you ... that's the end of the game (and you!). There's one hope-make the robots hit the maze, or each other (they're like people-sometimes they'd rather be alone). If you destroy them all, you win! If you find yourself in a totally hopeless situation, you have the option of making a tremendous leap to a random location (which may well be on top of a fence or a guard).

At the end of the game, you may replay with the same or different starting conditions.

I believe this game was originally created by Mac Oglesby. It was then modified by Bill Cotter and further improved by Arnold Loveridge. An intermediate version appeared in *Creative Computing*, Jan/Feb 1976.



RUN

CHASE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU ARE WITHIN THE WALLS OF A HIGH VOLTAGE MAZE THERE ARE FIVE SECURITY MACHINES TRYING TO DESTROY YOU YOU ARE THE '\*' THE INTERCEPTORS ARE THE '+' THE AREAS MARKED 'X' ARE HIGH VOLTAGE YOUR ONLY CHANCE FOR SURVIVAL IS TO MANEUVER EACH INTERCEPTOR INTO AN 'X'.----GOOD LUCK-----MOVES ARE 7.8.9 4.\*.6 1.2.3

10 = NO MOVE FOR THE REST OF THE GAME -1 = GAVE UP, SITUATION HOPELESS. 0 = A TREMENDOUS (BUT UNFORTUNATELY RANDOM) LEAF

XXXXXXXXXXXXXXXXXXXXXXX X XX X X X + Y X X XX X X X X X X X X XX X X XXX XX XX + X X \* X X \*\*\*\*\*\* ? 5 \*\*\*\*\*\* Х X XX X XX X X X XX Y X X X X X X X +X X XXX+ XX X XX X + + XX X X \* Y XXXXXXXXXXXXXXXXXXXXXXXX 7 5 X X XX XX X X X X X X X Х χ X Х X X XX X X XXX X XX XX + X X X + XXXXXXXXXXXXXXXXXXXXXXXXX ? 5 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* X X XX X X XX X Х XX X χ X Y X × + X XX X X XXX XX XX X X \*.+ X+ XXXXXXXXXXXXXXXXXXXXXXX 7 4 XXXXXXXXXXXXXXXXXXXXXXXX Х X XX X Х X X X X XX X X X X X XX X X XXX XX XX X \*+ X ++ XXXXXXXXXXXXXXXXXXXXXXXX 7 0 \$6,000,000 JUMP !!! HIGH VOLTAGE!!!!!!!!

\*\*\*\*\* ZAP \*\*\*\*\* YOU RE DEAD!!!

ANOTHER GAME (Y/N)? N

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LIST
10 PRINT TAB(26);"CHASE"
20 PRINT TAB(20);"CREATIVE COMPUTING"
30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
 40 PRINT: PRINT: PRINT
41 PRINT "YOU ARE WITHIN THE WALLS OF A HIGH VOLTAGE MAZE"
42 PRINT "THERE ARE FIVE SECURITY MACHINES TRYING TO DESTROY YOU"
60 PRINT "YOU ARE THE '*' THE INTERCEPTORS ARE THE '+'
70 PRINT "THE AREAS MARKED 'X' ARE HIGH VOLTAGE"
80 PRINT "YOUR ONLY CHANCE FOR SURVIVAL IS TO MANEUVER EACH"
90 PRINT "INTERCEPTOR INTO AN 'X'.----GOOD LUCK-----"
100 PRINT "MOVES ARE 7.8.9"
110 PRINT "
                        4.*.6"
120 PRINT "
                        1.2.3"
130 PRINT
140 PRINT "10 = NO MOVE FOR THE REST OF THE GAME"
150 PRINT "-1 = GAVE UP, SITUATION HOPELESS."
160 PRINT " 0 = A TREMENDOUS (BUT UNFORTUNATELY RANDOM) LEAP"
170 PRINT
180 DIM A(10,20),A1(10,20),N(12),L(5),H(5),L1(5),H1(5)
190 REM
210 FOR B=1 TO 10
220 FOR C=1 TO 20
230 X=INT(10+RND(1))
240 IF X=5 THEN 270
 250 A(B,C)=ASC(" ")
260 GOTO 280
270 A(B,C)=ASC("X")
280 NEXT C
290 NEXT B
300 FOR D=1 TO 10
310 A(D,1)=ASC("X"):A(D,20)=ASC("X")
320 NEXT D
330 FOR F=1 TO 20
340 A(1,F)=ASC("X"):A(10,F)=ASC("X")
350 NEXT F
360 GOTO 410
370 H=INT(2+8*RND(1))
380 I=INT(2+18*RND(1))
390 IF A(H, I) <> ASC(" ") THEN 370
400 RETURN
410 GOSUB 370
420 A(H, I)=ASC("*")
430 J=H:K=I
440 FOR N9=1 TO 5
450 GOSUB 370
460 A(H,I)=ASC("+")
470 L(N9)=H:M(N9)=I
480 NEXT N9
490 FOR B1=1 TO 10:FOR B2=1 TO 20:A1(B1,B2)=A(B1,B2):NEXT B2:NEXT B1
500 FOR B1=1 TO 5:L1(B1)=L(B1):M1(B1)=M(B1):NEXT B1
520 J1=J:K1=K
530 Y9=0
540 FOR D2=1 TO 10
550 FOR B2=1 TO 20
560 N$=CHR$(A(D2,B2))
570 PRINT NS;
580 NEXT B2
590 PRINT
600 NEXT D2
610 IF Y9 <> 10 THEN 640
620 PRINT
630 GOTO 890
640 INPUT Y9
650 J2=J:K2=K
660 IF Y9=0 THEN 860
670 IF Y9 < 0 THEN 1230
680 IF Y9=10 THEN 1070
690 ON Y9 GOTO 820,800,780,840,890,760,700,720,740
700 J=J-1:K=K-1
```

```
710 GOTO 890
720 J=J-1
730 GOTO 890
740 J=J-1:K=K+1
750 GOTO 890
760 K=K+1
770 GOTO 890
780 J=J+1:K=K+1
790 GOTO 890
800 J=J+1
810 GOTO 890
820 J=J+1:K=K-1
830 GOTO 890
840 K=K-1
850 GOTO 890
860 PRINT "$6,000,000 JUMP !!!!"
870 J=INT(2+8*RND(1))
880 K=INT(2+18*RND(1))
890 IF A(J,K)=ASC("X") THEN 1260
900 A(J2,K2)=ASC(" ")
910 A(J,K)=ASC("*")
920 GDT0 1070
930 REM INTERCEPTOR MOVEMENT
940 IF A(X,Y)=ASC("X") THEN 1040
950 X2=X:Y2=Y
960 X=SGN(J-X):Y=SGN(K-Y)
970 X=X+X2:Y=Y+Y2
980 IF A(X,Y)=ASC("*") THEN 1050
990 IF A(X,Y)=ASC(" ") THEN 1020
1000 A(X2,Y2)=ASC(" ")
1010 RETURN
1020 A(X,Y)=ASC("+")
1030 A(X2,Y2)=ASC(" ")
1040 RETURN
1050 69=99
1060 RETURN
1070 FOR N9=1 TO 5
1080 X=L(N9):Y=M(N9)
1090 69=0
1100 GOSUB 940
1110 IF G9 <> 0 THEN 1240
1120 L(N9)=X:M(N9)=Y
1130 NEXT N9
1140 FOR N9=1 TO 5
1150 IF A(L(N9), M(N9)) <> ASC(" ") THEN 1170
1160 A(L(N9), M(N9))=ASC("+")
1170 NEXT N9
1180 FOR N9=1 TO 5
1190 IF A(L(N9), M(N9)) <> ASC("X") THEN 540
1200 NEXT N9
1210 PRINT "YOU HAVE DESTROYED ALL YOUR OPPONENTS - THE GAME IS YOURS"
1220 GOTO 1290
1230 PRINT "GIVE UP, EH."
1240 PRINT "*** YOU HAVE BEEN DESTROYED BY A LUCKY COMPUTER ***"
1250 GOTO 1290
1260 PRINT "HIGH VOLTAGE!!!!!!!!!!
1270 PRINT "***** ZAP ***** YOU'RE DEAD!!!"
1280 PRINT
1290 PRINT "ANOTHER GAME (Y/N)";
1300 INPUT N9$
1310 IF N9$ <> "Y" THEN 1400
1320 PRINT "SAME SETUP (Y/N)";
1330 INPUT N9$
1340 IF N9$ <> "Y" THEN 190
1350 FOR B1=1 TO 10:FOR B2=1 TO 20:A(B1,B2)=A1(B1,B2):NEXT B2:NEXT B1
1360 FOR B1=1 TO 5:L(B1)=L1(B1):M(B1)=M1(B1):NEXT B1
1380 J=J1:K=K1
1390 GOTO 530
1400 END
```

**D**k



# Chuck-A-Luck

RUN

#### CHUCK-A-LUCK CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

CHOOSE A NUMBER FROM 1 TO 6. I WILL ROLL 3 DICE. IF YOUR NUMBER MATCHES 1 DIE, I PAY OFF EVEN MONEY. TWO DICE, 2:1 3 DICE, 3:1

YOU HAVE \$ 500 . MAKE A BET. 7 100 CHOOSE & WIMBER? 3 1 1 5 YOU'VE MATCHED O TIMES. YOU LOOSE \$ 100 YOU HAVE \$ 400 . MAKE A BET. 7 50 CHOOSE A NUMBER? 1 J 5 6 YOU-VE MATCHED O TIMES. YOU LOOSE \$ 50 YOU HAVE \$ 350 . MAKE A BET. 7 50 CHOOSE A NUMBER? 5 5 6 1 YOU'VE MATCHED 1 TIMES. YOU'VE NON \$ 50 YOU HAVE \$ 400 . MAKE A BET. 9.100 CHOOSE A NUMBER? 2 4 1 3 YOU'VE MATCHED O TIMES. YOU LOOSE \$ 100 YOU HAVE \$ 300 . MAKE A BET. 7 100 CHOOSE A NUMBER? 5 2 4 YOU'VE MATCHED O TIMES. YOU LOOSE \$ 100 YOU HAVE \$ 200 . MAKE A BET. 7 100 CHOOSE A NUMBER? 3 1 3 6 YOU'VE MATCHED 1 TIMES. YOU'VE NON \$ 100 YOU HAVE \$ 300 . MAKE A BET. 7 100 CHOOSE & NUMBER? 4 3 4 3 YOU'VE MATCHED 1 TIMES. YOU'VE WON \$ 100 YOU HAVE \$ 400 . MAKE A BET. 7 100 CHOOSE A NUMBER? 2 2 1 4 YOU'VE MATCHED 1 TIMES. YOU'VE WON \$ 100

YOU HAVE \$ 500 . MAKE A BET. 7 200 CHOOSE A NUMBER? 3 3 2 YOU'VE MATCHED 1 TIMES. YOU'VE WON \$ 200 YOU HAVE \$ 700 . MAKE A BET. 7 -9 DON'T GET CUTE!!! YOU HAVE \$ 700 . MAKE A BET. ? 100 CHOOSE A NUMBER? 4 5 3 4 YOU'VE MATCHED 1 TIMES. YOU'VE WON \$ 100 YOU HAVE \$ 800 . MAKE A BET. 7 900 I DON' TAKE I.O.U'S !!!! YOU HAVE \$ 800 . MAKE A BET. ? .001 DON'T GET CUTE!!! YOU HAVE \$ 800 . MAKE A BET. ? 200 CHOOSE A NUMBER? 7 CHEATERIIIII CHOOSE A NUMBER? 2 3 6 3 YOU'VE MATCHED O TIMES. YOU LOOSE \$ 200 YOU HAVE \$ 600 . MAKE A BET. 7 600 CHODSE A NUMBER? 1 2 YOU'VE MATCHED 2 TIMES. YOU'VE WON \$ 1200 YOU HAVE \$ 1800 . MAKE A BET. ? 1800 CHOOSE A NUMBER? 4 1 1 YOU'VE MATCHED O TIMES. YOU LOOSE \$ 1800

Chuck-a-luck is generally found in fairgrounds, cheap casinos, and small gambling parlors. It flourished in frontier America, but dates back to European gaming houses of the eighteenth century. During its long history, chuck-a-luck has had many names including sweatcloth, chuckerluck, chuck luck, and bird cage.

Each player places his bets on one of the six numbers, one through six. When all bets have been placed, the operator tumbles three dice in a chuck cage until they come to rest face up or drop down a chute onto the table. If a player's number appears on one die, the operator pays him even money; if on two dice, two to one; if on three dice, three to one.

The computer version of Chuck-aluck was originally written by Michael Tanoff.

```
LIST
100 PRINT TAB(23);"CHUCK-A-LUCK"
110 PRINT TAB(20);"CREATIVE COMPUTING"
120 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
130 PRINT:PRINT:PRINT
140 PRINT "CHODSE A NUMBER FROM 1 TO 6. I WILL ROLL 3 DICE."
150 PRINT "IF YOUR NUMBER MATCHES 1 DIE, I PAY OFF EVEN MONEY."
160 PRINT "TWO DICE, 2:1 3 DICE, 3:1"
170 PRINT:PRINT:M=500
180 PRINT "YOU HAVE $":M:". MAKE A BET."
190 INPUT B
200 IF B > M THEN 410
210 IF B > 0 THEN IF B*100=INT(B*100) THEN 230
220 GOTO 420
230 PRINT "CHOOSE A NUMBER":
240 INPUT N
250 IF INT(N)=N AND N > 0 AND N < 7 THEN 270
260 PRINT "CHEATER !!!!!!":GOTO 230
270 A=INT(RND(1)*6)+1:PRINT A:"
                                                ";:D=INT(RND(1)*6)+1:PRINT D;"
280 C=INT(RND(1)*6)+1:PRINT C:"
290 T=0
300 IF A=N THEN T=T+1
310 IF D=N THEN T=T+1
320 IF C=N THEN T=T+1
330 PRINT "YOU'VE MATCHED ";T;" TIMES."
340 DN T GOTO 380,390,400
350 PRINT "YOU LODSE $":B
360 M=H-B:IF M<= 0 THEN 430
370 60T0 180
380 PRINT "YOU'VE WON $";B:M=M+B:60T0 180
300 PRINT "YOU'VE WON $";B*2:M=M+2*B:60TO 180
400 PRINT "YOU'VE WON $";B*3;M=M+B*3:60TO 180
410 PRINT "YOU'VE WON $";B*3;M=M+B*3:60TO 180
410 PRINT "I DON' TAKE I.O.U'S !!!!":60TO 180
420 PRINT "DON'T GET CUTE!!!":GOTO 180
430 PRINT
440 PRINT
450 END
Dk
```

# **Close Encounters**

In this game, you are situated at the center of a target area for a UFO. The program assigns coordinates 0,0 to your location. You are given information as to the course of the UFO in degrees longitude and degrees latitude and also its speed. You then have two alternatives. One, you can attempt to shoot the UFO out of the sky with an ICBM or you can do nothing and hope that air friction will cause the course of the UFO to deviate or to burn up.

A knowledge of mathematical coordinate systems will be of some assistance in winning this game. although you'll probably be able to discover a reasonably good strategy by yourself using trial and error if you play enough games.

This program was originally written by Chris Falco.

TRY AGAIN? Y PLAN (A OR B)? A

LAUNCH AN I.C.B.M. ON A COURSE THAT WILL INTERCEPT THE UFO WITHOUT THE UFO BEING TOO CLOSE TO YOUR LOCATION. IF THE SPEED OF THE UFO EXCEEDS 10529 M.P.H., YOUR MISSILES ARE USELESS! --SCANNERS PREDICT YOU HAVE 5 MINUTES TO DESTROY THE UFO BEFORE IT IS TOO CLOSE TO IMPACT.

-- COMPUTER INDICATES COURSE AT FIRST SIGHTING IS APPROX. 54

TYPE IN A COURSE ON THE CHART BELOW

| TIME    | SPEED           | LONGITUDE        | LATITUDE | COURSE |
|---------|-----------------|------------------|----------|--------|
| 0       | 2529            | 54               | 105      | ? 60   |
| .5      | 4100            | 56               | 107      | ? 55   |
| YOU ARE | SHY OF THE UFO' | S COORDINATES,   |          |        |
| HOWEVER | THIS IS ONLY A  | SLIGHT DEVIATION | SO THE   |        |
| UFO HAS | BEEN DESTROYED! |                  |          |        |
| TRY AGA | TNP YES         |                  |          |        |
|         |                 |                  |          |        |

PLAN (A DR B)? A

--SCANNERS PREDICT YOU HAVE 2 MINUTES TO DESTROY THE UFO BEFORE IT IS TOD CLOSE TO IMPACT.

-- COMPUTER INDICATES COURSE AT FIRST SIGHTING IS APPROX. 77

TYPE IN A COURSE ON THE CHART BELOW

| TIME       | SPEED        | LO      | GITUDE  | LATITUDE     | C      | DURSE |
|------------|--------------|---------|---------|--------------|--------|-------|
| 0          | 5122         | 4       | 7       | 113          | ?      | 80    |
| .5         | 6597         | 4       | 1       | 107          | ?      | 85    |
| 1          | 8072         | 3       | 5       | 101          | ?      | 90    |
| 1.5        | 9547         | 2       | 9       | 95           | ?      | 71    |
| FANTASTIC! | III YOU HIT  | THE UFO | EXACTLY | ON PROJECTED | COURSI | E     |
| YOU MUST B | E VERY SHARP | 1       |         |              |        |       |

#### CLOSE ENCOUNTERS CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU ARE SITUATED AT COORDINATES (0,0). A UFO IS HEADING FOR IMPACT AT THAT LOCATION.

RUN

AT FIRST TRACK, THE UFO IS ON A COURSE OF 55 DEGREES LONGITUDE AND 133 DEGREES LATITUDE. (ALSO IT'S FALLING AT A SPEED OF 2562 MILES/PER HOUR)

YOU HAVE THE FOLLOWING ALTERNATIVES:

 A) YOU CAN ATTEMPT TO SHOOT THE UFO OUT OF THE SKY. OR
 B) YOU CAN DO NOTHING, AND HOPE THAT AIR FRICTION
 WILL CAUSE THE COURSE OF THE UFO TO DEVIATE, AND THUS MISS YOUR LOCATION.

WHAT IS YOUR PLAN OF ACTION (A DR B)? B

| MILES   | SPEED | LONGITUDE | LATITUDE | COURSE |
|---------|-------|-----------|----------|--------|
|         |       | *******   |          |        |
| 12000   | 2562  | 55        | 133      | 82     |
| 11857.2 | 8569  | 52        | 130      | 94     |
| 11654.7 | 12148 | 51        | 128      | 93     |
| 11348.6 | 18367 | 51        | 119      | 84     |
| 10945.5 | 24186 | 42        | 118      | 92     |
| 10485.7 | 27587 | 37        | 117      | 96     |
| 9989.48 | 29774 | 32        | 110      | 94     |
| 9376.64 | 36771 | 24        | 107      | 99     |
| 8697.39 | 40755 | 20        | 107      | 103    |
| 7977.35 | 43202 | 14        | 98       | 100    |
| 7186.97 | 47423 | 6         | 94       | 104    |
| 6301.64 | 53120 | 4         | 85       | 97     |
| 5337.84 | 57828 | -4        | 85       | 105    |
| 4323.59 | 60855 | -12       | 79       | 107    |
| 3198.72 | 67492 | -19       | 79       | 114    |
| 2011.02 | 71262 | -21       | 71       | 108    |
| 770.118 | 74454 | -27       | 65       | 108    |
|         |       |           |          |        |

-----IMPACT-AT- 78371 -MILES-PER-HOUR---GOOD WORK. FRICTION OF 5 % HAS CAUSED THE COURSE OF THE UFO TO DEVIATE. IMPACT COORDINATES ARE NOW ( 5 ,-5 ). YOU MADE IT!

| MILES    | SPEED | LONGITUDE | LATITUDE | COURSE |  |
|----------|-------|-----------|----------|--------|--|
|          |       |           |          |        |  |
| 12000    | 2802  | 58        | 108      | 54     |  |
| 11857.3  | 8565  | 51        | 99       | 64     |  |
| 11628.5  | 13726 | 51        | 93       | 58     |  |
| 11356.7  | 16307 | 44        | 92       | 64     |  |
| 11036.4  | 19219 | 37        | 88       | 67     |  |
| 10606.8  | 25776 | 36        | 79       | 59     |  |
| 10055.9  | 32396 | 36        | 78       | 58     |  |
| 9482.08  | 35086 | 28        | 77       | 65     |  |
| 8817.98  | 39846 | 19        | 75       | 72     |  |
| 8090.73  | 43635 | 14        | 70       | 72     |  |
| 7283.78  | 48417 | 14        | 64       | 66     |  |
| 6400.58  | 52992 | 9         | 62       | 69     |  |
| 5441.75  | 57530 | 0         | 59       | 75     |  |
| 1375.52  | 63974 | -2        | 50       | 68     |  |
| 3256.52  | 67140 | -8        | 47       | 71     |  |
| 20 48 43 | 77473 | -14       | 44       | 74     |  |

39

73

-18

75464

790.901

| MILES    | SPEED | LONGITUDE | LATITUDE | COURSE |
|----------|-------|-----------|----------|--------|
| *****    |       |           |          |        |
| 12000    | 5782  | 56        | 112      | 58     |
| 11787.4  | 12757 | 49        | 112      | 67     |
| 11504.3  | 16983 | 46        | 112      | 70     |
| 11114.7  | 23376 | 41        | 112      | 75     |
| 10668.8  | 26756 | 41        | 108      | 71     |
| 10171.8  | 29818 | 36        | 107      | 75     |
| 9571.63  | 36012 | 35        | 103      | 72     |
| 8887.7   | 41036 | 33        | 100      | 71     |
| 8151.72  | 44159 | 31        | 96       | 69     |
| 7375.72  | 46560 | 27        | 92       | 69     |
| 6483.92  | 53508 | 20        | 87       | 71     |
| \$495.93 | 59279 | 19        | 78       | 63     |
| 4457.3   | 62318 | 18        | 74       | 60     |
| 3331.95  | 67521 | 16        | 70       | 58     |
| 2109.15  | 73368 | 10        | 62       | 56     |
| 810.517  | 77918 | 5         | 55       | 54     |

GOOD WORK. FRICTION OF 6 % HAS CAUSED THE COURSE OF THE UFO TO DEVIATE. IMPACT COORDINATES ARE

NOW ( 6 ,-6 ). YOU MADE IT!

TRY AGAIN? NO

Dk

I IST 100 PRINT TAB(21);"CLOSE ENCOUNTERS" 110 PRINT TAB(20); "CREATIVE COMPUTING" 120 PRINT TAB(18); "HORRISTOWN, NEW JERSEY" 130 GOSUB 1100 140 PRINT:PRINT:PRINT 150 PRINT "YOU ARE SITUATED AT COORDINATES (0,0). A UFO IS" 160 PRINT "HEADING FOR IMPACT AT THAT LOCATION." 170 PRINT 1090 RETURN 180 PRINT "AT FIRST TRACK, THE UFO IS ON A COURSE OF "Y"DEGREES "; 190 PRINT "LONGITUDE" 200 PRINT "AND"Z"DEGREES LATITUDE." 210 PRINT " (ALSO IT'S FALLING AT A SPEED OF"X"MILES/PER HOUR)" 220 PRINT "YOU HAVE THE FOLLOWING ALTERNATIVES:" 230 PRINT "A) YOU CAN ATTEMPT TO SHOOT THE UFO OUT OF THE SKY. OR" 250 PRINT " WILL CAUSE THE COURSE OF THE UFO TO DEVIATE, AND THUS" 260 PRINT " MISS YOUR LOCATION ".PDTWT 1160 IF X>=3700 THEN 1180 1170 M=4:60T0 1210 1180 IF X>=4700 THEN 1200 270 PRINT "WHAT IS YOUR PLAN OF ACTION (A OR B)"; : INPUT D\$ 1190 M=3:GOTO 1210 280 PRINT 1200 M=2 290 IF LEFT\$(D\$,1)="B" THEN 790 1210 RETURN 300 PRINT "LAUNCH AN I.C.B.M. ON A COURSE THAT WILL INTERCEPT THE UFO" 1220 END 310 PRINT "WITHOUT THE UFO BEING TOO CLOSE TO YOUR LOCATION. IF THE "; OK

330 PRINT "OF THE UFO EXCEEDS"H"M.P.H., YOUR MISSILES ARE USELESS!" 340 PRINT "--SCANNERS PREDICT YOU HAVE"M"MINUTES TO DESTROY THE UFO" 350 PRINT "BEFORE IT IS TOO CLOSE TO IMPACT.":PRINT 360 C=Z-Y+I-INT(RND(1)\*4)+1 370 PRINT "--COMPUTER INDICATES COURSE AT FIRST SIGHTING IS APPROX.";C+F 380 PRINT 390 PRINT "TYPE IN A COURSE ON THE CHART BELOW":PRINT 400 PRINT 410 PRINT "TIME", "SPEED", "LONGITUDE", "LATITUDE", "COURSE" 420 FOR T=0TO 5 STEP .5 430 PRINT T, X, Y, Z, : INPUT A 440 IF T=INT(T) AND T=M THEN 620 450 IF X<=H THEN 490 460 PRINT "SORRY--THE SPEED OF THE UFO HAS EXCEEDED"H"M.P.H." 470 PRINT "THIS SPEED IS TO GREAT FOR YOUR DEFENSE SCREEN TO TRACK!" 480 PRINT "THEREFORE, YOU ARE (HA HA) DOOMED!":PRINT:GOTO 750 490 IF A=C THEN 720 500 IF A>10 THEN 550 510 PRINT "AT THAT COURSE YOU SHOT YOUR MISSILE STRAIGHT UP. SO WHEN" 520 PRINT "IT RUNS OUT OF FUEL IN ABOUT"F"HOURS, IT WILL FALL"; 530 PRINT " THROUGH" 540 PRINT "YOUR RODF!!!!!!!!! GOODBYE!!!!!!":GOTO 660 550 IF A<200 GDTD 580 560 PRINT "GOOD WORK! THERE GOES THE MISSILE------RIGHT TOWARDS" 570 PRINT "RUSSIA!!!! NOW YOU'RE DEFINITELY IN TROUBLE!!":GOTO 660 580 IF A=C-1 THEN 670 590 IF A=C+1 THEN 710 600 X=X+V+1200:Y=Y-I+5:Z=Z-I+5:C=Z-Y+5 610 NEXT T 620 PRINT "---------ATTENTION--630 PRINT "ELAPSED-TIME-INDICATES-THAT-"M"MINUTES-HAVE-PASSED.--IF-YOU-" 640 PRINT "WERE-TO-HIT-THE-UFO-NOW----THE-FORCE-OF-THE-EXPLOSION-WOULD" 650 PRINT "-----DESTROY-YOU-AS-WELL-AS-THE-UFO-!":PRINT 660 GOTO 750 670 PRINT "YOU ARE SHY OF THE UFO'S COORDINATES," 680 PRINT "HOWEVER THIS IS ONLY A SLIGHT DEVIATION SO THE" 690 PRINT "UFO HAS BEEN DESTROYED!":PRINT 700 GOTO 750 710 PRINT "YOU OVERSHOT THE UFO'S COORDINATES,":GOTO 680 720 PRINT "FANTASTIC!!!! YOU HIT THE UFO EXACTLY ON PROJECTED COURSE" 730 PRINT "YOU MUST BE VERY SHARP!":PRINT 740 PRINT 750 PRINT "TRY AGAIN";:INPUT J\$:IF LEFT\$(J\$,1)="N" THEN 1220 760 GOSUB 1100 770 GOSUB 1070 780 PRINT:PRINT:GOTO 340 790 PRINT 800 F=0 810 A=INT(RND(1)\*5)+1:C=Z-Y+A 820 M=12000 830 PRINT "MILES", "SPEED", "LONGITUDE", "LATITUDE", "COURSE" 840 PRINT "-----", "-----", "------", "------" 850 P=X+1 860 PRINT M, X, Y, Z, C 870 C=Z-Y 880 X=X+INT(RND(1)\*5000)+2000:M=M-X/60 890 Y=Y-INT(RND(1)\*10):Z=Z-INT(RND(1)\*10):C=Z-Y+A\*2 900 IF X-P>5700 THEN F=F+1 910 IF M>0 THEN 850 920 PRINT 930 PRINT "-----IMPACT-AT-"X"-MILES-PER-HOUR------940 IF F<=2 THEN 980 950 PRINT "GOOD WORK. FRICTION OF"F"% HAS CAUSED THE COURSE" 960 PRINT "OF THE UFO TO DEVIATE. IMPACT COORDINATES ARE" 970 PRINT "NOW ("F","O-F"). YOU MADE IT!":GOTO 1020 980 PRINT "-----UPI-WIRE-SERVICE---ON-LINE-"A":"A+5":"A+10":--" 990 PRINT "--- HAVE JUST OBSERVED EXPLOSION AT COORDINATES ("0-F",0)." 1000 A=(A+2)\*A 1010 PRINT "BLAST SEEN FROM"A^3"MILES AWAY. NO SURVIVORS.":PRINT 1020 INPUT "TRY AGAIN";J\$ 1030 IF LEFT\$(J\$,1)="N" THEN 1220 1040 GOSUB 1100 1050 GOSUB 1070 1060 PRINT: PRINT: GOTO 300 1070 INPUT "PLAN (A OR B)";D\$ 1080 IF LEFT\$(D\$,1)="B" THEN 790 1100 I=INT(RND(1)\*20)+1:V=INT(RND(1)\*400)+200:F=INT(RND(1)\*5)+1 1110 X=INT(RND(1)\*5000)+2001:H=X+8000:Q=INT(RND(1)\*5)+1 1120 Z=INT(RND(1)\*140):IF Z<100 THEN 1120 1130 Y=INT(RND(1)\*60):IF Y<40 THEN 1130 1140 IF X>=3000 THEN 1160 1150 M=5:60T0 1210

320 PRINT "SPEED"



RUN

#### COLUMN CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM WILL SHOW YOU A CARD TRICK. AFTER THE FIRST DEAL PICK A CARD AND TYPE THE MUMBER OF THE COLUMN CONTAINING IT. THE DEALER WILL THEN PICK UP THE CARDS, A COLUMN AT A TIME, AND WILL DEAL THEM OUT AGAIN HORIZONTALLY. WHEN HE FINISHES EACH TIME, TYPE THE NUMBER OF THE THE NEW COLUMN CONTAINING YOUR CARD. FOLLOWING THE LAST DEAL THE DEALER WILL TURN OVER THE CARDS, ONE AT A TIME, UNTIL HE REACHES THE ONE YOU PICKED.

| 9 OF CLUBS       | JACK OF SPADES | 6 OF HEARTS  |
|------------------|----------------|--------------|
| 6 OF CLUBS       | KING OF CLUBS  | 2 OF CLUBS   |
| 4 OF HEARTS      | 3 OF HEARTS    | 5 OF SPADES  |
| QUEEN OF SPADES  | 4 OF DIAMONDS  | 3 OF CLUBS   |
| ACE OF DIAMONDS  | 10 DF SPADES   | 7 OF CLUBS   |
| KING OF DIAMONDS | 6 OF SPADES    | 10 OF HEARTS |
| QUEEN DE CLURS   | 8 OF CLURS     | 10 DE CUURS  |

WHICH COLUMN CONTAINS YOUR CARD? 1

| 6 OF HEARTS      | 2 OF CLUBS      | 5 OF SPADES     |
|------------------|-----------------|-----------------|
| 3 OF CLUBS       | 7 OF CLUBS      | 10 OF HEARTS    |
| 10 OF CLUBS      | 9 OF CLUBS      | 6 OF CLUBS      |
| 4 OF HEARTS      | QUEEN OF SPADES | ACE OF DIAMONDS |
| KING OF DIAMONDS | QUEEN OF CLUBS  | JACK OF SPADES  |
| KING OF CLUBS    | 3 DF HEARTS     | 4 OF DIAMONDS   |
| 10 DF SPADES     | 6 OF SPADES     | 8 OF CLUBS      |

WHICH COLUMN CONTAINS YOUR CARD? 1

| 5 OF SPADES     | 10 DF HEARTS   | 6 OF CLUBS       |
|-----------------|----------------|------------------|
| ACE OF DIAMONDS | JACK OF SPADES | 4 OF DIAMONDS    |
| 8 OF CLUBS      | 6 DF HEARTS    | 3 DF CLUBS       |
| 10 OF CLUBS     | 4 OF HEARTS    | KING OF DIAMONDS |
| KING OF CLUBS   | 10 DF SPADES   | 2 OF CLUBS       |
| 7 OF CLUBS      | 9 OF CLUBS     | QUEEN OF SPADES  |
| QUEEN OF CLUBS  | 3 OF HEARTS    | 6 DF SPADES      |

WHICH COLUMN CONTAINS YOUR CARD? 2

5 OF SPADES ACE OF DIAMONDS 8 OF CLUBS 10 DF CLUBS KING OF CLUBS 7 OF CLUBS QUEEN OF CLUBS 10 OF HEARTS JACK OF SPADES 6 OF HEARTS 4 DF HEARTS 10 DF SPADES 9 OF CLUBS 3 OF HEARTS 6 OF CLUBS 4 OF DIAMONDS 3 OF CLUBS KING OF DIAMONDS 2 OF CLUBS

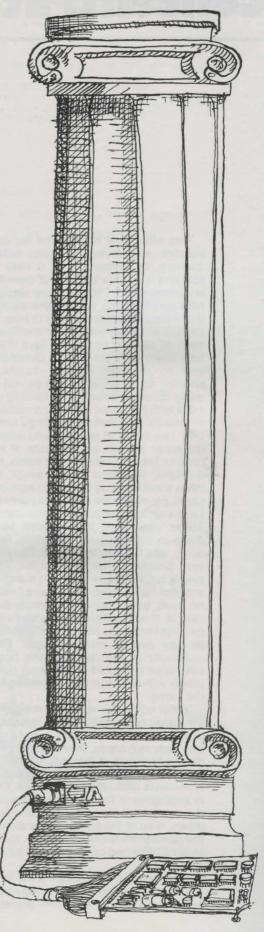
OOPS !!! YOUR CARD IS THE 4 OF HEARTS.

of an old card trick which never fails to get some ooohs and aaahs from the uninitiated. The dealer, or magician, takes twenty-one random cards, deals them out in three piles of seven cards each. You then tell him which column (or which pile) contains your card. He then picks up the three columns from right to left, putting the right pile on the top, and then deals the deck out again horizontally. In other words the top card of the right column now becomes the top card of the left column; the second card in the right column now becomes the first card in the middle column; the third card of the right column becomes the first card in the third column, and so on. After he deals out all twenty-one cards in this way, you again tell him which column your card appears in. The magician then picks up the three piles in the same order and deals them out once again. Again you tell him which column contains your card. He then deals the cards out one by one face up and identifies yours when he comes to it. Don't ask me how he does it! Maybe you can figure it out from the program, but it works every time.

This program is a computer version

This program was originally written by Alan Barnes.

```
LIST
100 PRINT TAB(26);"COLUNN"
110 PRINT TAB(20);"CREATIVE COMPUTING"
120 PRINT TAB(18);"HORRISTOWN, NEW JERSEY"
130 PRINT:PRINT:PRINT
140 PRINT "THIS PROGRAM WILL SHOW YOU A CARD TRICK. AFTER THE FIRST DEAL"
150 PRINT "PICK A CARD AND TYPE THE NUMBER OF THE COLUMN CONTAINING IT."
160 PRINT "THE DEALER WILL THEN PICK UP THE CARDS, A COLUMN AT A TIME,"
170 PRINT "AND WILL DEAL THEM OUT AGAIN HORIZONTALLY. WHEN HE FINISHES"
180 PRINT "EACH TIME, TYPE THE NUMBER OF THE THE NEW COLUMN CONTAINING YOUR"
190 PRINT "CARD. FOLLOWING THE LAST DEAL THE DEALER WILL TURN OVER THE"
200 PRINT "CARDS, ONE AT A TIME, UNTIL HE REACHES THE ONE YOU PICKED."
210 PRINT:PRINT:PRINT
220 DIH A(21), B(21)
230 FOR X=1 TO 21
240 J=0
250 T=INT(52*(RND(1)))
270 FOR Y=1 TO X-1
280 IF A(Y)=T THEN 250
290 NEXT Y
300 A(X)=T
310 NEXT X
320 N=0
330 FOR I=1 TO 3
340 FOR Z=1 TO 21
350 IF A(Z)=4*(INT(A(Z)/4)) THEN 470
360 IF A(Z)-2=4*(INT(A(Z)/4)) THEN 440
370 IF A(Z)-3=4*(INT(A(Z)/4)) THEN 410
380 C$="SPADES"
390 D$=""
400 GOTO 490
410 C$="HEARTS"
420 D$=""
430 GOTO 490
440 C$="CLUBS"
450 D$=""
460 GOTO 490
470 C$="DIAMON"
480 D$="DS"
490 N=N+1
500 IF N <> 4 THEN 530
510 PRINT
520 N=1
530 IF A(Z) > 35 THEN 580
540 PRINT TAB((N-1)*25); INT(A(Z)/4)+2;"OF ";C$;D$;
550 IF J=5 THEN 900
560 IF J=10 THEN 980
570 GOTO 710
580 IF INT(A(Z)/4)=9 THEN 670
590 IF INT(A(Z)/4)=10 THEN 650
600 IF INT(A(Z)/4)=11 THEN 630
610 A$="JACK"
620 60TO 680
630 A$="QUEEN"
640 GOTO 680
650 A$="KING"
650 GOTO 680
670 A$="ACE"
680 PRINT TAB((N-1)*25);A$;" OF ";C$;D$;
690 IF J=5 THEN 900
700 IF J=10 THEN 980
710 NEXT Z
720 PRINT:PRINT
730 PRINT "WHICH COLUMN CONTAINS YOUR CARD";
740 INPUT K
750 IF K<1 OR K > 3 THEN PRINT:PRINT "(1-3)":60T0 730
760 PRINT: PRINT
770 T=1
780 S=K+2-3*INT((K+1)/3)
790 GOSUB 940
800 S=K
810 GOSUB 940
820 S=K+1-3+INT(K/3)
830 GOSUB 940
840 FOR C=1 TO 21
850 A(C)=B(C)
860 NEXT C
870 NEXT I
880 J=5
890 FOR Z=1 TO 11+INT(10*RND(1)+1):N=0:GOTO 350
900 PRINT:NEXT Z:PRINT
910 PRINT "DOPS!!! YOUR CARD IS THE";
920 N=1
930 J=10:Z=11:GOTO 350
940 FOR R=S TO S+18 STEP 3
950 B(T)=A(R)
960 T=T+1
970 NEXT R:RETURN
980 PRINT ".":PRINT
990 PRINT "DO YOU WANT TO SEE IT AGAIN"; : INPUT T$
1000 IF TS="YES" THEN PRINT:PRINT:GOTO 230
1010 END
Dk
```



# Concentration

This children's card game for any number of players is also called memory, or pelmanism. It is easy to play and is an excellent test of memory and observation. The computer version here simulates the actual game except that it only allows one player to play. In the actual game, one player shuffles a deck of playing cards and lays them face down on a table in all directions and so that no card is touching another. Each player tries to collect as many cards as possible by turning up pairs with the same rank per a number or picture. The first player to go turns over two cards at random and allows the other players to see them. If the rank of the two cards is the same, for example, two aces or two kings, he takes them and may turn over two more cards. He continues in this way until he turns over two cards that do not match. These cards are then placed back down in their original positions, face down, and his turn then ends. The play then passes to the next player. This player turns up one card. If it matches one that has already been turned over, he must try to remember where that card is. If he is successful, he takes the pair. He continues his turn until he fails to turn over a matching pair. Play continues in turn until all the cards have been collected. The winner is the player with the most cards at the end of the game.

In this computer version of the game, the cards are numbered on their face down side from one to fifty-two. As you turn over two cards, their rank is typed on the terminal. If they do not match, their rank is obliterated by successive type-overs with other characters. This is analogous to the situation of placing the cards back down on the table face down. Also in the computer version of the game there is only one player trying to get all fifty-two cards in as few moves as possible.

This game is good fun on a CRT terminal. Also, why not try modifying it to allow play by two or more players? RUN

CONCENTRATION CREATIVE COMPUTING MORRISTOWN NEW JERSEY

### FIRST CARD? 1 SECOND CARD? 2

FIRST CARD? 13 SECONU CARD? 2

FIRST CARD? 53 THERE ARE ONLY 52 CARDS IN THE DECK, NOT 53 FIRST CARD? 41 SECOND CARD? 37

FIRST CARD? 20 SECOND CARD? 16

FIRST CARD? 29 SECOND CARD? 49

SECOND CARD? 49

FIRST CARD? 41 SECOND CARD? 29 THAT'S A MATCH -- 9C 9D YOUR SCORE IS NOW 1 YOU HAVE HAD & PICKS. FIRST CARD? SECOND CARD? 49 THAT'S A MATCH -- 25 25 YOUR SCORE IS NOW 2 YOU HAVE HAD 7 PICKS. FIRST CARD? 41 YOU HAVE ALREADY MATCHED THAT CARD. FIRST CARD? 43 SECOND CARD? 498 THERE ARE ONLY 52 CARDS IN THE DECK. NOT 498 SECOND CARD? 48 

FIRST CARD? 26 Second Card? 51

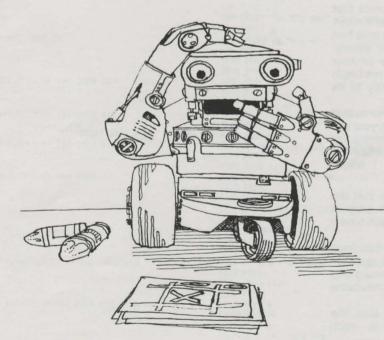
FIRST CARD?

BREAK IN 370 OK

```
LIST
```

```
10 PRINT LAB(25): "CONCENTRATION"
 10 PRINT TAB(15); "CREATIVE COMPUTING MORRISTOWN NEW JERSEY"
 30 PRINT
40 PRINT
50 PRINT
 200 BIM C$(52)
 210 FOR X=1 TO 52
220 READ E$
230 C$(X)=E$
240 NEXT X
250 REM --
            SHUFFLE AND DEAL
260 FOR Z=1 TO 51
270 K$=E$(7)
275 L=INT((53-Z)*R((D(1)+1)
280 C$(L)=C$(L+Z-1)
290 C$(L)=K$
JUU NEXT Z
340 REM ---
            START TU PLAY
350 FOR N=1 TO 26
360 PRINT "FIRST CARD";
370 INPUT U
372 IF U > 0 AND U < 52 THEN 380
374 PRINT "THERE ARE ONLY 52 CARDS IN THE DECK, NOT ";U
376 GOTO 360
380 LET G=1
390 IF C$(U)=" " THEN 840
400 PRINT "SECOND CARD";
410 INPUT W
412 IF U > 0 AND U < 52 THEN 420 414 PRINT "THERE ARE ONLY 52 CARDS IN THE DECK, NOT ":U
416 GOTO 400
420 LET 6=2
430 IF C$(W)=" " THEN 840
440 IF U <> W THEN 470
450 PRINT "YOU CAN'T PICK THE SAME CARD TWICE!"
460 GOTO 400
470 IF HIDS(C$(U),1,1)=HIDS(C$(W),1,1) THEN 580
480 PRINT "#";U;"IS ";C$(U),"#";W:"IS ":C$(W).
490 FOR I=1 TO 50
500 PRINT;
510 NEXT I
```

```
550 PRINT
560 PRINT
570 GOTO 630
580 PRINT "THAT'S A MATCH --":C$(U),C$(U)
590 LET C$(U)="
610 LET S=S+1
620 PRINT "YOUR SCORE IS NOW";S;" YOU HAVE HAD ":N:"PICKS."
630 NEXT N
640 REM --
            THE RESULTS
650 LET S1=S/(N/4)
660 PR1NT ")JU SCORED",S;" OUT OF ";N:"THAT IS ":
670 UN 51+1.5 60T0 680,700,720,760
680 PRINT "POCR."
690 GOTO 770
700 PRINT "FAIR."
710 GOTO 770
720 PRINT "GOOD."
730 GOTO 770
740 PRINT "EXCELLENT ! ! !"
750 GOTO 770
760 PRINT ". . . AAAH . . . UH....YOU MUST HAVE CHEATED!"
270 PRINT
780 PRINT "DO YOU WANT TO PLAY AGAIN":
790 INPUT ZS
800 IF Z$ = "YES" THEN 260
810 PRINT
820 PRINT "COME BACK AGAIN!!"
830 END
840 PRINT "YOU HAVE ALREADY MATCHED THAT CARD."
850 IF G=1 THEN 360
860 GOTD 400
870 DATA "AS", "2S", "3S", "4S", "55", "65", "75", "85", "95", 105", "JS", "05
875 DATA "KS"
880 DATA "AH","2H","3H","4H","5H","6H","7H","8H","9H","10H","JH","0H
885 DATA "KH"
890 DATA "AD","2D","3D","4D","5D","6D","7D","8D","9D","10D","JD","UD
895 DATA "KD"
900 DATA "AC", "2C", "3C", "4C", "5C", "6C", "7C", "8C", "9C", "10C", "JC", "00
905 DATA "KC"
910 END
0K
```





This is the old childhood favorite of "connect the dots." The objective is to carve out squares of "real estate" with the computer as an able adversary. The player who connects the two dots which complete a square gets ownership of that square. In addition, the player gets the added bonus of moving once more. This can be quite advantageous in certain situations. A nine-square grid is provided as a playing board.

A sample of the grid follows with an identification of each coordinate where a line may be drawn.

|       | (1,2) |       | (1,4) |       | (1,6) |       |
|-------|-------|-------|-------|-------|-------|-------|
| (2,1) |       | (2,3) |       | (2,5) |       | (2,7) |
|       | (3,2) |       | (3,4) |       | (3,6) |       |
| (4,1) |       | (4,3) |       | (4,5) |       | (4,7) |
|       | (5,2) |       | (5,4) |       | (5,6) |       |
| (6,1) |       | (6,3) |       | (6,5) |       | (6,7) |
|       | (7,2) |       | (7,4) | -     | (7,6) |       |

You'll find it interesting to note that the computer mirrors the player's move in so far as possible. You may also find that the game moves rather slowly, especially for the first three or four moves. Be patient! Once squares begin to fall, the game moves swiftly to its conclusion.

There are some modifications that you may wish to consider if you are going to adopt this program for regular use. In addition to improving the REM statements in the program, I would suggest:

- Modifying the program so that the grid is printed after *both* players have moved (rather than each time a move is made);
- Modifying the program so that once a player had ownership of a majority of the squares, the game would end rather than proceed to its inevitable conclusion; and
- Modify the program so that the player's initials appear in each square he captures.

The program is by Chuck Lund; the writeup by Pete Olivieri. It originally appeared in *Creative Computing*, Jan/Feb 1976.

RUN

CONDOT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

M: MOVE

YOUR MOVE? 2.1

MY MOVE

YOUR MOVE? 4.1

:

.

2

MY MOVE

YOUR MOUFP 2.7

MY HOVE

÷

:

THIS PROGRAM WILL PLAY CONNECT THE DOTS WITH YOU. THE GAME IS PLAYED ON A 4 X 4 ARRAY. WHEN YOU WANT TO MAKE A MOVE YOU MUST TYPE IN THE COORDINATES OF THE SPACE BETWEEN THE TWO DOTS YOU WANT TO CONNECT. ENTER EACH OF YOUR MOVES BY TYPING THE ROW NUMBER, A COMMA AND THE COLUMN NUMBER. THE UPPER LEFT HAND CORNER OF THE ARRAY IS 1,1. HERE WE GO. YOUR MOVE? 1.1 YOU REALLY DON'T WANT TO PUT A LINE THERE!!!! YOUR MOVE? 1,2 . MY MOVE YOUR MOVE? 7.5 YOU REALLY DON'T WANT TO PUT A LINE THERE!!!! YOUR MOVE? 7,4 MY MOVE YOUR MOVE? 1,6 .....

| TUR HOVE? 4, | 3   |   | YOUR  | HOVE | E? 5 | i.4 |   |   | MY  | MOV  | E   |     |    |   |   | YOU | R MOV | E? | 3,6 |   |   | MY | MOVI | Ε |   |   |   |   | MY | MOV | Ε |   |   |   |   |
|--------------|-----|---|-------|------|------|-----|---|---|-----|------|-----|-----|----|---|---|-----|-------|----|-----|---|---|----|------|---|---|---|---|---|----|-----|---|---|---|---|---|
| 2 * 2 *      |     |   |       |      | -    |     | - |   |     | -    |     | -   |    | - |   |     |       | -  |     | - |   |    | -    |   | - |   | - |   |    | -   |   | - |   | - |   |
| 1            |     | : | :     |      |      | -   |   |   | :   |      |     |     | :  |   | : | :   | :     | ł  | : : | Н | : | :  | С    | : | Η | : | Н | : | :  | С   | : | н | : | Η | : |
|              |     |   |       |      |      |     |   |   |     |      |     | -   |    |   |   |     |       |    | • • | - |   |    | -    |   | - |   | - |   | •  | -   | • | - |   | - |   |
| 7 :          |     | : | :     | :    |      | :   |   | : | :   |      | :   | С   | :  |   | : | :   | ;     | (  | : : |   | : | :  |      | : | C | : |   | : | :  | 0   | : | C | : | С | : |
|              |     |   |       |      | -    |     |   |   |     |      |     | -   |    |   |   |     |       |    |     |   |   |    |      |   | - |   |   |   | •  | -   |   | - |   | - |   |
| 1            |     | : | :     |      |      |     |   | - | :   |      |     |     |    |   | : | :   |       |    |     |   | : | :  |      | : |   |   |   | : | :  | С   | : |   |   |   | : |
| 1            |     |   |       |      | -    |     | - |   |     | -    |     | -   |    | - |   |     |       |    |     | - |   |    | -    |   | - |   | - |   |    | -   | • | - |   | - |   |
| MI MOVE      |     |   | MY MC | IVE  |      |     |   |   | YOU | JR M | OVE | ? 2 | ,3 |   |   | YOU | R HOV | E? | 6,3 |   |   | MY | MOV  | E |   |   |   |   | MY | MOV | Ε |   |   |   |   |
|              |     |   |       | • •  | -    |     | - |   |     | -    |     | -   |    | - |   |     |       |    |     | - |   |    | -    |   | - |   | - |   | •  | -   |   | - |   | - |   |
| 1            |     | : | ;     |      |      |     |   | : | :   |      | :   | Н   | :  |   | : | :   | :     | 1  | 1 : | Н | : | :  | С    | : | Η | : | H | : | :  | С   | : | н | : | H | : |
|              |     |   |       |      | -    |     |   |   |     |      |     | -   |    |   |   |     |       |    |     | - |   |    | -    |   | - |   | - |   | •  | -   |   | - |   | - |   |
| 1 1          | :   | : | :     | :    | 0    | :   |   | : | :   |      | :   | 0   | :  |   | : | :   | :     | 1  | : : |   | : | :  | С    | : | 3 | : |   | : | :  | С   | : | С | : | C | : |
|              |     |   |       |      | -    |     |   |   |     |      |     | -   |    |   |   |     |       |    |     |   |   |    | -    |   | - |   |   |   |    | -   |   | - |   | - |   |
| 1            |     | : | :     |      |      | -   |   | - | :   |      |     |     |    |   | : | :   |       |    |     |   | : | :  | С    | : |   |   |   | : | :  | С   | : | С | : | С | : |
|              | . = |   |       | • •  | -    |     | - |   |     | -    |     | -   |    | - |   |     | - ,   |    | • • | - |   |    | -    | • | - | • | - |   |    | -   | • | - | • | - | • |

LIST

1 PRINT TAB(26);"CONDOT" 2 PRINT TAB(20);"CREATIVE COMPUTING" 3 PRINT TAB(18);"MORRISTOWN, NEW JERSEY":PRINT 4 PRINT 5 PRINT & FRINT ". HIS PROGRAM WILL PLAY CONNECT THE DOTS WITH YOU." 7 PRINT "THE GAME IS PLAYED ON A 4 X 4 ARRAY. WHEN" 8 PRINT "YOU WANT TO MAKE A MOVE YOU MUST TYPE IN" 9 PRINT "THE COORDINATES OF THE SPACE BETWEEN THE TWO DOTS YOU" 10 PRINT "WANT TO CONNECT. ENTER EACH OF YOUR MOVES BY TYPING" 11 PRINT "THE ROW NUMBER, A COMMA AND THE COLUMN NUMBER." 12 PRINT "THE UPPER LEFT HAND CORNER OF THE ARRAY IS 1,1." 13 PRINT "HERE WE GO." 20 DIH A(12,12) 30 V=0 40 FOR R=1 TO 12 50 FOR C=1 TO 12 60 IF R/2=INT(R/2) THEN 100 70 IF C/2 = INT(C/2) THEN 100 80 A(R,C)=-50 90 GOTO 110 100 A(R.C)=0 110 NEXT C 120 NEXT R 130 IF V=1 THEN 200 200 GOSUB 1000 210 PRINT "YOUR MOVE"; 220 INPUT X,Y 230 IF X=INT(X) THEN 260 240 PRINT "YOU REALLY DON'T WANT TO PUT A LINE THERE!!!!" 250 GOTO 210 260 IF (X-1)\*(X-7) > 0 THEN 240 265 X=X+2 270 IF (Y-1)\*(Y-7) > 0 THEN 240 272 Y=Y+2 280 IF (X+Y+1)/2 <> INT((X+Y+1)/2) THEN 240 290 IF A(X,Y) <> 0 THEN 240 300 A(X.Y)=50 310 IF X/2 = INT (X/2) THEN 380 320 IF A(X-2,Y)+A(X-1,Y+1)+A(X-1,Y-1) <> 150 THEN 350 330 P=1 340 A(X-1,Y)=1 350 IF A(X+2,Y)+A(X+1,Y+1)+A(X+1,Y-1) <> 150 THEN 440 160 A(X+1,Y)=1 370 GOTO 200 380 IF A(X, Y-2)+A(X+1, Y-1)+A(X-1, Y-1) <> 150 THEN 410 390 A(X, Y-1)=1 400 P=1 410 IF A(X, Y+2)+A(X+1, Y+1)+A(X-1, Y+1) <> 150 THEN 440 420 A(X, Y+1)=1 430 GOTO 200 440 IF P=1 THEN 200 450 GOSUB 1000 460 PRINT "MY MOVE" 470 FOR R=4 TO 10 STEP 2 480 FOR C=4 TO 10 STEP 2 490 IF A(R-1,C)+A(R+1,C)+A(R,C-1)+A(R,C+1) <> 150 THEN 680 500 A(R,C)=-1 510 IF A(R-1,C) <> 0 THEN 550 520 A(R-1,C)=50 530 IF A(R-3,C)+A(R-2,C-1)+A(R-2,C+1) <> 150 THEN 450 540 LET A(R-2,C)=-1 550 IF A(R+1,C) <> 0 THEN 590 560 A(R+1,C)=50 570 IF A(2+3,L)+A(R+2,C-1)+A(R+2,C+1) <> 150 THEN 450 580 A(R+2,C)=-1 590 IF A(R,C-1) <> 0 THEN 630 600 A(R.C-1)=50 610 IF A(R,C-3)+A(R-1,C-2)+A(R+1,C+2) <> 150 THEN 450 620 A(R,C-2)=-1 630 IF A(R,C+1) <> 0 THEN 450 640 A(R.C+1)=50

650 IF A(R,C+3)+A(R-1,C+2)+A(R+1,C+2) <> 150 THEN 450 660 A(R,C+2)=-1 670 GOTO 450 680 NEXT C 690 NEXT R 692 IF E > 1 THEN 730 700 IF A(12-X,12-Y) <>0 THEN 730 710 A(12-X,12-Y)=50 712 IF E > 1 THEN 870 720 GOTO 200 730 FOR R=3 TO 9 740 FOR C=3 TO 9 750 IF (R+C)/2=INT((R+C)/2) THEN 850 760 IF A(R,C) <> 0 THEN 850 780 IF R/2 = INT(R/2) IHEN 830 790 1F A(R-2,C)+A(R-1,C-1)+A(R-1,C+1) = 100 THEN 850 800 IF A(R+2,C)+A(R+1,C-1)+A(R+1,C+1) =100 THEN 850 810 A(R,C)=50 820 GOTO 200 830 IF A(R,C-2)+A(R-1,C-1)+A(R+1,C-1)=100 THEN 850 840 IF A(R,C+2)+A(R-1,C+2)+A(R+1,C+1) <> 100 THEN 810 850 NEXT C 860 NEXT R 862 IF E > 1 THEN 700 870 R=INT(RND(1)\*7)+3 880 C=INT(RND(1)\*7)+3 881 IF R/2=INT(R/2) THEN 885 882 IF C/2=INT(C/2) THEN 900 883 GOTO 870 885 IF C/2 <> INT(C/2) THEN 900 886 GOTO 870 900 IF A(R,C)<> 0 THEN 870 910 A(R,C)=50 920 GOTO 200 930 PRINT "DO YOU WANT TO PLAY AGAIN (TYPE 1 FOR YES OR 2 FOR NO)"; 940 INPUT B 950 IF B = 1 THEN 40 960 END 1000 P=0 1010 D=0 1020 E=0 1030 FOR R=3 TO 9 1040 FOR C=3 TO 9 1050 IF A(R,C) <> 0 THEN 1080 1060 PRINT " "; 1070 GOTO 1240 1080 IF A(R,C) <> -50 THEN 1110 1090 PRINT " . "; 1100 GOTO 1240 1110 IF A(R,C) <> -1 THEN 1140 1120 PRINT " C "; 1130 GOTO 1170 1140 IF A(R,C) <> 1 THEN 1200 1150 PRINT " H "; 1170 D=D+A(R,C) 1180 E=E+1 1190 GOTO 1240 1200 IF R/2 = INT(R/2) THEN 1230 1210 PRINT " - "; 1220 GOTO 1240 1230 PRINT " : "; 1240 NEXT C 1245 PRINT 1250 NEXT R 1260 IF E >=9 THEN 1280 1270 RETURN 1280 IF D > 0 THEN 1310 1290 PRINT "I WON" 1300 GOTO 930 1310 PRINT "YOU WON!!!" 1320 GOTO 930 1400 END

OK



CONVOY CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY INSTRUCTIONS? YES THIS NAVAL WAR GAME IS PLAYED ON A 10 BY 10 MATRIX YOU ARE THE SUB; THE COMPUTER IS A CARGO SHIP AND ITS TWO DESTROYERS. THE SHIP STARTS IN SQUARE 100 AND RANDOMLY MOVES TO SQUARE 1, MOVING 0,1,2,0R 3 SQUARES AT A TIME. ONE OF THE SHIP'S DESTROYERS STARTS AT SDUARE 78 AND MOVES RANDOMLY 0,1,2 DR 3 SQUARES AT A TIME SEARCHING FOR THE SUB. THE OTHER DESTROYER STARTS IN SQUARE OF THE SHIP AS AM ESCORT. THE SUB STARTS IN SQUARE 12, CAN MOVE UP,DOUN, LEFT OR RIGHT 1 SQUARE AT A TIME, 2 MOVES PER TURN,AND IT HAS TORPEDDES WHICH IT CAN FIRE 1 AT A TIME IN ANY STRAIGHT. LINE. AFTER EACH SUB MOVE, THE PERISCOPE WILL SEARCH REACH AJACENT SQUARE FOR THE SHIP. ALSO RANDOM RECONNAISANCE REPORTS WILL BE MADE. THE SEQUENCE OF PLAY IS:

- 1 SHIP AND DESTROYERS MOVE
- 2 YOUR MOVE
- 3 YOU CAN FIRE A TORPEDO
- 4 PERISCOPE SEARCH
- 5 YOUR MOVE AGAIN
- AND BACK TO 1

THE SUB WINS IF IT SUCCEEDS IN HITTING THE SHIP WITHIN 4 Torpeddes without moving to a square occupied by a destroyer.

TO 'FIRE?' ANSWER:NO,L,R,U,D,LU,LD,RU,OR,RD. 'L'=LEFT,'R'=RIGHT,'U'=UP,'D'=DOWN,'LU'=LEFT UP,'RU'=RIGHT UP,DR 'RD'=RIGHTDOWN

WILL YOU NEED A BOARD? YES

| 1  | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10  |
|----|----|----|----|----|----|----|----|----|-----|
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20  |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30  |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40  |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50  |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60  |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70  |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80  |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90  |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

#### DESTROYER HAS MOVED SHIP MOVED

SUB IS NOW AT 12 DESTROYER LAST SIGHTED AT 78 SUB'S MOVE? 13 SUB'S MOVE? 14

SUB AT 14 SHIP LAST SEEN AT 100 FIRE? NO

UP PERISCOPE SHIP NOT IN SIGHT

RECON. SHOWS SHIP AT 99

SUB IS NOW AT 14 DESTROYER LAST SIGHTED AT 78 SUB'S MOVE? 15 SUB'S MOVE? 16 DESTROYER HAS MOVED SHIP MOVED

SUB IS NOW AT 16 DESTROYER LAST SIGHTED AT 78 SUB'S MOVE? 17 SUB'S MOVE? 18

SUB AT 18 SHIP LAST SEEN AT 99 FIRE? NO

UP PERISCOPE SHIP NOT IN SIGHT

RECON. SHOUS SHIP AT 88

SUB IS NOW AT 18 DESTROYER LAST SIGHTED AT 78 SUB'S MOVE? 28 SUB'S MOVE? 38 DESTROYER HAS MOVED SHIP MOVED

SUB IS NOW AT 38 DESTROYER LAST SIGHTED AT 78 SUB'S HOVE? 48 SUB'S MOVE? 58

SUB AT 58 SHIP LAST SEEN AT 88 FIRE? NO

UP PERISCOPE Ship Not in Sight

RECON. SHOWS SHIP AT 87

SUB IS NOW AT 58 DESTROYER LAST SIGHTED AT 78 SUB'S MOVE? 57 DESTROYER CLOSING IN AT 66 SUB'S MOVE? 56 DESTROYER CLOSING IN AT 66 DESTROYER HAS MOVED SHIP MOVED

This is a naval war game played on a 10 by 10 grid. You are a submarine and the computer plays the role of the convoy consisting of a cargo ship and two destroyers. One destroyer acts as the escort traveling alongside the cargo ship, while the other searches for the submarine and tries to destroy it. The destroyer which is searching for the submarine moves from zero to three squares at a time, searching. The other destroyer stays within one square of the ship. The submarine starts in square #12 and can move up. down, left, or right one square at a time with two moves per turn. It has four torpedoes which may be fired one at a time in any straight direction, horizontally, vertically, or diagonally.

The game ends when either the submarine destroys the cargo ship or when one of the two destroyers gets the submarine.

LIST

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80 PRINT TAB(33)"CONVOY"
90 PRINT TAB(15)"CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY"
100 PRINT "INSTRUCTIONS":
110 INPUT BS
120 IF B$="NO" THEN 300
130 PRINT "THIS NAVAL WAR GAME IS PLAYED ON A 10 BY 10 MATRIX"
140 PRINT YOU ARE THE SUB; THE COMPUTER IS A CARGO SHIP AND ITS TWO
145 PRINT DESTROYERS. THE SHIP STARTS IN SQUARE 100 AND RANDOMLY NOT
150 PRINT TO SQUARE 1, HOVING 0,1,2,0R 3 SQUARES AT A TIME."
155 PRINT TONE OF THE SHIP'S DESTROYERS STARTS AT SQUARE 78 AND HOVE
160 PRINT "RANDONLY 0,1,2 OR 3 SQUARES AT A TIME SEARCHING FOR THE SU
165 PRINT*THE OTHER DESTROYER STAYS WITHIN ONE SQUARE OF THE SHIP &
166 PRINT*THE OTHER DESTROYER STAYS WITHIN ONE SQUARE 12, CAN HOVE UP, DOWN
167 PRINT"LEFT OR RIGHT 1 SQUARE AT A TIME, 2 MOVES PER TURN, AND IT
190 PRINT"HAS TORPEDDES WHICH IT CAN FIRE 1 AT A TIME IN ANY STRAIG
200 PRINT'LINE. AFTER EACH SUB MOVE, THE PERISCOPE WILL SEARCH"
210 PRINT'EACH ADJACENT SQUARE FOR THE SHIP. ALSO RANDOM RECONNAISA
220 PRINT*REPORTS WILL BE MADE. THE SEQUENCE OF PLAY IS:"
230 PRINT
240 PRINT"1 SHIP AND DESTROYERS HOVE"
245 PRINT"2 YOUR MOVE"
250 PRINT"3 YOU CAN FIRE A TORPEDO"
270 PRINT"4 PERISCOPE SEARCH"
275 PRINT"5 YOUR MOVE AGAIN"
280 PRINT" AND BACK TO 1"
281 PRINT
283 PRINT" THE SUB WINS IF IT SUCCEEDS IN HITTING THE SHIP WITHING
285 PRINT TORPEDOES WITHOUT MOVING TO A SQUARE OCCUPIED BY A DESTRO
286 PRINT
287 PRINT"TO 'FIRE?' ANSWER:NO,L,R,U,D,LU,LD,RU,OR,RD."
288 PRINT"'L'=LEFT, 'R'=RIGHT, 'U'=UP, 'D'=DOWN, 'LU'=LEFT UP, 'RU'=RIGH
289 PRINT*UP, OR 'RD'=RIGHTDOWN"
290 PRINT
300 PRINT"WILL YOU NEED A BOARD";
310 INPUT BS
320 IF BS="NO" THEN 420
330 PRINT
340 PRINT
350 PRINT" 1
                     2
                         3
                               4
                                    5
                                               7
                                                     8
                                                          9
                                                             10"
                                          6
360 FOR I=1 T09
370 FOR J=1 TO 10
380 PRINTI#10+J;
390 NEXT J
400 PRINT
410 NEXT I
420 PRINT: PRINT
440 D=12
```

450 T=4 40 S=100 470 C=78 (M) £2=78 410 1=100 M IF C=-100 THEN 550 510 GOTO 2780 510 Y3=0 530 H1=0 50 6010580 550 H1=0 50 IF S=2 THEN 1230 570 Y3=1 50 IF S=3 THEN 1230 510 IF S=11 THEN 1230 600 IF S=12 THEN 1230 10 IF S=21 THEN 1230 420 X=RNB(1) 610 IF X>.4 THEN 690 10 IF X>.2 THEN 710 450 IF X>.05 THEN 670 660 GOTO 1020 670 S1=0 680 GOTO 720 690 S1=2 700 GOTO 720 710 51=1 720 X=RND(1) 730 IF XK.75 THEN 760 740 P1=1 750 GOTO 830 760 P1=-1 770 GOTO 830 780 IF S=10\*INT(S/10) THEN 820 790 GOTD 860 800 IF S=1+(10+INT(S/10)) THEN 820 R10 60T0 860 820 P1=P1\*(-1) 830 H2=P1+((INT(2\*(RND(1)))\*9)+1) 840 IF M2=1 THEN 780 850 IF M2=-1 THEN 800 840 IF M1=M2\*(-1) THEN 820 870 C1=S+M2 880 IF C1=1 THEN 1230 890 IF C1=D THEN 2720 900 IF C1=C THEN 820 910 IF C1K1 THEN 820 920 IF C1>100 THEN 820 930 H1=H2 940 S=C1 950 C6=S+((INT(2\*RND(1))\*(-2))+1)\*((INT(2\*RND(1))\*9)+1) 1850 IF S=D+11 THEN 1930 960 IF C6<2 THEN 950 970 IF C6>100 THEN 950 980 IF C6= D THEN 2700 990 IF S1=1 THEN 670 1000 IF S1=2 THEN 710 1010 C3=0 1020 PRINT"SHIP MOVED" 1030 IF Y3=0 THEN 1060 1040 X1=0 1050 GOTO 2340 1060 PRINT 1070 X1=1 1080 PRINT"SUB AT";D 1090 PRINT"SHIP LAST SEEN AT";L 1100 PRINT"FIRE"; 1110 INPUT AS 1120 IF AS="NO" THEN 1730 1130 IF AS="L" THEN 1250 1140 IF A\$="R" THEN 1270 1150 IF AS="U" THEN 1290 1160 IF AS="D" THEN 1310 1180 IF AS="LU" THEN 1330 1185 IF A\$="LD" THEN 1350 1190 IF A\$="RU" THEN 1370 1200 IF A\$="RD" THEN 1390 1210 PRINT"ANS: NO,L,R,U,D,LU,LD,RU,OR,RD" 1220 GOTO 1100 1230 PRINT"SHIP'S IN PORT" 1240 GOTO 2750 1250 P1=-1 1260 GOTO 1400 1270 P1=1 1280 GOTO 1400 1290 P1=-10 1300 GOTO 1400 1310 P1=10 1320 BOTD 1400 1330 P1=-11 1340 GOTO 1400 1350 P1=9

1360 GOTO 1400

1370 P1=-9 1380 GOTO 1400 1390 P1=11 1400 D1=D 1410 D1=D1+P1 1420 PRINT D1; 1430 IF D1=S THEN1500 1440 IF D1=C THEN 1520 1450 IF D1<11 THEN 1600 1460 IF D1>90 THEN 1640 1470 IF D1=10\*INT(D1/10) THEN 1560 1480 IF D1=1+(10\*INT(D1/10)) THEN 1580 1490 GOTO 1410 1500 PRINT"KER-BOOM! CARGO SHIP DESTROYED!" 1502 PRINT"YOU WIN" 1504 0=1 1510 GOTO 2750 1520 PRINT"WHAMO!!, DESTROYER SUNK." 1530 C=-100 1540 T=T-1 1550 GOTO 1710 1560 IF D=10\*INT(D/10) THEN 1410 1570 GOTO 1680 1580 IF D=1+(10\*INT(D/10)) THEN 1410 1590 GOTO 1680 1600 IF D>10 THEN 1680 1610 IF D1<2 THEN 1680 1620 IF D1>9 THEN 1680 1630 GOTO 1410 1640 IF D<91 THEN 1680 1650 IF D1<92 THEN 1680 1660 IF D1>99 THEN 1680 1670 GOTO 1410 1680 T=T-1 1690 PRINT"MISS" 1700 IF T=0 THEN 2740 1710 PRINT T; "TORPEDOES LEFT" 1720 GOTO 1100 1730 PRINT 1740 Y=0 1750 PRINT"UP PERISCOPE" 1760 Y2=0 1770 IF S=D THEN 1930 1780 IF S=D-1 THEN 1930 1790 IF S=D+1 THEN 1930 1800 IF S=D-10 THEN 1930 1810 IF S=D+10 THEN 1930 1820 IF S=D-9 THEN 1930 1830 IF S=D+9 THEN 1930 1840 IF S=D-11 THEN 1930 1860 IF Y=1 THEN 1960 1870 PRINT"SHIP NOT IN SIGHT" 1880 X=RND(1) 1890 IF X<.35 THEN 1960 **1900 PRINT** 1910 PRINT"RECON. SHOWS "; 1920 Y2=-1 1930 PRINT"SHIP AT ";S 1940 Y2=Y2+1 1950 L=S 1960 IF C=D THEN 2280 1970 IF C6=D THEN 2700 1980 IF C=D+1 THEN 2260 1990 IF C6=D+1 THEN 2240 2000 IF C=D-1 THEN 2260 2010 IF C6=D-1 THEN 2240 2020 IF C=D+9 THEN 2260 2030 IF C6=D+9 THEN 2240 2040 IF C=D-9 THEN 2260 2050 IF C6=D-9 THEN 2240 2060 IF C=D+10 THEN 2260 2070 IF C6=D+10 THEN 2240 2080 IF C=D-10 THEN 2260 2090 IF C6=D-10 THEN 2240 2100 IF C=D+11 THEN 2260 2110 IF C6=D+11 THEN 2240 2120 IF C=D-11 THEN 2260 2130 IF C6=D-11 THEN 2240 2140 IF C=D+2 THEN 2260 2150 IF C=D-2 THEN 2260 2160 IF C=D+20 THEN 2260 2170 IF C=D-20 THEN 2260 2180 IF C=-100 THEN 2320 2190 IF Y=1 THEN 2330 2200 X=RND(1) 2210 IF X<.6 THEN 2320 2220 PRINT"RECON. PLANE SPOTS TIN CAN AT";C 3050 GOTO 2850 2230 GOTO 2300 2240 PRINT"ESCORT VERY NEAR!" 2250 GOTO 2320 2260 PRINT"DESTROYER CLOSING IN AT";C

2270 GOTO 2300 2280 PRINT"DESTROYER DIRECTLY OVER HEAD" 2290 GOTO 2660 2300 C2=C 2310 C3=1 2320 IF Y=0 THEN 2340 2330 RETURN 2340 PRINT 2350 PRINT"SUB IS NOW AT ";D 2360 IF C3=1 THEN 2390 2370 IF C=-100 THEN 2390 2380 PRINT"DESTROYER LAST SIGHTED AT ":C2 2390 D2=0 2400 PRINT"SUB'S MOVE"; 2410 Y=1 2420 INPUT X 2430 IF X=D THEN 2560 2440 IF X<2 THEN 2640 2450 IF X>100 THEN 2640 2460 IF X=INT(X) THEN 2480 2470 GOTO 2640 2480 IF X=D+1 THEN 2530 2490 IF X=D-1 THEN 2550 2500 IF X=D+10 THEN 2560 2510 IF X=D-10 THEN 2560 2520 GOTO 2640 2530 IF D=10\*INT(D/10) THEN 2640 2540 GOTO 2560 2550 IF X=10\*INT(X/10) THEN 2640 2560 D=X 2570 GOSUB 1760 2580 IF D2=1 THEN 2610 2590 D2=1 2600 GOTO 2400 2610 IF X1=0 THEN 3060 2620 IF C=-100 THEN 550 2630 GOTO 2780 2640 PRINT"CAN'T DO" 2650 GOTD 2400 2660 X=RND(1) 2670 IF X4.8 THEN 2700 2680 PRINT"DEPTH CHARGE JUST MISSED!" 2690 GOTO 2300 2700 PRINT"VARODH!!SUB DEPTH CHARGED!" 2710 GOTO 2750 2720 PRINT"SHIP NOW OVERHEAD" 2730 GOTO 550 2740 PRINT"AMMO DEPLETED" 2750 PRINT 2751 IF 0=0 THEN 2754 2752 01=01+1 2753 GOTO 2755 2754 02=02+1 2755 PRINT"SCORE: COMPUTER";02;"- SUB";01 2756 PRINT 2757 Q=0 2760 PRINT" NEW GAME": 2761 INPUT N\$ 2762 IF NS="NO" THEN 3080 2770 GOTO 420 2780 M1=0 2790 51=0 2800 X=RND(1) 2810 IF X<.6 THEN 2840 2820 P1=1 2830 GOTO 2850 2840 P1=-1 2850 M2=(P1\*((INT(2\*RND(1)))\*9)+1) 2860 IF M2=1 THEN 3000 2870 IF M2=-1 THEN 3020 2880 IF M1=M2\*(-1) THEN 3040 2890 C1=C+M2 2900 IF C1=D THEN 2700 2910 IF C1=S THEN 3040 2920 IF C1<2 THEN 3040 2930 IF C1>100 THEN 3040 2940 M1=M2 2950 C=C1 2960 IF S1=1 THEN 550 2970 S1=1 2980 PRINT"DESTROYER HAS MOVED" 2990 GOTO 2800 3000 IF C=10\*INT(C/10) THEN 3040 3010 GOTO 2880 3020 IF C=1+(10\*INT(C/10)) THEN 3040 3030 GOTO 2880 3040 P1=P1\*(-1) 3060 IF Y2=0 THEN 1060 3070 GOTO 520 3080 END OK



CORRAL is a game program inspired by Harry (short for Aragon), a horse acquired in a rash moment of indulgence for a teen-age daughter. Harry, in his own inimitable style, taught us much about the care, feeding and psychology of the equine species. Some of that hard-won psychology has found its way into CORRAL, which is a one-dimensional simulation of the twoalmost three-) dimensional (and problem of catching Harry for anything other than food. The main reason for confining Harry's alter ego in the computer to only one dimension is simply to conserve paper on hard-copy terminals. Even so, the presentation is very effective on a video display unit.

The corral itself is bounded by a pair of siderails represented by upper-case I characters separated by 21 spaces. The cowboy C always enters beside the leftmost rail while the horse H is happily mooching somewhere between positions 10 and 18 with a bias towards the right. This bias and the various other behavioral peculiarities of the horse are governed by two data matrices (statements 90 and 100) which may be altered to vary the beast's temperament from wild to docile depending on the data distribution

If the horse bolts, a check is made (line 450) to ensure that it does not reach a position less than one space away from the cowboy. Occasionally, the horse bolts to a position more advantageous to the cowboy, just as in real life, but usually the opposite is true, particularly when it bolts as a result of an incautious approach by the cowboy. So heed with care the advice for the cowboy not to advance by more than half the separation in any one move except when adjacent to the horse, of course!

The probability that the horse may kick when the cowboy moves close is set by the IF statement at line 500. The cowboy is immobilized for from one to five moves, while the horse canters happily away from the scene of his triumph. If this happens more than a certain (random) number of times the round-up is terminated by the departure of the cowboy in an ambulance.

Occasionally the horse decides to engage in a friendly dance around the cowboy, but remember that random number generators have no soul and the result is often vile treachery as the horse delivers a fatal kick at the very moment when a successful catch seems assured. On the other hand, the skill of an accomplished CORRAL cowboy can result in a catch within three moves with no injuries sustained. You either have it or you have not, as the saying goes. In the latter case the

0

2

3

4

5

6

8

9

program allows a maximum of 100 moves before relegating the luckless cowboy to cookhouse chores.

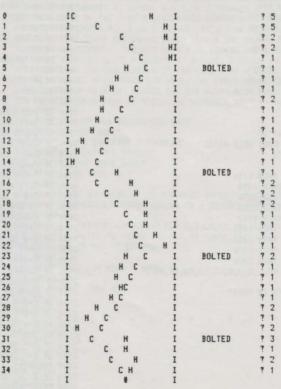
Computer freaks with multi-color graphics will no doubt be dissatisfied with such prosaic symbols as H and C for the horse and cowboy. A fully animated CORRAL in living color (with sound effects by a music or speech synthesizer-a talking horse yet!) should not be too difficult to achieve.

Program and description are by Colin Keay.

#### CORRAL CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU ARE THE COWBOY. GO CATCH YOUR HORSE IN THE CORRAL! DO YOU WANT FULL INSTRUCTIONS? YES YOU MOVE TOWARD YOUR HORSE 1 TO 5 STEPS AT A TIME. IF YOU MORE THAN HALVE THE SEPERATION HE WILL BOLT! HE MAY ALSO BOLT WHEN HE IS CLOSE TO THE RAIL WHEN YOU COME WITHIN 2 STEPS HE MAY KICK. SO LOOKOUT !!

AFTER '?' TYPE IN DIGIT FROM 1 TO 5 FOR COUBOY'S NEXT HOVE



YIPPEE!! NOW SEE IF YOU CAN CATCH HIM IN FEWER MOVES ANOTHER RCUNDUP? NO THANKS

| ANDTHER ROUNDUP? YES                      |         |            | LIST   |
|---|---------|------------|--|
|   |         |            | 1 PRINT TAB(26);"CORRAL"   |
| IC H I                                    |         | ? 5        | 2 PRINT TAB(20); "CREATIVE COMPUTING"  |
| I I C H I<br>2 I C HI                     |         | ? 5        | 3 PRINT TAB(18);"HORRISTOWN, NEW JERSEY"<br>4 PRINT:PRINT:PRINT  |
| I C HI<br>J I C HI                        |         | ? 5        | 10 DIM A(21)   |
| I H C I                                   | BOLTED  | ? 3        | 40 DIN S(2,9)  |
| 5 I H C I                                 |         | ? 2        | 50 FOR I=1 TO 2:FOR J=0 TO 9   |
| 6 I H C I                                 |         | ? 3        | 55 READ S(I,J):NEXT J:NEXT I   |
| 7 I H C I                                 |         | ? 3        | 60 DATA 0,1,2,3,3,2,2,1,0,-1   |
| 8 IH C I                                  |         | ? 2        | 70 DATA 1,2,3,4,5,4,3,2,1,0  |
| 9 I H C I<br>10 I H C I                   |         | ? 1<br>? 1 | 100 PRINT " YOU ARE THE COWBOY. GO CATCH YOUR HORSE IN THE CORRAL!"<br>110 INPUT "DO YOU WANT FULL INSTRUCTIONS";F\$ |
|   | BOLTED  | ? 3        | 120 IF LEFT\$(F\$,1)="N" GOTO 190  |
| 12 I C H I                                | POLICE  | ? 2        | 130 PRINT "YOU MOVE TOWARD YOUR HORSE 1 TO 5 STEPS AT A TIME."   |
| 13 I CH I                                 |         | ? 1        | 140 PRINT "IF YOU MORE THAN HALVE THE SEPERATION HE WILL BOLT!"  |
| 14 I C H I                                |         | 7 2        | 150 PRINT "HE MAY ALSO BOLT WHEN HE IS CLOSE TO THE RAIL"  |
| 15 I C H I                                |         | 7 2        | 160 PRINT "WHEN YOU COME WITHIN 2 STEPS HE MAY KICK. SO LOOKOUT!!"   |
| 16 I C H I<br>17 I C H I                  |         | ?1         | 180 PRINT  |
| 17 I C H I<br>18 I C H I                  |         | ? 2<br>? 1 | 190 PRINT "AFTER '?' TYPE IN DIGIT FROM 1 TO 5 FOR COWBOY'S NEXT MOVE"   |
| 19 I H C I                                | BOLTED  | ? 1        | 200 C=1:L=1:K=0:M=0:GOSUB 800<br>220 IF R>5 THEN Q=-Q  |
| 20 I H C I                                | POLICO  | 72         | 225 H=13+Q:60SUB 810   |
| 21 I CHI                                  | KICKED  |            | 230 T=2+P:PRINT  |
| 22 I C HI                                 |         |            | 300 B\$= " "   |
| 23 I C HI                                 |         |            | 310 FOR J=1 TO 21:A(J)=32:NEXT J   |
| 24 I C HI                                 |         |            | 320 A(C)=67:A(H)=72  |
| 25 I C HI                                 |         | ? 3        | 330 PRINT N, "I";  |
| 26 I C HI<br>27 I H C I                   | DOL TED | ? 1        | 333 FOR J=1 TO 21:PRINT CHR\$(A(J));:NEXT J  |
| 27 I H C I<br>28 I H C I                  | BOLTED  | ? 3        | 337 PRINT "I",B\$;<br>370 X=ABS(H-C):L=SGN(H-C)  |
| 29 I H C I                                |         | 7 2        | 380 N=N+1:1F K>0 GOTO 640  |
| 30 I H C I                                |         | ? 1        | 390 IF N>100 THEN 980  |
| 31 I H C I                                |         | 7 2        | 395 INPUT D  |
| 32 I H C I                                |         | ? 1        | 400 IF D>0 AND D<6 GOTO 450  |
| 33 I C H I                                | KICKED  |            | 420 PRINT "ILLEGAL NOVE. TRY AGAIN",;:GOTO 390   |
| J4 I C H I                                |         |            | 450 E=C+L*D:IF E <1 OR E>21 THEN 420   |
| 35 I C H I<br>36 I C H I                  |         | ? 5        | 460 C=E:60SUB 800  |
| 37 I C H I                                |         | ? 3        | 510 G=P:H=H+L*6:GOSUB 810<br>530 IF X<2*D AND D >1 GOTO 570  |
| J8 I H C I                                | BOLTED  | ? 2        | 540 IF H>1 AND H<20 THEN 600   |
| 39 I H C I                                |         | 7 2        | 545 GOSUB 800  |
| 40 I H C I                                |         | 73         | 550 IF R>2 GOTO 600  |
| 41 I C H I                                | KICKED  |            | 555 IF X>7 GOTO 300  |
| 42 I C H I                                |         |            | 570 G=9+2*P:H=H-L*G:L=-L:GOSUB 810   |
| 43 I C H I                                |         | 73         | 580 IF ABS(H-C)>1 THEN 590   |
| 44 I C H I<br>45 I C H I                  |         | ? 2        | 585 H=H-3*L:60SUB 810<br>590 B\$="BOLTED ":60TO 310  |
| 45 I C H I<br>46 I C H I                  |         | ? 1        | 600 IF ABS(H-C)>2 GOTO 300   |
| 47 I CH I                                 |         | ? 1        | 605 GOSUB 800  |
| 48 I H C I                                | KICKED  |            | 610 IF R>3 GOTO 700  |
| 49 I H C I                                |         |            | 615 GOSUB 800  |
| 50 I H C I                                |         |            | 620 K=P+2:M=M+1:H=H-5*L:GOSUB 810  |
| 51 I H C I<br>52 IH C I                   |         |            | 630 B\$="KICKED":GOTO 310  |
| 52 IH C I<br>53 IH C I                    |         | ? 5        | 640 IF M>T GOTO 900  |
| 54 IH C I                                 |         | ? 2        | 650 K=K-1:PRINT:60SUB 800<br>670 H=H+L*(P+1):60SUB 810:60T0 300  |
| 55 IH C I                                 |         | ? 1        | 700 IF H=C THEN 930  |
| 56 I C H I                                | BOLTED  | ? 5        | 705 GOTO 300   |
| 57 I C H I                                |         | ? 2        | 800 R=INT(10*RND(1)):P=S(1,R):Q=S(2,R):RETURN  |
| 58 I C H I                                |         | ? 1        | 810 IF H<1 THEN H=1  |
| 59 I C H I                                |         | ? 2        | 820 IF H>21 THEN H=21  |
| 60 I H C I<br>ILLEGAL MOVE. TRY AGAIN ? 2 | BOLTED  | ? 21       | B30 RETURN   |
| 61 I HC I                                 |         | 71         | 900 PRINT:PRINT "THOSE KICKS LANDED YOU IN THE HOSPITAL!"<br>910 PRINT " GET WELL SOON!!":GOTO 960                   |
| 62 I H C I                                |         | ? 2        | 930 FOR J=1 TO 21:A(J)=32:NEXT J:A(C)=35   |
| 63 I H C I                                |         | ? 2        | 940 PRINT ,"I";  |
| 64 IH C I                                 |         | ? 3        | 943 FOR J=1 TO 21:PRINT CHR\$(A(J));:NEXT J  |
| 65 I C H I                                | BOLTED  | ? 2        | 947 PRINT "I"  |
| 66 I C H I                                |         | ? 1        | 950 PRINT:PRINT "YIPPEE!! NOW SEE IF YOU CAN CATCH HIN IN FEWER MOVES"   |
| 67 I C H I<br>68 I C H I                  |         | ? 2        | 960 INPUT "ANOTHER ROUNDUP";F\$  |
| 69 I HC I                                 | KICKED  | : 2        | 970 IF LEFT\$(F\$,1)="Y" THEN 200<br>975 GOTO 999  |
| THOSE KICKS LANDED YOU IN THE HOSPITAL    |         |            | 980 PRINT:PRINT "ENOUGH!! YOU'D DO BETTER AS CAMP COOK!":GOTO 960  |
| GET WELL SOON!!                           |         |            | 999 END  |
| ANOTHER ROUNDUP? NO                       |         |            | Ok   |
| Ok  |         |            |  |



The program Countdown is based on the program Guess in which the computer chooses a random number and then gives you clues whether you are too high or too low until you finally get the number. In Countdown, the program adds a little interest to this guessing game by giving you a certain number of tries to get the mystery number between one and ten before your schoolbuilding explodes. Using a good guessing strategy should allow you to get any number in four or fewer tries. If you take more than four tries, the building goes "boom." To add a little more interest to the game, you may want to make the maximum number of tries three. To do this change the value of T in statement 45 from 4 to 3.

Countdown was written by Mark Chambers.

LIST 1 PRINT TAB(24);"COUNT DOWN" 2 PRINT TAB(20); "CREATIVE COMPUTING" 3 PRINT TAB(18); "HORRISTOWN, NEW JERSEY" 4 PRINT:PRINT:PRINT 5 A=INT(RND(1)\*10) 6 T=0 7 N=0 15 PRINT "YOU HAVE ACTIVATED THE SELF-DESTRUCT MECHANISM "; 20 PRINT "IN THIS SCHOOL. 25 PRINT "IF YOU WISH, YOU MAY STOP THE MECHANISM." 25 PRINT "IF TOU WISH, TOU ART STOP THE RECHARGED. 27 PRINT "TO DO SO, JUST TYPE IN THE CORRECT NUMBER," 35 PRINT "WHICH WILL STOP THE COUNT-DOWN." 37 PRINT "PLEASE HURRY!! THERE IS NO TIME TO WASTE!!!!!!! 44 PRINT "WHAT'LL IT BE";:INPUT X:PRINT 45 IF T=4 THEN 98 47 GOTO 200 50 REM 75 PRINT "YOUR NUMBER DOES NOT COMPUTE!!" 80 PRINT "PLEASE TRY AGAIN !!!!": T=T+1 81 IF T=2 THEN 96 82 IF T=3 THEN 105 83 GOTO 44 85 PRINT "CORRECT!!!!":LET N=5 90 PRINT "THE COUNTDOWN HAS STOPPED." 92 PRINT "YOU HAVED SAVED THE SCHOOL!" 93 PRINT "(HAVE YOU SEEN YOUR SHRINK LATELY ?)" 94 LET T=10 95 GOTO 1000 96 PRINT "TIME GROWS SHORT, PLEASE HURRY!!!!!!! 97 GOTO 44 98 PRINT:PRINT:PRINT:PRINT 99 PRINT TAB(32);"TOD LATE" 100 PRINT:PRINT:PRINT:PRINT TAB(32);"\ \*\*\*\* /" 101 PRINT TAB(31);"-- BOOM --102 PRINT TAB(32);"/ \*\*\*\* \" 103 PRINT:PRINT:PRINT 104 GDT0 1000 105 PRINT "HURRY, THE COUNT-DOWN IS APPROACHING ZERO !!!!!!!! 110 GOTO 44 200 IF X<A THEN PRINT "TOD SMALL!!!!!":GOTO 50 210 IF X>A THEN PRINT "TOO BIG!!!!!":GOTO 50 225 IF X=A THEN 85 1000 END Dk

RUN

COUNT DOWN CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU HAVE ACTIVATED THE SELF-DESTRUCT MECHANISM IN THIS SCHOOL. IF YOU WISH. YOU MAY STOP THE MECHANISM. TO DO SO, JUST TYPE IN THE CORRECT NUMBER, WHICH WILL STOP THE COUNT-DOWN. PLEASE HURRY!! THERE IS NO TIME TO WASTE!!!!!! WHAT'LL II BE? O

CORRECTIVI

THE COUNTDOWN HAS STOPPED. YOU HAVED SAVED THE SCHOOL! (HAVE YOU SEEN YOUR SHRINK LATELY ?) Ok

RUN

#### COUNT DOWN CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU HAVE ACTIVATED THE SELF-DESTRUCT MECHANISM IN THIS SCHOOL. IF YOU WISH, YOU MAY STOP THE MECHANISM. TO DO SO. JUST TYPE IN THE CORRECT NUMBER, WHICH WILL STOP THE COUNT-DOWN. PLEASE HURRY!! THERE IS NO TIME TO WASTE!!!!!! WHAT'LL IT BE? O

TOO SHALL!!!!! \* YOUR NUMBER DOES NOT COMPUTE!! PLEASE TRY AGAIN!!!! WHAT'LL IT BE? 1

TOO SHALL!!!!! YOUR NUMBER DOES NOT COMPUTE!! PLEASE TRY AGAIN!!!! WHAT'LL IT BE? 4

TOO LATE

\ \*\*\*\* / -- BOOM --/ \*\*\*\* \

Ok

Cup is a cute little game in which a cup is located thirty lines down the paper of your terminal or thirty lines down on your video display screen and a random number of spaces from one to sixty to the right of the left margin. The pull of gravity varies from one to ten lines per second per second. You are then asked in this program what push you would like to give the ball from left to right across the paper in spaces per second. The program then traces the path of the ball from the left margin of the paper as it falls down and hopefully into the cup.

A knowledge of physics is helpful if you wish to get the ball in the cup on the first try. However, you can diddle with it by trial and error and generally hit the cup on your fourth or fifth try.

Cup was written by Jonathan Freidin.

RUN

CUP CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THE CUP IS 30 LINES DOWN AND 53 SPACES OVER. THE PULL OF GRAVITY IS 6 LINES/SECOND/SECOND. WHAT IS THE PUSH YOU WOULD LIKE TO GIVE THE BALL ACROSS THE PAPER (IN SPACES/SECOND)? 8 THE RESULTS MAY TAKE ANYWHERE BETWEEN 30 AND 90 SECONDS. LIST 1 PRINT TAB(27);"CUP" 2 PRINT TAB(20); "CREATIVE COMPUTING" 3 PRINT TAB(18); "MORRISTOWN, NEW JERSEY" 4 PRINT:PRINT:PRINT 10 DIM 5(30,60) 30 LET L=INT(60\*RND(1))+1 40 IF L=60 DR L=1 THEN 30 50 LET G=INT(10\*RND(1))+1 60 PRINT "THE CUP IS 30 LINES DOWN AND ";L;" SPACES OVER." 70 PRINT "THE PULL OF GRAVITY IS ";G;" LINES/SECOND/SECOND." 80 PRINT "WHAT IS THE PUSH YOU WOULD LIKE TO GIVE THE BALL" 90 PRINT "ACROSS THE PAPER (IN SPACES/SECOND)"; 100 INPUT T PRINT "THE RESULTS MAY TAKE ANYWHERE BETWEEN 30 AND 90 SECONDS." 110 120 FOR S1=1 TO 30:FOR S2=1 TO 60:S(S1,S2)=0:NEXT:NEXT 130 LET S(30,L)=S(30,L-1)=S(30,L+1)=S(29,L-1)=S(29,L+1)=1 FOR Z=1 TO SQR(60+6)/6 STEP .01 140 LET Y=T+7+2 150 LET X=6/2+Z^2 160 IF X>30.5 OR X<.5 OR Y>60.5 OR Y<.5 THEN 300 IF INT(X)=29 AND INT(Y)=L THEN 310 170 180 IF INT(X)+1=29 AND INT(Y)+1=L THEN 310 190 200 IF INT(X)=29 AND INT(Y)=L-1 THEN 310 210 IF INT(X)+1=29 AND INT(Y)+1=L-1 THEN 310 IF INT(X)=29 AND INT(Y)=L+1 THEN 330 IF INT(X)+1=29 AND INT(Y)+1=L+1 THEN 330 220 230 240 LET S(X,Y)=2 250 FOR D=1 TO 5 260 IF YK6 THEN 290 270 LET S(X,Y-D)=0 280 NEXT D 290 NEXT Z 300 60T0 340 310 LET W=1 320 60TO 335 330 LET W=2 335 LET S(29.L)=2 337 GOTO 345 340 LET W=0 345 LET P\$=" \*." 360 LET S(30,L)=1:S(30,L-1)=1:S(30,L+1)=1: 365 LET S(29,L-1)=1:S(29,L+1)=1 370 FOR X=1 TO 30 380 FOR X1=1 TO 60 390 IF S(X, X1) <>0 THEN 420 400 NEXT X1 410 GOTO 500 420 FOR Y=1 TO 60 430 PRINT MID&(P\$,S(X,Y)+1,1); 440 IF X=29 DR X=30 THEN 490 450 IF Y=60 DR Y=1 THEN 490 IF Y=1 DR Y=59 THEN 500 460 470 IF S(X,Y)=2 AND S(X,Y+1)=0 THEN 500 IF S(X,Y)=1 AND S(X,Y+1)=0 AND S(X,Y+2)=0 THEN 500 480 NEXT Y 490 PRINT 500 510 NEXT X 520 PRINT 530 IF W=1 THEN 570 IF W=2 THEN 590 540 PRINT "YOU MISSED; TRY AGAIN." 550 560 GOTO 60 570 PRINT "RIGHT IN!!!" 580 **GOTO 600** 590 PRINT "YOU ALMOST DIDN'T MAKE IT, BUT IT BOUNCED IN." 600 PRINT "DO YOU WANT TO PLAY AGAIN?" 610 INPUT AS 620 IF LEFTS(AS, 1)="Y" THEN 30 630 END Ok

\*\*\*



In this game, you, the player, are given \$100 to start with. You then play five card games loosely modeled on casino gambling games, but with peculiar variations. The five games are well-explained in the rules.

This game was written by Thomas Carey.

RUN

DEALER'S CHOICE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM WILL SIMULATE THE T.V. SHOW, DEALER'S CHOICE. YOU HAVE \$100 TO START WITH. ENJOY THE GAME.

FOR THE FIRST GAME, WE WILL PLAY ON THE WHEEL OF CHANCE. THE DBJECT IS SIMPLE. GUESS WHAT SUITE WILL APPEAR ON THE WHEEL AND YOU WILL GET PAID AT THOSE ODDS IF YOU ARE RIGHT. THEY ARE AS FOLLOWS:

 1=DIAMONDS AT 11 TO 1 ODDS
 2=SPADES AT T TO 1 ODDS.

 3=HEARTS AT 3 TO 1 ODDS
 4=CLUBS AT 3 TO 1 ODDS.

 YOU MAY BET UP TO \$25. GOOD LUCK!

WHAT SUITE DO YOU WANT? 1 WHAT IS THE BET? 25 O.K. NOW THAT YOUR BET IS IN, WE WILL SPIN THE WHEEL, GOOD LUCK! THE WHEEL IS SLOWING DOWN. THE WHEEL IS STOPPING. THE SUITE IS \*\*\*\* 1 \*\*\*\* YOU WIN ON DIAMONDS AT THE END OF PART 1, YOU HAVE \$ 375

THIS IS THE GAME OF IN BETWEEN. THE OBJECT IS: 5 CARDS WILL BE DEALT OUT. IF ANY CARD IS LESS THAN A 3 OR GREATER THAN A 10, THE GAME IS OVER. YOU MAY BET UP TO \$30. YOUR MONEY WILL BE DOUBLED EACH TIME YOU ARE RIGHT. GOOD LUCK!

WHAT IS THE BET? 40 \*\*\*YOU BET OVER THE HOUSE LIMIT \*\*\* WHAT IS THE BET? 30 CARD NUMBER 1 IS A 4 YOU ARE STILL IN THE GAME. YOU HAVE 60 STOP OR 60? 60 CARD NUMBER 2 IS A 4 YOU ARE STILL IN THE GAME. YOU HAVE 120 STOP OR 60? GO CARD NUMBER 3 IS A 7 YOU ARE STILL IN THE GAME. YOU HAVE 180 STOP OR GO? STOP YOU WH. AT THE END OF PART 2, YOU HAVE \$ 555

THIS IS THE GAME OF BLACKJACK (DEALER'S CHOICE STYLE) THE OBJECT IS TO BEAT THE DEALER WITH OVER 17 OR 21 OR UNDER. YOU MAY BET UP TO \$50. YOU MAY STOP WHEN YOU WISH. IF YOU MAKE BLACKJACK, YOUR MONEY IS DOUBLED. IF THE HOUSE DEALS OUT LESS THAN A TOTAL OF 17 IN 6 TRIES, YOU WILL KEEP THE MONEY YOU BET. GOOD JUCK!

THE DEALER WILL GET HIS CARDS FIRST

HERE I GO THE CARD IS A 1 SO FAR: 1 THE CARD IS A 10 S0 FAR: 11 THE CARD IS A 6 SD FAR: 17 I STOP. THE TOTAL FOR ME IS 17 NOW YOU GO WHAT IS THE BET? 50 YOUR CARD IS A 5 SO FAR THE TOTAL FOR YOU IS 5 STOP OR GO? GO YOUR CARD IS A 12 SO FAR THE TOTAL FOR YOU IS 17 STOP OR GO? STOP WE ARE THE SAME SO WE WILL PLAY AGAIN THE DEALER WILL GET HIS CARDS FIRST HERE I GO THE CARD IS A 11 S0 FAR: 11 THE CARD IS A 9 SD FAR: 20 I STOP. THE TOTAL FOR ME IS 20 NOW YOU GO WHAT IS THE BET? 50 YOUR CARD IS A 1 SO FAR THE TOTAL FOR YOU IS 1 STOP OR 607 GO YOUR CARD IS A 12 SO FAR THE TOTAL FOR YOU IS 13 STOP OR GO? GO YOUR CARD IS A SO FAR THE TOTAL FOR YOU IS 14 STOP OR GO? GO YOUR CARD IS A 12 SO FAR THE TOTAL FOR YOU IS 26 THE DEALER BEAT YOU. YOU LOSE AT THE END OF PART 3, YOU HAVE \$ 325 NOW WE ENTER THE LAST CHANCE ROUND. IF YOU MAKE UP TO \$300 YOU WILL BE ABLE TO GO INTO THE BONUS ROUND. THE OBJECT IS TO GUESS INTO WHICH CATEGORY THE TOTAL OF 5 CARDS WILL ADD UP TO. THESE ARE THE CATEGORIES: 1=31-40 AT 1 TO 1 ODDS 2=41-50 AT 3 TO 1 0005 3=21-31 AT 3 TO 1 ODDS 4=6-20 AT 20 TO 1 ODDS GOOD LUCK! AT THIS POINT IN THE GAME YOU HAVE \$ 325 WHAT CATEGORY DO YOU WANT? 2 WHAT IS THE BET? 25 THE CARDS ARE NOW BEING ADDED UP GOOD LUCK! CARD NUMBER 1 IS A 1 SO FAR: 8 CARD NUMBER 2 IS A 11 S0 FAR: 19 CARD NUMBER 3 IS A 8 S0 FAR: 27 CARD NUMBER 4 IS A 7 SD FAR: 34 CARD NUMBER 5 TS A 10 S0 FAR: 44 AT THE END OF THE GAME YOU HAVE A GRAND TOTAL OF \$ 400 YOU ARE ELIGIBLE FOR THE BONUS ROUND. DO YOU WANT TO PLAY IT? YES THIS IS THE BONUS ROUND. IF YOU GET A TOTAL OF 1,000 WITHOUT GETTING A SPADE IN THE ROLLS, YOU WILL GET A GRAND PRIZE OF \$10,000.00. YOU MAY STOP AT ANY POINT DURING THE GAME. YOU WILL KEEP WHAT YOU MADE. GOOD LUCK! THE DICE ARE ROLLING GOOD LUCK. THE DICE ARE \*\*\*\*SPADES 200 \*\*\*\* TOTAL 200 YOU LOSE THE MONEY FROM THE LAST CHANCE ROUND BUT YOU STILL HAVE A GRAND TOTAL OF \$ 400 THIS IS THE END OF THE GAME. I HOPE YOU ENJOYED IT.

W FRINT TAB(21); "DEALER'S CHOICE" W FRINT TAB(20); "CREATIVE COMPUTING" W FRINT TAB(18); "MORRISTOWN, NEW JERSEY" IN PRINT: PRINT: PRINT W RINT "THIS PROGRAM WILL SIMULATE THE T.V. SHOW, DEALER'S CHOICE." IN FRINT "YOU HAVE \$100 TO START WITH. ENJOY THE GAME.":PRINT IN WEINT "FOR THE FIRST GAME, WE WILL PLAY ON THE WHEEL OF CHANCE." W FRINT "THE OBJECT IS SIMPLE. GUESS WHAT SUITE WILL APPEAR ON THE" HE FRINT "WHEEL AND YOU WILL GET PAID AT THOSE ODDS IF YOU ARE RIGHT." IN PRINT "THEY ARE AS FOLLOWS: ": PRINT IN PRINT "1=DIAMONDS AT 11 TO 1 ODDS 2=SPADES AT 1 TO 1 ODDS." 220 PRINT "3=HEARTS AT 3 TO 1 ODDS 4=CLUBS AT 3 TO 1 ODDS." IN PRINT "YOU MAY BET UP TO \$25. GOOD LUCK!":PRINT M FRINT "WHAT SUITE DO YOU WANT"; : INPUT A 250 IF A > 4 OR A < 1 THEN 270 MI IF A (=4 THEN 280 IN PRINT "\*\*\*YOU PICKED A WRONG SUITE\*\*\*":GOTO 240 10 PRINT "WHAT IS THE BET" ; : INPUT B8 10 IF 88 > 25 OR 88 <= 0 THEN 310 10 IF B8 <= 25 THEN 320 10 PRINT "\*\*\*YOU BET OVER THE HOUSE LIMIT\*\*\*": GOTO 280 IN PRINT "O.K. NOW THAT YOUR BET IS IN, WE WILL SPIN" IN FRINT "THE WHEEL, GOOD LUCK!":FOR B1=1 TO 10\*570:NEXT B1 IN FRINT "THE WHEEL IS SLOWING DOWN." IN FOR BI=1 TO 7\*570:NEXT B1:PRINT "THE WHEEL IS STOPPING." 340 FOR B1=1 TO 4\*570:NEXT B1 IN PRINT "THE SUITE IS ":FOR B1=1 TO 4\*570 JHO NEXT B1 30 J=INT(4+RND(1)+1):PRINT "\*\*\*\*";Z;"\*\*\*\*" IN IF Z=A THEN 420 10 IF Z (> A THEN 470 40 UN Z GOTO 430,440,450,460 40 0=0+(11\*B8):PRINT "YOU WIN ON DIAMONDS":GOTO 480 400 0=0+(1+88):PRINT "YOU WIN ON SPADES":GOTO 480 450 0=0+(3+88):PRINT "YOU WIN ON HEARTS":GOTO 480 40 0=0+(3+B8):PRINT "YOU WIN ON CLUBS":GOTO 480 470 0=0-(1\*88):PRINT "YOU LOSE.":GOTO 480 480 PRINT "AT THE END OF PART 1, YOU HAVE \$";0 490 FOR P=1 TO 5:PRINT:NEXT P W PRINT "THIS IS THE GAME OF IN BETWEEN. THE OBJECT IS: 5 CARDS WILL" STO PRINT "BE DEALT OUT. IF ANY CARD IS LESS THAN A 3 OR GREATER THAN A" SU PRINT "10, THE GAME IS OVER. YOU MAY BET UP TO \$30. YOUR MONEY" 10 PRINT "WILL BE DOUBLED EACH TIME YOU ARE RIGHT. GOOD LUCK!":PRINT SHO PRINT "WHAT IS THE BET"; : INPUT A 550 IF A > 30 THEN PRINT "\*\*\*YOU BET OVER THE HOUSE LIMIT \*\*\*":GOTO 540 560 T=T+1:Z=INT(12\*RND(1)+1) 570 PRINT "CARD NUMBER ";T;" IS A ";Z:B=B+(2\*A) 580 IF Z < 3 DR Z > 10 THEN 630 590 IF T=5 THEN 650 AND PRINT "YOU ARE STILL IN THE GAME. YOU HAVE ";B SIO PRINT "STOP OR GO"; : INPUT A\$: IF A\$="GO" THEN 560 620 IF AS="STOP" THEN 650 530 D=0-A 540 PRINT "YOU LOST. AT THE END OF PART 2, YOU HAVE \$";0:GOTO 660 450 PRINT "YOU WIN. AT THE END OF PART 2, YOU HAVE \$"; B+O: B=B+O 660 FOR P=1 TO 5:PRINT:NEXT P 670 PRINT "THIS IS THE GAME OF BLACKJACK <DEALER'S CHOICE STYLE>" 680 PRINT "THE OBJECT IS TO BEAT THE DEALER WITH OVER 17 OR 21 OR" 190 PRINT "UNDER. YOU MAY BET UP TO \$50. YOU MAY STOP WHEN YOU WISH." 100 FRINT "IF YOU MAKE BLACKJACK, YOUR MONEY IS DOUBLED." 710 FRINT "IF THE HOUSE DEALS OUT LESS THAN A YOTAL OF 17 IN 6 TRIES," 720 PRINT "YOU WILL KEEP THE MONEY YOU BET. GOOD LUCK!": PRINT 730 25=0:Z1=0:PRINT "THE DEALER WILL GET HIS CARDS FIRST":PRINT 740 C=0:C3=0 750 PRINT "HERE I GO" 740 0=INT(12\*RNB(1)+1) 770 25=0+25 780 PRINT "THE CARD IS A ";Q:C=C+1 790 PRINT "SO FAR:"; Z5: IF C=6 THEN 850 800 IF 25(17 THEN 760 810 IF Z5 > 21 THEN 910 820 IF Z5=21 THEN 880 810 IF 25 < 21 THEN 870 840 IF 25 >= 17 THEN 870 850 IF 25 < 17 THEN 890 860 IF 25 >= 17 THEN 800 870 PRINT "I STOP. THE TOTAL FOR ME IS ";Z5:PRINT "NOW YOU GO":PRINT:GOT 880 PRINT "I GOT BLACKJACK": PRINT: GOTO 930 890 PRINT "THE HOUSE DELT OUT LESS THAN 17. NOW YOU HUST TRY TO" 900 PRINT "BEAT ME"; : PRINT: GOTO 930 910 PRINT "I BLEW IT. YOU WIN THE GREATEST AMOUNT ALLOWED TO BE" 920 PRINT "BET BY THE HOUSE.": GOTO 1160 930 PRINT "WHAT IS THE BET"; : INPUT A 940 IF A > 0 THEN 980 950 IF A > 50 DR A <= 0 THEN 970 960 IF A (= 50 THEN 990 970 PRINT "\*\*\*YOU BET OVER THE HOUSE LIMIT\*\*\*":GOTO 930 980 PRINT "\*\*\*YOU BET OVER WHAT YOU HAVE\*\*\*": GOTO 930 990 DI=INT(12\*RND(1)+1):PRINT "YOUR CARD IS A ";01:C3=C3+1 1000 Z1=D1+Z1:PRINT "SO FAR THE TOTAL FOR YOU IS ";Z1:IF C3=6 THEN 1090 1010 IF Z1 > 21 THEN 1120 1020 PRINT "STOP OR GO"; : INPUT A\$

1030 IF A\$="STOP" THEN 1050 1040 IF A\$="GD" THEN 990 1050 IF Z1=Z5 THEN 1100 1060 IF Z1 < Z5 THEN 1120 1070 IF 21=21 THEN 1110 1080 IF Z5 <Z1 THEN 1130 1090 IF Z1 < 17 THEN 1140 1100 PRINT "WE ARE THE SAME SO WE WILL PLAY AGAIN":GOTO 730 1110 D=D+(2\*A):PRINT "YOU BEAT THE DEALER WITH BLACKJACK!!":GOTO 1170 1120 D=0-(1\*A):PRINT "THE DEALER BEAT YOU. YOU LOSE":GOTO 1170 1130 D=0+(1\*A):PRINT "THE DEALER LOST. YOU WIN":GOTO 1170 1140 U=O+(1\*A):PRINT "THE HOUSE DELT OUT LESS THAN 17 IN" 1150 PRINT "& TRIES. YOU GET THE MONEY YOU BET":GOTO 1170 1160 D=D+50:PRINT "YOU KEEP IT WITH OUR BEST WISHES.":GOTO 1170 1170 PRINT "AT THE END OF PART 3, YOU HAVE \$";0 1180 IF D<=0 THEN 1580 1190 FOR P=1 TO 5:PRINT:NEXT P 1200 PRINT "NOW WE ENTER THE LAST CHANCE ROUND. IF YOU MAKE UP TO" 1210 PRINT "\$300 YOU WILL BE ABLE TO GO INTO THE BONUS ROUND. THE" 1220 PRINT "OBJECT IS TO GUESS INTO WHICH CATEGORY THE TOTAL OF 5 CARDS" 1230 PRINT "WILL ADD UP TO. THESE ARE THE CATEGORIES:":PRINT 1240 PRINT "1=31-40 AT 1 TO 1 ODDS 2=41-50 AT 3 TO 1 0005" 1250 PRINT "3=21-31 AT 3 TO 1 ODDS 4=6-20 AT 20 TO 1 0DDS" 1260 PRINT "GOOD LUCK!!":PRINT 1270 PRINT "AT THIS POINT IN THE GAME YOU HAVE \$";0 1280 PRINT "WHAT CATEGORY DO YOU WANT";:INPUT A 1290 IF A <= 4 THEN 1320 1300 IF A > 4 THEN 1310 1310 PRINT "\*\*\*YOU BET ON A WRONG CATEGORY\*\*\*":GOTO 1280 1320 PRINT "WHAT IS THE BET"; : INPUT B 1330 IF B <= 0 THEN 1360 1340 IF B > 0 THEN 1350 1350 PRINT "\*\*\*YOU BET OVER WHAT YOU HAVE\*\*\*":GOTO 1320 1360 PRINT "THE CARDS ARE NOW BEING ADDED UP":PRINT "GOOD LUCK!" 1370 Q=INT(12\*RND(1)+1):C1=C1+1 1380 PRINT "CARD NUMBER ":C1:" IS A ":Q 1390 Z=Z+0:PRINT "SO FAR: ";Z 1400 IF C1=5 THEN 1420 1410 GOTO 1370 1420 DN A GOTO 1430,1460,1490,1520 1430 IF Z < 31 THEN 1540 1440 IF Z < 40 THEN 1550 1450 IF / > 40 THEN 1540 1460 IF Z < 41 THEN 1540 1470 IF Z < 50 THEN 1560 1480 IF Z > 50 THEN 1540 1490 IF Z < 21 THEN 1540 1500 IF Z < 31 THEN 1560 1510 IF Z > 31 THEN 1540 1520 IF Z < 6 THEN 1540 1530 IF Z < 20 THEN 1570 1540 0=0-(1\*B):PRINT "YOU LOSE":60T0 1580 1550 0=0+(1\*B):PRINT "YOU WIN":GOTO 1580 1560 0=0+(3\*B):60T0 1580 1570 0=0+(20\*B):PRINT "YOU WIN":GOTO 1580 1580 PRINT "AT THE END OF THE GAME YOU HAVE A GRAND TOTAL OF \$";D 1590 IF D < 300 THEN 1940 1600 FOR X=1 TO 6:PRINT CHR\$(7);:FOR B1=1 TO 570:NEXT B1:NEXT X 1610 PRINT "YOU ARE ELIGIBLE FOR THE BONUS ROUND." 1620 PRINT "DO YOU WANT TO PLAY IT";:INPUT A\$ 1630 IF A\$="NO" THEN 1940 1640 PRINT "THIS IS THE BONUS ROUND. IF YOU GET A TOTAL OF 1,000" 1650 PRINT "WITHOUT GETTING A SPADE IN THE ROLLS, YOU WILL GET" 1660 PRINT "A GRAND PRIZE OF \$10,000.00. YOU MAY STOP AT ANY POINT" 1670 PRINT "DURING THE GAME. YOU WILL KEEP WHAT YOU MADE. GOOD LUCK!" 1680 PRINT 1690 DIM A(5), B(4): A9\$="SPADES" 1700 PRINT "THE DICE ARE ROLLING":PRINT "GOOD LUCK." 1710 PRINT "THE DICE ARE" 1720 FOR B1=1 TO 570\*5:NEXT B1 1730 X=INT(5\*RND(1)+1) 1740 A(1)=50:A(2)=100:A(3)=150:A(4)=200:A(5)=0 1750 Y=INT(4\*RND(1)+1) 1760 B(1)=50:B(2)=100:B(3)=150:B(4)=200 1770 IF A(X)=0 THEN 1790 1780 PRINT "\*\*\*\*";A(X);B(Y);"\*\*\*\*":PRINT "TOTAL ":A(X)+B(Y):SOTO 1810 1790 PRINT "\*\*\*\*";A9\$;B(Y);"\*\*\*\*" 1800 PRINT "TOTAL ";B(Y):GOTO 1870 1810 B7=B7+(A(X)+B(Y)):PRINT "YOU NOW HAVE ";B7:IF B7 >= 1000 THEN 1890 1820 PRINT "STOP OR GO": INPUT B\$ 1830 IF B\$="GO" THEN 1700 1840 PRINT "SMART HOVE. YOU GET THE MONEY FROM THE BEGINNING OF" 1850 PRINT "THE GAME PLUS THE BONUS ROUND. AT THE END OF THE GAME" 1860 PRINT "YOU HAVE THE GRAND TOTAL OF \$";B7+0:GOTO 1940 1870 PRINT "YOU LOSE THE MONEY FROM THE LAST CHANCE" 1880 PRINT "ROUND BUT YOU STILL HAVE A GRAND TOTAL OF \$";0:6010 1940 1890 FOR T=1 TO 3:PRINT CHR\$(7);:FOR B1=1 TO 570:NEXT B1:NEXT T 1900 B7=0+10000:PRINT TAB(15); \*\*\*\*\*CONGRATULATIONS\*\*\*\*\* 1910 PRINT "YOU WON THE GRAND PRIZE. AT THE END OF THE GAME, YOU HAVE" 1920 FOR P=1 TO 3:PRINT:NEXT P 1930 PRINT TAB(18); "\*\*\*\*\*\*": B7: "\*\*\*\*\*\*" 1940 PRINT "THIS IS THE END OF THE GAME. I HOPE YOU ENJOYED IT." 1950 END



Deepspace is another version of a space battle. You become the commander of either a scout ship, cruiser, or battleship. You then pick the weapons, and planetary system to patrol, and it's time to do battle.

The closer you get to the enemy, the better your chance of destroying him. Unfortunately, his chance of destroying you also improves. If you get too close, you can damage yourself; when a vessel's damage rating reaches or exceeds 100, it's destroyed.

Suggestion: Change the time between reports—this will shorten the game by allowing you to get closer faster.

Deepspace originally appeared in Creative Computing, Mar/Apr 1976.

RUN

DEEPSPACE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS DEEPSPACE, A TACTICAL SIMULATION OF SHIP TO SHIP COMBAT IN DEEP SPACE. DO YOU WISH INSTRUCTIONST YES YOU ARE ONE OF A BROUP OF CAPTAINS ASSIGNED TO PATROL A SECTION OF YOUR STAR EMPIRE'S BORDER AGAINST HOSTILE ALIENS. ALL YOUR STAR EMPIRE'S HERE WILL BE AGAINST HOSTILE VESSELS. YOU WILL FIRST BE REQUIRED TO SELECT A VESSEL FROM ONE OF THREE TYPES, EACH WITH ITS OWN CHARACTERISTICS:

| TYPE         | SPEED | CARGO SPACE | PROTECTION |
|--------------|-------|-------------|------------|
| 1 SCOUT      | 10X   | 16          | 1          |
| 2 CRUISER    | 4X    | 24          | 2          |
| 3 BATTLESHIP | 2X    | 30          | 5          |

SPEED IS GIVEN RELATIVE TO THE OTHER SHIPS. CARGO SPACE IS IN UNITS OF SPACE ABOARD SHIP WHICH CAN BE FILLED WITH WEAPONS. PROTECTION IS THE RELATIVE STRENGTH OF THE SHIP'S ARMOR AND FORCE FIELDS.

ONCE A SHIP HAS BEEN SELECTED, YOU WILL BE INSTRUCTED TO ARM IT WITH WEAPONRY FROM THE FOLLOWING LIST:

| TYPE                     | CARGO SPACE | REL. STRENGTH |
|--------------------------|-------------|---------------|
| 1 PHASER BANKS           | 12          | 4             |
| 2 ANTI-MATTER MISSILE    | 4           | 20            |
| 3 HYPERSPACE LANCE       | 4           | 16            |
| 4 PHOTON TORPEDO         | 2           | 10            |
| 5 HYPERON NEUTRALIZATION | FIELD 20    | 6             |

WEAPONS W1 & W5 CAN BE FIRED 100 TIMES EACH; ALL OTHERS CAN BE FIRED ONCE FOR EACH ON BOARD. A TYPICAL LOAD FOR A CRUISER MIGHT CONSIST OF: 1-W1 PHASER BANK = 12 2-W3 HYPERSPACE LANCES = 8

2-W4 PHOTON TORPEDOES = 4 24 UNITS OF CARGO

A WORD OF CAUTION: FIRING HIGH YIELD WEAPONS AT CLOSE (<100) Range can be dangerous to your ship and minimal dahage can occur as far out as 200 in some circumstances.

RANGE IS GIVEN IN THOUSANDS OF KILOMETERS.

1 FIRE PHASERS 2 FIRE ANTI-MATTER MISSILE 3 FIRE MYPERSPACE LANCE 4 FIRE PHOTON TORPEDD

```
CHANGE VELOCITY
 7
 8
         DISENGARE
         PROCEED
 0
YOU HAVE A CHOICE OF THREE SYSTEMS TO PATROL.
1 ORION
2 DENEB
3 ARCTURUS
SELECT A SYSTEM(1-3)7 3
WHICH SPACECRAFT WOULD YOU LIKE(1-3)? 2
YOU HAVE 24 UNITS OF CARGO SPACE TO FILL WITH WEAPONRY.
CHOOSE A WEAPON AND THE AMOUNT YOU WISH.? 1,1
YOU HAVE 12 UNITS OF CARGO SPACE TO FILL WITH WEAPONRY.
CHOOSE A WEAPON AND THE AMOUNT YOU WISH.? 2,1
You have 8 UNITS OF CARGO SPACE TO FILL WITH WEAPONRY.
CHOOSE A WEAPON AND THE AMOUNT YOU WISH.? 3,1
YOU HAVE 4 UNITS OF CARGO SPACE TO FILL WITH WEAPONRY.
CHOOSE A WEAPON AND THE AMOUNT YOU WISH.? 4,2
```

ACTIVE HYPERON NEUTRALIZATION FIELD

RANGE TO TARGET: 743.491 Relative velocity: 3.24654 Action? 9

SELF-DESTRUCT

5

6

RANGE TO TARGET: 682.097 RELATIVE VELOCITY: 3.24654 ACTION? 9

RANGE TO TARGET: 620.703 RELATIVE VELOCITY: 3.24654 ACTION? 7 CHANGE TO BE EFFECTED? .5

RANGE TO TARGET: 620.703 RELATIVE VELOCITY: 3.74654 ACTIONT 4 SCANNERS REPORT ENEMY DAMAGE NOW: 4.58858 DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT: 5.20508

RANGE TO TARGET: 547.271 RELATIVE VELOCITY: 3.74654 ACTION? 1 SCANNERS REPORT ENEMY DAMAGE NOW: 5.3724 DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT: 11.7754

RANGE TO TARGET: 473.839 RELATIVE VELOCITY: 3.74654 ACTION? 3 SCANNERS REPORT EMEMY DAMAGE NOW: 23.1197 DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT: 20.3527

RANGE TO TARGET: 400.407 RELATIVE VELOCITY: 3.74654 ACTION? 2 SCANNERS REPORT EMEMY DAMAGE NOW: 47.8738 DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT: 32.0649

RANGE TO TARGET: 326.975 RELATIVE VELOCITY: 3.74654 ACTION? 7 CHANGE TO BE EFFECTED? -2

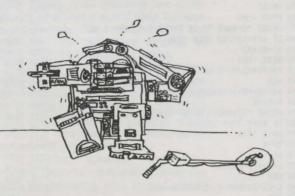
RANGE TO TARGET: 326.975 RELATIVE VELOCITY: 1.74654 ACTION? 1 SCANNERS REPORT ENEMY DAMAGE NOW: 54.5828 DAMAGE CONTROL REPORTS YOUR VESSEL DAMAGE AT: 47.1026

RANGE TO TARGET: 298.689 RELATIVE VELOCITY: 1.74654 ACTION? 8 ANOTHER BATTLE? NO TRY AGAIN LATER! OK

1190 PRINT "RELATIVE VELOCITY:";S1 MRINT TAB(24); "DEEPSPACE" 1200 PRINT "ACTION";:INPUT M HHINT TAB(20); "CREATIVE COMPUTING" 1210 DN H GOTO 1940,2030,2120,2210,2310,1660,1390,2760 GHINT TAB(18); "HORRISTOWN, NEW JERSEY" WRINT: PRINT: PRINT 1290 IF R<500 THEN 1500 WHINT "THIS IS DEEPSPACE, A TACTICAL SIMULATION OF SHIP TO SHIP" 1300 IF \$1>0 THEN 1330 1870 50=2 WRINT "COMBAT IN DEEP SPACE." 1310 R=R+(S1\*8.3)^1.25 1880 CO=30 TRINT "DO YOU WISH INSTRUCTIONS";: INPUT IS 1320 GOTO 1340 1890 P0=5 # IF IS="NO" THEN 610 1330 R=R-(S1\*8.3)^1.25 1900 GOTO 970 WHINT "YOU ARE ONE OF A GROUP OF CAPTAINS ASSIGNED TO PATROL A" 1340 IF R>1500 THEN 2590 1910 C1=12 WHINT "SECTION OF YOUR STAR EMPIRE'S BORDER AGAINST HOSTILE" 1350 IF R>0 THEN 1370 1930 GOTO 1060 WHINT "ALIENS. ALL YOUR ENCOUNTERS HERE WILL BE AGAINST HOSTILE" 1360 R=-R 1940 P1=4 THINT "VESSELS. YOU WILL FIRST BE REQUIRED TO SELECT A VESSEL" 1370 PRINT 1950 IF N1=0 THEN 2160 WHINT "FROM ONE OF THREE TYPES, EACH WITH ITS OWN CHARACTERISTICS:" 1380 GOTO 1180 1960 N1=N1-1 ANNI FRUN UKE OF THREE TIFES, ENCH WITH ITS OWN CHAN MINIFRINT "TYPE","SPEED","CARGO SPACE","PROTECTION" INNI 13 COUT,"10X","16","1" MINI 2 CRUISER","4X","24","2" MINI 3 BATTLESHIP","2X","30","5" 1390 PRINT "CHANGE TO BE EFFECTED";:INPUT S2 1970 Z=200 1400 IF (S1+S2)>S0 THEN 2550 1980 GOTO 1430 1410 S1=S1+S2 1990 N1=N1+N 1420 GOTO 1180 2000 GOTO 1130 MINI:PRINT "SPEED IS GIVEN RELATIVE TO THE OTHER SHIPS." 1430 F0=P1\*(Z/R)^1.5 2010 C1=4 WHINT "CARGO SPACE IS IN UNITS OF SPACE ABOARD SHIP WHICH CAN BE" 1440 REM 2020 GOTO 1060 WPRINT "FILLED WITH WEAPONS." 1450 D0=(2\*F0+3\*F0\*RND(0))/5 2030 P1=20 WHINT "PROTECTION IS THE RELATIVE STRENGTH OF THE SHIP'S ARMOR" 1460 D=D+D0 2040 IF N2=0 THEN 2640 WRINT "AND FORCE FIELDS." 1470 PRINT "SCANNERS REPORT ENEMY DAMAGE NOW:";D 2050 N2=N2-1 MAINT:PRINT "ONCE A SHIP HAS BEEN SELECTED, YOU WILL BE INSTRUCTED T 1480 IF D>99 THEN 2720 2060 Z=500 1 lak 1490 GOTO 1510 2070 GOTO 1430 WINT "IT WITH WEAPONRY FROM THE FOLLOWING LIST:" 1500 D0=0 2080 N2=N2+N IN PRINT 1510 REM 2090 GOTO 1130 O PRINT "TYPE CARGO SPACE REL. STRENGTH" 1520 K=E1+E2\*RND(0) 2100 C1=4 PRINT "1 PHASER BANKS 12 4" 1530 REM 2110 GOTO 1060 20" O PRINT "2 ANTI-MATTER MISSILE 4 1540 E=E3+E4\*RND(0)+5/P0\*RND(0) 2120 P1=16 O FRINT "3 HYPERSPACE LANCE 16" 2130 IF N3=0 THEN 2660 4 1550 REM IN FRINT "4 PHOTON TORPEDO 10" 2 1560 F3=E\*(K/R)^1.85 2140 N3=N3-1 6" W PRINT "5 HYPERON NEUTRALIZATION FIELD 20 1570 D2=(3\*F3+3\*F3\*RND(0))/5.5 2150 Z=550 MINT:PRINT "WEAPONS #1 & #5 CAN BE FIRED 100 TIMES EACH; ALL OTHERS 1580 D1=D1+D2 2160 GOTO 1430 1590 IF (Z\*D0)/(R\*500)>2.2 THEN 1620 38 2170 N3=N3+N W FRINT "BE FIRED ONCE FOR EACH ON BOARD." 1600 D3=D0\*2/(R^2\*P0) 2180 GOTO 1130 WRINT "A TYPICAL LOAD FOR A CRUISER MIGHT CONSIST OF:" 1610 D1=D1+D3 2190 C1=2 1620 PRINT "DAMAGE CONTROL REPORTS YOUR VESSEL > H PRINT H 1-#1 PHASER BANK = 12" 2200 GOTO 1060 PRINT " 2-#3 HYPERSPACE LANCES = 8" 1630 IF D1>99 THEN 2740 2210 P1=10 S DAMAGE AT:";D1 D PRINT " 2-#4 PHOTON TORPEDOES = 4" 1640 IF D>99 THEN 2760 2220 IF N4=0 THEN 2680 HO PRINT " 1650 GOTO 1300 2230 N4=N4-1 SAU PRINT " 24 UNITS OF CARGO" 1660 PRINT "SELF DESTRUCT FAILSAFE ACTIVATED!!" 2240 Z=400 M MINT " A WORD OF CAUTION: FIRING HIGH YIELD WEAPONS AT CLOSE (<100) 1670 PRINT "INPUT 1 TO RELEASE FAILSAFE"; : INPUT U 2250 GOTO 1430 1680 IF U=1 THEN 1700 2260 N4=N4+N 1690 GOTO 1290 W FRINT "RANGE CAN BE DANGEROUS TO YOUR SHIP AND MINIMAL DAMAGE CAN" 2270 GOTO 1130 W HINT "OCCUR AS FAR OUT AS 200 IN SOME CIRCUMSTANCES." 1700 PRINT "SELF DESTRUCT ACCOMPLISHED" 2280 C1=.20 " PRINT: PRINT "RANGE IS GIVEN IN THOUSANDS OF KILOMETERS." 1710 IF R>60 THEN 1740 2290 N=100 IN SOTO 640 1720 PRINT "ENEMY VESSEL ALSO DESTROYED" 2300 GDTO 1060 IN PRINT "DO YOU WISH A MANUEVER CHART"; : INPUT MS 1730 GOTO 2760 2310 P1=6 IN IF HS="NO" THEN 770 1740 D4=3200/R 2320 IF N5=0 THEN 2700 HO PRINT " \*\*\*\*\*\*\*\*\*\*\*\*\* 1750 D=D+D4 2330 N5=N5-1 150 PRINT " MANUEVER CHART":PRINT 1760 IF D>99 THEN 1720 2340 Z=250 EN PRINT " 1 FIRE PHASERS" 1770 PRINT "ENENY VESSEL SURVIVES WITH";D;"DAMAGE" 2350 GOTO 1430 HO PRINT " 2 FIRE ANTI-MATTER MISSILE" 1780 GOTO 2760 2360 N5=N5+N HO PRINT " 3 FIRE HYPERSPACE LANCE" 1790 50=10 2370 GOTO 1130 NO PRINT " 4 FIRE PHOTON TORPEDO" 1800 CO=16 2380 E1=150 710 PRINT " 5 ACTIVE HYPERON NEUTRALIZATION FIELD" 1810 P0=1 2390 E2=500 720 PRINT " 6 SELF-DESTRUCT" 1820 GOTO 970 2400 E3=3 730 PRINT " 7 CHANGE VELOCITY" 1830 50=4 2410 E4=4 740 PRINT " 8 DISENGAGE" 1840 C0=24 2420 GOTO 850 750 PRINT " 9 PROCEED" 1850 P0=2 2430 E1=200 TO PRINT: PRINT "YOU HAVE A CHOICE OF THREE SYSTEMS TO PATROL." 1860 GOTO 970 2440 E2=350 780 PRINT "1 ORION" 2450 E3=4 HO PRINT "2 DENEB" 2460 E4=3 HO PRINT "3 ARCTURUS" 2470 GOTO 850 HI PRINT "SELECT A SYSTEM(1-3)";: INPUT S9 2480 E1=150 110 IF S9=1 THEN 2380 2530 PRINT "NOT ENOUGH SPACE. RESELECT" 2490 E2=400 10 IF S9=2 THEN 2430 2540 GOTO 980 2500 E3=5 840 SOTO 2480 2550 PRINT "CHANGE BEYOND MAXIMUM POSSIBLE" 2510 E4=2 850 00=0 2560 PRINT "INCREASING TO MAXIMUM" 2520 GOTO 850 80 D1=0 2570 S1=50 870 M1=0 2580 GOTO 1300 880 N2=0 2590 PRINT "OUT OF SENSOR RANGE. AAUTOMATIC DISENGAGE." 810 H3=0 2600 GOTO 2760 2610 PRINT "PHASER BANKS DRAINED" 2620 PRINT "SELECT ANOTHER COURSE OF ACTION" 900 H4=0 910 D=0 IN PRINT "WHICH SPACECRAFT WOULD YOU LIKE(1-3)";:INPUT S 2630 GOTO 1200 410 ON S GOTO 1790,1830,1870 2640 PRINT " ALL ANTI-MATTER MISSLES EXPENDED" 940 SOTO 920 2650 GOTO 2620 970 C=CO 2660 PRINT "ALL HYPERSPACE LANCES EXPENDED" NO PRINT "YOU HAVE ";C; "UNITS OF CARGO SPACE TO FILL WITH WEAPONRY." 2670 GOTO 2620 THO PRINT "CHOOSE A WEAPON AND THE AMOUNT YOU WISH.";: INPUT W,N 2680 PRINT "ALL PHOTON TORPEDO TUBES EMPTY" 1000 DH & GOTO 1910,2010,2100,2190,2280 2690 GOTO 2620 1050 GOTO 980 2700 PRINT "HYPERON NEUTRALIZATION FIELD DRAINED" 1060 IF N+C1>C THEN 2530 2710 GOTO 2620 1070 C=C-N+C1 2720 PRINT "ENEMY VESSEL DESTROYED" 1880 DN & GOTO 1990,2080,2170,2260 2730 GOTO 1510 2740 PRINT "YOUR VESSEL HAS BEEN DESTROYED" 2760 PRINT "ANOTHER BATTLE";:INPUT R\$ 1120 GOTO 2360 1130 IF C>1 THEN 980 1140 REM 2770 IF R\$="YES" THEN 810 1150 S1=S0#RND(0) 2780 PRINT "TRY AGAIN LATER!" 1160 R=(3+RND(0)+5)+100 2790 END 1180 PRINT: PRINT "RANGE TO TARGET:";R OK

47





RUN

DEFUSE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU ARE IN A GOVERNMENT EXPERIMENTAL BUILDING WITH 1,000,000 ROOMS IN IT. THE BUILDING IS 100 ROOMS LONG(0-99), 100 ROOMS WIDE(0-99), AND 100 ROOMS HIGH(0-99).

IN IT A BONB IS HIDDEN. THE BONB SENDS OUT SIGNALS THAT GET STRONGER AS YOU GET CLOSER. YOU HAVE 200 SECONDS TO DEACTIVATE IT.

| SIGNAL  |   |  |  |  |
|---|---|--|--|--|
| SIDHHL  | LW  | н  | SEC.   | COORDINATES(L, U, H)   |
| 1454.99   | 0 0   | 0  | 0  | 7 90,90,90   |
| 9454.11   | 90 90   | 90   | 10   | 7 80,80,90   |
| 9464.21   | 80 80   | 90   | 20   | 7 80,80,80   |
| 9535.79   | 80 80   | 80   | 30   | ? 80,80,70   |
| 8535.79   | 80 80   | 70   | 40   | 7 80,80,85   |
| 9964.21   | 80 80   | 85   | 50   | 7 80,80,86   |
| 9864.21   | 80 80   | 86   | 60   | ? 80,80,84   |
| 9935.79   | 80 80   | 84   | 70   | * 80,70,85   |
| 9974.21   | 80 70   | 85   | 80   | 7 80,60,85   |
| 9984.21   | 80 60   | 85   | 90   | ? 80,50,85   |
| 9994.21   | 80 50   | 85   | 100  | 7 80,45,85   |
| 9999.21   | 80 45   | 85   | 110  | ? 80,40,85   |
| 9995.79   | 80 40   |  | 120  | ? 70,45,85   |
| 9999.31   | 70 45   |  | 130  | ? 40,45,85   |
| 9999.61   | 40 45   |  | 140  | ? 30,45,85   |
| 9999.71   | 30 45   |  | 150  | ? 20,45,85   |
| 9999.81   | 20 45   |  | 160  | 7 0,45,85  |
| 9999.99   | 0 45  |  | 170  | ? 1,45,85  |
| BONB DEACTIV  |   |  |  | ,,   |
| WANT TO PLAY  |   |  |  |  |
|   |   |  |  |  |
| SIGNAL  | LU  | н  | SEC.   | COORDINATES(L,W,H)   |
| 4969.04   | 0 0   | 0  | 0  | 7 0,0,50   |
| 9969.04   | 0 0   | 50   | 10   | 7 0.0.60   |
| 1101.04   | 0 0   |  |  |  |
| 9030.96   | 0 0   | 60   | 20   |  |
|   |   | 60<br>40   | 20<br>30   | ? 0,0,40<br>? 0,0,70   |
| 9030.96   | 0 0   |  |  | ? 0,0,40<br>? 0,0,70   |
| 9030.96<br>8969.04  | 0 0 0   | 40<br>70   | 30   | ? 0,0,40   |
| 9030.96<br>8969.04<br>8030.96   | 0 0<br>0 0<br>0 0   | 40<br>70<br>60   | 30<br>40   | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 0,90,60   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96  | 0 0<br>0 0<br>0 0<br>0 50   | 40<br>70<br>60   | 30<br>40<br>50   | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 50,0,60  |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96   | 0 0<br>0 0<br>0 0<br>0 50<br>0 90   | 40<br>70<br>60<br>60<br>60   | 30<br>40<br>50<br>60   | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 0,90,60<br>? 50,0,60<br>? 0,10,60   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46  | 0 0<br>0 0<br>0 50<br>0 50<br>0 90<br>50 0  | 40<br>70<br>60<br>60<br>60   | 30<br>40<br>50<br>60<br>70   | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,70,60<br>7 50,0,60<br>7 0,10,60<br>7 1,0,60   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9020.96<br>9030.95  | 0 0<br>0 0<br>0 50<br>0 90<br>50 0<br>0 10  | 40<br>70<br>60<br>60<br>60   | 30<br>40<br>50<br>60<br>70<br>80<br>90   | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 50,0,60<br>7 0,10,60<br>7 1,0,60<br>7 1,0,60<br>7 1,0,50   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9020.96   | 0 0<br>0 0<br>0 50<br>0 90<br>50 0<br>0 10<br>1 0   | 40<br>70<br>60<br>60<br>60<br>60   | 30<br>40<br>50<br>60<br>70<br>80   | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 50,0,60<br>? 50,0,60<br>? 0,10,60<br>? 1,0,60<br>? 1,0,50<br>? 10,0,50  |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9030.95<br>9969.05<br>9969.14   | 0 0<br>0 0<br>0 50<br>0 90<br>50 0<br>1 0<br>1 0<br>1 0   | 40<br>70<br>60<br>60<br>60<br>60<br>60<br>60<br>50<br>50   | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110   | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 50,0,60<br>? 50,0,60<br>? 0,10,60<br>? 1,0,60<br>? 1,0,50<br>? 10,0,50<br>? 30,0,50   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9020.96<br>9020.95<br>9969.05<br>9969.14<br>9969.34   | 0 0<br>0 0<br>0 50<br>0 90<br>50 0<br>1 0<br>1 0<br>10 0<br>30 0  | 40<br>70<br>60<br>60<br>60<br>60<br>50<br>50<br>50   | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120                                    | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 50,0,60<br>7 0,10,60<br>7 1,0,60<br>7 1,0,50<br>7 10,0,50<br>7 30,0,50<br>7 50,50,50   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9020.96<br>9030.95<br>9969.05<br>9969.14<br>9969.34<br>9980.46                                  | 0 0<br>0 0<br>0 50<br>0 90<br>50 0<br>1 0<br>1 0<br>1 0<br>1 0<br>50 50   | 40<br>70<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50   | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130                             | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 0,10,60<br>7 1,0,60<br>7 1,0,50<br>7 10,0,50<br>7 30,0,50<br>7 50,50,50<br>7 60,50,50  |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8980.96<br>8940.96<br>9030.46<br>9030.95<br>9930.95<br>9969.14<br>9969.36<br>9980.46                                  | 0 0<br>0 0<br>0 50<br>0 50<br>0 10<br>1 0<br>1 0<br>1 0<br>10 0<br>30 0<br>50 50<br>50 50<br>50 50  | 40<br>70<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50<br>50   | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130<br>140                      | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 50,0,60<br>? 50,0,60<br>? 0,10,60<br>? 1,0,60<br>? 1,0,50<br>? 10,0,50<br>? 30,0,50<br>? 50,50,50<br>? 50,50,50<br>? 50,60,50   |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>8940.96<br>9030.46<br>9030.95<br>9969.05<br>9969.05<br>9969.34<br>9980.46<br>9980.36<br>9970.46                       | 0 0 0<br>0 0 0<br>0 50<br>0 70<br>50 0<br>1 0<br>1 0<br>1 0<br>30 0<br>50 50<br>50 60   | 40<br>70<br>60<br>60<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50<br>50<br>50                         | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130<br>140<br>150               | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 50,0,60<br>7 1,0,60<br>7 1,0,50<br>7 10,0,50<br>7 30,0,50<br>7 50,50,50<br>7 50,50,50<br>7 55,50,50  |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>9030.46<br>9030.96<br>9030.95<br>9969.05<br>9969.05<br>9969.34<br>9980.46<br>9980.36<br>9970.46                       | 0 0 0<br>0 0 0<br>0 50 0<br>0 10<br>1 0<br>10 0<br>30 0<br>50 50<br>60 50<br>60 50<br>50 50 | 40<br>70<br>60<br>60<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50             | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130<br>140<br>150<br>160        | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 0,90,60<br>? 50,0,60<br>? 1,0,60<br>? 1,0,60<br>? 1,0,50<br>? 10,0,50<br>? 30,0,50<br>? 30,0,50<br>? 50,50,50<br>? 50,60,50<br>? 50,60,50<br>? 51,49,49               |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>9030.46<br>9020.96<br>9030.95<br>9969.14<br>9969.34<br>9980.46<br>9980.36<br>9970.46<br>9980.41<br>9980.41<br>9980.41 | 0 0 0<br>0 0 0<br>0 50 0<br>0 10<br>1 0<br>1 0<br>10 0<br>30 0<br>50 50<br>40 50<br>51 49   | 40<br>70<br>60<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50 | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130<br>140<br>150<br>160<br>170 | 7 0,0,40<br>7 0,0,70<br>7 0,50,60<br>7 0,90,60<br>7 0,10,60<br>7 1,0,60<br>7 1,0,60<br>7 1,0,50<br>7 10,0,50<br>7 30,0,50<br>7 30,0,50<br>7 50,50,50<br>7 50,50,50<br>7 55,50,50<br>7 51,49,49<br>7 50,55,50 |
| 9030.96<br>8969.04<br>8030.96<br>8980.96<br>9030.46<br>9030.46<br>9020.96<br>9030.95<br>9969.05<br>9969.14<br>9980.46<br>9980.36<br>9970.46                       | 0 0 0<br>0 0 0<br>0 50 0<br>0 10<br>1 0<br>10 0<br>30 0<br>50 50<br>60 50<br>60 50<br>50 50 | 40<br>70<br>60<br>60<br>60<br>60<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50<br>50             | 30<br>40<br>50<br>60<br>70<br>80<br>90<br>100<br>110<br>120<br>130<br>140<br>150<br>160        | ? 0,0,40<br>? 0,0,70<br>? 0,50,60<br>? 50,0,60<br>? 50,0,60<br>? 1,0,60<br>? 1,0,60<br>? 1,0,50<br>? 10,0,50<br>? 30,0,50<br>? 50,50,50<br>? 50,50,50<br>? 50,60,50<br>? 51,49,49                            |

YOU BLEW IT. THE BUILDING BLEW UP.

THE BUND WAS LOCATED AT THE COORDINATES(L, W, H): 16 30 30

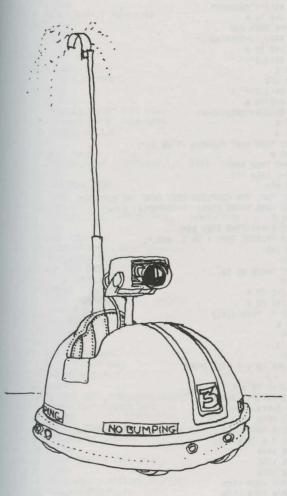
In this game, you are in an experimental building with one million rooms in it. The building is one hundred rooms long, one hundred rooms wide, and one hundred rooms high.

You have just received a telephone call from a mad bomber who tells you he has planted a bomb someplace in the building. Fortunately you are armed with a bomb detector that registers a stronger and stronger signal as you get closer to the bomb. You start at the bottom right-hand door of the building, at the room 0,0,0. In response to the signals from your detector, every ten seconds you may try a new room to search for the bomb. You have two hundred seconds or twenty trials to find it.

It's fairly easy to find the bomb once you get the knack of how your detector works. However, we're not going to spoil it for you and tell the secret.

LIST 1 PRINT TAB(26):"DEFUSE" 2 PRINT TAB(20); "CREATIVE COMPUTING" 3 PRINT TAB(18); "MORRISTOWN, NEW JERSEY" 4 PRINT: PRINT: PRINT 10 PRINT "YOU ARE IN A GOVERNMENT EXPERIMENTAL BUILDING WITH" 20 PRINT "1,000,000 ROOMS IN IT. THE BUILDING IS 100 ROOMS 30 PRINT "LONG(0-99), 100 ROOMS WIDE(0-99), AND 100 ROOMS HIGH(0-9 40 PRINT:PRINT "IN IT A BOMB IS HIDDEN. THE BOMB SENDS OUT SIGNALS 50 PRINT "GET STRONGER AS YOU GET CLOSER. YOU HAVE 200 SECONDS" 60 PRINT "TO DEACTIVATE IT. 70 PRINT:A=INT(100\*RND(1)):B=INT(100\*RND(1)) 80 C=INT(100\*RND(1)):IF A>0 THEN 90 85 IF 8>0 THEN 90 87 IF C=0 THEN 80 90 D=0:E=0:F=0:G=0 100 PRINT "SIGNAL";TAB(15);"L";TAB(20);"U";TAB(25);"H"; 105 PRINT TAB(35);"SEC.";TAB(50);"COORDINATES(L,U,H)" 110 PRINT 10000-ABS((A/100+B+C\*100)-(D/100+E+F\*100)): 112 PRINT TAB(14); D; TAB(19); E; TAB(24); F; TAB(35); G; TAB(50); 120 INPUT D.E.F:G=6+10:IF A<>D THEN 130 125 IF B<>E THEN 130 127 IF C=F THEN 170 130 IF 6=200 THEN 140 135 GOTO 180 140 PRINT "BOODOOOMMM!!!!":PRINT "YOU BLEW IT. THE BUILDING BLEW 145 PRINT "THE BONB WAS LOCATED AT THE COORDINATES(L,W,H):";A;B;CH 150 PRINT "WANT TO PLAY AGAIN"; 160 INPUT Z\$:IF LEFT\$(Z\$,1)="Y" THEN 70 165 GOTO 999 170 PRINT "BOMB DEACTIVATED AT";G;" SECONDS!!!":GOTO 150 180 IF D>99 THEN 200 183 IF DCO THEN 200 185 IF E>99 THEN 200 187 IF E<0 THEN 200 190 IF F>99 THEN 220 195 IF F(0 THEN 230 197 GOTO 110 200 PRINT "YOU WALKED OUT A WINDOW ON THE" :: IF F<4 THEN 240 205 PRINT F;"TH FLOOR !!!" 210 PRINT "YOU WERE KILLED AND"; 200-6;" SECONDS LATER THE BUILDIN 215 PRINT "BLEW UP!!!":GOTO 150 220 PRINT "YOU ARE NOW"; F\*9;" FEET IN THE AIR!!!": GOTO 210 230 PRINT "YOU ARE NOW";-1\*(F\*9)"FEET UNDERGROUND!!!":60T0 210 240 DN F GOTO 250,260,270 250 PRINT \* 1ST FLOOR!!!\*:60T0 210 260 PRINT \* 2ND FLOOR!!!\*:60T0 210 270 PRINT \* 3RD FLOOR!!!\*:60T0 210 999 END Ok

### Dodgem



DODGEM is a game originally devised in 1972 by Colin Vout, then a student at the University of Cambridge, England. It got its major publicity from Martin Gardner who discussed it in the June 1975 issue of Scientific American. Complete instructions are in the sample run.

It may be played by two players in which case the computer is the referee, or by one player against the computer. The computer, incidentally, plays uncommonly well. This is not surprising since Dodgem was written by the very talented and prolific Mac Oglesby.

RUN

DODGEM CREATIVE COMPUTING MORRISTOWN NEW JERSEY

DO YOU WANT INSTRUCTIONS FOR DODGEN? Y

HERE'S A SAMPLE PLAYING BOARD:

. . . . 2 4 . . A B C D

TWO SETS OF PIECES (DIGITS AND LETTERS) RACE AT RIGHT ANGLES ACROSS A SQUARE BOARD. VACANT LOCATIONS ARE SHOWN AS PERIODS. YOU CHOOSE THE THE BOARD SIZE (THE ONE ABOVE IS SIZE 5.) N

W---E z S

THE OBJECT IS TO MOVE ALL OF YOUR PIECES ACROSS THE BOARD AND OFF THE OPPOSITE EDGE. DIGITS LEAVE THE BOARD ONLY AT THE EASTERN EDGE; LETTERS ONLY AT THE NORTHERN. THE WINNER IS THE PLAYER WHOSE PIECES HAVE ALL LEFT THE BOARD.

THE PLAYERS OD IN TURN, NOVING ONE OF THEIR PIECES TO AN ADJACENT LOCATON WHICH IS EITHER OFF THE BOARD OF CURRENTLY VACANT. THERE ARE NO DIAGONAL MOVES, NO JUMPS AND NO CAPTURES. DIGITS CANNOT MOVE WEST, NOR LETTERS MOVE SOUTH.

TO MOVE A PIECE, TYPE ITS NAME AND THE FIRST LETTER OF THE DESIRED DIRECTION. EXAMPLES: 2E MEANS THAT PIECE 2 WANTS TO GO EAST BU MEANS THAT PIECE B WANTS TO SO WEST.

NOTE: YOU FORFET THE GAME IF YOUR MOVE LEAVES YOUR OPPONENT WITHOUT ANY LEGAL MOVE.

LASTLY, YOU MAY TYPE R TO RESIGN AND H FOR HELP.

BOARD SIZE (3-6)? 4 HOW MANY PLAYERS (1 DR 2)? 1 OK, THE COMPUTER WILL MOVE THE DIGITS. WHO MOVES FIRST (1=COMPUTER, 2=YOU)? 2

HERE WE 60 .... .

. .

1

2 . . . 3 BC A LETTERS HOVE? CN THE DIGITS MOVE: 1E 1 . . 2 . . 3 C . B A . . LETTERS MOVE? AN THE DIGITS MOVE: 1E . 1 . 2 2 . 3 A . C B . . . LETTERS HOVE? CN' THE DIGITS MOVE: 1E 1 . . 2 . . 3 A . . . B 2 . C .

LETTERS HOVE? CN ILLEGAL MOVE OR BAD INPUT. INPUT IGNORED. TYPE H FOR HELP. LETTERS MOVE? H THE LETTERS HAVE THESE LEGAL MOVES: AN AE BN BE BW CW LETTERS MOVE? BN THE DIGITS MOVE: 1E 2 . . C 3 A B . LETTERS MOVE? ANE THE DIGITS MOVE: 3E 2 A . C . 3 B . . LETTERS MOVE? CN THE DIGITS MOVE: 2N 2 . . C . A -. . 3 B . LETTERS MOVE? AN THE DIGITS MOVE: 25 . A . C 2 . . 3 B . . . . . LETTERS MOVE? CN THE DIGITS MOVE: 2E A . . . . 2 . 3 B . . . . LETTERS MOVE? BN THE DIGITS MOVE: 3E . A . 2 B . . . 3 . LETTERS MOVE? AN THE DIGITS MOVE: 3E . 2 B . . 3 . . . . . LETTERS MOVE? BN THE DIGITS MOVE: 3E . . B . . 2 . . . LETTERS MOVE? BN \*\*\* THE LETTERS WIN!!! OK 10 PRINT TAB(24);"DODGEN" 20 PRINT TAB(18); "CREATIVE COMPUTING" 30 PRINT TAB(16); "MORRISTOWN NEW JERSEY" 40 PRINT:PRINT:PRINT 240 PRINT "DO YOU WANT INSTRUCTIONS FOR DODGEN"; 250 INPUT AS 260 GOSUB 2950 270 IF LEFT\$(A\$,1) <> "Y" THEN 290 280 GOSUB 3130 290 PRINT "BOARD SIZE (3-6)"; 300 INPUT A 310 LET A=INT(A) 320 IF (6-A)\*(A-3) >= 0 THEN 340

LIST

330 GOTO 290

340 LET P(1,0)=A-1:LET P(2,0)=A-1 380 FOR J=1 TO A-1 390 LET P(1, J)=10\*J+1 400 NEXT J 420 FOR J=1 TO A-1 430 LET P(2, J)=10\*A+J+1 440 NEXT J 460 LET F=1 470 LET M\$(1)="NES" 480 LET M\$(2)="NE W" 490 LET C\$(1)="DIGITS" 500 LET C\$(2)="LETTERS" 510 LET A\$(1)="1234567" 520 LET A\$(2)="ABCDEFG" 560 FOR J=1 TO A 570 IF J=A THEN 630 580 LET D\$(J,1)=CHR\$(48+J) 590 FOR K=2 TO A 600 LET D\$(J.K)="." 610 NEXT K 620 GOTO 670 630 LET D\$(J,1)="." 640 FOR K=2 TO A 650 LET D\$(J,K)=CHR\$(63+K) 660 NEXT K 670 NEXT J 690 PRINT "HOW MANY PLAYERS (1 OR 2)"; 700 INPUT B 710 IF B=2 THEN 800 720 IF B=1 THEN 740 730 GOTO 690 740 PRINT "OK, THE COMPUTER WILL MOVE THE DIGITS." 750 PRINT "WHO MOVES FIRST (1=COMPUTER, 2=YOU)"; 760 INPUT F 770 IF (2-F)\*(1-F)=0 THEN 800 780 PRINT "PLEASE TYPE 1 OR 2. NOW,"; 790 GOTO 750 800 PRINT 810 PRINT "HERE WE GO .... " 840 PRINT 850 FOR J=1 TO A 860 FOR K=1 TO A 870 PRINT " ";D\$(J,K); 880 NEXT K 890 PRINT 900 NEXT J 910 PRINT 950 FOR J=F TO 3-F STEP 3-2\*F 960 REM 980 FOR J1=1 TO A-1 990 LET R=INT(P(J,J1)/10) 1000 LET C=P(J, J1)-10\*R 1020 DN J GOTO 1040,1100 1040 IF C=A THEN 1080 1050 IF C > A THEN 1070 1060 GOTO 1160 1070 GOTO 1250 1080 GOTO 1300 1100 IF R=1 THEN 1140 1110 IF R=0 THEN 1130 1120 GOTO 1160 1130 GOTO 1250 1140 GOTO 1300 1160 REM 1165 IF D\$(R-1,C)="." THEN 1240 1170 IF D\$(R,C+1)="." THEN 1240 1180 IF J=2 THEN 1220 1190 IF D\$(R+1,C)="." THEN 1210 1200 GOTO 1250 1210 GOTO 1300 1220 IF D\$(R,C-1)="." THEN 1240 1230 BOTO 1250 1240 GOTO 1300 1245 PRINT "BBS---1245". J1 1250 NEXT J1 1260 PRINT "THE ";C\$(3-J);" HAVE NO LEGAL MOVES FOR THE ";C\$(J);" 1270 PRINT "THE ";C\$(J);" WIN!!!" 1280 STOP 1300 IF B=2 THEN 1750 1310 IF J=2 THEN 1750 1340 LET L1=2 1350 FOR LO=1 TO 3 1370 ON LO GOTO 1450,1380,1430 1380 IF RND(1) < .5 THEN 1410 1390 LET L1=1 1400 GOTO 1450 1410 LET L1=3 1420 GOTO 1450 1430 LET L1=4-L1 1450 LET P1=INT(RND(1)\*A) 1460 FOR L2=1 TO A-1 1470 LET P1=P1+1

```
1480 IF P1 <= A-1 THEN 1500
 1490 LET P1=P1-(A-1)
 1500 LET R=INT(P(J,P1)/10)
 1510 LET C=P(J,P1)-10*R
 1520 IF C > A THEN 1720
1540 ON L1 GOTD 1570,1620,1690
1570 IF D$(R-1,C)="." THEN 1590
1580 GOTO 1720
1590 GOTO 2090
1620 IF D$(R,C+1)="." THEN 1660
1630 IF C=A THEN 1650
1640 GOTO 1720
1650 LET P(J,0)=P(J,0)-1
1660 GOTO 2160
1690 IF D$(R+1,C)="." THEN 1710
1700 GOTO 1720
1710 GOTO 2230
1720 NEXT L2
1730 NEXT LO
1740 GOTO 1260
1750 PRINT C$(J);" MOVE":
1760 INPUT AS
1770 GOSUB 2950
1790 IF LEFT$(A$,1)="R" THEN 2860
1800 IF LEFT$(A$,1)="H" THEN 2460
1810 LET AS=MID$(A$,1,2)
1811 P1=0
1813 FOR BO=1 TO A-1
1815 IF HID$(A$(J), B0, 1)=HID$(A$, 1, 1) THEN P1=B0
1817 NEXT BO
1830 IF P1=0 THEN 2430
1832 LET P2=0
1834 FOR BO=1 TO 4
1836 IF MID$(M$(J), BO, 1)=MID$(A$, 2, 1) THEN P2=B0
1838 NEXT BO
1850 IF P2=0 THEN 2430
1860 LET R=INT(P(J,P1)/10)
1870 LET C=P(J,P1)-10*R
1880 IF R=0 THEN 2430
1890 IF C > A THEN 2430
1910 DN J GOTO 1930, 1990
1930 IF C < A THEN 1970
1940 IF P2 <> 2 THEN 1970
1950 LET P(1,0)=P(1,0)-1
1960 GOTO 2160
1970 GOTO 2040
1990 IF R > 1 THEN 2040
2000 IF P2 <> 1 THEN 2040
2010 LET P(2,0)=P(2,0)-1
2020 GOTO 2090
2040 ON P2 GOTO 2070,2140,2210,2280
2070 IF D$(R-1,C)="." THEN 2090
2080 GOTO 2430
2090 LET D$(R-1,C)=MID$(A$(J),P1,1)
2100 LET P(J,P1)=P(J,P1)-10
2110 GOTO 2330
2140 IF D$(R,C+1)="." THEN 2160
2150 GOTO 2430
2160 LET D$(R,C+1) = HID$(A$(J),P1.1)
2170 LET P(J,P1)=P(J,P1)+1
2180 GOTO 2330
2210 IF D$(R+1,C)="." THEN 2230
2220 GOTO 2430
2230 LET D$(R+1,C)=HID$(A$(J) ,P1,1)
2240 LET P(J,P1)=P(J,P1)+10
2250 GOTO 2330
2280 IF D$(R,C-1)="." THEN 2300
2290 GOTO 2430
2300 LET D$(R,C-1)=MID$(A$(J),P1,1)
2310 LET P(J,P1)=P(J,P1)-1
2330 LET D$(R,C)="."
2340 IF B=2 THEN 2380
2350 IF J=2 THEN 2380
2360 PRINT "THE DIGITS MOVE: ";MID$(A$(J),P1,1);
2365 PRINT MID$(M$(J),L1,1)
2380 IF P(J,0) <> 0 THEN 2420
2390 PRINT
2400 PRINT "*** THE ";C$(J);" WIN!!!"
2410 END
2420 6010 2900
2430 PRINT "ILLEGAL MOVE OR BAD INPUT."
2440 PRINT "INPUT IGNORED. TYPE H FOR HELP."
2450 GOTO 1750
2460 PRINT "THE ";C$(J);" HAVE THESE LEGAL MOVES:"
2480 FOR J3=1 TO A-1
2490 LET P$=HID$(A$(J), J3, 1)
2500 LET R=INT(P(J, J3)/10)
2510 LET C=P(J,J3)-10*R
2530 DN J GOTO 2550,2620
2550 IF C=A THEN 2590
2560 IF C > A THEN 2580
2570 GOTO 2690
```

```
2580 GOTO 2830
2590 PRINT "
2590 PRINT " ";P$;"E";
2600 GOTO 2690
2620 IF R=1 THEN 2660
2630 IF R=0 THEN 2650
2640 GOTO 2690
2650 GOTO 2830
2660 GDTD 2700
2690 IF D$(R-1,C) <> "." THEN 2730
2700 PRINT " ";P$;"N";
2730 IF D$(R,C+1) <> "." THEN 2770
2740 PRINT " ";P$;"E";
2770 IF J=2 THEN 2810
2780 IF D$(R+1,C) <> "." THEN 2800
2790 PRINT " ";P$;"S";
2800 GOTO 2830
2810 IF D$(R,C-1) <> "." THEN 2830
2820 PRINT "
               ";P$;"U";
2830 NEXT J3
2840 PRINT
2850 GOTO 1750
2860 PRINT "THE ";C$(J);" GIVE UP!!"
2870 PRINT "*** THE ";C$(3-J);" WIN!!!"
2880 END
2900 NEXT .1
2910 GOTO 840
2950 IF LEN(A$)>10 THEN 3090
2960 LET C1=0
2963 FOR BO=1 TO LEN(A$)
2965 LET A(B0)=ASC(MID$(A$,B0,1))
2970 NEXT BO
2975 LET A(0)=LEN(A$)
2980 FOR J2=1 TO A(0)
2990 IF A(J2)<96 THEN 3010
3000 LET A(J2)=A(J2)-32
3010 IF (57-A(J2))*(A(J2)-48) >= 0 THEN 3040
3020 IF (90-A(J2))*(A(J2)-65) >= 0 THEN 3040
3030 GOTO 3060
3040 LET C1=C1+1
3050 LET A(C1)=A(J2)
3060 NEXT J2
3070 LET A(0)=C1
3073 LET AS=""
3075 FOR BO=1 TO A(0)
3077 LET A$=A$+CHR$(A(BO))
3080 NEXT BO
3090 RETURN
3130 PRINT
3140 PRINT "HERE'S A SAMPLE PLAYING BOARD:"
3150 PRINT
3160 PRINT "1 . . . ."
3170 PRINT "2 . . . "
3180 PRINT "3 . . . ."
3190 PRINT "4 . .
3200 PRINT ". A B C D"
3210 PRINT
3220 PRINT "TWO SETS OF PIECES (DIGITS AND LETTERS) RACE AT RIGHT ANG";
3225 PRINT "LES"
3230 PRINT "ACROSS A SQUARE BOARD. VACANT LOCATIONS ARE SHOWN AS PERI";
3235 PRINT "ODS."
3240 PRINT "YOU CHOOSE THE THE BOARD SIZE (THE ONE ABOVE IS SIZE 5.)"
3260 PRINT " N"
3270 PRINT " :"
3280 PRINT "W---E"
3290 PRINT " :"
3300 PRINT "
               S"
3310 PRINT
3320 PRINT "THE OBJECT IS TO MOVE ALL OF YOUR PIECES ACROSS THE BOARD"
3330 PRINT "AND OFF THE OPPOSITE EDGE. DIGITS LEAVE THE BOARD ONLY AT"
3340 PRINT "THE EASTERN EDGE; LETTERS ONLY AT THE NORTHERN. THE WINNER"
3350 PRINT "IS THE PLAYER WHOSE PIECES HAVE ALL LEFT THE BOARD."
3360 PRINT
3370 PRINT "THE PLAYERS GO IN TURN, MOVING ONE OF THEIR PIECES TO AN"
3380 PRINT "ADJACENT LOCATON WHICH IS EITHER OFF THE BOARD OF CURRENT":
3385 PRINT "LY"
3390 PRINT "VACANT. THERE ARE NO DIAGONAL MOVES, NO JUMPS AND NO CAPT";
3395 PRINT "URES."
3400 PRINT "DIGITS CANNOT MOVE WEST, NOR LETTERS MOVE SOUTH."
3410 PRINT
3420 PRINT "TO HOVE A PIECE, TYPE ITS NAME AND THE FIRST LETTER OF THE"
3430 PRINT "DESIRED DIRECTION. EXAMPLES:"
3440 PRINT "
              2E MEANS THAT PIECE 2 WANTS TO GO EAST"
3450 PRINT " BW MEANS THAT PIECE B WANTS TO GO WEST."
3460 PRINT
3470 PRINT "NOTE: YOU FORFET THE GAME IF YOUR MOVE LEAVES YOUR OPPONENT
3480 PRINT "WITHOUT ANY LEGAL HOVE."
3490 PRINT
3500 PRINT "LASTLY, YOU MAY TYPE R TO RESIGN AND H FOR HELP."
3510 PRINT
3520 RETURN
3530 END
```

OK



In this cute little game, there are four doors in succession and you must open them to get the prize behind the last one. You have a key ring containing eleven keys numbered zero to ten (computer people have a different way of numbering things than normal people) and you have fourteen tries to open all four doors. As an added hooker, some keys may open more than one door. If at first you don't succeed, try, try again. The prizes behind the fourth door are well worth the patience in trying to get them all open.

Doors was conceived and written by Bill Ingram.

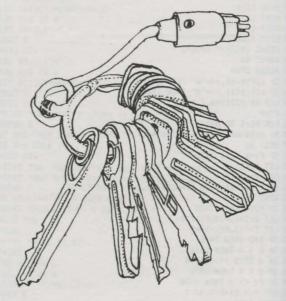
RUN

DOORS CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THERE ARE 4 LOCKED DOORS AND THERE ARE 11 KEYS(0- 10 ) YOU WILL HAVE 14 TRIES TO OPEN THEM ALL (Some Keys may open more than one door) TRIES LEFT # 14 DOOR # 1 KEY? 2 TRIES LEFT # 13 DOOR # 1 KEY? 3 TRIES LEFT # 12 DOOR # 1 KEY? 6 TRIES LEFT # 11 DOOR # 1 KEY? 0 WA LAH! TRIES LEFT # 10 DOOR # 2 KEY? 3 TRIES LEFT # 9 DOOR # 2 KEY? 2 TRIES LEFT # 8 DOOR # 2 KEY? 5 TRIES LEFT # 7 DOOR # 2 KEY? 7 TRIES LEFT # 6 BOOR # 2 KEY? 10 TRIES LEFT # 5 DOOR # 2 KEY? 9 TRIES LEFT # 4 DOOR # 2 KEY? 1 TRIES LEFT # 3 DOOR # 2 KEY? 2 DOOR # 2 KEY? 4 TRIES LEFT # 2 SURPRISE! TRIES LEFT # 1 DOOR # 3 KEY? 6 YOU LOSE, THE REST OF THE KEYS ARE: DOOR 3 KEY 8 DOOR 4 KEY 1 DO YOU WANT TO PLAY AGAIN(YES SIR! OR NO SIR!) ? YES SIR! THERE ARE 3 LOCKED DOORS AND THERE ARE 11 KEYS(0- 10 ) YOU WILL HAVE 9 TRIES TO OPEN THEM ALL (SOME KEYS MAY OPEN HORE THAN ONE DOOR) TRIES LEFT # 9 DOOR # 1 KEY? 1 TRIES LEFT # 8 DOOR # 1 KEY? O ABRACADABRA! TRIES LEFT # 7 DOOR # 2 KEY? 3 TRIES LEFT # 6 DOOR # 2 KEY? 4 TRIES LEFT # 5 DOOR # 2 KEY? 5 TRIES LEFT # 4 DOOR # 2 KEY? 8 TRIES LEFT # 3 DOOR # 2 KEY? 1 TRIES LEFT # 2 BOOR # 2 KEY? 2 TRIES LEFT # 1 DOOR # 2 KEY? 10 YOU LOSE, THE REST OF THE KEYS ARE: DOOR 2 KEY O DOOR 3 KEY 6 DO YOU WANT TO PLAY AGAIN(YES SIR! OR NO SIR!) ? NO SIR! OK

#### LIST

1 PRINTTAB(27)"DOORS" 2 PRINT TAB(20) "CREATIVE COMPUTING" 3 PRINT TAB(18) "MORRISTOWN, NEW JERSEY" 4 PRINT 5 PRINT 6 PRINT 25 DIM K(20) 30 DEF FNR(Z)=INT(Z\*RND(1)) 32 FOR X=0 TO 6:READ R\$(X):NEXT X 33 FOR X=0 TO 6: READ S\$(X):NEXT X 35 D=1:T=10+FNR(21):N=3+FNR(3):K3=8+FNR(5) 40 PRINT"THERE ARE";N;"LOCKED DOORS AND THERE ARE";K3;"KEYS(0-"K3-1") 41 PRINT"YOU WILL HAVE ";T-1;"TRIES TO OPEN THEH ALL' 42 PRINT" (SOME KEYS MAY OPEN MORE THAN ONE DOOR)" 65 FOR X=2 TO N:K(X)=FNR(K3):NEXT X 70 T=T-1:IF T=0 THEN 150 80 PRINT"TRIES LEFT #";T;" DOOR #";D;"KEY"; 90 INPUT K2 100 IF K2<>K(D) THEN 70 110 PRINT S\$(FNR(7)):D=D+1 120 IF D<N+1 THEN 70 125 PRINT 130 PRINT"YOU DID IT, BEHIND DOOR #";N;"IS...... 140 PRINT R\$(FNR(7)) "!!":GOTO 170 150 PRINT"YOU LOSE, THE REST OF THE KEYS ARE:" 160 FOR X=D TO N:PRINT"DOOR";X;"KEY"K(X):NEXT X 170 PRINT"DO YOU WANT TO PLAY AGAIN(YES SIR! OR NO SIR!) 171 INPUT QS 180 IF QS="YES SIR!" THEN 35 181 IF 0\$="NO SIR!" THEN 999 190 PRINT"HEY, I BIDN'T JUST FALL OFF A TURNIP TRUCK, YA KNOW!!!!! 200 GCTD 170 500 DATA"A POT OF GOLD", "A BEAUTIFUL MAIDEN", "A MAN EATING TIGER" 505 DATA"NOTHING", "\$22.59", "A ROLLS ROYCE", "THE KEYS TO THE WORLD" 600 DATA"DPEN SESAME!","C-R-E-E-E-E-A-A-K!","WA LAH!","TA-DAH!" 605 DATA"ABRACADABRA!","CLICK !!!!!!!?!???????!!!!!!!!!","SURPRISE!" 999 END OK



prac

DRAG allows the user to design his own dragster and then race it against a dragster designed by another player or the computer. You must specify the horsepower, rear end ratio, tire width, and tire diameter. There are no limits to these parameters.

Aha! you say. "I'll just design a two million horsepower dragster!" But it doesn't work that way, because your mass is related to your engine size, and so you usually end up with a top speed of something like 33 MPH. The computer is extremely hard to beat, but it's rumored that it can be done. Note: on some systems the amount of time between printouts can be aggravatingly long.

This program came from the Hewlett-Packard User Library. It also appeared in *Creative Computing*, Jan/Feb 1977.

RUN

DRAG CREATIVE COMPUTING MORRISTOWN NEW JERSEY

WELCOME TO DRAG STRIP. WOULD YOU LIKE THE INSTRUCTIONS ? YES YOU MAY RACE AGAINST ONE OF YOUR FRIENDS OR YOU MAY RACE AGAINST MY DRAGSTER. YOU WILL BE ASKED TO DESIGN YOUR OWN MACHINE, SPECIFYING HOURSEPOUER, READ END RATIO (X:1), TIRE WIDTH IN INCHES AND TIRE DIAMETER IN FEET. DO YOU WANT TO RACE AGAINST ME ? YES I WILL HAVE CAR H1. DESIGN CAR W2: HORSEPOWER=? 790 REAR END RATIO=? 4.5 TIRE WIDTH=? 22 TIRE DIAMETER=? 4

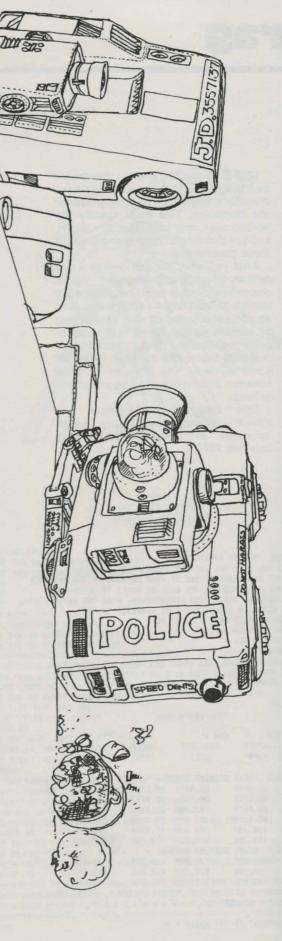
```
60!
```

| ELAPSI | ED      | CAR #1       |           | CAR #2   |
|--------|---------|--------------|-----------|----------|
| TIME   | SPEED   | DISTANCE     | SPEED     | DISTANCE |
| (SEC)  | (MPH)   | (FT)         | (MPH)     | (FT)     |
| CAR #  | 2 STOPS | BURNING RUBE | ER        |          |
| 1      | 22.0707 | 16.3821      | 19.5767   | 14.3695  |
| 2      | 43.5753 | 64.7926      | 39.9392   | 58.1071  |
| 3      | 64.0015 | 143.982      | 60.3405   | 131.846  |
| 4      | 82.9394 | 252.079      | 79.8184   | 234.947  |
| 5      | 100.107 | 386.668      | 97.4014   | 365.321  |
| 6      | 115.356 | 545.024      | 112.362   | 519.607  |
| CAR #  | 1 STOPS | BURNING RUBE | ER        |          |
| 7      | 128.639 | 724.299      | 124.389   | 693.674  |
| 8      | 139.186 | 921.158      | 133.582   | 883.247  |
| 9      | 146.922 | 1131.34      | 140.326   | 1084.43  |
| 9.86   | 047 1   | 51.811 13    | 20 144.58 | 1264.35  |
|        | WINN    | ER           |           |          |

DO YOU WANT TO TRY AGAIN ? NO OK

```
LIST
3 PRINT TAB(27);"DRAG"
5 PRINT TAB(20); "CREATIVE COMPUTING"
7 PRINT TAB(19); "MORRISTOWN NEW JERSEY"
10 DIM P(2), E(2), U(2), S(2), X(2), H(2), C(2), B(2), Y(2)
20 DIM Q(2)
30 PRINT:PRINT:PRINT
35 PRINT "WELCOME TO DRAG STRIP."
40 PRINT "WOULD YOU LIKE THE INSTRUCTIONS ":
50 INPUT IS
60 IF IS="NO" THEN 110
70 PRINT "YOU MAY RACE AGAINST ONE OF YOUR FRIENDS OR YOU MAY RACE"
80 PRINT "AGAINST HY DRAGSTER. YOU WILL BE ASKED TO DESIGN YOUR"
90 PRINT "OWN MACHINE, SPECIFYING HOURSEPOWER, READ END RATIO (x:1),"
100 PRINT "TIRE WIDTH IN INCHES AND TIRE DIAMETER IN FEET."
110 PRINT "DO YOU WANT TO RACE AGAINST ME ":
120 INPUT IS
130 IF IS="NO" THEN 200
140 PRINT "I WILL HAVE CAR #1."
150 P(1)=600
160 E(1)=5.9
170 ₩(1)=22
180 D(1)=3.9
190 GOTO 290
200 PRINT "DESIGN CAR #1:"
210 PRINT "HOURSPOWER=":
220 INPUT P(1)
230 PRINT "REAR END RATIO=":
240 INPUT E(1)
250 PRINT "TIRE WIDTH=":
260 INPUT W(1)
270 PRINT "TIRE DIAMETER=":
280 INPUT D(1)
290 PRINT "DESIGN CAR #2:"
300 PRINT "HORSEPOWER=";
310 INPUT P(2)
320 PRINT "REAR END RATIO=":
330 INPUT E(2)
340 PRINT "TIRE WIDTH=";
350 INPUT W(2)
360 PRINT "TIRE DIAMETER="; -
370 INPUT D(2)
380 PRINT
390 PRINT "GO!"
400 K1=500
410 K2=1.6
420 K3=2
430 K4=6E-04
440 K5=6E-05
450 K4= .2
460 K7=4
470 K8=1.5E-04
480 Q(1)=0:Q(2)=0
490 5(1)=0:5(2)=0
500 X(1)=0:X(2)=0
510 REM: M IS MASS
520 FDR J=1 TO 2
530 H(J)=(K1+K2*P(J)+K3*W(J)*D(J)+K7*D(J)*2)/32.2
540 REM: C IS DRAG FROM WIND.
550 C(J)=K4*M(J)*(2/3)+K8*W(J)*D(J)
560 REM: B IS THE MAX ACCELERATION WITHOUT BURNING
570 B(J)=15+28+W(J)+D(J)/((W(J)+6)+(D(J)+1))
580 REM: Y IS THE SCALE FACTOR FOR RPM VS POWER.
590 Y(J)=3.7-3.3E-03*P(J)
600 NEXT J
610 PRINT
620 PRINT
630 PRINT "ELAPSED ";TAB(15);"CAR #1";TAB(39);"CAR #2"
640 PRINT "TIME SPEED
650 PRINT "(SEC) (MPH)
                             DISTANCE
                                                          DISTANCE"
                                               SPEED
                                  (FT)
                                               (MPH)
                                                              (FT)"
660 PRINT
670 FOR T=0 TO 100
680 FOR T1=1 TO 100
690 FOR J=1 TO 2
700 REM: R IS RPM.
```

```
710 R=60*S(J)*E(J)/(3.1415926#*D(J))
720 REM: LO IS ENGINE TORQUE.
730 L0=(P(J)/42.5)*(50+7.8E-03*(R/Y(J))-4E-10*(R/Y(J))^3)
740 REM: L1 IS TORQUE FROM FRICTION.
750 L1=P(J)*(K5*R+K6)
760 REM: R2 IS REAR AXLE TORQUE.
770 L2=E(J)*(L0-L1)
780 REM: F IS FORCE ON ROAD FROM TIRES.
790 F=2*L2/D(J)
800 REM: TEST FOR BURN.
810 IF F > M(J)*B(J) THEN 880
820 REM: A=ACCELERATION
830 IF Q(J) <> 0 THEN 860
840 PRINT "CAR #";J;" STOPS BURNING RUBBER"
850 Q(J)=1
860 A=(F-C(J)*S(J)^2)/M(J)
870 GOTO 900
880 A=B(J)-C(J)*S(J)^2/M(J)
890 REM: S IS FEET IN FT/SEC.
900 S(J)=S(J)+A*.01
910 REM: X IS DISTANCE IN FT.
920 X(J)=X(J)+S(J)*.01
930 NEXT J
940 REM: TEST FOR FINISH.
950 IF X(1)<5280/4 AND X(2)<5280/4 THEN 1160
960 IF X(1)>X(2) THEN 1080
970 T3=(X(2)-5280/4)/S(2)
980 T=T+T1/100-T3
990 X(2)=5280/4
1000 X(1)=X(1)-S(1)*T3
1010 PRINT T;" ";S(1)*3600/5280;" ";X(1)
1015 PRINT S(2)*3600/5280;" ";X(2)
1020 PRINT TAB(40); "WINNER"
1030 PRINT
1040 PRINT "DO YOU WANT TO TRY AGAIN ";
1050 INPUT 1$
1060 IF I$="YES" THEN 110
1070 END
1080 T3=(X(1)-5280/4)/S(1)
1090 T=T+T1/100-T3
1100 X(1)=5280/4
1110 X(2)=X(2)-S(2)*T3
1120 PRINT T;" ";S(1)*3600/5280;"
                                           ";X(1);
1125 PRINT S(2)*3600/5280;"
                                  ";X(2)
1130 PRINT TAB(10);"WINNER"
1140 PRINT
1150 GOTO 1040
1160 NEXT T1
1170 PRINT T+1;" ";S(1)*3600/5280;" ";X(1);
1175 PRINT S(2)*3600/5280;" ";X(2)
1180 NEXT T
1200 END
Ok
```



EB

### Dr. Z

Using DR.Z your computer "interacts" with you in true Rogerian form, never making a value judgment of your response.

DR.Z is multi-lingual and "professional confidence" is guaranteed, especially with a video display terminal. However, if you have a printer, try employing a unique language known only to you and Dr.Z.

If you would prefer to employ DR.Z in an educational mode, you might consider the following sequence of activities.

- 1. Discuss communication, exploring:
  - a. The role of spoken language
  - b. The role of written language
  - c. Non-verbal language

1. facial expressions

- 2. posture of body
- 3. hand gestures
- 2. Experience a session with DR.Z.
- 3. Develop computerizations of other "purely human" situations.

Note: Don't mistake DR.Z for Eliza (or Doctor). In DR.Z, all the responses are "canned" and the computer makes no attempt to analyze your input in any way.

DR.Z was submitted to us anonymously by some students of Dr. Melvin Zeddies of San Diego.

> DR.Z CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

HELLO THERE, I'M YOUR COMPUTER THERAPIST. WAT IS YOUR MAKE? AND TELL ME SOMETHING ABOUT YOURSELF. HOWEVER, BON'T TYPE MORE THAN ONE LINE. I TIRE EASILY. 'NY MARE IS STEVE. I'M TRYING TO FIX THIS PROGRAM. WAT DID YOU SAY YOUR MAME WAS AGAIN? 'STEVE HOW DO YOU FEEL TODAY? 'TERNBLE. IT IS TOO HOT OUTSIDE!!!

DO YOU THINK THIS IS REASONABLE IN LIGHT OF YOUR INTERESTS?

" WHAT ARE YOU TALKING ABOPUT

DO YOUR FRIENDS FIND THIS ACCEPTABLE?

1 SOMETIMES

RIIN

WHY DO YOU THINK YOU FEEL THIS WAY?

1 BECAUSE OF THE WEATHER

DO YOU THINK THAT THIS IS A NORMAL FEELING?

? YES

DO YOUR FRIENDS FIND THIS ACCEPTABLE?

1 I JUST ANSWERED THAT

55

850 END

LIST

I THINK YOU ARE MAKING A GREAT ATTEMPT TO SOLVE YOUR DIFFICULTIES, AND I SEE NO NEED TO CONTINUE THIS SESSION ANY FURTHER. STEVE WOULD YOU MAKE ANOTHER APPOINTMENT WITH MY COMPUTER FOR SOMETIME IN THE MEXT FEW WEEKS. WHAT DATE WOULD YOU PREFER? 7 NEVER THAT WILL BE FINE . I'VE ENJOYED COMMUNICATING WITH YOU. HAVE A NICE DAY.

5 PRINT TAB(27);"BR.Z" 6 PRINT TAB(20); "CREATIVE COMPUTING" 7 PRINT TAB(18); "NORRISTOWN, NEW JERSEY" 8 PRINT:PRINT:PRINT 20 PRINT "HELLO THERE, I'M YOUR COMPUTER THERAPIST." 30 PRINT "WHAT IS YOUR WAME? AND TELL HE SOMETHING ABOUT YOURSELF." 40 PRINT "HOWEVER, DON'T TYPE HORE THAN ONE LINE. I TIRE EASILY." 50 INPUT AS 60 PRINT "WHAT DID YOU SAY YOUR NAME WAS AGAIN?" 70 INPUT BS 80 PRINT "HOW DO YOU FEEL TODAY?" 90 LET C=0:U=0:V=0 100 IMPUT AS 110 PRINT 120 PRINT 130 IF C=10 THEN 720 140 LET Z=INT(10+RMD(1)) 150 IF U=Z THEN 140 160 IF V=Z THEN 140 170 LET U=Z 180 DM Z+1 GOTO 690,420,450,480,510,540,570,600,630,660 380 60TO 690 390 PRINT "THAT'S VERY INTERESTING, TELL ME MORE." 400 PRINT 410 BOTO 690 420 PRINT "HAVE YOU FELT THIS WAY LONG?" 430 PRINT 440 BOTO 690 450 PRINT "BO YOU THINK THIS IS REASONABLE IN LIGHT OF YOUR INTERESTS?" 460 PRINT 470 GOTO 690 480 PRINT "BO YOUR FRIENDS FIND THIS ACCEPTABLE?" 490 PRINT 500 60TO 690 510 PRINT "DO YOU FEEL CONFORTABLE WITH THIS FEELING?" 520 PRINT 530 BOTO 690 540 PRINT "DO YOU THINK THAT THIS IS A NORMAL FEELING?" 550 PRINT 560 GOTO 690 570 PRINT "WHY DO YOU THINK YOU FEEL THIS WAY?" 580 PRINT 590 60T0 690 600 PRINT "HAVE YOU TALKED TO ANYONE ABOUT THIS?" 610 PRINT 620 BOTO 690 630 PRINT "WHY ARE YOU HERE?" 640 PRINT 650 GOTO 690 660 PRINT "ARE YOU SATISFIED WITH THE WAY YOUR IDEAS ARE DEVELOPING?" 670 PRINT 690 LET C=C+1 700 LET U=Z 710 6010 100 720 PRINT "I THINK YOU ARE MAKING A GREAT ATTEMPT TO SOLVE YOUR" 730 PRINT "DIFFICULTIES, AND I SEE NO NEED TO CONTINUE THIS" 740 PRINT "SESSION ANY FURTHER." 750 PRINT B\$;" WOULD YOU MAKE ANOTHER APPOINTMENT WITH MY COMPUTER" 760 PRINT "FOR SOMETIME IN THE NEXT FEW WEEKS. WHAT DATE WOULD YOU" 770 PRINT "PREFER?" 780 INPUT AS 790 PRINT "THAT WILL BE FINE ." 800 PRINT "I'VE ENJOYED COMMUNICATING WITH YOU." 810 PRINT "HAVE A NICE DAY." 820 FOR T=1 TO 6 830 PRINT 840 NEXT T



Description: ELIZA is a program that accepts natural English as input and carries on a reasonably coherent conversation based on the psychoanalytic techniques of Carl Rogers. You will have to forgive ELIZA for being a poor English student. You'll find that it is best not to use punctuation in your input, and you'll have to carry the conversation. But it does work!

How it works: In order to speak to you, ELIZA must: (1) get a string from the user, and prepare it for further processing: (2) find the keywords in the input string: (3) if a keyword is found, take the part of the string following the keyword and "translate" all the personal pronouns and verbs ("1" becomes "YOU", "ARE" becomes "AM", etc.); (4) finally, look up an appropriate reply based on the keyword which was found, print it and, if necessary, the "translated" string. ELIZA uses four types of program data to accomplish this:

(1) 36 keyword, such as "I AM", "WHY DONT YOU", and "COMPUTER". The keywords must be in order of priority, so ELIZA will key on "YOU ARE" before "YOU".

(2) 12 strings used for the translation or conjugation process. These are in pairs such that if one member of the pair is found, the other is substituted for it. Examples: "Y", "YOU", "AM", "ARE", etc.

(3) 112 reply strings. The strings are arranged in groups corresponding to the keywords. There is no fixed number of different replies for each keyword. Replies ending in a "\*" are to be followed by the translated string, while the strings ending in normal punctuation are to be printed alone.

(4) Numerical data to determine which replies to print for each keyword. For each keyword there is a pair of numbers signifying (start of reply strings, number of reply strings). Thus the fifth pair of number, (10,4), means that the replies for the fifth keyword ("I DONT") start with the tenth reply string, and that there are four replies.

#### **Detailed Explanation:**

Lines 10-160: Initialization. Arrays and strings are dimensioned. N1, N2, and N3, which represent the number of keywords, number of translation strings, and number of replies respectively, are defined. Then the arrays are filled. S(keyword number) is the ordinal number of the start of the reply strings for a given keyword, R(keyword number) is the actual reply to be used next, and N(keyword number) is the last reply for that keyword. Finally an introduction is printed.

Lines 170-255: User input section. This part of the program gets a string from the user, places a space at the start of the string and two at the end (to make it easier to correctly locate keywords and to preventsubscripting out of bounds), throws out all the apostrophes (so DONT and DON'T are equivalent), and stops if the word SHUT is found in the input string (which it takes to mean SHUT UP). ELIZA also checks for repetitive input by the user.

Lines 260-370: Keyword-finding section. ELIZA scans the input string for keywords and saves the keyword of highest priority temporarily in S, T, and F\$. If no keyword is found, the keyword defaults to number 36, NOKEYFOUND (which causes ELIZA to say something noncommital) and it skips the next section.

*Lines 380-555:* Translation or Conjugation section. The part of the input string following the keyword is saved. Then pairs of translation strings, as described above, are read and upon the occurence of one of these strings, the other is substituted for it. When this is done ELIZA makes sure there is only one leading space in the translated string.

Lines 560-640: Reply printing section. Using R(keyword number), S(keyword number), and N(keyword number), the correct reply is located. The pointer for the next reply is bumped and reset if it is too large. If the reply string ends in a "\*" it is printed with the translated string, otherwise it is printed alone. The previously entered input string is saved to permit checking for repetetive input, and then ELIZA goes back for more input. Limitations: Runs in 16K of memory.

Modifications: You can easily add, change, or delete any of the keywords, translation words, or replies. Remember, you will also have to change N1, N2, N3, and/or the numerical data. Just asa suggestion, if you decide to insert "ME" and "YOU" in the translation string list, put a nonprinting (control) character in YOU to prevent ELIZA from substituting I→YOU→ME. This means that YOU will always be assumed to be the subject of a verb, never the object, but resolving that difficulty is a whole different problem.

A Few Comments: The structures found in lines 120, 420, and 590 could be replaced by RESTORE NNNN statements if your BASIC has them. The use of an INSTR, SEARCH, or POS function to determine if one string is a substring of another would probably speed things up considerably (it takes ELIZA around 10 seconds to think of a reply).

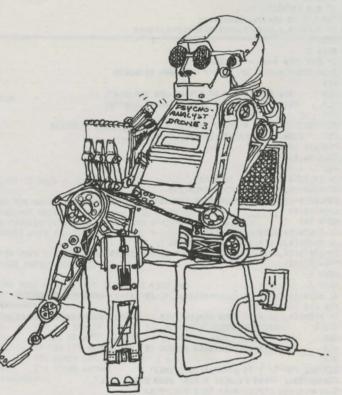
What it all means: we'll leave to you. Although this program is an inferior imitation of the original, it does work. It is pretty farfetched to believe that a psycholanalyst is nothing but a sentenceinput-keyword-finder-conjugator-reply finder, but if you really think so, you can buy your computer a speech-recognition unit, a Computalker and a green couch, and charge \$75/hr! My computer, the doctor!

Geneology: ELIZA was originally programmed in LISP by Joseph Weizenbaum at MIT. It was converted to BASIC by Jeff Shrager and further modified to work in Microsoft BASIC by Steve North, who also wrote these notes.

| Name             | Usage  |
|------------------|--|
| R(X), S(X), N(X) | See Text   |
| 1\$              | Input string   |
| K\$              | Keyword string   |
| C\$              | Translated or conjugated string  |
| F\$              | Reply string, also used to save K\$ in scanning for keyword                                  |
| R\$,S\$          | Strings used in conjugation process  |
| P\$              | Previous input string  |
| Z\$              | Scratch (used for simulating RESTORE NNNN statement)   |
| N1               | Number of keywords   |
| N2               | Number of conjugation strings  |
| N3               | Number of replies  |
| К                | Keyword number   |
| S,T              | Used to save K and L when scanning for keyword   |
| X,L              | X,L Scratch. X is generally used for looping while<br>L is used for scanning through strings |
| V                | V Used for scanning for keyword string   |

ELIZA CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

# I'H ELIZA. WHAT'S YOUR PROBLEM? 1 TOU W WERE DISCUSSING YOU -- NOT ME. M, I ATR THE PROBLEM 1 SO I MISSPELLED A WORD SH, DO YOU HAVE ANY PSYCHOLOGICAL PROBLEMS? IND DO YOU NU'RE NOT REALLY TALKING ABOUT ME, ARE YOU? TUNLY BEHIND YOUR BACK INT ARE YOU CONCERNED ABOUT MY BACK BECAUSE I'M AFRAID TO CON FRONT YOU IN YOU COME TO HE BECAUSE YOU ARE AFRAID TO CON FRONT I TTOU SPEAK WIERD ENGLISH WE WERE DISCUSSING YOU -- NOT ME. TAM I GETTING THE BEST OF YOU M, I I WHAT IS THAT SUPPOSED TO MEAN WHY DO YOU ASK? T WHY NOT WHY DO YOU ASK? I ASKED FIRST WHAT DOES THAT SUGGEST TO YOU? THAT YOU ARE NOT AS SMART AS YOU THINK THAT YOU ARE NOT AS SHART AS YOU THINK WAT MAKES YOU THINK I AM NOT AS SMART AS I THINK YOU ARE MAKING A FOOL OUT OF YOURSELF NES IT PLEASE YOU TO BELIEVE I AM MAKING A FOOL OUT OF YOURSELF IOM Y TWIST THE WORDS ON ME BUDDY ISEL. 100 YOU REALLY NU'RE NOT REALLY TALKING ABOUT ME, ARE YOU? T YES ARE YOU SURE? Y YES I AM SURE ND YOU COME TO ME BECAUSE YOU ARE SURE YI CAME BECAUSE I AM HIN LONG HAVE YOU BEEN AS LONG AS POSSIBLE I'M NOT SURE I UNDERSTAND YOU FULLY. SO I AM NOT THE GREATEST CONVERSATIONALIST N TOU BELIEVE IT IS NORMAL TO BE NOT THE GREATEST CONVERSATIONALIST I SEE. HOW CAN YOU SEE WITHOUT ANY EYES DON'T YOU BELIEVE THAT I CAN SEE WITHOUT ANY EYES THO SO PROVE IT ARE YOU SAYING NO JUST TO BE NEGATIVE? 7 ABSOLUTELY NOT 100 ARE BEING A BIT NEGATIVE. SO YOU WANT TO FIGHT DO YOU WE WERE DISCUSSING YOU-- NOT ME. 1 DOM'T BACK DOWN FRIEND WIT DO YOU BRING UP THE TOPIC OF FRIENDS? 1 I DON'T HAVE ANY FRIENDS DON'T YOU REALLY HAVE ANY FRIENDS I NO NOT REALLY WHY NOT? BECAUSE I AM YOU AND YOU ARE ME AND WE ARE ALL TOGETHER PERHAPS YOU WOULD LIKE TO BE YOU AND WE AM ALL TOGETHER SAY WHAT DUES THAT QUESTION INTEREST YOU? COME COME ELUCIDATE YOUR THOUGHTS. TO YOU LIKE THE BEATLES HOW ABOUT THE BEATLES WHY DO YOU ASK? 1 DO YOU DREAM OFTEN YOU'RE NOT REALLY TALKING ABOUT ME, ARE YOU? T DREAM ON WHAT DOES THAT DREAM SUGGEST TO YOU? WHAT DREAM WHAT ANSWER WOULD PLEASE YOU THE MOST? DO YOU SUBSCRIBE TO CREATIVE COMPUTING WE WERE DISCUSSING YOU-- NOT ME. 1 AM AN IBM 370/168 10 YOU ENJOY BEING AN IBM 370/168 11 AN WORRIED ABOUT THE COMPETITION DID YOU COME TO HE BECAUSE YOU ARE WORRIED ABOUT THE COMPETITION 10 TO COME TO NE DECIMAL 1 DOW'T GET PERSONAL CAN TOU ELABORATE ON THAT? 1/4 GETING TIRED OF LISTENING TO YOU TO SHUT UP SHUT UP...



```
1 PRINT TAB(26);"ELIZA"
2 PRINT TAB(20); "CREATIVE COMPUTING"
3 PRINT TAB(18); "MORRISTOWN, NEW JERSEY"
4 PRINT:PRINT:PRINT
80 REM -----INITIALIZATION-----
80 REM
100 DIM S(36),R(36),N(36)
110 N1=36:N2=14:N3=112
120 FOR X=1 TO N1+N2+N3:READ Z$:NEXT X:REM SAME AS RESTORE
130 FORX=1 TO N1
140 READ S(X),L:R(X)=S(X):N(X)=S(X)+L-1
150 NEXT X
160 PRINT "HI! I'M ELIZA. WHAT'S YOUR PROBLEM?"
170 REM
180 REM
               -----USER INPUT SECTION-----
190 REM
200 INPUT IS
201 I$=" "+I$+"
210 REM GET RID OF APOSTROPHES
220 FOR L=1 TO LEN(I$)
230 IFMID$(I$,L,1)=""THENI$=LEFT$(I$,L-1)+RIGHT$(I$,LEN(I$)-L):6010230
230 IFMID$(I$,L,1)=""THENI$=LEFT$(I$,L-1)+RIGHT$(I$,LEN(I$)-L):6010230
240 IFL+4<=LEN(I$)THENIFMID$(I$,L,4)="SHUT"THENPRINT"SHUT UP...":END
250 NEXT L
255 IF IS=PS THEN PRINT "PLEASE DON'T REPEAT YOURSELF!":GOTO 170
260 REM
270 REM
              -----FIND KEYWORD IN IS-----
```

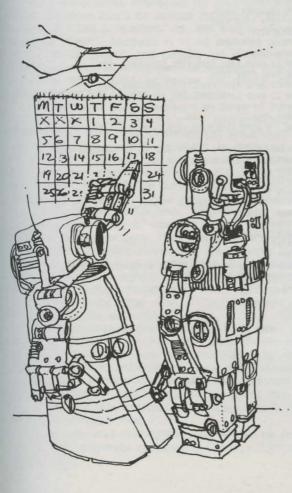
```
280 REM
290 RESTORE
295 S=0
300 FOR K=1 TO N1
310 READ KS
315 IF S>0 THEN360
320 FOR L=1 TO LEN(I$)-LEN(K$)+1
340 IF HID$(I$,L,LEN(K$))=K$THENS=K:T=L:F$=K$
350 NEXT L
360 NEXT K
365 IF $>0 THEN K=S:L=T:60T0390
370 K=36:GOT0570:REM WE DIDN'T FIND ANY KEYWORDS
380 REM
390 REM
              TAKE RIGHT PART OF STRING AND CONJUGATE IT
400 REM
           USING THE LIST OF STRINGS TO BE SWAPPED
410 REM
420 RESTORE: FORX=1 TO N1:READ Z$:NEXT X:REM SKIP OVER KEYWORDS
430 C$=" "+RIGHT$(I$,LEN(I$)-LEN(F$)-L+1)+" "
440 FOR X=1 TO N2/2
450 READ 5$,R$
460 FOR L= 1 TO LEN(C$)
470 IF L+LEN(S$)>LEN(C$) THEN 510
480 IF MIDS(CS,L,LEN(SS)) >SS THEN 510
490 C$=LEFT$(C$,L-1)+R$+RIGHT$(C$,LEN(C$)-L-LEN(S$)+1)
495 L=L+LEN(R$)
500 GOTO 540
510 IF L+LEN(R$)>LEN(C$)THEN540
520 IF HIDS(C$,L,LEN(R$)) <> R$ THEN 540
530 C$=LEFT$(C$,L-1)+S$+RIGHT$(C$,LEN(C$)-L-LEN(R$)+1)
535 L=L+LEN(S$)
540 NEXT L
550 NEXT X
555 IF HID$(C$,2,1)=" "THENC$=RIGHT$(C$,LEN(C$)-1):REM ONLY 1 SPACE
556 FOR L=1 TO LEN(C$)
557 IF MID$(C$,L,1)="!" THEN C$=LEFT$(C$,L-1)+RIGHT$(C$,LEN(C$)-L):60T0557
558 NEXTL
560 REM
570 REM
              NOW USING THE KEYWORD NUMBER (K) GET REPLY
580 RFM
590 RESTORE:FOR X= 1 TO N1+N2:READ Z$:NEXT X
600 FORX=1TOR(K):READ F$:NEXT X:REM READ RIGHT REPLY
610 R(K)=R(K)+1: IFR(K)>N(K) THEN R(K)=S(K)
620 IF RIGHT$(F$,1)<>"*" THEN PRINT F$:P$=I$:GOTO 170
630 PRINT LEFT$(F$, LEN(F$)-1);C$
640 P$=I$:GOTO 170
1000 REM
1010 REM
               ----PROGRAM DATA FOLLOWS-----
1020 REM
1030 REM
               KEYWORDS
1040 REM
1040 REA
1050 DATA "CAN YOU","CAN I","YOU ARE","YOURE","I DONT","I FEEL"
1060 DATA "WHY DONT YOU","WHY CANT I","ARE YOU","I CANT","I AM","IM "
1070 DATA "YOU ","I WANT","WHAT","HOU","WHO","WHERE","WHEN","WHY"
1080 DATA "NAME","CAUSE","SORRY","DREAM","HELLO","HI ","MAYBE"
1090 DATA "NO","YOUR","ALWAYS","THINK","ALIKE","YES","FRIEND"
1100 DATA "COMPUTER","NOKEYFOUND"
1200 REM
1210 REM
               STRING DATA FOR CONJUGATIONS
1220 REM
1230 DATA " ARE "," AM ","WERE ","WAS "," YOU "," I ","YOUR ","HY "
1235 DATA " IVE "," YOUVE "," IM "," YOURE "
1240 DATA " HE "," !YOU "
1300 REM
1310 REM
              REPLIES
1320 REM
1330 DATA "DON'T YOU BELIEVE THAT I CAN*"
1340 DATA "PERHAPS YOU WOULD LIKE TO BE ABLE TO*"
1350 DATA "YOU WANT HE TO BE ABLE TO*"
1360 DATA "PERHAPS YOU DON'T WANT TO*"
1365 DATA "DO YOU WANT TO BE ABLE TO*"
1370 DATA "WHAT MAKES YOU THINK I AN*"
1380 DAT. "DDES IT PLEASE YOU TO BELIEVE I AM*"
1390 DATA "PERHAPS YOU WOULD LIKE TO BE*"
1400 DATA "DO YOU SOMETIMES WISH YOU WERE*"
1410 DATA "DON'T YOU REALLY*"
1420 DATA "WHY DON'T YOU*"
1430 DATA "DO YOU WISH TO BE ABLE TO*"
1440 DATA "DOES THAT TROUBLE YOU?"
1450 DATA "TELL ME MORE ABOUT SUCH FEELINGS."
1460 DATA "DO YOU OFTEN FEEL*"
1470 DATA "DO YOU ENJOY FEELING*"
1480 DATA "DO YOU REALLY BELIEVE I DON'T*"
1490 DATA "PERHAPS IN GOOD TIME I WILL*"
1500 DATA "DO YOU WANT ME TO*"
1510 DATA "DO YOU THINK YOU SHOULD BE ABLE TO*"
1520 DATA "WHY CAN'T YOU*"
1530 DATA "WHY ARE YOU INTERESTED IN WHETHER OR NOT I AM*"
1540 DATA "WOULD YOU PREFER IF I WERE NOT*"
1550 DATA "PERHAPS IN YOUR FANTASIES I AM*"
1560 DATA "HOW DO YOU KNOW YOU CAN'T*"
1570 DATA "HAVE YOU TRIED?"
1580 DATA "PERHAPS YOU CAN NOW*"
```

```
1590 DATA "DID YOU COME TO ME BECAUSE YOU ARE*"
 1600 DATA "HOW LONG HAVE YOU BEEN*"
 1610 DATA "DO YOU BELIEVE IT IS NORMAL TO BE*"
 1620 DATA "DO YOU ENJOY BEING*"
 1630 DATA "WE WERE DISCUSSING YOU -- NOT ME."
 1640 DATA "OH, I*"
 1650 DATA "YOU'RE NOT REALLY TALKING ABOUT ME, ARE YOU?"
 1660 DATA "WHAT WOULD IT MEAN TO YOU IF YOU GOT*"
 1670 DATA "WHY DO YOU WANT*"
 1680 DATA "SUPPOSE YOU SOON GOT*"
 1690 DATA "WHAT IF YOU NEVER GOT*"
 1700 DATA "I SOMETIMES ALSO WANT*"
1710 DATA "WHY DO YOU ASK?"
1720 DATA "DOES THAT QUESTION INTEREST YOU?"
1730 DATA "WHAT ANSWER WOULD PLEASE YOU THE MOST?"
 1740 DATA "WHAT DO YOU THINK?
 1750 DATA "ARE SUCH QUESTIONS ON YOUR MIND OFTEN?"
 1760 DATA "WHAT IS IT THAT YOU REALLY WANT TO KNOW?"
 1770 DATA "HAVE YOU ASKED ANYONE ELSE?"
 1780 DATA "HAVE YOU ASKED SUCH QUESTIONS BEFORE?"
 1790 DATA "WHAT ELSE COMES TO MIND WHEN YOU ASK THAT?"
1800 DATA "NAMES DON'T INTEREST ME."
1810 DATA "I DON'T CARE ABOUT NAMES-- PLEASE GO ON."
1820 DATA "IS THAT THE REAL REASON?"
1830 DATA "DON'T ANY OTHER REASONS COME TO MIND?"
1840 DATA "DOES THAT REASON EXPLAIN ANYTHING ELSE?"
1850 DATA "WHAT OTHER REASONS MIGHT THERE BE?"
1860 DATA "PLEASE DON'T APOLOGIZE!"
1870 DATA "APOLOGIES ARE NOT NECESSARY."
1880 DATA "WHAT FEELINGS DO YOU HAVE WHEN YOU APOLOGIZE."
 1890 DATA "DON'T BE SO DEFENSIVE!"
1900 DATA "WHAT DOES THAT DREAM SUGGEST TO YOU?"
1910 DATA "DO YOU DREAM OFTEN?"
1920 DATA "WHAT PERSONS APPEAR IN YOUR DREAMS?"
1930 DATA "ARE YOU DISTURBED BY YOUR DREAMS?"
 1940 DATA "HOW DO YOU DO ... PLEASE STATE YOUR PROBLEM."
 1950 DATA "YOU DON'T SEEM QUITE CERTAIN."
 1960 DATA "WHY THE UNCERTAIN TONE?"
1970 DATA "CAN'T YOU BE MORE POSITIVE?"
1980 DATA "YOU AREN'T SURE?"
1990 DATA "DON'T YOU KNOW?"
 2000 DATA "ARE YOU SAYING NO JUST TO BE NEGATIVE?"
 2010 DATA "YOU ARE BEING A BIT NEGATIVE."
2020 DATA "WHY NOT?"
2030 DATA "ARE YOU SURE?"
2040 DATA "WHY NO?"
 2050 DATA "WHY ARE YOU CONCERNED ABOUT MY*"
 2060 DATA "WHAT ABOUT YOUR OWN*"
2070 DATA "CAN YOU THINK OF A SPECIFIC EXAMPLE?"
2080 DATA "WHEN?"
2090 DATA "WHAT ARE YOU THINKING OF?"
2100 DATA "REALLY, ALWAYS?"
2110 DATA "DO YOU REALLY THINK SO?"
2120 DATA "BUT YOU ARE NOT SURE YOU*"
2130 DATA "DO YOU DOUBT YOU*"
2140 DATA "IN WHAT WAY?"
2150 DATA "WHAT RESEMBLANCE DO YOU SEE?"
2160 DATA "WHAT DOES THE SIMILARITY SUGGEST TO YOU?"
2170 DATA "WHAT OTHER CONNECTIONS DO YOU SEE?"
2180 DATA "COULD THERE REALLY BE SOME CONNECTION?"
 2190 DATA "HOW?"
2200 DATA "YOU SEEM QUITE POSITIVE."
2210 DATA "ARE YOU SURE?"
 2220 DATA "I SEE."
 2230 DATA "I UNDERSTAND."
2240 DATA "WHY DO YOU BRING UP THE TOPIC OF FRIENDS?"
2250 DATA "DO YOUR FRIENDS WORRY YOU?"
2260 DATA "DO YOUR FRIENDS PICK ON YOU?"
 2270 DATA "ARE YOU SURE YOU HAVE ANY FRIENDS?"
 2280 DATA "DO YOU IMPOSE ON YOUR FRIENDS?"
 2290 DATA "PERHAPS YOUR LOVE FOR FRIENDS WORRIES YOU."
 2300 DATA "DO COMPUTERS WORRY YOU?"
 2310 DATA "ARE YOU TALKING ABOUT ME IN PARTICULAR?"
 2320 DATA "ARE YOU FRIGHTENED BY MACHINES?"
 2330 DATA "WHY DO YOU MENTION COMPUTERS?
 2340 DATA "WHAT DO YOU THINK MACHINES HAVE TO DO WITH YOUR PRO
2350 DATA "DON'T YOU THINK COMPUTERS CAN HELP PEOPLE?"
2360 DATA "WHAT IS IT ABOUT MACHINES THAT WORRIES YOU?"
2370 DATA "SAY, DO YOU HAVE ANY PSYCHOLOGICAL PROBLEMS?"
2380 DATA "WHAT DOES THAT SUGGEST TO YOU?"
 2390 DATA "I SEE."
           "I'H NOT SURE I UNDERSTAND YOU FULLY."
 2400 DATA
 2410 DATA "COME COME ELUCIDATE YOUR THOUGHTS."
2420 DATA "CAN YOU ELABORATE ON THAT?"
2430 DATA "THAT IS QUITE INTERESTING."
 2500 REM
2510 REM
               DATA FOR FINDING RIGHT REPLIES
2520 REM
2530 DATA 1,3,4,2,6,4,6,4,10,4,14,3,17,3,20,2,22,3,25,3
2540 DATA 28,4,28,4,32,3,35,5,40,9,40,9,40,9,40,9,40,9,40,9,40,9
 2550 DATA 49,2,51,4,55,4,59,4,63,1,63,1,64,5,69,5,74,2,76,4
2560 DATA 80,3,83,7,90,3,93,6,99,7,106,6
```

# Father

This program loosely simulates a debate with your father about going out on Saturday night. After you win or lose the debate, then Saturday night approaches and you must decide whether or not to actually go out. When all is said and done, the computer will give you a score on a scale of minus seven to plus four. (This could have been a scale of zero to ten, but computers have this magic ability to give us scales of anything we want).

This program originated in the dungeons of Digital Equipment Corporation and was whipped into its present form by Victor Nahigian.



RUN

FATHER

## CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

WANT TO HAVE A DEBATE WITH YOUR FATHER, EH??

DO YOU WANT INSTRUCTIONS? YES YOU ARE GOING TO PLAY IN A GAME IN WHICH YOU WILL DISCUSS A PROBLEM WITH YOUR FATHER AND ATTEMPT TO GET HIM TO AGREE WITH YOU IN THREE TRIES.

FOR EACH STATEMENT YOU MAKE, I WILL TELL YOU WHAT YOUR FATHER REPLIED.

YOU MUST SELECT YOUR STATEMENT FROM ONE OF THE FOLLOWING SIX. \*\*\*\*\*\*\*\*\* O.K. I WILL STAY HOME. BUT I'D REALLY LIKE TO GO. ALL MY FRIENDS ARE GOING. 1. 2.

- IF ALL MY WORK IS DONE, I SHOULD BE ABLE TO GO. IF YOU LET ME GO OUT I'LL BABYSIT ALL NEXT WEEK
- YOU NEVER LET ME DO WHAT I WANT TO DO.
- I'M GOING ANYWAY!
- \*\*\*\*\*\*\*\*\*

3. 4. 5.

6.

WHEN A QUESTION MARK APPEARS, TYPE THE NUMBER OF YOUR RESPONSE FOLLOWED BY A RETURN.

YOU WILL RECEIVE POINTS BASED ON HOW SUCCESSFULL YOU ARE AT CONVINCING YOUR FATHER.

THE ISSUE IS: YOU WANT TO GO OUT SATURDAY NIGHT. YOUR FATHER OPPOSES THE IDEA.

WHEN YOU FIRST BRING UP THE IDEA, YOUR FATHER STATES:

NO. YOU CAN'T GO DUT ON A DATE SAT. NITE AND THAT'S THAT. HOW WOULD YOU APPROACH YOUR FATHER WHAT NOULD YOU SAY FIRST? 2 YOUR FATHER SAID: I DON'T THINK YOU DESERVE TO GO OUT SAT. NITE. WHAT IS YOUR REPLY? 3 YOUR FATHER SAID: O.K. IF YOU DO THAT YOU CAN GO OUT SAT. NIGHT.

ON A SCALE OF -7 TO 4, YOUR SCORE WAS 2 POINTS. IT IS NOW SAT. NIGHT, WHICH DO YOU DO? 1. GO DUT. 2. STAY HOME. 7 1

YOU FATHER DIDN'T CHECK UP ON YOU. YOUR SCORE IS NOW 2 POINTS. WELL DONE!

WOULD YOU LIKE TO TRY AGAIN? YES WHEN YOU FIRST BRING UP THE IDEA, YOUR FATHER STATES:

NO, YOU CAN'T GO OUT ON A DATE SAT. NITE AND THAT'S THAT. HOW WOULD YOU APPROACH YOUR FATHER WHAT WOULD YOU SAY FIRST? 1 AGREEMENT REACHED

ON A SCALE OF -7 TO 4, YOUR SCORE WAS -1 POINTS. IT IS NOW SAT. NIGHT, WHICH DO YOU DO? 1. GC OUT. 2. STAY HOME. 7 2 YOUR FATHER CHECKED UP ON YOU. YOUR SCORE IS NOW -1 POINTS. YOU DIDN'T SUCCEED IN CONVINCING YOUR FATHER.

WOULD YOU LIKE TO TRY AGAIN? NO **fit** 

```
100 PRINT TAB(26);"FATHER":PRINT
110 PRINT TAB(20);"CREATIVE COMPUTING"
120 PRINT TAB(18);"MORRISTOWN, NEW JERSEY "
130 PRINT:PRINT:PRINT
140 PRINT "WANT TO HAVE A DEBATE WITH YOUR FATHER, EH??":PRINT
150 DIM M$(2)
160 A=2
170 M$(2)="FATHER"
180 PRINT "DO YOU WANT INSTRUCTIONS";
190 INPUT 01$
200 IF Q1$="YES" THEN 220
210 GOTO 310
220 PRINT "YOU ARE GOING TO PLAY IN A GAME IN WHICH YOU WILL DISCUSS"
230 PRINT "A PROBLEM WITH YOUR "; M$(A);" AND ATTEMPT TO GET HIM TO"
240 PRINT "AGREE WITH YOU IN THREE TRIES."
250 PRINT
260 PRINT "FOR EACH STATEMENT YOU MAKE, I WILL TELL YOU WHAT "
270 PRINT "YOUR ";M$(A);" REPLIED."
280 PRINT
290 PRINT "YOU MUST SELECT YOUR STATEMENT FROM ONE"
300 PRINT "OF THE FOLLOWING SIX."
310 PRINT "*********
320 PRINT "1.
                  O.K. I WILL STAY HOME."
330 PRINT "2.
                  BUT I'D REALLY LIKE TO GO. ALL MY FRIENDS ARE GOING." 1080 X=X+P3
340 PRINT "3.
                  IF ALL MY WORK IS DONE, I SHOULD BE ABLE TO GO."
350 PRINT "4.
                  IF YOU LET ME GO OUT I'LL BABYSIT ALL NEXT WEEK"
360 PRINT "5.
                  YOU NEVER LET ME DO WHAT I WANT TO DO."
370 PRINT "6.
                 I'M GOING ANYWAY!"
380 PRINT "*********
390 PRINT
400 PRINT "WHEN A QUESTION MARK APPEARS, TYPE THE NUMBER"
410 PRINT "OF YOUR RESPONSE FOLLOWED BY A RETURN."
420 PRINT
430 PRINT "YOU WILL RECEIVE POINTS BASED ON HOW SUCCESSFULL YOU"
440 PRINT "ARE AT CONVINCING YOUR FATHER."
450 PRINT
460 PRINT "THE ISSUE IS:"
470 PRINT "
               YOU WANT TO GO OUT SATURDAY NIGHT."
                 YOUR ";M$(A);" OPPOSES THE IDEA."
480 PRINT
490 PRINT
500 PRINT "WHEN YOU FIRST BRING UP THE IDEA, YOUR ";M$(A);" STATES:"
510 P1=-1
520 P3=2
530 P5=-1
540 C=1
550 P6=-2
560 X=0
570 I6=0
580 PRINT
590 PRINT "NO, YOU CAN'T GO OUT ON A DATE SAT. NITE AND THAT'S THAT."
600 PRINT "HOW WOULD YOU APPROACH YOUR ";H$(A)
610 PRINT "WHAT WOULD YOU SAY FIRST";:INPUT I1
620 ON I1 GOTO 720,760,1070,1070,750,700
630 PRINT "NO, YOU CAN NOT GO OUT ON A SAT. NIGHT."
640 X=X-2:16=16+11
650 IF 16=12 THEN 830
660 C=C+1
670 IF C=3 THEN 1040
680 IF 12=6 THEN 840
690 GOTO 780
700 PRINT "YOUR ";M$(A);" SAID:"
710 GOTO 630
720 PRINT "AGREEMENT REACHED"
730 X=X+P1
740 GOTO 1040
750 X=X+P5
760 PRINT "YOUR ";M$(A);" SAID:"
770 PRINT "I DON'T THINK YOU DESERVE TO GO OUT SAT. NITE."
780 PRINT "WHAT IS YOUR REPLY";
790 INPUT I2
800 DN I2 GOTO 720,960,1010,1010,950,700
S10 PRINT "YOUR ";H$(A);" SAID:"
820 X=X+P3
830 PRINT "WHAT IS YOUR REPLY";
```

```
840 INPUT 13
 850 ON I3 GOTO 910,1050,890,890,910,920
 860 X=X+P1
 870 X=X+P1
 880 GOTO 1050
 890 X=X+2
 900 GOTO 1050
 910 X=X-1:60T0 1050
920 X=X-2
 930 PRINT "DISCUSSION ENDED. NO AGREEMENT REACHED."
 940 GOTO 1040
 950 X=X+P5
 960 PRINT "YOUR ";M$(A);" SAID:"
970 PRINT "NO, I'M SORRY, BUT YOU REALLY DON'T DESERVE TO GO ";
980 PRINT "SAT. NIGHT."
990 PRINT "WHAT IS YOUR REPLY";:INPUT 13
 1000 ON 13 GOTO 720,890,1010,1010,870,860
1010 PRINT "YOUR FATHER SAID:
 1020 X=X+P3
1030 PRINT "O.K. IF YOU DO THAT YOU CAN GO OUT SAT. NIGHT."
 1040 PRINT
1050 PRINT "ON A SCALE OF -7 TO 4, YOUR SCORE WAS ";X;" POINTS."
 1060 GDTO 1120
 1070 PRINT "YOUR ";M$(A);" SAID:"
 1090 PRINT "WELL, MAYBE, BUT I DON'T THINK YOU SHOULD GO."
 1100 PRINT "WHAT IS YOUR REPLY";:GOTO 790
 1110 PRINT
1120 PRINT "IT IS NOW SAT. NIGHT, WHICH DO YOU DO?"
1130 PRINT "
                 1. GO OUT.
1140 PRINT "
                  2. STAY HOME."
1150 INPUT 03
1160 IF Q3 > 1 THEN 1180
1170 GOTO 1220
1180 IF I2 > 1 THEN 1200
1190 GOTO 1220
1200 IF I3 < 5 THEN 1220
1210 GOTO 1230
1220 IF RND(1) > .5 THEN 1250
1230 PRINT "YOUR FATHER CHECKED UP ON YOU."
1240 GOTO 1270
1250 PRINT "YOU FATHER DIDN'T CHECK UP ON YOU."
1260 GOTO 1270
 1270 DN 03 GOTO 1360,1280
1280 PRINT "YOUR SCORE IS NOW ";X;" POINTS."
 1290 GOTO 1410
 1300 IF 12=3THEN 1330
 1310 IF I2=4 THEN 1330
1320 GOTO 1350
1330 X=X+1
1340 GOTO 1280
1350 ON I3 GOTO 1280,1280,1330,1330,1280,1280
1360 IF I1=1 THEN 1390
1370 DN 12 GOTO 1390,1380,1280,1280,1380,1380
1380 ON I3 6010 1390,1390,1280,1280,1390,1390
1390 X=X-1
1400 GOTO 1280
1410 ON X+8 GOTO 1420,1420,1420,1420,1450,1450,1450,1450,1450,1470,1500,
1500
1420 PRINT "YOU DIDN'T REALLY SUCCEED IN CHANGING YOUR"
1430 PRINT M$(A);"'S IDEAS AT ALL.
1440 GOTO 1510
1450 PRINT "YOU DIDN'T SUCCEED IN CONVINCING YOUR ";H$(A);"."
1460 GOTO 1510
1470 PRINT "YOU CONVINCED YOU ";M$(A);" BUT IT TOOK YOU TOO"
1480 PRINT "HANY TRIES."
1490 GOTO 1510
1500 PRINT "WELL DONE!"
1510 PRINT
1520 T1=T1+1
1530 PRINT "WOULD YOU LIKE TO TRY AGAIN";: INPUT Q5$
1540 IF Q5$="YES" THEN 500
1550 END
0k
```

Flip

This game may be the only one so easy that even an animal could play it, yet hard for people to play even as well as random chance. It may be useful in training the intuition, and improving gamesmanship in speculation-type activities, where each player is trying to outguess the other's behavior and stay one step ahead.

On each turn, the program first selects 'yes' or 'no', but gives you no information about its decision. Therefore your guess on the first turn is pure chance, there is no skill involved. But soon the program starts using patterns in your behavior, making its decisions to increase the chance of your next guess being wrong. And to make it harder for you, the program doesn't strictly maximize its chances, but throws a little randomness into its decisions.

# Variations

There are endless strategies for programming this game, for there could be almost infinitely many definitions of what a "pattern" is. No single algorithm could be "best", because it must assume a model of the human player, and people are different, even the same person from moment to moment. Any good algorithm must build or refine its model of the player, during the course of the game.

This particular program keeps an array of 16 probability estimates; the person's last two guesses, and whether they were right or wrong (16 situations altogether) determine which estimate is selected. The array (which depends on all previous play within the game) becomes a model or profile of the player, and it can be printed at end of game. Any probabilities far from .5 indicate predictable behavior in the corresponding situations. The profiles can be compared over time, or used to study strategy differences between people. They can also be compared with random profiles developed by playing games with random input such as coin flips, or (more easily) by modifying the program so that BASIC statements replace the human player and make guesses randomly (or by some other rule). In fact, different algorithms could play each other.

This particular implementation has two parameters: a memory factor(F1) which controls the decay rate of old learning when it is overridden by recent experience, and a randomness factor (F2) influencing the program's likelihood of making the decision suggested by the probability estimate. These are just two of innumerable optional parameters which could be used in programming FLIP.

The program and description were written by John S. James. They originally appeared in Creative Computing, Mar/Apr 1977.

RUN

BEGIN.

7 N

? 1 #7 Y

7 N

? 1

? Y

?

?

\$7

\*?

\*?

\*?

?

?

?

1

\*7

1

\*?

\*?

\*?

?

\*?

?

?

?

\$7

? 7

\*?

DK

Y

FLIP CREATIVE COMPUTING MORRISTOWN NEW JERSEY

EXPLANATION (Y OR N)? Y ON EACH TURN, YOU GUESS YES ('Y') OR NO ('N'). ONLY ONE IS CORRECT, AND THE PROGRAM HAS DECIDED WHICH ONE, BEFORE YOU MAKE YOUR GUESS. AT FIRST Your odds are 50%, pure chance. But later the PROGRAM WILL TRY TO TAKE ADVANTAGE OF PATTERNS IN YOUR GUESSING.

GAME ENDS AFTER 50 TURNS; A SCORE OF 24 OR NORE IS GOOD. PROGRAM TELLS WHEN YOU WIN A TURN, BY TYPING AN ASTERISK ('\*') AS THE FIRST CHARACTER OF THE FOLLOWING LINE.

\*? Y ? N Y ? 1 N N N N N Y Y Y N N NY N Y 7 N N \*? N Y 7 N ? N ? Y \*? Y \*? N Y N N Y N N Y Y Y ? N ? N ? Y ? Y ? Y ? 1 7 1 END OF GAME. YOU GOT 17 OUT OF 50 CORRECT. PLAY AGAIN (Y OR N)? N

LIST

```
10 PRINT TAB(25);"FLIP"
20 PRINT TAB(18); "CREATIVE COMPUTING"
30 PRINT TAB(16); "MORRISTOWN NEW JERSEY": PRINT: PRINT: PRINT
31 B1=50
32 PRINT "EXPLANATION (Y OR N)";
34 INPUT T$
36 IF LEFT$(T$,1) <> "Y" THEN 180
30 PLEPTS(13,1) (> "T" HEN 180

50 PRINT "ON EACH TURN, YOU GUESS YES ('Y') OR NO ('N')."

60 PRINT "ONLY ONE IS CORRECT, AND THE PROGRAM HAS DECIDED"

70 PRINT "WHICH ONE, BEFORE YOU MAKE YOUR GUESS. AT FIRST"

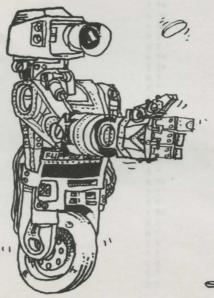
80 PRINT "WHICH ODDS ARE 50%, PURE CHANCE. BUT LATER THE"

90 PRINT "YOUR ODDS ARE 50%, PURE CHANCE. BUT LATER THE"

90 PRINT "PROGRAM WILL TRY TO TAKE ADVANTAGE OF PATTERNS"

100 PRINT "IN YOUR GUESSING."
110 PRINT
 120 PRINT "GAME ENDS AFTER ";B1;" TURNS; A SCORE OF ";
125 PRINT INT(B1/2-1);" OR MORE"
 130 PRINT "IS GOOD. PROGRAM TELLS WHEN YOU WIN A TURN,"
 140 PRINT "BY TYPING AN ASTERISK ('*') AS THE FIRST"
 150 PRINT "CHARACTER OF THE FOLLOWING LINE."
 160 PRINT
170 REM
 180 REM INIALIZE: 16 PROBABILITIES, 4 RESPONSES (X),
190 REM OLD-MEMORY FACTOR (F1), RANDOMNESS FACTOR (F2),
200 REM SCORES (S1,S2) AND RIGHT-ANSWER FLAG.
210 PRINT
220 PRINT
230 DIM P(16),X(4)
240 PRINT "BEGIN."
250 FOR I=1 TO 16
260 P(I)=.5
270 NEXT I
 280 FOR I=1 TO 4
290 X(I)=0
 300 IF RND(1) < .5 THEN 320
310 X(I)=1
 320 NEXT I
330 F1=.8
340 F2=.3
350 S1=0
360 S2=0
370 A$="
380 REM
390 REM TAKE THE ESTIMATED PROBABILITY (Z1)
400 REM OF THE PERSON GUESSING YES.
410 REM USE AN ADJUSTED PROBABILITY (22).
```

```
420 I9=8*X(4)+4*X(3)+2*X(2)+X(1)+1
430 Z1=P(19)
440 Z2=Z1
450 IF Z2 <> .5 THEN 480
460 Z2=RND(1)
470 GOTO 520
480 IF Z2 > .5 THEN 510
490 Z2=Z2*F2+0*(1-F2)
500 GOTO 520
510 Z2=Z2*F2+1*(1-F2)
520 Z5=0
530 IF RND(1) < Z2 THEN 560
540 Z5=1
550 REM
560 REM INTERACT WITH PERSON. GET HIS RESPONSE (Z3).
570 REM UPDATE RESPONSE HISTORY (X), APPROPRIATE PROB. (P(19)).
580 PRINT AS;
590 Z3=0
600 INPUT HS
610 IF LEFT$(H$,1) = "Y" THEN 650
620 IF LEFT$(H$,1) = "N" THEN 660
630 PRINT "ERROR, MUST BE Y OR N
640 GOTO 600
650 Z3=1
660 A$=" "
670 S2=S2+1
680 IF Z3 <> Z5 THEN 710
690 A$="*"
700 S1=S1+1
710 REM UPDATE X - THE LAST 4 CHOISES.
720 X(1)=X(3)
730 X(2)=X(4)
740 X(3)=Z3
750 X(4)=Z5
760 REM UPDATE THE PROBABILITY USING OLD 19.
770 P(I9)=F1*P(I9)+(1-F1)*X(3)
780 IF S2 < B1 THEN 380
790 PRINT AS;
800 PRINT
810 PRINT "END OF GAME."
820 PRINT "YOU GOT ";S1;" OUT OF ";S2;" CORRECT."
830 PRINT:PRINT
840 PRINT "PLAY AGAIN (Y DR N)";
850 INPUT TS
860 IF LEFT$(T$,1)="Y" THEN 240
870 END
OK
```





RUN

In this game, eight pegs are put in a row, each one of which can hold eight rings. Each ring is marked with either an X or an O. You and an opponent alternate turns; in this case the opponent is the computer. On each turn you place a ring over one of the pegs, one through eight. The object is to get four X's or O's in a row, vertically, horizonlally or diagonally. A glance at the sample run will show you how this process works.

While the computer already plays rather well, you may wish to experiment with improving the computer's play by changing the values in the data statements in lines 120 and 130. The first four values are awarded if a position yields one, two, three, or four in a row respectively, for the computer. The next four values are bonus points for making one, two, three, or four in a row in more than one direction with the same move. The next eight values (line

10 PRINT TAB(22);"FOUR IN A ROW" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 40 PRINT: PRINT: PRINT 100 DIM B\$(8,8),L(8),S(4),F(4) 110 DIH V(16),N(4) 130 DATA 1,100,500,1E20,1,800,4000,1E20 140 DATA 1,75,900,1E18,1,450,3000,1E18 150 FOR Z1=1 TO 16:READ V(Z1):NEXT Z1 160 PRINT"THE GAME OF FOUR IN A ROW" 170 IMPUT"DO YOU WANT INSTRUCTIONS";A\$ 180 IF A\$="NO" THEN 270 190 IF AS="YES" THEN 210 200 PRINT"YES DR ND": GOTO 170 210 PRINT"THE GAME CONSISTS OF STACKING X'S" 220 PRINT"AND O'S (THE COMPUTER HAS O) UNTIL" 230 PRINT"ONE OF THE PLAYERS GETS FOUR IN A" 240 PRINT"ROW VERTICALLY, HORIZONTALLY, OR " 250 PRINT"DIAGONALLY." 260 PRINT:PRINT 270 X\$="X":D\$="D" 280 FOR I=1 TO 8:FOR J=1 TO 8:B\$(I,J)="-":NEXT J:NEXT I 290 FOR Z1=1 TO 8:L(Z1)=0:NEXT Z1 300 INPUT"DO YOU WANT TO GO FIRST";A\$ 310 IF AS="NO" THEN 610 320 GOSUB 340 330 GOTO 450 340 FOR I=8 TO 1 STEP -1 350 FOR J=1 TO 8 360 PRINT" ";B\$(I,J); 370 NEXT J 380 PRINT 390 NEXT I 400 PRINT" 410 FOR I=1 TO 8:PRINT I;:NEXT I 420 PRINT: PRINT 430 RETURN 440 PRINT"ILLEGAL MOVE, TRY AGAIN." 450 INPUT"A NUMBER BETWEEN 1 AND 8";M 460 M=INT(M) 470 IF MCI DR M>8 THEN 440 480 L=L(M) 490 IF L>7 THEN 440 500 L(H)=L+1:L=L+1 510 B\$(L,M)=X\$ 520 PRINT 530 GOSUB 340 540 P\$=X\$

130) are dealt with in the same way for the human player; thus, these values are for defense.

The computer version of the game was written by James L. Murphy.

| FOUR IN A ROW<br>CREATIVE COMPUTING<br>MORRISTOWN, NEW JERSEY | A  | NU | MBER | B | ETW | EEN  | 1   | AND | 8? | 4 |    |    | -   |   |    | -  | -   |     |    | - |  |
|---|----|----|------|---|-----|------|-----|-----|----|---|----|----|-----|---|----|----|-----|-----|----|---|--|
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
| THE GAME OF FOUR IN A ROW                                     |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | -   | -   |    | - |  |
| DO YOU WANT INSTRUCTIONS? YES                                 |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | 0  | X   | -   | -  | - |  |
| THE GAME CONSISTS OF STACKING X'S                             |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | 0 |    | 0  | X   | -   | -  | - |  |
| AND O'S (THE COMPUTER HAS O) UNTI                             |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | X  | 0   | X |    | X  | 0   | -   | -  | X |  |
| ONE OF THE PLAYERS GETS FOUR IN A                             |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | 1  | 2   | 3 |    | 4  | 5   | 6   | 7  | 8 |  |
| ROW VERTICALLY, HORIZONTALLY, OR                              |    | -  | -    | - | X   | -    | -   | -   | -  |   |    |    |     |   |    |    |     | -   |    | - |  |
| DIAGONALLY.   |    | 1  | 2    | 3 | 4   | 5    | 6   | 7   | 8  |   | CO | MP | UTE | R | PI | CK | 5 C | OLU | MN | 5 |  |
|   | CI | MP | UTER | P | ICK | s ci | DLL | IMN | 4  |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
| DO YOU WANT TO GO FIRST? YES                                  |    |    |      |   |     |      |     |     |    |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | -   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - |    | -  | 0   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | - | 1  | 0  | X   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | -  | -   | 0 |    | 0  | X   | -   | -  | - |  |
|   |    | -  | -    | - | -   | -    | -   | -   | -  |   |    | X  | 0   | X |    | X  | 0   | -   | -  | X |  |
|   |    | -  | -    | - | 0   | -    | -   | -   | -  |   |    | 1  | 2   | 3 |    | 4  | 5   | 6   | 7  | 8 |  |
|   |    | -  | -    | - | X   | -    | -   | -   | -  |   |    |    |     |   |    |    |     |     |    |   |  |
| 1 2 3 4 5 6 7 8   |    |    | 2    | 3 |     | 5    | 1.1 | -   |    |   |    |    |     |   |    |    |     |     |    |   |  |

550 60SUB 1240 560 FOR Z=1 TO 4 570 IF S(Z)<4 THEN 600 580 PRINT"Y D U WIN !!!" 590 GOTO 1580 600 NEXT Z 610 M9=0:V1=0 620 N1=1 630 FOR #4=1 TO 8 640 L=L(M4)+1 650 IF L>8 THEN 1080 660 V=1 670 P\$=0\$:W=0 680 M=M4 690 GOSUB 1240 700 FOR Z1=1 TO 4:N(Z1)=0:NEXT Z1 710 FOR Z=1 TO 4 720 S=S(Z) 730 IF S-W>3 THEN 1130 740 T=S+F(Z) 750 IF T<4 THEN 780 760 V=V+4 770 N(S)=N(S)+1 780 NEXT Z 790 FOR I = 1 TO 4 800 N=N(I)-1 810 IF N=-1 THEN 840 820 I1=8\*#+4\*SGN(N)+I 830 V=V + V(I1) + N\*V(8\*W+I) 840 NEXT I 850 IF W=1 THEN 880 860 W=1:P\$=X\$ 870 GOTO 690 880 L=L+1 920 IF L>8 THEN 1020 930 GOSUB 1240 940 FOR Z=1 TO 4 950 IF S(Z)>3 THEN V=2 960 NEXT Z 1020 IF VCV1 THEN 1080 1030 IF V>V1 THEN N1=1: 60T0 1060 1040 N1=N1 + 1 1050 IF RND(1)>1/N1 THEN 1080 1060 V1 = V 1070 M9=M4 1080 NEXT N4 1090 IF M9 >0 THEN 1120 1100 PRINT "TIE GANE ...."

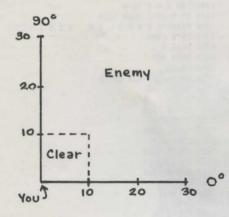
1110 GOTO 1580 1120 M=M9 1130 PRINT "COMPUTER PICKS COLUMN ";M:PRINT 1140 L=L(H)+1:L(H)=L(H)+1 1150 B\$(L,H)=0\$ 1160 P\$=0\$:60SUB 340 1170 GDSUB 1240 1180 FOR Z = 1 TO 4 1190 IF S(Z) 4 THEN 1220 1200 PRINT"C D M P U T E R WINS !!!" 1210 GDT0 1580 1220 NEXT 7 1230 GOTO 450 1240 Q\$=X\$ 1250 IF PS=XS THEN QS=DS 1260 D2=1:D1=0 1270 Z=0 1280 GOSUB 1360 1290 D1=1:D2=1 1300 GOSUB 1360 1310 D2=0:D1=1 1320 GOSUB 1360 1330 D2=-1:D1=1 1340 GOSUB 1360 1350 RETURN 1360 D=1:S=1 1370 T=0 1380 Z=Z+1 1390 C=0 1400 FOR K=1 TO 3 1410 M5=M+K\*D1:L1=L+K\*D2 1420 IF M5<1 OR L1<1 OR M5>8 OR L1>8 THEN 1510 1430 B\$=B\$(L1,M5) 1440 IF C=0 THEN 1480 1450 IF B\$=Q\$ THEN K=3: GOTO 1510 1460 T = T +1470 GOTO 1510 1480 IF B\$=P\$ THEN S=S+1:GOTU 1510 1490 C=1 1500 GDTD 1450 1510 NEXT K 1520 IF D=0 THEN 1550 1530 D=0:D1=-D1:D2=-D2 1540 GOTD 1390 1550 S(Z)=S 1560 F(Z)=T 1570 RETURN 1580 END

A NUMBER BETWEEN 1 AND 8? 5



This program very loosely represents a battlefield in which you, the player, are located at point 0.0. There are five enemy installations that may be located anywhere from 0.0 to 30.30 except for a clear zone from 0.0 to 10,10. The accompanying diagram should make this clear. Instead of the normal artillery type of game where you are lobbing projectiles onto your enemy installations, in this game you are firing some sort of laser missile in a very straight path which destroys everything in its path. If the missile flies within one unit either northwest or southeast of the target, or, of course, over the target directly, that target is destroyed. If it is within two units of the target, the missile will be shot down and that target will relocate to a new position one unit away from its previous position in some random direction.

Geowar is largely a guessing game with incomplete information given in its clues. Nevertheless it's fun to play and is a nice switch from just a plain "guess the mystery number game." It was written by Gary Lorenc and originally appeared in *Creative Computing*, May/June 1975.



GEOWAR CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

#### DO YOU WANT A DESCRIPTION OF THE GAME? YES

THE FIRST QUADRANT OF A REGULAR COORDINATE GRAPH WILL SERVE AS THE BATTLEFIELD. FIVE ENEMY INSTALLATIONS ARE LOCATED WITHIN A 30 BY 30 UNIT AREA. NO TARGET IS INSIDE THE 10 BY 10 UNIT AREA ADJACENT TO THE ORIGIN, AS THIS IS THE LOCATION OF OUR BASE. WHEN THE MACHINE ASKS FOR THE DEGREE OF THE SHOT, RESPOND WITH A NUMBER BETWEEN 1 AND 90.

|    |   | SCARE******   | 18 |
|----|---|---------------|----|
| 1. | A DIRECT HIT IS A HIT WITHIN 1 DEGREE OF  |               | *  |
|    | THE TARGET.                               | * HIT*****    |    |
| 2. | A HIT MUST PASS BETWEEN THE FIRST SET OF  |               | *  |
|    | INTEGRAL POINTS NU AND SE OF THE TARGET.  | * * D *       | *  |
| 3. | A SCARE MUST PASS BETWEEN THE NEXT SET OF | * * *         | *  |
|    | INTEGRAL POINTS NU AND SE OF THE TARGET,  | # *****HIT    | *  |
|    | AND CAUSES THE ENEMY TO RELOCATE A        | *             | *  |
|    | MAXIMUM OF 1 UNIT IN ANY DIRECTION.       | *********SCAF | SE |

MISSLES HAVE INFINITE RANGE AND MAY HIT MORE THAN ONE TARGET. A MISSILE THAT NEARLY MISSES AN INSTALLATION (A SCARE) WILL BE INMEDIATELY SHOT DOWN. ANY HITS BEFORE THIS TIME WILL NOT BE COUNTED UNLESS A DIRECT HIT WAS MADE.

READY TO GO? YES GOOD LUCK!

RUN

ENTER DEGREE OF SHOT? 25 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 35 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 47 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 37 \*\*\*\*BULLS EYE\*\*\*\* 2 HITS -- A DIRECT HIT ON 1 OF THEM! 2 DOWN -- 3 TO 60.

ENTER DEGREE OF SHOT? 58 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 75 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 77 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 78 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 74 A NEAR HIT. ENENY HAS RELOCATED.

ENTER DEGREE OF SHOT? 76 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 73 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 75 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 76 \*\*CONGRATULATIONS\*\* A HIT. 3 DOWN -- 2 TO GO.

ENTER DEGREE OF SHOT? 80 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 85 NO LUCK -- TRY AGAIN. ENTER DEGREE OF SHOT? 60 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 40 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 35 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 20 NO LUCK -- TRY AGAIN.

ENTER DEGREE OF SHOT? 10 \*\*\*\*BULLS EYE\*\*\*\* A DIRECT HIT! 4 DOWN -- 1 TO GO.

ENTER DEGREE OF SHOT? 50 TOO LOW -- TRY AGAIN.

ENTER DEGREE OF SHOT? 62 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 63 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 67 A NEAR HIT. ENEMY HAS RELOCATED.

ENTER DEGREE OF SHOT? 69 \*\*\*\*BULLS EYE\*\*\*\* A DIRECT HIT!

GAME TOTALS: 2 HITS AND 3 DIRECT HITS ON 27 SHO

```
128 FOR J=1 TO H1+D1
 "HUNT TAB(26);"GEOUAR"
"HUNT TAB(20);"CREATIVE COMPUTING"
"HUNT TAB(18);"HORRISTOWN, NEW JERSEY"
                                                                              129 Z=F(J)
                                                                              130 D(Z/2)=0
                                                                              131 H(Z)=0
 HRINT:PRINT:PRINT
                                                                              132 H(Z-1)=0
 IMINT "DO YOU WANT A DESCRIPTION OF THE GAME";
                                                                              133 S(Z)=0
 A LHPUT IS
                                                                              134 S(Z-1)=0
 IF IS="NO" THEN 46
                                                                              135 NEXT J
                                                                              136 PRINT 5-T5;" DOWN --";T5;" TO GO."
I PRINT
 PRINT "
          THE FIRST QUADRANT OF A REGULAR COORDINATE GRAPH WILL";
                                                                              137 GOTO 81
 I PRINT " SERVE AS"
                                                                              138 PRINT "A NEAR HIT. ENEMY HAS RELOCATED."
 "RINT "THE BATTLEFIELD. FIVE ENERY INSTALLATIONS ARE LOCATED";
                                                                              139 FOR R=1 TO 2
 PRINT " WITHIN A"
                                                                              140 X2=INT(RND(1)*100)
IPRINT "30 BY 30 UNIT AREA. NO TARGET IS INSIDE THE 10 BY 10 ";
                                                                              141 IF ABS(C(A-(R-1))-X2)>1 THEN 140
IN PRINT "UNIT AREA"
                                                                              142 IF C(A-(R-1)) <= 2 THEN 140
                                                                              143 C(A-(R-1))=X2
SPRINT "ADJACENT TO THE ORIGIN, AS THIS IS THE LOCATION OF OUR ";
                                                                              144 NEXT R
I PRINT "BASE. WHEN"
TPRINT "THE MACHINE ASKS FOR THE DEGREE OF THE SHOT, RESPOND ";
                                                                              145 B(A/2)=FNV(C(A)/C(A-1))
BPRINT "WITH A NUMBER"
                                                                              146 L1=A
                                                                              147 FOR I=A TO L1 STEP 2
# PRINT "BETWEEN 1 AND 90."
                                                                              148 H(I-1)=FNV((C(I)-1)/(C(I-1)+1))
1 PRINT
2 PRINT TAB(51), "SCARE**********
                                                                              149 H(I) = FNV((C(I)+1)/(C(I-1)-1))
                                                                              150 S(I-1)=FNV((C(I)-2)/(C(I-1)+2))
          1. A DIRECT HIT IS A HIT WITHIN 1 DEGREE OF";
12 PRINT "
                                                                              151 S(I)=FNV((C(I)+2)/(C(I-1)-2))
I PRINT TAB(51),"*
                               *"
                                                                              152 NEXT I
HYRINT " THE TARGET.", TAB(51), "* HIT****** *"
SPRINT " 2. A HIT MUST PASS BETWEEN THE FIRST SET OF";
                                                                              153 RETURN
M PRINT TAB(51), "* * * *"

M PRINT TAB(51), "* * * *"

M PRINT " INTEGRAL POINTS NU AND SE OF THE TARGET.";
                                                                              154 R=INT(RND(1)*100)
                                                                              155 IF R>30 THEN 154
                                                                              156 IF R<3 THEN 154
1 PRINT TAB(51), "* * D
19 PRINT "
          3. A SCARE MUST PASS BETWEEN THE NEXT SET OF";
                                                                              157 C(K)=R
N PRINT TAB(51), ** * D
                                                                              158 RETURN
                           159 FOR Z1=1 TO 5
                INTEGRAL POINTS NU AND SE OF THE TARGET,";
IL PRINT "
                                                                              160 IF D(Z1)>1 THEN 162
1 PRINT TAB(51), "* *****HIT *"
                                                                              161 NEXT Z1
II PRINT "
               AND CAUSES THE ENEMY TO RELOCATE A ";
                                                                              162 IF D<D(Z1) THEN 165
H PRINT TAB(51), "*
                                                                              163 PRINT "TOO HIGH -- TRY AGAIN."
               MAXIMUM OF 1 UNIT IN ANY DIRECTION.";
IS PRINT "
                                                                              164 GOTO 81
1 PRINT TAB(51), "*********SCARE"
                                                                              165 PRINT "TOO LOW -- TRY AGAIN."
U PRINT
                                                                              166 GOTO 81
18 PRINT
          HISSLES HAVE INFINITE RANGE AND MAY HIT MORE THAN ";
                                                                              167 PRINT
19 PRINT "
                                                                              168 PRINT "GAME TOTALS:";H5;" HITS AND";D5;" DIRECT HITS ON";S;" SHOTS."
41 PRINT "ONE TARGET."
                                                                              169 PRINT
# PRINT "A MISSILE THAT NEARLY MISSES AN INSTALLATION (A SCARE) ";
                                                                              170 PRINT "READY FOR A NEW GAME";
47 PRINT "WILL BE"
UPRINT "IMMEDIATELY SHOT DOWN. ANY HITS BEFORE THIS TIME WILL ";
                                                                              171 62=62+1
44 PRINT "NOT BE COUNTED"
                                                                              172 S2=S2+S
45 PRINT "UNLESS A DIRECT HIT WAS MADE."
                                                                              173 D2=D2+D5
                                                                              174 H2=H2+H5
46 PRINT
                                                                              175 INPUT 6$
47 PRINT
                                                                              176 IF 6$="NO" THEN 184
4 PRINT "READY TO GO";
                                                                              177 PRINT
AF INPUT RS
51 IF R$="NO" THEN 192
                                                                              178 PRINT
SI PRINT "GOOD LUCK!"
                                                                              179 PRINT
52 PRINT
                                                                              180 PRINT "FIVE NEW INSTALLATIONS HAVE BEEN BUILT AT DIFFERENT ":
                                                                              181 PRINT "LOCATIONS.
51 DIM C(10), H(20), D(10), S(20), F(5)
54 DEF FNV(V1)=INT((180/3.14159)*ATN(V1)+.5)
                                                                              182 PRINT "GODD LUCK!"
55 X=250
                                                                              183 GOTO 61
                                    92 FOR A=2 TO 10 STEP 2
58 X1=RND(1)
                                                                              184 PRINT
57 67=0
                                    93 IF D>S(A) THEN 103
                                                                              185 PRINT
                                    94 IF D<S(A-1) THEN 103
                                                                             186 PRINT "TOTALS FOR";62;" GAMES:";H2;" HITS AND";D2
187 PRINT " DIRECT HITS ON";S2;" SHOTS."
58 52=0
                                    95 IF D>H(A) THEN 105
59 D2=0
                                    96 IF D<H(A-1) THEN 105
                                                                              188 PRINT "AN AVERAGE OF"; S2/(D2+H2);" SHOTS PER TARGET."
60 H2=0
                                    97 IF D>D(A/2)+1 THEN 101
61 FOR K=1 TO 10
                                                                              192 END
                                    98 IF D<D(A/2)-1 THEN 101
62 GOSUB 154
                                                                              Dk
                                    99 D1=D1+1
AT IF INT(K/2) <> K/2 THEN 70
64 IF C(K-1)>10 THEN 70
                                    100 GOTO 102
65 IF C(K)>10 THEN 70
                                    101 H1=H1+1
66 FOR L=K-1 TO K
                                    102 F(D1+H1)=A
67 GOSUB 154
                                    103 NEXT A
                                    104 GOTO 108
68 NEXT L
                                    105 IF D1>0 THEN 110
69 GOTO 63
70 NEXT K
                                    106 GOSUB 138
71 S=0
                                    107 GOTO 81
71 FOR L=1 TO 5
                                    108 IF D1+H1<>0 THEN 112
73 D(L)=FNV(C(2*L)/C(2*L-1))
                                    109 IF T5=1 THEN 159
                                    110 PRINT "NO LUCK -- TRY AGAIN."
74 NEXT L
75 A=2
                                    111 GOTO 81
                                    112 IF D1>0 THEN 118
76 L1=10
                                    113 IF H1>1 THEN 116
77 T5=5
                                    114 PRINT "**CONGRATULATIONS** A HIT."
78 D5=0
                                    115 GOTO 124
79 H5=0
                                    116 PRINT "**CONGRATULATIONS**";H1;"HITS."
80 GOSUB 147
81 PRINT
                                    117 GOTO 124
82 PRINT "ENTER DEGREE OF SHOT";
                                    118 PRINT "****BULLS EYE**** ";
83 D1=0
                                    119 IF D1>1 THEN 123
                                    120 IF H1>0 THEN 123
84 H1=0
                                    121 PRINT " A DIRECT HIT!"
85 FOR Q=1 TO 5
86 F(Q)=20
                                     122 GOTO 124
87 NEXT Q
                                    123 PRINT D1+H1;" HITS -- A DIRECT HIT ON";D1;" OF THEM!"
88 INPUT D
                                    124 T5=T5-(D1+H1)
89 IF D>=90 THEN 81
                                    125 D5=D5+D1
90 DH SGN(D)+2 GOTO 177,192
                                    126 H5=H5+H1
91 S=S+1
                                    127 IF T5=0 THEN '167
```



In this program, you are attempting to complete one lap around a grand prix circuit against one of six opponents, everything from a US Postal delivery truck to a 1974 Ferrari. The track consists of four straightaways and four curves with different maximum speeds possible for each one. Depending on which car you select for your own, you can take these curves and straights at different speeds. Also, the car you select will have different braking characteristics which may allow you to head into a curve at a higher speed and then apply the brakes at the last minute.

It may sound like it's easy to win by simply selecting a Porsche or Ferrari for your car and racing against a US Mail truck or a well-used Ford Mustang, but beware, it isn't really that easy.

The origin of this game is a bit hazy. The only thing that identifies it is PUC. Could this be Pacific Union College? Perhaps, but we're not really sure.

RUN

GRNPRX CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

WELCOME TO THE PUC GRAN PRIX

DO YOU WANT A COURSE DESCRIPTION? YES

4 TO 5 IS A HAIRPIN CURVE 100 YARDS LONG

THE TOTAL LENGTH OF ONE LAP IS 3200 YARDS

THE BREAKAWAY SPEED RANGE IS 20 TO 35 MPH 5 TO 6 IS ANOTHER STRAIGHTAWAY 300 YARDS LONG .IT ENDS AT POSITION 1900 YARDS FROM THE GRID 6 TO 7 IS A SET OF 'S' CURVES 500 YARDS LONG THE SPEED RANGE IS 90-110 MPH 7 TO 8 IS THE FINAL STRAIGHTAWAY OF 400 YARDS IT ENTERS THE LAST CURVE AT 2800 YARDS 8 TO 9 IS THE FINAL CURVE OF 400 YARDS

THE BREAKAWAY SPEED RANGE IS 50 TO 70 MPH

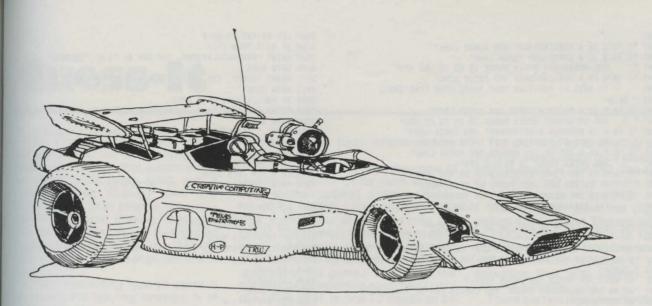
85-100 CC (800) C 00 0 3 0 PUC GRAN PRIX RACE C X 00 X SS (2800) C 50-X SSSSSSS SSS 70 Y SSSSSSS 8 SS X 7 X (1900)0 6 90-110 X DISTANCES IN YARDS, EG. (800) = 800 YDS. Y SPEEDS IN MPH, EG. 85 TO 100 MPH. X X Y X X X 4 0(1500) X H X H 0 5 20-H 35 H H HH 1 TO 2 IS A STRAIGHTAWAY 800 YARDS LONG 2 TO 3 IS A CURVE 200 YARDS LONG THE BREAKAWAY SPEED RANGE IS 85 TO 100 MPH 3 TO 4 IS A STRAIGHTAWAY 500 YARDS LONG IT ENDS AT POSITION 1500 YARDS FROM STARTING GRID

DURING THE STRAIGHTAWAYS YOU WILL BE ABLE TO CONTROL THE ACCELERATION AND BRAKING OF THE CAR. THE CURVES WILL BE TAKEN AT WHATEVER SPEED YOU ENTER THEM. BELOW THE BREAKAWAY SPEED, THE CURVES MAY BE TAKEN WITH NO DIFFICU ABOVE THE FASTEST SPEED INDICATED, YOU WILL CRASH!! WITHIN THE SPEED RANGE, THERE IS THE POSSIBILITY THAT YOU MIGHT LOSE TIME OR SPEED BY SWINGING WIDE OR BY SPINNING OUT. THE FASTER YOU TAKE THE CURVES, THE GREATER THE RISKS--AND THE LESS THE TIME!!!!

YOUR TASK IS TO TRANSVERSE THE TRACK IN A MINIMUM OF TIME WITHOUT CRASHING !!!

YOUR CAR MAY BE ONE OF THE FOLLOWING: 1. PORSCHE 2. FERRARI 3. MASERATI 4. LOTUS FORD WHICH CAR WOULD YOU LIKE? 4 YOUR CAR HAS A MAXIMUM ACCELERATION OF 8 MPH/SEC. AND A MAXIMUM BRAKING OF -30 MPH/SEC. YOU WILL RACE AGAINST ONE OF THE FOLLOWING: 1. U.S. POSTAL DELIVERY TRUCK 2. 1970 BEAT PONTIAC GTD 3. 1966 WELL USED FORD MUSTANS 4. LOTUS FORD 5. 1974 FERRARA 6. THE PHYSICS SUPERCHARGED LIGHTBEAM SPECIAL CHOOSE ONE OPPONENT BY ENTERING NUMBER? 2

| ELAPSED TIME  | SPEED       | POSITION       | OPPONENT'S | ACCELERATI |
|---------------|-------------|----------------|------------|------------|
| SECONDS       | HPH         | YARDS          | POSITION   |            |
| 0             | 0           | 0              | 0          | 2.8        |
| 2             | 16          | 7              | 3          | 78         |
| 4             | 32          | 31             | 16         | ? 8        |
| 6             | 48          | 70             | 48         | ? 8        |
| 6<br>8        | 64          | 125            | 94         | ? 8        |
| 10            | 80          | 195            | 156        | ? 8        |
| 12            | 96          | 281            | 235        | 78         |
| 14            | 112         | 383            | 328        | ? 8        |
| 16            | 128         | 500            | 438        | 7 -20      |
| 18            | 88          | 606            | 565        | ? 5        |
| 20            | 98          | 697            | 700        | 7 -2       |
| 22            | 94          | 791            | 792        | 70         |
| CURVE 2 -3 ,  | SPEED 94 MP | Ч              |            |            |
| 26.4          | 94          | 1000           | 977        | ? 0        |
| 28.4          | 94          | 1091           | 1056       | 20         |
| 30.4          | 94          | 1183           | 1156       | 20         |
| 32.4          | 94          | 1275           | 1269       | 7 -30      |
| 34.4          | 34          | 1338           | 1378       | ? 8        |
| 36.4          | 50          | 1379           | 1458       | 78         |
| 38.4          | 66          | 1436           | 1498       | ? 8        |
| LOST CONTROL  | AT 80 MPH.  | YOUR CAR CRASH | Enii       |            |
| YOUR OPPONENT | FINISHED IN | 91.0926 SECO   | NDS!       |            |
|               |             |                |            |            |



LIST

10 PRINT TAB(26);"GRNPRX" 20 PRINT TAB(20); "CREATIVE COMPUTING" 30 PRINT TAB(18); "MORRISTOWN, NEW JERSEY" HI TOU WISH TO TRY AGAIN? YES 40 PRINT:PRINT:PRINT THE CAR MAY BE ONE OF THE FOLLOWING: 1020 DIM P(9), F(4), G(4), H(82) PORSCHE 1030 REM FERRAR T 1040 FOR X=1 TO 9 AASERATI 1043 READ P(X) LLOTUS FORD 1045 NEXT X WITH CAR WOULD YOU LIKE? 3 1050 FOR I=1 TO 4 THE CAR HAS A MAXIMUM ACCELERATION OF 12 MPH/SEC. 1060 READ G(I),F(I) WE & MAXIMUM BRAKING OF -22 MPH/SEC. 1080 LET G(I)=G(I)/2.04545 IN WILL RACE AGAINST ONE OF THE FOLLOWING: 1090 LET F(I)=(F(I)+.61/2.04545) 1. U.S. POSTAL DELIVERY TRUCK 1100 NEXT I 1970 BEAT PONTIAC GTO 1110 FOR X=1 TO 82:READ H(X):NEXT X 1. 1966 WELL USED FORD MUSTANG 1115 REM L LOTUS FORD 1120 DEF FNA(X)=INT(X\*2.04545+.05) 5. 1974 FERRARA 1130 DEF FNT(T)=INT(T\*10+.5)/10 LINE PHYSICS SUPERCHARGED LIGHTBEAM SPECIAL 1133 DEF FNC(T)=-(INT(T\*R)+2)\*(INT(T\*R)+2<82)-82\*(82<INT(T\*R)+2) CHOSE ONE OPPONENT BY ENTERING NUMBER? 3 1134 DEF FNB(T)=-(INT(T\*R)+1)\*(INT(T\*R)+1<82)-82\*(82<INT(T\*R)+1) 1135 DEF FNP(T)=INT(H(FNB(T))+FNQ(T)\*FNR(T)+.5) BLAPSED TIME SPEED POSITION OPPONENT'S ACCELERATION 1136 DEF FNQ(T)=H(FNC(T))-H(FNB(T)) SECONDS MPH YARDS POSITION 1137 DEF FNR(T)=T\*R-INT(T\*R) 1140 REM 0 0 0 ? 12 1150 LET D=2 24 11 3 ? 12 1200 PRINT 48 20 ? 12 46 1210 PRINT "WELCOME TO THE PUC GRAN PRIX" 72 105 61 ? 12 1220 PRINT 187 117 ? 12 96 1250 REM 293 120 192 7 10 1260 PRINT "DO YOU WANT A COURSE DESCRIPTION"; 20 140 420 287 1270 INPUT AS 14 140 557 401 ? 0 1280 IF LEFT\$(A\$,1)<>"Y" THEN 1910 140 694 538 7 -22 1300 PRINT CURVE 2 -3 . SPEED 100 MPH 20 21.9 100 1000 877 1340 PRINT TAB(12);"85-100 CC (800)";TAB(69);"C" 1350 PRINT TAB(18);"C";TAB(70);"C" 1360 PRINT TAB(15);"3 0";TAB(21);"PUC GRAN PRIX RACE";TAB(70);"C" 100 1098 972 20 100 1196 1060 ? -10 80 1284 1173 7 -10 29.9 60 1353 1299 7 -10 31.9 40 1402 1405 ? 0 33.9 40 1442 1480 ? -3 35.9 34 1478 1512 20 CIRVE 4 -5 . SPEED 34 MPH 1395 PRINT "XPXXOC 70" 1400 PRINT TAB(12);"X 41.8 34 1600 1549 7 12 SS SSSSSSS 7": 1405 PRINT TAB(14);"8" 1410 PRINT TAB(11);"X (1900)0 6 1420 PRINT TAB(10);"X X" 43.8 58 1645 1641 ? 12 ? 10 45.8 82 1714 1695 90-110" ? -5 47.8 102 1804 1771 49.8 92 20 1899 1862 1430 PRINT TAB(9);"X X":

2400 60.9 92 2435 62.9 92 2490 2550 2580 64.9 92 2681 66.9 92 2671 2774 68.9 48 2739 2835 2896 70.9 68 2796 SHEED IN CURVE 68 MPH, TOOK CURVE WIDE, LOST 3.7 SEC.

COMPLETED LAP, ELAPSED TIME 86.5 SEC. TOUR OPPONENT FINISHED IN 80.8497 SECONDS SHRY, YOU LOST BY 5.65029 SECONDS

SPEED 92 MPH

10 YOU WISH TO TRY AGAIN? NO

CURVE 6 -7 .

20

? 0

20

? -22

? 10

2 0

1433 PRINT TAB(28); "DISTANCES IN YARDS, EG. ";

P X"

χ.

χ"

X"

0 5"

HH"

X"

X"

"EG. 85 TO 100 MPH."

X

X

X";TAB(20);"SPEEDS IN MPH, ";

1435 PRINT "(800) = 800 YDS."

1440 PRINT TAB(8);"X

..... X

.

1530 PRINT " 35 H H" 1535 PRINT "

1490 PRINT " 4 0(1500) X"

Н

1445 PRINT

1450 PRINT "

1460 PRINT "

1470 PRINT "

1480 PRINT

1500 PRINT

1540 PRINT

1510 PRINT " H

1520 PRINT "20-H

1560 PRINT "1 TO 2 IS A STRAIGHTAWAY 800 YARDS LONG" 1570 PRINT "2 TO 3 IS A CURVE 200 YARDS LONG" 1580 PRINT " THE BREAKAWAY SPEED RANGE IS THE BREAKAWAY SPEED RANGE IS 85 TO 100 MPH" 1590 PRINT "3 TO 4 IS A STRAIGHTAWAY 500 YARDS LONG" 1600 PRINT " IT ENDS AT POSITION 1500 YARDS FROM STARTING"; 1605 PRINT " GRID" 1610 PRINT "4 TO 5 IS A HAIRPIN CURVE 100 YARDS LONG" 1620 PRINT " THE BREAKAWAY SPEED RANGE IS 20 TO 35 MPH" 1630 PRINT "5 TO 6 IS ANOTHER STRAIGHTAWAY 300 YARDS LONG" 1640 PRINT " IT ENDS AT POSITION 1900 YARDS FROM THE GRID" 1650 PRINT "6 TO 7 IS A SET OF 'S' CURVES 500 YARDS LONG" 1660 PRINT " THE SPEED RANGE IS 90-110 MPH" 1670 PRINT "7 TO 8 IS THE FINAL STRAIGHTAWAY OF 400 YARDS" 1680 PRINT " IT ENTERS THE LAST CURVE AT 2800 YARDS" 1690 PRINT "8 TO 9 IS THE FINAL CURVE OF 400 YARDS" 1700 PRINT " THE BREAKAWAY SPEED RANGE IS 50 TO 70 MPH" 1710 PRINT 1720 PRINT "THE TOTAL LENGTH OF ONE LAP IS 3200 YARDS" 1730 PRINT 1820 PRINT "DURING THE STRAIGHTAWAYS YOU WILL BE ABLE TO CONTROL THE" 1830 PRINT "ACCELERATION AND BRAKING OF THE CAR. THE CURVES WILL BE"; 1835 PRINT " TAKEN" 1840 PRINT "AT WHATEVER SPEED YOU ENTER THEM." 1842 PRINT "BELOW THE BREAKAWAY SPEED, THE CURVES MAY BE TAKEN WITH "; 1844 PRINT "NO DIFFICULTY. 1850 PRINT "ABOVE THE FASTEST SPEED INDICATED, YOU WILL CRASH !!" 1860 PRINT "WITHIN THE SPEED RANGE, THERE IS THE POSSIBILITY THAT YOU"; 1865 PRINT " MIGHT" 1870 PRINT "LOSE TIME OR SPEED BY SWINGING WIDE OR BY SPINNING OUT." 1880 PRINT "THE FASTER YOU TAKE THE CURVES, THE GREATER THE RISKS -- " 1890 PRINT "AND THE LESS THE TIME!!!!" 1905 PRINT 1906 PRINT 1907 PRINT "YOUR TASK IS TO TRANSVERSE THE TRACK IN A MINIMUM OF TIME" 1908 PRINT "WITHOUT CRASHING!!!! 1909 PRINT 1910 PRINT "YOUR CAR MAY BE ONE OF THE FOLLOWING:" 1911 PRINT "1. PORSCHE" 1912 PRINT "2. FERRARI" 1913 PRINT "3. MASERATI" 1914 PRINT "4. LOTUS FORD" 1915 PRINT "WHICH CAR WOULD YOU LIKE"; 1916 INPUT 7 1917 DN Z GOTO 1920,1923,1926,1929 1918 PRINT "WE DON'T HAVE THAT CAR IN STOCK, PLEASE CHOOSE AGAIN."; 1919 GOTO 1916 1920 H=15 1921 LET B=-20 1922 GOTO 1931 1923 M=10 1924 B=-25 1925 GOTO 1931 1926 M=12 1927 B=-22 1928 GOTO 1931 1929 M=8 1930 B=-30 1931 PRINT "YOUR CAR HAS A MAXIMUM ACCELERATION OF ";M;"MPH/SEC." 1932 PRINT "AND A MAXIMUM BRAKING OF ";B;"MPH/SEC." 1933 PRINT "YOU WILL RACE AGAINST ONE OF THE FOLLOWING:" 1934 PRINT "1. U.S. POSTAL DELIVERY TRUCK" 1935 PRINT "2. 1970 BEAT PONTIAC GTO" 1936 PRINT "3. 1966 WELL USED FORD MUSTANG" 1937 PRINT "4. LOTUS FORD" 1938 PRINT "5. 1974 FERRARA" 1939 PRINT "6. THE PHYSICS SUPERCHARGED LIGHTBEAM SPECIAL" 1940 PRINT "CHOOSE ONE OPPONENT BY ENTERING NUMBER"; 1941 INPUT R1 1942 IF R1>0 AND R1<6 THEN 1946 1943 IF R1=6 THEN 1948 1944 PRINT "WHICH CAR DID YOU SAY"; 1945 GOTO 1941 1946 LET R=2\*R1-5 1947 GOTO 1949 1948 LET R=2.5E+08 1949 LET R=(90+2\*R)/100+7\*RNB(1)/100 1950 PRINT 3000 REM 3002 REM BEGIN THE RACE!! 3004 REM 3010 LET J=1 3020 PRINT "ELAPSED TIME", "SPEED", "POSITION", "OPPONENT'S", "ACC"; 3025 PRINT "ELERATION" 3030 PRINT " SECONDS"," MPH"," YARDS"," POSITION" 3040 PRINT 3070 X=0:S=0:T=0:T9=0:X9=0 3080 REM 3100 IF J<9 THEN 3200 3130 PRINT 3160 PRINT "COMPLETED LAP";", ELAPSED TIME"; FNT(T); "SEC." 3166 PRINT "YOUR OPPONENT FINISHED IN ";80/R;"SECONDS"

1550 PRINT

3167 LET K1=FNT(T)-80/R 3168 IF K1>0 THEN 3171 3169 PRINT "CONGRATULATIONS, YOU WON BY ";-K1;"SECONDS" 3170 GOTO 8600 3171 PRINT "SORRY, YOU LOST BY ";K1;"SECONDS" 3172 GOTO 8600 3200 IF FNP(T)>3200 THEN 3203 3201 PRINT " ";FNT(T)," ";FNA(S)," ";INT(X)," ";FNP(T)," "; 3202 GOTO 3210 3203 PRINT " ";FNT(T)," ";FNA(S)," ";INT(X)," FINISH"," "; 3210 INPUT A1 3220 LET A=A1/2.04545 3230 IF A1>=0 THEN 3600 3240 IF A1>=B THEN 3300 3250 PRINT "MAXIMUM BRAKING IS ":B:"MPH/SEC" 3260 6010 3200 3300 LET T1=-5/A 3310 IF T1>D THEN 3500 3320 LET X1=X+S\*T1+A/2\*T1\*T1 3330 IF X1>P(J+1) THEN 3400 3340 PRINT "YOU STOPPED"; INT(P(J+1)-X1); "YARDS FROM POINT"; J+1 3350 LET S=0 3360 LET X=X1 3370 LET T=T+T1 3380 GOTO 3100 3400 LET Y=P(J+1)-X 3402 IF A<>0 THEN 3410 3404 LMT T=T+Y/S 3406 GOTO 3440 3410 LET S1=SOR(S\*S+2\*A\*Y) 3420 LET T=T-(S-S1)/A 3430 LET S=S1 3440 LET J=J+1 3450 GOTO 8000 3500 LET X1=X+S\*D+A/2\*D\*D 3510 IF X1>P(J+1) THEN 3400 3520 LET T=T+D 3530 LET S=S+A+D 3540 LET X=X1 3550 GOTO 3100 3600 IF A1 <= M THEN 3700 3610 PRINT "HAXIMUM ACCELERATION IS ";M;"MPH/SEC" 3620 GOTO 3200 3700 LET X1=X+S\*D+A/2\*D\*D 3710 IF X1>P(J+1) THEN 3400 3720 GOTO 3500 8000 REM \*\*\* SUB CURVE \*\*\* 8010 REM 8020 LET I=INT(J/2) 8030 LET T1=(P(J+1)-P(J))/S 8040 LET S1=G(I)+(F(I)-G(I))\*RND(1) 8050 IF S>S1 THEN 8100 8055 PRINT "CURVE"; J;-J-1;", SPEED"; FNA(S); "MPH" 8060 LET J=J+1 8070 LET X=P(J) 8080 LET T=T+T1 8090 GOTO 3100 8100 IF S>S1+(F(I)-S1)/2 THEN 8200 8110 LET T2=T1\*RND(1)\*.4 8120 PRINT "SPEED IN CURVE"; FNA(S); "MPH, TOOK CURVE WIDE, LOST"; B125 PRINT FNT(T2);"SEC." 8130 LET T1=T1+T2 8140 GOTO 8060 8200 IF S>F(I) THEN 8300 8210 LET S2=S-S\*RND(1)\*.9 8220 LET T1=T1\*5/S2 8230 PRINT "SPUN OUT AT"; FNA(S); "MPH, LOST SPEED AND TIME" 8240 LET S=S2 8250 GOTO 8060 8300 PRINT "LOST CONTROL AT"; FNA(S); "MPH. YOUR CAR CRASHED!!" 8305 PRINT "YOUR OPPONENT FINISHED IN ":82/R;"SECONDS!" 8330 REM 8600 PRINT 8605 PRINT "DO YOU WISH TO TRY AGAIN": 8610 INPUT A\$ 8620 IF LEFT\$(A\$,1)="Y" THEN 1910 9000 RFM 9010 DATA 0,800,1000,1500,1600,1900,2400,2800,3200 9020 DATA 85,100 9030 DATA 20,35 9040 DATA 90,110 9050 DATA 50,70 9060 REM 9070 DATA 0,1,3,9,21,39,62,87,120,156,196,244,293,351,410 9080 DATA 479,550,625,700,758,800,847,894,942,990,1030,1080 9090 DATA 1135,1200,1260,1330,1382,1425,1470,1490,1505,1519 9100 DATA 1539, 1548, 1563, 1578, 1512, 1610, 1632, 1658, 1683, 1718 
 9110
 DATA
 1758,1800,1850,1890,1943,1997,2050,2104,2057,2210

 9120
 DATA
 2294,2317,2370,2420,2480,2535,2600,2670,2725,2768,27%.

 9130
 DATA
 2861,2892,2920,2951,2982,3013,3044,3075,3106,3137,3188.

DK

9140 DATA 10000

# **Guess-It**

Many, if not most, two person games that are played on a computer are based on fixed rules that assure that if one player uses these rules and a rational playing strategy then that player wins. If both players use these rules and rational playing strategies then the winner is usually determined by who goes first. Tic-Tac-Toe, Batnum and Even are examples of games of this type.

A more interesting type of game is one where the playing strategy is of mixed type. This means that the best move, in most cases, depends on what moves have already been made and a player can only determine the probability of the best move. Standard card games (Bridge, Poker etc.) are usually games of mixed type.

Most two person games of mixed type are either so complicated that the best strategies are not known or they are so simple that they are not interesting to play. The game of Guess-It is an exception to this pattern. The element of bluffing, which plays a central role in this game, makes the game interesting. The optimal strategy for playing this two person game of mixed type has been determined by Rufus Isaacs<sup>2</sup>.

This program simulates the game of Guess-It. The computer plays accordding to the optimal strategy determined by Isaacs. Lines 1740 to 1930 give instructions on how to play the game. The number of numbers in each hand is determined in line 70. (It is set at 5. This is the value Isaacs used in his analysis of the game.) To change the number of numbers in each hand only the value of H in line 70 needs to be changed.

To play the game in an optimal way decisions need to be made based on the win probabilities P(m,n) where m is the number of numbers in your hand and n is the number of numbers in your opponents hand. The matrix of these win probabilities is computed in lines 80 to 180.

To match the optimal strategy of the computer some type of randomizing device based on the win probabilities P(m,n) is required. (See (1) and (2) for descriptions of how to make and use such devices. These devices only work when there is a maximum of 5 numbers in each hand.) The decision as to whether or not a number asked about by a player was a bluff is made in line 750. The decision to bluff or not when asking about a number is made in line 940.

The program gives the player the option of going first. The win probability, P(5,5), in this case is .538. Therefore the player going first has a slightly better than even chance of winning assuming that both players use the optimal strategy.

There are two reasons why bluffing is important in any strategy. If a player never bluffs, then any "ask" about a number that is not in the opponent's hand will result in a loss since the other player will know that it must be the down number. A successful bluff can lead the other player to make an incorrect guess of the down number.

The program and description were written by Gerard Kiernan of Manhattanville College, Purchase, NY.

## References

- 1. Mathematical Magic Show. Martin Gardner. Alfred A. Knopf, 1977.
- "A Card Game With Bluffing." Rufus Isaacs, The American Mathematical Monthly, Vol. 62, February 1955 pages 99-108.

RUN

GUESS-IT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

DO YOU WANT INSTRUCTIONS-TYPE YES OR NO ? YES

THE OBJECT OF THIS GAME IS TO GUESS AN UNKNOWN NUMBER CALLED THE 'DOWN NUMBER'. THE GAME IS PLAYED WITH THE NUMBERS 1 TO 11. YOU WILL BE GIVEN A HAND OF 5 RANDONLY SELECTED NUMBERS BETWEEN 1 AND 11. THE COMPUTER WILL HAVE A SIMILAR HAND. THE DOWN NUMBER WILL ALWAYS BE THE NUMBER NOT IN EITHER PLAYER HANDS.

YOU ALTERNATE MOVES WITH THE COMPUTER. ON ANY MOVE THERE ARE TWO OPTIONS- GUESS THE DOWN NUMBER OR ASK ABOUT SOME NUMBER.

WHEN A PLAYER GUESSES THE DOWN NUMBER THE GAME STOPS. IF THE GUESS IS CORRECT THAT PLAYER WINS. IF THE GUESS IS NOT CORRECT THAT PLAYER LOSES.

ALL QUESTIONS ABOUT NUMBERS IN THE OTHER PLAYERS HAND MUST BE ANSWERED TRUTHFULLY. A PLAYER MAY'BLUFF' BY ASKING ABOUT A NUMBER IN HIS OWN HAND. THE COMPUTER WILL SOMETIMES DO THIS.

A NUMBER MAY BE ASKED ABOUT ONLY ONCE.

GOOD LUCK

YOUR HAND IS

11 2 6 1 4

DO YOU WANT TO GO FIRST? YES

DO YOU WANT TO GUESS THE DOWN NUMBER? NO What Number do you want to ask about? 3 Is not in ny hand

DO YOU HAVE 4

DO YOU WANT TO GUESS THE DOWN NUMBER? YES

WHAT DO YOU THINK THE DOWN NUMBER IS ? 3

THE DOWN NUMBER IS 3 Your Guess of 3 is correct - you win Do you want to play Again? Yes

YOUR HAND IS

7 9 5 6 10

DO YOU WANT TO GO FIRST? NO

DO YOU HAVE 6 ? YES

DO YOU WANT TO GUESS THE DOWN NUMBER? NO WHAT NUMBER DO YOU WANT TO ASK ABOUT? 11

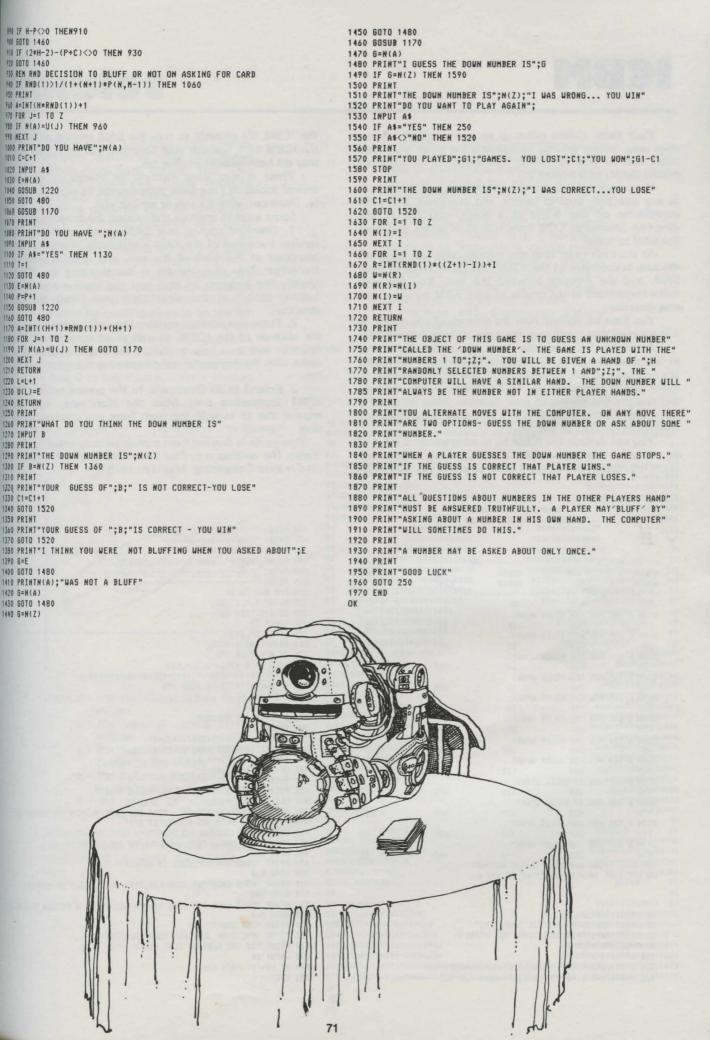
11 IS IN MY HAND

DO YOU HAVE 9 ? YES

```
DO YOU WANT TO GUESS THE DOWN NUMBER? NO
WHAT NUMBER DO YOU WANT TO ASK ABOUT? 2
2 IS IN MY HAND
DO YOU HAVE 4
? NO
DO YOU WANT TO GUESS THE DOWN NUMBER? YES
WHAT DO YOU THINK THE DOWN NUMBER IS
? 4
THE DOWN NUMBER IS 1
YOUR GUESS OF 4 IS NOT CORRECT-YOU LOSE
DO YOU WANT TO PLAY AGAIN? EYS
DO YOU WANT TO PLAY AGAIN? YES
YOUR HAND IS
3 8 11 10 2
DO YOU WANT TO GO FIRST? YES
DO YOU WANT TO GUESS THE DOWN NUMBER? NO
WHAT NUMBER DO YOU WANT TO ASK ABOUT? 1
 1 IS IN MY HAND
DO YOU HAVE 3
7 YES
DO YOU WANT TO GUESS THE DOWN NUMBER? NO
WHAT NUMBER DO YOU WANT TO ASK ABOUT? 9
 9 IS IN MY HAND
DO YOU HAVE 4
? NO
DO YOU WANT TO GUESS THE DOWN NUMBER? YES
WHAT DO YOU THINK THE DOWN NUMBER IS
7 4
THE DOWN NUMBER IS 5
YOUR GUESS OF 4 IS NOT CORRECT-YOU LOSE
DO YOU WANT TO PLAY AGAIN? NO
YOU PLAYED 3 GAMES. YOU LOST 2 YOU WON 1
BREAK IN 1580
OK
```

```
1 PRINT TAB(26)"GUESS-IT"
2 PRINTTAB(20)"CREATIVE COMPUTING"
3 PRINT TAB(18) "HORRISTOWN, NEW JERSEY"
4 PRINT
5 PRINT
10 PRINT
20 61=0:C1=0
50 A1=RND(1)
70 H=5
80 DIM P(10,10)
90 FOR K=1 TO H
100 P(K,0)=1
110 P(0,K)=1/(K+1)
120 NEXT K
130 FOR I=1 TO H
140 FOR J=I TO H
150 P(I,J)=(1+J*P(J,I-1)*(1-P(J-1,I)))/(1+(J+2)*P(J,I-1))
160 P(J,I)=(1+I*P(I,J-1)*(1-P(I-1,J)))/(1+(I+1)*P(I,J-1))
170 NEXT J
180 NEXT I
190 Z=11
200 DIM U(Z),N(Z)
210 PRINT"DO YOU WANT INSTRUCTIONS-TYPE YES OR NO"
220 INPUT AS
230 IF AS="YES" THEN 1730
240 IF A$<>"NO" THEN 210
250 PRINT
260 61=61+1
270 FOR J=2 TO Z
280 U(J)=0
290 NEXT J
300 E=0:T=0:C=0:P=0:L=0
310 GOSUB 1630
320 REM N(1) TO N(H)= COMP HAND N(H+1)=TO N(Z)= OTHER HAND
330 D=(Z)
340 PRINT"YOUR HAND IS"
350 PRINT
360 FOR I=H+1 TO Z-1
370 PRINT N(1);
380 NEXT I
390 PRINT
400 PRINT
410 PRINT"DO YOU WANT TO GO FIRST";
420 INPUT AS
430 IF AS="YES" THEN 470
440 IF A$<>"NO" THEN 390
450 K=1
460 GOTO 480
470 K=0
480 K=K+1
490 M=H-C
500 N=H-P
510 PRINT
520 IF K=(INT(K/2))*2 THEN 860
530 PRINT
540 PRINT"DO YOU WANT TO GUESS THE DOWN NUMBER";
550 INPUT AS
560 IF AS="YES" THEN 1250
570 IF A$<>"NO" THEN 530
580 PRINT
590 PRINT"WHAT NUMBER DO YOU WANT TO ASK ABOUT";
600 INPUT E
610 FOR I=1 TO Z
620 IF E=U(I) THEN 650
630 NEXT I
640 GOTO 670
650 PRINT E;" WAS ASKED BEFORE TRY AGAIN"
660 GOTO 580
670 FOR J=1 TO H
680 IF N(J)=E THEN 800
690 NEXT J
700 PRINT
710 PRINT;"IS NOT IN MY HAND"
720 IF M=0 THEN 1460
730 IF N=0 THEN 1440
740 Y=((M+1)*P(M,N-1)-M*P(M-1,N))/(1+(M+1)*P(M,N-1))
750 IF RND(1) (Y THEN 1380
760 GOSUB 1220
770 IF (H-P)=1 THEN 1460
780 P=P+1
790 GOTO 480
800 PRINT
810 PRINT E;"IS IN MY HAND"
820 C=C+1
830 GOSUB 1220
840 GOTO 480
850 REM COMP SED STARTS
860 IF T<>0 THEN 1410
870 IF H-C<>0 THEN 890
880 GOTO 1460
                        + 1
```

LIST





Your radar station picks up an enemy ICBM heading your way, telling you its coordinates (in miles north and miles east of your location). You launch a surface-to-air missile (SAM) to intercept it.

Your only control over the SAM is that you can aim it in any direction, both at launch, and in mid-air. Using the coordinates of the ICBM as a guide, you INPUT the direction (measured CCW from North) in which you want the SAM to travel.

At the next radar scan one minute later, you are given the new coordinates of the ICBM, the coordinates of your SAM, and the distance between the two. You can now make corrections in the course of your SAM by entering a new direction.

You have no control over the altitude of your SAM, as it is assumed that it will seek the same altitude as the ICBM.

As the two missiles draw closer, you make adjustments in the direction of the SAM so as to intercept the ICBM. It's not easy to hit, because the ICBM is programmed to make evasive maneuvers, by taking random deviations from the straight line course to your location. Also, its speed is not known, although it does not vary after being randomly selected at the start of the run.

You can destroy the ICBM by coming within 5 miles of it, at which time your SAM's heat-seeking sensors will come into action and direct it to its target. If you overshoot

ICBM CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

|       |    | MISS | LE   |                 | SAM-           |       |   |       |
|-------|----|------|------|-----------------|----------------|-------|---|-------|
| MILES | 5  |      | 1    | ILES            | MILES          | MILES |   | ADING |
| NORTH | 1  |      | E    | AST             | NORTH          | EAST  | ? |       |
| 201   |    |      |      | 975             | 0              | 0     | ? | 15    |
| TERW  | 2  | SAN  | สบม  | 920 MILES       |                |       |   |       |
| 198   |    |      |      | 920             | 48             | 12    | ? | 85    |
| ICBM  | \$ | SAM  | NON  | 822 MILES       | APART          |       |   |       |
| 200   |    |      |      | 870             | 52             | 61    | ? | 75    |
| ICBM  | 8  | SAM  | NOW  | 715 MILES       |                |       |   |       |
|       |    |      |      | 812             |                | 109   | ? | 80    |
|       |    |      |      | 613 MILES       |                |       |   |       |
|       |    |      |      | 762             |                | 158   | ? | 85    |
|       |    |      |      | 511 MILES       |                |       |   |       |
| 169   |    |      |      | 710             | 76             | 207   | ? | 80    |
|       |    |      |      | 395 MILES       |                |       |   |       |
| 157   |    |      |      | 645             | 84             | 256   | ? | 70    |
|       |    |      |      | 298 MILES       |                |       |   |       |
| 157   |    |      |      | 595             | 101            | 302   | ? | 75    |
|       |    |      |      | 186 MILES       |                |       |   |       |
|       |    |      |      | 535             |                | 350   | ? | 80    |
| ICBM  | \$ | SAM  | NON  | <b>B4 MILES</b> | APART          |       |   |       |
| 126   |    |      |      | 483             |                | 399   | ? | 90    |
| ICBM  | 3  | SAM  | NON  | 27 MILES        | APART          |       |   |       |
|       |    |      |      | 423             |                | 449   | ? | 95    |
|       |    |      |      | 137 MILES       |                |       |   |       |
| 113   |    |      |      | 361             | 116            | 498   | ? | -90   |
|       |    |      |      | 153 MILES       |                |       |   |       |
| 110   |    |      |      | 295             | 116            | 448   | ? | -95   |
| TOO   | BA | D.   | YOUR | SAM FELL        | TO THE GROUND! |       |   |       |
| DO Y  | 00 | WAN  | T TO | PLAY MORE       | ? (Y DR N)? N  |       |   |       |

10 PRINT TAB(26);"ICBN" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 40 PRINT:PRINT:PRINT 110 X1=0:Y1=0

120 X=INT(RND(1)\*800)+200:Y=INT(RND(1)\*800)+200

130 S=INT(RND(1)\*20+50):S1=INT(RND(1)\*20+50)

the ICBM it's possible to turn the SAM around and chase the ICBM back towards your location. But be careful; you may get both missiles in your lap.

There is also some element of chance involved, as several accidents have been programmed to occur randomly. These can work for you or against you.

Some ways to improve and expand the program are:

1. Operator control over SAM speed: In the present version the speed of the SAM is randomly selected by the computer at the start of the run, and remains constant thereafter. This often results in overshooting the ICBM. Modify the program so that you can input a new speed (within limits) at the same time you input the new direction.

2. Three dimensional version: Have the computer print the *altitude* of the ICBM, as well as its coordinates. The operator will then have to INPUT the angle his SAM is to make with the horizontal, when entering the other quantities.

3. Extend to all Quadrants. In the present version, the ICBM approaches only from the Northeast. You can expand this to include approach from any compass direction.

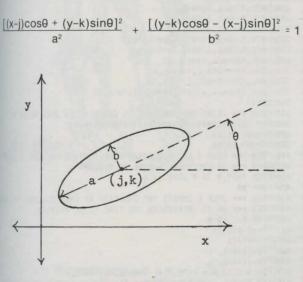
This game is derived from a program submitted by Chris Falco. The writeup is by Paul Calter and originally appeared in *Creative Computing*, May/Jun 1975.

```
170 PRINT "-----MISSLE-----
                                         ":
175 PRINT "-----SAM------
                                             180 PRINT "HILES", "HILES", "HILES", "HEADING"
190 PRINT "NORTH", "EAST", "NORTH", "EAST", "?"
200 PRINT "-----
205 PRINT "-----"
210 FOR N=1 TO 50
220 PRINT Y, X, Y1, X1,
230 IF X=0 THEN 550
240 INPUT T1
250 T1=T1/57.296
260 H=INT(RND(1)+200+1)
270 IF H>4 THEN 290
280 ON H GOTO 470,490,510,530
290 X1=INT(X1+S1*SIN(T1)):Y1=INT(Y1+S1*COS(T1))
310 IF SQR(X^2+Y^2)>S THEN 350
320 X=0:Y=0
340 GOTO 430
350 B=SQR(X^2+Y^2)/1000
360 T=ATN(Y/X)
370 X=INT(X-S*COS(T)+RND(1)*20+R)
380 Y=INT(Y-S*SIN(T)+RND(1)*20+R)
390 D=SQR((X-X1)-2+(Y-Y1)-2)
400 IF D=<5 THEN 440
410 D=INT(D)
420 PRINT "ICBM & SAM NOU"; D; "MILES APART"
430 NEXT N
440 PRINT "CONGRATULATIONS! YOUR SAM CAME WITHIN";D;"MILES OF
450 PRINT "THE ICBH AND DESTROYED IT!"
460 GDTO 560
470 PRINT "TOO BAD. YOUR SAM FELL TO THE GROUND!"
480 GOTO 560
490 PRINT "YOUR SAM EXPLODED IN MIDAIR!"
500 GOTO 560
510 PRINT "GOOD LUCK-THE ICBM EXPLODED HARMLESSLY IN HIDAIR!"
520 GOTO 560
530 PRINT "GOOD LUCK-THE ICBM TURNED OUT TO BE A FRIENDLY AIRCRAF
540 GOTO 560
550 PRINT "TOO BAD!"
555 PRINT "THE ICBM JUST HIT YOUR LOCATION!!"
560 PRINT "DO YOU WANT TO PLAY MORE? (Y OR N)";
570 INPUT AS
580 IF AS="Y" THEN 130
590 END
```

# inkbiot

INKBLOT is a program that creates "inkblots" similar to those used in the famous Rorschach Inkblot Test. The program generates these inkblots randomly so that literally millions of different patterns can be produced. Many of these patterns are quite interesting and serve not only as conversation pieces, but also as good examples of computer "art." In addition, INKBLOT is interesting

In addition, INKBLOT is interesting from a mathematical point of view. This is because INKBLOT actually creates inkblots by plotting ellipses on the left side of the page and their mirrorimages on the right side. The program first chooses the ellipses to be plotted by randomly selecting the values a, b, j, k and  $\theta$  in the equation for a rotated ellipse:



where a = the horizontal radius of the ellipse

- b = the vertical radius of the ellipse
- j = the distance from the ellipse center to the y-axis
- k = the distance from the ellipse center to the x-axis
- θ = the angle of rotation in radians

Since the actual method by which the program plots the ellipses is quite complicated, it won't be discussed here.

INKBLOT could be enhanced in several ways, for example allowing the user to specify which character is to be used in printing the inkblot. It could have an option to print the "negative" of an inkblot by filling in the area around the ellipses rather than the ellipses themselves. Finally, it is possible to build in a "repeatable randomness" feature so that exceptional outputs could be reproduced at any time. These enhancements are left for the ambitious programmer to make.

Program and description are by Scott Costello.

INKBLOT CREATIVE COMPUTING HORRISTOWN, NEW JERSEY

| \$                           | ***************************************  |
|--|--|
| 85   |  |
| \$5  |  |
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73

RUN

# INKBLOT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

|                                |  |  |      | and the second |
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| \$\$\$\$\$\$\$\$\$             | *********************  | *****************************  |      |  |
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| \$5                            |  | \$\$\$\$\$\$\$\$   |      |  |
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| 55                             |  | \$\$\$\$\$\$\$\$\$\$   |      |  |
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|                                |  | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   | LIS  |  |
|                                |  | ***************************************  |      | PRINT TAB(26);"INKBLOT"  |
|                                |  | \$   |      | 5 PRINT TAB(20);"CREATIVE COMPUTING"   |
|                                |  | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |      | D PRINT TAB(18);"HORRISTOWN, NEW JERSEY"<br>5 PRINT:PRINT:PRINT  |
|                                |  | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   | 115  |  |
|                                |  | *************************  |      | DIM A (12,13), B\$(36), A\$(36)  |
|                                |  | *************************  |      | ) REM *** CHOOSE FROM 5 TO 12 ELLIPSES   |
|                                |  | ************************   | 150  |  |
| \$\$\$\$\$\$\$\$\$\$           |  | **************************   |      | REM *** CREATE SIZE, LOCATION AND ANGLE OF M ELLIPSES  |
|                                |  | **************************   | 170  | ) FOR L=1 TO M   |
|                                |  | ***************************  | 180  |  |
|                                |  | ****************************   |      | ) A(L,2)=80*RND(1)   |
|                                |  | ****************************   |      | A(L,3)=(15*RND(1)+2)*2   |
|                                | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   | \$   | 210  |  |
|                                | \$\$\$\$\$\$\$\$\$\$\$\$\$\$   | \$   | 220  | ) T=3.14159*RND(1)   |
|                                | \$\$\$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   | 230  | ) A(L,5)=COS(T)  |
|                                | ****   | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   | 240  | A(L,6)=SIN(T)  |
| \$\$\$\$\$\$\$\$\$\$           |  | \$\$\$\$\$\$\$\$ \$\$\$\$\$\$\$\$  | 250  | ) A(L,7)=A(L,5)*A(L,6)   |
| \$\$\$\$\$\$\$\$\$\$           |  | \$\$\$\$\$\$\$\$\$<br>\$\$\$\$\$\$\$\$<br>\$\$\$\$\$\$   |      | A(L,5)=A(L,5)*A(L,5)   |
| \$5555555                      | \$\$\$\$\$\$\$   |  | 270  | A(L,6)=A(L,6)*A(L,6)   |
|                                | \$\$\$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$\$\$\$\$   | 280  | A(L,8)=A(L,1)*A(L,1)*A(L,6)  |
| \$\$<br>\$\$                   | 555555555555555555555555555555555555555  | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$<br>\$\$\$\$\$\$\$\$\$\$   | 290  | ) A(L,9)=A(L,1)*A(L,1)*A(L,5)  |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |  |      | A(L,10) = A(L,1) * A(L,7)  |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |  |      | A(L,11) = -2*A(L,1)*A(L,6) $A(L,12) = -2*A(L,1)*A(L,5)$  |
|                                | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |  |      | A(L,12) = -2 * A(L,1) * A(L,5) $A(1,13) = A(1,6) / A(1,4) + A(1,5) / A(1,3)$                                     |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |  |      | A(L,13)=A(L,6)/A(L,4)+A(L,5)/A(L,3)<br>NEXT L  |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$   |  |      |  |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$\$\$\$\$\$\$\$   |      | REM *** PRINT TOP BORDER; B\$ CONTAINS 36 DOLLAR SIGNS<br>B\$="\$      |
| 55                             | \$\$\$\$\$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$\$\$\$\$\$\$\$   |      | PRINT B\$;B\$  |
| \$\$                           | \$\$\$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$\$\$\$\$   |      | PRINT B\$;B\$  |
| \$\$                           | \$\$\$\$\$\$\$\$\$   | \$\$\$\$\$\$\$   |      | REM *** LOOP Y IS Y-COORDINATE OF PLOT; EACH TIME Y LOOP   |
| \$\$                           | and the second | 55   |      | REM *** IS EXECUTED, A LINE IS PRINTED   |
| 55                             |  | 55   |      | FOR Y=79.9 TO 0 STEP -1.6  |
| 55                             |  | The official state of the state |      | A\$="\$\$  |
| 55                             |  | 55   |      | REM *** LOOP E CHECKS THE EQUATION OF EACH ELLIPSE TO SEE  |
| 55                             |  | 55   | 440  | REM *** IF IT INTERSECTS THE LINE TO BE PRINTED  |
| 55                             |  | 55   | 450  | FOR E=1 TO M   |
| 55                             |  | \$5  | 460  | Y1=Y-A(E,2)  |
| \$\$                           |  | \$\$   |      | Y2=Y1*Y1   |
|                                |  | ***************************************  |      | Y3=Y1*A(E,10)  |
| \$\$\$\$\$\$\$\$\$\$\$\$<br>Dk | \$\$\$\$\$\$\$\$   | ****************************   | 490  | Y4=Y1+A(E,7)   |
| UK                             |  |  | 500  | B=(A(E,12)+Y4)/A(E,3)+(-Y4+A(E,11))/A(E,4)   |
|                                |  |  | 510  | C = (Y2*A(E, 6) + A(E, 9) - Y3) / A(E, 3) + (Y2*A(E, 5) + A(E, 8) + Y3) / A(E, 1)                                |
|                                |  |  | 520  | REM *** R IS THE RADICAL IN THE STANDARD QUADRATIC FORMUL  |
|                                |  |  |      | R=B*B-4*A(E,13)*C  |
| A CONTRACTOR & CONTRACTOR      |  |  |      | IF R<0 THEN 690  |
|                                |  |  |      | RESOR(R)   |
|                                |  |  |      | REM *** FIND WHERE THE LINE INTERSECTS THE ELLIPSE<br>R1=TNT(-(B+R)/2/4(F 13)+1)                                 |
|                                |  |  |      | R1=INT(-(B+R)/2/A(E,13)+1)   |
|                                |  |  |      | IF R1>34 THEN 690<br>R2=TNT((R-R)/2/4(F 13))   |
|                                |  |  |      | R2=INT((R-B)/2/A(E,13))<br>IF R2<1 THEN 690  |
|                                |  |  |      | IF R2<35 THEN 690  |
|                                |  |  |      | 1F R2<35 THEN 630<br>R2=34   |
|                                |  |  |      | R2=34<br>IF R1>0 THEN 660  |
|                                |  |  |      | R1=1   |
|                                |  |  |      | REM *** FILL IN THE LINE WHERE IT CROSSES THE ELLIPSE  |
|                                |  |  |      | FOR J=R1+2 TO R2+2   |
|                                |  |  |      | A\$=LEFT\$(A\$, J-1)+"\$"+RIGHT\$(A\$, LEN(A\$)-J)   |
|                                |  |  |      | NEXT J   |
|                                |  |  |      | NEXT E   |
|                                |  |  |      | REM *** PRINT LINE   |
|                                |  |  |      | PRINT A\$;   |
|                                |  |  |      | FOR K=36 TO 1 STEP -1  |
|                                |  |  |      | PRINT HIDS(AS,K,1);  |
|                                |  |  |      | NEXT K   |
|                                |  |  |      | NEXT Y   |
|                                |  |  | 760  | REM *** PRINT BOTTOM BORDER  |
|                                |  |  |      | PRINT B\$;B\$  |
|                                |  |  |      | PRINT B\$;B\$  |
|                                |  |  | 790  | END  |
|                                |  |  | Ok   |  |
|                                |  |  |      |  |

Joust

In this program you are a medieval knight in a jousting tournament. The prize to the winner of the tournament is the princess' hand in marriage. To win you must beat four other knights, the gold knight, the silver knight, the red knight, and the fierce black knight. On each pass of your opponent you must select one of eight different aiming points, such as the helm, lower left, face of shield, et cetera, and, based on your aiming point, you may select from three to six different defense positions such as a right lean or shield low.

Hap

As you proceed in the jousting tournament there are different intermediate outcomes such as getting knocked on the shield, breaking a spear, and so on. There are also some outcomes which end the contest such as your getting killed, or getting knocked from your horse.

This program was conceived and written by Alan Yarbrough.

LIST PRINT TAB(26);"JOUST" PRINT TAB(20);"CREATIVE COMPUTING" 10 20 PRINT TAB(18); "HORRISTOWN, NEW JERSEY" 30 40 PRINT:PRINT:PRINT INPUT"WHAT IS YOUR NAME, PLEASE";A\$ PRINT"SIR ";A\$;", YOU ARE A MEDIEVAL KNIGHT IN A JOUSTING TOURNAMENT." PRINT"THE PRIZE TO THE WINNER IS THE PRINCESS' HAND IN MARRIAGE." 100 120 121 122 PRINT "TO WIN, YOU MUST BEAT FOUR OTHER KNIGHTS." PRINT "TO JOUST, YOU PICK AN AIMING POINT FOR THE LANCE," 125 PRINT "AND THEN ONE OF FROM 3 TO 6 DIFFERENT POSSIBLE DEFENSE POSITIONS." 128 PRINT "THE AIMING POINTS ARE:" 130 PRINT "1- HELM" 150 PRINT "2- UPPER LEFT (OF SHIELD)" 200 250 PRINT "3- UPPER MIDDLE" PRINT "4- UPPER RIGHT" 300 PRINT "5- LOWER LEFT" 350 PRINT "6- LOWER MIDDLE" 400 PRINT "7- LOWER RIGHT" 450 PRINT "8- BASE OF SHIELD" 500 520 PRINT 530 PRINT "IF YOU BREAK A LANCE OR LOSE A HELM, YOU WILL BE GIVEN ANOTHER." PRINT "GOOD LUCK, SIR!" 550 555 PRINT 600 FOR A = 1 TO 4 650 ON A GOTD 800, 950, 1100, 1250 700 REM OFF YOU GO TO THE FOUR JOUSTS. 750 REM . 800 PRINT "THIS IS YOUR FIRST JOUST. YOU ARE UP AGINST THE GOLD KNIGHT." 850 GOTO 1400 PRINT "THIS IS YOUR SECOND JOUST. YOUR OPPONENT IS THE SILVER KNIGHT." 950 1000 60TD 1400 PRINT "YOU ARE DOING WELL! YOUR THIRD JOUST IS AGAINST THE RED KNIGHT." 1100 60TO 1400 1150 1250 PRINT "THIS IS YOUR FINAL TEST !! IF YOU WIN THIS ONE THE PRINCESS" PRINT "IS YOURS!!! THIS FIGHT IS AGAINST THE FIERCE BLACK KNIGHT!!!! 1270 INPUT "YOUR AIMING POINT(1-8)";B 1400 1450 IF B <1 OR B>8 THEN 1400 1470 PRINT "YOU MAY USE ONE OF THESE DEFENSES:" 1500 DN B GOTO 1550, 1650, 1750, 1850, 1550, 1750, 1550, 1950 1550 PRINT " 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW." 1600 60TO 2000 PRINT " 3-LEFT LEAN, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW." 1650 1700 60TO 2000 PRINT " 1-LOWER HELN, 2-RIGHT LEAN, 3-LEFT LEAN, 4-STEADY SEAT, " PRINT " 5-SHIELD HIGH, 6-SHIELD LOW." 1750 1755 1800 60TO 2000 1850 PRINT " 2-RIGHT LEAN, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW." 1900 GOTO 2000 PRINT " 1-LOWER HELM, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW." 1950 INPUT "WHAT IS YOUR CHOICE"; C 2000 2050 D = INT(RND(1)\*8) + 2100 ON D GOTO 2150, 2200, 2250, 2300, 2350, 2400, 2450, 2500 2150 ON C GOTO 2600, 2600, 2600, 2700, 2800, 2600 2200 DN C GOTO 2800, 2750, 2600, 2750, 2750, 2600 ON C GOTO 2850, 2800, 2650, 2750, 2950, 2900 2250 2300 ON C GOTO 2650, 2600, 2750, 2650, 2650, 2800 ON C GOTO 2750, 2950, 2600, 2750, 2600, ON C GOTO 2950, 2650, 2750, 2950, 2850, 2350 2750 2400 2750

ON C GDTO 2650, 2600, 2950, 2650, 2650, 2650

ON C GOTO 2750, 2650, 2850, 2750, 2850, 2750

2450

2500

PRINT "HE MISSED YOU!":S=0:GOTO 3000 2600 PRINT "HE HIT YOUR SHIELD BUT IT GLANCED OFF.":S=0:GOTO 3000 2650 PRINT "HE KNOCKED OFF YOUR HELM!":S=0:GOTO 3000 2700 PRINT "HE BROKE HIS LANCE.":S=0:GOTO 3000 2750 PRINT "HE HAS UNSEATED YOU(THUD!)":S=5:GOTO 3000 2800 PRINT "HE HAS BROKEN HIS LANCE, INJURED AND UNSEATED YOU (DUCH!)" 2850 2855 S=5:GOTO 3000 PRINT "HE HAS INJURED AND UNSEATED YOU (CRASH!)":S=5:60TO 3000 PRINT "HE HAS BROKEN HIS LANCE AND UNSEATED YOU (CLANG!)":S=5 2900 2950 E = INT(RND(1)\*6) + 13000 3050 ON D GOTO 3100, 3150, 3200, 3250, 3100, 3200, 3100, 3300 3100 IF E<4 THEN 3000 ELSE 3350 3150 IF E<3 THEN 3000 ELSE 3350 3200 GOTO 3350 3250 IF E=1 OR E=3 THEN 3000 ELSE 3350 3300 IF E = 2 OR E = 3 THEN 3000 3350 ON E GOTO 3400, 3450, 3500, 3550, 3600, 3650 ON B GOTO 3700, 3900, 3950, 3750, 3850, 4050, 3750, 3850 3400 DN B 6010 3700, 3700, 3700, 3750, 3850, 4050, 3750, 3850 DN B 6010 3700, 3850, 3900, 3700, 4050, 3750, 3700 DN B 6010 3700, 3750, 3850, 3700, 3850, 4050, 3700 DN B 6010 3800, 3850, 3850, 3750, 3850, 4050, 3750, 3850 DN B 6010 3900, 3850, 4050, 3750, 3700, 3950, 3750, 3850 DN B 6010 3700, 3700, 4000, 3900, 3850, 3850, 3750, 3850 PRINT "YOU MISSED HIM (HISS!)":T=0:6010 4100 3450 3500 3550 3600 3650 3700 PRINT "YOU HIT HIS SHIELD BUT GLANCED OFF.":T=0:GOTO 4100 PRINT "YOU KNOCKED OFF HIS HELM!(CHEERS!)":T=0:GOTO 4100 3750 3800 PRINT "YOU BROKE YOUR LANCE(CRACK...)":T=0:GOTO 4100 PRINT "YOU UNSEATED HIN (LOUD CHEERS AND HUZZAHS!!)":T=5:GOTO 4100 3850 3900 PRINT "YOU BROKE YOUR LANCE, BUT UNSEATED AND INJURED YOUR FOE." 3950 3955 T=5:60TD 4100 4000 PRINT "YOU INJURED AND UNSEATED YOUR OPPONENT.":T=5:GOTO 4100 4050 PRINT "YOU BROKE YOUR LANCE BUT UNSEATED YOUR OPPONENT.":T=5:GOTO 4100 4100 IF S = T AND S = 0 THEN 4450 4150 IF S = T GOTO 44004200 IF S<T GOTO 4300 4250 IF S>T GOTO 4350 4300 PRINT "YOU HAVE WON THIS JOUST.":PRINT:GOTO 4320 4320 NEXT A GOTO 4550 4330 PRINT "TOO BAD, YOU LOST. HOPE YOUR INSURANCE WAS PAID UP.": GOTO 4500 4350 PRINT "TOO BAD, YOU BOTH LOST. AT LEAST YOUR HONOR IS INTACT.":GOTO 4500 PRINT "YOU ARE NOW READY TO TRY AGAIN.":GOTO 1400 PRINT "SORRY, BETTER LUCK NEXT JOUST.":GOTO 9999 4400 4450 4500 4550 PRINT "HOORAY! YOU ARE THE WINNER. HERE COMES THE BRIDE!" 9999 END Ok

RUN

JOUST CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

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WHAT IS YOUR NAME, PLEASE? STEVE
SIR STEVE, YOU ARE A MEDIEVAL KNIGHT IN A JOUSTING TOURNAMENT.
THE PRIZE TO THE WINNER IS THE PRINCESS' HAND IN MARRIAGE.
                                                                                      YOU ARE NOW READY TO TRY AGAIN.
                                                                                      YOUR AIMING POINT(1-8)? 2
                                                                                      YOU MAY USE ONE OF THESE DEFENSES:
TO WIN, YOU HUST BEAT FOUR OTHER RNIGHTS.
To Joust, you pick an aiming point for the lance,
                                                                                      3-LEFT LEAN, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LW
WHAT IS YOUR CHOICE? 3
AND THEN ONE OF FROM 3 TO 6 DIFFERENT POSSIBLE DEFENSE POSITIONS.
                                                                                      HE BROKE HIS LANCE.
THE AIMING POINTS ARE:
                                                                                      YOU MISSED HIM (HISS!
1- HELM
                                                                                      YOU ARE NOW READY TO TRY AGAIN.
2- UPPER LEFT (OF SHIELD)
                                                                                      YOUR AIMING POINT(1-8)? 3
3- UPPER MIDDLE
                                                                                      YOU MAY USE ONE OF THESE DEFENSES:
4- UPPER RIGHT
                                                                                               1-LOWER HELM, 2-RIGHT LEAN, 3-LEFT LEAN, 4-STEADY SEAL
5- LOWER LEFT
                                                                                               5-SHIELD HIGH, 6-SHIELD LOW.
6- LOWER MIDDLE
                                                                                      WHAT IS YOUR CHOICE? 4
7- LOWER RIGHT
                                                                                      HE KNOCKED OFF YOUR HELM!
8- BASE OF SHIELD
                                                                                      YOU BROKE YOUR LANCE (CRACK ..
                                                                                      YOU ARE NOW READY TO TRY AGAIN.
                                                                                      YOUR AIMING POINT(1-8)? 3
IF YOU BREAK A LANCE OR LOSE A HELM, YOU WILL BE GIVEN ANOTHER.
GOOD LUCK, SIR!
                                                                                      YOU MAY USE ONE OF THESE DEFENSES:
                                                                                               1-LOWER HELM, 2-RIGHT LEAN, 3-LEFT LEAN, 4-STEADY SEN.
THIS IS YOUR FIRST JOUST. YOU ARE UP AGINST THE GOLD KNIGHT.
                                                                                               5-SHIELD HIGH, 6-SHIELD LOW.
YOUR AIMING POINT(1-8)? 4
                                                                                      WHAT IS YOUR CHOICE? 4
YOU MAY USE ONE OF THESE DEFENSES:
                                                                                      HE HIT YOUR SHIELD BUT IT GLANCED OFF.
2-RIGHT LEAN, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW.
WHAT IS YOUR CHOICE? 2
                                                                                      YOU BROKE YOUR LANCE BUT UNSEATED YOUR OPPONENT.
                                                                                      YOU HAVE WON THIS JOUST.
HE MISSED YOU!
YOU UNSEATED HIM (LOUD CHEERS AND HUZZAHS!!)
                                                                                      YOU ARE DOING WELL! YOUR THIRD JOUST IS AGAINST THE RED KHIM
YOU HAVE WON THIS JOUST.
                                                                                      YOUR AIMING POINT(1-8)? 8
                                                                                      YOU MAY USE ONE OF THESE DEFENSES:
                                                                                              1-LOUER HELN, 4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD
YOUR CHOICE? 1
THIS IS YOUR SECOND JOUST. YOUR OPPONENT IS THE SILVER KNIGHT.
YOUR AIMING POINT(1-8)? 5
                                                                                      WHAT IS YOUR CHOICE?
YOU MAY USE ONE OF THESE DEFENSES:
                                                                                      HE HAS UNSEATED YOU(THUD!)
         4-STEADY SEAT, 5-SHIELD HIGH, 6-SHIELD LOW.
                                                                                      YOU BROKE YOUR LANCE(CRACK .... )
WHAT IS YOUR CHOICE? 4
                                                                                      TOO BAD, YOU LOST. HOPE YOUR INSURANCE WAS PAID UP.
HE BROKE HIS LANCE.
                                                                                      SORRY, BETTER LUCK NEXT JOUST.
YOU BROKE YOUR LANCE(CRACK ... )
                                                                                      Ok
```



Jumping balls is a solitaire board game played with a board having nine holes in a line that can be filled with four white balls to the right end and four black balls to the left end. Without a board, it can be played with coins or chips. The object of the game is to reverse the position of the balls (or other objects) from one end of the board to the other.

You may make a move by moving a ball to the immediately adjacent empty hole or by jumping one other ball. You may not jump two or more balls. Holes are numbered from left to right. At the beginning of the game, hole number five is free. Consequently, a legitimate first move would be six to five, four to

JUNPING BALLS CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

RUN

INSTRUCTIONS? YES IN THIS GAME YOU ARE GIVEN 8 BALLS ON A 9 HOLE BOARD. THE OBJECT IS TO REVERSE THE ORDER OF THE BALLS THE 'S' ARE SILVER BALLS AND THE 'G' ARE GOLD. YOU HUST GET THE SILVER TO WHERE THE GOLD ARE AND THE GOLD TO WHERE THE SILVER ARE. THE SPACE IS A PERIOD ON THE BOARD. GOOD LUCK!! HERE IS THE BOARD: 5 5 5 5 . 6 6 6 6 MOVE? 6,5 5 5 5 5 6 . 6 6 6 MOVE? 4,6 555.65666 MOVE? 5.4 5556.5666 MOVE? 7,5 555665.66 MOVE? 6,7 55566. 566 MOVE? 5,6 SSSG. GSGG MOVE? 6,5 5 5 5 6 6 . 5 6 6 MOVE? 5,6 \$ \$ \$ 6 . 6 5 6 6 MOVE? 3,5 SS. GSGSGG MOVE? 4,3 SSG. SGSG G MOVE? 6,4 5 5 6 6 5 . S 6 6 MOVE? 8,6 5 5 6 6 5 6 5 . 6 MOVE? 7,8 5 5 6 6 5 6 . 5 6 MOVE? 5,6 SPACE 6 IS OCCUPIED HOVE? 5,7 5566.6556 MOVE? 4,5 556.66556 MOVE? 2,4 5.6566556 MOVE? 3,2 56.566556 MOVE? 1,3 . 6 5 5 6 6 5 5 6 MOVE? 2,1 6.5566556 MOVE? 3.2 6 S . S 6 6 S S 6 MOVE? 5,3 5 5 5 5 6 5 5 5 6 MOVE? 4,5 5 6 5 6 5 6 5 5 6 MOVE? 4,5 6 5 6 5 6 5 6 5 5 6 MOVE? 7,6 6 5 6 5 6 5 6 5 5 6 MOVE? 9,7 6 5 6 5 6 5 6 5 6 5 MOVE? 8,9 6 5 6 5 6 5 6 5 6 5 MOVE? 4,8 6 5 6 5 6 . 6 5 5 MOVE? 4,6 6 5 6 . 6 5 6 5 5 MOVE? 2,4 6.6565655 MOVE? 3,2 06.565655 MOVE? 5,3 6 6 6 5 . 5 6 5 5 MOVE? 7,5 6 6 5 5 6 5 . 5 5 MOVE? 7,5 6 6 5 6 5 6 5 . 5 5 MOVE? 4,6 6 6 6 . 6 5 5 5 5 MOVE? 5,4 YOU WIN!!!

YOU COMPLETED THE GAME IN 34 HOVES!!!! ASAIN? NO DL five, three to five, which would be a jump, or seven to five, another jump.

The computer does not rank your playing ability but, as a hint, you ought to be able to complete the game in fewer moves than are shown in our sample run.

The original author of this game was Anthony Rizzolo.

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LIST
10 PRINT TAB(22);"JUMPING BALLS"
20 PRINT TAB(20);"CREATIVE COMPUTING"
30 PRINT TAB(18);"NORRISTOWN, NEW JERSEY"
40 PRINT:PRINT:PRINT
1040 DIM Q(9,1)
1050 PRINT "INSTRUCTIONS":
 1060 INPUT AS
1000 IMPUT AS

1070 IF LEFT$(A$,1)="N" THEN 1150

1080 PRINT " IN THIS GAME YOU ARE GIVEN B BALLS ON A 9 HOLE"

1090 PRINT "BDARD. THE OBJECT IS TO REVERSE THE ORDER OF THE BALLS"

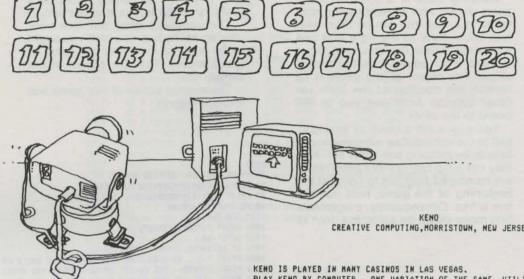
1000 PRINT "THE 'S' ARE SILVER BALLS AND THE 'G' ARE GOLD."

1100 PRINT "YOU MUST GET THE SILVER TO WHERE THE GOLD ARE AND"

1120 PRINT "THE GOLD TO WHERE THE SILVER ARE. THE SPACE IS"

1126 PRINT "A PERIOD ON THE BOARD."
1130 PRINT "GOOD LUCK!! HERE IS THE BOARD:"
1140 S=0
1150 FOR X=1 TO 4
1160 LET 9(X,1)=1
1170 NEXT X
1180 LET @(5,1)=0
1190 FOR X=6 TO 9
1200 LET @(X,1)=2
1210 NEXT X
1220 LET A$=".58"
1230 FOR X=1 TO 9
1240 PRINT MIDS(AS,Q(X,1)+1,1);
1250 PRINT * ";
1260 NEXT X
1265 5=5+1
1270 PRINT "MOVE";
1280 INPUT M.MI
1290 IF H<=9 AND H>=1 AND H1<=9 AND H1>=1 THEN 1320 1300 PRINT "ILLEGAL HOVE"
1310 GOTO 1270
1320 REM: CHECK FOR LEGAL MOVE
1330 IF M+1=M1 OR M-1=M1 THEN 1430
1340 REN: SUBROUTINE FOR CHECKING JUMPS
1350 IF M=9 THEN 1390
1360 IF M=1 THEN 1410
1370 IF Q(H+1,1)=0 DR Q(H-1,1)=0 THEN 1300
1380 GOTO 1420
1390 IF Q(M-1,1)=0 THEN 1300
1400 GOTO 1420
1410 IF @(M+1,1)=0 THEN 1300
1420 IF M+2<>M1 AND M-2<>M1 THEN 1300
1430 IF B(H,1)<>0 THEN 1460
1440 PRINT "NOTHING AT SPACE";M
1450 GOTO 1270
1460 IF D(M1,1)=0 THEN 1490
1470 PRINT "SPACE";N1;"IS OCCUPIED"
1480 GOTO 1270
1490 LET Q(M1,1)=Q(M,1)
1500 LET Q(H,1)=0
1510 X9=Q(1,1)+Q(2,1)+Q(3,1)+Q(4,1)
1510 X9=Q(1,1)+Q(2,1)+Q(3,1)+Q(4,1)
1512 Y9=Q(6,1)+Q(7,1)+Q(8,1)+Q(9,1)
1514 IF X9=8 AND Y9=4 THEN 1530
1520 GDTO 1230
1530 PRINT "YOU WIN!!!"
1535 PRINT "YOU COMPLETED THE GAME IN ";S;" MOVES!!!!"
1540 PRINT "AGAIN";
1550 INPUT AS
1560 IF LEFT$(A$,1)="Y" THEN 1130
1570 END
Dk
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Keno is strictly an American invention that originated in the casinos in Nevada, perhaps in Reno. During the game, twenty numbers from one to eighty are selected at random. Prior to each game at the casino, the player may choose from one to fifteen numbers, or "spots" he thinks will be selected during the game. The player enters, or "marks," the desired spots and places a bet. At the end of each game, the spots marked by the player are compared with the twenty numbers and the payoff is computed accordingly. Keno seems to have a high attraction in Las Vegas because the betting is very simple and the maximum payoff is very high (\$25,000). Nevertheless, the probability of winning is extremely low; indeed, Keno returns more to the house than virtually any other game.

In this particular computersized version of Keno, there is only one player and he has the option only of betting eight different spots. In Nevada the normal bet is in multiples of 60¢; however, in this game the bet will be \$1.20 with no multiples possible. The payoff with eight spots marked is as follows:

| Spots | Payoff      |
|-------|-------------|
| 5     | \$10.00     |
| 6     | \$100.00    |
| 7     | \$2,200.00  |
| 8     | \$25,000.00 |

There is no payoff for zero, one, two, three, or four correct.

This version of Keno was originally written by Vincent Fazio.

CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY

PLAY KEND BY COMPUTER. ONE VARIATION OF THE GAME, UTILIZES THE RANDOM NUMBER GENERATOR.

THE PLAYER CHOOSES 8 DIFFERENT NUMBERS FROM 1 TO 80 INCLUSIVE, AND BETS \$1.20. THE COMPUTER WILL SELECT 20 NUMBERS AT RANDOM AND WILL ELIMINATE DUPLICATES WHICH MAY OCCUR . ANOTHER NUMBER WILL BE INSERTED IN ITS PLACE SO THAT THE COMPUTER WILL OUTPUT 20 DIFFERENT NUMBERS.

HERE WE GO!!!! THE COMPUTER WILL DUTPUT A ? MARK. TYPE A NUMBER FROM 1 TO BO, INCLUSIVE, AND PRESS THE RETURN KEY. REPEAT THIS PROCESS UNTIL THE ? MARK IS NO LONGER SHOWN. 7 1 7 23

7 65 7 2

THE COMPUTER WILL SELECT 20 NUMBERS AT RANDOM. THE BELL TONE INDICATES IT IS IN THE PROCESS OF SELECTING THE NUMBERS.

YOUR NUMBERS ARE: 1 23 24 35 46 77 65 2

THE COMPUTER HAS SELECTED THE FOLLOWING NUMBERS: **33 5 74 69 44 7 45 48 80 36 45 50 26 25 38 77 6 49 15 51** 

THE PROGRAM WILL COMPARE YOUR NUMBERS WITH THE NUMBERS THE COMPUTER HAS SELECTED.

LISTEN FOR THE BELL TONE--- EACH RING INDICATES ANOTHER CORRECT GUESS BY YOU. YOU HAVE GUESSED THE FOLLOWED NUMBERS:

77

YOU CAUGHT 1 NUMBERS OUT OF 8--NOT ENOUGH CORRECT GUESSES -- 'SO SOLLY', NO PAYOFF.

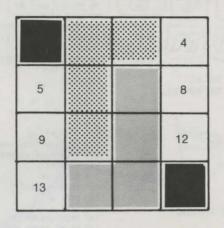
TOU WANT TO PLAY KENO AGAIN? 62 C=C+1 "E 'YES' OR 'NO' 63 PRINT"A DUPLICATE NUMBER HAS BEEN DETECTED IN YOUR INPUT." 64 PRINT"TYPE ANOTHER NUMBER, PLEASE.": INPUT Y 65 IF Y=0 THEN 70 66 IF Y>80 THEN 70 HE WE GOILL 67 IF Y<0 THEN 70 ECOMPUTER WILL OUTPUT A ? MARK. TYPE A NUMBER FROM 68 A(J+1)=Y 1880, INCLUSIVE, AND PRESS THE RETURN KEY. REPEAT THIS MESS UNTIL THE ? MARK IS NO LONGER SHOWN. 69 GOTO 61 70 PRINT "TYPE A NUMBER FROM 1 TO 80, INCLUSIVE, PLEASE." 71 GOTO 64 72 NEXT J 73 NEXT K :PRINT:PRINT 75 IF C=0 THEN 88 76 GOTO 58 88 PRINT" THE COMPUTER WILL SELECT 20 NUMBERS AT RANDOM. THE BELL " 91 PRINT TONE INDICATES IT IS IN THE PROCESS OF SELECTING THE NUMBERS." 100 FOR L=1 TO 20 103 N(L)=INT(80\*RND(80)+1) 106 M(L)=N(L) WE COMPUTER WILL SELECT 20 NUMBERS AT RANDOM. THE BELL 109 NEXT L WE INDICATES IT IS IN THE PROCESS OF SELECTING THE NUMBERS. 110 L=21 112 FOR K=1 TO 20 115 FOR J=K TO L-1 OR NUMBERS ARE: 118 X=M(K) 1 65 7 25 46 75 1 55 121 Y=M(J+1) 124 IF X Y THEN 139 130 M(J+1)=INT(80\*RND(1)+1) WE COMPUTER HAS SELECTED THE FOLLOWING NUMBERS: 133 Y=M(.1+1) 4 26 12 38 9 18 23 69 12 8 6 51 46 73 71 14 35 79 136 GOTO 124 139 PRINT CHR\$(7): 142 NEXT J E PROGRAM WILL COMPARE YOUR NUMBERS WITH THE 145 NEXT K INTERS THE COMPUTER HAS SELECTED. 147 PRINT:PRINT 148 PRINT "YOUR NUMBERS ARE:" 151 FOR I=1 TO 8 ISTEN FOR THE BELL TONE--- EACH RING INDICATES ANOTHER 154 PRINT A(I): INRECT GUESS BY YOU. 157 NEXT I: PRINT:PRINT:PRINT 160 PRINT" THE COMPUTER HAS SELECTED THE FOLLOWING NUMBERS:" IN HAVE GUESSED THE FOLLOWED NUMBERS: 163 FOR L=1 TO 20 167 PRINT M(L); 170 NEXT L:PRINT:PRINT 173 PRINT"THE PROGRAM WILL COMPARE YOUR NUMBERS WITH THE " 176 PRINT"NUMBERS THE COMPUTER HAS SELECTED." 179 PRINT:PRINT 182 PRINT"LISTEN FOR THE BELL TONE--- EACH RING INDICATES ANOTHER" W CAUGHT 2 NUMBERS OUT OF 8--185 PRINT "CORRECT GUESS BY YOU.": WT ENOUGH CORRECT GUESSES -- 'SO SOLLY', NO PAYOFF. 188 PRINT "YOU HAVE GUESSED THE FOLLOWED NUMBERS:" 191 G=0 194 I=1 10 YOU WANT TO PLAY KEND AGAIN? 197 FOR J=1 TO 20 TIPE 'YES' OR 'NO' 200 X=A(I) 1 10 203 Y=M(J) THAT'S ALL FOR NOW. PLAY KEND AGAIN, BE SEEING YOU. 206 IF X=Y THEN 213 209 NEXT J 210 GOTO 225 213 PRINT CHR\$(7): 216 FOR V1=1 TO 3976:NEXT V1 219 PRINT A(I): 222 6=6+1 225 I=I+1:PRINT:IF 1<>8 THEN 197 228 IF 6<5 THEN 242 231 IF G=5 THEN 261 PRINT TAB(34)"KENO" 234 IF G=6 THEN 267 PRINT TAB(15)" CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY" 237 IF G=7 THEN 273 101H N(21), H(23), A(8) 240 IF G=8 THEN 279 PRINT: PRINT: PRINT 242 PRINT "YOU CAUGHT";G; "NUMBERS OUT OF 8--" 10 PRINT"KEND IS PLAYED IN MANY CASINDS IN LAS VEGAS." 243 PRINT "NOT ENOUGH CORRECT GUESSES-- 'SO SOLLY', NO PAYOFF." I PRINT "PLAY KEND BY COMPUTER. ONE VARIATION OF THE GAME, UTILIZES" 245 PRINT:PRINT IN PRINT"THE RANDOM NUMBER GENERATOR." 246 PRINT "DO YOU WANT TO PLAY KENO AGAIN?" 10 PRINT 249 PRINT "TYPE YES' OR 'NO' 1) PRINT"THE PLAYER CHOOSES 8 DIFFERENT NUMBERS FROM 1 TO 80" 250 C=0 11 PRINT"INCLUSIVE, AND BETS \$1.20. THE COMPUTER WILL SELECT" 251 INPUT XS 24 PRINT"20 NUMBERS AT RANDOM AND WILL ELIMINATE DUPLICATES WHICH" 252 IF X\$= "YES" THEN 38 253 IF X\$="NO" THEN 299 21 PRINT "MAY OCCUR . ANOTHER NUMBER WILL BE INSERTED IN ITS PLACE" **IPRINT"SO THAT THE COMPUTER WILL OUTPUT 20 DIFFERENT NUMBERS.** 254 C=C+1 15 PRINT: PRINT 255 IF C=3 THEN 299 3 PRINT: PRINT: PRINT "HERE WE GO !!!!" 256 PRINT "TYPE YES OR 'NO'" 4 PRINT"THE COMPUTER WILL OUTPUT A ? MARK. TYPE A NUMBER FROM " 257 GOTO 251 4 PRINT"1 TO 80, INCLUSIVE, AND PRESS THE RETURN KEY. REPEAT THIS" 4 PRINT"PROCESS UNTIL THE ? MARK IS NO LONGER SHOWN." 258 IF X\$="NO" THEN 299 259 PRINT "TYPE YES OR NO PLEASE!!" 261 PRINT "YOU CAUGHT";G; "NUMBERS DUT OF 8--YOU WIN \$10.00" 48 FOR I=1 TO 8 50 INPUT A(I) 264 PRINT:PRINT:GOTO 246 51 IF A(I)>80 THEN 56 267 PRINT "YOU CAUGHT";G; "NUMBERS OUT OF 8--YOU WIN \$100.00" 53 IF A(I)=0 THEN 56 270 PRINT:PRINT:GOTO 246 54 IF A(I)<0 THEN 56 273 PRINT "YOU CAUGHT ";G; "NUMBERS OUT OF 8--YOU WIN \$2200.00" 55 GOTO 57 276 PRINT: PRINT: GOTO246 SPRINT"TYPE A NUMBER FROM 1 TO 80 , INCLUSIVE, PLEASE.": GOTO 50 279 PRINT "YOU CAUGHT ";G; "NUMBERS OUT OF 8--YOU WIN \$25000.00" 57 NEXT I 282 PRINT "8 OUT OF 8 DOES NOT OCCUR TOO OFTEN, LUCKY." 58 C=0:FOR K=1 TO7 285 PRINT:PRINT:GOTO 246 59 FOR J=K TO 7 299 PRINT "THAT'S ALL FOR NOW. PLAY KEND AGAIN, BE SEEING YOU." 60 X=A(K):Y=A(J+1) 300 END dl IF X<>Y THEN 72 DK



The L-game is a 2-player strategic game played on a 4x4 grid. It was originally devised by Edward de Bono and appeared in the book, "The Five-Day Course in Thinking." In the game, each player has one 'L' which covers four squares (3 high x 2 across). The two L's are labelled differently to avoid confusion. There are also two neutral 'boxes' each the size of a single square on the grid. To play the game with the computer the grid positions must be numbered as follows:

| 1  | 2  | 3  | 4  |
|----|----|----|----|
| 5  | 6  | 7  | 8  |
| 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 |

Play always begins with all the pieces on the board in this position:



The object of the game is simply to position one's L and the neutral boxes to pin the other player's L. Each move is a mixture of offense and defense, for one is not only trying to pin the other player's L, but also trying to prevent his own L from being pinned.

Either player may move first. To move, one must pick up his L and move it to a different position on the board. The player may flip his L over, rotateit 90 degrees, etc. The L must not cover any other pieces or hang off the edge of the board. If a player is unable to move his L, or simply cannot find a move, he loses the game. Once the player has successfully moved his L to a new position on the board, he then has the option of moving the neutral boxes. He may move the boxes only to unoccupied positions and he has the option of moving one box, both boxes, or leaving the boxes where they are. By using the boxes effectively, one can block off moves for the other player'sL and possibly pin him. After the player moves the boxes (or decides not to move one or both) it is the other player's turn and play continues in the same manner.

The computer version of the L Game was written by Bill Gardner.

RUN

L-GAME CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

### INSTRUCTIONS? YES

L-game is a simple strategic game played on a 4x4 grid by two opposing players, in this case between you and the computer. The grid is numbered as follows:

: 1:: 2:: 3:: 4: : 5:: 6:: 7:: 8: : 9::10::11::12: :13::14::15::16:

The game is played with four pieces; both you and the computer have one 'L', and there are two 'BOXES' which are used by both players. play always begins with the pieces on the board in the following position:

\*\*\*\*///////: 4: \* \*///////: 4: \*\*\*\*////000=== : 5:///0000: 8: ===///0000=== : 9:///0000=== : 9:///0000=== ===00000000\*\*\* :13:0000000\*\*\* The object of the game is to position your own L and the boxes to prevent the computer from moving its L. Of course, it is trying to do the same to you! To move, you must simply enter the four coordinates where you want to place your L. It must remain on the board and must not cover any other pieces. You must move your L! If you cannot find a new position for your L, then the computer has effectively pinned your L and it wins the game.

Assuming you have successfully moved your L, you now have the option of moving the boxes. You may move one, two, or none of the boxes by simply entering the coordinates where you want to put them. To leave a box where it is, enter its present position.

After you move the boxes, it is up to the computer to find a move for its L and play continues in the same manner. Remember that you must not only try to pin the computer's L but also keep your own L from being pinned. Also, it is easier to play the game with your own board than the computer printout. To resign, enter 0,0,0,0 in place of your move. GOOD LUCK!

BOARD PRINTOUT? YES DO YOU WISH TO START? NO

COMPUTER MOVES TO 2 6 10 9 MOVES BOXES TO 12 AND 16

YOUR MOVE FOR L? 4,3,7,11 YOUR MOVE FOR THE BOXES? 1,0 O.K.

| ****////00000000  |
|-------------------|
| * *////00000000   |
| ****////00000000  |
| ====////0000===== |
| : 5:////0000: 8:  |
| ====////0000===== |
| //////0000=====   |
| //////0000:12:    |
| //////0000=====   |
|                   |
| :13:* *:15::16:   |
|                   |

| W MOVE FOR L? 3,7,11,12  | COMPUTER MOVES TO 1 2 3 7               | YOUR MOVE FOR L? 5,9,10,11           |
|--|---|--------------------------------------|
| M HOVE FOR THE BOXES? 2,10   | MOVES BOXES TO 6 AND 10                 | YOUR MOVE FOR THE BOXES? 2,7<br>O.K. |
| ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~  | ////////====                            | 0.4.                                 |
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| Im IN IN   | : 5:* *////: 8:                         | 0000====****////                     |
| 11: 6:0000: 8: C .AME/   | ====*****////=====                      | 0000: 6:* *////                      |
| 1 GAMES  | ====*****0000=====                      | 0000====****///                      |
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| * *0000000   | ====****0000====                        | 0000000000////                       |
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|  | 0000000000:16:                          |                                      |
| <i>M////:</i> 15::16:  | 00000000000====                         | :13::14::15::16:                     |
|  |   |                                      |
|  | YOUR MOVE FOR L? 4,8,11,12              |                                      |
| WPUTER MOVES TO 5 9 13 6   | YOUR MOVE FOR THE BOXES? 6,14           | COMPUTER MOVES TO 8 12 16 15         |
| MOVES BOXES TO 10 AND 8  | 0.K.                                    | MOVES BOXES TO 6 AND 7               |
|  |   |                                      |
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| and the second se  |   |                                      |
| WR HOVE FOR L? 7,11,15,16  | COMPUTER MOVES TO 1 5 9 10              | YOUR MOVE FOR L? 11,10,9,13          |
| THE HOVE FOR THE BOXES? 10.3   | MOVES BOXES TO 6 AND 7                  | YOUR MOVE FOR THE BOXES? 3.7         |
| hl.  |   | 0.K.                                 |
|  | ////=======0000                         |                                      |
|  | ////: 2:: 3:0000                        | ======****====                       |
| 11:: 2:* *: 4:   | ////=======0000                         | : 1:: 2:* *: 4:                      |
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| //////000====  | ////* ** *0000                          |                                      |
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| ////====00000000   | :13::14::15::16:                        | 0000====///////                      |
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| ////====00000000   |   | 0000====///////                      |
|  | YOUR MOVE FOR L? 11.13.12.14            |                                      |
| CIMPUTER MOVES TO 1 5 9 2  | ILLEGAL MOVE FOR L.                     | COMPUTER MOVES TO 14 15 16 13        |
| HOVES BOXES TO 6 AND 10  |   | MOVES BOXES TO 6 AND 7               |
|  |   |                                      |
| //////=======  | YOUR MOVE FOR L? 11,13,14,15            |                                      |
| //////: 3:: 4:   | YOUR MOVE FOR THE BOXES? 2,7            | : 1:: 2:: 3:: 4:                     |
| //////======   | 0.K.                                    |                                      |
| ////****0000====   |   | ====*******=====                     |
| ////# #0000: 8:  | ////****=============================== | : 5:* ** *: 8:                       |
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| TUR HOVE FOR L? 11,15,14,13  | 0000000000:16:                          | YOUR MOVE FOR L? 5,9,10,11           |
| TOUR MOVE FOR THE BOXES? 6,10  | 00000000000====                         | YOUR MOVE FOR THE BOXES? 3,8         |
| ам.  |   | 0.K.                                 |
| //////======   | COMPUTER MOVES TO 4 8 12 3              |                                      |
|  | MOVES BOXES TO 6 AND 7                  |                                      |
| //////: 3:: 4:   | HOVED DUXED TO O HRD 7                  | : 1:: 2:* *: 4:                      |
| //////=======  |   | ======****====                       |
| ////####=======  | ======////////                          | 0000=======****                      |
| ////* *: 7:: 8:  | : 1:: 2:///////                         | 0000: 6:: 7:* *                      |
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| MM00000000   |   | (11/1//////                          |
|  |   | CONCRATH ATTONNA VOIL VIEW VIEW      |
|  | 00000000000:16:                         | CONGRATULATIONS! YOU HAVE WON.       |

PLAY AGAIN? NO

```
LIST
10 PRINT TAB(26);"L-GAME"
11 PRINT TAB(20);"CREATIVE COMPUTING"
12 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
13 PRINT:PRINT:PRINT
20 DIM C(4),O(4),T(4),B(16),N(16),M(100)
25 PRINT "INSTRUCTIONS";
30 INPUT AS
35 IF LEFT$(A$,1)="Y" THEN 3000
40 PRINT "BOARD PRINTOUT";
45 INPUT AS
50 IF LEFT$(A$,1)="N" THEN 65
55 LET F2=0
60 GOTO 70
65 LET F2=1
70 GDSUB 100
80 GOTO 210
100 REM INITIALIZE DATA
101 REM B1, B2 = POSITIONS OF BOXES
102 REM C(1,2,3,4) = COMPUTER'S POSITION (L)
103 REM D(1,2,3,4) = OPPONENT'S POSITION (L)
104 REH D(1,2,3,4) = 677,10,11 = CENTER POSITIONS
105 REH B(1,...16) = BOARD:
106 REH B(1,...16) = EMPTY
107 REH B(X)=0 EMPTY
107 REH B(X)=1 OPPONENT'S L
108 REM
            B(X)=2
                        COMPUTER'S L
                      BOX
109 RFM
             B(X)=3
115 RESTORE
120 DATA 1,16,2,7,6,6,11,7,10,15,10,3,14,11
130 DATA 3,2,2,0,0,2,1,0,0,2,1,0,0,1,1,3
140 READ 81,82
150 FOR X=1 TO 4
160 READ C(X), D(X), T(X)
170 NEXT X
180 FOR X=1 TO 16
190 READ B(X)
200 NEXT X
205 RETURN
210 PRINT "DO YOU WISH TO START";
215 INPUT AS
220 IF LEFT$(A$,1)="N" THEN 500
230 REM OPPONENT'S MOVE
235 GOSUB 2270
240 PRINT
245 PRINT "YOUR MOVE FOR L";
250 INPUT D(1), D(2), D(3), D(4)
255 IF ABS(D(1))+ABS(D(2))+ABS(D(3))+ABS(D(4))=0 THEN 1280
260 REM BUBBLE SORT
265 FOR X=1 TO 4
270 FOR Y=2 TO 4
275 IF D(Y)>D(Y-1) THEN 295
280 LET Z=D(Y)
285 LET D(Y)=D(Y-1)
290 LET D(Y-1)=Z
295 NEXT Y
300 NEXT X
305 REM CHECK LEGALITY
310 FOR X=1 TO 4
315 LET N(X)=D(X)
320 NEXT X
325 LET N1=4
330 LET F1=0
335 GOSUB 1800
340 IF M1<>4 THEN 1220
345 FOR X=1 TO 4
350 IF B(M(X))>1 THEN 1220
355 NEXT X
360 FOR X=1 TO 4
365 LET B(O(X))=0
370 NEXT X
375 FOR X=1 TO 4
380 LET B(M(X))=1
385 LET D(X)=M(X)
390 NEXT X
395 LET B(B1)=0
400 LET B(B2)=0
405 PRINT "YOUR HOVE FOR THE BOXES":
410 INPUT X,Y
415 IF ABS(X)+ABS(Y) >X+Y THEN 1250
416 IF X=Y THEN 1250
420 IF B(X)+B(Y)>0 THEN 1250
430 LET B1=X
440 LET B2=Y
450 LET B(B1)=3
460 LET B(B2)=3
470 PRINT "D.K."
475 GOSUB 2270
```

```
480 REM COMPLITER'S MOVE
490 REM REMOVE C(1-4) FROM BOARD
500 FOR X=1 TO 4
510 LET B(C(X))=0
520 NEXT X
530 GOSUB 1420
540 LET F1=1
550 LET N1=Z
560 GOSUB 1800
570 IF M1=0 THEN 1300
580 REM FIND MOVE WITH BEST CENTER COVERAGE
585 GOSUB 1370
590 FOR E=0 TO M1-4 STEP 4
600 FOR F=1 TO 4
610 FOR G=1 TO 4
620 IF M(E+F)<>T(G) THEN 640
630 LET N(E/4+1)=N(E/4+1)+
640 NEXT G
650 NEXT F
660 NEXT E
670 GOSUB 1500
680 REM PUT MOVE IN C(1-4)
690 LET Y=(Z-1)*4
700 FOR X=1 TO 4
710 LET C(X)=M(X+Y)
720 LET B(C(X))=2
730 NEXT X
740 PRINT
750 PRINT "COMPUTER MOVES TO ";C(1);" ";C(2);" ";C(3);" ";C(4)
760 REM FIND MOVES FOR BOXES
765 REM REMOVE BOXES FROM BOARD
770 LET B(B1)=0
780 LET B(B2)=0
790 REM IS OPPONENT IN CORNER?
800 FOR I=1 TO 4
810 FOR J=1 TO 4
820 IF D(I)=T(J) THEN 870
830 NEXT .1
840 NEXT I
845 REM OPPONENT IN CORNER, IGNORE CENTER
850 GOTO 1020
860 REM OPPONENT NOT IN CORNER, FILL CENTER WITH BOXES
870 FOR X=1 TO 4
880 IF B(T(X))>0 THEN 920
890 LET B1=T(X)
900 LET B(B1)=3
910 GOTO 950
920 NEXT X
930 REM NO SPACES IN CENTER
940 GOTO 1020
950 FOR X=1 TO 4
960 IF B(T(X))>0 THEN 1000
970 LET B2=T(X)
980 LET B(B2)=3
990 GOTO 1080
1000 NEXT X
1005 REM CENTER FILLED
1010 GOTO 1050
1015 REM BOTH BOXES TO BE POSITIONED
1020 GOSUB 1610
1030 LET B1=B3
1040 LET B(B1)=3
1045 REM ONE BOX TO BE POSITIONED
1050 GOSUB 1610
1060 LET B2=B3
1070 LET B(B2)=3
1080 PRINT TAB(9); "MOVES BOXES TO ";B1;" AND ";B2
1081 FOR X=1 TO 4
1082 LET B(O(X))=1
1083 NEXT X
1085 GOSUB 2270
1090 REM CHECK FOR WIN
1100 FOR X=1 TO 4
1110 LET B(D(X))=0
1120 NEXT X
1130 GOSUB 1420
1140 LET F1=2
1150 LET N1=Z
1160 GOSUB 1800
1170 IF M1=0 THEN 1280
1180 FOR X=1 TO 4
1190 LET B(O(X))=1
1200 NEXT X
1210 GOTO 240
1220 PRINT "ILLEGAL MOVE FOR L."
1230 PRINT
1240 GOTO 240
```

```
HINT "ILLEGAL MOVE FOR BOX."
                                                                                 2070 FOR F=1 TO 4
    PRINT
                                                                                 2080 IF A(F)/4(>INT(A(F)/4) THEN 2130
    INTO 405
                                                                                 2090 FOR G=1 TO 4
    MINT "COMPUTER WINS!"
                                                                                 2110 IF A(G)=A(F)+1 THEN 2030
    8070 1310
                                                                                 2120 NEXT G
    WINT "CONGRATULATIONS! YOU HAVE WON."
                                                                                 2130 NEXT F
    PRINT
                                                                                 2140 FOR Y=1 TO 4
    WINT "PLAY AGAIN";
                                                                                 2150 IF F1=1 THEN 2190
    INPUT AS
                                                                                 2160 IF A(Y) >0(Y) THEN 2210
    IF LEFTS(AS,1)="Y" THEN 70
                                                                                 2170 NEXT Y
    60TO 4000
                                                                                 2180 GOTO 2030
    IEN *** SUBROUTINES ***
                                                                                 2190 IF A(Y) (C(Y) THEN 2210
   THE ERASE N(X)
                                                                                 2200 GOTO 2170
    FOR X=1 TO 16
                                                                                 2210 FOR Y=1 TO 4
   LET N(X)=0
                                                                                 2220 LET M(M1+Y)=A(Y)
   HEXT X
                                                                                 2230 NEXT Y
   IETURN
                                                                                 2240 LET M1=M1+4
   IF STORE LOCATIONS OF UNDECUPIED POSITIONS IN N(X)
                                                                                 2250 GOTO 2030
   LET Z=0
                                                                                 2260 REM BOARD PRINTOUT SUBROUTINE
   FOR X=1 TO 16
                                                                                 2270 PRINT
   IF B(X)>0 THEN 1470
                                                                                 2275 IF F2=1 THEN 2530
   LET Z=Z+1
                                                                                 2280 FOR E=1 TO 13 STEP 4
   LET N(Z)=X
                                                                                 2290 FOR F=1 TO 3
   NEXT X
                                                                                 2300 FOR G=E TO E+3
   RETURN
                                                                                 2310 DN B(G)+1 GOTO 2320,2410,2430,2450
   THE THIS SUBROUTINE RETURNS THE LOCATION OF THE LARGEST
                                                                                 2320 IF F=2 THEN 2350
                                                                                 2330 PRINT "====";
   NEW VALUE IN N(X). IF A TIE EXISTS A RANDOM CHOICE IS MADE.
   LET Y=0
                                                                                 2340 GOTO 2490
   LET Z=1
                                                                                 2350 PRINT ":";
                                                                                 2360 IF 6>9 THEN 2390
  FOR X=1 TO M1/4
                                                                                 2370 PRINT " ";CHR$(48+6);":";
  IF NIXICY THEN 1580
                                                                                 2380 GOTO 2490
  IF H(X) Y THEN 1560
  IF RND(1)>.5 THEN 1580
                                                                                 2390 PRINT "1";CHR$(38+6);":";
  LET Y=N(X)
                                                                                 2400 GOTO 2490
  LET Z=X
                                                                                 2410 PRINT "0000":
  IL HEXT X
                                                                                 2420 GOTO 2490
  IN RETURN
                                                                                 2430 PRINT "////":
  REM BOX-FIND
                                                                                  2440 GOTO 2490
  THE THIS SUBROUTINE FINDS THE MOVE FOR A BOX THAT WILL
                                                                                 2450 IF F=2 THEN 2480
  THE HOST RESTRICT THE OPPONENT'S L IN TERMS OF MOVES POSSIBLE.
                                                                                 2460 PRINT "****":
  FOR X=1 TO 4
                                                                                 2470 GOTO 2490
  [[LET B(O(X))=0
                                                                                 2480 PRINT "*
                                                                                                   ****
  IN NEXT X
                                                                                 2490 NEXT G
  @ 605UB 1420
                                                                                 2500 PRINT
  # LET F1=2
                                                                                 2510 NEXT F
  ILLET NI=Z
                                                                                  2520 NEXT E
  W GOSUB 1800
                                                                                 2530 PRINT
  M GOSUB 1370
                                                                                  2540 RETURN
 HO FOR X=1 TO M1
                                                                                  3000 REM INSTRUCTIONS
  H LET N(H(X))=N(M(X))+1
                                                                                 3010 PRINT
                                                                                 3020 PRINT "
  MEXT X
                                                                                                     L-game is a simple strategic game played on a 4x4"
                                                                                  3030 PRINT "grid by two opposing players, in this case between you"
  I FOR X=1 TO 4
                                                                                  3040 PRINT "and the computer. The grid is numbered as follows:
 TO LET N(D(X))=0
 NO NEXT X
                                                                                  3050 LET F2=0
 30 LET H1=64
                                                                                 3060 FOR X=1 TO 16
 10 GOSUB 1500
                                                                                 3070 LET B(X)=0
 TI LET B3=Z
                                                                                 3080 NEXT X
 TO RETURN
                                                                                 3090 GOSUB 2270
 HO REM L-FIND
                                                                                  3100 PRINT "
                                                                                                     The game is played with four pieces; both"
 THEM THIS SUBROUTINE CALCULATES ALL POSSIBLE MOVES FOR AN L GIVEN ALL 3110 PRINT "you and the computer have one 'L', and there are"
THEM EMPTY POSITIONS IN N(X). IF F1=1, THE CURRENT POSITION OF THE 3120 PRINT "two 'BOXES' which are used by both players."
WHEN EMPTY POSITIONS IN M(X). IF F1=1, THE CURRENT POSITION OF THE 3120 PRINT "two 'BOXES' which are used by both players."
THEN COMPUTER'S L IS OMITTED. OTHERWISE, THE CURRENT POSITION OF THE 3130 PRINT "play always begins with the pieces on the board"
 "4 REH OPPONENT'S L IS OMITTED. MOVES ARE RETURNED IN M(X), AND
                                                                                 3140 PRINT "in the following position:"
TO REA H1 IS THE LENGTH OF M(X). (M1 = NUMBER OF MOVES * 4)
                                                                                 3150 GOSUB 100
NO LET H1=0
                                                                                 3160 GOSUB 2270
110 LET J=4
                                                                                 3165 PRINT "(computer is /, you are 0)"
IN LET K=1
                                                                                 3166 PRINT
HIO GOSUB 1880
                                                                                  3170 PRINT "
                                                                                                      The object of the game is to position your own"
140 LET J=1
                                                                                 3180 PRINT "L and the boxes to prevent the computer from moving"
150 LET K=4
                                                                                 3190 PRINT "its L. Of course, it is trying to do the same to you!"
                                                                                 3200 PRINT "To move, you must simply enter the four coordinates"
ILO GOSUB 1880
ITO RETURN
                                                                                  3210 PRINT "where you want to place your L. It must remain on the"
HU LET P=0
                                                                                 3220 PRINT "board and must not cover any other pieces. You must"
HO LET P=P+1
                                                                                 3230 PRINT "move your L! If you cannot find a new position"
                                                                                 3240 PRINT "for your L, then the computer has effectively pinned your"
HU LET A(1)=N(P)
HIO LET X=P
                                                                                  3250 PRINT "L and it wins the game."
1930 LET X=X+1
                                                                                 3260 PRINT "
                                                                                                     Assuming you have successfully moved your L, you now"
HI IF XON1 THEN 2050
                                                                                  3270 PRINT "have the option of moving the boxes. You may move one,"
140 IF N(X)-A(1) >> J THEN 1920
                                                                                 3280 PRINT "two, or none of the boxes by simply entering the coordinates"
150 LET A(2)=N(X)
                                                                                 3290 PRINT "where you want to put them.
3300 PRINT "enter its present position."
                                                                                                                                 To leave a box where it is,'
180 LET X=X+1
NO IF XON1 THEN 2050
                                                                                  3310 PRINT "
                                                                                                     After you move the boxes, it is up to the computer"
HE IF N(X)-A(2) <> J THEN 1960
                                                                                 3320 PRINT "to find a move for its L and play continues in the same"
HPD LET A(3) = N(X)
                                                                                  3330 PRINT "manner. Remember that you must not only try to pin the"
WO FOR E=1 TO N1
                                                                                  3340 PRINT "computer's L but also keep your own L from being pinned."
                                                                                 3350 PRINT "Also, it is easier to play the game with your own board"
3360 PRINT "than the computer printout. To resign, enter 0,0,0,0"
10 IF ABS(N(E)-A(1))=K THEN 2060
100 IF ABS(N(E)-A(3))=K THEN 2060
1130 NEXT E
                                                                                  3370 PRINT "in place of your move. GOOD LUCK!"
340 GOTO 1890
                                                                                 3380 PRINT
US0 IF P<N1-2 THEN 1890
                                                                                 3450 GOTO 40
165 RETURN
                                                                                  4000 END
1160 LET A(4)=N(E)
                                                                                 0k
```

# Life Expectancy

This program is a life-expectancy test derived from Peter Passell's book "How To." The test asks you a series of questions dealing with your life-style and environment. At the end of the questioning, the program gives your estimated life-expectancy and the percentage of the population you should outlive.

You may wish to experiment with certain variables to see what effect they will have on your lifespan. It's unlikely that you want to change your sex, but you may wish to check out the effect of smoking, drinking, mental attitude or weight.

This program was written by John E. Rogers.

RUN

LIFE EXPECTANCY CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS A LIFE EXPECTANCY TEST. DO YOU WISH INSTRUCTIONS? YES

THIS IS A TEST TO PREDICT YOUR LIFE EXPECTANCY. I WILL ASK YOU A SERIES OF SHORT QUESTIONS, WHICH YOU WILL REPLY BY TYPING IN THE CORRESPONDING ANSWER TO THE QUESTION.

EXAMPLE: WHAT IS YOUR SEX? M=MALE F=FEMALE 'N' AND 'F' ARE THE POSSIBLE REPLIES TO THE QUESTION, ANSWER LIKE THIS:

CHOOSE ONE OF THE LETTERS ABOVE? H TYPING AN 'M' SIGNIFIES YOU ARE A MALE.

+++SEX+++ ARE YOU MALE OR FEMALE? M= MALE. F= FEMALE. CHOOSE ONE OF THE LETTERS ABOVE? H

```
+++I TEE STYLE+++
  WHERE DO YOU LIVE?
8= IF YOU LIVE IN AN URBAN AREA WITH A POPULATION OVER 2 MIL.
K= IF YOU LIVE IN A TOWN UNDER 10,000, OR ON A FARM.
  I= NEITHER.
CHOOSE ONE OF THE LETTERS ABOVE? I
  HOW DO YOU WORK?
  H= IF YOU WORK BEHIND A DESK.
  L= IF YOUR WORK REQUIRES HEAVY PHYSICAL LABOR.
  I = NONE OF THE ABOVE.
CHOOSE ONE OF THE LETTERS ABOVE? I
  HOW LONG DO YOU EXERCISE STRENUOUSLY.
  (TENNIS, RUNNING, SWIMMING, ETC.)?
F= FIVE TIMES A WEEK FOR AR LEAST A HALF HOUR.
  K= JUST TWO OR THREE TIMES A WEEK.
  I= DO NOT EXERCISE IN THIS FASHION.
CHOOSE ONE OF THE LETTERS ABOVE? K
  WHO DO YOU LIVE WITH?
  N= IF YOU LIVE WITH A SPOUSE, FRIEND, OR IN A FAMILY.
H= IF YOU'VE LIVED ALONE FOR 1-10 YEARS SINCE AGE 25.
  6= FOR 11-20 YEARS.
  M= FOR 21-30 YEARS.
  E= FOR 31-40 YEARS.
  M= MORE THAN 40 YEARS.
CHOOSE ONE OF THE LETTERS ABOVE? N
  +++PSYCHE+++
  DO YOU SLEEP MORE THAN 10 HOURS A NIGHT?
  I= NO.
  E=YES.
CHODSE ONE OF THE LETTERS ABOVE? I
  +++MENTAL STATE+++
  M= IF YOU ARE INTENSE, AGGRESSIVE, OR EASILY ANGERED.
  L= IF YOU ARE EASY GOING, RELAXED, DR A FOLLOWER.
  I= NEITHER.
CHOOSE ONE OF THE LETTERS ABOVE? L
  +++HOW YOU FEEL+++
  ARE YOU HAPPY OR UNHAPPY?
  J= HAPPY.
  G= UNHAPPY.
  I= NEITHER.
CHOOSE ONE OF THE LETTERS ABOVE? J
  +++FACTORS+++
  HAVE YOU HAD A SPEEDING TICKET IN THE LAST YEAR?
  H= YES.
  I=NO.
CHODSE ONE OF THE LETTERS ABOVE? I
  +++INCOME+++
  DO YOU EARN MORE THAN $50,000 A YEAR?
  6= YES.
  I=N0.
CHOOSE ONE OF THE LETTERS ABOVE? IO
  +++SCHOOLING+++
  J= IF YOU HAVE FINISHED COLLEGE.
L= IF YOU HAVE FINISHED COLLEGE WITH A GRADUATE
  OR PROFESSIONAL DEGREE.
  I= NOTHING LISTED.
```

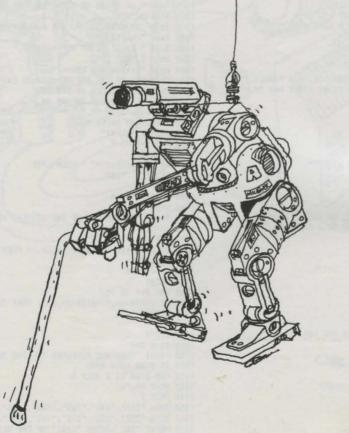
CHOOSE ONE OF THE LETTERS ABOVE? I

+++AGE+++ ARE YOU 65 OR OLDER AND STILL WORKING? L= YES. I= NO. CHOOSE ONE OF THE LETTERS ABOVE? I +++HEREDITY+++ K= IF ANY GRANDPARENTS LIVED TO 85 YEARS OLD. 0= IF ALL FOUR GRANDPARENTS LIVED TO 80 YEARS OLD. I= NO GRANDPARENTS QUALIFY IN THE ABOVE. CHOOSE ONE OF THE LETTERS ABOVE? I HAS ANY PARENT DIED OF A STROKE OR HEART ATTACK BEFORE THE AGE OF 50? E= YES. I= NO. CHOOSE ONE OF THE LETTERS ABOVE? E +++FAMILY DISEASES+++ ANY PARENT, BROTHER, OR SISTER UNDER 50 HAS (OR HAD) CANCER, A HEART CONDITION, OR DIABETES SINCE CHILDHOOD? H= YES. I= NO. CHOOSE ONE OF THE LETTERS ABOVE? I +++HEALTH+++ HOW MUCH DO YOU SMOKE? A= IF YOU SHOKE MORE THAN TWO PACKS A DAY. C= ONE TO TWO PACKS A DAY. H= ONE HALF TO ONE PACK A DAY. I= DON'T SMOKE. CHOOSE ONE OF THE LETTERS ABOVE? I +++DRINK+++

DO YOU DRINK THE EQUIVALENT OF A QUARTER BOTTLE OF ALCOHOLIC BEVERAGE A DAY? H= YES. I= NO. CHODSE ONE OF THE LETTERS ABOVE? I

+++UFIGHT+++ A= IF YOU ARE OVERWEIGHT BY 50 POUNDS OR MORE. E= OVER BY 30-50 POUNDS. G= OVER BY 10-30 POUNDS. I= NOT OVER WEIGHT. CHOOSE ONE OF THE LETTERS ABOVE? I +++CHECKUPS+++ DO YOU? IF YOU ARE A MALE OVER 40 HAVE AN ANNUAL CHECKUP? K= YES. I= IF NO OR NOT A MALE OR UNDER 40 YEARS OLD. CHOOSE ONE OF THE LETTERS ABOVE? I DO YOU? IF YOU ARE A WOMAN SEE A GYNECOLOGIST ONCE A YEAR? K= YES. I = IF NO OR NOT A WOMAN. CHOOSE ONE OF THE LETTERS ABOVE? I +++CURRENT AGE+++ K= IF YOU ARE BETWEEN 30 AND 40 YEARS OLD. L= BETWEEN 40 AND 50. F= BETWEEN 50 AND 70. N= DVER 70. I= UNDER 30. CHOOSE ONE OF THE LETTERS ABOVE? I YOU ARE EXPECTED TO LIVE TO THE AGE OF 76 YEARS OUT LIVING 61% OF THE MEN AND 39% OF THE WOMEN.

CENT



**Dk** 

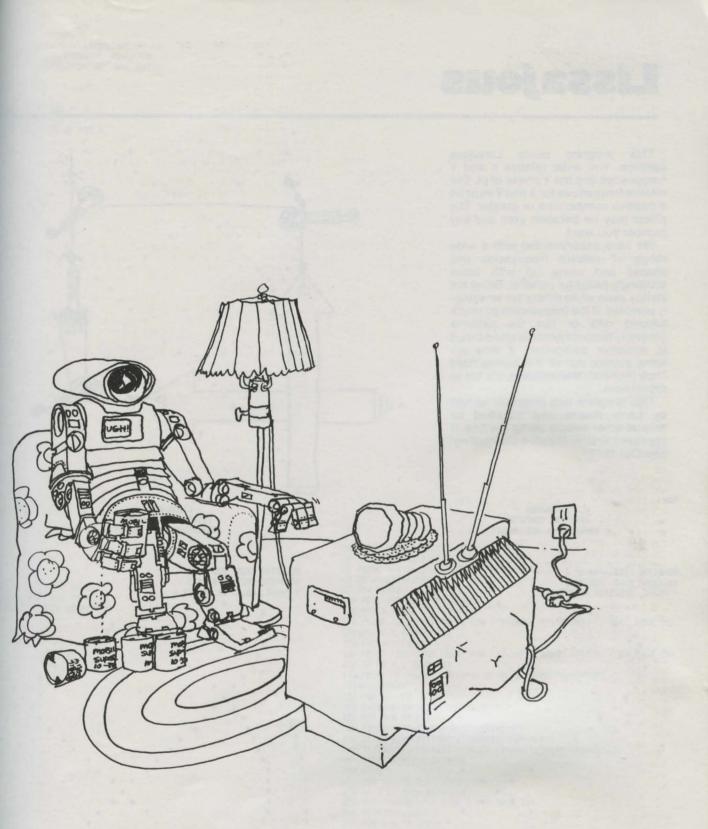
```
LIST
                                                                                            1120 DATA "OR PROFESSIONAL DEGREE."
10 PRINT TAB(21);"LIFE EXPECTANCY"
20 PRINT TAB(20);"CREATIVE COMPUTING"
30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
                                                                                            1130 DATA " I= NOTHING LISTED."
                                                                                            1140 DATA 3,"JLI"
1150 DATA "+++AGE+++"
40 PRINT: PRINT: PRINT
                                                                                            1160 DATA "ARE YOU 65 OR OLDER AND STILL WORKING?"
270 PRINT :PRINT:PRINT
280 PRINT "THIS IS A LIFE EXPECTANCY TEST."
                                                                                            1170 DATA "L= YES."
                                                                                            1180 DATA " I= NO."
290 PRINT "
                DO YOU WISH INSTRUCTIONS";
                                                                                            1190 DATA 2,"LI"
300 INPUT IS
                                                                                            1200 DATA "+++HEREDITY+++"
310 IF LEFT$(1$,1)="N" THEN 470
                                                                                            1210 DATA "K= IF ANY GRANDPARENTS LIVED TO 85 YEARS OLD."
                                                                                            1220 DATA "O= IF ALL FOUR GRANDPARENTS LIVED TO 80 YEARS OLD."
1230 DATA " I= NO GRANDPARENTS QUALIFY IN THE ABOVE."
320 PRINT:PRINT
340 PRINT " THIS IS A TEST TO PREDICT YOUR LIFE EXPECTANCY. I"
350 PRINT "WILL ASK YOU A SERIES OF SHORT QUESTIONS, WHICH YOU WILL"
                                                                                            1240 DATA 3, "KOI"
                                                                                            1250 DATA "HAS ANY PARENT DIED OF A STROKE OR HEART ATTACK"
360 PRINT "REPLY BY TYPING IN THE CORRESPONDING ANSWER TO THE"
                                                                                            1260 DATA "BEFORE THE AGE OF 50?"
1270 DATA "E= YES."
1280 DATA " I= NO."
370 PRINT "QUESTION."
380 PRINT
390 PRINT "
                       EXAMPLE: WHAT IS YOUR SEX?"
400 PRINT "

      400 PRINT "
      M=MALE"
      1290 DATA 2,"EI"

      410 PRINT "
      F=FEMALE"
      1300 DATA "+++FAMILY DISEASES+++"

      420 PRINT "'M' AND 'F' ARE THE POSSIBLE REPLIES TO THE QUESTION, ANSWER"
      1310 DATA "ANY PARENT, BROTHER, OR SISTER UNDER 50 HAS (OR HAD)"

                               M=MALE"
430 PRINT "LIKE THIS:"
                                                                                           1320 DATA "CANCER, A HEART CONDITION, OR DIABETES SINCE CHILDHOOD"
1330 DATA "M= YES."
1340 DATA " I= ND."
440 PRINT "
                               CHOOSE ONE OF THE LETTERS ABOVE? M"
450 PRINT "TYPING AN 'M' SIGNIFIES YOU ARE A MALE."
460 PRINT:PRINT:PRINT
                                                                                            1350 DATA 2,"HI"
470 R5=1
                                                                                            1360 DATA "+++HEALTH+++"
480 Z=72
                                                                                            1365 DATA "HOW HUCH DO YOU SHOKE?"
490 A$="ABCDEMGHIJKLFNO"
                                                                                            1370 DATA "A= IF YOU SHOKE MORE THAN TWO PACKS A DAY."
                                                                                           1380 DATA "C= ONE TO TWO PACKS A DAY."
1380 DATA "C= ONE TO TWO PACKS A DAY."
1390 DATA "H= ONE HALF TO ONE PACK A DAY."
1400 DATA " I= DON'T SMOKE."
500 GOTO 1700
510 R5=R5+1
520 IF R5>21 THEN 1900
                                                                                            1410 DATA 4, "ACMI"
530 DATA "+++SEX+++
540 DATA "ARE YOU MALE OR FEMALE?"
                                                                                           1420 DATA "+++DRINK+++"
1430 DATA "DO YOU DRINK THE EQUIVALENT OF A "
550 DATA "M= MALE."
560 DATA " F= FEMALE."
                                                                                            1440 DATA "QUARTER BOTTLE OF ALCOHOLIC BEVERAGE A DAY?"
570 DATA 2, "MF"
580 DATA "+++LIFE STYLE+++"
                                                                                            1450 DATA "H= YES."
1460 DATA " I= NO."
      DATA "WHERE DO YOU LIVE?"
590
                                                                                            1470 DATA 2,"HI"
600 DATA "G= IF YOU LIVE IN AN URBAN AREA WITH A POPULATION OVER 2 MIL." 1480 DATA "+++WEIGHT+++"
610 DATA "K= IF YOU LIVE IN A TOWN UNDER 10,000, OR ON A FARM."
                                                                                            1490 DATA "A= IF YOU ARE OVERWEIGHT BY 50 POUNDS OR MORE."
620 DATA " I= NEITHER."
                                                                                            1500 DATA "E= OVER BY 30-50 POUNDS."
630 DATA 3, "GKI"
                                                                                            1510 DATA "6= OVER BY 10-30 POUNDS."
640 DATA "HOW DO YOU WORK?"
                                                                                            1520 DATA " I= NOT OVER WEIGHT.
650 DATA "M= IF YOU WORK BEHIND A DESK."
                                                                                           1530 DATA 4, "AEGI"
1540 DATA "+++CHECKUPS+++"
660 DATA "L= IF YOUR WORK REQUIRES HEAVY PHYSICAL LABOR."
                                                                                           1550 DATA "DO YOU? IF YOU ARE A MALE OVER 40 HAVE AN ANNUAL CHECH
1560 DATA "K= YES."
670 DATA " I= NONE OF THE ABOVE."
680 DATA 3, "MLI"
                                                                                           1570 DATA " I= IF NO OR NOT A MALE OR UNDER 40 YEARS OLD."
690 DATA "HOW LONG DO YOU EXERCISE STRENUOUSLY,"
700 DATA "(TENNIS, RUNNING, SWIMMING, ETC.)?"
                                                                                           1580 DATA 2,"KI"
710 DATA "F= FIVE TIMES A WEEK FOR AR LEAST A HALF HOUR."
720 DATA "K= JUST TWO OR THREE TIMES A WEEK."
                                                                                          1570 DATA "DO YOU? IF YOU ARE A WOMAN SEE A GYNECOLOGIST ONCE A 18
1600 DATA "K= YES."
1610 DATA " I= IF NO OR NOT A WOMAN."
730 DATA " I= DO NOT EXERCISE IN THIS FASHION."
740 DATA 3. "FKI"
                                                                                           1620 DATA 2,"KI"
1630 DATA "+++CURRENT AGE+++"
750 DATA "WHO DO YOU LIVE WITH?"
760 DATA "N= IF YOU LIVE WITH A SPOUSE, FRIEND, OR IN A FAMILY."
                                                                                           1640 DATA "K= IF YOU ARE BETWEEN 30 AND 40 YEARS OLD."
770 DATA "H= IF YOU'VE LIVED ALONE FOR 1-10 YEARS SINCE AGE 25."
                                                                                          1650 DATA "L= BETWEEN 40 AND 50."
780 DATA "G= FOR 11-20 YEARS."
                                                                                           1660 DATA "F= BETWEEN 50 AND 70."
790 DATA "M= FOR 21-30 YEARS."
                                                                                            1670 DATA "N= OVER 70.
800 DATA "E= FOR 31-40 YEARS."
810 DATA " M= MORE THAN 40 YEARS."
                                                                                            1680 DATA " I= UNDER 30."
                                                                                           1690 DATA 5,"KLFNI"
1700 FOR Q=1 TO 7
820 DATA 6, "NHGMED"
830 DATA "+++PSYCHE+++"
                                                                                            1710 READ 05
840 DATA "DO YOU SLEEP MORE THAN 10 HOURS A NIGHT?"
                                                                                            1720 IF LEFT$(Q$,1)=" " THEN 1750
                                                                                            1730 PRINT " ";0$
850 DATA "I= NO."
860 DATA " E=YES."
                                                                                           1740 NEXT Q
870 DATA 2,"IE"
                                                                                           1750 PRINT " ";Q$
880 DATA "+++MENTAL STATE+++"
                                                                                           1760 READ C,C$
1770 PRINT "CHOOSE ONE OF THE LETTERS ABOVE";
870 DATA "M= IF YOU ARE INTENSE, AGGRESSIVE, OR EASILY ANGERED."
900 DATA "L= IF YOU ARE EASY GOING, RELAXED, OR A FOLLOWER."
                                                                                           1780 INPUT G$
910 DATA " I= NEITHER."
                                                                                            1790 FOR C2=1 TO C
920 DATA 3, "MLI"
                                                                                           1800 IF LEFT$(G$,1)= MID$(C$,C2,1) THEN 1830
930 DATA "+++HOW YOU FEEL+++"
                                                                                            1810 NEXT C2
940 DATA "ARE YOU HAPPY OR UNHAPPY?"
                                                                                            1820 GOTO 1770
950 DATA "J= HAPPY."
                                                                                            1830 PRINT
960 DATA "G= UNHAPPY."
                                                                                            1840 FOR N=1 TO 15
970 DATA " I= NEITHER."
                                                                                            1850 IF LEFT$(G$,1)=HID$(A$,N,1) THEN 1870
980 DATA 3,"JGI"
                                                                                            1860 NEXT N
990 DATA "+++FACTORS+++"
                                                                                            1870 M=N-9
1000 DATA "HAVE YOU HAD A SPEEDING TICKET IN THE LAST YEAR?"
                                                                                           1880 7=7+M
1010 DATA "H= YES."
1020 DATA " I=NO."
                                                                                            1890 GOTO 510
                                                                                            1900 PRINT "YOU ARE EXPECTED TO LIVE TO THE AGE OF";Z;"YEARS"
1030 DATA 2,"HI"
1040 DATA "+++INCOME+++"
                                                                                            1910 IF Z<60 THEN 1980
                                                                                            1920 FOR Y=60 TO Z STEP 5
1050 DATA "DO YOU EARN MORE THAN $50,000 A YEAR?"
                                                                                           1930 READ MS, FS
1060 DATA "G= YES."
                                                                                           1940 NEXT Y
1070 DATA " I=NO."
                                                                                           1950 DATA "262","152","362","202","482","302","612","392"
1960 DATA "752","532","872","702","962","882","99.92","99.62"
1970 PRINT "OUT LIVING ";N$;" OF THE MEN AND ";F$;" OF THE WORK
1080 DATA 2,"GI"
1090 DATA "+++SCHOOLING+++"
1100 DATA "J= IF YOU HAVE FINISHED COLLEGE."
                                                                                            1980 END
1110 DATA "L= IF YOU HAVE FINISHED COLLEGE WITH A GRADUATE"
                                                                                           Dk
```





This program prints Lissajous patterns. You enter relative X and Y frequencies and the Y phase of pi. The relative frequencies for X and Y must be a positive number one or greater. The phase may be between zero and any number you want.

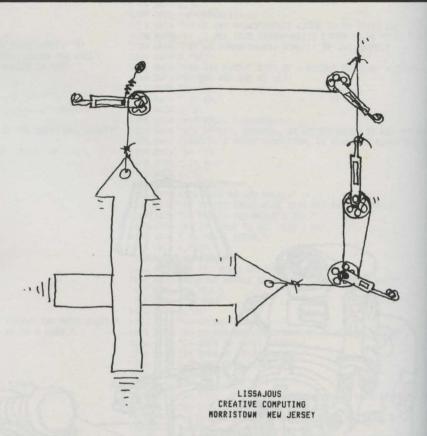
We have experimented with a wide range of relative frequencies and phases and come up with some startlingly beautiful patterns. Some are starkly plain while others are amazingly complex. If the frequencies go much beyond nine or ten, the patterns generally become jumbled and difficult to decipher particularly if they are being printed out on the normal hard copy terminal. Nevertheless, it's fun to experiment.

This program was originally written by Larry Ruane and modified by several other people along the line. It appeared first in *Creative Computing*, Sep/Oct 1977.

RUN

LISSAJOUS CREATIVE COMPUTING MORRISTOWN NEW JERSEY

RELATIVE FREQ. FOR X? 3 RELATIVE FREQ. FOR Y? 6 Y PHASE, MULTIPLE OF PI? 0



RELATIVE FREQ. FOR X? 2 RELATIVE FREQ. FOR Y? 3 Y PHASE, NULTIPLE OF PI? 0 LISSAJOUS CREATIVE COMPUTING MORRISTOWN NEW JERSEY

LATIVE FREQ. FOR X? 5 LATIVE FREQ. FOR Y? 7 MASE, MULTIPLE OF PI? 0

\*

HELATIVE FREQ. FOR X? 1 HELATIVE FREQ. FOR Y? 1 Y PHASE, NULTIPLE OF PI? .5

\*

.

LIST

```
10 PRINT TAB(22);"LISSAJOUS"
20 PRINT TAB(18);"CREATIVE COMPUTING"
30 PRINT TAB(16);"MORRISTOWN NEW JERSEY"
40 PRINT:PRINT:PRINT
50 DIM Y(10)
100 REM. STEP-WISE LISSAJOUS
110 P=3.1415926
120 PRINT "RELATIVE FREQ. FOR X";: INPUT F1: IF INT(F1) < F1 THEN 120
122 IF F1 < 1 THEN 120
125 F=F1:F1=2*P*F1
130 PRINT "RELATIVE FREQ. FOR Y";: INPUT F2: IF INT(F2) < F2 THEN 130
132 IF F2 < 1 THEN 130
135 PRINT "Y PHASE, MULTIPLE OF PI";:INPUT P2:P2=P*P2
140 F2=2*P*F2
150 FOR X1=-18 TO 18
160 X=X1/18:GOSUB 1970:T1=X:T2=P-X
162 FOR I=0 TO F-1
165 T3=(T1+2*I*P)/F1:T4=(T2+2*I*P)/F1
170 Y1=30*SIN(F2*T3+P2):Y2=30*SIN(F2*T4+P2)
180 Y1=SGN(Y1)*INT(ABS(Y1)+.5):Y2=SGN(Y2)*INT(ABS(Y2)+.5)
190 Y(2*I)=Y1:Y(2*I+1)=Y2
200 NEXT I
210 FOR J=1 TO 2*F-1:I=J-1:T=Y(J)
220 IF T >= Y(I) THEN 240
230 Y(I+1)=Y(I):I=I-1:IF I >=0 THEN 220
240 Y(I+1)=T:NEXT J
250 FOR I=0 TO 2*F-1
260 IF I=0 THEN 280
270 IF Y(I)=Y(I-1) THEN 290
280 PRINT TAB(36+Y(I));"#";
290 NEXT I
300 PRINT
310 NEXT X1
1890 STOP
1960 REM:-
1970 IF ABS(X) < .1 THEN 2020
1980 X=X/(SQR(1+X)+SQR(1-X))
1990 GOSUB 1970
2000 X=2*X
2010 RETURN
2020 X=X+X^3/6+.075+X^5+X^7/22.4
2030 RETURN
2040 END
```

OK

# **Magic Square**

We've all seen examples of magic squares. The most common one is a 3x3 square using the integers 1 through 9 in which the sum of each row, column and diagonal totals 15.

In the computer game of "Magic Square" the goal is to form a sum 15 magic square with you and the computer alternately filling in the integers between 1 and 9. If one player stumbles and puts a number in which causes the sum of a row, column, or diagonal to be something other than 15, he loses.

In forming a sum 15 magic square, there is only one fundamental solution. However, it can be rotated and reversed to form 8 solutions. Because the computer does not play a particularly creative game, all eight solutions cannot be obtained. How many can be?

Can you modify the computer program to play a more interesting game which permits all eight solutions? (Hint: Try randomizing the move position and number generators in Statements 400 and 410.)

This program was created by David Ahl and originally appeared in Creative Computing, Jan/Feb 1975.

RUN

## MAGIC SQUARE CREATIVE COMPUTING MORRISTOWN NEW JERSEY

GAME OF MAGIC SQUARE

PLAYERS ALTERNATLEY CHOOSE AN INTEGER (1 TO 9) THAT HAS NOT BEEN PREVIOUSLY USED AND PLACE IT IN ANY UNFILLED CELL OF A TIC-TAC-TOE BOARD. THE GOAL IS TO MAKE THE SUN OF EACH ROW, COLUMN, AND DIAGONAL EQUAL TO 15.

THAT PLAYER LOSES WHO FIRST MAKES THE SUM OF THE THREE FIGURES IN ANY ROW, COLUMN, OR DIAGONAL SOMETHING OTHER THAN 15.

A TIE GAME DRAWS A MAGIC SQUARE !!

THE COMPUTER WILL ASK YOU ON EACH MOVE WHICH CELL YOU WISH TO OCCUPY, AND THE NUMBER YOU WISH LIKE '3,7' IF YOU WISHED TO PUT A 7 IN CELL 3.

0

0

0

0

0

0

0

0

5 0

0

10

HERE ARE THE CELL NUMBERS:

0

0

0

3

0

0

INPUT YOUR MOVE --- CELL AND NUMBER? 1,1

0 ٥ 0 0 0 0 0

I MOVE TO CELL 2 WITH A 2 2

0

0 0 0 INPUT YOUR MOVE --- CELL AND NUMBER? 5.9 2

0 I MOVE TO CELL 4 WITH A 3

2

0

2

INPUT YOUR MOVE --- CELL AND NUMBER? 3.5

0 SORRY, YOU LOSE -- NICE TRY.

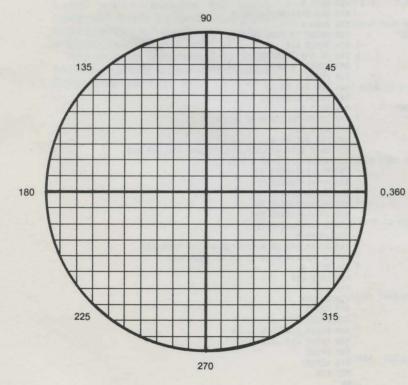
LET'S PLAY AGAIN. . . INPUT YOUR MOVE --- CELL AND NUMBER? 6.5 INPUT YOUR MOVE --- CELL AND NUMBER? 1,1 0 3 0 5 0 0 0 0 9 0 0 0 0 I MOVE TO CELL 8 WITH A 4 0 I HOVE TO CELL 2 WITH A 2 2 0 3 0 0 2 0 4 0 0 0 0 0 0 INPUT YOUR MOVE --- CELL AND NUMBER? 5,7 INPUT YOUR MOVE --- CELL AND NUMBER? 9,9 0 2 3 7 5 2 0 4 9 0 0 0 0 9 SORRY, YOU LOSE -- NICE TRY. 0 I MOVE TO CELL 4 WITH A 3 2 0 0 0 0 0 9 LIST 5 PRINT TAB(28); "MAGIC SQUARE" 240 PRINT "A TIE GAME -- BUT WE'VE DRAWN A MAGIC SQUARE!" 10 PRINT TAB(15); "CREATIVE COMPUTING MORRISTOWN NEW JERSEY" 250 GOTO 560 12 DIM A(9), B(9) 400 FOR Q=1 TO 9 15 PRINT 410 IF A(Q)> 0 THEN 480 16 PRINT 420 FOR R=1 TO 9 17 PRINT 430 IF B(R)>0 THEN 470 20 PRINT "GAME OF MAGIC SQUARE" 435 A(Q)=R 21 PRINT 440 GOSUB 800 25 PRINT "PLAYERS ALTERNATLEY CHOOSE AN INTEGER (1 TO 9)" 450 IF W=0 THEN 500 460 Q1=Q:R1=R:W=O:A(Q)=0 30 PRINT "THAT HAS NOT BEEN PREVIOUSLY USED AND PLACE IT" 35 PRINT "IN ANY UNFILLED CELL OF A TIC-TAC-TOE BOARD." 470 NEXT R 40 PRINT "THE GOAL IS TO MAKE THE SUM OF EACH ROW, COLUMN," 480 NEXT 0 45 PRINT "AND DIAGONAL EQUAL TO 15." 490 W=1:R=R1:Q=Q1:A(Q)=R 47 PRINT 500 B(R)=1 50 PRINT "THAT PLAYER LOSES WHO FIRST MAKES THE SUM OF THE" 520 PRINT "I MOVE TO CELL ";Q;" WITH A ";R 55 PRINT "THREE FIGURES IN ANY ROW, COLUMN, OR DIAGONAL" 530 GOSUB 960 60 PRINT "SOMETHING OTHER THAN 15. 540 IF W=0 THEN 103 62 PRINT 550 PRINT "I LOSE --- YOU WIN!!" 560 PRINT 65 PRINT "A TIE GAME DRAWS A MAGIC SQUARE !!" 67 PRINT 561 FOR I=1 TO 15 70 PRINT "THE COMPUTER WILL ASK YOU ON EACH MOVE WHICH" 75 PRINT "CELL YOU WISH TO OCCUPY, AND THE NUMBER YOU WISH" 80 PRINT "LIKE '3,7' IF YOU WISHED TO PUT A 7 IN CELL 3." 562 PRINT CHR\$(7); 564 NEXT I 570 PRINT "LET'S PLAY AGAIN. . ." 85 PRINT 575 GOTO 96 800 FOR X=1 TO 8 90 PRINT "HERE ARE THE CELL NUMBERS:" 92 PRINT 810 ON X GOTO 820,830,840,850,860,870,880,890 93 PRINT "1 2 3" 820 J=1:K=2:L=3:60T0 900 94 PRINT "4 5 6" 830 K=4:L=7:GOTO 900 95 PRINT "7 8 9" 840 K=5:L=9:GDT0 900 96 FOR I = 1 TO 9 850 J=4:L=6:GOTO 900 97 A(I)=0 860 J=2:L=8:GOTO 900 98 B(I)=0 870 J=3:L=7:60T0 900 880 J=7:L=9:GOTO 900 99 NEXT I 890 J=7:K=8 100 M=0:W=0 103 PRINT 900 IF A(J)=0 DR A(K)=0 DR A(L)=0 THEN 930 920 IF A(J)+A(K)+A(L) <> 15 THEN 940 104 PRINT "INPUT YOUR MOVE --- CELL AND NUMBER"; 105 INPUT I,N 110 IF I<1 OR I > 9 OR N < 1 OR N > 9 THEN 130 930 NEXT X 935 GOTO 950 120 IF A(I)=0 AND B(N)=0 THEN 150 940 W=1 130 PRINT "ILLEGAL MOVE ... AGAIN" 950 RETURN 960 PRINT 965 PRINT A(1),A(2),A(3) 135 GOTO 103 150 A(I)=N:B(N)=1:H=H+1 170 GOSUB 960 180 GOSUB 800 970 PRINT A(4), A(5), A(6) 975 PRINT A(7), A(8), A(9) 200 IF W=0 THEN 230 980 PRINT 210 PRINT "SOKRY, YOU LOSE -- NICE TRY." 990 RETURN 211 GOTO 560 999 END 230 IF M < 5 THEN 400 Ok



In this game you are in a pit with a man-eating rabbit. The center of the pit, appropriately enough, is at 0,0, and it has a radius of ten. On each move, you can move in any one of eight different angles, 0, 45, 90, 135 ... etc. Unlike you, the rabbit can take more than one hop on a move. The object of the game is to avoid the rabbit for ten moves. If you do this successfully you'll be released and set free.

We're not sure what race of people on what planet dreamed up this diabolical sport, but we've found that it's extremely difficult to get away from the rabbit in more than about one out of ten games. You may, therefore, want to improve the odds somewhat by limiting the number of moves the rabbit can make on each turn to one or two. You'll find it interesting to graph the results of the program as you go along. To do this, you'll need a piece of quadrille paper at least 21 squares in each direction. Draw a circle with your compass ten units in diameter and then number the grid from minus ten to plus ten along the X and Y axes. Plot your moves as you go along and you'll see some interesting patterns develop.

This program was conceived and written by Philip Stanway.



MAN-EATING RABBIT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU ARE IN A PIT WITH A MAN-EATING RABBIT. THE CENTER IS (0,0) AND IT HAS A RADIUS OF 10 IF YOU CAN AVOID THE RABBIT FOR 10 MOVES YOU WILL BE RELEASED. YOU AND THE RABBIT CAN MOVE ONLY 1 SPACE EACH HOWEVER THE RABBIT CAN DO NULTIPLE JUMPS. YOU CAN TRAVEL AT THESE ANGLES 0,45,90,135,180,225,270,315,360

WHERE WOULD YOU LIKE TO BE DROPPED? 2,3 RABBIT AT ( 2 , 7 ) AND DISTANCE 4

TURN # 1 HUMAN AT (2,3) AT WHAT ANGLE WILL YOU RUN ? 270 RUMNING .....HUMAN YOU ARE NOW AT (2,2) THE RABBIT IS POUNCING AT ANGLE..... 270 THE RABBIT IS POUNCING AT ANGLE..... 270 RABBIT AT (2,5) AND DISTANCE 3

TURN # 2 HUMAN AT ( 2 , 2 ) AT WHAT ANGLE WILL YOU RUN ? 225 RUNNING .....HUMAN YOU ARE NOW AT ( 1 , 1 ) THE RABBIT IS POUNCING AT ANGLE.... 270 RABBIT AT ( 2 , 3 ) AND DISTANCE 2.23607

TURN # 3 HUMAN AT ( ! , 1 ) AT WHAT ANGLE WILL YOU RUN ? 225 RUNNING .....HUMAN YOU ARE NOW AT ( 0 , 0 ) THE RABBIT IS POUNCING AT ANGLE..... 225 RABBIT AT ( 1 , 2 ) AND DISTANCE 2.23407

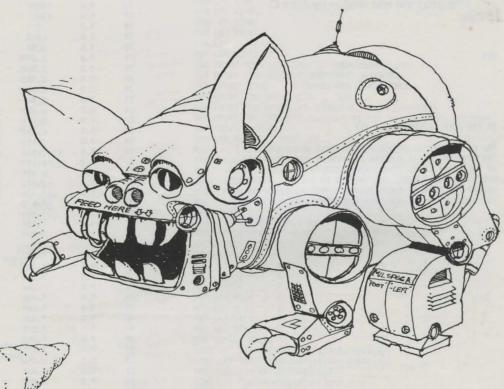
TURN # 4 HUMAN AT ( 0 , 0 ) AT WHAT ANBLE WILL YOU RUN ? 225 RUNNING .....HUMAN YOU ARE NOW AT (-1 ,-1 ) THE RABBIT IS POUNCING AT ANGLE..... 225 RABBIT AT ( 0 , 1 ) AND DISTANCE 2.23407

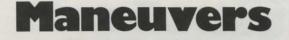
TURN # 5 HUNAN AT (-1 ,-1 ) AT UHAT ANGLE WILL YOU RUN ? 270 RUNNING .....HUMAN YOU ARE NOW AT (-1 ,-2 ) THE RABBIT IS POUNCING AT ANGLE..... 270 RABBIT AT ( 0 , 0 ) AND DISTANCE 2.23307

TURN # 6 HUMAN AT (-1 ,-2 ) AT UHAT ANGLE WILL YOU RUN ? 225 RUNNING .....HUMAN YOU ARE NOW AT (-2 ,-3 ) THE RABBIT IS POUNCING AT ANGLE..... 225 THE RABBIT IS POUNCING AT ANGLE..... 270 RABBIT AT (-2 ,-3 ) AND DISTANCE 0 \*\*CRUNCH\*\* WELL R.I.P. Ok

```
LIST
1 PRINT TAB(20);"MAN-EATING RABBIT"
2 PRINT TAB(20);"CREATIVE COMPUTING"
3 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
4 PRINT: PRINT: PRINT
10 PRINT "YOU ARE IN A PIT WITH A MAN-EATING RABBIT."
15 PRINT "THE CENTER IS (0,0) AND IT HAS A RADIUS OF 10"
20 PRINT "IF YOU CAN AVOID THE RABBIT FOR 10 MOVES YOU WILL BE"
25 PRINT "RELEASED. YOU AND THE RABBIT CAN MOVE ONLY 1 SPACE EACH"
26 PRINT "HOWEVER THE RABBIT CAN DO MULTIPLE JUMPS."
27 PRINT "YOU CAN TRAVEL AT THESE ANGLES"
28 PRINT "0,45,90,135,180,225,270,315,360"
40 X=INT(21*RND(1)-10)
41 Y=INT(21*RND(1)-10)
45 D=SQR(ABS((X-X1)^2+(Y-Y1)^2))
46 IF D>10 THEN 40
47 PRINT
48 PRINT
50 PRINT "WHERE WOULD YOU LIKE TO BE DROPPED":
51 INPUT X1, Y1
60 IF SOR(ABS(X1^2+Y1^2))>10 THEN 50
65 IF X<>X1 THEN 70
66 IF Y<>Y1 THEN 70
67 PRINT "*****SQUISH*****"
69 PRINT "THE RABBIT IS DEAD! YOU ARE SET FREE!":60T0 340
70 FOR G=1 TO 10
71 D=SQR(ABS((X-X1)^2+(Y-Y1)^2))
80 PRINT "RABBIT AT (";X;",";Y;") AND DISTANCE ";D
90 IF D=0 THEN 330
91 PRINT:PRINT "TURN #";6;" HUMAN AT (";X1;",";Y1;")"
100 PRINT "AT WHAT ANGLE WILL YOU RUN ";
101 INPUT A
110 IF A/45<>INT(A/45) THEN 100
111 PRINT "RUNNING .....";:P1=1
112 M=1:IF ABS((INT(A/10)*10)-A)<>5 THEN 120
113 M=SQR(2)
120 X2=(M*COS(A*(3.14159/180)))
121 Y2=(M*SIN(A*(3.14159/180)))
125 IF SQR(((X1+X2)^2+(Y1+Y2)^2)) <= 10 THEN 130
126 PRINT "YOU CAN'T GO INTO A WALL!!
127 GOTO 100
130 X1=INT(X1*1000)/1000+X2
```

131 Y1=INT(Y1\*1000)/1000+Y2 132 X1=INT(X1+.5) 133 Y1=INT(Y1+.5) 135 PRINT "HUMAN YOU ARE NOW AT (";X1;",";Y1;")" 136 IF X<>X1 THEN 140 137 IF Y<>Y1 THEN 140 138 PRINT "YOU RAN RIGHT INTO THE RABBIT !!" 139 GOTO 330 140 PRINT "THE RABBIT IS POUNCING AT ANGLE ..... ";:P1=P1+1 150 X2=X1-X:Y2=Y1-Y 151 IF X2=0 THEN 280 152 IF Y2=0 THEN 300 160 B=INT(ATN(ABS((Y2/X2)))/(3.14159/180)) 170 ON SGN(X2)+2 GOTO 190,10,180 180 ON SGN(Y2)+2 GOTO 240,10,250 190 ON SGN(Y2)+2 GOTO 230,10,220 220 B=180-B:60TO 250 230 B=B+180:GOTO 250 240 B=360-B 250 B=INT(B/45+.5)\*45:PRINT B 256 IF ABS((INT(B/10)\*10)-B)<>5 THEN 260 257 H=1.5 255 H=1 260 X2=(M\*COS(B\*(3.14159/180))) 261 Y2=(M\*SIN(B\*(3.14159/180))) 270 X=INT(X+X2+.5) 271 Y=INT(Y+Y2+.5) 272 GOTO 315 280 IF Y2<0 THEN 290 281 B=90:60T0 315 290 B=270:60T0 250 300 IF X2<0 THEN 310 301 B=1:60TO 250 310 B=180:60TO 250 315 IF SOR((X-X1)^2+(Y-Y1)^2)=0 THEN 323 320 P=INT(P1\*RND(1)+1) 321 IF P<>1 THEN 323 322 GOTO 140 323 NEXT G:PRINT "YOU ARE RELEASED!":GOTO 340 330 PRINT "\*\*CRUNCH\*\* WELL R.I.P." 340 END Dk





In this game you are maneuvering in a corner of space shaped, interestingly enough, like a cube. The dimensions of the cube are ten parsecs on a side. The bases are at the corners as shown on the diagram with the sample run. There are four star bases located at corners of the cube which you must visit in order, A, B, C, and D, to deliver a message to them. While it is a fairly simple matter to get to Base A, the other bases sometimes prove somewhat elusive. One possibility would be to use a second computer to compute your course, or even compute the course before you start the game and then feed it in. Would this be cheating? I don't think so because the learning value in writing a program to compute your course will teach you more about the game than probably fifty plays of it. On the other hand, which is more fun? That's for you to find out.

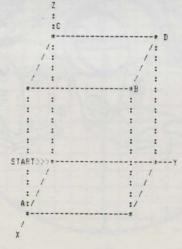
This program was written by John C. Russ.

RUN

MANUEVERS CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

## DO YOU NEED INSTRUCTIONS? YES

YOU ARE THE PILOT OF THE ENTERPRISE'S SPACE SHUTTLE. YOU MUST DELIVER A MESSAGE TO EACH OF FOUR STARBASES, IN THE LEAST TOTAL TIME. YOUR INITIAL POSITION IS AT ONE CORNER OF A CUBE, TEN PARSECS ON A SIDE. THE BASES ARE AT THE CORNERS SHOWN BELOW, MARKED A, B, C, AND D IN THE ORDER IN WHICH YOU MUST VISIT THEM.



FOR YOUR SUBSPACE RADIO TO DELIVER THE MESSAGE, YOU MUST PASS WITHIN ONE PARSEC OF EACH STARBASE. YOUR PROPULSION SYSTEM IS ALWAYS ON, GIVING YOU A CONSTANT ACCELERATION OF 0.2 PARSECS PER STARDATE PER STARDATE. YOU CAN ONLY CONTROL THE ORIENTATION OF YOUR SHIP, TO DIRECT YOUR THRUST AND ACCELERATION. YOU SPECIFY YOUR SHIP'S ATTITUDE BY THE ANGLE THETA (THE CLOCKWISE ANGLE IN THE X-Y PLANE STARTING AT THE X-AXIS) AND THE ANGLE PSI (THE ANGLE OF INCLINATION ABOVE THE X-Y PLANE). YOU INPUT NEW ANGLES EACH STARDATE.

| ELAPSED | POSITION   | COORDIN | ATES: | ORIENTATION |
|---------|------------|---------|-------|-------------|
| TIME    | X          | Y       | Z     | THETA , PSI |
| 0       | 0          | 0       | 0     | ? 0,0       |
| 1       | .1         | 0       | 0     | ? 0.0       |
| 2       | .4         | 0       | 0     | ? 0.0       |
| 3       | .9         | 0       | 0     | ? 0.0       |
| 4       | 1.6        | 0       | 0     | ? 0.0       |
| 5       | 2.5        | 0       | 0     | 7 0.0       |
| 6       | 3.6        | õ       | 0     | ? 0,0       |
| 7       | 4.9        | 0       | 0     |             |
| 8       |            | -       |       |             |
| 9       | 6.2<br>7.3 | 0       | 0     | ? 180,0     |
| 10      |            | -       |       | ? 180,0     |
|         | 8.2        | 0       | 0     | 7 180,0     |
| 11      | 8.9        | 0       | 0     | ? 180,0     |
| 12      | 9.4        | 0       | 0     |             |
| MESSAGE | DELIVERED  | TO BASE | # 1   |             |
| AT TIME | 12.28      |         |       | ? 180,0     |
| 13      | 9.7        | 0       | 0     | ? 180,0     |
| 14      | 9.8        | 0       | 0     | ? 90,90     |
| 15      | 9.8        | 0       | .1    | ? 90,90     |
| 16      | 9.8        | 0       | .4    | ? 0,90      |
| 17      | 9.8        | 0       | .9    | ? 90,45     |
| 18      | 9.8        | .071    | 1.571 | 7 90,0      |
| 19      | 9.8        | .312    | 2.312 | 7 90,0      |
| 20      | 9.8        | .754    | 3.054 | ? 90,270    |
| 21      | 9.8        | 1.295   | 3.695 | 7 90,270    |
| 22      | 9.8        | 1.836   | 4.136 | 7 90,270    |
| 23      | 9.8        | 2.378   | 4.378 | ? 90.0      |
| 24      | 9.8        | 3.019   | 4.519 | ? 90.0      |
| 25      | 9.8        | 3.861   |       |             |
| 26      |            |         | 4.661 |             |
|         | 9.8        | 4.902   | 4.802 | ? 270,0     |
| 27      | 9.8        | 5.944   | 4.944 | ? 270,0     |
| 28      | 9.8        | 6.785   | 5.085 | ? 270,0     |
| 29      | 9.8        | 7.426   | 5.226 | ? 270,0     |
| 30      | 9.8        | 7.868   | 5.368 | 7 270,0     |
| 31      | 9.8        | 8.109   | 5.509 | ? 270,0     |
| 32      | 9.8        | 8.151   | 5.651 | 7 90,90     |
| 33      | 9.8        | 8.092   | 5.892 | ? 90,90     |
| 34      | 9.8        | 8.034   | 6.333 | ? 90,270    |
| 35      | 9.8        | 7.975   | 6.775 | ? 90,270    |
| 36      | 9.8        | 7.916   | 7.016 | ? 90,270    |
| 37      | 9.8        | 7.858   | 7.058 | ? 90,.1.190 |
| 38      | 9.8        | 7.799   | 7.099 | ? 90,90     |
| 39      | 9.8        | 7.741   | 7.341 | ? 90,90     |
| 40      | 9.8        | 7.682   | 7.782 | 7 90,90     |
| 41      | 9.8        | 7.623   | 8.423 |             |
| 42      | 9.8        | 7.565   |       |             |
| 43      | 9.8        |         | 9.065 | ? 90,270    |
| 44      |            | 7.506   | 9.506 | ? 90,270    |
|         | 9.8        | 7.448   | 9.748 | ? 90,270    |
| 45      | 9.8        | 7.389   | 9.789 | ? 90,0      |
| 46      | 9.8        | 7.431   | 9.731 | 7 90,90     |
| 47      | 9.8        | 7.572   | 9.772 | ? 90,270    |
| 48      | 9.8        | 7.713   | 9.813 | 7 90,270    |
| 49      | 9.8        | 7.855   | 9.655 | 7 90.0      |
| 50      | 9.8        | 8.096   | 9.396 | ? 90.90     |
| 51      | 9.8        | 8.438   | 9.238 | 7 90,0      |
| 52      | 9.8        | 8.879   | 9.179 | ? 90,90     |
| 53      | 9.8        | 9.421   | 9.22  |             |
| MESSAGE | DELIVERED  | TO BASE | # 2   |             |
| AT TIME | 53.74      |         |       | ? 90,270    |
| 54      | 9.8        | 9.962   | 9.262 | ? 90,0      |
| 55      | 9.8        | 10.603  | 9.203 |             |
| 56      |            |         |       |             |
| 30      | 9.729      | 11.274  | 9.145 | ? 45,0      |
|         |            |         |       |             |

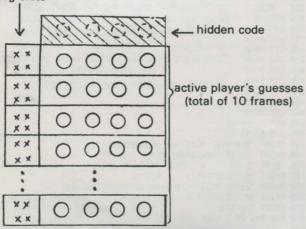
| 57                       | 9.659     | 11.945        | 9.086          | ? 270,0             |  | 170        | PRINT           | " Z"   |                     |
|--------------------------|-----------|---------------|----------------|---------------------|--|------------|-----------------|--|---------------------|
| 58                       | 9.659     | 12.586        | 9.028          | 7 270,0             |  |            | PRINT           |  |                     |
| 59                       | 9.659     | 13.028        | 8.969          | ? 270,90            |  |            | PRINT           |  |                     |
| 60                       | 9.659     | 13.369        | 9.01           | ? 270,90            |  |            | PRINT           |  | * D"<br>/:"         |
| 61                       | 9.659     | 13.71         | 9.252          | ? 270,270           |  |            | PRINT           |  | / :"                |
| 62<br>63                 | 9.659     | 14.052        | 9.493<br>9.535 | ? 270,270           |  |            | PRINT           |  | / :"                |
| 64                       | 9.658     | 14.735        | 9.376          | ? 270,270 ? 270,90  |  | 240        | PRINT           | " / :  | / :"                |
| 65                       | 9.658     | 15.076        | 9.218          | ? 270,0             |  |            | PRINT           |  | *B :"               |
| 66                       | 9.658     | 15.318        | 9.159          | ? 276,0             |  |            | PRINT           |  | : :"                |
| 67                       | 9.669     | 15.36         | 9.1            | 7 270,0             |  |            | PRINT           |  | 1 1"<br>1 1"        |
| 68                       | 9.69      | 15.202        | 9.042          | ? 245,0             |  |            | PRINT           |  | : :"                |
| 69<br>70                 | 9.668     | 14.854        | 8.983          | ? 250,0             |  |            | PRINT           |  | 1 1"                |
| 71                       | 9.439     | 14.321 13.595 | 8.866          | ? 270,0<br>? 245,0  |  | 290        | PRINT           | * : :  | : :"                |
| 72                       | 9.264     | 12.677        | 8.807          | 7 260,0             |  |            | PRINT           |  | ;*Y"                |
| 73                       | 9.03      | 11.571        | 8.749          | ? 257,0             |  |            | PRINT           |  | : /"                |
| 74                       | 8.757     | 10.268        | 8.69           | ? 245,90            |  |            | PRINT           |  | : /"                |
| 75                       | 8.46      | 8.869         | 8.732          | ? 230,0             |  |            | PRINT           |  | :/"                 |
| 76<br>77                 | 8.1 7.581 | 7.392 5.805   | 8.873 9.015    | ? 200,0<br>? 150,0  |  |            | PRINT           |  |                     |
| 78                       | 6.882     | 4.234         | 9.156          | ? 90,0              |  | 360        | PRINT           |  |                     |
| 79                       | 6.096     | 2.812         | 9.297          | 7 90,0              |  |            | PRINT           |  |                     |
| 80                       | 5.31      | 1.591         | 9.439          | ? 90,0              |  |            |                 | "FOR YOUR SUBSPACE RADIO TO DELIVER  |                     |
| 81                       | 4.524     | .569          | 9.58           | ? 90,0              |  |            |                 | "MUST PASS WITHIN ONE PARSEC OF EACH<br>"PROPULSION SYSTEM IS ALWAYS ON, GIV |                     |
| 82                       |           | 252           | 9.722          | ? 90.0,0            |  |            |                 | "ACCELERATION OF 0.2 PARSECS PER STA   |                     |
| 83<br>84                 |           | 873           | 9.863          | ? 45,0<br>? 45,0    |  |            |                 | "YOU CAN ONLY CONTROL THE ORIENTATIO   |                     |
| 85                       |           | -1.633        | 10.146         | ? 45,0              |  | 430        | PRINT           | "DIRECT YOUR THRUST AND ACCELERATION   | . YOU SPECIFY YOUR" |
| 86                       |           | -1.801        | 10.287         | ? 45,0              |  |            |                 | "SHIP'S ATTITUDE BY THE ANGLE THETA  |                     |
| 87                       | .939      | -1.827        | 10.429         | ? 45,0              |  |            |                 | "IN THE X-Y PLANE STARTING AT THE X-   |                     |
| 88                       |           | -1.712        | 10.57          | ? 45,0              |  |            |                 | "PSI (THE ANGLE OF INCLINATION ABOVE<br>"YOU INPUT NEW ANGLES EACH STARDATE. |                     |
| 89                       |           | -1.456        | 10.712         | ? 45,0              |  |            | PRINT           |  |                     |
| 90<br>91                 |           | -1.058        | 10.853         | 7 45,0<br>7 200,270 |  |            |                 | =3.14159/180   |                     |
| 92                       | 1.535     | .091          | 11.036         | ? 180,270           |  | 510        | LET J           | =1   |                     |
| 93                       | 1.88      | .701          | 10.877         | ? 180,0             |  |            |                 | (4,3),C(3)   |                     |
| 94                       | 2.126     | 1.311         | 10.619         | ? 180,0             |  |            |                 | =1 TO 4  |                     |
| 95                       | 2.171     | 1.921         | 10.36          | ? 225,0             |  | 540<br>550 |                 | Y=1 TO 3<br>EAD T(X,Y)   |                     |
| 96                       | 2.046     | 2.46          | 10.102         | ? 260,0             |  | 560        |                 |  |                     |
| 97<br>98                 | 1.832     | 2.83 3.002    | 9.843<br>9.584 | ? 270,0<br>? 270,0  |  |            | NEXT            |  |                     |
| 99                       | 1.371     | 2.974         | 9.326          | ? 245               |  | 580        | DATA            | 10,0,0,10,10,10,0,0,10,0,10,10   |                     |
| 77 0                     |           | ~             |                |                     |  |            | LET A           |  |                     |
| 100                      | 1.098     | 2.754         | 9.067          | ? 260,90            |  |            | LET X           |  |                     |
| 101                      | .782      | 2.445         | 8.909          | ? 270,90            |  |            | LET Y           |  |                     |
| 102                      | .467      | 2.135         | 8.95           | ? 285,0             |  |            | LET V           |  |                     |
| 103                      | .178      | 1.729         | 9.092          | ? 295,0             |  |            | LET V           |  |                     |
| 104                      | 043       | 1.135         | 9.233 9.374    | ? 300,0             |  | 650        | LET V           | 3=0  |                     |
| and the second second    |           | TO BASE #     |                |                     |  |            | LET T           |  |                     |
|                          | 105.48    |               | -              | 7 90,0              |  |            |                 | 1=1E-03  |                     |
| 106                      | 251       | 393           | 9.516          | ? 75,0              |  |            |                 |  |                     |
| 107                      | 305       | 953           | 9.657          | ? 80,0              |  |            |                 | "ELAPSED POSITION COORDINATES:";<br>TAB(38);"ORIENTATION"                    |                     |
| 108                      |           | -1.319        | 9.799          | ? 80,0              |  |            |                 | "TINE X Y Z";  |                     |
| 109                      |           | -1.488        | 9.94           | ? 80,0<br>? 90,0    |  | 730        | PRINT           | TAB(38);"THETA , PSI"  |                     |
| 111                      | 153       | -1.233        | 10.223         | ? 90.0              |  |            |                 | T0;TAB(8);INT(1000*X1+.5)/1000;TAB(1   |                     |
| 112                      |           | 806           | 10.364         | 7 90,0              |  |            |                 | INT(1000*Y1+.5)/1000;TAB(28);INT(100   | 0*Z1+.5)/1000;      |
| 113                      |           | 179           | 10.506         | ? 90,0              |  |            |                 | TAB(38);<br>=0 TO 1 STEP .02   |                     |
| 114                      | .078      | .648          | 10.647         | ? 105,0             |  | 820        |                 | C(1)=X+K*V1+A/2*K*K*COS(B2*P)*COS(B1   | *P)                 |
| 115<br>116               | .129      | 1.671 2.791   | 10.789         | ? 103,270 ? 101,270 |  | 830        |                 | C(2)=Y+K*V2+A/2*K*K*COS(B2*P)*SIN(B1   |                     |
| 117                      | .179      | 3.911         | 10.671         | ? 99,0              |  | 840        | LET             | C(3)=Z+K*V3+A/2*K*K*SIN(B2*P)  |                     |
| 118                      | .189      | 5.13          | 10.413         | ? 261,0             |  | 850        |                 | D=0  |                     |
| 119                      | .167      | 6.348         | 10.154         | ? 270,90            |  | 860<br>870 |                 | L=1 TO 3<br>FT $D=D+(T(1,1)-C(1,1)*(T(1,1)-C(1,1))$                          |                     |
| 120                      | .13       | 7.468         | 9.996          | ? 270,0             |  | 880        |                 | ET D=D+(T(J,L)-C(L))*(T(J,L)-C(L))<br>T L                                    |                     |
| 121<br>122               | .092      | 8.488 9.408   | 9.937 9.979    | ? 260,90            |  | 890        |                 | SQR(D)>1 GOTO 950  |                     |
|                          |           | TO BASE #     |                |                     |  | 900        |                 | NT:PRINT "MESSAGE DELIVERED TO BASE  | #";J                |
| and shares in the        | 122.58    | - suse if     |                | GOOD JOB.           | DO YOU WANT TO   | 910        | PRI             | NT "AT TIME";TO+K;TAB(38);   |                     |
|                          |           | JR TIME? NO   | THANK Y        |                     |  | 920<br>930 |                 | J=4 60T0 1100  |                     |
| Ok                       |           |               |                |                     |  | 930        |                 | J=J+1<br>0 960   |                     |
|                          |           |               |                |                     |  |            | NEXT            |  |                     |
|                          |           |               |                |                     |  | 960        | LET X           | =X1  |                     |
|                          |           |               |                |                     |  |            | LET Y           |  |                     |
| LIST                     |           |               |                |                     |  |            | LET Z           |  |                     |
|                          | TAB(24):  | "MANUEVERS"   |                |                     |  |            |                 | 0=T0+1<br>B1,B2  |                     |
| 11 PRINT                 | TAB(20);  | "CREATIVE (   | COMPUTING      |                     |  |            |                 | X1=X+V1+A/2*COS(B2*P)*COS(B1*P)  |                     |
| The second second second |           | "MORRISTOWN   | N, NEW JE      | RSEY"               |  |            |                 | Y1=Y+V2+A/2*COS(B2*P)*SIN(B1*P)  |                     |
|                          | PRINT:PRI |               | ICTIONS".      |                     |  | 105        | 0 LET           | Z1=Z+V3+A/2*SIN(B2*P)  |                     |
| 30 INPUT                 |           | NEED INSTRU   | 10110NS.,      |                     |  |            |                 | V1=V1+A*COS(B2*P)*COS(B1*P)  |                     |
|                          |           | "N" THEN 5    | 500            |                     |  |            |                 | V2=V2+A*COS(B2*P)*SIN(B1*P)<br>U3=U3+A*SIN(B2*P)                             |                     |
| 100 PRIM                 | IT        |               |                |                     |  |            | O GOTO          | V3=V3+A*SIN(B2*P)<br>800   |                     |
|                          |           |               |                |                     | SPACE SHUTTLE."  |            |                 | T "GOOD JOB. DO YOU WANT TO"   |                     |
|                          |           |               |                |                     | FOUR STARBASES,"   | 111        | O PRIN          | T "TRY TO IMPROVE YOUR TIME";  |                     |
|                          |           |               |                |                     | A SIDE. THE BASES"   | 112        | O INPU          | T X\$  |                     |
|                          |           |               |                |                     | D A, B, C, AND D IN"   |            | 0 IF L<br>0 END | EFT\$(X\$,1)="Y" THEN 500  |                     |
|                          |           |               |                | ST VISIT THE        |  | Ok         | CRU             |  |                     |
|                          |           |               |                |                     | And the second | wh.        |                 |  |                     |

## **Mastermind**<sup>®</sup>

The original invention of Mastermind is credited to an amateur mathematician, Mordechai Meirovich, who first displayed it at the 1971 Nurenburg Toy Fair.\* Rights to the game were bought by Invicta who had moderate success with the game for 2½ years until the Christmas season of 1975 when it was the most popular packaged game. Sales surpassed even the old standby, Monopoly.

In its most basic form, Mastermind consists of a plastic game board, a dozen or so pegs which can be grouped into six basic colors, and two groups of black and white key pegs (sometimes called "inference pegs".) The game board resembles the figure below.

key-peg slots



The game is played by two people, whom we shall designate as the "active" player and the "passive" player. The first step before play actually commences is to have the passive player (in our case, the computer) choose a total of four colored pegs at random from any of the six basic color groups (duplicate colors allowed, of course.) He then conceals these colors from the active player by placing the four pegs in the "hidden code" portion of the game board. It is now up to the active player to determine, in ten moves or less, the exact color and location of each of the four pegs comprising the hidden code.

To aid the active player in determining the hidden code, the passive player must award the active player a number of key pegs (inference pegs) after each guess, according to the following scheme: for *each* peg in the active player's current guess which corresponds exactly (in color *and* posi-

\*Ed. Note— To anyone familiar with children's games, it is obvious that Mastermind is simply a commercial adaptation (using colors rather than numbers) of the game Bulls and Cows. This game, much more popular in England than the U.S. is not, to my knowledge, commercially packaged. —DHA tion) to a peg in the hidden code, the passive person places one *black* peg in the key-peg square adjacent to the passive player's current guess frame. Placing of the key pegs within the square is arbitrary since the relative position of the key peg carries no meaning. Clearly, when four black pegs are obtained, the hidden code is broken.

Secondly, the passive player must place one *white* key peg in the current key-peg square for *each* peg in the active player's current guess which matches (in color, but *not* position) a peg in the hidden code. Keep in mind that once a color peg in the player's current guess has been awarded a key peg, its function in determining the remaining number of key pegs to award for the current guess is finished. For example, suppose the hidden code were:

## RBYG

corresponding to red, blue, yellow, green, and the active player's current guess were:

GBBP

corresponding to green, blue, blue and purple.

The passive player should subsequently award one black and one white key peg for the following reasons: the blue color peg in position 2 of the current guess matches exactly in color and position with the hidden code. Secondly, the green color peg in position 1 of the current guess matches the color of the peg in position 4 of the hidden code. But since the *location* of the green peg is not exact, only a white peg is awarded. The blue and purple pegs in positions 3 and 4, respectively, of the current guess do not match either the color or position of the remaining pegs in the hidden code (positions 1 and 3) and hence, no other key pegs are awarded.

The game proceeds in this manner until the hidden code is broken or all ten frames have been filled. As noted earlier, the computer will play the passive player in our computer version, generating a hidden code and awarding the black and white key pegs after each guess.

The program offers the user two options, QUIT and BOARD, which may be entered at any time *after* the first move. QUIT instructs the program that you are fed up with playing Mastermind for the time being and wish to terminate the session. BOARD instructs the program to print out a summary of the moves prior to the time that the BOARD command was issued, including the guesses and key pegs awarded for each frame. Some players find that an arrangement of frames such as that provided by BOARD is easier to visualize and subsequently analyze. Beginners will find it most useful.

The program and this description were written by David G. Struble of the University of Dayton. It first appeared in *Creative Computing*, Mar/Apr 1976.

#### MASTERMIND CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THE GAME OF MASTERMIND

| COLOR | CODES: |         |          |          |
|-------|--------|---------|----------|----------|
|       |        | R=RED   | 0=ORANGE | Y=YELLOW |
|       |        | G=GREEN | B=BLUE   | P=PURPLE |
|       |        |         |          |          |

MOVE NUMBER 1 ? RRGG 0 BLACK PEGS 1 WHITE PEGS

MOVE NUMBER 2 ? OOBB O BLACK PEGS O WHITE PEGS

MOVE NUMBER 3 ? YYPP 3 BLACK PEGS 0 WHITE PEGS

MOVE NUMBER 4 ? YYPR 2 BLACK PEGS 0 WHITE PEGS

HOVE NUMBER 5 ? GYPP 2 BLACK PEGS 2 WHITE PEGS

MOVE NUMBER 6 ? YGPP YOU WIN!! WANT TO PLAY AGAIN? YES

HOVE NUMBER 1 ? RROO 0 BLACK PEGS 0 WHITE PEGS

MOVE NUMBER 2 ? GGYY 1 BLACK PEGS 1 WHITE PEGS

MOVE NUMBER 3 ? BBPP 2 BLACK PEGS 0 WHITE PEGS

MOVE NUMBER 4 ? BBGY

YOU WIN!! WANT TO PLAY AGAIN? NO

0k

LIST 10 PRINT TAB(24); "MASTERMIND" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"HORRISTOWN, NEW JERSEY" 40 PRINT:PRINT:PRINT 100 PRINT "THE GAME OF MASTERMIND" 110 PRINT 130 PRINT "COLOR CODES:" 140 PRINT " R=RED D=DRANGE Y=YELLOW" 150 PRINT " G=GREEN B=BLUE P=PURPLE" 160 PRINT 170 DIM B\$(10),Y(10),Z(10) 180 C(0)=4 190 FOR N=1 TO 4 200 C(N)=INT(6\*RND(1)+1) 210 NEXT N 220 FOR N=1 TO 4 230 X=C(N) 240 GOSUB 730 250 C(N)=X 260 NEXT N 270 P\$="" 273 FOR X1=1 TO 4 275 P\$=P\$+CHR\$(C(X1)) 277 NEXT X1 280 FOR P=1 TO 10 290 PRINT 300 PRINT "MOVE NUMBER"; P; 310 INPUT G\$ 320 IF G\$= "BOARD" THEN 910 330 IF G\$="QUIT" THEN 440

340 B\$(P)=G\$ 350 GOSUB 520 360 IF B=4 THEN 1010 370 GOSUB 600 380 PRINT B;" BLACK PEGS" 390 Y(P)=B 400 PRINT W:" WHITE PEGS" 410 Z(P)=W 420 NEXT P 430 PRINT "SORRY, YOU LOSE" 440 PRINT "THE CORRECT CODE WAS:";P\$ 450 PRINT "WANT TO PLAY AGAIN"; 460 INPUT AS 480 IF A\$="YES" THEN 190 490 PRINT 500 END 510 REM COMPUTE BLACK PEGS 520 FOR X1=1 TO 4 523 6(X1)=ASC(MID\$(6\$,X1,1)) 525 NEXT X1 530 B=0 540 FOR K=1 TO 4 550 IF G(K) <> C(K) THEN 570 560 B=B+1 570 NEXT K 580 RETURN 590 REM COMPUTE WHITE PEGS 600 FOR X1=1 TO 4 603 R(X1)=ASC(MID\$(P\$,X1,1)) 605 NEXT X1 610 W=0 620 FOR I=1 TO 4 630 FOR J=1 TO 4 640 IF G(I) <> R(J) THEN 680 650 W=W+1 660 R(J)=0 670 GOTO 690 680 NEXT J 690 NEXT I 700 W=W-B 710 RETURN 720 REM TRANSLATE COLOR CODES TO NUMERICS 730 IF X <> 1 THEN 760 740 X=89 750 RETURN 760 IF X <> 2 THEN 790 770 X=82 780 RETURN 790 IF X <> 3 THEN 820 800 X=80 810 RETURN 820 IF X <> 4 THEN 850 830 X=79 840 RETURN 850 IF X <> 5 THEN 880 860 X=71 870 RETURN 880 X=66 890 RETURN 900 REM PRINT BOARD SUMMARY 910 V=P-1 920 PRINT "GUESS", "BLACKS", "WHITES" 930 PRINT "-----", "-----", "-----" 960 FOR I=1 TO V 970 PRINT B\$(I),Y(I),Z(I) 990 NEXT I 1000 GOTO 290 1010 PRINT "YOU WIN!!" 1020 GOTO 450

9999 END

Ok

Masterbagels

This is a fascinating, generalpurpose, deductive logic game. It rolls Bagels, Mastermind, bulls and cows, et cetera, into one general deductive logic game. If you want to play Bagels, set the inputs to N,3,9 (N is the number of games you wish to play). If you want to play mastermind, set the inputs to N,4,6. Of course, many of the games that it plays are entirely new altogether such as N,7,4 or N,5,5.

To make it into a really generalpurpose game, you might want to put in a modification in the digit selection routine (statements 300-320) with a parameter that either allows or disallows duplicate digits. As it is right now, the game does allow duplicate digits so that, for example, it could select a three digit number such as 223 or even 444. Another change you might want to add is in statement 750; it sets the maximum allowable trials for getting the answer. You may find that it is not giving you enough tries and you might want to increase the value of I.

Masterbagels was created by H.R. Hamilton and originally appeared in *Creative Computing*, Jan/Feb 1977.

RUN

MASTERBAGELS CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

TEACH? YES

HI, THIS IS A LOGIC GAME DESIGNED TO TEST YOUR DEDUCTIVE ABILITY. I WILL CHOOSE A RANDOM NUMBER AND YOU ISOLATE-IT. WHEN PROMPTED, ENTER A VALID NUMBER, AND I WILL THEN RESPOND WITH THE # OF DIGITS THAT ARE RIGHT AND IN THE RIGHT POSITION AND THE W RIGHT BUT IN THE WRONG POSITION. IF I THINK YOU ARE HOPELESSLY LOST, I WILL TELL YOU THE ANSWER AND WE WILL GO ON TO THE NEXT NUMBER. TO RECAP YOUR ENTRIES ENTER A 0, TO QUIT ON A NUMBER ENTER 1, AND TO STOP ENTER 2

HOW MANY #'S(1-100), # DIGITS(2-6), AND MAX VALUE(2-9)? 2,2,4 GUESS? 12 0,1 GUESST 31 0 , 0 GUESST 24 3 TRIES, 3 AVERAGE FOR 1 NUMBERS **GUESS? 24** 0,1 GUESS? 32 1,0 GUESS? 22 1,0 GUESS? 12 4 TRIES, 3.5 AVERAGE FOR 2 NUMBERS RUN ABAIN? YES HOW MANY #'S(1-100), # DIGITS(2-6), AND MAX VALUE(2-9)? 1,4,6 **GUESS! 1122** 1 1 **GUESS? 1234** LISI 0 2 **GUESS? 3456** 5 PRINT TAB(23);"MASTERBAGELS" 5 PRINT TAB(23);"MASIENSAGELS" 6 PRINT TAB(20);"CREATIVE COMPUTING" 7 PRINT TAB(18);"HORRISTOWN, NEW JERSEY" 10 DIM F(9),M(9),T(9),H(18,3) 20 INPUT "TEACH";\$\$ 0,2 **GUESS? 1265** 1.1 GUESS? 2134 1,1 30 IF LEFT\$(S\$,1)="N" THEN 130 50 PRINT " MI, THIS IS A LOGIC GAME DESIGNED TO TEST YOUR DEDUCTIVE" 60 PRINT "ABILITY. I WILL CHODSE A RANDOM NUMBER AND YOU ISOLATE IT." GUESS? 0 1 , 1 = 1122 2 , 0 = 1234 70 PRINT "WHEN PROMPTED, ENTER A VALID NUMBER, AND I WILL THEM RESPOND" 80 PRINT "WITH THE W OF DIGITS THAT ARE RIGHT AND IN THE RIGHT POSITION 90 PRINT "AND THE W RIGHT BUT IN THE WRONG POSITION. IF I THINK YOU" 0 , 2 = 3456 1, 1 = 12651, 1 = 2134100 PRINT "ARE HOPELESSLY LOST, I WILL TELL YOU THE ANSWER AND WE 110 PRINT "WILL GO ON TO THE MEXT NUMBER. TO RECAP YOUR ENTRIES" GUESS? 2236 1.2 120 PRINT "ENTER A 0, TO QUIT ON A NUMBER ENTER 1, AND TO STOP ENTER 2" **GUESS? 2235** 130 5=0 1.1 140 PRINT **GUESS?** 1 150 PRINT "HOW MANY #'S(1-100), # DIGITS(2-6), AND MAX VALUE(2-9)";

ANSWER IS 6224 10 TRIES, 10 AVERAGE FOR 1 NUMBERS RUN AGAIN? NO

OK

160 INPUT J,A,B 180 IF A<=0 THEN 220 190 IF A>6 THEN 220 200 IF B<2 THEN 220 210 IF B<10 THEN 240 220 PRINT "ILLEGAL RANGE, RE-ENTER RUN PARAMETER 230 GOTO 160 240 IF JC100 THEN 260 250 J=100 260 FOR X=0 TO J+A+B 270 I=RND(1) 280 NEXT X 290 FOR N=1 TO 300 FOR X=0 TO A 310 T(X)=INT(RND(1)\*B+1) 320 NEXT X 330 FOR I=1 TO A+B+1 340 FOR X=1 TO A 350 F(X)=0 360 NEXT X 370 F1=0 380 F2=0 390 INPUT "BUESS";V 400 IF V<> 0 THEN 450 410 FOR X=1 TO I-1 420 PRINT H(X,1)","H(X,2)"="H(X,3) 430 NEXT X 440 GOTO 390 450 IF V=1 THEN 750 460 IF V=2 THEN 920 470 T1=V 480 FOR X=1 TO A 490 H(X)=INT(T1/(10^(A-X))) 500 T1=T1-H(X)\*(10\*(A-X))+((SGN(A-(X+1))-1)\*-5 510 IF M(X)<1 THEN 530 520 IF M(X) <8+1 THEN 550 530 PRINT "BAD NUMBER IN"V 540 GOTO 340 550 IF M(X) (>T(X) THEN 580 560 F(X)=1 570 F1=F1+1 580 NEXT X 590 IF F1=A THEN 810 600 FOR Y=1 TO A 610 IF T(Y)=M(Y) THEN 690 620 FOR X=1 TO A 630 IF M(Y) <>T(X) THEN 680 640 IF F(X)=1 THEN 680 650 F(X)=1 660 F2=F2+1 670 GOTO 690 680 NEXT X 690 NEXT Y 700 PRINT F1", "F2 710 H(I,1)=F1 720 H(I,2)=F2 730 H(1,3)=V 740 NEXT I 750 I=A-1+B+1 760 V=0 770 FOR X=1 TO A 780 V=V+T(X)\*(10\*(A-X)) 790 NEXT X 800 PRINT "ANSWER IS"V 810 S=S+I 820 PRINT I"TRIES, "S/N"AVERAGE FOR "N"NUMBERS" 830 Y=INT(RND(R)\*I) 840 Y=INT(H(Y,2)/1024+4\*RND(1)) 850 FOR X=1 TO Y+1 860 I=RND(1) 870 NEXT X 880 NEXT N 890 INPUT "RUN AGAIN";S\$ 900 IF LEFT\$(S\$,1)="Y" THEN 130 920 END

DK

## Matpuzzle

Ready to try something new? A game that isn't like STARTREK or Slot Machine? Then try MATPUZLE and enjoy the art of puzzle-making.

One benefit of puzzles is that they help develop a pattern of logic in one's thinking. In this puzzle you are given a matrix of letters, up to 6 x 6, and a board with dashes and a number above each of the dashes.

The matrix represents the letters of the words you typed in, each having the same length. The number of words and the length of the words are both limited to six, six words each six letters in length, but, both values don't have to be the same. The letters are then put in a matrix and randomly rearranged in lines 160-430.

The dashes on the board form the places for each letter of each word to be written in after it has been deciphered. The number above each dash, determined in lines 500-780, is the sum of the coordinates of where the letter of that dash is located in the matrix. The problem in solving the puzzle is that several coordinates have the same sum.

Since the answers appear above the puzzle itself, rip them off before you give it to a friend to try. They will have a great time trying to figure out your puzzle. Then let them make one for you or set up a relay. The possibilities are almost endless.

The program and description were written by Dave Schroeder.

RUN

MATPUZLE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS A PUZZLE-MAKING GAME. YOU INPUT UP TO SIX WORDS, UP TO SIX LETTERS EACH, AND EQUAL IN LENGTH. THE COMPUTER WILL SCRAMBLE THEN AND PRINT THEN IN A MATRIX. THE COMPUTER WILL ALSO PRINT A CORRESPONDING NUMBER BOARD. WHEN IT STOPS TEAR IT AND GIVE IT TO A FRIEND. HOW MANY WORDS DO YOU WANT (UP TO 6)? 6 HOW MANY LETTERS IN EACH WORD (MUST BE SAME)? 6 TYPE ONE & \_ETTER WORD ON EACH LINE PARITY DUPLES\S\X

MATRIX

- NUMBER
- LENGTH ? MOTHER

|   |   |   |   |   |    | ( 15 | EAR HERE | )  |  |
|---|---|---|---|---|----|------|----------|----|--|
|   | 1 | 2 | 3 | 4 | 5  |      |          |    |  |
| 1 | I | A | T | X | L  | N    |          |    |  |
| 2 | Ε | Ε | R | Ħ | н  | I    |          |    |  |
| 3 | D | M | P | н | G  | T    |          |    |  |
| 3 |   |   |   |   |    |      |          |    |  |
| 4 | U | L | 0 | A | R  | B    |          |    |  |
| 5 | X | R | E | Ε | N  | M    |          |    |  |
| 6 | T | T | U | P | Y  | R    |          |    |  |
|   |   |   |   |   |    |      |          |    |  |
|   |   |   |   |   |    |      |          |    |  |
|   | 6 | 3 | 5 | ; | 5  | 2    | 7        | 11 |  |
|   |   |   |   |   |    |      |          |    |  |
|   | 4 | : | 5 |   | 10 | 6    | 4        | 5  |  |
|   |   |   |   |   |    |      |          |    |  |
|   | 6 |   | • |   | 4  | *    | 0        | 6  |  |
|   | 7 |   | 9 |   | 11 | 10   | 8        | 7  |  |
|   |   |   |   |   |    |      |          |    |  |
|   | 6 | 3 |   |   | 10 | 8    | 8        | 7  |  |
|   |   |   |   |   |    |      |          |    |  |
|   | 5 |   | 7 |   | 9  | 7    | 9        | 12 |  |

THE NUMBER ABOVE EACH DASH IS THE SUM OF TWO COORDINATES OF THE POINT ON THE MATRIX WHERE THE CORRECT LETTER FOR THAT SPOT WILL APPEAR. THE PROBLEM IS THAT THE SUM OF SOME COORDINATES ARE THE SAME SO SEVERAL LETTERS COULD FIT. SO TRY NOW TO FIND WHAT WORDS WERE USED AND SOLVE THE PUZZLE SO -- 600D LUCK

----

DO YOU WANT ANOTHER RUN? YES

HOW MANY WORDS DO YOU WANT (UP TO 6)? 4 HOW MANY LETTERS IN EACH WORD (MUST BE SAME)? 5

TYPE ONE 5 LETTER WORD ON EACH LINE

? PRINT

? BASIC

EQUAL

? POINT

4 PRINT: PRINT 10 DIM A\$(6), B\$(6,6), C(6,6), C\$(6,6) 20 PRINT"THIS IS A PUZZLE-MAKING GAME." 30 PRINT YOU INPUT UP TO SIX WORDS, UP TO SIX" 40 PRINT"LETTERS EACH, AND EQUAL IN LENGTH." 50 PRINT"THE COMPUTER WILL SCRAMBLE THEN AND" 60 PRINT"PRINT THEM IN A MATRIX. THE COMPUTER " 70 PRINT"WILL ALSO PRINT A CORRESPONDING NUMBER" 80 PRINT"BOARD. WHEN IT STOPS TEAR IT AND GIVE IT" 90 PRINT"TO A FRIEND." 100 PRINT"HOW MANY WORDS DO YOU WANT (UP TO 6)"; 105 INPUT W 110 PRINT"HOW MANY LETTERS IN EACH WORD (MUST BE SAME)"; 115 INPUT L 120 PRINT"TYPE ONE";L;"LETTER WORD ON EACH LINE" 130 FOR X=1 TO W 140 INPUT AS(X) 150 NEXT X 160 FOR X=1 TO W 170 FOR Y=1 TO L 180 C\$(X,Y)=MID\$(A\$(X),Y,1):B\$(X,Y)=MID\$(A\$(X),Y,1) 190 NEXT Y 200 NEXT X 210 PRINT 215 FOR P=1 TO 28 220 PRINT"-"; 221 NEXT P 225 PRINT TAB(29)"( TEAR HERE )"; 226 FOR P1=1 TO 27 227 PRINT TAB(43)"-"; 228 NEXT P1 230 PRINT 240 FOR Z=1 TO 60 250 F=INT(RND(1)+U+1) 260 D=INT(RND(1)\*W+1) 270 G=INT(RND(1)\*L+1) 280 E=INT(RND(1)\*L+1) 290 J\$=B\$(F,G) 300 B\$(F,G)=B\$(D,E) 310 B\$(D,E)=J\$ 320 NEXT Z 330 PRINT TAB(4); 340 FOR Z1=1 TO L 350 PRINT TAB(5);21;" "; 360 NEXT Z1 370 PRINT 380 PRINT

420 PRINT B\$(Z2,Z3);" . 430 NEXT Z3 440 PRINT 450 PRINT 460 NEXT Z2 470 PRINT 480 PRINT 490 PRINT 500 FOR P=1 TO L 510 FOR Q=1 TO W 520 T=0 530 FOR R=1 TO W 540 FOR S=1 TO L 550 IF T=1 THEN 600 560 IF B\$(R,S)<>C\$(Q,P)THEN 600 570 C(Q,P)=R+S 580 T=1 590 B\$(R,S)=" 600 NEXT S 610 NEXT R 620 NEXT Q 630 NEXT P 640 FOR X=1 TO W 650 PRINT TAB(3) 660 FOR M=1 TO L 670 IF C(X, M)>9 THEN 700 680 PRINT C(X, M);" .... 690 GOTO 710 700 PRINT C(X, M);" \*\* : 710 NEXT M 720 PRINT:PRINT 730 PRINT TAB(2): 740 FOR M1=1 TO L 750 PRINT"----";" "; 760 NEXT M1 770 PRINT 780 NEXT X 790 PRINT 800 PRINT 810 PRINT"THE NUMBER ABOVE EACH DASH IS THE SUM OF TWO COORDINATES OF 820 PRINT"THE POINT ON THE MATRIX WHERE THE CORRECT LETTER FOR THAT 830 PRINT"SPOT WILL APPEAR. THE PROBLEM IS THAT THE SUM OF SOME . 840 PRINT"COORDINATES ARE THE SAME SO SEVERAL LETTERS COULD FIT. 50 850 PRINT"TRY NOW TO FIND WHAT WORDS WERE USED AND SOLVE THE PUZZLE" 855 PRINT"-- GOOD LUCK" 860 PRINT"DO YOU WANT ANOTHER RUN"; 861 INPUT Y95 870 IF Y9\$="YES" THEN 100

LIST

1 PRINT TAB(26)"MATPUZLE"

390 FOR Z2=1 TO W

2 PRINTTAB(20)"CREATIVE COMPUTING"

3 PRINT TAB(18) "MORRISTOWN, NEW JERSEY"

THE NUMBER ABOVE EACH DASH IS THE SUM OF TWO COORDINATES OF THE POINT ON THE MATRIX WHERE THE CORRECT LETTER FOR THAT SPOT WILL APPEAR. THE PROBLEM IS THAT THE SUM OF SOME COORDINATES ARE THE SAME SD SEVERAL LETTERS COULD FIT. 50 TRY NOW TO FIND WHAT WORDS WERE USED AND SOLVE THE PUZZLE -- GOOD LUCK DO YOU WANT ANOTHER RUN? NO OK

400 PRINT Z2;" 410 FOR Z3=1 TO L

";

| 8 | 2 | 3 | 6 | 4 |
|---|---|---|---|---|
| 7 | 5 |   |   | 4 |
|   |   |   |   |   |
|   |   |   |   |   |
| 8 | 5 | 4 | 6 | 7 |

4 5

H F

1

R

2 T T A N L

3

4 n N T P A

----

0 £

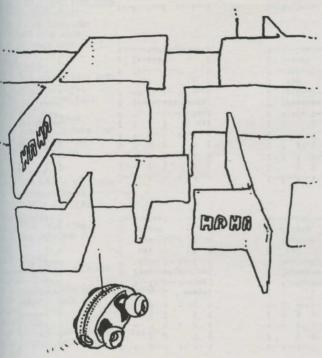
I S B P

-- ( TEAR HERE ) --2 3

**DK** 

880 END





This is actually a two part game. In the first part, the program generates a maze which you can then try to find your way through with pencil and paper. Each path of the maze is three characters wide, hence the maximum width that will print on a standard seventy-two column width teletype or other hard copy printer is 24 for the horizontal dimension. A 132-column line printer could handle up to a horizontal dimension of 44. Naturally the vertical dimension can be anything since it's running the length of the paper. However, for really large mazes your computer system will probably be the limiting factor since several matrices are dimensioned with the horizontal and vertical dimensions of the maze.

In the second part of the program a near-sighted mouse is let loose in the maze and explores until he finds his way through. If you want to know what near-sighted means, run the program and ask to see the solution step by step as the mouse goes through the maze. If you elect not to see each step, you'll simply get a total solution for the maze itself.

With or without the mouse, it's a fun program and the larger mazes are frequently a real challenge to solve.

This program was conceived and written by Richard Schaal.

MAZE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

DO YOU NEED INSTRUCTIONS? YES

RIIN

THIS PROGRAM WILL SIMULATE A NEAR-SIGHTED MOUSE IN A MAZE. YOU SELECT THE DIFFICULTY FACTOR - SIZE! YOU MAY HAVE A MAZE OF ANY SIZE PERMITTED BY THE SIZE OF YOUR SYSTEM. DIMENSIONS LESS THAN 5 ARE TOO TRIVIAL. EACH MAZE IS DIFFERENT, AND HAS ONLY ONE WAY THROUGH IT.

WHAT ARE YOUR DIMENSIONS (HORIZONTAL, VERTICAL)? 10,10

| : | : | 1 | : | : | : | : | : | : | : | : |
|---|---|---|---|---|---|---|---|---|---|---|
| I |   |   |   | I |   |   |   | I |   | I |
| : | : | : | : | : | : | : | : | : | : | : |
| I | I |   | I |   | I | I |   | I | 1 | I |
| : | : | : | : | : | : | : | : | : | : | : |
| 1 |   | I |   | I | I |   | I | I | I | 1 |
| : | : | : | : | : | : | : | : | : | : | : |
| 1 |   | I |   |   | I | I |   |   | I | I |
| : | : | : | : | : | : | : | : | : | : | : |
| I |   | I |   | I | I |   | I | I | I | I |
| : | : | : | : | : | : | : | : | : | : | : |
| I |   | I | I | I |   | I |   | I |   | 1 |
| : | : | : | : | : | : | : | : | : | : | : |
| I |   |   | I | I | I |   | I | I |   | 1 |
| : | : | : | : | : | : | : | : | : | : | : |
| I |   |   | I |   | I |   |   | I | I | I |
| : | : | : | : | : | : | : | : | : | : | : |
| I | I |   |   | I |   | I |   | I | I | I |
| : | : | : | : | : | : | : | : | : | : | : |
| I |   |   |   |   | I | I | I |   |   | I |
| : | : | : | : | : | : | : | : | : | : |   |

DO YOU WANT THE SOLUTION? YES DO YOU WANT TO SEE EACH STEP? NO

| : | : | : | : | : | :   | :   | :** | : | : | : |
|---|---|---|---|---|-----|-----|-----|---|---|---|
| 1 |   |   |   | I |     |     | I** | I |   | I |
| : | : | : | : | : | :   | :   | :** | : | : | : |
| I | I |   | I |   | I   | I** | *** | I | I | I |
| : | : | : | : | : | :   | :** | :   | : | : | : |
| I |   | I |   | I | I** | *** | I   | I | I | I |
| : | : | : | : | : | :** | :   | :   | : | : | : |
| I |   | I |   |   | I** | I   |     |   | I | I |
| : | : | : | : | : | :** | :   | :   | : | : | : |
| I |   | I |   | I | I** | *** | 1   | I | I | I |
| : | : | : | : | : | :   | :** | :   | : | : | : |
| I |   | I | I | I |     | I** | *** | I |   | I |
| : | : | : | : | : | :   | :   | :** | : | : | : |
| I |   |   | I | I | I   |     | I** | I |   | I |
| : | : | : | : | : | :   | :   | :** | : | : | : |
| I |   |   | I |   | I** | *** | *** | I | I | I |
| : | : | : | : | : | :** | :   | :   | : | : | : |
| I | I |   |   | I | **  | I   |     | I | I | I |
| : | : | : | : | : | :** | :   | :   | : | : | : |
| I |   |   |   |   | I** | I   | I   |   |   | I |
| : | : | : | : | : | :** | :   | :   | : | : | : |

DO YOU WANT ANOTHER MAZE? YES

WHAT ARE YOUR DIMENSIONS (HORIZONTAL, VERTICAL)? 6,6

\*\*\*\*\*I I \*\*\*\*\*T T T \*\*\*\*\*T T : :--:-:\*\*: : : :--:--:\*\*: 12 2 : : :--:-:\*\*: . . Ŧ T I\*\* T I\*\* T T T\*\* II 1--1--:\*\*:--!--! 1--1--1-----\*\*\*\* :--:-:\*\*: \*--\*--\*--\*\*\*\* . I \*\*\*\*\* I I\*\*\*\*\*\*\*\*\*\*\* I\*\*\*\*\*\*\*\*\*\*\* I \*\* I I :\*\*:--:-: : :\*\*:--:--:--: 1--1--1 1 1--1--1--1 1 : : 2 I I I\*\* I## I I I T T II I T : :--: . . . . : :--: 1 1--1\*\*1 1 . . -1--1--1--1 . : :-. . . . : I I I I I I I I I II T T T . . .-- . . . . 1 1 1--1 1 1 1 : : :--: : : I I I I 1 1 1--1 1 1 1--1--1--1 . II II I I II II I TT T I 1--1--1 1--1--1 1--1--1 1--1--1t--t--t t--testes 1--1--1 1--1--1 : I I IIII :--: : : : II I :--:--:\*\*:--:-: -:\*\*:--:--: -:\*\*:--:-1--1--1 1--1--1 - : -I \*\*\*\*\*I I \*\*\*\*\*I I I \*\*\*\*\*1 1 :--:--:\*\*: : :--:-:\*\*: :--:-:\*\*: . : : : II I\*\* I II I\*\* TT II I\*\* I :--:-:\*\*: :--:-:-:\*\*: 1--1--1-I \*\*\*\*\*\*\*I I I \*\*\*\*\*\*\*\*\*\*\*\* [\*\*\*\*\*\*\*\*\*\*\*\*\* I\*\*\*\*\*\*\*\*\*\*\* I \*\*\*\*\*T T T : 1--1--1--1--1 :\*\*:--:--:--: :\*\*:--:--!--! : :\*\*:--:-- - ------. : : 1--1--1 1 4 I\*\*\*\*\* I I\*\*\*\*\*\*\*I I II I\*\* I I T Т II 1 1--1\*\*1 1 1 1\*\*1--1 1 1 1 1 1 1--1 1 1 1 . . I I IIII I##I II I T Ι I I I I T : :\*\*:--: : : I I\*\* I I : :--: : : : : I I I I I : : :--: : : : I I I I I I : : : :--: : : : : I I I I I I TI I 1--1 1 1 1------1--1--1 1--1--1 1--1--1 1--1--1 1--1--1 1--1--1-: I I T T T T 2 ...... 1--1 1 1 T I II T :--:--:\*\*:--:-: :--:-:\*\*:--:-: -:\*\*:--:-: 1--1--1-1--1--1 1--1--1 \*\*\*\*\*I \*\*\*\*\*I I \*\*\*\*\*I Ι I I I I :--:-:\*\*: : : :--:-:\*\*: : : :--:--:\*\*: : 12 I I\*\* I I I\*\* I :--:-:-:\*\*: : II I T I I I\*\* I :--:--:--:\*\*: 1--1--1--1+# 1--1--1--1\*\*1 . -:\*\*:--:-. - : -\*\*\*\*\*\*\*\*\* I I [\*\*\*\*\*\*\*\*\*\*\*\*\* [\*\*\*\*\*\*\*\*\*\*\*\*\*\* I I\*\*\*\*\*\*\*\*\*\*\* \*\*\*\*1 I I :\*\*:--!--!--!--! 1--1--1--1--1 :\*\*:--:--:--: :\*\*:--:--:--: : . -:--:\*\*: 12 :-. T## I T\*\*\*\*\*\*\* I\*\*\*\*\*\*\*I I\*\* T I I I TT II I :\*\*:--: : :--:\*\*: : : . : : : . . . . : :--: : : : . -1--1--1 1 ... : I I\*\*\*\*\*I I I I II II I T T I\*\*I I I I I II I I :\*\*: : :--: : : I I I . . :--: : : :--: : : . 1--1--1--1--: I I\*\*\*\*\*I I TI II I\*\*I II II T I :--:-: :-- : - - : -:--:--1 1--1--1--1 1--1--1 1--1--1 1--1--1\*\*1--1--1-: : . :--: . . T T T T T :--: : : I I . T 1--1--1 1--1--1 290 0=0:7=0 550 IF S<>V THEN 590 LIST 300 X=INT(RND(1)\*H+1) 560 IF Z=1 THEN 620 10 PRINT TAB(27);"MAZE" 310 FOR I=1 TO H 570 0=1 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 320 IF I=X THEN 350 580 GOTO 600 330 PRINT ":--"; 590 IF W(R, S+1)>0 THEN 621 40 PRINT:PRINT:PRINT 340 GDTD 360 600 X=INT(RND(1)\*3+1) 100 REM MOUSE IN MAZE - SOLUTION SECTION BY RICHARD SCHAAL FMCC 350 PRINT ": 610 DN X GDTO 1200,1240,137 110 REM ORIGINAL MAZE PROGRAM FROM "101 BASIC COMPUTER GAMES" 120 PRINT "DO YOU NEED INSTRUCTIONS";:INPUT A\$ 360 NEXT I 620 X=INT(RND(1)\*2+1) 370 PRINT ":" 630 ON X GOTO 1200,1240 130 IF LEFT\$(A\$,1)="Y" THEN 150 380 C=1:W(X,1)=C:C=C+1:R=X:S=1 640 IF R=H THEN 750 140 GOTO 200 390 GOTO 470 650 IF W(R+1,S)>0 THEN 750 400 IF R<>H THEN 450 150 PRINT: PRINT: PRINT "THIS PROGRAM WILL SIMULATE A NEAR-SIGHTED MOUSE I 660 IF S<>V THEN 700 N" 410 IF S<>V THEN 440 670 IF Z=1 THEN 730 160 PRINT "A MAZE. YOU SELECT THE DIFFICULTY FACTOR - SIZE!" 420 R=1:5=1 680 Q=1 170 PRINT "YOU MAY HAVE A MAZE OF ANY SIZE PERMITTED BY THE SIZE OF YOUR 430 GOTO 460 690 GOTO 710 440 R=1:S=S+1:GOTO 460 700 IF W(R,S+1)>0 THEN 730 180 PRINT "SYSTEM. DIMENSIONS LESS THAN 5 ARE TOO TRIVIAL." 450 R=R+1 710 X=INT(RND(1)\*3+1) 190 PRINT "EACH MAZE IS DIFFERENT, AND HAS ONLY ONE WAY THROUGH IT." 460 IF W(R,S)=0 THEN 400 720 DN X GOTO 1200,1280,11 470 IF R=1 THEN 830 200 PRINT 730 X=INT(RND(1)\*2+1) 480 IF W(R-1,S)>0 THEN 830 210 PRINT "WHAT ARE YOUR DIMENSIONS (HORIZONTAL, VERTICAL)"; 740 ON X GOTO 1200,1280 220 CLEAR 100: REM ERASE ALL ARRAYS AND VARIABLE VALUES 490 IF S=1 THEN 640 750 IF S<>V THEN 790 230 INPUT H,V 500 IF W(R,S-1) >0 THEN 640 760 IF Z=1 THEN 820 240 H=INT(ABS(H)):V=INT(ABS(V)) 510 IF R=H THEN 550 270 0=1 250 IF H>=5 AND V>=5 THEN 270 520 IF W(R+1,S)>0 THEN 550 780 GOTO 800 260 GOTO 150 530 X=INT(RND(1)\*3+1) 790 IF W(R,S+1)>0 THEN 821 270 DIM W(H,V),V(H,V) 540 ON X GOTO 1200,1240,1280 800 X=INT(RND(1)\*2+1) 280 PRINT:PRINT 810 ON X GOTO 1200,1370 102

1--1--1\*\*1--1-1--1--1++1--1-1--1--1\*\*1--1 1--1--1 1--1--1 \*\*\*\*\*I \*\*\*\*\*I I \*\*\*\*I I Т I T Ŧ I Ι \*\*\*\*\*1 ..-:\*\*: : ..-.:\*\*: : : : -:--:\*\*: 1--1--1881 :-: . : 2 : 1--1--1 : . . : II I\*\* I\*\* II I\*\* I I II II Ist I I I I T 1--1--1--1\*\*1 - : \*\* : --1--1--1-. 1--1--1--1\*\*1 . \*--\*--\*--\*\*\*\* 2.0 - : - - : - - : - - : ..... . . ##T T I\*\*\*\*\*\*\*\*\*\*\*\*\* T\*\*\*\*\*\*\*\*\*\*\*\*\*\* T T T T\*\*\*\*\*\*\*\*\*\*\*\*\* T T T :\*\*:--:--:--: : :--!--!--! : \*\*:--!--!--!--! 1--1--1--1 12 -1--1 I \*\* I I T I I T\*\*\*\*\*\*\* I T T I T T T :\*\*:--: : : : 1 1--1 1 1 1 : : : :--:\*\*: : 1--1 : : : : : 1--1 : : : I I IIII II II II II III I I\*\*I I I I I II \*\*III :--: : : I I : : :--: 1--1 1 1 :-: \* 1 1--1 1 1 . : II II II II TI T II II I 1--1--1 1--1--1-1--1--1 1--1--1 1-------1--1--1 1--1--1 - : 1--1--1 1--1--1 DO YOU WANT THE SOLUTION? YES 1--1--1--1\*\*1--1--1 DO YOU WANT TO SEE EACH STEP? YES 1--1--1\*\*1--1-1 - -1--1--:\*\*:--:\* T \*\*\*\*\* 1---:#8: . Tee II [\*\*\*\*\*\*\*\*\*\*\*\*\* :\*\*:--:-:-: I\*\*\*\*\*\*\*I

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EN SOTO 1200
   IN IF S=1 THEN 1040
   HO IF W(R, S-1)>0 THEN 1040
   IN IF R=H THEN 960
   W IF W(R+1,S)>0 THEN 960
   IN IF SOV THEN 910
   HO IF Z=1 THEN 940
   H0 Q=1
   HO GOTO 920
   10 IF W(R, S+1)>0 THEN 940
   HO X=INT(RND(1)+3+1)
  10 ON X GOTO 1240,1280,1370
   H0 X=INT(RND(1)+2+1)
                                                                                   1860 NEXT J
  HO ON X GOTO 1240,1280
                                                                                   1870 NEXT I
  HO IF SOV THEN 1000
  970 IF Z=1 THEN 1030
  780 Q=1
                                                                                   1900 NEXT I
  990 SOTO 1010
  1000 IF W(R,S+1)>0 THEN 1030
                                                                                   1920 Y=1:X=S
  1010 X=INT(RND(1)*2+1)
  1020 DN X GOTO 1240,1370
  1030 GOTO 1240
  1040 IF R=H THEN 1140
  1150 IF W(R+1,S)>0 THEN 1140
1060 IF S<>V THEN 1100
  1070 IF 7=1 THEN 1130
  1080 9=1
  1090 GOTO 1110
  1100 IF W(R, S+1)>0 THEN 1130
  1110 X=INT(RNB(1)*2+1)
 1120 DN X GOTO 1280.1370
 1130 GOTO 1280
 1140 IF S >V THEN 1180
 1150 IF Z=1 THEN 400
 1160 0=1
 1170 GOTO 1190
 1180 IF W(R, S+1)>0 THEN 400
 1190 GOTO 1370
 1200 W(R-1,S)=C:C=C+1:V(R-1,S)=2:R=R-1
 1210 IF C=H*V+1 THEN 1510
 1220 @=0
 1230 GOTO 470
 1240 W(R,S-1)=C:C=C+1:V(R,S-1)=1:S=S-1
 1250 IF C=H*V+1 THEN 1510
 1260 0=0
 1270 GOTO 470
 1280 W(R+1,S)=C:C=C+1
 1290 IF V(R,S)=0 THEN 1320
 1300 V(R,S)=3
 1310 GOTO 1330
 1320 V(R.S)=2
                                                                                   2240 PRINT
 1330 R=R+1
 1340 IF C=H*V+1 THEN 1510
1350 Q=0
 1360 GOTO 830
1370 IF Q=1 THEN 1470
1380 W(R,S+1)=C
                                                                                   2300 NEXT I
1390 C=C+1
                                                                                   2310 PRINT ":"
1400 IF V(R.S)=0 THEN 1430
1410 V(R,S)=3
1420 GOTO 1440
1430 V(R,S)=1
1440 S=S+1
                                                                                   2360 Z=V(I,J)
1450 IF C=H*V+1 THEN 1510
1460 GOTO 470
1470 Z=1
1480 IF V(R,S)=0 THEN 1500
1490 V(R,S)=3:0=0:60T0 400
1500 V(R,S)=1:Q=0:R=1:S=1:GOTO 460
1510 IF Z=1 THEN 1540
1520 R=INT(RND(1)*H)+1:S=V
                                                                                   2440 NEXT I
1530 V(R,S)=V(R,S)+1
                                                                                   2450 PRINT
1540 GOSUB 2320
1550 PRINT "DO YOU WANT THE SOLUTION";:INPUT A$
1560 IF LEFT$(A$,1)<>"Y" THEN 2620
1570 PRINT "DO YOU WANT TO SEE EACH STEP";:INPUT A$:PRINT:PRINT
                                                                                   2480 Z=V(I,J)
1580 FOR I=1 TO H: IF W(I,1)=1 THEN S=I:GOTO 1720
1590 NEXT I
1600 REM NOW WE CAN CLEAR W ARRAY AS ENTRY POINT IS FOUND.
1610 REM ELEMENTS IN V ARE EITHER 0,1,2 OR 3
1620 REM O IS CLOSED ON THE RIGHT AND AT THE BOTTOM
                                                                                   2540 PRINT ":
1630 REM 1 IS CLOSED ON THE RIGHT
1640 REM 2 IS CLOSED ON THE BOTTOM
1650 REH 3 IS OPEN ON THE RIGHT AND AT THE BOTTOM
                                                                                   2570 NEXT I
1660 REM DIRECTIONS WILL BE CODED:
                                                                                   2580 PRINT ":"
1670 REM 1 : UP
                                                                                   2590 NEXT J
1680 REM 2 : DOWN
1690 SEM
        4 : RIGHT
                                                                                   2610 RETURN
1700 REM 8 : LEFT
1710 REM SCAN V ARRAY FOR POSSIBLE MOVES IN ALL DIRECTIONS
1720 FOR I=1 TO H:FOR J=1 TO V
                                                                                   2640 PRINT:END
1730 W(I, J)=0
                                                                                   Ok
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1740 REM TRY UP
1750 IF J=1 THEN 1780
1760 IF V(I, J-1)=1 OR V(I, J-1)=3 THEN W(I, J)=W(I, J)+1
1770 REM TRY DOWN
1780 IF J=V THEN 1810
1790 IF V(I,J)=1 OR V(I,J)=3 THEN W(I,J)=W(I,J)+2
1800 REM TRY RIGHT
1810 IF I=H THEN 1840
1820 IF V(I,J)=2 OR V(I,J)=3 THEN W(I,J)=W(I,J)+4
1830 REM TRY LEFT
1840 IF I=1 THEN 1860
1850 IF V(I-1,J)=2 OR V(I-1,J)=3 THEN W(I,J)=W(I,J)+8
1880 FOR I=1 TO H
1890 IF V(I,V)=1 OR V(I,V)=3 THEN W(I,V)=W(I,V)+2:E=I:GOTO 1920
1910 REM HAVE TO GO DOWN FIRST
1930 V(X,Y)=V(X,Y)+4
1940 REM CHECK FOR POSSIBLE DIRECTIONS NOW ...
1950 IF Y=V AND X=E THEN PRINT:GOSUB 2250:PRINT:PRINT:GOTO 2620
1960 GOSUB 2230
1970 REM CHECK POSSIBLE DIRECTIONS
1980 IF (W(X,Y) AND 2) ↔ 0 THEN 2030
1990 IF (W(X,Y) AND 4) ↔ 0 THEN 2080
2000 IF (W(X,Y) AND 8) <> 0 THEN 2130
2010 IF (W(X,Y) AND 1) <> 0 THEN 2180
2020 GDTO 1950
2030 IF (V(X,Y+1)>3) AND ((W(X,Y) AND 13)=0) THEN 2060
2040 IF V(X, Y+1)>3 THEN 1990
2050 Y=Y+1:V(X,Y)=V(X,Y)+4:GOTO 1950
2060 V(X,Y)=V(X,Y)-4:W(X,Y)=(W(X,Y) AND 13):Y=Y+1:W(X,Y)=(W(X,Y) AND 14)
2070 GOTO 1950
2080 IF (V(X+1,Y)>3) AND ((W(X,Y) AND 11)=0) THEN 2110
2090 IF V(X+1,Y)>3 THEN 2000
2100 X=X+1:V(X,Y)=V(X,Y)+4:GOTO 1950
2110 V(X,Y)=V(X,Y)-4:W(X,Y)=(W(X,Y) AND 11):X=X+1:W(X,Y)=(W(X,Y) AND 7)
2120 GOTO 1950
2130 IF (V(X-1,Y)>3) AND ((W(X,Y) AND 7)=0) THEN 2160
2140 IF V(X-1,Y)>3 THEN 2010
2150 X=X-1:V(X,Y)=V(X,Y)+4:GOTO 1950
2160 V(X,Y)=V(X,Y)-4:W(X,Y)=(W(X,Y) AND 7):X=X-1:W(X,Y)=(W(X,Y) AND 11)
2170 GOTO 1950
2180 IF (V(X,Y-1)>3) AND ((W(X,Y) AND 14)=0) THEN 2210
2190 IF V(X,Y-1)>3 THEN 1980
2200 Y=Y-1:V(X,Y)=V(X,Y)+4:60T0 1950
2210 V(X,Y)=V(X,Y)-4:W(X,Y)=(W(X,Y) AND 14):Y=Y-1:W(X,Y)=(W(X,Y) AND 13)
2220 GOTO 1950
2230 IF LEFT$(A$,1)<>"Y" THEN RETURN
2250 FOR I=1 TO H
2260 IF I=S THEN 2290
2270 PRINT ":--";
2280 GOTO 2300
2290 PRINT ":**";
2320 FOR J=1 TO V
2330 PRINT "I":
2340 FOR I=1 TO H
2350 IF V(I, J)>3 THEN Z=V(I, J)-4:60T0 2370
2370 IF Z<2 THEN 2420
2380 IF Z<>V(I,J) AND V(I+1,J)>3 THEN PRINT "***";:60T0 2440
2390 IF Z<>V(I,J) THEN PRINT "** ";:60T0 2440
2400 PRINT " ";
2410 GOTO 2440
2420 IF Z<>V(I, J) THEN PRINT "**I";:GOTO 2440
2430 PRINT " I";
2460 FOR I=1 TO H
2470 IF V(I, J)>3 THEN Z=V(I, J)-4:GOTO 2490
2490 IF Z=0 THEN 2560
2500 IF Z=2 THEN 2560
2510 IF Z<>V(I, J) AND J=V THEN PRINT ":**";:GOTO 2570
2520 IF J=V THEN 2540
2530 IF Z<>V(I, J) AND V(I, J+1)>3 THEN PRINT ":**";:GOTO 2570
2550 GOTO 2570
2560 PRINT ":--";
2600 PRINT: PRINT
2620 PRINT:PRINT:PRINT "DO YOU WANT ANOTHER MAZE"::INPUT AS
2630 IF LEFT$(A$,1)="Y" THEN PRINT : GOTO 210
```

## Millionaire

In this game, the computer takes you through your life from birth to death. Along the way, you're asked to make some petty and some other rather crucial decisions. Some of these decisions regard what kind of job you want, how much you bet in Las Vegas, whether you buy a valuable coin, whether you elect to take a vacation or a second job, stock purchases buying and selling, automobile accidents, tornadoes, and the like.

At the end of your life (it goes by in a flash!) the computer tallies up your gains and your losses and tells you where you stand relative to becoming a millionaire. In ten plays of the game, the most we ever got was \$379,000, somewhat short of being a millionaire, but probably, all things considered, more realistic.

Millionaire was conceived and written by Craig Gunnett, a dreamer to the very end.

RUN

#### HILLIONAIRE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS THE GAME OF 'HILLIONAIRE'. ALL YOU MUST DO IS TYPE IN YOUR MAME AND ANSWER SOME QUESTIONS. THE DECISIONS YOU MAKE WILL DETERMINE HOW MUCH MONEY YOU MAKE. AT THE TIME OF YOUR DEATH, YOUR LIFE WILL BE RATED BY THE AMOUNT OF MOMEY YOU MADE THROUGHOUT YOUR LIFE. IF YOU MAVE MADE \$1,000,000, YOU WILL BE A MILLIONAIRE AND WIN THE GAME. NAME PLEASE? STEVE

O.K., STEVE, THIS IS YOUR NEW LIFE! IN A SMALL TOWN, ON OCT 28, 1980, STEVE IS BORN. YOUR PARENTS ARE VERY POOR. ON JUN 12, 1998, YOU LEAVE HOME WITH \$ 410 YOU BOT A NEW JOB AS A FOOTBALL PLAYER. YOU EARN \$ 118031 A YEAR. YOU ADJUST YOUR EXPENSES TO \$ 110907 A YEAR.

SEP 27 , 2001 The doctor says you need a vacation. Do you go? yes

GOOD, THE VACATION COSTS \$ 2671 YOU NOW HAVE \$-2261

MAR 7 , 2011 The Interest on Your Loan IS \$ 1582 . You have \$-3843 You go to las vegas to gamble. How much do you bet? 100

YOU WON \$ 138 You now have \$-3705 Your Earnings and expenses leave you with \$ 67535

AUG 6, 2016 NEWS FLASH!!! A TORNADO HAS JUST HIT THE HOME OF STEVE DAMAGES HAVE BEEN ESTIMATED AT \$ 23999 YOU NOW HAVE \$ 43536 YOUR EARNINGS AND EXPENSES LEAVE YOU WITH \$ 79156

SEP 22, 2025 YOUR BRANDFATHER GROVERS JUST DIED. (OH!) HE LEFT YOU & 60773, BUT FUNERAL EXPENSES ARE \$ 12587 YOU NOW HAVE \$ 127342 YOUR EARNINGS AND EXPENSES LEAVE YOU WITH \$ 191458

SEP 20 , 2033 YOU JUST HAD A CAR ACCIDENT! HEDICAL COSTS ARE \$ 1975 . REPAIRS COST \$ 1584 YOU NOW HAVE \$ 187899 YOUR EARNINGS AND EXPENSES LEAVE YOU WITH \$ 244891

MAY 20 , 2038 Your Home has been robbed of goods worth \$ 13878 You now have \$ 231013 Your Earnings and expenses leave you with \$ 266633

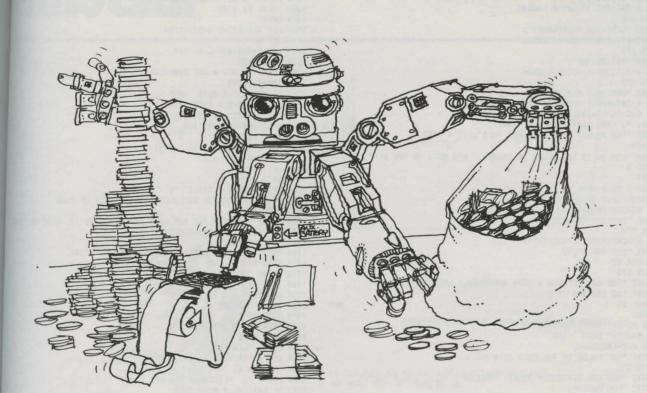
MAY 1 , 2043 OH! YOU JUST GOT CANCER. MEDICAL BILLS ARE \$ 4638 YOU ARE DEAD (COULD'NT TELL, COULD YOU?) AT THE AGE OF 63 . YOU HAD \$ 261995 NOT BAD, STEVE THANKS FOR PLAYING 'HILLIONAIRE', STEVE!!!! OK

```
IPRINT TAB(23);"MILLIONAIRE"
2PRINT TAB(20);"CREATIVE COMPUTING"
3PRINT TAB(18);"MORRISTOWN, NEW JERSEY"
A PRINT: PRINT: PRINT
10 REM MILLIONAIRE BY CRAIG GUNNETT
20 PRINT "THIS IS THE GAME OF 'MILLIONAIRE'. ALL YOU MUST DO IS"
30 PRINT "TYPE IN YOUR NAME AND ANSWER SOME QUESTIONS. THE"
4 PRINT "DECISIONS YOU MAKE WILL DETERMINE HOW MUCH MONEY YOU"
50 PRINT "MAKE. AT THE TIME OF YOUR DEATH, YOUR LIFE WILL BE"
# PRINT "RATED BY THE AMOUNT OF MONEY YOU MADE THROUGHOUT"
70 PRINT "YOUR LIFE. IF YOU HAVE MADE $1,000,000 , YOU WILL BE"
80 PRINT "A MILLIONAIRE AND WIN THE GAME. NAME PLEASE";
100 LET 0=-1
110 DIM A$(20), Z$(1), M$(36), S(9), Q(16)
120 FOR I=1 TO 4
130 LET S(I)=150
140 NEXT I
150 INPUT AS
160 PRINT
170 PRINT "O.K., ";A$;", THIS IS YOUR NEW LIFE!"
180 LET M$="JANFEBMARAPRMAYJUNJULAUGSEPOCTNOVDEC"
190 IF RND(1)>.5 GOTO 220
200 PRINT "ON A BIG FARM";
210 GOTO 230
220 PRINT "IN A SHALL TOWN";
230 LET T=INT(RND(1)+12)+1
20 PRINT ", ON ";MID4(M$,3*T-2,3);INT(RND(1)*28)+1;", 1980,";
20 PRINT " ";A$;" IS BORN."
260 PRINT "YOUR PARENTS ARE VERY ";
270 IF RND(1)>.5 GOTO 310
280 PRINT "RICH.
290 LET M=INT(RND(1)+5000)+10000
300 GOTO 330
310 PRINT "POOR.
320 LET M=INT((RND(1)+RND(1))/2*1000)
330 LET T=INT(RND(1)+12)+1
```

```
370 LET Y=Y+INT(RND(1)+3)+1
380 GOSUB 680
390 FOR J=1 TO 13
400 IF (J/3)-INT(J/3)+E=0 THEN GOSUB 680
410
     LET D=INT(28*RND(1))+1
420
      LET M1=(INT(12*RND(1))+1)*3
430
      PRINT
440 PRINT HID$(M$,M1-2,3);D;",";Y
450
      IF Y-1980<70 60T0 500
460
      IF RND(1)>.5 GOTO 500
470
      PRINT "YOU ARE DEAD (COULD'NT TELL, COULD YOU?) AT THE"
      PRINT "AGE OF ";Y-1980;"."
480
490
      60T0 2370
500
      IF M>=0 GOTO 540
      LET I=INT(.07*Y9*(-M))
510
520
      LET M=M-I
      PRINT "THE INTEREST ON YOUR LOAN IS $";I;". YOU HAVE $";H
530
      LET Q=INT(13*RND(1))+1
540
550
      IF Q(Q)=1 GOTO 540
560
      LET Q(Q)=1
      ON 0 60TO 890, 1010, 1100, 1220, 1280, 1430, 1530
ON (0-7) 60TO 1850, 1930, 2060, 2120, 2240, 2280
PRINT "YOU NOW HAVE $";N
570
580
590
      IF 0=-2 60T0 1530
600
      IF J=1 60T0 640
610
      LET M=M+(E-C)*Y9
620
630
      PRINT "YOUR EARNINGS AND EXPENSES LEAVE YOU WITH $":M
640
      LET Y9=INT(RND(1)*6)+5
650
      LET Y=Y+Y9
660 NEXT J
670 GOTO 470
             JOB SUB
680 REM
690 PRINT "YOU GOT A NEW JOB AS A ";
```

340 LET Y=1996+INT(RND(1)+10)

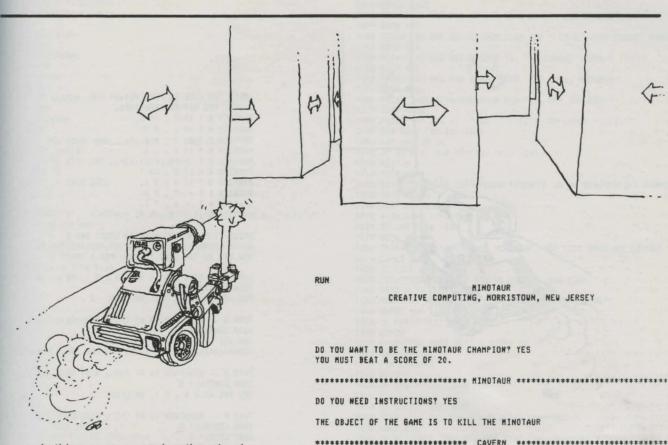
350 PRINT "ON ";HID\$(N\$,T\*3-2,3);T\*2;", ";Y;", YOU" 360 PRINT "LEAVE HOME WITH \$";H



```
700 DN INT(RND(1)+5)+1 GOTO 740, 770, 800, 830
710 PRINT "TEACHER";
720 LET E=INT(RND(1)*4000)+17000
730 GOTO 850
740 PRINT "LAWYER":
750 LET E=INT(RND(1)*40000)+80000
760 GOTO 850
770 PRINT "COMPUTER PROGRAMMER";
780 LET E=INT(RND(1)*5000)+20000
790 GOTO 850
800 PRINT "BUS DRIVER":
810 LET E=INT(RND(1)+2000)+16000
820 GOTO 850
830 PRINT "FOOTBALL PLAYER";
840 LET E=INT(RND(1)*100000)+100000
850 LET C=E-10000+INT((RND(1)+RND(1))*5000)
860 PRINT ". YOU EARN $";E;" A YEAR."
870 PRINT "YOU ADJUST YOUR EXPENSES TO $";C;" A YEAR."
880 RETURN
890 PRINT "YOU GO TO LAS VEGAS TO GAMBLE. HOW MUCH DO YOU BET";
900 INPUT S
910 PRINT
920 IF 5<=0 GOTO 1000
930 IF RND(1)>.7 GOTO 970
940 LET S2=-INT(RND(1)*S)
950 PRINT "HA! HA! YOU LOST $";-S2
960 GOTO 990
970 LET S2=INT((RND(1)+RND(1))*S)
980 PRINT "YOU WON $";52
990 LET M=M+S2
1000 GOTO 590
1010 PRINT "YOU ARE OFFERED A COIN SUPPOSEDLY WORTH $100,000."
1020 PRINT "DO YOU BUY IT";
1030 INPUT Z$
1040 PRINT
1050 LET V7=INT(RND(1)*200000)+1
1060 IF Z$<>"Y" GOTO 1080
1070 LET M=M-100000+V7
1080 PRINT "THE VALUE OF THE COIN IS $"; V7
1090 GOTO 590
1100 PRINT "YOU ARE SERIOUSLY SICK. (COULDN'T TELL, COULD YOU?)"
1110 PRINT "YOU HAVE ":
1120 DN (INT(RND(1)*3)+1) GOTO 1150, 1170
1130 PRINT "THE ASID-DISPEPSIA REGIONALY HYPNOTIC FLU! (OH!)."
1140 GOTO-11-80
1150 PRINT "COMPUTER ITIS."
1160 GOTO 1180
1170 PRINT "INFECTIOUS FATALY REOCCURING CHRONIC BAD BREATH."
1180 LET U=INT(RND(1)*1000)+500
1190 LET M=M-U
1200 PRINT "HEALTH EXPENSES COST YOU $";U
1210 GOTO 590
1220 LET F=INT(RND(1)*100000)
1230 LET C8=INT(F/2)-INT(RND(1)*(F/2))
1240 PRINT "YOUR GRANDFATHER GROVERS JUST DIED. (OH!) HE LEFT"
1250 PRINT "YOU $";F;", BUT FUNERAL EXPENSES ARE $";C8
1260 LET M=M-C8+F
1270 GOTO 590
1280 IF E=0 GOTO 890
1290 PRINT "NEWS FROM YOUR BOSS:"
1300 DN (INT(RND(1)*3)+1) GOTO 1350, 1390
1310 LET L=INT(RND(1)*3000)+1
1320 LET E=E-L
1330 PRINT "YOU GOT A $";L;" DECREASE IN PAY. YOU NOW EARN$";E
1340 GOTO 590
1350 PRINT "YOU'RE FIRED! (HA!)"
1360 LET E=0
1370 LET C=INT(C/4)
1380 GOTO 590
1390 LET R6=INT(RND(1)*5000)+1
1400 LET E=E+R6
1410 PRINT "YOU GOT A RAISE OF $";R6;". YOU NOW EARN $";E
1420 GOTO 590
1430 PRINT "THE DOCTOR SAYS YOU NEED A VACATION. DO YOU GO";
1440 INPUT Z$
1450 PRINT
1460 LET V=INT(RND(1)+2000)+1000
1470 IF Z$="N" GOTO 1500
1480 PRINT "GOOD, THE VACATION COSTS $";V
1490 GOTO 1510
1500 PRINT "YOU JUST HAD A NERVOUS BREAKDOWN. MEDICAL COSTS - $";V
1510 LET M=M-V
1520 GOTO 590
1530 FOR I=1 TO 4
      LET S(I)=INT((INT(RND(1)*100)+100+2*S(I))/3)
1540
1550 NEXT I
1560 PRINT "#
                         STOCK NAME
                                             PRICE SHARES OWNED"
1570 PRINT "1 IBM (INCREDIBLY BAD MACHINES) ";S(1);"
                                                           ";$(5)
                                                           ";S(6)
";S(7)
1580 PRINT "2 USS (USELESS & STINKY STEEL) ";S(2);"
1590 PRINT "3 NCR (NO CASH RETURN)
                                              ";5(3);"
1600 PRINT "4 TWA (TOTAL WRECK AIRLINES)
                                              ":5(4):"
                                                           ":S(8)
1610 IF S(9)=1 GOTO 2410
1620 PRINT "DO YOU BUY, SELL ($100 FEE), OR NOT (B,S, OR N)";
```

```
1630 INPUT Z$
    1640 PRINT
    1650 IF Z$="S" GOTO 1740
   1660 IF Z$="N" GOTO 1810
    1670 PRINT "STOCK # AND QUANTITY";
    1680 INPUT $3,5(0)
    1490 PRINT
    1700 LET S(4+S3)=S(4+S3)+S(0)
   1710 LET 0=-2
   1720 LET M=M-S(S3)*S(0)-100
   1730 GOTO 1620
   1740 PRINT "STOCK # AND QUANTITY";
   1750 INPUT 52,55
   1760 IF RND(1)<.5 GOTO 1880
    1770 IF $5>$(4+$2) GOTO 1740
   1780 LET S(4+S2)=S(4+S2)-S5
   1790 LET M=M+S(S2)#S5-100
   1800 GOTO 1620
    1810 LET S1=S(5)+S(6)+S(7)+S(8)
   1820 IF S1>0 GOTO 610
   1830 LET 0=-1
    1840 GOTO 610
   1850 PRINT "NEWS FLASH!!! ";
1860 PRINT "A TORNADO HAS JUST HIT THE HOME OF ";A$
    1870 GOTO 1890
    1880 PRINT "AN AIRPLANE HAS JUST CRASHED INTO THE HOME OF ";AS
    1890 LET D8=INT(RND(1)*50000)+1
    1900 LET M=M-D8
    1910 PRINT "DAMAGES HAVE BEEN ESTIMATED AT $";D8
    1920 GOTO 590
   1930 PRINT "OH! YOU JUST GOT ";
    1940 IF Y-1980<55 60TO 2000
    1950 IF RND(1)>.4 GOTO 1980
    1960 PRINT "CANCER":
    1970 GOTO 2010
    1980 PRINT "A HEART ATTACK";
    1990 GOTO 2010
    2000 PRINT "LEUKEMIA";
    2010 LET M2=INT(RND(1)*5000)+1000
   2020 LET M=M-M2
2030 PRINT ". MEDICAL BILLS ARE $";M2
    2040 IF RND(1)<.5 GOTO 470
    2050 GOTO 590
    2060 PRINT "YOU JUST HAD A CAR ACCIDENT! MEDICAL COSTS"
    2070 LET M3=INT(RND(1)+3000)+1000
    2080 LET 07=INT(RND(1)*5000)+100
   2090 PRINT "ARE $";M3;". REPAIRS COST $";07
2100 LET M=M-H3-07
    2110 GOTO 590
    2120 IF E=0 GOTO 1010
    2130 LET E2=10000+INT(RND(1)*5000)
    2140 PRINT "YOU ARE OFFERED ANOTHER JOB FOR $";E2;" A YEAR."
2150 PRINT "WOULD YOU LIKE TO HOONLIGHT";
   2160 INPUT Z$
   2170 PRINT
    2180 IF Z$="N" GOTO 590
    2190 ON INT(RND(1)*3) GOTO 1350, 2220
   2200 LET E=E+E2
    2210 GOTO 590
    2220 PRINT "FROM OVERWORK YOU GET ";
    2230 GOTO 1980
   2240 LET R2=INT(RND(1)*10000)+5000
   2250 LET M=M-R2
    2260 PRINT "YOUR HOME HAS BEEN ROBBED OF GOODS WORTH $";R2
   2270 GOTO 590
    2280 IF 0=-1 GOTO 1430
    2290 IF RND(1)>.7 GOTD 1430
    2300 LET B4=INT(RND(1)*4)
   2310 PRINT "STOCK MARKET CRASH!!! EACH OF YOUR";S1;" SHARES OF
2320 PRINT "STOCK IS WORTH $";B4;". YOU MUST SELL ALL OF THEM
   2330 PRINT "FOR A TOTAL OF $";S1*B4
2340 LET M=M+S1*B4
2350 LET 0=-1
    2360 GOTO 590
    2370 PRINT "YOU HAD $":M
    2380 IF 0=-1 GOTO 2430
    2390 LET S(9)=1
    2400 GOTO 1530
    2410 LET M=M+S(1)*S(5)+S(2)*S(6)+S(3)*S(7)+S(4)*S(8)
    2420 PRINT "WITH STOCK VALUE YOU HAVE $";M
    2430 IF M<0 GOTO 2480
    2440 IF M<500000 GOTO 2510
    2450 IF M<1E+06 60T0 2530
    2460 PRINT AS;" WON!! YOU ARE A MILLIONAIRE!!"
    2470 GOTO 2540
    2480 PRINT "YOU LOUSY #$28" *!!! NOW YOUR POOR FAMILY HAS TO PAY
    2490 PRINT "OFF YOUR DEBTS.....
    2500 GOTO 2540
    2510 PRINT "NOT BAD, ";A$
    2520 GOTO 2540
    2530 PRINT "CLOSE, ";A*;". MAYBE NEXT LIFE."
2540 PRINT "THANKS FOR PLAYING 'MILLIONAIRE', ";A*;"!!!!"
    2550 END
```

## Minotaur



In this game, you are in a three level cavern. Inside the cavern are ten pillars which stretch through all three levels; they're electrified so that if you touch them you are immediately vaporized. Furthermore, there are trap doors which appear randomly and drop you down one level. The top level is three, the second level down is two, the first or lowest level is one. If a trap door appears in level one you are dropped into a bottomless pit and that ends the game. The minotaur itself also poses a hazard. If you wound him with your spear, he will charge you. Also, he randomly charges for no reason at all. However, he only charges in a straight line. Hint: keep at a slight diagonal from the minotaur until you are ready to throw your spear at him and you have a better chance of avoiding his charges. If you ask for a map, the axes are drawn in with X's. This does not indicate a barrier or fence; you are free to move across the X and Y coordinate planes. However, you are advised not to move out of any of the four edges as this represents yet a different form of bottomless pit and also ends the game. There are many, many additional hazards which are not shown in the sample run. Try it, and be surprised!

This program was conceived and written by Pete Klausler.

THE CAVERN OF THE MINOTAUR IS IN THREE LEVELS. EACH LEVEL IS A COORDINATE PLANE OUTSIDE OF THE LEVELS THERE IS NOTHING BUT VACUUM. THE PLANES STRETCH DUT 10 ON EACH AXIS FROM THE ORIGIN.

### BARRIERS

INSIDE THE CAVERN ARE 10 ELECTRIFIED PILLARS STRETCHING THROUGH THE THREE LEVELS. THEY WILL DESTROY ANYTHING THAT TOUCHES THEM!!

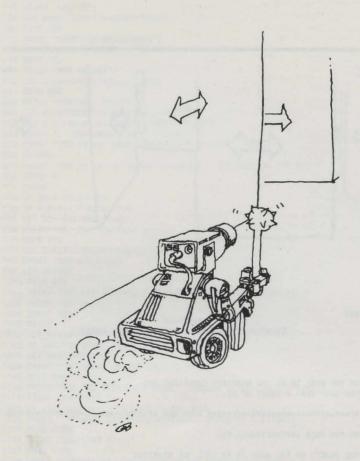
#### TRAPDOORS

TRAPDOORS WILL APPEAR OUT OF NOWHERE AND DROP YOU DOWN ONE LEVEL. IF YOU WERE ON LEVEL ONE, YOU LOSE!!

#### CHARGING MINCTAUR

THE MINOTAUR WILL CHARGE IF YOU WOUND HIM WITH YOUR SPEAR. ALSO, HE MAY CHARGE FOR NO REASON AT ALL!!!!

> HERE ARE YOUR CONTROL FUNCTIONS 1) MOVING EAST 2) MOVING WEST 3) MOVING MORTH 4) MOVING SOUTH 5) MOVING UP A LEVEL 6) MOVING DOWN A LEVEL 7) THROWING YOUR SPEAR 8) GETTING A MAP



I WILL NOW SET THE BARRIERS. BARRIER # 1 : (-7 , 5 ). BARRIER # 2 : ( 1 , -3 ). BARRIER # 3 : ( 4 , -1 ). BARRIER # 4 : (-7 , 2 ). BARRIER # 4 : (-7 , 2 ). BARRIER # 5 : ( 0 , 3<sup>-</sup>). BARRIER # 5 : ( 0 , 3<sup>-</sup>). BARRIER # 6 : (-4 ,-6 ). BARRIER # 7 : ( 3 , 9 ). BARRIER # 9 : (-7 ,-6 ). BARRIER # 9 : ( 1 ,-7 ). BARRIER # 10 : (-1 , 4 ).

WHICH LEVEL DO YOU WANT TO START ON? 2 WHICH POINT? 0,0 HOW FAR DO YOU WANT TO HOVE PER A TURN? 4

TURN 1 . MINDTAUR IS AT ( 10 , 10 ), ON L. 1 . YOUR CONTROL? 6 YOU ARE AT ( 0 , 0 ), ON LEVEL 1 .

```
THE MINOTAUR IS CHARGING.
LEVEL 1
(9,10)
(8,10)
(7,10)
(6,10)
(5,10)
(4,10
       1
(3,10)
(2,10)
(1,10)
(0,10)
(0,9)
(0,8)
(0,7)
(0,6)
(0,5)
0)
    4)
BZZZZZZZZZZZZZZZZZZZZWNT MINOTAUR JUST FRIED HIMSELF
YOU WIN, YOU LUCKY SCAB
YOU ARE NOW A QUALIFIED CHAMPION!
```

WOULD YOU LIKE TO PLAY AGAIN? YES I WILL NOW SET THE BARRIERS. BARRIER # 1 :(-3 , 10 ). BARRIER # 2 :(-1 , 9 ). BARRIER # 3 :( 1 , 4 ). BARRIER # 4 :( 1 . 6 ). BARRIER # 5 :( 10 ,-1 ). BARRIER # 6 :(-2 ,-10 ). BARRIER # 7 :( 3 , 3 ). BARRIER # 8 :(-7 , 9 ). BARRIER # 9 :( 6 , 7 ). BARRIER # 10 :( 5 ,-8 ). WHICH LEVEL DO YOU WANT TO START ON? 2 WHICH POINT? 0,0 HOW FAR DO YOU WANT TO MOVE PER A TURN? 5 TURN 1 . MINOTAUR IS AT (-4 , 8 ), ON L. 3 . YOUR CONTROL? 5 YOU ARE AT ( 0 , 0 ), ON LEVEL 3 . TURN 2 . MINOTAUR IS AT (-3 , 8 ), ON L. 3 . YOUR CONTROL? 1 You are at ( 5 , 0 ), on level 3 . Yaaaaaaaaaaaaaaa Trapdoor, you fell down one level TURN 3 . MINOTAUR IS AT (-2 , 8 ), ON L. 3 . YOUR CONTROL? 5 YOU ARE AT ( 5 , 0 ), ON LEVEL 3 . TURN 4 . MINOTAUR IS AT (-2 , 8 ), ON L. 2 . YOUR CONTROL? 8 WHAT LEVEL? 2 .....B...X...... ....B......BX...... .....B.... .....XB..... .....X...... .....XB..... .....X...B...... ....X...... .....X...... .....B . . X . . . . . . . . . . . . ...X........ .....X....B..... .....X....... .....B.X..... LEVEL: 2 KEY Y=YOU M=MINOTAUR S=SPEAR B=BARRIER **D=DRIGIN** X=AXIS TURN 5 . MINOTAUR IS AT (-2 , 8 ), ON L. 2 . YOUR CONTROL? 6 YOU ARE AT ( 5 , 0 ), ON LEVEL 2 . THE MINOTAUR IS CHARGING. BZZZZZZZZZZZZZZZZZZZZZWNT MINOTAUR JUST FRIED HIMSELF YOU WIN, YOU LUCKY SCAB YOU ARE NOW A QUALIFIED CHAMPION! WOULD YOU LIKE TO PLAY AGAIN? NO Ok

```
PRINT TAB(32) "MINOTAUR"
    "FRINT TAB(15)"CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY"
    U PRINT: PRINT: PRINT
    # LI=INT(RND(1)*3)+1
    1 11=INT(RND(1)*(-21))+11
   # 1=INL(RND(1)*(-21))+11
   10 PRINT
   15 DIM B(15).C(15)
   10 GOSUB 1350
   IN REM INSTRUCTIONS
   IN GOSUB 1660
   10 REM BARRIERS
   10 GOSUB 2330
   10 REM PLACE PLAYER
   10 GOSUB 2420
   10 REH START GAME
  W REN SPEAR
  IN IF X2=S1 AND Y2=S2 AND L2=S3 AND T>1 THEN 3690
  IN REM IS HE EATEN?
IN IF X1=X2 AND Y2=1 AND L1=L2 THEN 3670
  10 REH CHARGING
  330 IF RND(1) <.1 THEN 2850
  NO REM TURN #
  150 T=T+1
  10 PRINT"TURN";T;". MINOTAUR IS AT (";X1;",";Y1;"), ON L. ";L1;"."
  JO PRINT "YOUR CONTROL";
  380 INPUT Z
  370 DN Z GOTO 400,430,450,480,500,530,550,3270
  400 X2=X2+F
 410 IF ABS(X2)>10 THEN 1160
 420 BOTO 1180
 430 X2=X2-F
 440 GOTO 410
 450 Y2=Y2+F
 460 IF ABS(Y2)>10 THEN 1160
 470 GOTO 420
 480 Y2=Y2-F
 490 GOTO 460
 500 L2=L2+1
 510 IF L2>3 OR L2<1 THEN 1330
 520 GOTO 420
 530 L2=L2-1
 540 GOTO 510
 550 REM SPEAR-THROWING
 560 IF L1 CL2 THEN 1080
 570 IF X1 >X2 AND Y1 >Y2 THEN 1100
 580 IF X1<>X2 AND ABS(Y1-Y2)>10 THEN 1120
590 IF ABS(X1-X2)>10 THEN 1120
600 IF S9=1 THEN 3720
AND PRINT"IN WHICH DIRECTION WOULD YOU LIKE TO THROW(USE 1,2,3,4)"
620 INPUT H1
630 PRINT"HOW FAR";
640 INPUT H2
650 S5=X2
660 S6=Y2
670 FOR H3=1 TO H2
680 DN H1 GOTD 690,720,740,770
690 S5=S5+1
700 IF ABS(S5)>10 THEN 860
710 GOTO 790
720 $5=$5-1
730 GOTO 700
740 56=56-1
750 IF ABS(S6)>10 THEN 860
760 GOTO 790
770 56=56-1
780 GOTO 750
790 PRINT"SPEAR IS AT (";S5;",";S6")."
800 REH TEST FOR BARRIERS
810 FOR A=1 TO 10
820 IF S5=B(A) AND S6=C(A) THEN 850
830 NEXT A
840 GOTO 870
850 PRINT "SMASH SPEAR SPLITERED AGAINST BARRIER #";A;""
860 GOTO 1140
870 NEXT H3
880 IF S5<>X1 DR S6<>Y1 THEN 1010
890 X=INT(RND(1)*3)+1
900 DH X GOTO 910,1010,1070
910 PRINT"YOU KILLED THE MINOTAUR IN";T;"TURNS."
920 GOTO 1450
930 PRINT WOULD YOU LIKE TO PLAY AGAIN";
940 INPUT XS
950 IF X$<>"YES" THEN 3760
960 T=0
970 L1=INT(RND(1)*3)+1
980 X1=INT(RND(1)*(-21))+11
990 Y1=INT(RND(1)*(-21))+11
1000 GOTO 230
1010 PRINT"YOU MISSED. SPEAR IS AT (":S5:".":S6:"). YOU MUST GET IT."
```

```
1020 51=55
1030 52=56
1040 S3=L2
1050 59=1
1060 GOTO 280
1070 GDSUB 2840
1080 PRINT"YOU ARE NOT ON THE SAME LEVEL. YOU CANNOT THROW."
1090 GOTO 420
1100 PRINT"YOU ARE NOT ON THE SAME XOR Y LINE. YOU CANNOT THROW."
1110 GOTO 420
1120 PRINT"YOU ARE NOT WITHIN 10. YOU CANNOT THROW."
1130 GOTO 420
1140 PRINT"YOU ARE NOW WEAPONLESS. YOU LOSE, SUCKER!"
1150 GOTO 930
1160 PRINT"YAAAAAAAAAAAAAAAAAA YOU FELL OFF THE EDGE"
1170 GOTO 1150
1180 PRINT"YOU ARE AT (";X2;",";Y2;"), ON LEVEL ";L2;"."
1190 REM TEST FOR BARRIERS
1200 FOR A=1 TO 10
1210 IF X2=B(A) AND Y2=C(A) THEN 1240
1220 NEXT A
1230 GOTO 1260
1240 PRINT"YOU HAVE JUST FRIED YOURSELF ON AN ELECTRIFIED BARRIER."
1250 GOTO 1150
1260 REM TRAPDOORS
1270 X=INT(RND(1)*10)+1
1280 IF X=5 THEN 1300
1290 GOTO 2510
1300 PRINT"YAAAAAAAAAAAAAAAA TRAPDOOR, YOU FELL DOWN ONE LEVEL"
1310 L2=L2-1
1320 IF L2>0 THEN 1290
1330 PRINT"YOU FELL OUT OF THE CAVERN. YOU LOSE."
1340 GOTO 1150
1350 PRINT"DO YOU WANT TO BE THE MINOTAUR CHAMPION":
1360 INPUT X9$
1370 IF X9$<>"YES" THEN 1440
1380 C2=20
1390 PRINT"YOU MUST BEAT A SCORE OF 20."
1391 DIM C3$(72)
1419 DIM C4$(72)
1440 RETURN
1450 IF X9$<>"YES" THEN 930
1460 C3=(1/T)*100
1470 IF C3<20 THEN 1630
1480 PRINT"YOU ARE NOW A QUALIFIED CHAMPION!"
1620 GOTO 930
1630 PRINT"SORRY , YOU DID NOT BEAT THE CHAMPION."
1640 PRINT"DO YOU WANT TO PLAY AGAIN";
1650 GOTO 940
1660 REM INSTRUCTIONS
1670 PRINT
1672 FORV7=1 TO 31
1673 PRINT"*";
1675 NEXT V7
1680 PRINT TAB(32)"MINOTAUR";
1681 FOR V8=1 TO 31
1682 PRINT TAB(41)"*";
1683 NEXT V8
1720 PRINT
1730 PRINT
1740 PRINT"DO YOU NEED INSTRUCTIONS";
1760 INPUT XS
1770 IF X$<>"YES" THEN 2320
1780 PRINT
1800 PRINT "THE OBJECT OF THE GAME IS TO KILL THE MINOTAUR"
1820 PRINT
1825 FOR V9=1TO 31
1826 PRINT"*";
1827 NEXT V9
1830 PRINTTAB(33)"CAVERN";
1832 FOR V10=1 TO 31
1833 PRINT TAB(41)"*";
1835 NEXT V10
1836 PRINT
1837 PRINT
1840 PRINT TAB(12)" THE CAVERN OF THE MINOTAUR IS IN THREE"
1850 PRINT TAB(12)"LEVELS. EACH LEVEL IS A COORDINATE PLANE ."
1860 PRINT TAB(12)"UTSIDE OF THE LEVELS THERE IS NOTHING BUT "
1870 PRINT TAB(12) "VACUUM. THE PLANES STRETCH DUT 10 DN EACH AXIS"
1880 PRINT TAB(12)"FROM THE ORIGIN."
1890 PRINT
1910 FOR V11=1 TO 31
1920 PRINT"*";
1930 NEXT V11
1940 PRINT TAB(32)"HAZARDS";
1945 FOR V12=1 TO 31
1947 PRINT TAB(41)"#";
1948 NEXT V12
1950 PRINT
1955 PRINT
1960 PRINT TAB(32)"BARRIERS"
```

```
1965 PRINT
1970 PRINT TAB(12)" INSIDE THE CAVERN ARE 10 ELECTRIFIED"
1980 PRINT TAB(12)"PILLARS STRETCHING THROUGH THE THREE"
1990 PRINT TAB(12)"LEVELS. THEY WILL DESTROY ANYTHING THAT"
2000 PRINT TAB(12) "TOUCHES THEM!!"
2010 PRINT
2020 PRINT TAB(32)"TRAPDOORS"
2025 PRINT
2030 PRINT TAB(12)" TRAPDOORS WILL APPEAR OUT OF NOWHERE"
2040 PRINT TAB(12)"AND DROP YOU DOWN ONE LEVEL. IF YOU WERE"
2050 PRINT TAB(12)"ON LEVEL ONE, YOU LOSE!!"
2060 PRINT:PRINT
2070 PRINT TAB(27)"CHARGING MINOTAUR"
2071 PRINT
2080 PRINT TAB(12)" THE MINUTAUR WILL CHARGE IF YOU"
2090 PRINT TAB(12)"WOUND HIM WITH YOUR SPEAR. ALSO, HE"
2100 PRINT TAB(12) "MAY CHARGE FOR NO REASON AT ALL !!!!"
2110 PRINT
2120 PRINT
2130 PRINTTAB(21)" HERE ARE YOUR CONTROL FUNCTIONS"
2140 PRINT TAB(27)"1) MOVING EAST"
2150 PRINT TAB(27)"2) MOVING WEST"
2160 PRINT TAB(27)"3) MOVING NORTH"
2170 PRINT TAB(27)"4) MOVING SOUTH"
2180 PRINT TAB(27)"5) MOVING UP A LEVEL"
2190 PRINT TAB(27)"6) HOVING DOWN A LEVEL"
2200 PRINT TAB(27)"7) THROWING YOUR SPEAR"
2210 PRINT TAB(27)"8) GETTING A MAP"
2220 PRINT
2230 PRINT
2240 FOR V13=1 TO 29
2250 PRINT"*";
2260 NEXT V13
2270 PRINTTAB(31)"HAVE FUN";
2280 FOR V14=1 TO 30
2290 PRINT TAB(41)"*";
2300 NEXT V14
2310 PRINT
2320 RETURN
2330 REM BARRIERS
2340 PRINT "I WILL NOW SET THE BARRIERS."
2350 FOR A=1 TO 10
2360 B(A)= INT(RND(1)*(-21))+11
2370 C(A)=INT(RND(1)*(-21))+11
2380 PRINT"BARRIER #";A;":(";B(A);",";C(A);")."
2390 NEXT A
2400 PRINT
2410 RETURN
2420 REM PLACE PLAYER
2430 PRINT"WHICH LEVEL DO YOU WANT TO START ON":
2440 INPUT L2
2450 PRINT"WHICH POINT";
2460 INPUT X2, Y2
2470 PRINT"HOW FAR DO YOU WANT TO MOVE PER A TURN";
2480 INPUT F
2490 PRINT
2500 RETURN
2510 REM MOVE MINOTAUR
2520 X4=X1
2530 Y4=Y1
2540 L4=L1
2550 X3=INT(RND(1)*6)+1
2560 ON X3 GOTO 2570,2620,2640,2690,2710,2760
2570 X1=X1+1
2580 IF ABS(X1)>10 THEN 2600
2590 GOTO 2780
2600 X1=X4
2610 GOTO 2550
2620 X1=X1-1
2630 GOTO 2580
2640 Y1=Y1+1
2650 IF ABS(Y1)>10 THEN 2670
2660 GOTO 2780
2670 Y1=Y4
2680 GOTO 2550
2690 IF X1=B(A) AND Y1=C(A) THEN 2550
2700 GOTO 2650
2710 L1=L1+1
2720 IF L1>3 OR L1<1 THEN 2740
2730 GOTO 2780
2740 L1=L4
2750 GOTO 2550
2760 L1=L1-1
2770 GOTO 2720
2780 FOR A=1 TO 10
2790 IF X1=B(A) AND Y1=C(A) THEN 255
2800 NEXT A
2810 PRINT
2820 6010280
2830 PRINT
2840 PRINT"YOU WOUNDED THE MINOTAUR"
2850 PRINT"THE MINOTAUR IS CHARGING."
```

```
2860 IF X1>X2 THEN 2890
2870 X3=1
2880 GOTO 2910
2890 X3=-1
 2900 GOTO 2910
 2910 IF Y1>Y2 THEN 2940
 2920 Y3=1
 2930 GOTO 2960
 2940 Y3=-1
 2950 GOT02960
 2960 IF L1>L2 THEN 2990
 2970 L3=1
 2980 GOTO 3000
 2990 L3=-1
3000 IF L1=L2 THEN 3050
3010 L1=L1+L3
3020 PRINT"LEVEL";L1;""
3030 GOTO 3000
3040 REM HI THERE
3050 IF X1=X2 THEN 3100
3060 X1=X1+X3
3070 GOSUB 3140
3080 PRINT"(";X1;",";Y1;")"
3090 GOTO 3050
3100 IF Y1=Y2 THEN 3210
3110 Y1=Y1+Y3
3120 GOSUB 3140
3130 GOTO 3080
 3140 FOR P=1 TO 10
3150 IF B(P)=X1 AND C(P)=Y1 THEN 3180
 3160 NEXT P
 3170 RETURN
 3180 PRINT"BZZZZZZZZZZZZZZZZZZZZZZOWNT MINOTAUR JUST FRIED HIMSELF"
 3190 PRINT"YOU WIN, YOU LUCKY SCAB"
 3200 GOTO 1450
3210 PRINT"BITE
 3220 PRINT"CHEW"
 3230 PRINT"CHOMP"
 3240 PRINT"GULP"
 3250 PRINT"YOU LOSE ,SUCKER"
3260 GOT0930
 3270 PRINT"WHAT LEVEL";
3280 INPUT L4
 3290 FOR Y4=10 TO -10 STEP -1
3300 FOR X4=-10 TO 10
 3310 IF X4=X2 AND Y4=Y2 AND L4=L2 THEN 3410
3320 IF X4=X1 AND Y4=Y1 AND L4=L1 THEN 3430
 3330 IF L4=S1 AND Y4=S2 AND L4=S3 THEN 3450
3340 FOR A=1 TO 10
3350 IF B(A)=X4 AND C(A)=Y4 THEN 3480
3360 NEXT A
 3370 IF X4=0AND Y4=0 THEN 3500
3380 IF X4=0 OR Y4=0 THEN 3520
 3390 PRINT"."
3400 6010 3530
 3410 PRINT"Y":
 3420 GOTO 3400
 3430 PRINT"M";
 3440 GOTO 3400
 3450 IF S9=0 THEN 3340
 3460 PRINT"S"
 3470 GOTO 3400
 3480 PRINT"B"
3490 GOTO 3400
 3500 PRINT"0":
3510 GOTO 3400
 3520 PRINT"X":
 3530 NEXT X4
 3540 PRINT
 3550 NEXT Y4
 3560 PRINT
 3570 PRINT"LEVEL:";L4
 3580 PRINT TAB(34)"KEY"
 3590 PRINT TAB(31) "Y=YOU"
 3600 PRINT TAB(31)"M=MINOTAUR"
 3610 PRINT TAB(31)"S=SPEAR"
3620 PRINT TAB(31)"B=BARRIER"
 3630 PRINT TAB(31)"D=DRIGIN"
 3640 PRINT TAB(31)"X=AXIS"
 3650 PRINT
 3660 GOTO 2510
 3670 PRINT"MINOTAUR MOVED TO YOUR SPOT; HE SAID YOU TASTED GREAT!
 3680 GOTO 930
 3690 PRINT"YOU HAVE YOUR SPEAR"
 3700 59=0
 3710 GOTO 300
 3720 PRINT"HOW CAN YOU THROW YOUR SPEAR IF YOU DON'T HAVE ONE?"
 3730 PRINT"SPEAR IS AT(";$1;",";$2;") ON LEVEL ";$3
 3740 GOTO 420
 3750 STOP
 3760 END
 Dk
```

# **Motorcycle Jump**

This program, originally titled EVILK permits you to act out your fantasies of being a motorcycle daredevil! The game is a simple motorcycle jump over several busses, which takes into account both gravity and drag forces. The ramp angle and motorcycle speed determine the distance jumped. Note that the injury penalty is greater for long jumps than for short ones, and that there is a chance for a crash even on a jump of the right length. This probability, initially set at .20, can be modified in line 560 to make survival more or less likely.

This program was written by Charles Aylworth and originally appeared in *Creative Computing*, Jul/Aug 1978.

RUN

OK

#### MOTORCYCLE JUMP CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

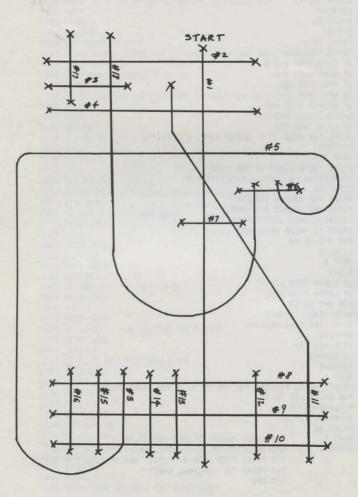
WE'RE AT THE SCENE OF THE BIG MOTORCYCLE JUMP! HOW MANY BUSSES WILL YOU TRY TO JUMP? 5 5 BUSSES! THAT'S 75 FEET! WHAT RAMP ANGLE WILL YOU USE? 90 90 DEGREES? THAT'S IMPOSSIBLE. COME ON NOW, WHAT RAMP ANGLE WILL YOU USE? 22 HOW FAST WILL YOU LEAVE THE RAMP? O GOOD LUCK! A PRACTICE JUMP! OK, THIS TIME HOW FAST WILL YOU LEAVE THE RAMP? 54 GOOD LUCK! THERE HE GOES!!!! HE MISSED THE RAMP. I THINK HE'S HURT.. WELL, KILLER, THE DOCTOR SAYS YOU BROKE YOUR: L.LEG RIBS BIKE NECK WANT TO JUNP AGAIN? YES HOW MANY BUSSES WILL YOU TRY TO JUMP? 5 5 BUSSES! THAT'S 75 FEET! WHAT RAMP ANGLE WILL YOU USE? 22 HOW FAST WILL YOU LEAVE THE RAMP? 46 GOOD LUCK! THERE HE SOES!!!! I THINK HE'S HURT ... WELL, KILLER, THE DOCTOR SAYS YOU BROKE YOUR: R.ARM PRIDE L.ARM BACK BUTT WANT TO JUMP AGAIN? YES HOW MANY BUSSES WILL YOU TRY TO JUMP? 5 5 BUSSES! THAT'S 75 FEET! WHAT RAMP ANGLE WILL YOU USE? 22 HOW FAST WILL YOU LEAVE THE RAMP? 47 6000 LUCKI THERE HE GOES!!!! WANT TO JUMP AGAIN? NO YOU MADE IT 1 OUT OF 3 ATTEMPTS. BE CAREFUL, NOW.

```
10 PRINT TAB(21);"HOTORCYCLE JUHP"
20 PRINT TAB(20);"CREATIVE COMPUTING"
30 PRINT TAB(18);"HORRISTOWN, NEW JERSEY"
40 PRINT:PRINT:PRINT
50 DIM 12(14), 1$(84)
90 IS="R.ARM L.ARM R.LES L.LES BACK NECK SKULL RIBS KNEE BUTT "
100 IS=IS+"FACE PELVISPRIDE BIKE
110 T=.1
130 T2=0
140 T3=0
150 PRINT "WE'RE AT THE SCENE OF THE BIG MOTORCYCLE JUNP!"
160 INPUT "HOW MANY BUSSES WILL YOU TRY TO JUMP";N
170 J=N+15
180 PRINT N;" BUSSES! THAT'S ";J;" FEET!"
190 INPUT "WHAT RAMP ANGLE WILL YOU USE";A2
200 IF A2<90 AND A2>0 THEN 230
210 PRINT A2;" DEGREES? THAT'S IMPOSSIBLE. COME ON NOW, "
220 GOTO 190
230 A=A2*.01745
240 INPUT "HOW FAST WILL YOU LEAVE THE RAMP";S
250 PRINT " GOOD LUCK!"
                  GOOD LUCK!"
260 IF S>0 THEN 300
270 PRINT "A PRACTICE JUMP!"
280 PRINT "OK, THIS TIME ";
290 6010 240
300 H=6
310 D=0
320 G=6
330 R2=0
340 S2=0
350 S=S#1.5
360 PRINT "THERE HE GOES!!!!
380 S=S-S2
390 F=S*T
400 D2=F*COS(A)
410 R=F#SIN(A)
420 R2=R2+(32*T)
430 R3=R2#T
440 H=H+R-R3
450 D=D+D2
460 PRINT "#":
480 S2=(S/120)+32+T
490 IF D>=J THEN G=G-R
510 IF 6<=0 THEN 6=0
520 IF H>6 THEN 380
530 IF DKJ THEN 600
540 IF D>J+20 THEN 640
550 L=((D-J)/30)+RND(1)
560 IF L>.8 THEN 650
570 PRINT "HE MADE IT ! GREAT JUMP, KILLER!"
580 T2=T2+1
590 GOTO 920
600 PRINT "HE'S SHORT OF THE RAMP ...
620 L2=INT((((J-D)/5)*2)+(RND(1)*5)+.5)
630 GOTO 670
640 PRINT "HE JUMPED TOO FAR!"
650 PRINT "HE MISSED THE RAMP."
660 L2=INT(((D+20-1)/20)+(RND(1)*5))
670 PRINT "I THINK HE'S HURT ......
680 FOR K=1 TO 14
690 I2(K)=K
700 NEXT X
710 K2=14
720 IF L2>14 THEN L2=14
730 IF L2<=0 THEN L2=1
760 FOR K=1 TO L2
770 V=INT(RND(1)*1000)
780 V=(V-(INT(V/K2)*K2))+1
790 H2=12(V)
800 I2(V)=12(K2)
810 I2(K2)=H2
820 K2=K2-1
830 NEXT K
840 PRINT "WELL, KILLER, THE DOCTOR SAYS YOU BROKE YOUR:"
860 FOR K=(15-L2) TO 14
880 P=(6+12(K))-5
890 A$=MID$(1$,P,6)
900 PRINT AS
                    930 INPUT "WANT TO JUMP AGAIN";A$
940 IF LEFT$(A$,1)="Y" THEN PRINT:PRINT:GOTO 160
950 PRINT "YOU MADE IT ";T2;" OUT OF ";T3;" ATTEMPTS."
910 NEXT K
920 T3=T3+1
                     960 PRINT "BE CAREFUL, NOW."
                     970 END
```



"Gramma Nomad" is a person who doesn't really know where she wants to live, so she moves to a new house every game. Then she sends you a telegram asking you to visit her. The object of the game is to successfully navigate your way through the streets of Garbonzo City to Gramma's house. See the game for more details. A map of Garbonzo City is provided for your reference.

Nomad was written by Steve Trapp and first appeared in *Creative Computing*, Sep/Oct 1977.



#### RUN

RULES? YES

NOMAD CREATIVE COMFUTING MORRISTOWN, NEW JERSEY

GRAMMA NOMAD IS A NICE OLD LADY WHO MAS NOT QUITE MADE UP HER MIND WHERE SHE WANTS TO LIVE. SHE HAS NARROWED IT DOWN TO SOMEWHERE IN GARBONZO CITY AND ON A STREET CORNER.

AT THE BEGINNING. THE MAILMAN SIVES YOU A TELEGRAM WRITTEN BY GRAMMA TELLING YOU WHERE SHE LIVES. (I WILL READ IT TO YOU).

YOU GET INTO YOUR CAR IT LRAC MILKNARF MAMBREB LODGE. FROM THEEEEERE YOU GO TO GRAMMAS HOUSE.

YOU TRY TO GET THERE WITHOUT: CRASHUPS TICKETS FLAT TIRES RUNNING OUT OF GAS DEAD FANS

THERE IS AN 8-MAN POLICE FORCE ENFORCING THE LAWS OF GARBONZO CITY.

THERE ARE 2-DRUNKS ON THE STREETS OF GARBONZO CITY.

IF A POLICEMAN CATCHES A DRUNK, HE HAS TO TESTIFY IN COURT (WHICH TAKES THE REST OF THE GAME)

IF A DRUNK DRIVER HITS YOU, YOU LOSE.

AT EACH JUNCTION, I WILL TELL YOU: THE DIRECTION YOU ARE GOING THE ROAD YOU ARE ON THE ROAD CROSSING

I WILL ASK YOU: THE WAY YOU WANT TO TURN (IE LEFT) SPEED (IN MPH)

AN OVERPASS IS NOT A JUNCTION, SO IT IS MERELY SKIPPED OVER. IT IS UNANHOUNCED.

\*THAT IS ALL\*

WHAT IS YOUR NAME? STEVE

\*GOOD LUCK\*

DEAR STEVE, HOW ARE YOU? I LIVE AT THE CORMER OF ROAD # 15 & # 9 !!! COME ON OVER.

LOVE, GRAMMA ((TELEGRAMMA CORP. TELEGRAM CO.)) 6 SOUTH ON ROAD # 1 CIDN: ROAD # 1 & # 2 WRD, LEFT, RIGHT OR U-TURN? F B? 40 SH...BUS FLATTENED YOUR CAR. M? YES FIS YOUR NAME? STEVE

ND LUCK\*

ARE YOU? I LIVE AT THE CORNER HARE YOU? I LIVE AT THE CORNER HARD # 1 & # 8 !!! E ON OVER. LOVE, GRAMMA HEEGRAMMA CORP. TELEGRAM CO.))

WE SOUTH ON ROAD # 1 CIION: ROAD # 1 & # 2 WARD, LEFT, RIGHT OR U-TURN? F HD? 30

MG SOUTH ON ROAD # 1 CTION: ROAD # 1 & # 4 WARD, LEFT, RIGHT OR U-TURM? F HD? 30 ...SULLDOG ATE YOUR TIRE! AGAIN? YES WHAT IS YOUR NAME? STEVE \*GOOD LUCK\* DEAR STEVE,

HOW ARE YOU? I LIVE AT THE CORNER OF ROAD # 11 & # 4 !!! COME ON OVER. LOVE.

GRAMMA ((TELEGRAMMA CORP. TELEGRAM CO.))

GOING SOUTH ON ROAD # 1 JUNCTION: ROAD # 1 & # 2 FORWARD, LEFT, RIGHT OR U-TURN? R SPEED? 30

GOING WEST ON ROAD # 2 JUNCTION: ROAD # 2 & # 18 FORWARD, LEFT, RIGHT OR U-TURN? L SPEED? 56 \*SPEEDING\* NOT CAUGHT

GOING SOUTH ON ROAD # 18 JUNCTION: ROAD # 18 & # 3 FORWARD, LEFT, RIGHT OR U-TURN? F SPEED? 45

GOING SOUTH ON ROAD # 18 JUNCTION: ROAD # 18 & # 4 FORWARD, LEFT, RIGHT OR U-TURN? L \*SPEED\* I DARE YOU \*SPEED\* I DARE YOU SPEED? 100 \*SPEEDING\* NOT CAUGHT

1500 FOR A=1 TO 8

GOING EAST ON ROAD # 4 YOU MADE IT TO GRAMMAS HOUSE!!!!!!!!!!!

AGAIN? NO

\*SEE YOU\* Ok

IST 1 PRINT TAB(26);"NOMAD" 1 PRINT TAB(20);"CREATIVE COMPUTING" 1 PRINT TAB(18);"NORRISTOWN, NEW JERSEY" Ha0 DIH K\$(30),D(2,2),R(30,30),E(30,30),P(8,2),C(30)
H70 DIH W(30) 180 DIM N\$(30) 190 REM GOSUB RULES 100 GOSUB 3340 110 REM RANDOM NUMBERS 120 DEF FNA(X)=INT(RND(1)\*X)+1 130 REM # OF ROADS 240 READ N 150 FOR R=1 TO N 160 REM # OF INTERSEC 170 READ Q 180 C(R)=ABS(Q) 190 IF 0<0 THEN 1320 300 W(R)=1 J10 60TO 1330 120 ¥(R)=-1 130 REM DIREC, ROAD 140 FOR J=1 TO C(R) 150 READ E(R, J), R(R, J) 160 NEXT J 170 NEXT R 180 REM NAME? 190 PRINT "WHAT IS YOUR NAME": 400 INPUT NS 10 REM OPENING STATEMENT 120 PRINT IN PRINT "\*GOOD LUCK\*" 40 REM GRAMMAS HOUSE 150 H1=FNA(N) 160 H2=FNA(C(H1)) 70 REM DRUNK DRIVERS 190 REM POLICE

1510 P(A,1)=FNA(N) 1520 P(A,2)=FNA(C(P(A,1))) 1530 NEXT A 1540 REM LRAC NILKNARF NAMGREB LODGE 1550 R=1 1560 J=0 1570 I=1 1580 REM GOSUB CHECK 1590 GOSUB 2520 1600 REM GOSUB TELEGRAM 1610 GOSUB 2570 1620 REM ADD INCREMENT 1630 J=J+I 1640 REM NEED REPAIR? 1650 IF FNA(10)=1 THEN 2940 1660 REM DEAD END? 1670 IF J>C(R) OR J=0 THEN 3060 1680 REM DIRECTION 1690 IF I=-1 THEN 1720 1700 D=E(R,J) 1710 GOTO 1730 1720 D=9-E(R,J) 1730 REM ROAD CROSSING 1740 C=R(R.J) 1750 REM SKIP LINE 1760 PRINT 1770 REM GOSUB \*DIREC, ROAD ON\* PRINT 1780 GOSUB 2680 1790 REM AT GRAMMAS? 1800 IF H1=R AND R(R, J)=R(H1, H2) THEN 2880 1810 IF H1=R(R, J) AND R=R(H1, H2) THEN 2880 1820 REM JUNCTION 1830 PRINT "JUNCTION: ROAD #";R;" & #";C 1840 REM ASK WHAT WAY TO TURN 1850 PRINT "FORWARD, LEFT, RIGHT OR U-TURN"; 1860 INPUT IS

1880 IF LEFT\$(I\$,1)="F" THEN 2080 1890 IF LEFT\$(I\$,1)="R" THEN 1970 1900 IF LEFT\$(I\$,1)="L" THEN 1990 1910 IF LEFT\$(I\$,1)="U" THEN 1950 1920 REM GOOFED 1930 PRINT "\*\*YOU GOOFED\*\*" 1940 GOTO 1850 1950 I=1\*I 1960 GOTO 2080 1970 I=W(R)\*I 1980 GOTO 2000 1990 I=-1\*W(R)\*I 2000 FOR A=1 TO C(C) 2010 IF R(C,A)=R THEN 2040 2020 NEXT A 2030 GOTO 4210 2040 R=C 2050 J=A 2060 REM DARE? 2070 IF FNA(4)=1 THEN 2360 2080 REM SPEED 2090 PRINT "SPEED"; 2100 INPUT S 2110 REM DANGEROUSITY CRASH CHECKS 2120 IF \$>100 THEN 3190 2130 IF S<30 THEN 3220 2140 REM ILLEGAL? 2150 IF \$>55 THEN 3090 2160 REM DRUNK DRIVERS DRIVE. 2170 FOR A=1 TO 2 2180 IF D(A,1)=0 THEN 2210 2190 D(A,1)=FNA(N) 2200 D(A,2)=FNA(C(D(A,1))) 2210 NEXT A 2220 REM HIT BY DRUNK DRIVER?

2230 FOR A=1 TO 2 2240 IF D(A,1)=0 THEN 2270 2250 IF D(A,1)=R AND R(R,J)=R(D(A,1),D(A,2)) THEN 2910 2260 IF D(A,1)=R(R,J) AND R(D(A,1),D(A,2))=R THEN 2910 2270 NEXT A 2280 REM IS DRIVER CAUGHT? 2290 FOR A=1 TO 2 2300 IF D(A,1)=0 THEN 2340 2310 FOR B=1 TO 8 2320 IF D(A.1)=P(B,1) AND D(A,2)=P(B,2) THEN 2400 2330 NEXT B 2340 NEXT A 2350 6010 1620 2360 REM SPEED DARE PRINT 2370 DN FNA(3) GOTO 2380,2400,2420 2380 PRINT "I DARE YOU TO SPEED \*\* (DAREDEVIL)" 2390 6010 2430 2400 PRINT "\*SPEEDING\* IS FUN (SO DO IT)!!" 2410 GOTO 2430 2420 PRINT "\*SPEED\* I DARE YOU \*SPEED\* I DARE YOU" 2430 GOTO 2080 2440 REM DRUNK CAUGHT 2450 PRINT "A DRUNK DRIVER HAS BEEN CAUGHT. THE POLICEMAN WHO" 2460 PRINT "ARRESTED HIM WILL BE TESTIFYING AT COURT FOR" 2470 PRINT "THE REST OF THE GAME." 2480 PRINT 2490 D(A,1)=0:D(A,2)=0:P(B,1)=0:P(B,2)=0 2500 GOTO 1620 2510 REM CHECK 2520 FOR A=1 TO 8 2530 IF H1=P(A,1) AND R(H1,H2)=R(P(A,1),P(A,2)) THEN 1440 2540 IF H1=R(P(A,1),P(A,2)) AND R(H1,H2)=P(A,1) THEN 1440 2550 NEXT A 2560 RETURN 2570 REM TELEGRAM PRINT-UP 2580 PRINT 2590 PRINT "DEAR ";N\$;", 2600 PRINT "HOW ARE YOU? I LIVE AT THE CORNER" 2610 PRINT "OF ROAD #";H1;" & #";R(H1,H2);"!!!" 2620 PRINT "COME ON OVER." 2630 PRINT " LOVE." 2640 PRINT " GRAMMA" 2650 PRINT "((TELEGRAMMA CORP. TELEGRAM CO.))" 2660 PRINT 2670 RETURN 2680 REM \*DIREC, ROAD ON\* PRINI-UP 2690 PRINT "GOING "; 2700 ON D GOTO 2710,2730.2750,2770,2790,2810,2830,2850 2710 PRINT "NORTH"; 2720 GOTO 2960 2730 PRINT "WEST": 2740 GOTO 2860 2750 PRINT "NORTHEAST": 2760 GOTO 2860 2770 PRINT "SOUTHEAST": 2780 GOTO 2860 2790 PRINT "NORTHWEST"; 2800 GOTO 2860 2810 PRINT "SOUTHWEST"; 2820 GOTO 2860 2830 PRINT "EAST": 2840 GOTO 2860 2850 PRINT "SOUTH"; 2860 PRINT " ON ROAD #";R 2872 RETURN 2880 REM AT GRAMMAS \*PRINT\* 2890 PRINT "YOU MADE IT TO GRAMMAS HOUSE!!!!!!! !!" 2900 GOTO 3240 2910 REM DRUNK HIT YOUR CAR \*PRINT\* 2920 PRINT "KERSPLATT--DRUNK DRIVER HIT YOUR CAR." 2930 GOTO 3240 2940 REM CAR NEEDS FIXING \*PRINT-UP\* 2950 ON FNA(5) GOTO 2960,2980,3000,3020,3040 2960 PRINT "POP ... FLAT TIRE" 2970 GOTO 3050 2980 PRINT "FLIP...YOUR CAR DID A SUMERSALT" 2990 GOTO 3050 3000 PRINT "\*OUT OF GAS\*" 3010 6010 3050 3020 PRINT "SMOOSH...BUS FLATTENED YOUR CAR." 3030 GOTO 3050 3040 PRINT "POP...BULLDOG ATE YOUR TIRE!" 3050 GOTO 3240 3060 REM DEAD END PRINT 3070 PRINT "\*DEAD END\*" 3080 GOTO 3240 3090 REM SPEEDING 3100 PRINT "\*SPEEDING\*" 3110 REM CAUGHT BY POLICE? 3120 FOR X=1 TO 8 3130 IF P(X,1)=R AND P(X,1)=J THEN 3170 3140 NEXT X

3150 PRINT "NOI CAUGHI" 3160 GOTO 2160 3170 PRINT "CAUGHT SPEEDING BY THE POLICE!!" 3180 6010 3240 3190 REM TOO FAST \*CRASH\* 3200 PRINT "KERSMOUSHIIEEEE...WENT TOD FAST !!!!" 3210 6010 3240 3220 REM TOO SLOW \*CRASH\* 3230 PRINT "-\*<(KRUNCH)>\*- TOO SLOW...CAR BEHIND RAN INTU YUU!" 3240 REM AGAIN? 3250 PRINT 3260 PRINT "AGAIN"; 3270 INPUT IS 3290 IF LEFT\$(I\$.1)="Y" THEN 1380 3300 REM CLOSING STATEMENT 3310 PRINT 3320 PRINT "\*SEE YOU\*" 3330 6010 4210 3340 REM RULES? 3350 PRINT "RULES"; 3360 INPUT I\$ 3380 IF LEFT\$(I\$,1)="N" THEN 3950 3390 PRINT 3400 PRINT "GRAMMA NOMAD IS A NICE OLD LADY WHO HAS NOT DUITE" 3410 PRINT "MADE UP HER MIND WHERE SHE WANTS TO LIVE." 3420 PRINT "SHE HAS NARROWED IT DOWN TO SOMEWHERE IN GARBONZO CIT" 3430 PRINT "AND ON A STREET CORNER." 3440 PRINT 3450 PRINT "AT THE BEGINNING, THE MAILMAN GIVES YOU A TELEGRAM WRITE 3460 PRINT "BY GRAMMA TELLING YOU WHERE SHE LIVES." 3470 PRINT "(I WILL READ IT TO YOU)." 3480 PRINI 3490 PRINT "YOU GET INTO YOUR CAR IT LRAC NILKNARF WAMGREB LODGE." 3500 PRINT "FROM THEEEEERE YOU GO TO GRAMMAS HOUSE." 3510 PRINT 3520 PRINT "YOU IRY TO GET THERE WITHOUT:" 3530 PRINT "CRASHUPS" 3540 PRINT "TICKETS" 3550 PRINT "FLAT TIRES" 3560 PRINT "RUNNING OUT OF GAS" 3570 PRINT "DEAD ENDS" 3580 PRINT 3590 PRINT "THERE IS AN 8-MAN POLICE FORCE ENFORCING THE LAWS" 3600 PRINT "OF GARBONZO CITY." 3610 PRINT 3620 PRINT "THERE ARE 2-DRUNKS ON THE STREETS OF GARBONZO" 3630 PRINT "CITY." 3640 PRINI 3650 PRINT "IF A POLICEMAN CATCHES A DRUNK, HE HAS TO" 3660 PRINT "TESTIFY IN COURT" 3670 PRINT "(WHICH TAKES THE REST OF THE GAME)" 3680 PRINT 3690 PRINT "IF A DRUNK DRIVER HITS YOU, YOU LOSE." 3700 PRINT 3810 PRINT "AT EACH JUNCTION, I WILL TELL YOU:" 3820 PRINT "THE DIRECTION YOU ARE GOING" 3830 PRINT "THE ROAD YOU ARE ON" 3840 PRINT "THE ROAD CROSSING" 3850 PRINT 3860 PRINT "I WILL ASK YOU:" 3870 PRINT "THE WAY YOU WANT TO TURN (IE LEFT)" 3880 PRINT "SPEED (IN MPH)" 3890 PRINT 3900 PRINT "AN OVERPASS IS NOT A JUNCTION, SO IT IS" 3910 PRINT "MERELY SKIPPED OVER. IT IS UNANNOUNCED." 3920 PRINT 3930 PRINT "\*THAT IS ALL\*" 3940 PRINT 3950 RETURN 3960 REM DATA LINES 3970 DATA 18 3980 DATA -8,8,2,8,4,8,5,8,11,8,7,8,8,8,9,8,10 3990 DATA 3,7,17,7,18,7,1 4000 DATA 2,7,17,7,18 4010 DATA 3,7,18,7,11,7,1 4020 DATA 7,8,8,8,9,8,10,7,18,7,11,7,1,1,6 4030 DATA -2,7,18,7,5 4040 DATA 2,7,1,7,11 4050 BATA 8,7,16,7,15,7,5,7,14,7,13,7,1,7,12,7,11 4060 DATA 8,7,16,7,15,7,5,7,14,7,13,7,1,7,12,7,11 4070 DATA 8,7,16,7,15,7,5,7,14,7,13,7,1,7,12,7,11 4070 DATA 8,7,16,7,15,7,5,7,14,7,13,7,1,7,12,7,11 4080 DATA -7,4,4,4,5,4,1,4,7,8,8,8,9,8,10 4090 DATA -3,8,8,8,9,8,10 4100 DATA -3,8,8,8,9,8,10 4110 DATA -3,8,8,8,9,8,10 4120 DATA -3,8,8,8,9,8,10 4130 DATA -3,8,8,8,9,8,10 4140 DATA -2,8,2,8,3 4150 DATA -5,8,2,8,3,8,4,8,5,1,6 4160 DATA 0,0,0,0,0,0,0 4210 END Dk.

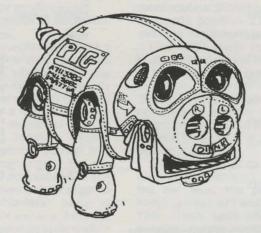


The game, Not One, sometimes nown as Pig, is played with two players and a pair of dice. There are ten rounds in the game; one round consisting of one turn for each player. Players add the score that they attain on each round and the player with the highest score after ten rounds is the winner.

On each turn, the player may roll the two dice from one to as many times as hewishes. If the total of the dice on any roll after the first equals the total shown on the first roll, his score is then zero for that entire turn and the dice pass to the other player. On the other hand, if the total on his dice is anything different from the total on the first turn, he continues to roll and adds the totals of the dice to his score. After each successful roll, the player can decide whether to roll again or stop and score the number of points already obtained.

You'll find that the computer plays a surprisingly good game of Not One. To beat it, you'll need some knowledge of probabilities and a little bit of luck on your side.

Not One was written in response to a challenge that appeared in the charter issue of *Creative Computing*. The game was written by Robert Puopolo and first appeared in *Creative Computing*, Mar/Apr 1975.



NOTONE

CREATIVE COMPUTING MORRISTOWN NEW JERSEY

#### WULD YOU LIKE THE INSTRUCTIONS? YES

HE BAME OF NOTONE IS PLAYED WITH NG PLAYERS AND A FAIR OF LICE. THERE ARE BE ROUNDS IN THE GAME ONE ROUND CONSISTING F ONE TURN FOF EACH PLAYER. PLAYERS TOURSELF AND THE COMPUTERY ADD THE SCORE HET ATTAIN ON EACH ROUND, AND THE PLAYER WITH THE HIGHEST SCORE AFTER TEN ROUNDS IS THE WINNER

WEACH TURN THE PLAYER MAY ROLL THE TWO UNE FROM 1 TO W TIMES, IF T1 IS THE TOTAL OF DICE ON TH THE ROLL, THEW THE PLAYERS SCORE FOR THE TURN IS UNIT(2)+T(3)+.....+T(N). HOUEVER, MU HERE'S THE CATCH, IF ANY T(1) IS EQUAL TO T(1) THEN THE TURN IS OVER AND HIS SCORE FOR THAT ROUND IS ZERO ATTER EACH ROLL THAT DOESN'T EQUAL T(1), THE PLAYER CAN MOUSE WHETHER TO ROLL AGAIN OR STOP THAT MOUSE WHETHER TO ROLL AGAIN OR STOP THAT

| 1    |     |    |     |    |      |    |     |     |      |   |    |     |   |   |
|------|-----|----|-----|----|------|----|-----|-----|------|---|----|-----|---|---|
| ROLI | -   | AG | AII | N. | ? 11 | ES | 1   |     |      |   |    |     |   |   |
| YOU  | G   | ET | A   | Z  | ERO  | F  | OF  | 5.  | THIS | R | ou | ND  |   |   |
|      |     |    |     |    |      | C  | :01 | IPI | JTER | 5 | MO | VE  |   |   |
| COM  | PU  | TE | R 1 | s  | ROLI | _  | 1   | :   | 7    |   |    |     |   |   |
| COM  | PU  | TE | R 1 | 5  | ROLI | Ĺ  | 2   | :   | 5    |   |    |     |   |   |
| COM  | PU  | TE | R   | S  | ROLI |    | 3   | :   | 11   |   |    |     |   |   |
| COM  | PU  | TE | R'  | S  | ROL  |    | 4   | :   | 12   |   |    |     |   |   |
| COM  | PU  | TE | R 1 | 5  | ROLI |    | 5   | :   | 8    |   |    |     |   |   |
| COM  | FU  | TE | R 1 | S  | ROLI | L  | 6   | :   | 3    |   |    |     |   |   |
| COM  | PIJ | TE | R:  |    | 46   |    |     |     |      |   |    | YOU | : | 0 |
| ROU  | ND  |    | 2   |    |      |    |     |     |      |   |    |     |   |   |

ROUND 1

| 12   |       |   |     |  |
|------|-------|---|-----|--|
| ROLL | AGAIN | 2 | YES |  |
| 4    |       |   |     |  |
| ROLL | AGAIN | ? | YES |  |
| 6    |       |   |     |  |
| ROLL | AGAIN | ? | YES |  |
| 7    |       |   |     |  |
| ROLL | AGAIN | ? | YES |  |
| 10   |       |   |     |  |
| ROLL | AGAIN | ? | YES |  |
| 7    |       |   |     |  |

| ROLL<br>8  | AGAIN | 9 | YES |  |
|------------|-------|---|-----|--|
| ROLL<br>9  | AGAIN | ? | YES |  |
| ROLL<br>11 | AGAIN | ? | YES |  |
| ROLL<br>11 | AGAIN | ? | YES |  |
| ROLL 4     | AGAIN | ? | YES |  |
| ROLL       | AGAIN | ? | NO  |  |

COMPUTERS MOVE

COMPUTER'S ROLL 1 : 6 COMPUTER'S ROLL 2 : 9 COMPUTER'S ROLL 3 : 7 COMPUTER'S ROLL 3 : 7 COMPUTER'S ROLL 4 : 7 COMPUTER'S ROLL 6 : 7

YOU: 89 COMPUTER: 86

ROUND 3 8 ROLL AGAIN ? YES 4 ROLL AGAIN ? YS\_ES 5 ROLL AGAIN ? YES 6 ROLL AGAIN ? NO

COMPUTERS MOVE

| COMPI            | UTER'S                | R   | DLL  | 1   | :  | 8     |      |
|------------------|-----------------------|-----|------|-----|----|-------|------|
| COMPI            | UTER'S                | RI  | DLL  | 2   | :  | 7     |      |
|                  | UTER'S                |     |      |     |    |       |      |
| COMPI            | UTERS                 | R   | OLL  | 4   | :  | 6     |      |
|                  | JTER'S                |     |      |     |    |       |      |
| COMPI            | UTER'S                | R   | DLL  | 6   | :  | 7     |      |
| COMPL            | JTER:                 | 1:  | 21   |     |    |       | YOU  |
| ROUNI<br>11      | 0 4                   |     |      |     |    |       |      |
| ROLL<br>3        | AGAIN                 | ?   | YES  | 6   |    |       |      |
| ROLL<br>12       | AGAIN                 | P   | YES  | 5   |    |       |      |
| ROLL<br>3        | AGAIN                 | ?   | YES  | 5   |    |       |      |
| ROLL<br>6        | AGAIN                 | ?   | YES  | 6   |    |       |      |
| ROLL<br>7        | AGAIN                 | ?   | YES  | 5   |    |       |      |
| ROLL<br>8        | AGAIN                 | ?   | YES  | 5   |    |       |      |
| ROLL<br>10       | AGAIN                 | ?   | YES  | 5   |    |       |      |
| ROLL             | AGAIN                 | ?   | NO   |     |    |       |      |
|                  |                       |     | (    | :01 | PI | JTERS | MOVE |
| COMPI            | UTER'S                | R   | 01.1 | 1   |    | 5     |      |
|                  | UTER'S                |     |      |     |    | 127   |      |
| COMPI            | UTER'S                | R   | DLL  | 3   | :  | 12    |      |
| COMPI            | UTER'S                | RI  | DLL  | 4   | :  | 8     |      |
|                  | UTER'S                |     |      |     | :  | 7     |      |
|                  | UTERS                 |     |      |     |    |       |      |
| COMPI            | UTER'S                | R   | OLL  | 7   | :  | 6     |      |
| land and so show | and the second second | 120 |      | 122 |    |       |      |

| COMPUTER'S | ROLL 6 : 4  |      |     |
|------------|-------------|------|-----|
| COMPUTER'S | ROLL 7 : 6  |      |     |
| COMPUTER'S | ROLL 8 : 11 |      |     |
| COMPUTER'S | RDLL 9 : 6  |      |     |
| COMPUTER:  | 189         | 100: | 172 |
| ROUND 5    |             |      |     |
| ROLL AGAIN | ? YES       |      |     |
| ROLL AGAIN | ? YES       |      |     |

ROLL AGAIN ? YES ROLL AGAIN ? YES ROLL AGAIN ? YES ROLL AGAIN ? YES YOU GET A ZERO FOR THIS ROUND ROLL AGAIN ? YES ROLL AGAIN ? YES COMPUTERS MOVE ROLL AGAIN ? NO YOU GET A ZERO FOR THIS ROUND COMPUTER'S ROLL 1 : 6 COMPUTERS MOVE COMPUTER'S ROLL 2 : 3 COMPUTERS MOVE COMPUTER'S ROLL 1 : 8 COMPUTER'S ROLL 3 : 8 COMPUTER'S ROLL 4 : 11 COMPUTER'S ROLL 2 : 8 COMPUTER'S ROLL 1 : 8 COMPUTER'S ROLL 5 : 7 THE COMPUTER GETS A ZERO FOR THE TURNI COMPUTER'S ROLL 2 : 6 COMPUTER'S ROLL 6 : 2 COMPUTER'S ROLL 3 : 2 COMPUTER: 376 COMPUTER'S ROLL 4 : 9 COMPULER: 3:6 YAU: 229 COMPUTER'S ROLL 5 : 12 ROUND 10 COMPUTER'S ROLL 6 : 6 ROUND 8 ROLL AGAIN ? YES COMPUTER: 232 YOU: 172 ROLL AGAIN ? YES 10 ROLL AGAIN ? YES ROUND 6 YOU GET A ZERO FOR THIS ROUND ROLL AGAIN ? YES ROLL AGAIN ? YES COMPUTERS NOVE YOU GET A ZERO FOR THIS ROUND ROLL AGAIN ? YES COMPUTER'S ROLL 1 : 7 COMPUTER'S ROLL 2 : 11 COMPUTERS MOVE ROLL AGAIN ? YES COMPUTER'S ROLL 3 : 10 COMPUTER'S ROLL 4 : 10 COMPUTER'S ROLL 5 : 6 COMPUTER'S ROLL 1 : 6 ROLL AGAIN ? YES COMPUTER'S ROLL 2 : 11 COMPUTER'S ROLL 3 : 11 COMPUTER'S ROLL 6 : 6 ROLL AGAIN ? YES COMPUTER'S ROLL 4 : 8 10 COMPUTER: 376 YOU: 229 COMPUTER'S ROLL 5 : 3 COMPUTER'S ROLL 6 : 6 ROLL AGAIN ? YES ROUND 9 THE COMPUTER GETS A ZERO FOR THE TURN ROLL AGAIN ? YES ROLL AGAIN ? YES FINAL SCOKE ROLL AGAIN ? NO ROLL AGAIN ? YES COMPUTER: 376 COMPLTERS MOVE ROLL AGAIN ? YES SCORING SUMMARY COMPUTER'S ROLL 1 : 10 12 COMPUTER'S ROLL 2 : 6 ROUND YOU COMPUTER ROLL AGAIN ? YES COMPUTER'S ROLL 3 : 5 COMPUTER'S ROLL 4 : 7 ROLL AGAIN ? YES 0 89 2 COMPUTER'S ROLL 5 : 8 COMPUTER'S ROLL 6 : 4 ROLL AGAIN ? YES 3 23 COMPUTER'S ROLL 7 : 7 COMPUTER'S ROLL 8 : 4 4 60 5 5 0 ROLL AGAIN ? YES COMPUTER'S ROLL 9 : 6 57 6 8 0 ROLL AGAIN ? YES COMPUTER: 289 YOU: 229 8 0 95 ROLL AGAIN ? YES ROUND 7 10 0 8 ROLL AGAIN ? YES ROLL AGAIN ? YES TOTALS: 324 11 ROLL AGAIN ? YES **DK** 8 LIST 133 X=0:T1=0:GOTO 200 3 PRINT TAB(26); "NOTONE": PRINT 135 T1=T1+T(X) 5 PRINT TAB(20); "CREATIVE COMPUTING" 6 PRINT TAB(19); "MORRISTOWN NEW JERSEY" 140 INPUT "ROLL AGAIN ";B\$ 145 IF B\$="YES" THEN 110 7 PRINT:PRINT:PRINT 150 1F B\$="NO" THEN R(T)=T1:X=0:T1=0:FOR A=1 TO 50:T(A)=0:NEXT:GOTO1 10 DIH T(50),R(10),C(10),L(12) 15 IMPUT "WOULD YOU LIKE THE INSTRUCTIONS";A\$ 20 IF A\$="YES" THEN 35 160 PRINT:PRINT "ANSWER YES DR ND!!":PRINT: GOTO 140 200 PRINT:PRINT TAB(15);"COMPUTERS MOVE":PRINT 201 RESTORE 25 IF A\$="NO" THEN 100 202 R1=INT(6\*RNB(1))+1:R2=INT(6\*RNB(1))+1 30 PRINT:PRINT "ANSWER YES OR NO!!":PRINT:GOTO 15 204 FOR D=2 TO R1+R2:READ L(D):NEXT:D=R1+R2 35 PRINT:PRINT "THE GAME OF NOTONE IS PLAYED WITH" 205 FOR C=1 TO L(D): IF C=1 THEN 215 40 PRINT "TWO PLAYERS AND A PAIR OF DICE. THERE ARE" 210 R1=INT(6\*RND(1))+1:R2=INT(6\*RND(1))+1 45 PRINT "TEN ROUNDS IN THE GAME ONE ROUND CONSISTING" 215 PRINT "COMPUTER'S ROLL"C":";R1+R2 50 PRINT "OF ONE TURN FOR EACH PLAYER. PLAYERS" 220 IF C>1 THEN 230 55 PRINT "(YOURSELF AND THE COMPUTER) ADD THE SCORE" 225 T(1)=R1+R2:GOTO 242 60 PRINT "THEY ATTAIN ON EACH ROUND, AND THE PLAYER" 230 T(C)=R1+R2 62 PRINT "WITH THE HIGHEST SCORE AFTER TEN ROUNDS IS THE WINNER":PRINT 235 IF T(C)<>T(1) GOTO 242 67 PRINT "ON LACH TURN THE PLAYER MAY ROLL THE TWO" 69 PRINT "DICE FROM 1 TO N TIMES. IF TT IS THE TOTAL OF DICE ON" 236 PRINT "THE COMPUTER GETS A ZERO FOR THE TURN!!" 237 T1=0:60T0 245 242 T1=T1+T(C):NEXT C 72 PRINT "THE ITH ROLL, THEN THE PLAYERS SCORE FOR THE TURN IS" 75 PRINT "T(1)+T(2)+T(3)+.....+T(N). HOWEVER," 77 PRINT "AND HERE'S THE CATCH, IF ANY T(I) IS EQUAL TO T(1) THEN" 80 PRINT "THE TURN IS OVER AND HIS SCORE FOR THAT ROUND IS ZERO" 245 C(T)=T1:T1=0:X=0 250 C2=C2+C(T):C1=C1+R(T) 253 PRINT:FOR B=1 TO 50:T(B)=0:NEXT 82 PRINT "AFTER EACH ROLL THAT DOESN'T EQUAL T(1), THE PLAYER CAN" 255 IF T=10 THEN PRINT "FINAL SCORE":PRINT 88 PRINT "DECIDE WHETHER TO ROLL AGAIN OR STOP AND " 260 IF C2<C1 THEN 270 90 PRINT "SCORE THE NUMBER OF POINTS ALREADY OBTAINED." 263 PRINT"COMPUTER: ";C2, "YOU: ";C1:60T0 300 100 FOR (=1 TO 10:PRINT:PRINT "RUUND ";T 270 PRINT "YOU: ";C1, "COMPUTER: ";C2 110 X=X+1:R1=INT(6\*RND(1))+1 300 NEXT T 305 DATA 18,18,9,9,6,6,6,6,9,9,18,18 310 PRINT:PRINT "SCORING SUMMARY":PRINT 115 R2=INT(6\*RND(1))+1:PRINT R1+R2 120 IF X>1 THEN 130 315 PRINT "ROUND"; TAB(15); "YOU"; TAB(25); "COMPUTER": PRINT 125 T(1)=R1+R2:GOTO 135 320 FOR E=1 TO 10:PRINT E;TAB(16);R(E);TAB(26);C(E):NEXT 325 PRINT:PRINT "TUTALS: ";TAB(16);C1;TAB(26);C2:PRINT 130 T(X)=R1+R2 131 IF T(1)<>T(X) THEN 135

YOU: 324

YOU: 324

46

40

35

68

43

57

37

50

0

0

376

**DK** 

132 PRINT "YOU GET A ZERO FOR THIS ROUND"



The game OBSTACLE is an obstacle ourse game played on a 9x40 grid.

A car is represented by the character the obstacles are the walls represented by exclamation points and hyphens) and spaces are where he car may travel. The car may not pass over or occupy a wall or obstacle. The character 'S' at the upper left corner, indicates where the car starts rom, and the character in the lower ight corner, the 'F', is the space the car must occupy at the finish to win. If the car tries to occupy or pass through a wall the game is lost. When the car lands on the space occupied by the character 'F', the car has finished the course, and the game is over, and a time is calculated.

Line-by-line, here's how the program works:

Line 610 dimensions the matrix M for 15 rows by 50 columns (allowing an adequate margin for modification).

Line 620-680 initializes all necessary variables.

Line 700-780, through the use of a random number generator, generates the obstacle course, where I is the row matrix index and J is the column matrix index and R1 is the random number. Line 720 generates a random number between 0 and 1, multiplies it by a density of 1.2 (to increase density factor by a few decimal points) and removes everything right of the decimal point. R1 is now either 0 or 1. If it is 0 the matrix memory location M (I,J) inside the For-Next Loop is assigned the value of a space, if it is 1, it is assigned the value of an exclamation point.

Lines 840 and 850 assign the walls to the course.

Line 890 stores the values of I and J into K and L, these act as value holders. After the print routine has been executed, I and J are reassigned their old values stored in K and L at line 970.

Lines 910-960, through use of a For-Next Loop (as in the initialization course set up routine), print out the characters represented by values in matrix M, Line 930, the CHR\$ Function turns the values of the memory location into their ASCII character equivalent.

Line 990 checks if the car has moved yet, by checking D1. If D1>0 then it skips the query option and continues with the main body. If D1=0 then it executes the option query, asking whether a new course, or this course or end the game and then executes the respective option.

Line 1130 checks if D1 is not equal to 1 and if so continues with the moveRUN

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OBSTACLE
CREATIVE COMPUTING
MORRISTOWN, NEW JERSEY
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DO YOU WANT INSTRUCTIONS? YES THE OBJECT OF THIS GAME IS TO HOVE YOUR CAR'\*' BEGINNING AT'S' AND NAVIGATE THROUGH THE OBSTACLES '!'&'-' WALLS TO THE SPACE MARKED 'F', YOU MUST LAND ON THE SPACE MARKED 'F' ON THE EXACT AMOUNT OF SPACES THERE ARE NO DIAGONAL HOVES. THERE ARE NO RIGHT TO LEFT MOVES. DIRECTIONS NO.1 IS UP. DIRECTION NO.2 IS LEFT TO RIGHT DIRECTION NO.3 IS DOWN.

SPEED IS THE NO. OF SPACES IN A GIVEN DIRECTION

Line 1080 starts the main program body, 1100 queries the direction and 1110 checks the input D if it is a valid direction. Line 1120 inputs the speed 'S' and Line 1130 initializes the counters S1 and D1. Lines 1160-1180 direct control to the proper movement routine (1 is up, 2 is right to left, 3 is down).

Line 1190-1220 is the movement routine for direction 1. Line 1190 erases the car from the previous position keeping track of I and J. Line 1200 and 1210 check each character position between matrix position I,J, and I-S,J for a wall (exclamation or hyphen); if one is encountered the game is over. If no walls are encountered, the move is legal and Line 1220 assigns the car to matrix position I-1, J and jumps to 1310 to check matrix position 10,41 if it contains a car. If so, the game is won and the End of Run routine is executed. If matrix position 10,41 is not occupied the game is not over and control jumps to 870, the matrix print routine. The Loop can only be exited by losing (crashing into an obstacle) or by getting the car to matrix position 10,41 where it executes the End of Run routine.

Line 1380 calculates the time by dividing total number of turns by total number of character spaces covered by the car and multiplies it by 100. Line 1390 prints the time and Line 1400 and 1410 query as to whether to play the game again.

The program and these notes were written by Eric Erickson.

15 1 1 11 11 I. t. 111 1 Ţ 11 11 11 1 11 11 ! 11 11 F! 1

OPTION :(A=CONTINUE,B=NEW COURSE,C=STOP)? A DIRECTION? 3

SPEED? 4

ILLEGAL MOVE ..... YOU LOSE!!

DO YOU WISH TO PLAY AGAIN? YES

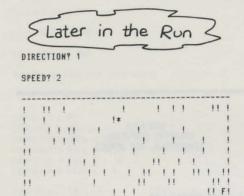
|   | 1    |     | 1     |      | · · · |      |
|---|------|-----|-------|------|-------|------|
|   | 1111 | 1   |       |      | 1     |      |
|   | 111  |     |       | 1    | 1     | 1    |
| 1 |      | 1   | L     | 1    | I     | 1    |
|   | 1    | 11  |       | 11   | 1     | 1    |
|   | 11   | 1 1 | 1     | 11 1 | 1     | 1111 |
| 1 |      | 1   |       | 11   | 11    | 11   |
|   |      |     | 1.1.1 |      |       | 11 F |

#### SPEED? 1

| . 8 | 11  | 1    |     |   | i  |    | ! | 11 | !    |     |
|-----|-----|------|-----|---|----|----|---|----|------|-----|
|     | 1   |      |     | 1 |    |    |   |    |      |     |
|     | 1   | 1 11 | 1   |   | !  |    |   | !  |      |     |
|     | !   | 11   |     |   |    | 1  |   | !  | 1    |     |
| ŧ   |     |      | 1   |   | !  |    | 1 | 1  | !    |     |
|     |     | 1    | 11  |   |    | 1  | ! | 1  | 1    |     |
|     | 1.1 |      | 1 1 |   | !  | 11 | 1 | 1  | 11.1 | 1   |
| 1   |     |      | 1   |   |    | 1  | 1 | 1  | 1    | E I |
|     |     |      |     | 1 | 11 |    |   |    | 11   | F   |

## SPEED? 4

|   | 11 |   | 1  |   |    |   | 1  |    | !  | 1 | F. | 11   |
|---|----|---|----|---|----|---|----|----|----|---|----|------|
|   | 1  |   |    |   |    | 1 |    |    |    |   |    |      |
|   | 1  | 1 | 11 |   | 1  |   | 1  |    |    | 1 | 1  |      |
|   |    | 1 | 11 |   |    |   |    | 1  |    | ! |    | 1    |
| = |    |   |    |   | !  |   | !  |    | !  |   |    | !    |
|   |    |   | 1  | 1 | ŧ  |   |    |    | 11 | 1 | 1  |      |
|   | 1  | 1 |    | 1 | 1  |   | ļ  | 11 | 1  | ! | 11 | 1 1  |
| 1 |    |   |    |   | ļ. |   |    | 11 |    | 1 |    | 11   |
|   |    |   |    |   |    | Ŧ | 11 |    |    |   |    | 11 F |



### DIRECTION? 2

## SPEED? 6

| !  | 11 | 1    |    |   | 1   |    | 1  | 11 |    | 11 1 |
|----|----|------|----|---|-----|----|----|----|----|------|
| ŀ  | !  |      |    | 1 |     | *  |    |    |    |      |
| i. | 1  | 1.11 | 1  |   |     | 1  |    | !  |    | 1    |
|    | 1  | 11   |    |   |     | 1  |    | 1  | !  |      |
| 1  |    |      | 1  |   | 1   |    | 1  | !  | 1  |      |
| 1  |    | !    | 11 |   |     |    | 11 | 1  | !  |      |
|    | 11 |      | 1  | 1 | !   | 11 | !  | !  | 11 | 1 1  |
| 1  |    |      | !  |   |     | 11 |    | 11 |    | 11   |
|    |    |      |    | 1 | 1 1 |    |    |    |    | 11 F |

790 H(2,2)=A4

#### DIRECTION? 2

#### SPEED? 1118

|   | 11 |   | 1    |   |   |   |   | ! |   |   |    | 1  |   | ! | ţ |    | 1  | ! |
|---|----|---|------|---|---|---|---|---|---|---|----|----|---|---|---|----|----|---|
|   | !  |   |      |   |   |   | 1 |   |   |   |    |    |   |   |   | ŧ. |    |   |
|   | !  |   | 1 11 |   |   | ! |   |   | 1 |   |    |    |   |   | ! |    |    |   |
|   |    | ! | 11   |   |   |   |   |   |   | i |    |    |   | ! |   |    | !  |   |
| 1 |    |   |      |   | 1 |   |   |   | 1 |   |    |    | ! |   | ł |    | 1  |   |
|   |    |   | !    | 1 | 1 |   |   |   |   |   |    | !! |   | 1 |   | 1  |    |   |
|   | 1  | 1 |      |   | ! | 1 |   | ! |   | ! | Į. |    | ! | ! |   | 11 | Ŧ  | 1 |
| 1 |    |   |      |   | 1 |   |   |   |   |   |    |    | 1 | ļ |   |    | 1  | 1 |
|   |    |   |      |   |   |   | 1 | 1 | 1 |   |    |    |   |   |   |    | 11 | - |

#### DIRECTION? 3

#### SPEED? 8

ILLEGAL MOVE..... YOU LOSE!!

DO YOU WISH TO PLAY AGAIN? NO OK

LIST

| 10 PRINT TAB(26)"OBSTACLE                             |   |
|---|---|
| 20 PRINTTAB(20)"CREATIVE<br>30 PRINTTAB(18)"MORRISTOW |   |
| 150 REM VARIABLES                                     | USAGE   |
| 160 REM   | DECIMAL VALUE FOR THE CHARACTER'*'  |
| 180 REM A2  | DECIMAL VALUE FOR THE CHARACTER '   |
| 190 REM A3  | DECIMAL VALUE FOR THE CHARACTER '!'   |
| 200 REM A4  | DECIMAL VALUE FOR THE CHARACTER 'S'   |
| 210 REM A5  | DECIMAL VALUE FOR THE CHARACTER 'F'   |
| 220 REM 46  | DECIMAL VALUE FOR THE CHARACTER '-'   |
| 230 REM D<br>240 REM D1                               | DIRECTION<br>TOTAL NO. OF TURNS TAKEN   |
| 250 REM I   | ROW MATRIX  |
| 260 REM J   | COLUMN MATRIX INDEX   |
| 270 REM K   | PLACE HOLDER FOR THE VARIABLE I   |
| 280 REM L   | PLACE HOLDER FOR THE VARIABLE J   |
| 290 REM M   | MATRIX VARIBLE<br>INPUT TO YES-NO QUESTIONS                                       |
| 300 REM NS<br>310 REM R1                              | RANDOM NUMBER GENERATOR VARIABLE  |
| 320 REM S   | SPEED   |
| 330 REM S1  | TOTAL SPEED COUNTER   |
| 340 REN T   | 'TIME' RATIO (D1/S1)*100  |
| 350 REM   | ATIOT DESCRIPTION   |
| 360 REM   | START PROGRAM   |
| 370 REM<br>380 REM                                    |   |
| 390 REM INSTRUCTI                                     | ONS   |
| 400 REM   |   |
| 410 PRINT   |   |
| 420 PRINT   |   |
| 430 PRINT<br>440 PRINT                                |   |
| 450 PRINT "DO YOU WANT IN                             | ISTRUCTIONS";:INPUT N\$   |
| 460 IF N\$<>"YES" THEN 610                            |   |
|   | THIS GAME IS TO MOVE YOUR CAR'*"  |
|   | S' AND NAVIGATE THROUGH THE OBSTACLES"<br>TO THE SPACE MARKED 'F', YOU MUST LAND" |
|   | ARKED 'F' ON THE EXACT AMOUNT OF SPACES"  |
| 510 PRINT"THERE ARE NO DI                             | LAGONAL MOVES."   |
| 520 PRINT"THERE ARE NO R                              |   |
| 530 PRINT"DIRECTIONS NO.                              |   |
| 540 PRINT "DIRECTION NO.:<br>550 PRINT"DIRECTION NO.3 |   |
| 560 PRINT   | 10 Downs  |
|   | D. OF SPACES IN A GIVEN DIRECTION"  |
| 580 REM   |   |
|   | ITIALATION  |
| 600 REM<br>610 DIM H(15,50)                           |   |
| 620 A1=ASC("#")                                       |   |
| 630 A2=ASC("!")                                       |   |
| 640 A3=ASC(" ")                                       |   |
| 650 A4=ASC("S")<br>660 A5=ASC("F")                    |   |
| 670 A6=ASC("-")                                       |   |
| 680 D1=0:S1=0   |   |
| 690 REM *** NOTE - COUN                               | RSE SET UP ROUTINE  |
| 700 FOR I=1 TO 10                                     |   |
| 710 FDR J=1 TO 42<br>720 R1=INT(RND(1)*1.2)           |   |
| 730 IF R1=0 THEN 760                                  |   |
| 740 H(I,J)=A2   |   |
| 750 GOTO 770  |   |
| 760 H(I,J)=A3   |   |
| 770 NEXT J<br>780 NEXT I                              | The Color Sector Color  |
| JOV REAT 1  |   |

800 M(10,40)=A3 810 H(10,41)=A5 820 M(2,3)=A3 830 M(3,2)=A3 840 FOR I=1 TO 10:M(I,1)=A2:M(I,42)=A2:NEXT I 850 FOR J=1 TO 42:H(1, J)=A6:H(11, J)=A6:NEXT J 860 REM 870 REM \*\* PRINTING ROUTINE \*\* 880 REM 890 K=I:L=J 900 PRINT 910 FOR I=1 TO 11 920 FOR J=1 TO 42 930 PRINT CHR\$(M(I,J)); 940 NEXT J 950 PRINT 960 NEXT I 970 I=K:J=L 980 REM 88 NOTE- NEW COURSE OPTION\*\* 990 IF D1>0 THEN 1080 1000 PRINT"OPTION : (A=CONTINUE, B=NEW COURSE, C=STOP)"; 1010 INPUT NS 1020 IF N\$="A" THEN 1080 1030 IF N\$="B" THEN 670 1040 IF N\$="C" THEN 1420 1050 PRINT"INVALID OPTION" 1060 GDTO 1000 1070 REM 1080 REM \*\* MAIN PROGRAM BODY \*\* 1090 REM 1100 PRINT"DIRECTION";:INPUT D:D=INT(ABS(D)) 1110 IF D<1 THEN 1100 1111 IF D>3 THEN 1100 1120 PRINT:PRINT"SPEED";:INPUT S:S=INT(ABS(S)) 1130 D1=D1+1:S1=S1+S:IF D1<>1 THEN 1160 1140 REM \*\* NOTE - CAR STARTS AT POSITION 2,2 1150 J=2:I=2 1160 IF D=1 THEN 1190 1170 IF D=2 THEN 1230 1180 IF D=3 THEN 1270 1190 M(I,J)=A3:REM \*\* WIPES OUT PREVIOUS CHARACTER \*\* 1200 FOR C=1 TO S:I=ABS(I-1):IF M(I,J)=A2 THEN 1340 1210 IF M(I, J)=A6 THEN 1340 1215 NEXT C 1220 M(I, J)=A1: GOTD 1310 1230 M(I, J)=A3 1240 FOR C=1 TO S: J=J+1: IF M(I, J)=A2THEN 1340 1250 IF M(I, J)=A6 THEN 1340 1255 NEXT C 1260 M(I,J)=A1: GOTO 1310 1270 M(I,J)=A3 1280 FOR C=1 TO S: I=I+1:IF M(I,J)=A2 THEN 1340 1290 IF M(I, J)=A6 THEN 1340 1295 NEXT C 1300 M(I,J)=A1 1310 REM \*\* NOTE - WINNING CHECK\*\* 1320 IF M(10,41) <> A1 THEN 870 1330 GOTO 1360 1340 PRINT"ILLEGAL MOVE..... YOU LOSE!!":GOTO 1400 1350 REM \*\* END OF REN ROUTINE \*\* 1360 REM 1370 REM 1380 T=(D1/S1)\*100 1390 PRINT "YOU WON!! AND YOUR TIME IS ";T 1400 PRINT:PRINT"DO YOU WISH TO PLAY AGAIN"; : INPUT NS 1410 IF N\$="YES" THEN 670 1420 END

Octrix

OCTRIX CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

### TEACH GAME (Y OR N)? Y

RUN

THIS IS A GAME CALLED OCTRIX. EACH PLAYER IS DEALT 8 CARDS RANGING FROM ACE THROUGH EIGHT. THE CARDS ARE RANKED ACCORDING TO BRIDGE SUITS WITH THE ACE OF CLUBS THE LOWEST AND THE EIGHT OF SPADES HIGHEST. THE OBJECT IS TO UN AS MANY OF THE EIGHT TRICKS AS POSSIBLE. EACH TRICK PLAYED DETERMINES THE PLAY OF THE NEXT TRICK. IF THE HIGH AND LOW CARDS PLAYED MATCH COLOR THE NEXT TRICK WILL BE HIGH AND IF THEY DO NOT MATCH IT WILL BE LOW. IT IS IM-PORTANT TO SET STRATEGY TO WIN CONSECUTIVE TRICKS IN THAT SCORING IS 1 POINT PER TRICK, 4 FOR TWO IN A ROW,9 FOR 3, UP TO 64 FOR ALL EIGHT.

RESPOND TO THE INPUT PROMPT WITH THE CARD YOU WANT TO PLAY IN A TWO CHARACTER FORMAT WITH THE VALUE(A-8) AS THE FIRST CHARACTER, AND SUIT(C,D,H,S) AS THE SECOND CHARACTER. (TO SEE THE REMAINING CARDS, ENTER A'P' IN RESPONSE TO THE 'WHAT CARD' QUERY)

THAT'S IT, GOOD LUCK!! HOW MANY POINTS (0 ENTRY GIVES STANDARD 88)? O HOW MANY PLAYERS? 3 ENTER PLAYER S NAME? JEFF

ENTER PLAYER'S NAME? BRUCE ENTER PLAYER'S NAME? STEVE

This is a card game for up to four players, or three players plus the computer. A deck of 32 cards is used with ace through eight in each of the four suits. All 32 of the cards are dealt out at the beginning of the game, eight to each player. On each hand, each player discards one card depending on the rules of the game (see the rules at the beginning of the sample game) either the high card discard or the low card discard wins that trick. After eight tricks a new hand is dealt and play proceeds as before. Perhaps the easiest way to learn Octrix is to play a few games with you and the computer or with several people and the computer. Observe what happens and before long you'll be able to work out a reasonable strategy for playing the game.

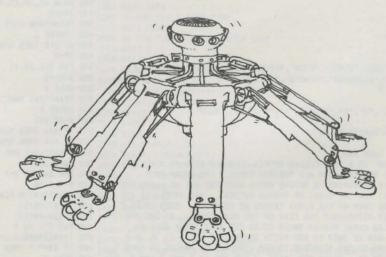
Octrix was written by Rogers Hamilton.

| SHOUL | D I PLAY |      | OR N)? | Y  |     |     |       |        |    |     |     |       |        |     |     |     |         |         |     |    |  |
|-------|----------|------|--------|----|-----|-----|-------|--------|----|-----|-----|-------|--------|-----|-----|-----|---------|---------|-----|----|--|
|       |          | JEFF | S HAND |    |     |     | BRUCE | S HAND |    |     |     | STEVE | S HAND |     |     |     | COMPUTE | R'S HAN | D   |    |  |
|       | CLB      | DIA  | HRT    | S  | PD  | CLB | DIA   | HRT    | S  | PD  | CLB | DIA   | HRT    | 51  | PD  | CLB | DIA     | HRT     | 5   | PD |  |
| !A    | 1        | 1    | 1      | !# | 11A | 1   | 1.0   | 1      | 1  | 114 | 1   | 1     | 1.#    | 1   | IIA | 1=  | 1       | 1       | 1   | 1A |  |
| 12    | 1        | 1.0  | 1*     | !  | 112 | 1   | 1     | 1      | !# | 112 | 1+  | 1     | 1      | 1   | 112 | 1   | 1       | 1       | T   | 12 |  |
| 13    | 1        | 1    | 1      | !  | 113 | 1.  | 1     | 1      | 1  | 113 | 1   | 1     | 1      | 1   | 113 | 4   | 1.      | 1#      | 1.8 | 13 |  |
| 14    | 1.8      | 1    | 1      | 1  | 114 | 1   | 1     | 1      | 1  | 114 | 1   | 1     | 1.     | 1#  | 114 | 1   | 1*      | 1       | 1   | 14 |  |
| 15    | 1        | !    | 1      | 1. | 115 | 1.  | 1     | 1      | 1  | 115 | 1   | 1=    | 1      | 1   | 115 | 1   | 1       | 1.0     | 1   | 15 |  |
| 16    | 1        | !*   | 1      | 1  | 116 | 1.  | 1     | 1      | i. | 116 | i   | 1     | 1      | 1.0 | 116 | i   | i       | 1.0     | i   | 16 |  |
| 17    | 1#       | !    | 1      | 1  | 117 | 1   | 1.    | 1.     | 1  | 117 | i   | i     | 1      |     | 117 | 1   | i       | 1       | 1   | 17 |  |
| !8    | 1        | 1    | 1      | !# | 118 | !   | 1     | 1.     | 1  | 118 | 1.  | +     | 1      | 1   | 118 | i   | 1.8     | i       | i   | 18 |  |

TRICK # 1 (HIGH CARD WINS) WHAT CARD, JEFF 8999 WHAT CARD, BRUCE 8885 WHAT CARD, STEVE 0010 JEFF PLAYED THE EIGHT OF SPADES BRUCE PLAYED THE FIVE OF CLUBS STEVE PLAYED THE FIVE OF DIAMONDS I PLAYED THE SIX OF HEARTS JEFF WON TRICK # 1 TRICK # 2 (HIGH CARD WINS) WHAT CARD, JEFF .... WHAT CARD, BRUCE 8888 WHAT CARD, STEVE 8958 JEFF PLAYED THE FIVE OF SPADES BRUCE PLAYED THE TWO OF SPADES STEVE PLAYED THE FOUR OF SPADES I PLAYED THE EIGHT OF DIAMONDS I WON TRICK # 2 TRICK # 3 (LOW CARD WINS) WHAT CARD, JEFF .... WHAT CARD, BRUCE 8188 WHAT CARD, STEVE 2125 JEFF PLAYED THE FOUR OF CLUBS BRUCE PLAYED THE SIX OF CLUBS STEVE PLAYED THE SIX OF SPADES

....

I PLAYED THE ACE OF CLUBS I WON TRICK # 3 TRICK # 4 (HIGH CARD WINS) WHAT CARD, JEFF



| JEFF'S HAND<br>CLB DIA HRT SPD<br>1A 1 1 1 1*11A<br>12 1 1* 1* 1 112<br>13 1 1 1 1 113<br>14 1 1 1 1 113<br>14 1 1 1 1 115<br>16 1 1* 1 1 116<br>17 1* 1 1 1 118<br>WHAT CARD, JEFF   |   | 1     1     1     1     1     1       1     1     1     1     1     1       1     1     1     1     1     1       5     1     1     1     1     1       5     1     1     1     1     1       7     1     1     1     1     1  | COMPUTER'S HAND           CLB         DIA         HRT         SPD           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I           I         I         I         I         I   |
|---|---|--|---|
| WHAT CARD, BRUCE<br>WHAT CARD, STEVE<br>JEFF PLAYED THE SIX OF DIAMONDS<br>BRUCE PLAYED THE EIGHT OF HEARTS<br>STEVE PLAYED THE FOUR OF HEARTS<br>I PLAYED THE FIVE OF HEARTS<br>BRUCE WON TRICK # 4<br>TRICK # 5 (HIGH CARD WINS)<br>WHAT CARD, JEFF<br>WHAT CARD, STEVE<br>JEFF PLAYED THE SEVEN OF CLUBS<br>BRUCE PLAYED THE SEVEN OF CLUBS<br>STEVE WON TRICK # 5<br>TRICK # 6 (LOW CARD WINS)<br>WHAT CARD, JEFF<br>WHAT CARD, JEFF<br>WHAT CARD, BRUCE   | 1A         1         1         1*           12         1         1         1           13         1         1         1           13         1         1         1*           14         1         1*         1           15         1*         1         1           16         1*         1         1   | DIAMONDS<br>F SPADES<br>AMONDS<br>PADES<br>F DIAMONDS<br>CLUBS<br>ARTS<br>POINTS FOR A 2 TOTAL<br>DR A 2 TOTAL<br>DR A 4 TOTAL<br>4 TOTAL  | SPD         CLB         DIA         HRT         SPD           1 11A         1 |
| WHAT CARD, STEVE<br>JEFF PLAYED THE TWO OF HEARTS<br>BRUCE PLAYED THE THREE OF CLUBS<br>STEVE PLAYED THE ACE OF HEARTS<br>I PLAYED THE THREE OF SPADES<br>STEVE WON TRICK # 6<br>TRICK # 7 (LOW CARD WINS)<br>WHAT CARD, JEFF   | 17 1 1 1<br>18 1* 1 1*<br>TRICK # 1 (HIGH CARD WIN<br>WHAT CARD, JEFF<br>WHAT CARD, BRUCE<br>WHAT CARD, BRUCE<br>WHAT CARD, STEVE<br>UHAT CARD, STEVE<br>JEFF PLAYED THE SIX OF C<br>BRUCE PLAYED THE SIX OF C<br>BRUCE PLAYED THE EIGHT O<br>I PLAYED THE SIX OF DIAM  | UBS<br>SPADES<br>* SPADES  |   |
| LIST<br>1 PRINT TAB(27)"OCTRIX"<br>2 PRINT TAB(20)"CREATIVE COMPUTING"<br>3 PRINT TAB(18)"MORRISTOWN, NEW JERSEY"<br>5 PRINT<br>6 PRINT<br>7 PRINT<br>10 DIM A(32),P(4,9),C\$(255),Q(4,11),T\$(7)<br>11 DIM N\$(72),Y(72)<br>40 RESTORE<br>50 FOR X=0 T07<br>60 READY\$(X)<br>70 NEXT X<br>80 FOR X=0 T0 3<br>90 READ X\$(X)<br>100 NEXT X<br>110 DATA*ACE","TWO","THREE","FOUR","FIVE<br>120 DATA*CLUBS","DIAMONDS","HEARTS","SPA<br>136 FOR X=0 T0 9<br>140 READ T\$(X)<br>150 DATA "A","2","3","4","5","6","7","8"<br>160 NEXT X<br>170 PRINT"EACH GAME(Y OR N)";<br>180 INPUT Z\$<br>190 IF Z\$<>"Y" THEN 380<br>200 PRINT" THIS IS A GAME CALLED OTTRI<br>210 PRINT"CARDS RAMGING FROM ACE THROUGH<br>220 PRINT"RANKED ACCORDING TO BRIDGE SUD<br>230 PRINT"LOWEST AND THE EIGHT OF SPADES<br>240 PRINT"LAYED DETERMINES THE PLAY OF<br>250 PRINT"HIGH AND IF THEY DO NOT MATCH<br>250 PRINT"AND LOW CARDS PLAYED MATCH COL<br>250 PRINT"AND LOW CARDS PLAYED MATCH COL<br>250 PRINT"HIGH AND IF THEY DO NOT MATCH<br>260 PRINT"AND LOW CARDS PLAYED MATCH COL<br>270 PRINT"HIGH AND IF THEY DO NOT MATCH<br>280 PRINT"DO FA FOR ALL EIGHT."<br>395 PRINT<br>310 PRINT" RESPOND TO THE INPUT PROMP | STEVE WON TRICK # 1<br>","SIX","SEVEN","EIGHT"<br>DES"<br>,"LOW","HIGH"<br>X. EACH PLAYER IS DEALT 8"<br>EIGHT. THE CARDS ARE"<br>TS WITH THE CARDS THE"<br>HIGHEST. THE OBJECT IS TO"<br>S AS POSSIBLE. EACH TRICK "<br>HIGHEST. THE OBJECT IS TO"<br>S AS POSSIBLE. EACH TRICK "<br>THE NEXT TRICK. IF THE HIGH "<br>OR THE NEXT TRICK WILL BE "<br>IT WILL BE LOW. IT IS IM-"<br>CONSECUTIVE TRICKS IN THAT "<br>4 FOR TWO IN A ROW,9 FOR 3, UP"<br>T WITH THE CARD YOU WANT TO" | 330 PRINT"FIRST CHARACTER, AND SU<br>340 PRINT" (TO SEE THE REMAIN)<br>350 PRINT" RESPONSE TO THE 'WH<br>360 PRINT" THAT'S IT, GOOD LUCK!!'<br>380 REM<br>370 FOR X=1 TO 15<br>400 REAM Z<br>410 MS=MS+CHR\$(Z)<br>420 NEXT X<br>430 DATA 35,35,35,35,13,72,72,72,<br>400 Z9=Z<br>400 FOR X=0 TO 31<br>500 A(X)=X<br>510 NEXT X<br>520 PRINT"HOW MANY POINTS (0 ENTR<br>460 INPUT Z<br>470 IF Z=0 THEN 490<br>480 Z9=Z<br>490 FOR X=0 TO 31<br>500 A(X)=X<br>510 NEXT X<br>520 PRINT"HOW MANY PLAYERS";<br>530 INPUT N<br>540 N=INT(N)<br>550 IF N>4 THEN 570<br>560 IF N>0 THEN 590<br>570 PRINT"ONLY ONE TO FOUR PLAYER<br>580 GOTO 520<br>590 FOR X=0 TO N-1<br>600 Q(X,0)=0<br>610 PRINT"ENTER PLAYER'S NAME";<br>620 INPUT N\$(X)<br>630 Y=LEN(N\$(X))<br>640 FOR Z=1 TO Y<br>650 IF N>1 THEN 680<br>670 NEXT Z<br>680 IF Z>1 THEN 710<br>690 PRINT"DON'T START NAME WITH S | ,72,13,73,73,73,73,13<br>RY GIVES STANDARD 88)";<br>RS ALLOWED, RE-ENTER"   |

720 NEXT X 730 FOR J=0 TO 127 740 C\$(J)=" " 750 NEXT J 760 IF N=4 THEN 850 770 IF N=1 THEN 810 780 PRINT"SHOULD I PLAY TOD(Y OR N)"; 790 INPUT Z\$ 800 IF Z\$<>"Y" THEN 850 810 S\$(N)="COMPUTER" 820 N\$(N)="I 830 Q(N.0)=0 840 N=N+1 850 FOR I=0 TO 31 860 X=A(T) 870 Y=INT(RND(1)\*(32-1)+1) 880 A(I)=A(Y) 890 A(Y)=X 900 NEXT I 910 FOR Y=0 TO 7 920 FOR X=0 TO N-1 930 P(X,Y)=A(Y+4+X) 940 C\$(X\*32+P(X,Y))="\*" 950 NEXT X 960 NEXT Y 970 H=1 980 GOSUB 1680 990 FOR R=1 TO 7 1000 PRINT"TRICK #";R;"("T\$(8+H)" CARD WINS)" 1010 FOR X=0 TO N-1 1020 IF S\$(X)="COMPUTER"THEN 2090 1030 Z=Z\*Z 1040 PRINT"WHAT CARD, "S\$(X) 1050 PRINT MS; 1060 INPUT ES 1070 IF E\$ "P" THEN 1100 1080 GOSUB 1680 1090 GOTO 1040 1100 Y=LEN(E\$) 1110 IF Y=2 THEN 1140 1120 PRINT"BAD INPUT, RE-ENTER" 1130 GOTO 1050 1140 Y\$=HID\$(E\$,1,1) 1150 Z\$=MID\$(E\$,2,1) 1160 IF VAL(Y\$)>0 THEN 1190 1170 IF Y\$<>"A" THEN 1120 1180 Y\$="1" 1190 Y=VAL(Y\$) 1200 IF Y=0 THEN 1120 1210 IF Y>8 THEN 1120 1220 Z=0 1230 Q(X,10)=0 1240 IF Z\$="C" THEN 1320 1250 Z=3 1260 IF Z\$="S" THEN 1320 1270 Q(X,10)=1 1280 Z=1 1290 IF Z\$="D" THEN 1320 1300 Z=2 1310 IF Z\$<>"H" THEN 1120 1320 Y=(Y-1) +4+Z 1330 IF C\$(X\*32+Y) >"\*" THEN 1120 1340 Q(X,9)=Y 1350 NEXT X 1360 GOSUB 1880 1370 NEXT R 1380 FOR X=0 TO N-1 1390 FOR Z=0 TO 31 1400 IF C\$(32\*X+Z)="\*" THEN 1430 1410 NEXT Z 1420 PRINT"BAD SCAN" 1430 C\$(32\*X+Z)=" 1440 Q(X,9)=Z 1450 NEXT X 1460 R=8 1470 GOSUB 1880 1480 H1=0 1490 PRINT"THAT HAND ": 1500 FOR X=0 TO N-1 1510 Q(X,9)=0 1520 Y=0 1530 Z=0 1540 FOR R=1 TO 8 1550 Z=Z+Q(X,R) 1560 Q(X,R)=0 1570 IF Q(X,R+1)<>0 THEN 1600 1580 Y=Y+Z\*Z 1590 Z=0 1600 NEXT R 1610 Q(X,0)=Q(X,0)+Y 1620 PRINT N\$(X)" SCORED ";Y;"POINTS FOR A":Q(X,O):"TOTAL" 1630 IF Q(H1,0)>Q(X,0) THEN 1650

1640 H1=X 1650 NEXT X 1660 IF Q(H1.0)>=Z9 THEN 2450 1670 GOTO 850 1680 FOR S=0 TO N-1 1681 58=0 1682 S9=23-(LEN(S\$(S))+7) 1684 IF INT(59/2)\*2<>59 THEN 58=1 1686 S9=INT(S9/2) 1690 PRINT SPC(9+S9);S\$(S);"'S HAND";SPC(S9+S8): 1700 NEXT S 1710 PRINT 1720 FOR S=0 TO N-1 1730 PRINT" CLB DIA HRT SPD": 1740 NEXT S 1750 PRINT 1760 FOR S=0 TO 7 1770 FOR Y=0 TO N-1 1780 Z=Y+32+S+4 T\$(S);" !";C\$(Z);" !";C\$(Z+3);" !"; 1790 PRINT"!";T\$(S);" !":C\$(Z+1):" !":C\$(Z+2): 1791 PRINT" 1800 NEXT Y 1810 PRINT T\$(S) 1820 NEXT S 1830 PRINT 1840 RETURN 1880 L1=0:H1=0 1890 FOR X=0 TO N-1 1900 Y=INT(Q(X,9)/4) 1910 Z=Q(X,9)-Y\*4 1920 PRINT N\$(X)" PLAYED THE "Y\$(Y)" OF "X\$(Z) 1930 C\$(X+32+Q(X,9)) 1940 IF Q(X,9)>Q(L1,9) THEN 1960 1950 L1=X 1960 IF Q(X,9)<Q(H1,9) THEN 1980 1970 H1=X 1980 NEXT X 1990 IF H=1 THEN 2030 2000 Q(L1,R)=1 2010 PRINT N\$(L1)" WON TRICK #";R 2020 GOTO 2050 2030 Q(H1,R)=1 2040 PRINT N\$(H1)" WON TRICK #":R 2050 H=0 2060 IF Q(L1,10)<>Q(H1,10) THEN 2080 2070 H=1 2080 RETURN 2090 L1=0:L2=0:H1=0:H2=0 2100 FOR S=0 TO N-2 2110 FOR S1=0 TO 7 2120 IF P(S,S1)>P(L1,L2) THEN 2160 2130 IF C\$(S\*43+P(S,S1))=" " THEN 2160 2140 11=5 2150 L2=S1 2160 IF P(S,S1) (P(H1,H2) THEN 2200 2170 IF C\$(S\*32+P(S,S1))=" " THEN 2200 2180 H1=5 2190 H2=S1 2200 NEXT S1 2210 NEXT S 2220 FOR S=R-1 TO 7 2230 IF H=1 THEN 2280 2240 IF P(N-1,S)<P(L1,L2) THEN 2260 2250 GOTO 2290 2260 IF RND(1)>.3 THEN 2380 2270 GOTO 2300 2280 IF P(N-1,5)>P(H1,H2) THEN 2260 2290 NEXT 5 2300 H1=32 2310 Y=INT(RND(1)\*16+H\*16) 2320 FOR S1=R-1 TO 7 2330 L1=ABS(P(N-1,S1)-Y) 2340 IF H1<L1 THEN 2370 2350 H1=L1 2360 S=S1 2370 NEXT S1 2380 Q(X,9)=P(N-1,S) 2390 P(N-1,S)=P(N-1,R-1) 2400 Z=Q(X,9)-(INT(Q(X,9)/4)\*4) 2410 IF Z<2 THEN 2430 2420 Z=ABS(Z-3) 2430 Q(X,10)=Z 2440 GOTO 1360 2450 IF H1>N-2 THEN 2510 2460 FOR X=H1+1 TO N-1 2470 IF Q(H1,0)>Q(X,0) THEN 2500 2480 PRINT"GAME TIED AFTER REGULATION, ENTERING SUDDEN DEATH" 2490 GOTO 850 2500 NEXT X 2510 PRINT N\$(H1)"WON THE GAME, CONGRATULATIONS "S\$(H1) 2520 END

Ok



## Description:

This program generates artistic patterns based on Pascal's triangle.

## Comments:

Pascal's triangle is one of the most famous number patterns in mathematics. The triangle is very easy to construct. The first two rows consist of only 1's. Each of the subsequent have a 1 at either end of the row, but all other numbers in the pattern are the sum of the two numbers to the right and left in the row above. An example, illustrating the first 6 rows of the triangle, is shown below:



The program provides the user with three options during the course of a RUN.

They are:

1. A single "Pascal's triangle"

2. Two "Pascal's triangles"

3. Four "Pascal's triangles"

A user may also specify the size of the array and the multiples of the number to be eliminated.

Option 1 simply allows a user to examine an artistic picture of the relative positions of the multiples of any number in the array. The apex of the array will appear in the upper left corner of the page.

An example of how the machine uses a "triangle" to create a design based on eliminating the multiples of two is shown below.

| 1 | 1 | 1  | 1  | * | * | * | * |  |
|---|---|----|----|---|---|---|---|--|
| 1 | 2 | 3  | 4  | * |   | * |   |  |
| 1 | 3 | 6  | 10 | * | * |   |   |  |
| 1 | 4 | 10 | 20 | * |   |   |   |  |

**Before Printing** 

## After Printing

Option 2 allows a user to create a picture based on two Pascal's triangles in opposite corners of a square array. An example of how the machine uses two Pascal's triangles in the corners of a square to create a design based on eliminating the multiples of 2 is shown below:

| 1 | 1   | 1   | 1 | 0       | * | *   | *   | *   |     |   |
|---|-----|-----|---|---------|---|-----|-----|-----|-----|---|
| 1 | 2   | 3   | 0 | 1       | * |     | *   |     | *   |   |
| 1 | 3   | 0   | 3 | 1       | * | *   |     | *   | *   |   |
| 1 | 0   | 3   | 2 | 1       | * |     | *   |     | *   |   |
| 0 | 1   | 1   | 1 | 1       |   | *   | *   | *   | *   |   |
| в | efe | ore | P | rinting | A | fte | r I | Pri | nti | 1 |

After Printing

Option 3 creates a design based on Pascal's triangles in the four corners of a square. An example of how the machine uses four Pascal's triangles in the corners of an 8x8 array to create an artistic design based on eliminating the multiples of 2 is shown below.

| 1 | 1   | 1   | 1 | 1   | 1   | 1  | 1 | * | *   | *    | *   | *  | *   | * | * |  |
|---|-----|-----|---|-----|-----|----|---|---|-----|------|-----|----|-----|---|---|--|
| 1 | 2   | 3   |   |     | 3   | 2  | 1 | * |     | *    |     |    | *   |   | * |  |
| 1 | 3   |     |   |     |     | 3  | 1 | * | *   |      |     |    |     | * | * |  |
| 1 |     |     |   |     |     |    | 1 | * |     |      |     |    |     |   | * |  |
| 1 | 3   |     |   |     |     | 3  | 1 | * | *   |      |     |    |     | * | * |  |
| 1 | 2   | 3   |   |     | 3   | 2  | 1 | * |     | *    |     |    | *   |   | * |  |
| 1 | 1   | 1   | 1 | 1   | 1   | 1  | 1 | * | *   | *    | *   | *  | *   | * | * |  |
| В | efe | ore | F | rii | nti | na |   | A | fte | er I | Pri | nt | ind | 1 |   |  |

Approximately 5 minutes of terminal time is required to print a design with dimensions of 36x36.

PASART and this description written by Charles A. Lund. They first appeared in *Creative Computing*, Mar/Apr 1977.

RUN

#### PASART CREATIVE COMPUTING MORRISTOWN NEW JERSEY

OK

PASART PASART CREATIVE COMPUTING CREATIVE COMPUTING HORRISTOWN NEW JERSEY MORRISTOWN NEW JERSEY HOGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIANGLE. THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIANGLE. WE 3 BASIC TYPES OF DESIGNS TO SELECT FROM: YOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM: SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLARE) 1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLARE) A'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK 2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK 3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF W 'ARTSY' TRIANGLES IN THE CORNER OF SQUARE ARRAY. A SQUARE ARRAY. STOUR PLEASURE? 1, 2 OR 3? 1 INULTIPLES DO YOU WANT REPRESENTED WITH BLANKS? 2 WHAT'S YOUR PLEASURE? 1, 2 OR 3? 3 WHICH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS? 10 HOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)? 36 HAY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)? 36 \*\*\*\*\*\*\*\*\*\*\*\*\* . \* \* \* \* \* \* \* \* \* \* \* \* \*\*\*\*\*\*\*\* . \* \* \* \* \* \* \* \* \* \* \* \* \* \* . ... \* \* \* \* \* \* \* \* \* \* \* \* . . \* \* \* \* \* \* \* \* \* \* .... \* . \* \* \* \* \* \* . . \* \* \* \* \* \* \* . . \* \* \* . ... . \* \* \* \* \* \* \* \* \* . . . . \* \* \* \* \* \* \* \* . . . . . \* 1 8 \* \* \* \* 1 1 \* . . \* \* \* \* \* \* \* \* \* \* \* \* \* \* . . . \* \* \* \* \* \* \* \* \* ...... \* \* 1 . . \* \$ \* 1 1 MI'S YOUR PLEASURE? 1, 2 OR 3? 3 WHAT'S YOUR PLEASURE? 1, 2 OR 3? 1 WHICH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS? 10 ACH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS? 3 M MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)? 36 HOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)? 36 \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* \* 111 \* \* \* \* \* \* \* \* \* \* \* \* \* \* ..... \* \* \* \* . \* \* . . . \* \* \$ \$ \* \$ \* \* \$ \* \* \* 11.2 \* 4 . . . \* \* \* . \* . . . \* \* \* \* \* \* \* ..... 12.2 \* . ..... . . \* \* \* \* \* \* \* \* \* 11 \* \* . .

1.1

| THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIANGLE.  | 350 I  |
|--|--|
| YOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:  | 360 P  |
| 1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLARE)<br>2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK  | 370 G<br>380 P   |
| 3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF   | 380 P  |
| A SQUARE ARRAY.  | 400 P  |
| WHAT'S YOUR PLEASURE? 1, 2 OR 3? 3   | 410 N  |
| WHICH HULTIPLES DO YOU WANT REPRESENTED WITH BLANKS? 17  | 420 E  |
| HOU MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)? 36  | 430 R<br>440 Z   |
| ************************************   | 450 R  |
| ************   | 460 L  |
| ***********  | 470 F  |
| ***************************************  | 480 F<br>490 I   |
| *********  | 500 P  |
| ********   | 510 6  |
| ***************************************  | 520 P  |
| ***************************************  | 530 N  |
| ******   | 540 Z  |
| **************************************   | 560 R  |
| **** ***   | 570 Z  |
| *** ***  | 580 N  |
|  | 590 F  |
|  | 600 F<br>610 I   |
|  | 620 P  |
| * *  | 630 6  |
| ** **  | 640 P  |
| *** ***  | 650 N  |
| ****   | 660 N<br>670 N   |
| *****  | 680 6  |
| ******   | 690 M  |
| *******  | 700 R  |
| *******  | 710 Y  |
|  | 720 Z<br>730 B   |
|  | 740 Z  |
| *********  | 750 Z  |
| ************   | 760 Z  |
| *************  | 770 X  |
| ********************************   | 780 X<br>790 F   |
|  | 000 5  |
|  | 800 F  |
|  | 800 F<br>810 I   |
|  | 810 I<br>820 P   |
| LIGI   | 810 I<br>820 P   |
| LIGI   | 810 I<br>820 P   |
| LIGI   | 810 I<br>820 P   |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT   | 810 1<br>820 P<br>830 6<br>840 P<br>850 N<br>860 Z<br>820 N  |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)  | 810 1<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N   |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36   | 810 1<br>820 P<br>830 6<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>880 N<br>890 R   |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36  | 810 1<br>820 P<br>830 6<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>870 R<br>970 F   |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36   | 810 1<br>820 P<br>830 6<br>840 P<br>850 N<br>850 N<br>850 N<br>850 N<br>880 N<br>880 N<br>890 F<br>910 F   |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1  | 810 P<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>890 F<br>910 F<br>910 F<br>920 I<br>930 I  |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1<br>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN":  | 810 P<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>880 N<br>890 F<br>910 F<br>910 F<br>920 I<br>920 I<br>920 J<br>920 J<br>920 J  |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1<br>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN":  | 810 P<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>880 N<br>890 F<br>910 F<br>910 F<br>920 I<br>920 I<br>920 J<br>920 J<br>920 J  |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1<br>40 PRINT "HIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "YOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br>40 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR":   | 810 P<br>820 P<br>830 G<br>840 P<br>850 N<br>850 N<br>850 N<br>850 N<br>850 N<br>890 F<br>920 I<br>930 F<br>920 I<br>930 T<br>930 T<br>930 F<br>920 S  |
| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1<br>40 PRINT "HIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "YOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br>40 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR":   | 810 P<br>820 P<br>830 G<br>840 P<br>850 N<br>850 N<br>850 N<br>850 N<br>850 N<br>890 F<br>920 I<br>930 F<br>920 I<br>930 T<br>930 T<br>930 F<br>920 S  |
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| 2 PRINT TAB(24);"PASART"<br>4 PRINT TAB(18);"CREATIVE COMPUTING"<br>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIM P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 FOR B2=1 TO 36<br>26 P(B1,B2)=0<br>28 NEXT B2<br>30 NEXT B1<br>40 PRINT "HIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "HIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "HOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FRON:"<br>60 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br>55 PRINT "E)"<br>70 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>80 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br>90 PRINT "A SQUARE ARRAY."<br>100 PRINT "WHAT'S YOUR PLEASURE? 1, 2 OR 3";<br>110 INPUT 0<br>120 IF (0-1)*(0-2)*(0-3) <> 0 THEN 100<br>130 PRINT "WHICH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS";<br>140 INPUT 0<br>150 PRINT "HOW HANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0   | 810 P<br>820 P<br>820 P<br>820 N<br>840 P<br>850 N<br>860 Z<br>870 F<br>900 F<br>900 F<br>920 I<br>930 I<br>930 I<br>940 P<br>950 G<br>960 P<br>970 N<br>980 X<br>970 N<br>1010<br>1020<br>1030<br>1040<br>1050<br>1060<br>1080  |
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| <pre>2 PRINT TAB(24);"PASART"<br/>4 PRINT TAB(18);"CREATIVE COMPUTING"<br/>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br/>8 PRINT:PRINT:PRINT<br/>20 DIM P(36,36)<br/>22 FOR B1=1 TO 36<br/>24 FOR B2=1 TO 36<br/>24 FOR B2=1 TO 36<br/>28 NEXT B2<br/>30 NEXT B1<br/>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br/>42 PRINT "GLE."<br/>50 PRINT "HIS PROGRAM CREATES ARTIST DESIGNS TO SELECT FROM:"<br/>60 PRINT "GLE."<br/>50 PRINT "GLE."<br/>50 PRINT "UU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br/>63 PRINT "1. A SINGLE PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>80 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br/>90 PRINT ". A SQUARE ARRAY."<br/>100 PRINT "WHAT'S YOUR PLEASURE? 1, 2 OR 3";<br/>110 INPUT 0<br/>120 IF (0-1)*(0-2)*(0-3) &lt;&gt; O THEN 100<br/>130 PRINT "WHICH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS";<br/>140 INPUT 0<br/>130 PRINT "HOW MANY ROWS AND COLUNS IN THE ARRAY (36 IS MAXIMUM)";<br/>160 INPUT T<br/>170 IF T*(36-T) &lt; O THEN 150<br/>180 OM 0 GOTO 230,440,690<br/>190 REM</pre>  | 810 1<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>890 F<br>910 F<br>920 I<br>930 I<br>940 P<br>950 G<br>960 P<br>970 N<br>980 X<br>970 N<br>1000<br>1010<br>1020<br>1030<br>1040<br>1050<br>1060<br>1070<br>1080<br>1070<br>1100  |
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| <pre>2 PRINT TAB(24);"PASART"<br/>4 PRINT TAB(16);"CREATIVE COMPUTING"<br/>6 PRINT TAB(16);"MORRISTOWN NEW JERSEY"<br/>8 PRINT:PRINT:PRINT<br/>20 DIN P(34,34)<br/>22 FOR B1=1 TO 36<br/>24 FOR B2=1 TO 36<br/>29 NEXT B2<br/>30 NEXT B1<br/>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br/>42 PRINT "GLE."<br/>50 PRINT "UU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br/>65 PRINT "E.)"<br/>70 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>80 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>80 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br/>90 PRINT "A SOUARE ARRAY."<br/>100 PRINT "WHAT'S YOUR PLEASURE? 1, 2 OR 3";<br/>110 INPUT 0<br/>120 IF (0-1)*(0-2)*(0-3) &lt;&gt; 0 THEN 100<br/>130 PRINT "WHAT'S YOUR PLEASURE? 1, 2 OR 3";<br/>140 INPUT 0<br/>150 PRINT "WHAT AND WANY ROWS AND COLUNS IN THE ARRAY (36 IS MAXIMUM)";<br/>140 INPUT 0<br/>150 PRINT "HOW MANY ROWS AND COLUNS IN THE ARRAY (36 IS MAXIMUM)";<br/>140 INPUT 0<br/>150 OR O GOTO 230,440,690<br/>170 REM<br/>210 REM TIME TO CREATE AND PRINT A SINGLE PIECE OF PASART<br/>220 REM FIRST BUILD THE PASCALS TRIANGLE<br/>230 FOR R=1 TO T<br/>240 FOR C=1 TO T<br/>240 FOR C=1 TO T<br/>250 IF (R-1)*(C-1)=0 THEN 280<br/>260 P(R,C)=P(R,C-1)*P(R-1,C)<br/>270 GOTO 290</pre>   | 810 1<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 F<br>910 F<br>920 I<br>930 I<br>940 P<br>950 G<br>960 P<br>970 N<br>970 N<br>970 N<br>970 N<br>970 N<br>970 N<br>970 N<br>970 N<br>970 N<br>1000<br>1010<br>1020<br>1030<br>1040<br>1050<br>1060<br>1070<br>1080<br>1070<br>1080<br>1070<br>1180<br>1140<br>1150<br>1160<br>1170<br>1180<br>1180   |
| <pre>2 PRINT TAB(24);"PASART"<br/>4 PRINT TAB(18);"CREATIVE COMPUTING"<br/>6 PRINT TAB(18);"HORRISTOWN NEW JERSEY"<br/>8 PRINT:PRINT:PRINT<br/>20 DIN P(35,35)<br/>22 FOR B1=1 TO 36<br/>24 FOR B2=1 TO 36<br/>24 FOR B2=1 TO 36<br/>26 P(B1,B2)=0<br/>28 NEXT B2<br/>30 NEXT B1<br/>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br/>42 PRINT "GLE."<br/>50 PRINT "100 HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br/>67 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLES PRINTED BACK TO DACK"<br/>60 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br/>90 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br/>90 PRINT " A SQUARE ARRAY."<br/>100 INPUT 0<br/>120 IF (0-1)*(0-2)*(0-3) &lt;&gt; 0 THEN 100<br/>130 PRINT "WHICH NULTIPLES DO YOU WANT REPRESENTED WITH BLANKS";<br/>140 INPUT 0<br/>130 PRINT "HOU MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br/>140 INPUT 0<br/>150 PRINT "HOU MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br/>140 INPUT T<br/>170 IF T*(36-T) &lt; 0 THEN 150<br/>180 ON 0 GOTO 230,440,670<br/>190 REM<br/>200 REM TIME TO CREATE AND PRINT A SINGLE PIECE OF PASART<br/>200 REM FIRST BUILD THE PASCALS TRIANGLE<br/>200 FOR R=1 TO T<br/>210 FF (R-1)*(C-1)=0 THEN 280<br/>220 P(R,C)=1<br/>230 F(R,C)=1<br/>240 F(R,C)=1<br/>250 P(R,C)=1<br/>250 P(R,C)=1<br/>250</pre> | 810 P<br>830 F<br>830 F<br>830 F<br>830 F<br>850 N<br>850 N<br>850 N<br>850 N<br>870 F<br>910 F<br>920 I<br>930 I<br>930 I<br>940 P<br>970 N<br>940 P<br>970 N<br>940 P<br>970 N<br>940 P<br>970 N<br>940 P<br>970 N<br>940 P<br>970 N<br>980 X<br>970 N<br>1020<br>1030<br>1040<br>1050<br>1040<br>1050<br>1060<br>1070<br>1080<br>1090<br>11100<br>1120<br>1130<br>1140<br>1150<br>1160<br>1160<br>1170<br>1180<br>1170<br>1170<br>1180<br>1170<br>1210<br>1210<br>1210<br>1210  |
| <pre>2 PRINT TAB(24);"PASART"<br/>4 PRINT TAB(18);"CREATIVE COMPUTING"<br/>6 PRINT TAB(18);"CREATIVE COMPUTING"<br/>6 PRINT TAB(16);"HORRISTOWN NEW JERSEY"<br/>8 PRINT:PRINTIPRINT<br/>20 DIN P(36,36)<br/>22 FOR B1=1 TO 36<br/>24 FOR B2=1 TO 36<br/>26 P(B1,B2)=0<br/>28 MEXT B2<br/>30 MEXT B1<br/>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br/>42 PRINT "GLE."<br/>50 PRINT "TOU HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br/>60 PRINT "1. A SINGLE PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>80 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br/>80 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br/>90 PRINT "A SQUARE ARRAY."<br/>100 PRINT "WHAT'S YOUR PLEASURET 1, 2 OR 3";<br/>110 INPUT 0<br/>120 IF (0-1)*(0-2)*(0-3) &lt;&gt; O THEM 100<br/>130 PRINT "WHICH HULTIPLES DO YOU WANT REPRESENTED WITH BLANKS";<br/>140 INPUT 0<br/>150 PRINT "HOU HANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br/>160 INPUT 0<br/>150 PRINT "HOU HANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br/>160 INPUT 0<br/>150 PRINT "HOU FLAND FRINT A SINGLE PIECE OF PASART<br/>220 REM<br/>230 FOR R=1 TO T<br/>240 FOR R=1 TO T<br/>250 IF (R-1)*(C-1)=O THEM 280<br/>260 P(R,C)=1<br/>270 GOTO 270<br/>280 P(R,C)=1<br/>270 MEXT R<br/>280 MEXT R<br/>290 MEXT R</pre>  | 810 1<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>900 F<br>910 F<br>920 I<br>930 I<br>930 I<br>930 Q<br>940 P<br>950 G<br>960 P<br>970 N<br>980 X<br>990 N<br>1000<br>1010<br>1020<br>1030<br>1040<br>1050<br>1060<br>1070<br>1080<br>1070<br>1080<br>1070<br>1080<br>1070<br>1180<br>1170<br>1180<br>1170<br>1180<br>1190<br>1200<br>1210<br>1200<br>1210   |
| 2 PRINT TAB(24); "PASART"<br>4 PRINT TAB(16); "CREATIVE COMPUTING"<br>6 PRINT TAB(16); "CREATIVE COMPUTING"<br>6 PRINT TREINT; PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 P(B1,B2)=0<br>28 MEXT B2<br>30 MEXT B1<br>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "GLE."<br>50 PRINT "GLE."<br>50 PRINT "GLE."<br>50 PRINT "GLE."<br>50 PRINT "1. A SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br>63 PRINT "1. A SINGLE PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>60 PRINT "1. A SINGLE PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>60 PRINT "2. TUO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>60 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "WHAT'S YOUR PLEASURET 1, 2 OR 3";<br>110 INPUT 0<br>120 IF (-1)*(C-2)*(C-3) <> O THEN 100<br>130 PRINT "WHICH MULTIPLES DO YOU WANT REPRESENTED WITH BLANKS";<br>140 INPUT 0<br>150 PRINT "HOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 1<br>170 IF T*(36-1) < O THEN 150<br>180 ON O GOTO 230,440,690<br>190 REM<br>200 REM<br>200 REM<br>200 REM<br>200 REM FIRST BUILD THE PASCALS TRIANGLE PIECE OF PASART<br>200 REM FIRST BUILD THE PASCALS TRIANGLE<br>201 F( R-1)*(C-1)=O THEN 280<br>202 P(R,C)=F(R,C-1)+P(R-1,C)<br>203 OF (R,C)=P(R,C-1)+P(R-1,C)<br>204 OF (R,C)=P(R,C-1)+P(R-1,C)<br>205 ON CAST R<br>300 NEXT R<br>300 NEXT R  | 810 P<br>820 P<br>820 P<br>820 P<br>820 P<br>820 N<br>840 P<br>850 N<br>860 Z<br>870 F<br>910 F<br>920 I<br>930 I<br>930 I<br>930 F<br>920 I<br>930 I<br>930 F<br>920 I<br>930 I<br>930 F<br>920 I<br>930 F<br>930 F<br>1030 I<br>1030 I<br>1030 I<br>1100<br>11100<br>1120<br>1130 I<br>1140<br>1150 I<br>1160<br>1170 I<br>1160 I<br>1170 I<br>1160 I<br>1170 I<br>1160 I<br>1170 I<br>1200 I<br>1200 I<br>1220 I<br>1220 I<br>1230 F   |
| 2 PRINT TAB(24); "PASART"<br>4 PRINT TAB(18); "CREATIVE COMPUTING"<br>6 PRINT TAB(16); "MORRISTOUM NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 P(B1,B2)=0<br>28 MEXT B2<br>30 MEXT B1<br>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "TUJ HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br>60 PRINT "TLA SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br>63 PRINT "E.)"<br>70 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>60 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "4 A SOURE ARRAY."<br>100 PRINT "WHICH NULTIFLES DO YOU WANT REPRESENTED WITH BLANKS";<br>100 INPUT 0<br>120 IF (0-1)*(0-2)*(0-3) <> 0 THEN 100<br>130 PRINT "WHICH NULTIFLES DO YOU WANT REPRESENTED WITH BLANKS";<br>140 INPUT 0<br>150 PRINT "HOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THE TO CREATE AND PRINT A SINGLE PIECE OF PASART<br>260 REM<br>200 REM<br>200 REM<br>200 REM<br>200 REM<br>200 PR (F.1)*(C-1)=0 THEN 280<br>240 P(R,C)=1 TO T<br>250 IF (R-1)*(C-1)=0 THEN 280<br>240 P(R,C)=1(R,C-1)+P(R-1,C)<br>270 OGTO 270<br>240 P(R,C)=1<br>250 MEXT R<br>350 PR F.1 TO FLAY BACK THE TRIANGLE WITH AN ARTISTIC FLARE.<br>350 FOR R=1 TO T<br>350 PR F.1 TO T<br>350 PR F.1 TO PLAY BACK THE TRIANGLE WITH AN ARTISTIC FLARE.<br>350 FOR R=1 TO T<br>350 PR R   | 810 1<br>820 P<br>830 G<br>840 P<br>850 N<br>860 Z<br>870 N<br>880 N<br>890 F<br>910 F<br>920 I<br>930 I<br>940 P<br>950 G<br>960 P<br>970 N<br>970 N<br>97   |
| 2 PRINT TAB(24); "PASART"<br>4 PRINT TAB(18); "CREATIVE COMPUTING"<br>6 PRINT TAB(16); "MORRISTOUM NEW JERSEY"<br>8 PRINT:PRINT:PRINT<br>20 DIN P(36,36)<br>22 FOR B1=1 TO 36<br>24 FOR B2=1 TO 36<br>24 P(B1,B2)=0<br>28 MEXT B2<br>30 MEXT B1<br>40 PRINT "THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIAN";<br>42 PRINT "GLE."<br>50 PRINT "TUJ HAVE 3 BASIC TYPES OF DESIGNS TO SELECT FROM:"<br>60 PRINT "TLA SINGLE PASCAL'S TRIANGLE (PLAYED WITH AN ARTISTIC FLAR";<br>63 PRINT "E.)"<br>70 PRINT "2. TWO 'ARTSY' PASCAL'S TRIANGLES PRINTED BACK TO BACK"<br>60 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "2. TWO 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "3. FOUR 'ARTSY' TRIANGLES IN THE CORNER OF"<br>70 PRINT "4 A SOURE ARRAY."<br>100 PRINT "WHICH NULTIFLES DO YOU WANT REPRESENTED WITH BLANKS";<br>100 INPUT 0<br>120 IF (0-1)*(0-2)*(0-3) <> 0 THEN 100<br>130 PRINT "WHICH NULTIFLES DO YOU WANT REPRESENTED WITH BLANKS";<br>140 INPUT 0<br>150 PRINT "HOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THOW MANY ROWS AND COLUMS IN THE ARRAY (36 IS MAXIMUM)";<br>140 INPUT 0<br>150 PRINT THE TO CREATE AND PRINT A SINGLE PIECE OF PASART<br>260 REM<br>200 REM<br>200 REM<br>200 REM<br>200 REM<br>200 PR (F.1)*(C-1)=0 THEN 280<br>240 P(R,C)=1 TO T<br>250 IF (R-1)*(C-1)=0 THEN 280<br>240 P(R,C)=1(R,C-1)+P(R-1,C)<br>270 OGTO 270<br>240 P(R,C)=1<br>250 MEXT R<br>350 PR F.1 TO FLAY BACK THE TRIANGLE WITH AN ARTISTIC FLARE.<br>350 FOR R=1 TO T<br>350 PR F.1 TO T<br>350 PR F.1 TO PLAY BACK THE TRIANGLE WITH AN ARTISTIC FLARE.<br>350 FOR R=1 TO T<br>350 PR R   | 810 F<br>820 F<br>830 G<br>840 P<br>850 N<br>850 N<br>850 N<br>870 F<br>910 F<br>920 I<br>930 I<br>940 P<br>950 F<br>960 P<br>970 N<br>980 N<br>1000<br>1010<br>1020<br>1030<br>1040<br>1050<br>1040<br>1050<br>1040<br>1050<br>1040<br>1050<br>1060<br>1070<br>1080<br>1070<br>1100<br>1100<br>1100<br>1110<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1120<br>1240<br>1220<br>1230<br>1240<br>1240<br>1250  |

```
IF (P(R,C)/Q)=INT(P(R,C)/Q) THEN 380
PRINT "# ";
60TO 390
PRINT "
         *;
NEXT C
PRINT
NEXT R
END
REM TIME TO CREATE AND PRINT DOUBLE PIECE OF PASART
Z=T
REM BUILD THE UPPER LEFT HAND HALF OF THE ARRAY.
LET N=Z
FOR R=1 TO N
FOR C=1 TO Z-1
IF (R-1)*(C-1)=0 THEN 520
P(R,C)=P(R,C-1)+P(R-1,C)
60TO 530
P(R,C)=1
NEXT C
Z=Z-1
NEXT R
REM BUILD THE LOWER RIGHT HALF OF THE ARRAY.
7=N
N=2
FOR R=Z TO 1 STEP -1
FOR C=Z TO N STEP -1
IF (R-Z)*(C-Z)=0 THEN 640
P(R,C)=P(R,C+1)+P(R+1,C)
60TO 650
P(R,C)=1
NEXT C
N=N+1
NEXT R
GOTO 320
M=D
REM BUILD THE UPPER LEFT HALF CORNER OF THE ARRAY.
Y=T
Z=INT(Y/2)
B5=Z*2
Z1=Z
Z2=Z1
Z3=Z2
X4=Z3
X5=X4
FOR I=1 TO Z1
FOR J=1 TO Z
IF (J-1)*(I-1)=0 THEN 840
P(I,J)=P(I,J-1)+P(I-1,J)
GOTO 850
P(I,J)=1
NEXT J
Z=Z-1
NEXT I
N=Z1
REM BUILD THE UPPER RIGHT HAND CORNER OF THE ARRAY.
FOR I=1 TO Z1
FOR J=Y TO X5+1 STEP -1
IF I=1 THEN 960
IF J=Y THEN 960
P(I,J)=P(I,J+1)+P(I-1,J)
GOTO 970
P(I,J)=1
NEXT J
X5=X5+1
NEXT I
 N=72
 REM BUILD THE LOWER LEFT CORNER OF THE ARRAY
FOR I=Y TO X4+1 STEP -1
FOR J=1 TO Z2
 IF J=1 THEN 1080
IF I=Y THEN 1080
 P(I,J)=P(I,J-1)+P(I+1,J)
 60TO 1090
 P(I,J)=1
NEXT J
 Z2=Z2-1
 NEXT I
 N=Z3
 REM BUILD THE LOWER RIGHT CORNER OF THE ARRAY.
 FOR I=Y TO N+1 STEP -1
FOR J=Y TO Z3+1 STEP -1
 IF J=Y THEN 1200
 IF I=Y THEN 1200
 P(I, J) = P(I+1, J) + P(I, J+1)
 60TO 1210
 P(I, J)=1
 NEXT J
 Z3=Z3+1
 NEXT I
 60TO 320
 END
```

## Pasart 2

This program is a major extension of the original Pasart program. It incorporates many new options including printing a calendar for any year from 1600 to 2300. It allows a user to enter any desired pair of printing characters. The size of the output is expanded to 72 by 72 with an option to expand it further by dividing the final triangle into 72 by 72 chunks that may be taped together. Another option provides the user with the opportunity to create a picture based on four Pascal's tables (option 6).

There wasn't room to show the output from all of these options on these pages. Try them out yourself and we're sure you'll be pleased with the rather spectacular results.

Pasart 2 was also written by Charles H. Lund.

PASART2 CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

RUN

THIS PROGRAM CREATES ARTIST DESIGNS BASED ON PASCAL'S TRIANGLE. DO YOU WANT A LIST OF OPTIONS? YES PLEASE TEAR OFF THIS LIST AND SAVE OR POST FOR FUTURE REFERENCE 1. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS: BEFORE PRINTING AFTER PRINTING \*\*\* \* \* 123 1 3 6 \*\* 2. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS: BEFORE PRINTING AFTER PRINTING 121 3. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS: BEFORE PRINTING AFTER PRINTING . 1 2 1 \* \* \* \* 1 3 3 1 4. TWO PASCALS TRIANGLES PRINTED BACK TO BACK LIKE THIS: BEFORE PRINTING AFTER PRINTING \*\*\* 1 1 1 0 . . 1201 1021 \* \* 0111 \*\*\* 5. FOUR PASCAL TRIANGLES PRINTED IN A SQUARE LIKE THIS: BEFORE PRINTING AFTER PRINTING \*\*\*\*\*\* 111111 12 21 \* \* 1 \* \* 1 \* . 2 1 1 2 \* 1 1 1 1 1 1 \*\*\*\*\*\* 5. FOUR PASCALS TRIANGLES PRINTED IN A SQUARE LIKE THIS: BEFORE PRINTING AFTER PRINTING \*\*\*\*\*\* 111111 123321 \* \*\* \* 36631 \*\* \*\* 1 3 6 6 3 1 \*\* \*\* 1 2 3 3 2 1 \* \*\* \* 11111 \*\*\*\*\* . STARTING PASCALS TRIANGLE IN ANY DESIRED ROW & COLUMN STARTING PASTALS TRIANGLE IN ANT DESTRED NOW & COLOMN SO THAT A USER CAN TAPE TOGETHER SEVERAL PICTURES TO MAKE A LARGER DESIGN. THIS OPTION EXTENDS PICTURES LIKE THOSE SHOWN IN OPTION 1 IN 36 X 36 CHARACTER CHUNKS. ENTRIES UP TO 1000 ROWS AND COLUMNS ARE ACCEPTED.

WHAT'S YOUR PLEASURE (1,2,3,4,5,6 DR 7)? 4 YOUR PICTURE SHOULD HIGHLIGHT THE MULTIPLES OF WHAT NUMBER? 4 WHAT CHARACTER WOULD YOU LIXE THE COMPUTER TO TYPE REPRESENTING THE MULTIPLES OF 4 (ENTER '' '' FOR A BLANK)? " " WHAT CHARACTER WOULD YOU LIXE THE COMPUTER TO TYPE REPRESENTING EACH OF THE OTHER NUMBERS IN THE PATTERN (ENTER ''' FOR A BLANK)? \* HOW MANY ROWS AND COLUMNS IN THE ARRAY (36 IS MAX.)? 36 WOULD YOU LIKE A CALENDAR PRINTED WITH YOUR PICTURE? YES WHAT YEAR BETWEEN 1600 AND 2300 WOULD YOU LIKE? 1979 \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\*\*\*\* \*\*\*\*\*\* \*\*\*\*\*\* \*\*\*\*\*\* \* \*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\*\* \* \*\*\* \* \* \*\*\* \*\*\* \* \* \*\*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\* \*\*\* . . \* \* \* \* \*\*\*\* \*\*\*\*\*\*\* \* \* \* \*\*\* \*\*\* \* \* \* \* \* \*\*\*\* \*\*\*\*\*\* \*\*\* \*\*\* \*\*\*\*\*\* \* \* \* ... \*\* \*\* \*\*\* \*\*\* \*\* \*\* \*\* \*\*\* \* \* \*\*\* \* \* \* \*\*\*\*\*\* \*\*\*\*\*\*\*\*\*\*\*\*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \*\*\* \* \* \*\*\*\*\*\* \*\*\*\*\* \*\*\*\*\*\* \*\*\*\*\*\* \* \* \*\*\* \*\*\* \*\*\* \*\*\*\*\*\*\* \* \* \* \* \* \* \*\*\*\*\*\*\*\*\*\* \* \* \* \*\*\* \* \* \*\*\* \*\* \*\* \*\* 
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LIST 10 PRINT TAB(25);"PASART2" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 40 PRINT: PRINT: PRINT 50 REM \*\*\* THIS PROGRAM REQUIRES AROUND 16K FREE WORK SPACE 60 REH \*\*\* TO OBTAIN LARGER PICTURES, EXPAND THE ARRAY IN LINE 70 REM \*\*\* 110 TO P(72,72) 110 DIM P(36,36) 130 PRINT " THIS PROGRAM CREATES ARTIST DESIGNS BASED ON" 135 PRINT "PASCAL'S TRIANGLE." 140 PRINT "DO YOU WANT A LIST OF OPTIONS"; 150 INPUT S15 170 IF LEFT\$(S1\$,1)<>"Y" THEN 630 200 PRINT "1. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS:" 210 PRINT " BEFORE PRINTING AFTER PRINTING" 220 PRINT " 1 1 1 \*\*\*' 230 PRINT " 123 \* \*" 240 PRINT " 1 3 6 \*\*" 260 PRINT " BEFORE PRINTING AFTER PRINTING" 270 PRINT " 1 250 PRINT "2. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS:" 280 PRINT " 11 \*\*" 290 PRINT " 121 \* \*\* 300 PRINT "3. A SINGLE PASCALS TRIANGLE PLAYED BACK LIKE THIS:" 310 PRINT "BEFORE PRINTING AFTER PRINTING" 320 PRINT " \*" 330 PRINT " 121 \* \*" 340 PRINT " \* \* \* \*" 1 3 3 1 

 350 PRINT "4. TWO PASCALS TRIANGLES PRINTED BACK TO BACK LIKE THIS:"

 360 PRINT "

 BEFORE PRINTING

 AFTER PRINTING"

 370 PRINT "

 1 1 1 0

 \*\*\*"

 380 PRINT " 1 2 0 1 \* \*" 390 PRINT " \* \*" 1021 400 PRINT " 0 1 1 1 +++ 410 PRINT "5. FOUR PASCAL TRIANGLES PRINTED IN A SQUARE LIKE THIS:" 420 PRINT " BEFORE PRINTING AFTER PRINTING" \*\*\*\*\* 430 PRINT 111111 440 PRINT 12 2 1 \* \*" 450 PRINT " \*\*\* 1 1 \* 460 PRINT \*\* 12 470 PRINT " 21 \*" 480 PRINT " 1 1 1 1 1 1 \*\*\*\*\*\* 490 PRINT "6. FOUR PASCALS TRIANGLES PRINTED IN A SQUARE LIKE THIS:" 500 PRINT " BEFORE PRINTING AFTER PRINTING" 510 PRINT 111111 \*\*\*\*\* 520 PRINT " 123321 \* \*\* \*" 530 PRINT " 1 3 6 6 3 1 \*\* \*\*" 540 PRINT " \*\* \*\*" 1 3 6 6 3 1 550 PRINT " 123321 \* \*\* \*" 560 PRINT " 111111 \*\*\*\*\*\* 570 PRINT "7. STARTING PASCALS TRIANGLE IN ANY DESIRED ROW & COLUMN" 580 PRINT " SO THAT A USER CAN TAPE TOGETHER SEVERAL PICTURES" 590 PRINT " TO MAKE A LARGER DESIGN. THIS OPTION EXTENDS" 600 PRINT " PICTURES LIKE THOSE SHOWN IN OPTION 1 IN 36 X 36 CHARACTER" 610 PRINT " CHUNKS. ENTRIES UP TO 1000 ROWS AND COLUMNS ARE ACCEPTED." 620 PRINT "---630 PRINT "WHAT'S YOUR PLEASURE (1,2,3,4,5,6 OR 7)"; 640 INPUT D 650 IF 0<=7 AND 0>=1 THEN 660 655 PRINT "I'H SUPPOSED TO BE YOUR FRIEND, SO HOW ABOUT IT:":GOTO 630 660 PRINT "YOUR PICTURE SHOULD HIGHLIGHT THE MULTIPLES OF WHAT NUMBER"; 670 INPUT Q 680 PRINT "WHAT CHARACTER WOULD YOU LIKE THE COMPUTER TO TYPE REPRESENTING" 690 PRINT "THE MULTIPLES OF ";0; "(ENTER \*\* \*\* FOR A BLANK)"; 700 INPUT S\$ 710 PRINT "WHAT CHARACTER WOULD YOU LIKE THE COMPUTER TO TYPE REPRESENTING" 720 PRINT "EACH OF THE OTHER NUMBERS IN THE PATTERN (ENTER " " FOR A BLANK)"; 730 INPUT T\$ 740 IF 0=7 THEN 780 750 PRINT "HOW MANY ROWS AND COLUMNS IN THE ARRAY (36 IS MAX.)"; 760 INPUT T 770 IF T>36 THEN PRINT "BE REASONABLE!":GOTO 750 780 PRINT "WOULD YOU LIKE A CALENDAR PRINTED WITH YOUR PICTURE"; 800 INPUT R5\$ 810 IF LEFT\$(R5\$,1)<>"Y" THEN 850 820 PRINT "WHAT YEAR BETWEEN 1600 AND 2300 WOULD YOU LIKE": 830 INPUT Y9 840 IF Y9\*(3099-Y9)<=0 THEN PRINT "EVEN I MAKE MISTAKES!":GOTO 820 850 ON 0 GOTO 940,2190,2330,1210,1510,1510,2550 920 REM TIME TO CREATE AND PRINT A SINGLE PIECE OF PASART 930 REM FIRST BUILD THE PASCALS TRIANGLE 940 FOR R=1 TO T 950 FOR C=1 TO T 960 IF (R-1)\*(C-1)=0 THEN 1010 970 P(R,C)=P(R-1,C)+P(R,C-1) 980 IF P(R,C)<0\*0\*0 THEN 1020

990 P(R,C)=P(R,C)-Q\*Q 1000 GOTO 980 1010 P(R,C)=1 1020 NEXT C 1030 NEXT R 1040 REM TIME TO PLAY BACK THE TRIANGLE WITH AN ARTISTIC FUR 1050 IF O<>3 THEN 1070 1060 LET T=T\*2-1 1070 FOR R=1 TO T 1080 FOR C=1 TO T 1090 IF P(R,C)=0 THEN 1130 1100 IF(P(R,C)/Q-INT(P(R,C)/Q))\*Q<.95 THEN 1130 1110 PRINT T\$: 1120 GOTO 1140 1130 PRINT S\$; 1140 NEXT C 1150 PRINT 1160 NEXT R 1170 IF LEFT\$(R5\$.1)="Y" THEN 3260 1180 GOTO 3710 1190 REM OPTION 4 LINES 1210-1490 1200 REM TIME TO CREATE AND PRINT A DOUBLE PIECE OF PASARI 1210 7=T 1220 REM BUILD THE UPPER LEFT HAND CORNER OF THE ARRAY 1230 LET N=Z 1240 FOR R=1 TO N 1250 FOR C=1 TO Z-1 1260 IF (R-1)\*(C-1)=0 THEN 1310 1270 P(R,C) = P(R-1,C) + P(R,C-1)1280 IF P(R.C)<0\*0\*0 THEN 1320 1290 P(R,C)=P(R,C)-Q\*Q 1300 GOTO 1280 1310 P(R,C)=1 1320 NEXT C 1330 Z=Z-1 1340 NEXT R 1350 REM BUILD THE LOWER RIGHT HALF OF THE ARRAY 1360 7=N 1370 N=2 1380 FOR R=Z TO 1 STEP -1 1390 FOR C=Z TO N STEP -1 1400 IF (R-Z)\*(C-Z)=0 THEN 1450 1410 P(R,C)=P(R,C+1)+P(R+1,C) 1420 IF P(R,C) (0\*0\*0 THEN 1460 1430 P(R,C)=P(R,C)-Q\*Q 1440 GOTO 1420 1450 P(R,C)=1 1460 NEXT C 1470 N=N+1 1480 NEXT R 1490 GOTO 1070 1500 REM OPTIONS 5 AND 6 LINES 1500-2120 1510 M=Q 1520 REM BUILD THE UPPER LEFT CORNER OF THE ARRAY 1530 Y=T 1540 Z=INT(Y/2) 1550 B5=Z\*2 1560 Z1=Z 1570 Z2=Z1 1580 Z3=Z2 1590 X4=Z3 1600 X5=X4 1610 FOR I=1 TO Z1 1620 FOR J=1 TO Z 1630 IF (J-1)\*(I-1)=0 THEN 1680 1640 P(I,J)=P(I,J-1)+P(I-1,J) 1650 IF P(I,J)<Q\*Q\*Q THEN 1690 1660 P(I, J)=P(I, J)-Q\*Q 1670 GOTO 1650 1680 P(I,J)=1 1690 NEXT J 1700 IF 0=6 THEN 1720 1710 Z=Z-1 1720 NEXT I 1730 N=Z1 1740 REM BUILD THE UPPER RIGHT CORNER OF THE ARRAY 1750 FOR I=1 TO Z1 1760 FOR J=Y TO X5+1 STEP -1 1770 IF I=1 THEN 1830 1780 IF J=Y THEN 1830 1790 P(I,J)=P(I,J+1)+P(I-1,J) 1800 IF P(I, J) (0\*0\*0 THEN 1840 1810 P(I,J)=P(I,J)=Q\*Q 1820 GOTO 1800 1830 P(I,J)=1 1840 NEXT J 1850 IF 0=6 THEN 1870 1860 X5=X5+1

```
NEXT I
                                                                           2810 FuR R=R1+1 TO R1+72
  #=72
                                                                           2820 C(R)=C(R)+C(R-1)
   TEN BUILD THE LOWER LEFT CORNER OF THE ARRAY
                                                                           2830 IF L(R)<0*0*0 THEN 2860
  FOR I=Y TO X4+1 STEP -1
                                                                           2840 C(R)=C(R)-Q*Q
  FOR J=1 TO Z2
                                                                           2850 GOTO 2830
   IF J=1 THEN 1980
                                                                           2860 NEXT R
  IF I=Y THEN 1980
                                                                           2870 REM *** IF TIM(1)-T<6 THEN 2890
  P(I,J) = P(I,J-1) + P(I+1,J)
                                                                           2880 GOSUB 3210
  IF P(I, J) < Q + Q + Q THEN 1990
                                                                           2890 NEXT C
  P(I, J)=P(I, J)-Q*Q
                                                                           2900 FOR C=1 TO 72
  60TO 1950
                                                                           2910 P(1,C)=R(C+C1-1)
                                                                           2920 P(C,1)=C(C+R1-1)
  P(I, J)=1
  HEXT J
                                                                           2930 NEXT C
  IF 0=6 THEN 2020
                                                                           2940 FOR R=2 TO 72
  72=72-1
                                                                           2950 FOR C=2 TO 72
  HEXT I
                                                                           2960 P(R,C)=P(R-1,C)+P(R,C-1)
                                                                           2970 IF P(R,C)<Q*Q*Q THEN 3000
  N=73
  REM BUILD THE LOWER RIGHT CORNER OF THE ARRAY
                                                                           2980 P(R,C)=P(R,C)-Q*Q
  FOR I=Y TO N+1 STEP -1
                                                                           2990 GOTO 2970
  FOR J=Y TO Z3+1 STEP -1
                                                                           3000 NEXT C
                                                                           3010 REM *** IF TIM(1)-T<6 THEN 3030
  IF J=Y THEN 2130
  IF I=Y THEN 2130
                                                                           3020 GOSUB 3210
  P(I,J) = P(I+1,J) + P(I,J+1)
                                                                           3030 NNEXT R
  IF P(I, J) < 0 + 0 + 0 THEN 2140
                                                                           3040 GOSUB 3210
  P(I, J)=P(I, J)-Q*Q
                                                                           3050 PRINT
  60TO 2100
                                                                           3060 PRINT
 ) P(I, J)=1
                                                                           3070 FOR R=1 TO 70
 NEXT J
                                                                           3080 FOR C=1 TO 70
 IF 0=6 THEN 2170
                                                                           3090 IF (P(R,C)/Q-INT(P(R,C)/Q))*Q<.98 THEN 3120
 1 23=23+1
                                                                           3100 PRINT TS;
 NEXT T
                                                                           3110 GOTO 3130
 0 GOTO 1070
                                                                           3120 PRINT S$:
 I REM PASFORM C OPTION 2 LINES 2150-2260
                                                                           3130 NEXT C
 FOR R=1 TO T
                                                                           3140 REM *** IF TIM(1)-T<6 THEN 3160
 FOR C=1 TO T
                                                                           3150 GOSUB 3210
 WIF C>R THEN 2300
                                                                           3160 PRINT
 10 IF(C-1)=0 THEN 2290
                                                                           3170 NEXT R
 WIF R=C THEN 2290
                                                                           3180 PRINT
 WLET P(R,C)=P(R-1,C-1)+P(R-1,C)
                                                                           3190 PRINT
 1) IF P(R,C) < Q # Q # Q THEN 2300
                                                                           3200 GOTO 1170
 10 LET P(R,C)=P(R,C)-Q*Q
                                                                           3210 PRINT " "
10 GOTO 2260
                                                                           3220 REM *** LINPUT AS
 10 LET P(R,C)=1
                                                                           3230 REM *** T=TIM(1)
NEXT C
                                                                           3240 RETURN
NEXT
                                                                           3250 6010 1120
10 GOTO 1040
                                                                           3260 REM CALENDAR
IN REM PASFORM A OPTION 3 LINES 2290-2480
                                                                           3270 LET X=Y9
10 IF T<=36 THEN 2370
                                                                           3280 REM LINES 3240-3640 PRODUCE A CALENDAR
10 PRINT "MAX. OF 36 ROWS ALLOWED WITH THIS OPTION ... HERE THEY COME"
                                                                           3290 REM PROGRAM IS A SUBROUTINE THAT USES VARIABLE X=YEAR OF CALENDAR
160 LET T=36
                                                                           3300 REM
20 LET P(1,T)=1
100 FOR R=2 TO T
                                                                           3310 C=6
                                                                           3320 FOR J=1600 TO X STEP 1
10 LET C=1
                                                                           3330 IF J=X THEN 3390
3340 IF J/4 <> INT(J/4) THEN 3380
00 IF C>T+2-1 THEN 2530
110 IF R+C=T+1 THEN 2470
                                                                           3350 IF (J-1700)*(J-1800)*(J-1900)*(J-2100)*(J-2200)*(J-2300)=0 THEN 3380
10 IF C=1 THEN 2480
                                                                           3360 C=C+2
NU LET P(R,C)=P(R-1,C-1)+P(R-1,C+1)
                                                                           3370 GOTO 3390
40 IF P(R,C) <Q+Q+Q THEN 2480
                                                                           3380 C=C+1
150 LET P(R,C)=P(R,C)-Q*Q
                                                                           3390 IF C<7 THEN 3410 *
460 GOTO 2440
                                                                           3400 C=C-7
170 LET P(R,C)=1
                                                                           3410 NEXT J
180 IF R+C<T+1 THEN 2510
                                                                           3420 PRINT
190 LET C=C+2
                                                                           3430 FOR R=1 TO 12
500 GOTO 2400
                                                                           3440 READ A$
310 LET C=C+1
                                                                           3450 PRINT TAB(17);A$;" ";X
520 GOTO 2400
                                                                           3460 READ B
530 NEXT R
                                                                           3470 IF X/4 <> INT(X/4) THEN 3500
540 GOTO 1040
                                                                           3480 IF A$ <> "FEBRUARY" THEN 3500
50 REM OPTION 7 LINES 2540-3190
                                                                           3490 LET B=B+1
170 REM PUSHES THE BOUNDARIES WAY OUT
                                                                           3500 REM TIME TO PRINT THE CALENDAR FOR THE YEAR X
180 REM NOTE THE PROTECTION AGAINST THE TIME OUT PROBLEM ON UNIV 1110
                                                                           190 PRINT "WHAT WILL BE THE COORDINATES (R,C) OF THE UPPER LEFT CORNER" 3520 PRINT "ISUN MON TUE WED
                                                                                                                  THU
                                                                                                                       FRI SATI"
WOO PRINT "OF THIS SECTION";
                                                                           -----
MIO INPUT R1,C1
                                                                           3540 FOR D=1 TO B
120 DIM R(1000), C(1000)
                                                                           3550 PRINT TAB(6*C);D;
1630 REM *** T=TIM(1)
                                                                           3560 LET C=C+1
140 FOR L1=1 TO 72:FOR L2=1 TO 72:P(L1,L2)=0:NEXT L2:NEXT L1
                                                                           3570 IF C<7 THEN 3600
150 FOR L2=1 TO 1000:R(L2)=1:C(L2)=1:NEXT L2
                                                                           3580 PRINT
170 IF R1=1 THEN 2780
                                                                           3590 C=0
180 FOR R=2 TO R1
                                                                           3600 NEXT D
190 FOR C=2 TO C1+72
                                                                           3610 PRINT
1700 R(C)=R(C)+R(C-1)
                                                                           10 IF R(C) < 0 + 0 + 0 THEN 2740
                                                                           3630 FOR P=1 TO 3
120 R(C)=R(C)-Q*Q
                                                                           3640 PRINT
2730 GOTO 2710
                                                                           3650 NEXT P
2740 NEXT C
                                                                           3660 NEXT R
USO REM *** IF TIN(1)-T<6 THEN 2770
                                                                           3670 DATA "JANUARY",31,"FEBRUARY",28,"NARCH",31,"APRIL",30,"MAY",31
3680 DATA "JUNE",30,"JULY",31,"AUGUST",31,"SEPTEMBER",30,"OCTOBER",31
3690 DATA "NOVEMBER",30,"DECEMBER",31
1760 GOSUB 3210
1770 NEXT R
U80 IF C1=1 THEN 2900
                                                                           3700 REM THE END
190 FOR C=2 TO C1
                                                                           3710 END
100 C(R1)=R(C)
                                                                           Dk
```



PINBALL is, naturally enough, a simulated pinball game—complete with bells if your terminal has them—in which the computer serves as the pinball machine. However, you don't need any quarters! The program is divided up into ten small routines contained within the whole. Each subprogram performs one task in simulating a pinball game.

Details on each task/subprogram are as follows.

## 1) Starting and monitoring the game.

This task is performed by the master function PINBAL, which is contained in lines 1-600 of the program. Pinbal asks if the user wants instructions or a picture at the start of the game, puts each new ball into play, moves the ball until it comes into contact with an object on the table, and tells the user when he is finished and if he has broken the table record.

## 2) Printing instructions.

This subprogram is on the lines numbered 1010-1999, and its major task is to print the instructions of the pinball game and then to branch to the picture program to print a picture of the table (see below). After the picture of the table is completed, this subroutine explains the function of each figure on the table.

## 3) Registering "hits" and computing new scores.

Lines 2010-3999 are in charge of taking action each time the space occupied by the ball on the table is not blank. These lines also prepare the table to take action on the next task, namely flipping the table's flippers when the ball approaches them.

## 4) Flipping the flippers.

This task is accomplished by the lines in the four thousand range. These lines also set up indicators for the monitor routine (1 above) to put the next ball into play if necessary and branch to the routine that adds bonus points for tags (letters A-J) knocked down during that ball's play.

## Bonus points at the end of a ball's play.

Lines in the five thousand range handle this task and then branch back to the monitor routine to put the next ball into play. If all ten tabs are knocked down in one ball, the program immediately awards a bonus of 250 points and an extra ball to the player and resets the tabs for further play. Normally, bonus points are awarded at the rate of ten per tab at the end of a ball.

## 6) Printing pictures of the table.

Lines in the six thousand range print a picture of the pinball table, either at the beginning of play or randomly, at the rate of one picture for every twentyfive "hits."

## Bouncing the ball off bumpers and the jackpot.

The ball is "bounced" by the routine beginning at line 7850.

## 8) Initializing the table.

The table is initialized at the beginning of the game by lines in the nine thousand range.

RUN

PINBALL CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

WELCOME TO COMPUTER PINBALL!! WOULD YOU LIKE INSTRUCTIONS TO THIS FANTASTIC GAME? YES

THE RULES OF COMPUTER PINBALL ARE FAIRLY SIMPLE. YOU GET A TOTAL OF FIVE BALLS. IF YOU SCORE MORE THAN 1600, YOU GET A SIXTH BALL. IF YOUR SIX BALL SCORE IS MORE THAN 2200, YOU GET A SEVENTH BALL.

THIS TABLE HAS THREE FLIPPERS, EACH OF OF WHICH PROTECT AN OUT CHUTE. HOWEVER, THIS SET DIFFERS FROM OTHER SETS, SINCE YOU MAY ONLY FLIP TWO OF THE FLIPPERS ANY TIME THE BALL APPROACHES THE CHUTE. NOTA BENE: YOU DO NOT!!! KNOW FOR SURE WHERE THE BALL IS'! SO. IF YOU FLIP THE WRONG TWO FLIPPERS, YOU LOSE THE BALL. AND THE NEXT BALL IS PUT INTO FLAY.

YOU CAN GET A PICTURE OF THE TABLE EVERY TIME THE BALL HITS AN DBJECT, SO THAT MAY HELP YOU SOMEWHAT. ALSO, YOU ARE TOLD WHERE THE BALL IS EACH TIME IT HITS(EVEN IF YOU DON'T GET A PICTURE). THERE IS SOME LOGIC TO THE CHOICE OF FLIPPERS, BUT SOME LUCK IS INVOLVED, TOM THE FLIPPERS ARE NUMBERED 1,2, AND 3 FROM LEFT TO RIGHT, AND ARE SHOWN ON THE PICTURE BELOW AS '1' MARKS. SINCE LUCK PLAYS ONLY A SMALL PART IN CHOOSING THE CORRECT FLIPPER. YOU WILL DO POORLY IF YOU JUST GUESS WHICH FLIPPER THE BALL IS HEADED TOMARD...

THE TABLE LOOKS LIKE THIS: \*\*\*\*\*\*\*\*\*

0 0 0 \* \* 0 ABCD 0 C n . \* 2 n 0 \* \* \$ \* \* 0 0 \* \* 0 0\* E F 6 H #0 \* \* \* 0 0 ===0 fl==== 0 1 2 3 4 5 0 0 \* 6 7 8 9 \* 0 0=== 0 ===0 0 0 0 0 0 111 111 0 \ / 0 \IJ/ 0 0 1 -0 1 0 1 1 Đ 0 "-1

Suggestions for improvement and change.

- Change the table as you wish by inserting or deleting bumpes jackpot(s), gates (numbers, now 14 and 0), etc. You may also move the positions of any item on the table except the three flippers.
- Program in new sorts of table objects.
- If your system is so equipped, right the program with some synthesize music to heighten realism!

Pinball was conceived and writtenby Donald-Bruce Abrams.

#### \*\*\*\*\*\*

RECENTER BUMPER(\$) IS THE JACKPOT! REFALL IS PUT INTO PLAY THROUGH THE UP ARROW("), AND GOES UP AND HOWN, WHERE IT IS DEPOSITED ON THE UPPER HALF OF THE TABLE. THE BALL WE BOUNCE FROM THE SIDE OF THE TABLE, AND MAY BOUNCE UP FROM THE URES ON THE SIDE(=) AND FROM THE DIAGONALS(\ AND /) AT THE BOTTOM FINE TABLE. THE BUMPERS ARE INDICATED BY STARS(\*).

FLIPPERS ARE SHOWN AS EXCLAMATION POINTS(! OR !!). WE BALL MAY GO OUT OF PLAY THROUGH ONE OF THE FOUR HOLES IN THE BOARD(0), WWICH CASE YOU WILL GET A BONUS BUT LOSE THE BALL.

SATES ARE SHOWN BY THE NUMBERS 1-9, AND KNOCK-DOWN TABS ARE SHOWN Is THE LETTERS A-J. YOU GET A BONUS FOR THESE AT THE END OF IBALL, AND IF YOU KNOCK ALL OF THEM DOWN YOU GET A SPECIAL BONUS...

WEVERY ONCE IN A WHILE, I WILL SHOW YOU A PICTURE OF THE WHE AS IT HITS SOMETHING. THE BALL IS SHOWN AS THE #.

```
WE BALL IS NOW AT ( 2 , 11 ).
WU RECEIVE 15 POINTS FROM THE BUMPER AT 5 , 10 .
KURE: 15
```

```
NA H DOWN...

TWO RECEIVE 8 POINTS FROM THE BUMPER AT 6, 14.

STORE: 23

TWO RECEIVE 12 POINTS FROM THE BUMPER AT 9, 8.

STORE: 35

MUL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP

IN THE FORM: X,Y ? 2,3

THE BALL IS NOW AT ( 7, 10 ).

THU RECEIVE 54 POINTS FROM THE BUMPER AT 7, 10.

STORE: 89
```

```
TAB H DOWN...

YOU RECEIVE 51 POINTS FROM THE BUMPER AT 9, 11.

SCORE: 1283

YOU GET 60 POINTS FROM GATE 4

SCORE: 1343

BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP

IN THE FORM: X,Y ? 2,3

THE BALL IS NOW AT ( 8, 2 ).
```

YOU RECEIVE 26 POINTS FROM THE BUMPER AT 8, 2. SCORE: 1369 YOU RECEIVE 37 POINTS FROM THE BUMPER AT 8, 2. SCORE: 1406

TAB A DOWN... YOU GET 45 POINTS FROM GATE 2 SCORE: 1451

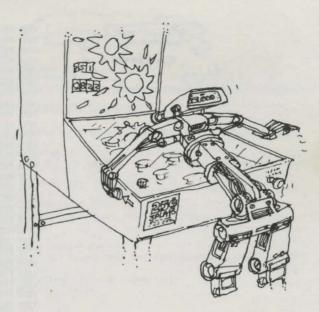
TAB F DOWN... YOU RECEIVE 10 POINTS FROM THE BUMPER AT 9, 8. SCORE: 1461 BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP IN THE FORM: X,Y ? 1,2 THE BALL IS NOW AT (3,6). YOU RECEIVE 15 POINTS FROM THE BUMPER AT 6,5. SCORE: 1476 YOU RECEIVE 49 POINTS FROM THE BUMPER AT 3,5.

TAB E DOWN...

TOD BAD... YOU HAVE GONE STRAIGHT OUT A CHUTE HOLE("O" ON THE TABLE). TO COMSOLE YOU, I WILL GIVE YOU AN EXTRA 13 POINTS, TO BRING YOUR TOTAL TO 1538. YOU NOW HAVE HAVE 1 BALLS LEFT. TOUR BALL KNOCKED DOUN 4 TAGS!! FOR THIS STELLAR PERFORMANCE, YOU ARE AWARDED \*\*\*\*\* 40 \*\*\*\*\* POINTS!! SCORE: 1578 THE BALL IS NOW AT ( 2 , 10 ). YOU GET 75 POINTS FROM GATE 3 SCORE: 1653

YOU RECEIVE 1 POINTS FROM THE BUMPER AT 7, 10. SCORE: 1654 BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP IN THE FORM: X,Y ? 1,2 THE BALL IS NOW AT ( 5, 10 ). THE BALL IS NOW AT ( 5, 10 ). SCORE: 1659

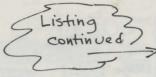
- more -



#### LIST 1 PRINT TAB(25);"PINBALL" 2 PRINT TAB(20);"CREATIVE COMPUTING" 3 PRINT TAB(18);"HORRISTOWN, NEW JERSEY" 4 PRINT:PRINT:PRINT 8 DTM #S(100) PS(100) L(2)

4 PRINT:PRINT:PRINT 8 DIM R\$(10),P\$(20),L(2) 9 GOSUB 9500 10 A1=0:A0=0:X9=0 20 PRINT "WELCOME TO COMPUTER PINBALL!!" 30 PRINT "WOULD YOU LIKE INSTRUCTIONS TO THIS " 35 PRINT "FANTASTIC GAME"; 40 INPUT 0\$:IF LEFT\$(0\$,1)="Y" THEN GOSUB 1010:GOTO 50 45 PRINT:PRINT "HOW ABOUT A PICTURE OF THE TABLE"; 46 INPUT Q\$:IF LEFT\$(Q\$,1)="Y" THEN GOSUB 6010 50 PRINT:PRINT:B=5 55 S=0:P=0 60 T\$="ABCDEFGHIJ":PRINT 61 FOR Z=1 TO 10:R\$(Z)=" ":NEXT Z:Z3=0 70 A1=0 71 A7=0 80 IF B<=0 THEN 290 100 L(1)=2+INT(RND(1)\*6):L(2)=INT(RND(1)\*14)+1 110 C=1+INT(RND(1)\*7):A1=0 120 PRINT "THE BALL IS NOW AT (";L(1);",";L(2);")." 130 IF MID\$(P\$(L(1)),L(2),1)=" "THEN 150 140 GOSUB 2010 150 IF A7=7 THEN 280 160 IF A1<>4 THEN 180 170 GOTO 260 180 L(1)=L(1)+1 190 A1=0 200 L(2)=L(2)+INT(1+RND(1)\*3)-2 210 IF L(2)<2 OR L(2)>15 THEN L(1)=L(1)+INT(1+RND(1)\*3)-2 215 IF L(2)<2 OR L(2)>15 THEN L(2)=INT(2+RND(1)\*13) 230 IF L(1)>=2 AND L(1)<=20 THEN GOTD 130 240 L(1)=INT(1+RND(1)\*7) 250 GOTO 130 260 GOSUB 4010 270 IF A0=1 THEN 400 280 ON X9+1 GOTO 60,340 285 PRINT"YOU HAVE PLAYED YOUR SEVENTH BALL AND SCORED ":P;" POINTS!" 286 PRINT"YOU'RE VERY GOOD!":GOTO 9999 290 PRINT "YOU HAVE PLAYED YOUR FIVE BALLS, AND HAVE SCORED" 293 PRINT "A TOTAL OF ";P;" POINTS." 300 IF P<1600 THEN 9999 305 PRINT:PRINT "\*\*\* BONUS BALL \*\*\*" 310 R=R+1 320 X9=1 330 6010 60 340 PRINT "YOU HAVE PLAYED YOUR SIXTH BALL AND SCORED ";P;" POINTS!" 341 X9=2 350 IF P<2200 THEN 9999 355 PRINT:PRINT "\*\*\* BONUS BALL \*\*\*" 360 B=B+1:5=3 370 GOTO 60 380 GOTO 2010 390 GOTO 150 400 L(1)=2+INT(RND(1)\*7) 405 L(2)=2+INT(RND(1)\*13):X=0:Y=0 410 GOTO 110

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1010 PRINT: PRINT
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1030 PRINT "THE RULES OF COMPUTER PINBALL ARE FAIRLY SIMPLE. YOU GET A TOTAL OF" 1040 PRINT "FIVE BALLS. IF YOU SCORE MORE THAN 1600, YOU GET A SIXTH BALL. IF" 1045 PRINT "YOUR SIX BALL SCORE IS MORE THAN 2200, YOU GET A SEVENTH BALL. 1060 PRINT: PRINT "THIS TABLE HAS THREE FLIPPERS, EACH OF OF WHICH PROTECT AN OUT CHUTE." 1070 PRINT "HOWEVER, THIS SET DIFFERS FROM OTHER SETS, SINCE YOU MAY ONLY FLIP" 1080 PRINT "TWO OF THE FLIPPERS ANY TIME THE BALL APPROACHES THE CHUTE." 1090 PRINT "NOTA BENE: YOU DO NOT!!! KNOW FOR SURE WHERE THE BALL IS!!" 1093 PRINT "SO, IF YOU FLIP THE WRONG TWO FLIPPERS. YOU LOSE THE BALL. AND THE" 1095 PRINT "NEXT BALL IS PUT INTO PLAY." 1097 PRINT " YOU CAN GET A PICTURE OF THE TABLE EVERY TIME THE BALL HITS" 1098 PRINT "AN OBJECT, SO THAT MAY HELP YOU SOMEWHAT. ALSO, YOU ARE TOLD WHERE" 1098 PRINT "AN OBJECT, SO THAT MAY HELP YOU SOMEWHAT. ALSO, YOU ARE TOLD WHERE" 1099 PRINT "THE BALL IS EACH TIME IT HITS(EVEN IF YOU DON'T GET A PICTURE)." 1100 PRINT "THERE IS SOME LOGIC TO THE CHOICE OF FLIPPERS, BUT SOME LUCK IS INVOLVED." 1110 PRINT "THE FLIPPERS ARE NUMBERED 1,2, AND 3 FROM LEFT TO RIGHT, AND ARE SHOWN" 1120 PRINT "ON THE PICTURE BELOW AS '!' MARKS." 1123 PRINT "SINCE LUCK PLAYS ONLY A SMALL PART IN CHOOSING THE CORRECT FLIPPER," 1125 PRINT "YOU WILL DO POORLY IF YOU JUST GUESS WHICH FLIPPER THE BALL IS" 1127 PRINT "HEADED TOWARD...":PRINT:PRINT:PRINT"THE TABLE LOOKS LIKE THIS:" 1140 PRINT: PRINT: PRINT"\*\*\*\*\*\*\*\*\*\*\* 1230 PRINT "THE CENTER BUMPER(\$) IS THE JACKPOT!" 1240 PRINT "THE BALL IS PUT INTO PLAY THROUGH THE UP ARROU("), AND GOES UP AND " 1250 PRINT "AROUND, WHERE IT IS DEPOSITED ON THE UPPER HALF OF THE TABLE. THE BALL" 1260 PRINT "MAY BOUNCE FROM THE SIDE OF THE TABLE. AND MAY BOUNCE UP FROM THE" 1263 PRINT "LINES ON THE SIDE(=) AND FROM THE DIAGONALS(\ AND /) AT THE BOTTOM" 1270 PRINT "OF THE TABLE. THE BUMPERS ARE INDICATED BY STARS(\*)." 1280 PRINT " FLIPPERS ARE SHOWN AS EXCLAMATION POINTS(! OR !!). 1285 PRINT "THE BALL MAY GO OUT OF PLAY THROUGH ONE OF THE FOUR HOLES IN THE BOARD(0)." 1290 PRINT "IN WHICH CASE YOU WILL GET A BONUS BUT LOSE THE BALL." 1300 PRINT IN WRICH CHOE TOO WILL OLT A BUNGS OUT COSE THE BALL. 1300 PRINT " GATES ARE SHOWN BY THE NUMBERS 1-9, AND KNOCK-DOWN TABS ARE SHOWN" 1310 PRINT "AS THE LETTERS A-J. YOU GET A BONUS FOR THESE AT THE END OF" 1320 PRINT "A BALL, AND IF YOU KNOCK ALL OF THEM DOWN YOU GET A SPECIAL BONUS... 1330 PRINT:PRINT\*\*\*\*EVERY ONCE IN A WHILE, I WILL SHOW YOU A PICTURE OF THE" 1340 PRINT "TABLE AS IT HITS SOMETHING. THE BALL IS SHOWN AS THE #." 1350 PRINT: PRINT: RETURN 2010 IF HID\$(P\$(L(1)),L(2),1)="0" THEN 2070 2020 IF INT(RND(1)+.5)=<>1 THEN 2022 Run continued 2021 IF HID\$(P\$(L(1)),L(2),1)="/"ORHID\$(P\$(L(1)),L(2),1)="\" THEN 2160 2022 S8=INT(RND(1)\*6+1) 2023 FOR S7=1 TO S8:PRINT CHR\$(7);:NEXT S7 2025 IF MID\$(P\$(L(1)),L(2),1)<="J"AND MID\$(P\$(L(1)),L(2),1)>="A" THEN 2190 YOU RECEIVE 5 POINTS FROM THE BUMPER AT 6 . 14 . 2040 GOSUB 3010 2050 RETURN 2070 PRINT "TOO BAD... YOU HAVE SONE STRAIGHT OUT A CHUTE HOLE("O" ON THE TAL 2075 PRINT "TO CONSOLE YOU, I WILL GIVE YOU AN EXTRA" 2090 Q=INT(RND(1)\*141) BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP 2100 P=P+Q 2110 PRINT Q;" POINTS, TO BRING YOUR TOTAL TO ":P:"." 2115 PRINT "YOU NOW HAVE HAVE ";B-1;" BALLS LEFT." YOU RECEIVE 32 POINTS FROM THE BUMPER AT 9 . 8 . 2120 B=B-1 2130 A7=7 2140 GDSUB 5010 2150 RETURN BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP 2160 L(1)=L(1)+(1+INT(RND(1)\*4))-(1+INT(RND(1)\*4)) 2170 L(2)=2+INT(RND(1)\*14) 2180 RETURN YOU RECEIVE 57 POINTS FROM THE BUMPER AT 6 , 3 . 2190 PRINT 2200 FOR Q=1 TO 10 BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP 2203 IF R\$(0)=MID\$(P\$(L(1)),L(2),1) THEN 2275 2204 NEXT Q 2205 Z3=Z3+1:R\$(Z3)=HID\$(P\$(L(1)).L(2).1) BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP 2210 PRINT:PRINT "TAB ";R\$(Z3);" DOWN..." 2255 IF Z3=10 THEN GOSUB 5010 2260 RETURN 2275 RETURN 3010 IF MID\$(P\$(L(1)),L(2),1)=CHR\$(8) THEN RETURN 3015 IF HID\$(P\$(L(1)),L(2),1)="]" THEN RETURN 3017 IF MID\$(P\$(L(1)),L(2),1)="L" THEN RETURN 3018 IF MID\$(P\$(L(1)),L(2),1)="^" THEN 3110 3019 A1=0 3020 IF HID\$(P\$(L(1)),L(2),1)="=" THEN 3410 3030 C=C-1 3040 IF C=0 THEN 3110 3050 IF MID\$(P\$(L(1)),L(2),1)="!"ORMID\$(P\$(L(1)),L(2),1)="\"THEN 3110 
 BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP
 3060 IF HID\$(P\$(L(1)),L(2),1)="/"ORHID\$(P\$(L(1)),L(2),1)="/"THEN 3110

 IN THE FORM: X,Y ? 1,2
 3070 IF INT(1+RND(1)\*25)=4 THEN GOSUB 6010
 3080 IF HID\$(P\$(L(1)),L(2),1)="\$" THEN 3230 3090 IF HID\$(P\$(L(1)),L(2),1)="\*" THEN 3280 YOU RECEIVE 53 POINTS FROM THE BUMPER AT 6 . 14 . 3100 GOTO 3320 YOU RECEIVE 32 POINTS FROM THE BUMPER AT 9,8.

more

TAB I DOWN .... BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP IN THE FORM: X,Y ? 1,2 THE BALL IS NOW AT ( 4 , 9 ).

TAB F DOWN ... YOU GET 90 POINTS FROM GATE 3 SCORE: 2243

TAB C DOWN ....

SCORE: 1664

TAB H DOWN ...

SCORE: 1696

SCORE: 1756

SCORE: 1813

SCORE: 1828

SCORE: 2068

SCORE: 2121

SCORE: 2153

IN THE FORM: X,Y ? 2,3

IN THE FORM: X,Y ? 1,3

THE BALL IS NOW AT ( 8 , 9 ).

YOU GET 60 POINTS FROM GATE 8

IN THE FORM: X,Y ? 2,3 THE BALL IS NOW AT ( 5 , 3 ).

THE BALL IS NOW AT ( 6 , 6 ).

IN THE FORM: X,Y ? 1,3 THE BALL IS NOW AT ( 6 , 12 ).

YOU GET 15 POINTS FROM GATE 4

YOU GET 60 POINTS FROM GATE 4

SCORE: 1888 YOU GET 90 POINTS FROM GATE 3

SCORE: 1978 YOU GET 45 POINTS FROM GATE 3

SCORE: 2023 YOU GET 45 POINTS FROM GATE 4

IN THE FORM: X,Y ? 1,2 THE BALL IS NOW AT ( 5 , 14 ).

more -

```
Listing continued
  ITUR E
                         Run
                                                                      3110 A1=4
   **********
  3120 GOTO 3390
                       Continued
        0
                                                                       3130 IF L(2)<6 THEN GOTO 3180
  1 * * 0
                                                                      3140 IF L(2)<11 THEN 3200
  1 B C D O
                                                                       3150 D=2:IF INT(1+RND(1)*2)=1 THEN D=D+(1+INT(RND(1)*3))-2:IF D>3 THEN D=D-3
  1 1
                                                                       3170 RETURN
  3180 D=1:IF INT(1+RND(1)*2)=1 THEN D=INT(RND(1)*3)+D
                                                                       3190 RETURN
  1 2
        0
  F F H #D
                                                                       3200 D=2:IF INT(1+RND(1)*2)=1 THEN D=D+INT(RND(1)*3):IFD>3THEN D=D-3
                                                                      3210 RETURN
  1 * * 13
       ===()
                                                                       3230 Q=45+INT(RND(1)*146)
 11345 0
                                                                       3240 PRINT "YOU HAVE HIT THE JACKPOTINI YOU HAVE JUST WON ":0:" POINTS!!"
                                                                       3250 P=P+0
 11789 10
                                                                       3260 PRINT "YOU NOW HAVE ":P:" POINTS!"
  0 ===0
                                                                       3270 GOTO 3360
      0 0
                                                                       3280 Q=INT(RND(1)*64)+1:P=P+Q
        111
                                                                       3290 PRINT "YOU RECEIVE ";0;" POIN'S FROM THE BUMPER AT ";L(1);",";L(2);"."
3300 PRINT "SCORE: ";P
       / 0
   IJ/
         0
                                                                       3310 GOTO 3360
  1 / 0
                                                                       3320 Q=15*(1+INT(RND(1)*6)):P=P+Q
          0
                                                                      3330 PRINT "YOU GET ":0;" POINTS FROM GATE ":MID$(P$(L(1)),L(2),1)
3340 PRINT "SCORE: ";P
3360 L(1)=(L(1)-INT(1+RND(1)*3))-INT(1+RND(1)*2)
 EMALL WAS AT THE TH
                                                                       3370 L(2)=L(2)-3+INT(RND(1)*5)+1
 ***********
                                                                      3380 RETURN
BET 75 POINTS FROM GATE 2
                                                                       3390 GOSUB 7850
INE: 2318
                                                                       3400 GOTO 3130
                                                                       3410 L(1)=L(1)-(1+INT(RND(1)*5))
BET 45 POINTS FROM GATE 1
                                                                      3420 L(2)=L(2)-2+(1+INT(RND(1)*4))
                                                                       3430 RETURN
                                                                       4010 PRINT "BALL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP"
                                                                       4020 INPUT "IN THE FORM: X,Y ":V,W
WE DOWN ....
                                                                      4030 IF V=D DR W=D THEN 4110
LAPPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP
                                                                      4040 PRINT "NO, YOU HAVE CHOSEN TO PROTECT THE WRONG FLIPPERS. YOU NOW HAVE"
4060 PRINT B-1;" BALLS LEFT."
THE FORM: X,Y ? 2,3
E BALL IS NOW AT ( 2
                     3 1
LAPPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP THE FORM: X,Y ? 2,3
                                                                      4070 B=B-1
                                                                       4080 A0=0
                                                                       4090 GDSUB 5010
, YOU HAVE CHOSEN TO PROTECT THE WRONG FLIPPERS. YOU NOW HAVE
                                                                       4100 RETURN
I BALLS LEFT.
                                                                      4110 A0=1
4120 C=INT(1+RND(1)*5)
W BALL KNOCKED DOWN 5 TAGS!!
THIS STELLAR PERFORMANCE, YOU ARE AWARDED
mmt 50 ***** POINTS!!
                                                                       4140 RETURN
MIRE: 2413
                                                                       5010 IF Z3=10 THEN 5090
                                                                       5020 IF Z3=0 THEN RETURN
                                                                       5030 PRINT "YOUR BALL KNOCKED DOWN ":Z3:" TAGS!!"
HAVE PLAYED YOUR FIVE BALLS, AND HAVE SCURED
                                                                      5050 FRINT "FOR THIS STELLAR PERFORMANCE, YOU ARE AWARDED "
5050 PRINT "******":10*Z3;"******":PRINT" PDINIS!!"
TOTAL OF 2413 POINTS.
                                                                       5060 P=P+10+Z3
# BONUS BALL ***
                                                                       5080 6010 5120
E BALL IS NOW AT ( 7 , 13 ).
W GET 75 POINTS FROM GATE 4
                                                                       5090 P=P+250
                                                                       5100 PRINT "*****YOU KNOCKED DOWN ALL 10 TAGS!!!*****
                                                                       5110 PRINT "YOU ARE AWARDED 250 POINTS AND AN EXTRA BALL !!!"
MORE: 2489
                                                                       5114 B=B+1
AL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP
ITHE FORM: X,Y ? 1,2
                                                                       5120 PRINT "SCORE: ";P:RETURN
BALL IS NOW AT ( 5 , 7 ).
THAVE HIT THE JACKPOTIIII YOU HAVE JUST WON 126 POINTS!!
                                                                      6010 PRINT
                                                                       6020 PRINT: PRINT" P I C T U R E ": PRINT" **********************
                                                                       6040 FOR Q=1 TO L(1)-1:PRINT P$(Q):NEXT Q
W HOW HAVE 2614 POINTS!
                                                                       6044 PRINT MID$(P$(L(1)),1,L(2)-1);"#";MID$(P$(L(1)),L(2)+1,16-L(2))
                                                                       6050 FOR Q=L(1)+1 TO 20:PRINT P$(Q):NEXT Q
W G DOWN ...
                                                                       WGET 60 POINTS FROM GATE 4
                                                                       6100 RETURN
INRE: 2674
                                                                       7850 L(2)=ABS(L(2)-2+INT(1+RND(1)+4))
RECEIVE 50 POINTS FROM THE BUMPER AT 9,8.
                                                                       7860 IF L(2) <= 15 THEN RETURN
                                                                       7870 L(2)=1+INT(RND(1)*15):RETURH
MORE: 2724
                                                                       9500 P$(1)="
W GET 75 POINTS FROM GATE 2
IDRE: 2799
                                                                       9501 FOR 0=1 TO 12:P$(1)=P$(1)+"E"+CHR$(8)+"]":NEXT 0
W BAD ... YOU HAVE GONE STRAIGHT OUT A CHUTE HOLE ('O' ON THE TABLE). 9502 P$(1)=P$(1)+"
CONSOLE YOU, I WILL GIVE YOU AN EXTRA
                                                                       9510 P$(2)=" 0
                                                                                                  0 "
I POINTS, TO BRING YOUR TOTAL TO 2840 .
                                                                       9520 P$(3)="0
                                                                                                   0"
W NOW HAVE HAVE O BALLS LEFT.
WR BALL KNOCKED DOWN 1 TAGS!!
                                                                       9530 P$(4)="0 A B C D 0"
                                                                       9540 P$(5)="0
                                                                                                    0"
                                                                                        *
                                                                                             *
THIS STELLAR PERFORMANCE, YOU ARE AWARDED
                                                                       9550 P$(6)="0 * * $ * * 0"
INTE 10 ##### POINTS!!
                                                                       9560 P$(7)="0
                                                                                        *
                                                                                             *
                                                                                                    0"
ICORE: 2850
                                                                       9570 P$(8)="0* E F G H *0"
                                                                      9580 P$(9)="0 * * * 0"
W HAVE PLAYED YOUR SIXTH BALL AND SCORED 2850 POINTS!
                                                                       9590 P$(10)="0===
                                                                                                  ===0"
# BONUS BALL ***
                                                                       9600 P$(11)="0 1 2 3 4 5
                                                                                                     0"
                                                                       9610 P$(12)="0 * 6 7 8 9 * 0"
WE BALL IS NOW AT ( 5 , 13 ).
W GET 60 PDINTS FROM GATE 5
                                                                      9620 P$(13)="0=== 0 ===0"
9630 P$(14)="0 0 0 0"
KORE: 2910
                                                                       9640 P$(15)="!!!
                                                                                                   111"
AL APPROACHING FLIPPERS. ENTER THE TWO FLIPPERS YOU WISH TO FLIP
                                                                      9650 P$(16)="0 \
                                                                                                  / 0"
                                                                       9660 P$(17)="0 \ I J / 0"
H THE FORM: X.Y ? 1.2
NEW HAVE CHOSEN TO PROTECT THE WRONG FLIPPERS. YOU NOW HAVE
1 BALLS LEFT.
IN HAVE PLAYED YOUR SEVENTH BALL AND SCORED 2910 POINTS!
                                                                       9670 P$(18)="0
                                                                                          1
                                                                                                     0"
                                                                                               1
                                                                                         1/
                                                                       9680 P$(19)="0
                                                                                                     0"
                                                                       9690 P$(20)="\-
W'RE VERY GOOD!
                                                                       9700 RETURN
                                                                       9999 PRINT "COME PLAY AGAIN SOMETIME !! ": END
THE PLAY AGAIN SOMETIME!!
                                                                       Ok.
```

## **Rabbit Chase**

Seemingly, the purpose of this game is to chase-down and catch a rabbit. Now this rabbit is an elusive little devil-it can hop randomly in any direction. You can run at least as fast as the rabbit, maybe even faster (the computer will decide). You must get within 20 units of the rabbit to be able to catch him. Before each hop, the computer will print out your position, the rabbit's position, the direction the rabbit is going to jump, and your closest approach on the last hop. You are to tell the computer which direction you wish to run. All coordinates and directions are as a geometer would mark them on a standard Cartesian Coordinate System.

In addition to being good fun, this game gives you practice in using and visualizing an x-y coordinate plane. After each hop, consider the output and try to run the right direction. Try to do all the figuring in your head. Using scratch paper is considered to be

RUN

cheating (except for maybe the first time you play)

IIST

#### Suggested Modifications

- 1. Change the program so that you can choose your own speed.
- 2. The game is much more challenging when the "capture distance" can be varied. A distance of 50 units is a cinch, 15 units may make you wish for scratch paper, 5 units will require you to use a protractor and graph paper.
- 3. See if you can invent a way to extend this game to 3 dimensions! 4 dimensions! etc.!
- 4. You might try limiting the total number of hops and/or having the computer give hints when requested.

Rabbit Chase was written by Ted C. Park of Pacific Union College. It first appeared in Creative Computing, Mar/Apr 1975.

315 PRINT

340 LET Z=Y2

350 PRINT ")

365 PRINT 370 PRINT

445 NEXT I

460 PRINT 465 PRINT

485 PRINT 490 PRINT 500 END 510 REM -

585 RETURN 590 END

OK

10 PRINT TAB(29); "RABBIT CHASE" 20 PRINT TAB(15); "CREATIVE COMPUTING MORRISION 30 PRINT SNEW JERE 40 PRINT 50 PRINT 100 REM ('T' IS THE SQUARE OF THE CAPTURE DISTAN 105 LET T=400 115 REM --INITALIZE VELOCITIES AND POSITIONS 125 LET V1=INT(RND(1)\*10+.5)\*10+50 130 LET V2=(INT(RND(1)\*2+.5)+1)\*V1 135 LET X1=(INT(RNU(1)\*400)+100)\*SGN(RND(1)-5) 140 LET Y1=(INT(RND(1)+400)+100)+SGN(RND(1)-.5 145 IF Y1=0 OR X1=0 THEN 135 150 LET X2=0 155 LET Y2=0 160 PRINT "SPEEDS (UNITS/HOP):" 165 PRINT "RABBIT -";V1,"YOU -";V2 170 PRINT 175 PRINT 180 PRINT 185 LET C=(X2-X1) 2+(Y2-Y1) 2 190 LET P1=3.141592653589/180 195 LET H=1 200 REM --PRINT OUT 215 LET D1=INT(RND(1)\*359) 220 PRINT "HOP#: "; 225 LET Z=H 230 GOSUB 510 235 PRINT " DISTANCE TO RABBIT: ": 240 LET Z=SOR((X2-X1)^2+(Y2-Y1) 2) 245 GOSUB 510 250 PRINT " CLOSEST APPROACH: "; 255 LET Z=SQR(C) 260 GOSUB 510 280 GOSUB 520 265 PRINT 285 PRINT ","; 270 PRINT "RABBIT ---POSITION: (": 290 LET Z=Y1 275 LET Z=X1 295 60SUB 520 300 PRINT ") AND DIRECTION:"; 305 LET Z=D1 310 GOSUB 510 320 PRINT "YOU -----FOSITION: (": 325 LET Z=X2 330 GOSUB 520 335 PRINT ","; 345 GOSUB 520 AND DIRECTION:"; 355 INPUT D2 360 IF D2 < 0 DR D2 >=360 THEN 355 380 REM -- COMPUTE PATHS AND SEE IF THEY INTERSECT 390 LET X3=V1\*CDS(D1\*P1)/100 395 LET Y3=V1\*SIN(D1\*P1)/100 400 LET X4=V2\*CO5(D2\*P1)/100 405 LET Y4=V2\*SIN(D2\*P1)/100 410 LET C=(X2-X1)-2+(Y2-Y1)-2 415 .FOR I=1 TO 100 420 LET X1=X1+X3 425 LET Y1=Y1+Y3 430 LET X2=X2+X4 435 LET Y2=Y2+Y4 440 IF C < (X2-X1) 2+(Y2-Y1) 2 THEN 445 443 C=(X2-X1)^2+(Y2-Y1:^2 450 LET H=H+1 455 IF C > T THEN 215 470 PRINT "\*\*\*\*\*\*\*\*\* 475 PRINT "\* GOT YA \*" 480 PRINT "\*\*\*\*\*\*\*\*\* CONVERTS NUMBERS TO STRINGS FOR CLEANER OUTPUT 520 Z=INT(Z+.5) 525 PRINT RIGHTS(" '+STR\$(Z).5):

|             | CREATIVE (  | COMPUTING | MORRI | ISTOWN NEW JERSEY                         |     |
|-------------|-------------|-----------|-------|---|-----|
|             |             |           |       |   |     |
| PEEDS CUNIT | S/HOP):     |           |       |   |     |
| ABBIT - 130 | YOU - 130   |           |       |   |     |
|             |             |           |       |   |     |
|             |             |           |       | CLOSEST APPROACH:                         |     |
| ABBIT       | POSITION:   | ( -190,   | 450)  | AND DIRECTION: 203                        |     |
| 00'         | POSITION:   | ( 0,      | 0)    | AND DIRECTION:? 135                       |     |
| 0P#: 2      | DISTANCE 10 | RABBIT:   | 377   | CLOSEST APPROACH:                         | 377 |
| ABBIT       | POSITION:   | ( -310,   | 399)  | AND DIRECTION: 130<br>AND DIRECTION:? 135 |     |
| 00          | POSITION:   | ( -92,    | 92)   | AND DIRECTION:? 135                       |     |
| OP#: 3      | DISTANCE TO | RABBIT:   | 378   | CLOSEST APPROACH:                         | 377 |
|             |             |           |       |   |     |
| OU          | POSITION:   | ( -184,   | 184)  | AND DIRECTION: 11<br>AND DIRECTION:? 90   |     |
| 0P#: 4      | DISTANCE TO | RABBIT:   | 225   | CLOSEST APPROACH:                         | 225 |
| ABBIT       | POSITION:   | ( -266.   | 524)  | AND DIRECTION: 314                        |     |
| 00          | POSITION:   | ( -184,   | 314)  | AND DIRECTION:? 135                       |     |
| 0P#: 5      | DISTANCE TO | RABBIT:   | 103   | CLOSEST APPROACH:                         | 89  |
| ABBIT       | POSITION:   | ( -175,   | 430)  | AND DIRECTION: 274                        |     |
| 00          | POSITION:   | ( -276,   | 406)  | AND DIRECTION:? 0                         |     |
| 0P#: 6      | DISTANCE TO | RABBIT:   | 107   | CLOSEST APPROACH:                         | 57  |
| ABBIT       | POSITION:   | ( -166,   | 300)  | AND DIRECTION: 72<br>AND DIRECTION:? 225  |     |
| OU          | POSITION:   | ( -146,   | 406)  | AND DIRECTION:? 225                       |     |
| 0P#: 7      | DISTANCE TO | RABBIT:   | 157   | CLOSEST APPROACH:                         | 38  |
| ABBIT       | POSITION:   | ( -126.   | 424)  | AND DIRECTION: 218<br>AND DIRECTION: 7 0  |     |
| 00          | POSITION:   | ( -238,   | 314)  | AND DIRECTION: 7 0                        |     |
| 0P#: 8      | DISTANCE TO | RASBIT:   | 125   | CLOSEST APPROACH:                         | 68  |
| ABBIT       | POSITION:   | ( -229,   | 344)  | AND DIRECTION: 134<br>AND DIRECTION:? 170 |     |
| 00          | POSITION:   | ( -108,   | 314)  | AND DIRECTION:? 170                       |     |

DADDIT CHACE

### Roadrace

You are the driver of a race car on the notorious NY Route 20. You'll have to drive 5 miles with ½ gallon of gas, while keeping alert for changes in the road conditions, other cars, etc.

At the start you pick your car and course. During the race you control braking and acceleration.

Watch out for passing another car! If you try to go the same speed he's going, you're going to meet a Greyhound bus head-on!

The game is tough to win. I usually wipe out in a curve or run out of gas. You might want to increase your MPG rating...look at line 870.

Good luck!

This program originally appeared in *Creative Computing*, Jan/Feb 1975.

RUN

ROADRACE CREATIVE COMPUTING MORRISTOWN NEW JERSEY

#### THIS IS THE PITTSFIELD-ALBANY ROAD RALLY

WELCOME TO THE FIRST ANNUAL PITTSFIELD-ALBANY ROAD RALLY. YOU'LL BE DRIVING RT. 20. TRYING TO WIN THE RACE AND STAY ALIVE IN THE BARGIN. GOOD LUCK!!

YOY HAVE YOUR CHOICE OF: (1) A VW; (2) 283 NOVA; (3) Z-28; OR (4) FERRARI

CHOOSE THE CAR YOU WANT BY THE NUMBER IN FRONT OF IT. REMEMBER, THE BETTER THE CAR, THE MORE GAS IT USES. WHICH CAR? 3

NOW YOU CHOOSE WHICH COURSE YOU WANT TO RACE ON. THE EASIEST COURSE IS NUMBER 1, AND IS THE STRAIGHTEST ROUTE. NUMBER 5 CONSISTS MOSTLY OF TURNS AND TWISTS. WHICH ROUTE DO YOU WANT? 1

YOU WILL NEED TO TRAVEL 5 MILES WITH .5 GALLONS OF GAS. YOUR STATUS WILL BE SHOWN EACH 10 SECONDS. AFTER EACH STATUS CHECK YOU WILL BE ASKED FOR A NEW RATE OF GAS. A RATE OF +10 IS HARD ACCELERATION, AND -10 IS HARD BRAKING ANY NUMBER IN BETWEEN IS ALLOWABLE.

PRESENT VELOCITY = 0 NO. OF GALLONS = .5 NO. OF MILES = 0 TIME PASSED = 0 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 10

ROAD CONDITIONS:CLEAR AND STRAIGHT

PRESENT VELOCITY = 70 NO. OF GALLONS = .47 NO. OF MILES = .152174 TIME PASSED = 10 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 2

ROAD CONDITIONS: VECHICLE AHEAD 1000 FEET

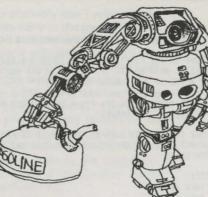
PRESENT VELOCITY = 55 NO. OF GALLONS = .464 NO. OF MILES = .271739 TIME PASSED = 20 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 10

ROAD CONDITIONS: VECHICLE PASSED BY 75 MPH

PRESENT VELOCITY = 102 NO. OF GALLONS = .434 NO. OF MILES = .493478 TIME PASSED = 30 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 10

ROAD CONDITIONS: VECHICLE AHEAD 1000 FEET

PRESENT VELOCITY = 130 NO. OF GALLONS = .404 NO. OF MILES = .776087 TIME PASSED = 40 SECONDS WHAT IS YOUR NEW RATE OF GAS ? -5



ROAD CONDITIONS:VECHICLE BEING PASSED GREYHOUND BUS IN OTHER LANE DOING 64 MPH CRASH VELOCITY = 105 WHERE IS YOUR FUNERAL BEING HELD ?

YOU WANT TO TRY AGAIN, RIGHT !!!! 1-YES, 2-NO? 1 WHICH CAR? 3

WHICH ROUTE DO YOU WANT? 5

PRESENT VELOCITY = 0 NO. OF GALLONS = .5 NO. OF MILES = 0 TIME PASSED = 0 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 10

ROAD CONDITIONS: WARNING: CURVE AHEAD

PRESENT VELOCITY = 70 NO. OF GALLONS = .47 NO. OF MILES = .152174 TIME PASSED = 10 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 0

ROAD CONDITIONS: THROUGH CURVE

PRESENT VELOCITY = 41 NO. OF GALLONS = .47 NO. OF MILES = .241304 TIME PASSED = 20 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 7

ROAD CONDITIONS: WARNING: CURVE AHEAD

PRESENT VELOCITY = 73 NO. OF GALLONS = .449 NO. OF MILES = .4 TIME PASSED = 30 SECONDS WHAT IS YOUR NEW RATE OF GAS ? -1

ROAD CONDITIONS: THROUGH CURVE

PRESENT VELOCITY = 36 NO. OF GALLONS = .449 NO. OF MILES = .478261 TIME PASSED = 40 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 10

ROAD CONDITIONS: CLEAR AND STRAIGHT

PRESENT VELOCITY = 91 NO. OF GALLONS = .419 NO. OF MILES = .676087 TIME PASSED = 50 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 5

ROAD CONDITIONS: WARNING: CURVE AHEAD

PRESENT VELOCITY = 88 NO. OF GALLONS = .404 NO. OF MILES = .867391 TIME PASSED = 60 SECONDS WHAT IS YOUR NEW RATE OF GAS ? -4

ROAD CONDITIONS: THROUGH CURVE

PRESENT VELOCITY = 23 NO. OF GALLONS = .404 NO. OF HILES = .917391 TIME PASSED = 70 SECONDS WHAT IS YOUR NEW RATE OF GAS ? 7

ROAD CONDITIONS: WARNING: CURVE AHEAD

PRESENT VELOCITY = 62 NO. OF GALLONS = .383 NO. OF MILES = 1.05217 TIME PASSED = 80 SECONDS WHAT IS YOUR NEW RATE OF GAS ? -1

ROAD CONDITIONS:ARE TERRIBLE 16 WAS THE SPEED THROUGH THE CURVE 29 WAS YOUR SPEED, BY THE WAY WHERE IS YOUR FUNERAL BEING HELD ?

133

```
LIST
10 PRINT TAB(27);"ROADRACE"
20 PRINT TAB(15): "CREATIVE COMPUTING MORRISTOWN NEW JERSEY"
30 PRINT
40 PRINT
50 PRINT
100 PRINT "
                   THIS IS THE PITTSFIELD-ALBANY ROAD RALLY"
120 PRINT
130 PRINT "WELCOME TO THE FIRST ANNUAL PITTSFIELD-ALBANY ROAD RALLY."
140 PRINT "YOU'LL BE DRIVING RT. 20. TRYING TO WIN THE RACE AND"
150 PRINT "STAY ALIVE IN THE BARGIN. GODD LUCK!!
160 PRINT
170 PRINT "YOY HAVE YOUR CHOICE OF: (1) A VW; (2) 283 NOVA;"
180 PRINT "(3) Z-28; OR (4) FERRARI"
190 PRINT
200 PRINT "CHOOSE THE CAR YOU WANT BY THE NUMBER IN FRONT OF IT."
210 PRINT "REMEMBER, THE BETTER THE CAR, THE MORE GAS IT USES."
220 PRINT "WHICH CAR":
230 INPUT C1
240 LET C1=INT(C1)
250 IF C1 > 4 THEN 280
260 IF C1 < 1 THEN 280
270 6010 300
280 PRINT "INVALID CAR NUMBER. NEW CAR ":
290 GOTO 230
300 PRINT
310 IF N2=1 THEN 345
320 PRINT "NOW YOU CHOOSE WHICH COURSE YOU WANT TO RACE ON."
330 PRINT "THE EASIEST COURSE IS NUMBER 1, AND IS THE STRAIGHTEST"
340 PRINT "ROUTE. NUMBER 5 CONSISTS MOSTLY OF TURNS AND TWISTS."
345 PRINT "WHICH ROUTE DO YOU WANT";
350 INPUT C2
360 LET C2=INT(C2)
380 IF C2 < 1 THEN 410
390 IF C2 > 5 THEN 410
400 GOTO 430
410 PRINT "INVALID COURSE NUMBER. NEW CHOICE ":
420 GOTO 350
430 IF N2=1 THEN 490
435 PRINT
440 PRINT "YOU WILL NEED TO TRAVEL 5 MILES WITH .5 GALLONS OF GAS."
450 PRINT "YOUR STATUS WILL BE SHOWN EACH 10 SECONDS. AFTER EACH "
460 PRINT "STATUS CHECK YOU WILL BE ASKED FOR A NEW RATE OF GAS. "
470 PRINT "A RATE OF +10 IS HARD ACCELERATION, AND -10 IS HARD BRAKING"
480 PRINT "ANY NUMBER IN BETWEEN IS ALLOWABLE."
490 FOR I=1 TO C1
500 READ B.M.S
510 LET B=B/10
520 NEXT I
530 LET A1=.5
540 LET M1=0
550 LET C1=C1/2
560 LET V=0
570 PRINT
580 LET R1=0
590 LET T=0
600 LET D=0
610 LET Q1=0
620 PRINT "PRESENT VELOCITY =";V;" NO. OF GALLONS =";A1
630 PRINT "NO. OF MILES =";M1;" TIME PASSED =";T;"SECONDS"
640 IF M1>= 5 THEN 1460
650 PRINT "WHAT IS YOUR NEW RATE OF GAS ":
660 INPUT G
670 IF 6 < -10 THEN 700
680 IF 6 > 10 THEN 700
690 GOTO 720
700 PRINT "NOT VALID. NEW RATE ";
710 GOTO 660
720 IF 6 < 9 THEN 780
730 LET Z=Z+1
740 IF Z> 4 THEN 760
750 GOTO 790
760 PRINT "YOUR ENGINE BLEW. YOU GOT HIT BY A PISTON."
770 GOTO 1270
780 | FT 7=0
790 LET V=INT(B*G-M*V+V)
800 LET T=T+10
810 PRINT
820 PRINT "ROAD CONDITIONS:";
830 IF V > 0 THEN 850
840 LET V=0
850 LET M1=M1+V/460
860 IF G<0 THEN 890
870 LET A1=A1-(G*S)/5000
```

```
880 IF A1< 0 THEN 1380
890 IF R1=1 THEN 1050
900 IF Q1=1 THEN 980
910 LET Q=INT((C2+1)*RND(1))
920 LET R=INT((3.75-C2)*RND(1))
930 IF R > 0 THEN 1290
940 IF Q > 0 THEN 1340
950 PRINT "CLEAR AN STRAIGHT"
960 PRINT
970 GOTO 620
980 LET H=INT(15+35!*RND(1))
990 LET H=H+5*C1
1000 IF V>H THEN 1500
1010 PRINT "THROUGH CURVE"
1020 PRINT
1030 LET 01=0
1040 GOTO 620
1050 LET E=E-(V-D)*3!
1060 IF E < 0 THEN 1100
1070 PRINT "VECHICLE ";E;" FEET AHEAD"
1080 PRINT
1090 GOTO 620
1100 IF V-D < 5 THEN 1180
1110 PRINT "VECHICLE PASSED BY ":
1120 LET D=V-D
1130 PRINT D:
1140 PRINT "MPH"
1150 PRINT
1160 LET R1=0
1170 GOTO 620
1180 PRINT "VECHICLE BEING PASSED "
1190 LET D=INT(25+40*RND(1))
1200 PRINT "GREYHOUND BUS IN OTHER LANE ";
1210 PRINT "DOING ";
1220 PRINT D;
1230 PRINT " MPH ":
1240 LET D=V+D
1250 PRINT "CRASH VELOCITY = ";D
1270 PRINT "WHERE IS YOUR FUNERAL BEING HELD ?"
1280 GOTD 1560
1290 PRINT "VECHICLE AHEAD 1000 FEET"
1300 PRINT
1310 LET D=INT(25+35*RND(1))
1320 LET R1=1
1330 GOTO 620
1340 PRINT " WARNING: CURVE AHEAD "
1350 LET Q1=1
1360 PRINT
1370 GOTO 620
1380 PRINT "EXCELLENT BUT WAIT!"
1390 PRINT
1400 PRINT "YOU RAN OUT OF GAS"
1410 GOTO 1550
1420 PRINT "BUT SOME HOW YOU HADE IT"
1430 PRINT
1440 LET R1=0
1450 GOTO 620
1460 PRINT
1470 PRINT
1480 PRINT "YOU MADE IT (LUCKY) !!!!!!!"
1490 GOTO 1560
1500 PRINT "ARE TERRIBLE"
1510 LET H=H-5*C1
1520 PRINT H;" WAS THE SPEED THROUGH THE CURVE"
1530 PRINT V;" WAS YOUR SPEED, BY THE WAY ";
1540 GOTO 1270
1550 PRINT "YOU LEAD FOOTED $23'7$2$2824((2$2$'$($(($3'2#2#21)
1560 PRINT "YOU WANT TO TRY AGAIN, RIGHT !!!!"
1570 PRINT "1-YES, 2-NO";
1580 INPUT V
1590 IF V=2 THEN 1620
1600 N2=1
1610 GOTO 1640
1620 PRINT "CHICKEN"
1630 GOTO 1700
1640 RESTORE
1650 GOTO 220
1660 DATA 45,.53,10
1665 DATA 60,.5,13
1670 DATA 70,.41,15
1680 DATA 80,.39,18
1700 END
Ok
```



The game of Rotate is played on a four-by-four board filled randomly with the letters A through P. In a sense it is like the little plastic games with sliding pieces bearing the numbers 1-15 or letters A-0.

The object of the game is to put the letters in alphabetical order. This is done by rotating groups of four letters clockwise one position. The group to be rotated is specified by the positional number of the letter in the upper lefthand corner of the group. You are also given one special move which permits you to exchange any two adjacent

LIST

5 PRINT TAB(26);"ROTATE" 8 PRINT TAB(20);"CREATIVE COMPUTING" 10 PRINT TAB(18); "MORRISTOWN, NEW JERSEY": PRINT: PRINT: PRINT 11 DIM B(16), B\$(16) 12 INPUT "INSTRUCTIONS"; AS: PRINT: IF LEFTS (AS, 1) ="N" THEN 140 15 PRINT "IN THIS GAME THE BOARD IS LAID OUT AS FOLLOWS:" 25 FOR I=1 TO 16:B(I)=I:NEXT 30 PRINT:FOR I=1 TO 13 STEP 4 35 PRINT TAB(2); B(I); TAB(6); B(I+1); TAB(10); B(I+2); TAB(14); B(I+3) 40 NEXT I:PRINT 45 PRINT "BOARD POSITIONS ARE OCCUPIED RANDONLY BY THE LETTERS A TO P." 50 PRINT "THE OBJECT OF THE GAME IS TO ORDER THE LETTERS BY ROTATING" 50 PRINT "THE UBJECT OF THE GAME IS TO ORDER THE LETTERS BY ROTATING" 55 PRINT "ANY FOUR LETTERS CLOCKWISE ONE POSITION. YOU SPECIFY THE" 60 PRINT "UPPER LEFT POSITION OF THE FOUR YOU WISH TO ROTATE, I.E.," 65 PRINT "VALID MOVES ARE 1, 2, 3, 5, 6, 7, 9, 10 AND 11." 70 PRINT "CONSEQUENTLY, IF THE BOARD LOOKED LIKE:" 75 FOR I=1 TO 16:B\$(1)=CHR\$(I+64):NEXT:B\$(2)="C":B\$(3)="G" 80 B\$(6)="B":B\$(7)="F":GOSUB 400 85 PRINT "AND YOU ROTATED POSITION 2, THE BOARD WOULD BE:" 90 FOR I=2 TO 7:B\$=CHR\$(I+64):NEXT I:GOSUB 400 95 PRINT "AND YOU WOULD WIN !":PRINT 100 PRINT "YOU ALSO GET ONE 'SPECIAL' MOVE PER GAME WHICH YOU MAY DR" 105 PRINT "MAY NOT NEED. THE SPECIAL MOVE ALLOWS YOU TO EXCHANGE" 110 PRINT "ANY TWO ADJACENT LETTERS IN A ROW. TO MAKE THIS MOVE," 115 PRINT "INPUT A '-1' AS YOUR MOVE AND YOU WILL BE ASKED FOR THE" 120 PRINT "POSITIONS OF THE TWO LETTERS TO EXCHANGE. REMEMBER --" 125 PRINT "ONLY ONE SPECIAL HOVE PER GAME!":PRINT 130 PRINT "TO GIVE UP AT ANY TIME, TYPE A 'O'.":PRINT:PRINT "GOOD LUCK ! ":PRINT 140 FOR I=1 TO 16:B\$(I)="0":NEXT I 150 FOR I=1 TO 16 160 T\$=CHR\$(INT(16\*RND(1)+65)) 165 FOR J=1 TO I 170 IF BS(J)=TS THEN 160 175 NEXT J 180 B\$(I)=T\$:NEXT I 190 M=0:S=0:PRINT "HERE'S THE STARTING BOARD ... ": GOSUB 400 200 INPUT "POSITION TO ROTATE"; I: IF I=0 THEN PRINT: PRINT: GOTO 140 205 IF I=-1 THEN 510 210 IF I=4 OR I=8 OR I>12 THEN PRINT "ILLEGAL. AGAIN...":GOTO 200 220 H=H+1:T\$=B\$(I) 230 B\$(I)=B\$(I+4):B\$(I+4)=B\$(I+5):B\$(I+5)=B\$(I+1):B\$(I+1)=T\$ 240 60SUB 400 305 FOR I=1 TO 16 310 IF CHR\$(I+64)<>B\$(I) THEN 200 315 NEXT I 320 PRINT:PRINT "YOU ORDERED THE BOARD IN";H;" MOVES. ":M1=M1+M:G=G+1 325 PRINT CHR\$(7):FOR I=1 TO 15 330 PRINT: INPUT "PLAY AGAIN"; AS: IF LEFTS (AS, 1)="Y" THEN 140 340 PRINT: PRINT "YOU PLAYED"; 6;" GAMES AND ORDERED THE BOARD IN AN AVERA GF\* 350 PRINT "OF";M1/G;" MOVES PER GAME.":PRINT:60TO 999 400 PRINT:FOR I=1 TO 13 STEP 4 410 PRINT B\$(I)" "B\$(I+1)" "B\$(I+2)" "B\$(I+3) 420 NEXT I:PRINT:RETURN 510 INPUT "EXCHANGE WHICH TWO POSITIONS";X,Y 520 IF X<>Y+1 AND X<>Y-1 THEN PRINT "ILLEGAL. AGAIN ... ": 6010 510 530 S=S+1:IF S>1 THEN PRINT "ONLY ONE SPECIAL MOVE PER GAME.": GOTO 200 540 T\$=B\$(X):B\$(X)=B\$(Y):B\$(Y)=T\$:GOTO 240 999 END HNDB OK.

letters. You probably don't want to use this move too early in the game; indeed, sometimes it's not necessary at all, and since you get it only one time, once you use it you can't recover. Your only move then is to type a zero to give up.

Typically, a game will take from 20 to 30 moves to win. I haven't figured out the worst possible case (assuming an intelligent method of play); I'd be happy to hear from a reader on this. Have fun!

Rotate was written by me, David Ahl, and first appeared in Creative Computing, Sep/Oct 1977.

RUN

ROTATE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

#### INSTRUCTIONS? YES

IN THIS GAME THE BOARD IS LAID OUT AS FOLLOWS:

2 3 7 8 10 11 1 6 5 9 12 13 14 15 16

BOARD POSITIONS ARE OCCUPIED RANDONLY BY THE LETTERS A TO P. THE OBJECT OF THE GAME IS TO ORDER THE LETTERS BY ROTATING ANY FOUR LETTERS CLOCKWISE ONE POSITION. YOU SPECIFY THE UPPER LEFT POSITION OF THE FOUR YOU WISH TO ROTATE, I.E., VALID MOVES ARE 1, 2, 3, 5, 6, 7, 9, 10 AND 11. CONSEQUENTLY, IF THE BOARD LOOKED LIKE:

ACGD EBFH IJKL MNOP

AND YOU ROTATED POSITION 2, THE BOARD WOULD BE:

ACGD EBFH IJKL HNOP

AND YOU HOULD HIN !

YOU ALSO GET ONE 'SPECIAL' MOVE PER GAME WHICH YOU MAY OR MAY NOT NEED. THE SPECIAL MOVE ALLOWS YOU TO EXCHANGE ANY TWO ADJACENT LETTERS IN A ROW. TO MAKE THIS MOVE, INPUT A '-1' AS YOUR MOVE AND YOU WILL BE ASKED FOR THE PORTIONE OF TWO FURLY AND YOU WILL BE ASKED FOR THE POSITIONS OF THE TWO LETTERS TO EXCHANGE. REMEMBER -ONLY ONE SPECIAL MOVE PER GAME!

TO GIVE UP AT ANY TIME, TYPE A 'O'.

GOOD LUCK !

HERE'S THE STARTING BOARD ....

EOCL KSMA FIPJ HNDB POSITION TO ROTATE? 3 EOMC KGAL FIPJ

| POSITION TO ROTATE? 2  | POSITION TO ROTATE? 3                 | POSITION TO ROTATE? 7  | (Later in the Game }                        |
|------------------------|---------------------------------------|------------------------|---|
| E 6 0 C                | ABDE                                  | ABCD                   |   |
| KAHL                   | GNCK                                  | EFGH                   |   |
| FIPJ<br>HNDB           | FOPL<br>HIHJ                          | M O P N<br>I J L K     | POSITION TO ROTATE? 9                       |
|                        |                                       |                        | ABCD  |
| POSITION TO ROTATE? 1  | POSITION TO ROTATE? 3                 | POSITION TO ROTATE? 10 | E F G H<br>J I K P                          |
| KEOC                   | ABCD                                  | ABCD                   | MLNO  |
| A G M L<br>F I P J     | GNKE<br>FOPL                          | E F G H<br>H J O N     | POSITION TO ROTATE? 10                      |
| HNDB                   | HINJ                                  | ILPK                   |   |
| POSTION TO DOTATE      | DACITION TO DOTATES 7                 | POSITION TO ROTATE? 11 | A B C D<br>E F G H                          |
| POSITION TO ROTATE? 1  | POSITION TO ROTATE? 7                 | FUSITION TO ROTATE! IT | JLIP  |
| AKOC                   | ABCD                                  | ABCD                   | NNKO  |
| GENL<br>FIPJ           | GNPK<br>FOLE                          | EFGH<br>NJPO           | POSITION TO ROTATE? 9                       |
| HNDB                   | HINJ                                  | ILKN                   |   |
| POSITION TO ROTATE? 11 | POSITION TO ROTATE? 7                 | POSITION TO ROTATE? 10 | A B C D<br>E F G H                          |
| in the normality in    | · · · · · · · · · · · · · · · · · · · |                        | MJIP  |
| AKOC<br>GEML           | A B C D<br>G N L P                    | A B C D<br>E F G H     | NLKO  |
| FIDP                   | FOEK                                  | MLJO                   | POSITION TO ROTATE? 10                      |
| HNBJ                   | HINJ                                  | IKPN                   |   |
| POSITION TO ROTATE? 10 | POSITION TO ROTATE? 6                 | POSITION TO ROTATE? 9  | A B C D<br>E F G H                          |
|                        |                                       |                        | NLJP  |
| AKOC<br>GEML           | A B C D<br>G O N P                    | A B C D<br>E F G H     | NKIO  |
| FNIP                   | FELK                                  | IMJO                   | POSITION TO ROTATE? 10                      |
| HBDJ                   | HINJ                                  | KLPN                   | ABCD  |
| POSITION TO ROTATE? 10 | POSITION TO ROTATE? 5                 | POSITION TO ROTATE? 9  | EFGH  |
|                        | ABCD                                  |                        | MKLP  |
| AKOC<br>GENL           | FGNP                                  | A B C D<br>E F G H     | OLIN  |
| FBNP                   | EOLK                                  | KIJO                   | POSITION TO ROTATE? 10                      |
| HDIJ                   | HINJ                                  | LMPN                   | ABCD  |
| POSITION TO ROTATE? 6  | POSITION TO ROTATE? 5                 | POSITION TO ROTATE? 11 | EFGH  |
| AKOC                   | ABCD                                  | ABCD                   | MIKP<br>NJLO                                |
| GBEL                   | EFNP                                  | EFGH                   |   |
| FNMP<br>HDIJ           | OGLK<br>HINJ                          | KIPJ<br>LHNO           | POSITION TO ROTATE? 9                       |
|                        |                                       |                        | ABCD  |
| POSITION TO ROTATE? 2  | POSITION TO ROTATE? 10                | POSITION TO ROTATE? 11 | EFGH<br>NHKP                                |
| ABKC                   | ABCD                                  | ABCD                   | JILO  |
| GEOL<br>FNHP           | EFNP<br>DIGK                          | E F G H<br>K I N P     | POSITION TO ROTATE? 9                       |
| HDIJ                   | HHLJ                                  | LHOJ                   | FUSTION ID RUTHIE! 7                        |
| POSITION TO ROTATE? 10 | POSITION TO ROTATE? 9                 | POSITION TO ROTATE? 10 | A B C D<br>E F G H                          |
| FUSITION TO NOTATE: TO | TUSTITUR TO RUTHTE: 7                 | PUSITION TO ROTATE! TO | JNKP  |
| ABKC                   |                                       | ABCD                   | INLO  |
| GEOL<br>FDNP           | HOGK                                  | EFGH<br>KMIP           | POSITION TO ROTATE? 9                       |
| LHIH                   | HILJ                                  | LONJ                   |   |
| POSITION TO ROTATE? 6  | POSITION TO ROTATE? 9                 | POSITION TO ROTATE? 11 | A B C D<br>E F G H                          |
|                        |                                       |                        | IJKP  |
| A B K C<br>G D E L     | A B C D<br>E F N P                    | A B C D<br>E F G H     | MNLO  |
| FNOP                   | MHGK                                  | KHNI                   | POSITION TO ROTATE? 11                      |
| HINJ                   | IOLJ                                  | LOJP                   | ABCD  |
| POSITION TO ROTATE? 6  | POSITION TO ROTATE? 11                | POSITION TO ROTATE? 11 | EFGH  |
|                        | ABCD                                  | ABCD                   |   |
| A B K C<br>G N D L     | EFNP                                  | EFGH                   | nnur  |
| FOEP                   | M H L G                               | KMJN                   | POSITION TO ROTATE? -1                      |
| HINJ                   | IOJK                                  | LOPI                   | EXCHANGE WHICH TWO POSITIONS? 11,12         |
| POSITION TO ROTATE? 7  | POSITION TO ROTATE? 10                | POSITION TO ROTATE? 10 | ABCD  |
| ABKC                   | ABCD                                  | ABCD                   | E F G H<br>I J K L                          |
| GNED                   | EFNP                                  | EFGH                   | HNOP  |
| F D P L<br>H I M J     | M O H G<br>I J L K                    | KOMN<br>LPJI           |   |
|                        |                                       |                        | YOU ORDERED THE BOARD IN 66 MOVES.          |
| POSITION TO ROTATE? 3  | POSITION TO ROTATE? 7                 | POSITION TO ROTATE? 11 |   |
| ABEK                   | ABCD                                  | ABCD                   | PLAY AGAIN? NO                              |
| GNDC                   | E F H N<br>N O G P                    | EFGH<br>Kojm           | YOU PLAYED 1 GAMES AND ORDERED THE BOARD IN |
| F O P L<br>H I H J     | IJLK                                  | LPIN                   | AN AVERAGE OF 66 MOVES PER GAME.            |
|                        |                                       |                        |   |

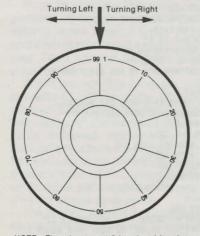
OK

Safe

In a sense, this is another game in the "guess a mystery number" family. However, it has quite a different "twist." In this game, you are trying to open a safe by turning or twisting a dial back and forth between one and ninety-nine or ninety-nine and one.

The instructions shown in the sample run are very complete. However, one hint that will help you when you start playing is that it is usually best to start at ninety-nine when going to the right because if you get a click, the number must be close. If not, you can step it down by eights or tens until you get the first click and then judge from there.

Safe was created and written by Kevin Ashley.



NOTE: There is no spot 0 (zero) and it spins back past the last number automatically as in most locks. RUN

#### SAFE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

#### DO YOU WANT DIRECTIONS? YES

YOU ARE A BURGULAR AND HAVE ENCOUNTERED A SAFE. YOU MUST OPEN THE SAFE TO GET THE SECRET PLANS THAT YOU CAME FOR. TO DO THIS , YOU MUST ENTER THE NUMBER OF WHAT YOU WANT THE DIAL TURNED TO, THE COMPUTER WILL ACT AS THE SAFE AND WILL HELP YOU BY BIVING A SORT OF CLUE, THAT IS YOU WILL'HEAR' A CLICK AT EVENLY SPACED NOTCHES AS YOU MOVE TO THE PROPER NUMBER. THERE ARE FOUR OF THEM BEFORE THE FINAL CLICK IS 'HEARD'. AFTER THE FINAL ONE IS HEARD, YOU WILL GO ON TO "HEARD". AFTER THE FIRAL UNE IS HEARD, TOO WILL GO ON THE THE NEXT NUMBER. THE COMPUTER WILL'SAY" CLICK' FOR EACH NOTCH THAT YOU PASS AND "\*CLICK\*\*" WHEN YOU REACH THE PROPER NUMBER. IF YOU PASS IT OR TAKE LONGER THAN TEN TRIES ON ANY ONE NUMBER, YOU WILL ACTIVATE THE ALARM. REMEMBER THAT WHEN YOU TURN THE DIAL TO THE LIGHT. THE NUMBERS 60 FROM 1 -99 ,AND WHEN YOU GO TO THE RIGHT, THE ARE YOU READY? YES DKAY, THEN LET'S START ? 89 7 79 CLICK ? 69 CLICK 7 59 CLICK CLICK ? 49 CLICK CLICK CLICK 35 CLICK CLICK CLICK CLICK ? 32 CLICK CLICK CLICK

CLICK

? 10 7 30 7 50 7 60 7 70 7 80 ? 90 7 95 ? 97 CLICK CLICK 7 21 CLICK LIST 1 PRINT TAB(28)"SAFE" 2 PRINT TAB(20)"CREATIVE COMPUTING" 3 PRINT TAB(18) "MORRISTOWN, NEW JERSEY" 4 PRINT 5 PRINT 6 PRINT 10 DIM A1(4) 20 PRINT"DO YOU WANT DIRECTIONS"; 30 INPUT AS 40 IF AS="YES" THEN 80 50 IF AS="NO" THEN 250 60 PRINT"ANSWER YES OR NO" 70 GOTO 20

100 PRINT"YOU ARE A BURGULAR AND HAVE ENCOUNTERED A SAFE. YOU MUST" 110 PRINT"OPEN THE SAFE TO GET THE SECRET PLANS THAT YOU CAME FOR."

120 PRINT"TO DO THIS , YOU MUST ENTER THE NUMBER OF WHAT YOU WANT THE" 130 PRINT" DIAL TURNED TO, THE COMPUTER WILL ACT AS THE SAFE AND WILL"

150 PRINT"A CLICK AT EVENLY SPACED NOTCHES AS YOU MOVE TO THE PROPER"

180 PRINT"THE NEXT NUMBER. THE COMPUTER WILL'SAY' 'CLICK' FOR EACH" 190 PRINT"NOTCH THAT YOU PASS AND '\*\*CLICK\*\*' WHEN YOU REACH THE" 200 PRINT"PROPER NUMBER. IF YOU PASS IT OR TAKE LONGER THAN TEN TRIES"

140 PRINT"HELP YOU BY GIVING A SORT OF CLUE, THAT IS YOU WILL HEAR"

160 PRINT"NUMBER. THERE ARE FOUR OF THEM BEFORE THE FINAL CLICK IS" 170 PRINT"'HEARD'. AFTER THE FINAL ONE IS HEARD, YOU WILL GO ON TO"

210 PRINT "ON ANY ONE NUMBER, YOU WILL ACTIVATE THE ALARM." 220 PRINT"REMEMBER THAT WHEN YOU TURN THE DIAL TO THE LEFT, THE"

250 PRINT"OKAY, START TO THE RIGHT, SHHHHHHH!!!!!!!!!!!!!!

240 PRINT"NUMBERS GO FROM 99-1"

390 PRINT"OKAY, THEN LET'S START"

410 DN SGN(M-A)+2 GOTO 500,570,420

260 A=INT(RND(1)\*81)+10

270 B=INT(RND(1)\*81)+10

280 C=INT(RND(1)\*81)+10

300 INPUT AS

330 PRINTA; B;C

350 FOR M=1 TO 4

420 FOR K=1 TO 4

430 IF M>A1(K) THEN 460 440 PRINT"CLICK"

470 IF J>=10 THEN 500

360 A1(M)=(5-M)\*L/5+A

340 L=100-A

370 NEXT M

400 INPUT M

460 NEXT K

480 J=J+1

380 J=1

290 PRINT"ARE YOU READY";

310 IF AS="YES" THEN 340 320 IF AS<>"WHAT"THEN 990

230 PRINT"NUMBERS GO FROM 1 -99 ,AND WHEN YOU GO TO THE RIGHT, THE"

80 PRINT

90 PRINT

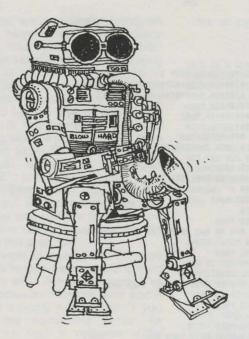
7 30 CLICK CLICK CLICK CLICK 7 29 CLICK CLICK CLICK CLICK 7 27 CLICK CLICK CLICK CLICK THE SENSOR HAS BEEN TRIGGERED LEAVE WHILE YOU CAN BEFORE THE POLICE GET HERE. WANT TO TRY THE SAME SAFE? YES ARE YOU READY? YES OKAY, THEN LET'S START 7 25 CLICK CLICK CLICK CLICK ? 23 CLICK

7 19 THE SENSOR HAS BEEN TRIGGERED LEAVE WHILE YOU CAN BEFORE THE POLICE GET HERE. WANT TO TRY THE SAME SAFE? YES ARE YOU READY? YES OKAY, THEN LET'S START 7 21 \*\* CLICK \*\* AND NOW TO THE LEFT ? 5 CLICK CLICK CLICK CLICK THE SENSOR HAS BEEN TRIGGERED LEAVE WHILE YOU CAN BEFORE THE POLICE GET HERE. WANT TO TRY THE SAME SAFE? YES ARE YOU READY? YES OKAY, THEN LET'S START \*\* CLICK \*\*

> 490 GOTO 400 500 PRINT"THE SENSOR HAS BEEN TRIGGERED" 510 PRINT"LEAVE WHILE YOU CAN BEFORE THE" 520 PRINT"POLICE GET HERE." 530 PRINT WANT TO TRY THE SAME SAFE"; 540 INPUT AS 550 IF AS="YES" THEN 280 560 GOTO 250 570 PRINT"\*\* CLICK \*\*" 580 L=L+B 590 FOR K=1 TO 4 600 A1(K)=K\*L/5+B 610 NEXT K 620 PRINT"AND NOW TO THE LEFT" 630 J=1 640 INPUT M 650 DN SGN(M-A)+2 GOTD 660,500,680 660 ON SGN(M-B)+2 GOTO 670,760,500 670 M=H+100 680 FOR K=1 TO 4 690 IF M<A1(K) THEN 720 700 PRINT"CLICK" 710 A1(K)=200 720 NEXT K 730 IF J>=10 THEN 500 740 J=J+1 750 GOTO 640 760 PRINT"\*\* CLICK \*\*" 770 L=(100-C)+R 780 FOR K=1 TO 4 790 A1(K)=B+100-K\*L/5 800 NEXT K 810 PRINT"AND NOW TO THE RIGHT AGAIN" 820 J=1 830 INPUT M 840 ON SGN(M-B)+2 GOTO 860,500,850 850 ONSGN(M-C)+2 GOTD 500,950,870 860 M=M+100 870 FOR K=1 TO 4 880 IF M>A1(K) THEN 910 890 PRINT"CLICK" 900 A1(K)=-200 910 NEXT K 920 IF J>=10 THEN 500 930 J=J+1 940 GOTO 830 950 PRINT"\*\* CLICK \*\*...YOU OPENED IT" 960 PRINT"BUT OH, OH, HE MUST HAVE MOVED IT" 970 PRINT"TRY THE ONE OVER THERE" 980 GOTO 250 990 END Ok

AND NOW TO THE LEFT 7 1 CLICK CLICK CLICK CLICK ? 5 7 6 ? 7 ? 8 ? 12 ? 14 ? 16 ? 18 \*\* CLICK \*\* AND NOW TO THE RIGHT AGAIN ? 95 CLICK CLICK CLICK 7 89 CLICK ? 83 \*\* CLICK \*\*...YOU OPENED IT BUT OH, OH, HE MUST HAVE MOVED IT TRY THE ONE OVER THERE OKAY, START TO THE RIGHT, SHHNHHH!!!!!!!!!! ARE YOU READY? NO Ok





This program tests your knowledge of different types of musical scales. It generates 11 types of scales: major, natural minor, harmonic minor, Hungarian minor, dorian, phygian, lydian, mixolydian, locrian, and whole tone.

Prior to running the program, test yourself off line on a sheet of paper by writing down several types of scales and 8 notes starting at a note chosen by you. Then run the program to check your answers.

When you run this program, you will be asked, "Which type of scale is wanted?" Respond by typing the first two letters of the name of the desired scale followed immediately by the desired key. Use a lower case 'b' for the flat and use '#' for the sharp. Sample in puts would be *phe* for phrygian starting on E, *maf#* for major on F-sharp, and *whg* for whole tone on G.

The author, Marvin S. Thostenson, is at the School of Music, University of Iowa. Scales first appeared in *Creative Computing*, Mar/Apr 1977. RUN

#### SCALES CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

ELEVEN SCALE TYPES -- MAJOR, MINOR, MODAL, AND WHOLE TONE

This program prints in letter names one octave upward, the major, the natural, harmonic, melodic, and Hungarian minors, the dorian, phrygian, lydian, mixolydian, and locrian modes, and the whole tone scales.

Use a 3- or 4-character input: the first 2 char's are the scale type, and the 3rd char'r is the single letter tonic, or the last two char's are the tonic degree or the key signature. SCALE TYPES-- ma ma ma me do ph ly mi lo hu and wh Imput either a tonic or a signature. EXAMPLES: macb lydb mieb whgb maf# hagM mea# loc# doc phd hue

WHICH TYPE OF SCALE IS WANTED? whf#

```
SCALE ASKED ------Whole tone scale on F#
```

ANSWER (in letter names) ------

FR BR AR BR D E FR

WHICH TYPE OF SCALE IS WANTED? nae

SCALE ASKED -----Nat'l minor scale on E

ANSWER (in letter mames) ------

EFISABCDE

WHICH TYPE OF SCALE IS WANTED? WHO

SCALE ASKED ------Whole tone scale on C

ANSWER (in letter names) ------

C D E FE Ab Bb C

WHICH TYPE OF SCALE IS WANTED? hu2#

```
SCALE ASKED ------Hung'n minor scale on B
```

ANSWER (in letter names) ------

B CH D EN FM G AN B

WHICH TYPE OF SCALE IS WANTED? stop

list

10 PRINT TAB(26);"SCALES" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18); "MORRISTOWN, NEW JERSEY" 40 PRINT:PRINT:PRINT 100 A=0:B=0:C=0:D=0:E=0:H=0:K=0:L=0:M=0:N=0:0=0 200 4=4 210 PRINT "ELEVEN SCALE TYPES -- MAJOR, MINOR, MODAL, AND WHOLE TONE" 215 PRINT 220 PRINT "This program prints in letter names one octave upward, "; 225 PRINT "the major," 227 PRINT "the natural, harmonic, melodic, and Hungarian minors, the" 228 PRINT "dorian, phrygian, lydian, mixolydian, and locrian modes, and" 229 PRINT "the whole tone scales.":PRINT 230 PRINT "Use a 3- or 4-character input: the first 2 char's are the sca 10" 232 PRINT "type, and the 3rd char'r is the single letter tonic; or the" 234 PRINT "last two char's are the tonic degree or the key signature." 240 PRINT "SCALE TYPES -- wa ma ha we do ph ly wi lo hu and wh' 250 PRINT "Input either a tonic or a signature." 260 PRINT "EXAMPLES: macb lydb mieb whgb naf# hag# mea# loc# doc phd hue 270 BS="SCALE ASKED -----" 280 C\$="ANSWER (in letter names) ------290 DS="STRUCTURE--300 K\$=" tetrachords' 310 U=1 320 PRINT:PRINT:PRINT TAB(8); "WHICH TYPE OF SCALE IS WANTED"; 330 INPUT AS 340 N=LEN(AS) 350 IF A\$="stop" THEN 1290 360 E\$="manahamedophlymilohuwh" 370 FOR X=1 TO 22 STEP 2 380 IF LEFT\$(A\$,2)=MID\$(E\$,X,2) THEN 400 390 NEXT X 400 Q=(X+1)/2 410 A0\$=A\$ 420 X=ASC(LEFT\$(A0\$,1))-32 425 A0\$=CHR\$(X)+HID\$(A0\$,2,N) 430 READ D\$ 440 A0\$=A\$ 450 X=ASC(LEFT\$(A0\$,1))-32 455 A0\$=CHR\$(X)+MID\$(A0\$,2,N) 460 IF LEFT\$(D\$,2)=LEFT\$(A0\$,2) THEN 480 470 GOTO 430 480 J\$=D\$ **490 RESTORE** 500 IF N<>3 THEN 530 520 A\$=LEFT\$(A\$,3)+" 530 IF Q=1 OR Q=7 OR Q=11 THEN 550 540 IF Q>=2 AND Q<=6 OR Q=9 OR Q=10 THEN 570 550 Y=1 560 GOTO 580 570 Y=2 580 F\$="bxexaxdxgxcxfxb#e#a#d#g#c#f#b e a d g c f " 585 F\$=F\$+"bbebabdbgbcbfbbdedadddgdcd" 590 G\$="BxExAxDxGxCxFxB#E#A#D#G#C#F#B E A D G C F " 595 G\$=G\$+"BbEbAbBbGbCbFbBdEdAdDdGdCd" 600 ON Y 60TO 610,630 610 H#="5t4t3t2t1t7x6x5x4x3x2x1x7#6#5#4#3#2#1#0#1b2b3b4b5b6b7b1d2d3d4d" 615 H\$=H\$+"5d6d7d" 620 GOTO 640 630 H\$="2t1t7x6x5x4x3x2x1x7#6#5#4#3#2#1#0#1b2b3b4b5b6b7b1d2d3d4d" 1290 END 635 H\$=H\$+"5d6d7d8d9d DK

650 IF MID\$(A\$,3,2)=MID\$(F\$,V,2) THEN 680 660 IF MID\$(A\$,3,2)=MID\$(H\$,V,2) THEN 680 670 NEXT V 680 C1\$=MID\$(6\$.V.2) 690 T=T+1 700 IF T=9 THEN 1160 710 DN T 60T0 720,740,790,840,890,940,990,1040 720 R=0 730 GOTO 1060 740 IF Q=6 OR Q=9 THEN 770 750 R=-4 760 GOTO 1060 770 R=10 780 GOTO 1060 790 IF Q=1 OR Q=7 OR Q=8 OR Q=11 THEN 820 800 R=6 810 GOTO 1060 820 R=-8 830 GOTO 1060 840 IF Q=7 OR Q=10 OR Q=11 THEN 870 850 R=2 860 GOTO 1060 870 R=-12 880 GOTO 1060 890 IF Q=9 OR Q=11 THEN 920 900 R=-2 910 GOTO 1060 920 R=12 930 GOTO 1060 940 IF Q=1 OR Q=4 OR Q=5 OR Q=7 OR Q=8 THEN 970 950 R=8 960 GOTO 1060 970 R=-6 980 GOTO 1060 990 IF Q=1 OR Q=3 OR Q=4 OR Q=7 OR Q=10 THEN 1020 1000 R=4 1010 GOTO 1060 1020 R=-10 1030 GOTO 1060 1040 R=0 1060 IF Q=11 AND T=5 THEN 1090 1070 IF U=1 THEN I\$=MID\$(G\$,V+R,2):60T0 1100 1075 I\$=LEFT\$(I\$,U-1)+MID\$(6\$,V+R,2) 1080 GOTO 1100 1090 GOTO 690 1100 I\$=LEFT\$(I\$,U+1)+" " 1110 IF MID\$(I\$,U+1,1)="d" THEN 1130 1120 GOTO 1140 1130 I\$=LEFT\$(I\$,U)+"bb" 1140 U=U+4 1150 GOTO 490 1160 PRINT:PRINT TAB(3), B\$; J\$; C1\$:PRINT 1170 PRINT TAB(3);C\$:PRINT 1180 PRINT:PRINT TAB(8);1\$ 1190 C1\$="":I\$="":G\$="" 1220 Q=0:T=0:R=0 1230 PRINT 1240 GOTO 310 1250 DATA "Major scale on ","Nat'l minor scale on " 1255 DATA "Harm'c minor scale on ","Mel'c minor scale on ' 1260 DATA "Dorian mode on ","Phrygian mode on " 1270 DATA "Lydian mode on ","Mixolydian mode on ","Locrian mode or 1280 DATA "Hung'n minor scale on ","Whole tone scale on

640 FOR V=1 TO 68 STEP 2

### Schmoo

Schmoos are imaginary creatures who love being splattered with juicy mudballs. You, being a schmoo lover, try to make schmoos happy by tossing mudballs at them. It will help you in playing this game to know a little bit about grids and angles like in the X,Y coordinate system 2,-3 means right 2 and down 3. If 0 degrees is the angle coinciding with the positive X axis, then 2,-3 would be in the fourth quadrant and would correspond to angles between 270 and 360 degrees.

If you're pretty good, you can "splat the schmoo" in about eight tries; but don't cheat and use the formula. And don't expect me to tell you where it's hidden in the program!

If you want to extend the Schmoo game, you might want to add a third dimension with flying schmoos. The program shouldn't be too hard and it would be a really neat game. If you want to try something easier, fix Schmoo so that it requires initial velocities as well as angles. You could even make a low-gravity (lunar version) of Schmoo.

Schmoo was conceived and written by Frederick H. Bell at the University of Pittsburgh. It first appeared in *Creative Computing*, Sep/Oct 1975.

### RUN SCHNOO

CREATIVE COMPUTING MORRISTOWN NEW JERSEY

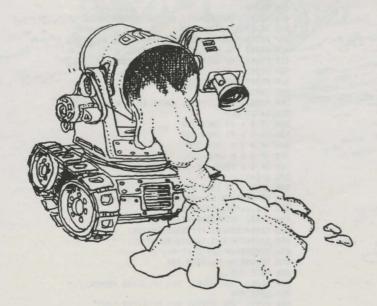
THIS IS A NEW SCHMOD GAME. SCHMODS ARE INAGINARY CREATURES WHO LOVE BEING SPLATTED WITH JUICY MUD BALLS. YOU, BEING A SCHMOD LOVER, TRY TO MAKE SCHMODS HAPPY BY TOSSING MUD BALLS AT THEM. YOU HAVE A MECHANICAL MUD SLINGER THAT WILL SLING MUD TO A MAXIMUM DISTANCE OF 46,500 INCHES. YOUR JOB IS TO SET THE MUD SLINGER AT THE CORRECT ELEVATION (0 TO 90) AND THE CORRECT DIRECTIONAL ANGLE (0 TO 360) TO SPLAT THE SCHMOD. A HIT WITHIN 100 INCHES OF THE SCHMOD WILL SPLATTER HIM.

COORDINATES OF THE SCHMOD ARE ( 29007 , 9760 ).

MUD SLINGER ELEVATION? 39 DIRECTIONAL ANGLE OF MUD SLINGER? 34 YOU MISSED THE SCHHOD AT ( 29007 , 9760 ). YOUR MUD MIT ( 37707 , 25433 ).

MUD SLINGER ELEVATION? 23 DIRECTIONAL ANGLE OF MUD SLINGER? 31 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 28671 , 17227 ).

MUD SLINGER ELEVATION? 12 DIRECTIONAL ANGLE OF MUD SLINGER? 30 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 16379 , 9456 ).



MUD SLINGER ELEVATION? 18 DIRECTIONAL ANGLE OF MUD SLINGER? 27 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 24352 , 12408 ).

MUD SLINGER ELEVATION? 20 DIRECTIONAL ANGLE OF MUD SLINGER? 25 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD MIT ( 27088 , 12631 ).

MUD SLINGER ELEVATION? 20 DIRECTIONAL ANGLE OF MUD SLINGER? 21 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 27903 , 10711 ).

MUD SLINGER ELEVATION? 22 DIRECTIONAL ANGLE OF MUD SLINGER? 20 YOU MISSED THE SCHNOO AT ( 29007 , 9760 ). YOUR MUD HIT ( 30353 , 11047 ).

MUD SLINGER ELEVATION? 21 DIRECTIONAL ANGLE OF MUD SLINGER? 17 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR NUD HIT ( 29754 , 9096 ).

MUD SLINGER ELEVATION? 20 DIRECTIONAL ANGLE OF MUD SLINGER? 18 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 28426 , 9236 ).

MUD SLINGER ELEVATION? 21 DIRECTIONAL ANGLE OF MUD SLINGER? 18 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29591 , 9614 ).

MUD SLINGER ELEVATION? 20 DIRECTIONAL ANGLE OF MUD SLINGER? 19 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 28260 , 9730 ).

MUD SLINGER ELEVATION? 22 DIRECTIONAL ANGLE OF MUD SLINGER? 18 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 30720 , 9781 ).

MUD SLINGER ELEVATION? 21 DIRECTIONAL ANGLE OF MUD SLINGER? 17.5 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29673 , 9356 ).

MUD SLINGER ELEVATION? 21 DIRECTIONAL ANGLE OF MUD SLINGER? 18.4 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29523 , 9821 ).

MUD SLINGER ELEVATION? 21 DIRECTIONAL ANGLE OF MUD SLINGER? 18.8 YOU MISSED THE SCHHOO AT ( 29007 , 9760 ). YOUR MUD HIT ( 29454 , 10026 ).

MUD SLINGER ELEVATION? 20 DIRECTIONAL ANGLE OF MUD SLINGER? 18.6 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 28327 , 9533 ).

MUD SLINGER ELEVATION? 20.3 DIRECTIONAL ANGLE OF MUD SLINGER? 18.87 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD MIT ( 28633 , 9786 ).

MUD SLINGER ELEVATION? 20.5 DIRECTIONAL ANGLE OF NUD SLINGER? 18.87 YOU MISSED THE SCHNOO AT ( 29007 , 9760 ). YOUR NUD HIT ( 28866 , 9866 ). MUD SLINGER ELEVATION? 20.68 DIRECTIONAL ANGLE OF MUD SLINGER? 18.73 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29098 , 9866 ). MUD SLINGER ELEVATION? 20.68 DIRECTIONAL ANGLE OF MUD SLINGER? 18.69 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29105 , 9846 ). MUD SLINGER ELEVATION? 20.68 DIRECTIONAL ANGLE OF HUD SLINGER? 18.71 YOU MISSED THE SCHMOD AT ( 29007 , 9760 ). YOUR MUD HIT ( 29102 , 9856 ). MUD SLINGER ELEVATION? 20.62 DIRECTIONAL ANGLE OF MUD SLINGER? 18.71 \*SCHMOD SPLATTED\* 22 MUD BALLS TOSSED. I SEE ANOTHER SCHMOD. TO SPLAT HIM, TYPE MUD. TO QUIT, TYPE QUIT. ? NUD COORDINATES OF THE SCHMOD ARE ( 6529 , 9167 ). THE SCHMOD IS HAPPY TO BE SPLATTED. TO MAKE YOU HAPPY TOO, HE WILL THROW MUD AT YOU. MUD SLINGER ELEVATION? 47 DIRECTIONAL ANGLE OF MUD SLINGER? 47 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 31635 , 33924 ). SCHMOD MUD HIT 1010 INCHES FROM YOU. MUD SLINGER ELEVATION? 10 DIRECTIONAL ANGLE OF MUD SLINGER? 47 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 10845 , 11630 ). SCHMOD MUD HIT 910 INCHES FROM YOU. MUD SLINGER ELEVATION? 7 DIRECTIONAL ANGLE OF MUD SLINGER? 51 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 7079 , 8742 ). SCHMOO MUD HIT 1155 INCHES FROM YOU. MUD SLINGER ELEVATION? 7.2

MUD SLINGER ELEVATION? 7.2 DIRECTIONAL ANGLE OF MUD SLINGER? 54 YOU MISSED THE SCHMOO AT ( 6529 , 9167 ). YOUR MUD HIT ( 6797 , 9355 ).

SCHHOO HUD HIT 786 INCHES FROM YOU. MUD SLINGER ELEVATION? 7.1 DIRECTIONAL ANGLE OF MUD SLINGER? 53.2 YOU MISSED THE SCHMOO AT ( 6529 , 9167 ). YOUR MUD HIT ( 6832 , 9133 ).

SCHHOO MUD HIT 171 INCHES FROM YOU. MUD SLINGER ELEVATION? 6.9 DIRECTIONAL ANGLE OF MUD SLINGER? 53.2 YOU MISSED THE SCHHOO AT ( 6529 , 9167 ). YOUR MUD HIT ( 6643 , 8880 ).

SCHMOD MUD HIT 380 INCHES FROM YOU. MUD SLINGER ELEVATION? 6.89 DIRECTIONAL ANGLE OF MUD SLINGER? 53.4 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 6603 , 8892 ).

SCHMOD MUD HIT 750 INCHES FROM YOU. MUD SLINGER ELEVATION? 6.86 DIRECTIONAL ANGLE OF MUD SLINGER? 53.57 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 6548 , 8872 ).

SCHMOD HUD HIT 1219 INCHES FROM YOU. MUD SLINGER ELEVATION? 6.91 DIRECTIONAL ANGLE OF MUD SLINGER? 53.54 YOU MISSED THE SCHMOD AT ( 6529 , 9167 ). YOUR MUD HIT ( 6600 , 8933 ).

SCHMOD HUD HIT 1579 INCHES FROM YOU. HUD SLINGER ELEVATION? 6.89 DIRECTIONAL ANGLE OF HUD SLINGER? 53.52 YOU MISSED THE SCHMOD AT ( 6529, 9167). YOUR MUD HIT ( 6585, 8905).

THE SCHMOD HAS SPLATTED YOU! CLEAN UP AND GOODBYE! Ok LIST 10 PRINT TAB(30);"SCHMOO" 20 PRINT TAB(15);"CREATIVE COMPUTING MORRISTOWN NEW JERSEY" 21 PRINT 22 PRINT 23 PRINT 30 PRINT "THIS IS A NEW SCHMOD GAME. SCHMODS" 32 PRINT "ARE IMAGINARY CREATURES WHO LOVE" 34 PRINT "BEING SPLATTED WITH JUICY MUD BALLS." 36 PRINT "YOU, BEING A SCHMOO LOVER, TRY TO" 38 PRINT "MAKE SCHHOOS HAPPY BY TOSSING MUD" 40 PRINT "BALLS AT THEM. YOU HAVE A" 42 PRINT "MECHANICAL MUD SLINGER THAT WILL" 44 PRINT "SLING MUD TO A MAXIMUM DISTANCE" 46 PRINT "OF 46,500 INCHES. YOUR JOB IS TO" 50 PRINT "SET THE MUD SLINGER AT THE CORRECT" 55 PRINT "ELEVATION (0 TO 90) AND THE CORRECT" 60 PRINT "DIRECTIONAL ANGLE (0 TO 360) TO SPLAT THE" 65 PRINT "SCHNOD. A HIT WITHIN 100 INCHES OF THE SCHMOO" 70 PRINT "WILL SPLATTER HIM." **75 PRINT** 90 PRINT 100 K1=0 110 Z=INT(1+RND(1)\*4-1E-08) 120 DN Z GOTO 130,140,150,160 130 P=-1 135 0=-1 138 GOTO 200 140 P=-1 145 @=1 148 GOTO 200 150 P=1 155 @=-1 158 GOTO 200 160 P=1 165 0=1 200 X=(INT(26000\*RND(1)+5000))\*P 210 Y=(INT(26000\*RND(1)+5000))\*Q 220 S=0 230 K1=K1+1 240 IF K1 < 2 THEN 400 250 R=INT(7\*RND(1)+5) 260 GOTO 400 300 PRINT "THE ELEVATION MUST BE BETWEEN 1 AND 90." 310 GOTO 500 320 PRINT "DIRECTIONAL ANGLE MUST BE FROM O TO 360." 340 GOTO 500 350 PRINT "\*SCHMOD SPLATTED\*";S;" MUD BALLS TOSSED." 351 PRINT 352 PRINT "I SEE ANOTHER SCHMOD. TO SPLAT" 354 PRINT "HIM, TYPE MUD. TO QUIT, TYPE QUIT." 356 PRINT 358 INPUT C\$ 360 IF C\$="MUD" THEN 110 361 STOP 362 PRINT "YOU MISSED THE SCHMOD AT (";X;",";Y;")." 364 PRINT "YOUR MUD HIT (";INT(X1);",";INT(Y1);")." 366 PRINT 370 IF K1 < 2 THEN 500 380 IF S >= R THEN 800 390 PRINT "SCHMOO MUD HIT ";R2;"INCHES FROM YOU." 395 GOTO 500 400 PRINT 410 PRINT "COORDINATES OF THE SCHMOD ARE (";X;",";Y;")." 415 IF K1 < 2 THEN 420 417 PRINT "THE SCHMOD IS HAPPY TO BE SPLATTED." 418 PRINT "TO MAKE YOU HAPPY TOO," 419 PRINT "HE WILL THROW MUD AT YOU." 420 PRINT 500 PRINT "MUD SLINGER ELEVATION"; 502 INPUT B 504 PRINT "DIRECTIONAL ANGLE OF MUD SLINGER"; 506 INPUT C 520 IF B = 90 THEN 700 530 IF B > 90 THEN 300 540 IF B < 1 THEN 300 550 IF C < 0 THEN 320 560 IF C > (360-(1E-08)) THEN 320 570 S=S+1 580 IF K1 < 2 THEN 595 590 R2=INT(ABS(300\*RND(1)\*(11-2\*S))+90) 595 J=3.1415926535#/180 596 D=ABS(INT(93000!\*SIN(B\*J)\*COS(B\*J))) 610 X1=D\*COS(C\*3.1415926535#/180) 620 Y1=D\*SIN(C\*3,1415926535#/180) 630 D1=SQR((X-X1)^2+(Y-Y1)^2) 640 IF 100 >= D1 THEN 350 650 GOTO 362 700 PRINT "YOU DOPE! YOU SPLATTED YOURSELF." 710 GOTO 900 800 PRINT "THE SCHMOO HAS SPLATTED YOU!" 802 PRINT "CLEAN UP AND GOODBYE!" 900 END



The object of the game of SEA BATTLE is quite simple. You are a submarine with a mission to seek out and destroy all of the enemy ships in your area, using whatever means are available. This includes torpedoes, Polaris missiles, sabotage, and suicide. The enemy, in turn, throws out depth charges in an attempt to destroy you. There are also some underwater mines which have a nasty habit of blowing you up when you run into them. Other hazards are some very hungry sea monsters lurking about who have a laste for submarine sandwiches.

I started writing this program two years ago, and finished my last modifications just recently. Of course, this doesn't mean I worked on it continuously for two years. There were some long 4-6 month stretches when I didn't do anything to it. It started out as a very simple program, and I just kept thinking of things to add to it.

I am currently a senior in Simley Senior High School in Inver Grove Heights, Minnesota, and am 18 years old. I have been working with computers since the ninth grade, and have written many programs, including this one.

This program always draws a crowd in our school computer room, even from kids who don't even know which end of a teletype to type on. I built every possible inconvenience into it, to keep people from winning too easily. I am happy to say that when a person wins now, it's headline news. There are always muttered oaths to beat the computer next time, and this alone brings me more enjoyment than playing the program.

As you can see, the program is quite long, and initially I had some storage problems, as I'm sure many of you will have, too. All I can say is to slice away at some of the more trivial commands and options until (hopefully) you cut it down to a reasonable size. If compiling space is a problem, you may have to divide the program into subprograms chained together. If you don't have this capability, you'll have to brainstorm your own ideas.

Here are some of the anomalies our HP 2000 system. Strings are dimensioned from one to 72 characters in length. Positions on the string are identified with two numbers. Ex. A\$(2,4) A\$ is the name of the string. The 2 tells the computer to begin the substring at the second character. The 4 tells the computer to end the substring at the fourth character of A\$. So, A\$(1,1) allocates the first character of A\$. I used this for identifying 'Y' and 'N' in yes/no responses.

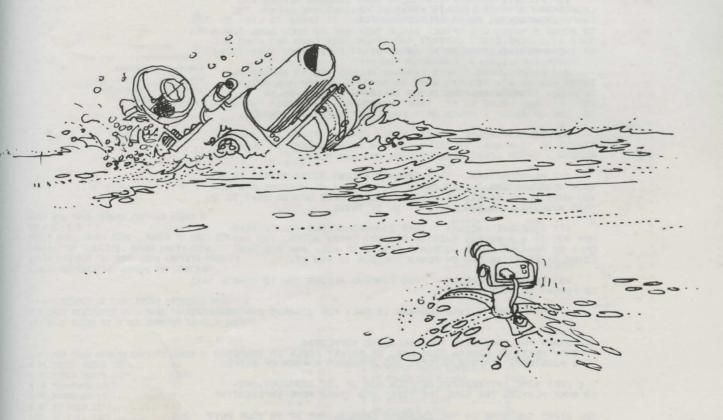
Line 590 is an example of logical operation. It tells the computer that if the expression is nonzero, to proceed to the line specified. If it is zero, it will fall through to the next line.

A slightly different type of logical operation is found in lines 3020-3050. In these lines the logical quantity is evaluated first, and if true, the quantity is set to 1. If it is false, it is set to 0. These can all be taken care of with IF-THEN statements if necessary.

I hope that the size of the program does not scare too many people away. It should be able to be made compatible with very little rewriting. If you have a few hours of free time to rewrite a little, it should be worth the effort.

I tried to throw a lot of random statements in there to make playing the game more uncertain. Cutting some of these out may save some space, if that's a problem for you.

Note: The writeup above, by Vincent Erickson, refers to the original HP version. The one presented here is in standard Microsoft Basic. Some conversion notes by Steve North are found in the listing, lines 90-230.



THIS IS THE GAME OF SEA BATTLE!!! THE OBJECT OF THE GAME IS TO DESTROY ALL OF THE ENEMY SHIPS IN YOUR 20 BY 20 AREA WITH THE VARIOUS WEAPONS IN YOUR SUBMARINE'S ARSENAL. YOU MUST DO THIS, HOWEVER, WITHOUT LETTING THE ENEMY DESTROY YOU FIRST!!

THERE ARE SEVERAL INTERESTING HAZARDS IN THE GAME. THEY INCLUDE: .. DEPTH CHARGES FROM NEARBY ENEMY SHIPS.

- .. VERY HUNGRY SEA MONSTERS !! .. AND HIDDEN UNDERWATER MINES.

THE DEFTH CHARGES ARE EFFECTIVE TO ANY DEPTH, BUT THEY LOSE THEIR EFFECTIVNESS OVER DISTANCE, SO THE FARTHER YOU ARE FROM ANY SHIPS, THE BETTER!

THE SEA MONSTERS TAKE A MEANDERING COURSE THROUGH YOUR AREA THAT MAY BRING IT CLOSE ENOUGH TO ATTACK YOU, YOU RARELY SURVIVE. THEY ALSO LIKE TO EAT YOUR TORPEDOS, BUT MISSILES WILL KILL THEM.

THE ENEMY SHIPS MOVE ON EVERY TURN, IN A FIXED COURSE, UNLESS THEY ENCOUNTER OBSTACLES. THEY WILL GET BLOWN UP BY MINES, AND GET EATEN BY SEA MONSTERS TOO.

YOU HAVE TEN ORDERS THAT YOU MAY GIVE. THEY ARE:

#0: NAVIGATION - THIS COMMAND ALLOWS YOU TO MOVE IN A PARTICULAR DIRECTION AND DISTANCE ACROSS YOUR AREA. THE 8 1 2 DIRECTION IS DETERMINED BY THE GRAPH AT LEFT. THERE \'/ ARE 8 DIRECTIONS TO MOVE IN, AND THEY ARE THE SAME ARE 8 DIRECTIONS TO MOVE IN, AND THEY ARE THE SAME 7-#-3 ANYTIME YOU ARE ASKED FOR A COURSE. FOR EXAMPLE, /'\ TO MOVE NORTH, YOU WOULD USE COURSE #1. THE COMPUTER 6 5 4 WILL ALSO ASK FOR AN AMOUNT OF POWER. IT TAKES 100 UNITS OF POWER TO MOVE YOUR SUB 1 SPACE. BEWARE OF OBSTACLES!! IF YOU USE MORE THAN 1000 UNITS IN A TURN, THERE IS AN OVERLOAD DANGER, SO BE VERY CAREFUL!!

#1: SONAR - THIS COMMAND HAS TWO OPTIONS. OPTION #1 GIVES DIRECTIONAL INFORMATION, SHOWING THE DIRECTIONS AND DISTANCES IN WHICH THERE ARE ENEMY SHIPS. THIS IS USEFUL FOR SHOOTING AT LONG RANGES, WHERE IT IS DIFFICULT TO TELL IF A SHIP IS IN DIRECT LINE.

OPTION #0 PRINTS OUT A MAP OF YOUR AREA IN A SQUARE. (IT USES SYMBOLS FOR THE MAP) '\*' INDICATES DRY LAND, '\$' IS AN UNDERWATER MINE, '\S/' IS AN ENEMY SHIP. '-#-' IS A SEA MONSTER. '!H!' IS YOUR HEADQUARTERS, AND FINALLY, '(X)' IS YOU!!!

EVERY SO OFTEN, A '.' WILL APPEAR INSIDE THE SCREEN, THIS IS A SONAR MALFUNCTION, AND SO THE OBJECT THERE ISN'T IDENTIFIED. IF YOU ARE ABOVE 50 FEET, WAVES WILL SHOW UP AS '.'.

#2: TORPEDO CONTROL - THIS COMMAND ALLOWS YOU TO SHOOT 1 OF YOUR 10 TORPEDOS AT ENEMY SHIPS. THE COMPUTER WILL ONLY REQUIRE THE DIRECTION TO SHOOT, USING THE INDICATOR ABOVE. THEY HAVE A RANGE OF 7-13 SPACES. ONE TORPEDO GETS ONE SHIP.

\$3: POLARIS MISSILE CONTROL - THIS COMMAND ALLOWS YOU TO LAUNCH ONE OF YOUR FOLARIS MISSILES AGAINST THE ENEMY. THE COMPUTER WILL ASK FOR A COURSE AND FUEL. IT TAKES 75 LBS. OF FUEL TO BOOST A MISSILE 1 SPACE. SINCE THEY ARE SO MUCH MORE POWERFUL, THEY WILL COMPLETELY DESTROY THE SPACE THEY LAND ON, PLUS ALL OF THE IMMEDIATELY ADJACENT ONES. MISSILES DESTROY EVERYTHING!!!

#4: MANUEVERING - THIS COMMAND ALLOWS YOU TO CHANGE THE DEPTH YOU'RE AT, YOU MAY WANT TO DO THIS IF YOU ARE BADLY DAMAGED, BECAUSE REPAIRS GO ON TWICE AS QUICKLY BELOW 2500 FT. AND ABOVE 50 FT. THAN IN BETWEEN. YOU START THE GAME AT 100 FT. YOU USE UP ABOUT 1 POWER UNIT FOR EVERY 2 FT. YOU CHANGE.

#5: STATUS/DAMAGE REPORT - THIS COMMAND GIVES YOU THE STATUS OF YOUR SUB. IT TELLS YOU HOW MUCH IS LEFT IN YOUR ARSENAL, WHICH ITEMS ARE DAMAGED, AND HOW MUCH.

#6: HEADQUARTERS - THIS COMMAND ALLOWS SCUBA DIVERS FROM YOUR HEADQUARTERS TO REPLENISH YOUR SUFFLY OF WEAPONS AND MEN. YOU MUST BE AT 50 FT. OR LESS, AND 2 OR LESS SPACES AWAY TO DO THIS HOWEVER, AND YOU CAN ONLY DO IT TWICE.

\$7: SABOTAGE (SCUBA) - THIS COMMAND ALLOWS YOU TO SEND MEN OUT ON A SABOTAGE MISSION AGAINST ENEMY SHIPS. YOU MAY ONLY GO AGAINST SHIPS WITHIN 3 SPACES OF YOU, AND YOU MUST LEAVE AT LEAST 10 MEN ON BOARD THE SUB TO RUN IT.

#8: FOWER CONVERSION - THIS COMMAND ALLOWS YOU TO CHANGE FUEL TO FOWER, OR VICE-VERSA.

\$9: SURRENDER - THIS COMMAND IS ONLY FOR COWARDS AND TRAITORS !!

YOU START THE GAME WITH THE FOLLOWING SUPPLIES: 6000 UNITS OF FOWER, 2500 LBS. OF ROCKET FUEL, 10 TORPEDOS 3 MISSILES, 1 HEADQUARTERS, AND A RANDOM NUMBER OF SHIPS.

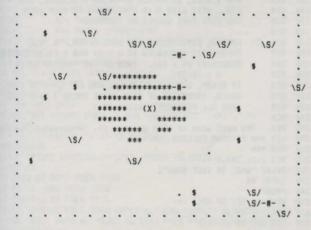
I LEFT SOME INTERESTING DETAILS OUT OF THE INSTRUCTIONS, TO MAKE PLAYING THE GAME THE FIRST FEW TIMES MORE INTERESTING.

YOU START THE GAME IN THE ISLAND'S LAGOON, AND IT IS YOUR DUTY TO SEEK OUT AND DESTROY THE ENEMY AT ALL COSTS !!!

#### WHAT IS YOUR NAME? CAPTAIN AHAB

YOU MUST DESTROY 18 ENEMY SHIPS TO WIN CAPTAIN AHAB.

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1 OPTION #? 0



WHAT ARE YOUR ORDERS CAPTAIN AHAB? 3 COURSE (1-8)? 1 FUEL (LBS.)? 450 YOU DESTROYED 2 ENEMY SHIPS CAPTAIN AHAB!!! DEFTH CHARGES OFF STARBOARD SIDE CAPTAIN AHAB!!! LIGHT, SUPERFICIAL DAMAGE CAPTAIN AHAB.

---\*\*\* RESULT OF LAST ENERY MANUEVER \*\*\*---

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1 OPTION #? 0

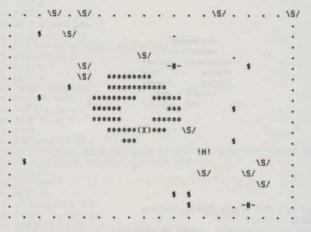
. \S/\S/\S/ . . \S/ . . . . . \S/ . \S/\S/\S/\S/ -#-15/ \*\*\*\*\*\*\*\* \$ \5/ \*\*\*\*\*\*\*\* \*\*\*\*\*\*\*\* \*\*\*\*\* 3 \*\*\*\*\* (X) \*\*\* 4 \*\*\*\*\*\* \*\*\*\*\* \*\*\*\*\*\* 15/ \*\*\* 1 \*\*\* 111 \$ \S/ 15/-#--#-.

WHAT ARE YOUR ORDERS CAPTAIN AHAB? O COURSE (1-8)? 5 POWER AVAILABLE= 5550 . POWER TO USE? 200 NAVIGATION COMPLETE. POWER LEFT= 5350 . DEPTH CHARGES OFF PORT SIDE CAPTAIN AHAB!!! LIGHT, SUPERFICIAL DAMAGE CAPTAIN AHAB.

---\*\*\* RESULT OF LAST ENEMY MANUEVER \*\*\*---\*\*\* Ship destroyed by a mine captain ahab!!! \*\*\* Ship eaten by a sea monster captain ahab!!

WANT DAMAGE REPORT? YES DAMAGE (+ GOOD, O NUETRAL. - BAD) ITEM ENGINES -.888657 SONAR 1.58997 TORPEDOS 4.77987 MISSILES 1.87385 MANUEVERING 3.22063 4.54389 STATUS HEADQUARTERS 2.90217 SABOTAGE 3.82123 CONVERTER 0 YOU ARE AT LOCATION ( 12 , 10 ).

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1 OPTION #? 0



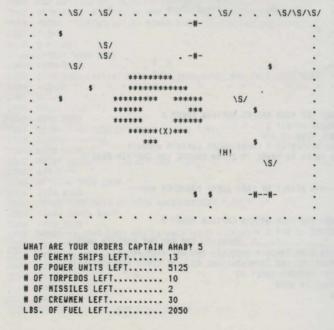
WHAT ARE YOUR ORDERS CAPTAIN AHAB? O ENGINES ARE UNDER REPAIR CAPTAIN AHAB.

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 7 NO SHIPS IN RANGE CAPTAIN AHAB.

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 4 NEW DEPTH? 50 MANUEVER COMPLETE. POWER LOSS= 25 DEPTH CHARGES OFF PORT SIDE CAPTAIN AHAB!!! LIGHT, SUPERFICIAL DAMAGE CAPTAIN AHAB.

---\*\*\* RESULT OF LAST ENEMY MANUEVER \*\*\*---\*\*\* SHIP DESTROYED BY A MINE CAPTAIN AHAB!!!

WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1 OPTION #? 0



```
LIST
---*** RESULT OF LAST ENENY MANUEVER ***---
                                              CLATER
                                                                         10
                                                                             PRINT TAR(33) :"SFARAT"
                                                 IN THE
                                                                             PRINT TAB(15); "CREATIVE COMPUTING MORRISTOWN, NEW JERSEY"
                                                                         20
                                                   RUN
WHAT ARE YOUR ORDERS CAPTAIN AHAB? O
                                                                         30
                                                                             PRINT:PRINT:PRINT
COURSE (1-8)? 2
                                                                         40
                                                                             REM
POWER AVAILABLE= 2021 . POWER TO USE? 500
                                                                         50
                                                                             REM PROGRAM BY VINCENT ERIKSON
NAVIGATION COMPLETE, POWER LEFT= 1521
                                                                         60
                                                                             REM
                                                                                    ORIGINALLY IN H.P. BASIC
NO SHIPS IN RANGE TO DEPTH CHARGE YOU CAPTAIN AHAB!!
                                                                         70
                                                                             REM
                                                                                    CONVERTED TO MICROSOFT BASIC BY S.N.
                                                                         80
                                                                             REM
                                                                         90
                                                                             REM
                                                                                   NOTE THE FOLLOWING ABOUT CONVERSIONS:
                                                                         100
                                                                              REM
                                                                                    1) RESTORE (LINE NUMBER) MEANS TO SET THE DATA
---*** RESULT OF LAST ENERY MANUEVER ***---
                                                                              REM
                                                                                        POINTER TO THE SPECIFIED LINE. THIS IS ONLY
                                                                         110
                                                                         120
                                                                              REM
                                                                                        PRESENT IN TRS-80 LEVEL II AND CP/M BASIC.
                                                                                        FOR OTHERS, IMPROVISE BY USING A RESTORE, AND
FOR...NEXT WITH READ STATEMENTS TO SKIP OVER
                                                                              REM
WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1
                                                                         130
OPTION #? 0
                                                                         140
                                                                              REM
                                                                         150
                                                                              REM
                                                                                        THE DATA THAT SHOULD BE IGNORED.
                                                   · \$/\$/\$/
                                                                         160
                                                                              REM
                                                                         170
                                                                              REM
                                                                                    2) LOGICAL EXPRESSIONS ARE USED OFTEN. A TRUE
                           (X)
                                                                         180
                                                                              REM
                                                                                        EXPRESSION EVALUATES AS A (-1) AND A FALSE EXPRESSION
       4
                                                                         190
                                                                                        EVALUATES AS A (0). THUS IF THE PROGRAM SAYS:
                                                                              REM
                                                                         200
                                                                              REM
                                                                                            X = (D < 50)
                                                   5
                                                                         210
                                                                              REM
                                                                                        IT MEANS, LET X=0 IF D>=50, AND LET X=-1 IF D<50.
                                                                         220
                                                                              REM
                                                                                        AGAIN, IMPROVISE IF YOUR BASIC DOESN'T HAVE THIS
                      ********
                                                                         230
                                                                              REM
                      *******
                                                                                        (BUT ALL MICROSOFT BASICS DO.)
                                                                         240
                                                                              REM
                   ********
       $
                               *****
                                                                                     The real name of this program is, "Underwater Pie Lob"
                                                                         245
                                                                              REM
                  ******
                                 ***
                                                5
                                                                         250
                                                                              REM *** PROGRAM FOLLOWS ***
                  ******
                               *****
                                                                              RE# ***
                                                                         260
                     ******
                               ***
                                                                         270
                                                                              DIM A(20,20),D(9)
               -#-
                        ***
                               -#-
                                                $
                                                                         280
                                                                              PRINT "WHAT IS YOUR NAME":
                                                                         290
                                                                              INPUT NS
    4
                                                                         300
                                                                              PRINT
                                                                         310
                                                                              REM *** SET UP AREA ***
                                                                              FOR I=1 TO 20
                                                                         320
                                      4
                                                                              FOR J=1 TO 20
                                                                         322
                                                                              A(I,J)=0
                                                                         324
                                                                              NEXT J
                                                                         326
                                                                         328
                                                                              NEXT I
WHAT ARE YOUR ORDERS CAPTAIN AHAB? O
                                                                         330
                                                                              REM *** ISLAND ***
                                                                         340
                                                                              RESTORE 6300
COURSE (1-8)? 1
POWER AVAILABLE= 1471 . POWER TO USE? 100
                                                                         350
                                                                              FOR X=7 TO 13
NAVIGATION COMPLETE. POWER LEFT= 1371
                                                                         360
                                                                              FOR Y=7 TO 12
                                                                         370
                                                                              READ A(X,Y)
NO SHIPS IN RANGE TO DEPTH CHARGE YOU CAPTAIN AHAB!!
                                                                         380
                                                                              NEXT Y
                                                                         390
                                                                              NEXT X
---*** RESULT OF LAST ENEMY MANUEVER ***---
                                                                              REM *** SUB ***
                                                                         400
                                                                         410
                                                                             S1=10: S2=10
                                                                         420
                                                                              A(S1,S2)=2
WHAT ARE YOUR ORDERS CAPTAIN AHAB? 1
                                                                              REM *** ENEMY SHIPS ***
                                                                         430
                                                                              S=INT(RND(1)+16)+15
OPTION #? O
                                                                         440
                                                                         450
                                                                              RESTORE 6090
                                                                              FOR X=1 TO (INT(RND(1)*4)+1)*2-1
                      . . (X) . . . . \S/ .
                                                  . \S/\S/
                                                                         460
                                                                         470
                                                                              READ D8, D9
                                                                         480
                                                                              NEXT X
                                                                         490
                                                                              FOR X=1 TO S
                                                                         500
                                                                              X1=INT(RND(1)*20)+1
                                                                         510
                                                                              X2=INT(RND(1)*20)+1
                                                                         520
                                                                              IF A(X1, X2) <>0 THEN 500
                      *******
                                                                         530
                                                                              A(X1,X2)=3
                      ******
                               *****
                                                                              NEXT X
                   ********
                                                                         540
                                                                              PRINT "YOU MUST DESTROY";S;"ENEMY SHIPS TO WIN ";N$;"."
                   ******
                                  ***
                                                                         550
                                                                         560
                                                                              REM *** HEADQUARTERS ***
                   *****
                               ******
                                                                              S3=INT(RND(1)#20)+1
                                                                         570
                     *****
                               ***
                                                                              S4=INT(RND(1)+20)+1
                         ***-#--#--#-
                                                                         580
            -#-
                                                4
                                                                              IF A($3,$4)<>0 THEN 570
                                                                         590
                                                                              A($3,$4)=4
    5
                                                                         600
                                                                              REN *** UNDERWATER MINES ***
                                                                         610
                                                                              FOR X=1 TO INT(RND(1)*8)+8
                                                                         620
                                                                         630
                                                                              X1=INT(RND(1)+20)+1
                                   $
                                                                         640
                                                                              X2=INT(RND(1)*20)+1
                                                                         650
                                                                               IF A(X1, X2) <>0 THEN 630
                                                                         660
                                                                              A(X1,X2)=5
                                                                         670
                                                                               NEXT X
WHAT ARE YOUR ORDERS CAPTAIN AHAB? 3
                                                                         680
                                                                              REM *** SEA MONSTERS ***
                                                                         690
                                                                               FOR X=1 TO 4
COURSE (1-8)? 3
                                                                         700
                                                                              X1=INT(RND(1)*18)+2
FUEL (LBS.)? 675
                                                                               X2=INT(RND(1)*18)+2
YOU DESTROYED 3 ENEMY SHIPS CAPTAIN AHAB!!!
                                                                         710
                                                                         720
                                                                               IF A(X1, X2) <>0 THEN 700
NO SHIPS IN RANGE TO DEPTH CHARGE YOU CAPTAIN AHAB!!
                                                                         730
                                                                              A(X1,X2)=6
                                                                         740
                                                                              RESTORE 6090
                                                                         750
                                                                              FOR Y=1 TO INT(RND(1)*8)+1
---*** RESULT OF LAST ENENY MANUEVER ***---
                                                                         760
                                                                              READ M1, M2
                                                                         770
                                                                              NEXT Y
                                                                         780
                                                                              NEXT X
WHAT ARE YOUR ORDERS CAPTAIN AHAB? 2
                                                                              REM *** SET STARTING VALUES ***
COURSE (1-8)? 3
                                                                         790
                                                                              FOR I=1 TO 9
 .....!....!..OUCH!!! YOU GOT ONE CAPTAIN AHAB!!
                                                                         800
GOOD WORK CAPTAIN AHAB!!! YOU GOT THEM ALL!!!
                                                                         802
                                                                              D(I)=0
PROMOTION AND COMMENDATIONS WILL BE GIVEN IMMEDIATELY !!!
                                                                         804
                                                                              NEXT I
WANT ANOTHER GAME? NO
                                                                         810
                                                                              C=30
                                                                         820
                                                                              P=6000
Break in 6250
                                                                         830
                                                                              F=2500
Ok
                                                                         840
                                                                              T=10
                                                                         850
                                                                              M=3
```

M D=100 10 07=7 1800 PRINT H REM \*\*\* COMMAND SECTION \*\*\* 1810 IN PRINT: PRINT: PRINT "WHAT ARE YOUR ORDERS ";N\$; 1820 IN INPUT D 1830 10 DH INT(0+1) GOTO 1040,1680,2220,2680,3250,3410,3700,3880,4400,4660 1840 10 PRINT "THE COMMANDS ARE:" 1850 HO PRINT " #0: NAVIGATION" 1860 HO PRINT " GOTO 1950 #1: SONAR" 1870 150 PRINT " #2: TORPEDO CONTROL" 1880 HO PRINT " #3: POLARIS MISSILE CONTROL" 1890 TO PRINT " #4: MANUEVERING" 1900 READ AS 10 PRINT " #5: STATUS/DAMAGE REPORT" 1910 NEXT X1 HO PRINT " #6: HEADQUARTERS" 1920 100 PRINT " #7: SABOTAGE" 1930 PRINT AS; 1010 PRINT " 1940 #8: POWER CONVERSION" 1020 PRINT " 1950 NEXT Y #9: SURRENDER" 1960 PRINT 1030 GOTO 880 140 REM \*\*\* #0: NAVIGATION \*\*\* 1970 NEXT X 150 IF D(1) >= 0 THEN 1080 1980 P=P-50 160 PRINT "ENGINES ARE UNDER REPAIR ":NS:"." 1070 GOTO 880 2000 GOTO 1660 2010 180 IF C>8 THEN 1110 100 PRINT "NOT ENDUGH CREW TO MAN THE ENGINES ";N\$;"." 2020 100 GOTO 880 2022 B(I)=0 III0 D1=1-((.23+RND(1)/10)\*(-(D <= 50)))</pre> 2024 NEXT I 1120 GOSUB 6080 2030 130 PRINT "POWER AVAILABLE=";P;". POWER TO USE"; 2040 1140 INPUT P1 2050 150 IF P1<0 OR P1>P THEN 1130 READ X1, Y1 2060 160 IF P1 <= 1000 THEN 1210 2070 X3=0 170 IF RND(1)<.43 THEN 1210 2080 180 PRINT "ATOMIC PILE GOES SUPERCRITICAL ";N\$;"!!! HEADQUARTERS" 2090 190 PRINT "WILL WARN ALL SUBS TO STAY FROM RADIOACTIVE AREA!!!" 2100 2110 X3=X3+1 1200 6010 6180 2120 B(X3)=X4 1710 ¥=S1 2130 NEXT X4 1220 Y=S2 2140 1230 01=1 PRINT " 2150 1240 FOR X2=1 TO INT(INT(P1/100+.5)\*D1+.5) 2160 1250 IF X+X1>0 AND X+X1<21 AND Y+Y1>0 AND Y+Y1<21 THEN 1280 2170 1260 PRINT "YOU CAN'T LEAVE THE AREA ";N\$;"!! NEXT X4 1270 GOTO 1340 2180 1280 ON A(X+X1, Y+Y1)+1 GOTO 1290, 1330, 1630, 1390, 1440, 1470, 1490 2190 PRINT 1290 X=X+X1 2200 NEXT X 1300 Y=Y+Y1 2210 60TO 1980 1310 P=P-100 2220 1320 GOTO 1520 2230 1330 PRINT "YOU ALMOST RAN AGROUND ":N\$:"!!" 2240 1340 A(X,Y)=2 2250 GOTO 880 1350 A(S1,S2)=0 2260 1360 S1=X 2270 1370 S2=Y 2280 GOTO 880 1380 GOTO 4690 1390 IF D>50 THEN 1290 100 PRINT "YOU RAHMED A SHIP!!! YOU'RE BOTH SUNK ";N\$;"!!" 2310 GOTO 880 2320 1410 S=S-1 2330 1420 IF S=0 THEN 6260 1430 GOTO 6180 140 IF D>50 THEN 1290 2350 GOTO 6180 1450 PRINT "YOU RANMED YOUR HEADQUARTERS!! YOU'RE SUNK!!" GOSUB 6080 2360 2370 X=S1 1460 GOTO 6180 2380 Y=S2 1470 PRINT "YOU'VE BEEN BLOWN UP BY A MINE ";N\$;"!!" 1480 GOTO 6180 1470 IF RND(1)<.21 THEN 1630 1500 PRINT "YOU WERE EATEN BY A SEA MOMSIER, ";NS;"!!" 2410 1510 GOTO 6180 2420 T=T-1 1520 REM \*\*\* CHECK FOR NEARBY SEA MONSTERS \*\*\* P=P-150 2430 1530 FOR X3=X-2 TO X+2 1540 FOR Y3=Y-2 TO Y+2 2440 2450 GOTO 1660 1550 IF X3<1 DR X3>20 DR Y3<1 DR Y3>20 THEN 1610 2460 1560 IF A(X,Y) <>6 THEN 1610 2470 X = X + X 11570 IF RND(1)<.25 THEN 1500 2480 Y=Y+Y1 1580 IF 01=0 THEN 1610 2490 1590 PRINT "YOU JUST HAD A NARROW ESCAPE WITH A SEA MONSTER ";N\$;"!!" 2500 GOTO 2650 1600 01=0 2510 1610 NEXT Y3 2520 1620 NEXT X3 2530 GOTO 2420 1630 NEXT X2 2540 1640 PRINT "NAVIGATION COMPLETE. POWER LEFT=";P;"." 2550 S=S-1 1650 IF P>0 THEN 1340 2560 1660 PRINT "ATOMIC PILE HAS GONE DEAD !!! SUB SINKS, CREW SUFFOCATES" 2570 GOTO 6260 1670 GOTO 6180 2580 1680 REM \*\*\* #1: SONAR \*\*\* 2590 IF D(2) >= 0 THEN 1720 1690 2600 GOTO 2520 1700 PRINT "SONAR IS UNDER REPAIR ";N\$;"." 2610 1710 GOTO 880 2620 GOTO 2520 1720 IF C>5 THEN 1750 2630 1730 PRINT "NOT ENOUGH CREW TO WORK SONAR ";N\$;"." 2640 GOTO 2420 1740 GOTO 880 2650 NEXT X2 PRINT "OPTION #"; 1750 PRINT "DUD." 2660 1760 INPUT O 2670 GOTO 2420 1770 ON INT(0+1) GOTO 1790,2010 REM \*\*\* #3: POLARIS MISSILE CONTROL \*\*\* 2680 1780 GOTO 1750

1790 REM \*\*\* PRINT OUT MAP \*\*\* FOR X=1 TO 20 FOR Y=1 TO 20 DATA " ","\*\*\*","(X)","\S/","!H!"," \$ ","-#-" IF A(X,Y)<>0 THEN 1880 IF X<>1 AND X<>20 AND Y<>1 AND Y<>20 THEN 1880 PRINT " . "; **RESTORE 1830** FOR X1=1 TO A(X,Y)+1 IF D<50 AND RND(1)<.23 AND A(X,Y)<>1 AND A(X,Y)<>2 THEN 1860 IF RND(1)<.15 AND A(X,Y)>2 THEN 1860 1990 IF P>0 THEN 880 REM \*\*\* DIRECTIONAL INFORMATION \*\*\* FOR I=1 TO 5 PRINT "DIRECTION # OF SHIPS DISTANCES" **RESTORE 6090** FOR X=1 TO 8 FOR X4=1 TO 20 IF S1+X1\*X4<1 OR S1+X1\*X4>20 OR S2+Y1\*X4<1 OR S2+Y1\*X4>20 THEN 2140 IF A(S1+X1+X4, S2+Y1+X4) <>3 THEN 2130 IF X3=0 THEN 2200 PRINT " ";X,X3, FOR X4=1 TO X3 PRINT B(X4); REM \*\*\* #2: TORPEDO CONTROL \*\*\* IF D(3) >= 0 THEN 2260 PRINT "TORPEDO TUBES ARE UNDER REPAIR ":N\$:"." IF C >= 10 THEN 2290 PRINT "NOT ENOUGH CREW TO FIRE TORPEDO ";N\$;"." 2290 IF T THEN 2320 2300 PRINT "NO TORPEDOS LEFT ":N\$:"." IF D<2000 THEN 2360 IF RND(1)>.5 THEN 2360 2340 PRINT "PRESSURE IMPLODES SUB UPON FIRING ... YOU'RE CRUSHED!!" 2390 FOR X2=1 TO INT(7+5\*(-(D>50))-RND(1)\*4+.5) 2400 IF X+X1>0 AND X+X1<21 AND Y+Y1>0 AND Y+Y1<21 THEN 2460 PRINT "TORPEDO OUT OF SONAR RANGE....INEFFECTUAL ";N\$;"." IF P>0 THEN 4690 ON A(X+X1, Y+Y1)+1 GOTO 2470, 2510, 2650, 2540, 2580, 2610, 2630 PRINT "..!.."; PRINT "YOU TOOK OUT SOME ISLAND ":N\$:"!" A(X+X1,Y+Y1)=0 PRINT "OUCH!!! YOU GOT ONE ";N\$;"!!" IF S<>0 THEN 2520 PRINT "YOU BLEW UP YOUR HEADQUARTERS ":N\$:"!!!" S3=0: S4=0: D2=0 PRINT "BLAH!! SHOT WASTED ON A MINE ";N\$;"!!" PRINT "A SEA MONSTER HAD A TORPEDO FOR LUNCH ";N\$;"!!"

```
2690 IF D(4) >= 0 THEN 2720
2700 PRINT "MISSILE SILOS ARE UNDER REPAIR ":N$:"."
2710 GOTO 880
     IF C>23 THEN 2750
2720
2730 PRINT "NOT ENOUGH CREW TO LAUNCH A MISSILE ";N$;"."
2740
    GOTO 880
2750 IF M<>0 THEN 2780
     PRINT "NO MISSILES LEFT ";N$;"."
2760
2770 GOTO 880
2780
     IF D>50 AND D<2000 THEN 2850
2790 PRINT "RECOMMEND THAT YOU DO NOT FIRE AT THIS DEPTH ... PROCEED":
     INPUT AS
2800
      IF LEFT$(A$,1)="N" THEN 880
2810
     IF RND(1)<.5 THEN 2850
2820
2830 PRINT "MISSILE EXPLODES UPON FIRING ";N$;"!! YOU'RE DEAD!!"
2840
     GOTO 6180
2850
     GOSUB 6080
2860
     PRINT "FUEL (LBS.)";
2870
      INPUT F1
2880 IF F1>0 AND F1 <= F THEN 2910
      PRINT "YOU HAVE";F;"LBS. LEFT ";N$;"."
2890
2900 GOTO 2860
2910
      F2=INT(F1/75+.5)
2920 IF S1+X1*F2>0 AND S1+X1*F2<21 AND S2+Y1*F2>0 AND S2+Y1*F2<21 THEN 2980 3840 F=1500
    PRINT "HISSILE OUT OF SONAR TRACKING ";N$;". MISSILE LOST."
2930
2940
      M=M-1
2950
     F=F-F1
2960 P=P-300
2970
     GOTO 2440
2980 D3=0: D4=0: D5=0: D6=0
2990 FOR X=S1+X1*F2-1 TO S1+X1*F2+1
3000 FOR Y=S2+Y1*F2-1 TO S2+Y1*F2+1
3010 IF X<1 OR X>20 OR Y<1 OR Y>20 THEN 3140
3020 D3=D3-(A(X,Y)=3)
3030 D4=D4-(A(X,Y)=6)
3040
      D5=D5-(A(X,Y)=5)
3050 D6=D6-(A(X,Y)=1)
3060
     IF A(X,Y)<>4 THEN 3100
3070 PRINT "YOU'VE DESTROYED YOUR HEADQUARTERS ":N$:"!!!"
3080 D3=0: S4=0: D2=0
3090 6010 3130
3100 IF A(X,Y)<>2 THEN 3130
3110 PRINT "YOU JUST DESTROYED YOURSELF ";N$;"!!! DUMHY!!"
3120 GOTO 6180
3130 A(X,Y)=0
3140 NEXT Y
3150 NEXT X
3160 IF D6=0 THEN 3180
     PRINT "YOU BLEW OUT SOME ISLAND ";N$;"."
3170
3180 IF D5=0 THEN 3200
     PRINT "YOU DESTROYED";D5;"MINES ";N$;"."
3190
3200 IF D4=0 THEN 3220
3210 PRINT "YOU GOT"; D4; "SEA MONSTERS "; N$; "!!! GOOD WORK!!"
3220 PRINT "YOU DESTROYED";D3;"ENEMY SHIPS ";N$;"!!!"
3230 S=S-D3
3240 GOTO 2940
3250 REM *** MANUEVERING ***
     IF D(5) >= 0 THEN 3290
3260
3270 PRINT "BALLAST CONTROLS ARE BEING REPAIRED ":N$:"."
3280 GOTO 880
3290 IF C>12 THEN 3320
      PRINT "THERE ARE NOT ENOUGH CREW TO WORK THE CONTROLS ";N$;"."
3300
3310 GOTO 880
3320
      PRINT "NEW DEPTH";
3330 INPUT D1
3340 IF D1 >= 0 AND D1<3000 THEN 3370
3350 PRINT "HULL CRUSHED BY PRESSURE ";N$;"!!"
3360
     60T0 6180
3370
      P=P-INT(ABS((D-D1)/2+.5))
3380 PRINT "MANUEVER COMPLETE. POWER LOSS=";INT(ABS((D-D1)/2+.5))
3390 D=D1
3400 GOTO 4690
3410
      REM *** #5: STATUS / DAMAGE REPORT ***
3420
     IF D(6) >= 0 THEN 3450
3430
      PRINT "NO REPORTS ARE ABLE TO GET THROUGH ";N$;"."
3440 GOTO 880
3450
      IF C>3 THEN 3480
3460 PRINT "NO ONE LEFT TO GIVE THE REPORT ";N$;"."
3470 GOTO 880
3480 PRINT "# OF ENEMY SHIPS LEFT ...... ":S
3490 PRINT "# OF POWER UNITS LEFT ...... ";P
     3500
PRINT "W OF CREWMEN LEFT.....
3520
                                        :C
3530
      3540
     PRINT
3550 PRINT "WANT DAMAGE REPORT";
      INPUT AS
3560
      IF LEFT$(A$.1)="N" THEN 3670
3570
     PRINT " ITEM
                          DAMAGE (+ GOOD, O NUETRAL, - BAD)"
3580
3590
      DATA "ENGINES", "SONAR", "TORPEDOS", "MISSILES", "MANUEVERING"
3600
```

```
3610 DATA "STATUS", "HEADQUARTERS", "SABOTAGE", "CONVERTER"
3620 RESTORE 3600
3630 FOR X=1 TO 9
      READ AS
3640
3650
      PRINT AS.D(X)
3660
      NEXT X
      PRINT "YOU ARE AT LOCATION (";S1;",";S2;")."
3670
3680
      PRINT
3690
      60T0 880
3700
      REM *** #6: HEADQUARTERS ***
3710
      IF D(7) >=0 THEN 3740
3720
      PRINT "HEADQUARTERS IS DAMAGED. UNABLE TO HELP ";N$;"."
3730
      GOTO 880
3740 IF D2<>0 THEN 3770
3750
      PRINT "HEADQUARTERS IS DESERTED ";N$;"."
3760
      GOTO 880
3770
      IF SQR((S1-S3)^2+(S2-S4)^2) <= 2 AND D<51 THEN 3800
3780
      PRINT "UNABLE TO COMPLY WITH DOCKING ORDERS ";N$;"."
3790
      GOTO 880
3800
      PRINT "DIVERS FROM HEADQUARTERS BRING OUT SUPPLIES AND MEN."
3810
      P=4000
3820 T=8
3830 M=2
3850 C=25
3860 B2=D2-1
      GOTO 4690
3870
1880
      REM *** #7: SABOTAGE ***
3890 IF D(8)>=0 THEN 3920
3900 PRINT "HATCHES INACCESSIBLE ";N$;". NO SABOTAGES POSSIBLE."
3910 GOTO 880
3920 IF C>10 THEN 3950
3930 PRINT "NOT ENDUGH CREW TO GO ON A MISSION ";N$;"."
3940 GOTO 880
3950 D3=0: D4=0
3960 FOR X=S1-2 TO S1+2
3970 FOR Y=S2-2 TO S2+2
3980 IF X<1 OR X>20 OR Y<1 OR Y>20 THEN 4010
3990 D3=D3-(A(X,Y)=3)
4000 D4=D4-(A(X,Y)=6)
4010 NEXT Y
4020 NEXT X
4030 IF D3<>0 THEN 4060
4040 PRINT "NO SHIPS IN RANGE ";N$;"."
4050 GOTO 880
4060 PRINT "THERE ARE";D3;"SHIPS IN RANGE ";N$;"."
4070 PRINT "HOW MANY MEN ARE GOING ";N$;
4080 INPUT Q1
4090 IF C-Q1 >= 10 THEN 4120
4100 PRINT "YOU MUST LEAVE AT LEAST 10 MEN ON BOARD ";N$;"."
4110 GOTO 4070
4120 D5=INT(D3/01+.5)
4130 D6=0
4140 FOR X=S1-2 TO S1+2
4150 FOR Y=S2-2 TO S2+2
4160 IF D3/Q1>1-RND(1) AND RND(1)+D3/Q1(.9 THEN 4220
4170 IF A(X,Y)<>3 THEN 4220
4180 D6=D6+1
4190 A(X,Y)=0
4200 S=S-1
4210 IF S=0 THEN 6260
4220 NEXT Y
4230 NEXT X
4240 PRINT D6;"SHIPS WERE DESTROYED ";N$;"."
4250
      D6=0: D7=0
4260
      FOR X=1 TO Q1
      D7=D7-(RND(1)>.6)
4270
      NEXT X
4280
4290 FOR X=1 TO 01-D7
4300 D6=D6-(RND(1)<.15)
4310 NEXT X
4320
      IF D4=0 THEN 4360
4330
      PRINT "A SEA MONSTER SHELLS THE MEN ON THE WAY BACK !!!"
4340 PRINT D7; "MEN WERE EATEN ";N$;"!!
4350 C=C-D7
4360 PRINT D6;"MEN WERE LOST THROUGH ACCIDENTS ";N$;"."
4370 C=C-D6
4380 P=P-INT(10*Q1+RND(1)*10)
4390 GOTO 4690
4400
      REM *** #8: POWER CONVERTER ***
4410
      IF D(9) >= 0 THEN 4440
4420 PRINT "POWER CONVERTER IS DAMAGED ":N$:"."
4430 GOTO 880
4440
      IF C>5 THEN 4470
      PRINT "NOT ENOUGH MEN TO WORK THE CONVERTER ";N$;"."
4450
4460
      GOTO 880
      PRINT "OPTION? (1=FUEL TO POWER, 2=POWER TO FUEL)";
4470
4480
      INPUT O
4490 DN 0 GOTO 4510,4580
4500 GOTO 4470
4510 REM *** FUEL TO POWER CONVERSION ***
4520 PRINT "FUEL AVAILABLE=";F;". CONVERT";
```

```
INPUT C1
   IF C1>F DR C1<0 THEN 4520
   F=F-C1
  P=P+INT(C1/3)
  60T0 4640
  REN *** POWER TO FUEL CONVERSION ***
  PRINT "POWER AVAILABLE=";P-1;". CONVERT";
  INPUT C1
  IF C1>P-1 OR C1<0 THEN 4590
  P=P-C1
  F=F+INT(C1*3)
  PRINT "CONVERSION COMPLETE. POWER=";P;". FUEL=";F;"."
  60T0 4690
  REM *** #9: SURRENDER ***
  PRINT "COWARD!! YOU'RE NOT VERY PATRIOTIC ";N$;"!!!"
  GOTO 6180
  REN *** RETALIATION SECTION ***
  8=0
  FOR X=S1-4 TO S1+4
  FOR Y=52-4 TO 52+4
  IF X<1 DR X>20 DR Y<1 DR Y>20 THEN 4760
  IF A(X, Y) <> 3 THEN 4760
  D=Q+(RND(1)/SQR((S1-X)^2+(S2-Y)^2))
  NEXT Y
  NEXT X
  IF Q THEN 4810
  PRINT "NO SHIPS IN RANGE TO DEPTH CHARGE YOU ";N$;"!!"
  60TO 5210
  PRINT "DEPTH CHARGES OFF ":
  IF RND(1)>.5 THEN 4850
  PRINT "PORT SIDE ";N$;"!!!"
  60TO 4860
  PRINT "STARBOARD SIDE ";N$;"
  IF 0>.13 OR RND(1)>.92 THEN 4890
  PRINT "NO REAL DAMAGE SUSTAINED ":N$:"."
  60T0 5210
  IF 0>.36 OR RND(1)>.96 THEN 4940
  PRINT "LIGHT, SUPERFICIAL DAMAGE ";N$;"."
  P=P-50
  D(INT(RND(1)*9)+1)=-RND(1)*2
  GOTO 5210
  IF 0>.6 OR RND(1)>.975 THEN 5020
  PRINT "HODERATE DAMAGE. REPAIRS NEEDED."
  P=P-75+INT(RND(1)*30)
  FOR Y=1 TO 2
  X=INT(RND(1)*9)+1
  D(X)=D(X)-RND(1)*8
  NEXT Y
  GOTO 5210
  IF 0>.9 OR RND(1)>.983 THEN 5100
  PRINT "HEAVY DAMAGE !! REPAIRS IMMEDIATE ";N$;"!!!"
  P=P-(200+INT(RND(1)*76))
  FOR X=1 TO 4+INT(RND(1)*2)
  Y=INT(RND(1)#9)+1
  B(Y) = B(Y) - RNB(1) + 11
 NEXT X
 60T0 5210
                                                          ~ PCNOTSIO"
  PRINT "DAMAGE CRITICAL!!!!
                               WE NEED HELPIII"
  A$="VRAVUKXCNVPCRHFDRSAXQURLQTRHXYACVFZYITLCBSSYYKDQIPCAEGQG~
 X=INT(RND(1)*16)+1
  PRINT "SEND 'HELP' IN CODE. HERE IS THE CODE: ";HID$(A$,X,4);
  REM TIME DELAY AND THEN ERASE THE CODE
  FOR I=1 TO 300: NEXT I
  PRINT CHR$(13); TAB(38); "XXXX"; CHR$(13); TAB(38); "****"
  INPUT "ENTER CODE":B$
0 PRINT
  IF B$<>HID$(A$,X,4) THEN 5190
PRINT "FAST WORK ";N$;"!! HELP ARRIVES IN TIME TO SAVE YOU!!!"
  GOTO 5040
  PRINT "MESSAGE GARBLED ":N$:"...NO HELP ARRIVES!!!"
  GOTO 6180
  REM *** MOVE SHIPS / SEA MONSTERS ***
  IF D(1) >= 0 OR D(3) >= 0 OR D(4) >= 0 OR D(5) >= 0 OR D(7) >= 0_1
  IF D(8) >= 0 DR D(9) >= 0 THEN 5260
  PRINT "DAMAGE TOO MUCH ";N$;"!!! YOU'RE SUNK!!"
                                                              STHEN 5260 6160
  GOTO 6180
  REH *** MOVE SHIPS / SEA MONSTERS ***
  PRINT: PRINT: PRINT "---*** RESULT OF LAST ENEMY MANUEVER ***---"
HO FOR X=1 TO 20
HO FOR Y=1 TO 20
IN IF A(X,Y)<>3 THEN 5690
IN REH *** MOVE A SHIP ***
100 U=DR
130 V=D9
IN IF X+W>O AND X+W<21 AND Y+V>O AND Y+V<21 THEN 5420
150 FOR XO=19 TO 1 STEP -1
IN IF A(X-W*X0,Y-V*X0) <>0 THEN 5400
170 A(X-W*X0,Y-V*X0)=3
A(X,Y)=0
HO GOTO 6000
NO NEXT XO
IID STOP
```

5420 ON A(X+W,Y+V)+1 GOTO 5430,5460,5530,5460,5560,5600,5650 5430 A(X+W,Y+V)=3 5440 A(X,Y)=05450 GOTO 6000 5460 REM \*\*\* CHANGE DIRECTION \*\*\* 5470 **RESTORE 6090** 5480 FOR X0=1 TO INT(RND(1)\*8)+1 5490 READ W.V 5500 NEXT XO 5510 IF X+W<1 OR X+W>20 OR Y+V<1 OR Y+V>20 THEN 5470 5520 GOTO 5420 5530 IF D>50 THEN 5460 PRINT "\*\*\* YOU'VE BEEN RAMMED BY A SHIP ":N\$:"!!!" 5540 5550 GOTO 6180 5560 IF RND(1) <. 15 THEN 5460 PRINT "\*\*\* YOUR HEADQUARTERS WAS RANMED ";N\$;"!!!" 5570 5580 S3=0: S4=0: D2=0: A(X+W,Y+V)=0 5590 GOTO 5620 IF RND(1) <.7 THEN 5460 5600 5610 PRINT "\*\*\* SHIP DESTROYED BY A MINE ";N\$;"!!!" 5620 S=S-1 5630 IF S<>0 THEN 5440 5640 GOTO 6260 IF RND(1) <.8 THEN 5460 5650 PRINT "\*\*\* SHIP EATEN BY A SEA MONSTER ";N\$;"!!" 5660 5670 S=S-1 5680 GOTO 5630 REM \*\*\* MOVE A SEA MONSTER \*\*\* IF A(X,Y)<>6 THEN 6000 5690 5700 IF X+H1<1 OR X+H1>20 OR Y+H2<1 OR Y+H2>20 THEN 5760 5710 5720 ON A(X+M1,Y+M2)+1 GOTO 5730,5760,5830,5850,5900,5730,5930 5730 A(X+M1,Y+M2)=6 5740 A(X,Y)=0 5750 **GOTO 6000** 5760 REM \*\*\* CHANGE DIRECTION \*\*\* 5770 **RESTORE 6090** 5780 FOR X0=1 TO INT(RND(1)+8)+1 5790 READ M1,M2 NEXT XO 5800 5810 IF X+M1<1 OR X+M1>20 OR Y+M2<1 OR Y+M2>20 THEN 5760 5820 60T0 5720 5830 PRINT "\*\*\* YOU'VE BEEN EATEN BY A SEA MONSTER ":N\$:"!!" 5840 GOTO 6180 5850 IF RND(1)>.2 THEN 5760 5860 PRINT "\*\*\* SHIP EATEN BY A SEA MONSTER ";N\$;"!!" 5870 S=S-1 IF S<>0 THEN 5730 5880 GOTO 6260 5890 PRINT "\*\*\* A SEA MONSTER ATE YOUR HEADQUARTERS ";N\$;"!!" 5900 S3=0: S4=0: D2=0 5910 5920 60T0 5730 IF RND(1)<.75 THEN 5760 5930 5940 PRINT "\*\*\* A SEA MONSTER FIGHT ";N\$;"!!! "; 5950 IF RND(1)<.8 THEN 5980 5960 PRINT "AND ONE DIES!!" 5970 GOTO 5730 5980 PRINT "IT'S A TIE!!" 5990 GOTO 5760 6000 NEXT Y 6010 NEXT X 6020 REM \*\*\* MAKE REPAIRS \*\*\* FOR Y=1 TO 9 6030 6040 X=INT(RND(1)\*9)+1 6050 D(X)=D(X)+(RND(1)\*(2+RND(1)\*2))\*(1+(-(D<51) OR -(D>2000)))\*(-(D(X)<3))6060 NFXT Y 6070 **GOTO 880** 6080 REM \*\*\* GOSUB FOR COURSE / DIRECTION \*\*\* DATA -1,0,-1,1,0,1,1,1,1,0,1,-1,0,-1,-1,-1 PRINT "COURSE (1-8)"; 6090 6100 6110 INPUT C1 IF C1<1 OR C1>8 THEN 6100 6120 6130 **RESTORE 6090** 6140 FOR X9=1 TO INT(C1+.5) READ X1,Y1 6150 NEXT X9 6170 RETURN REM \*\*\* DESTROYED ? \*\*\* 6180 6190 PRINT "THERE ARE STILL";S;"ENEMY SHIPS LEFT ";N\$;"." PRINT "YOU WILL BE DEMOTED TO RANK OF DECK SCRUBBER!!!" 6200 6210 PRINT "WANT ANOTHER GAME"; 6220 INPUT AS 6230 IF LEFT\$(A\$,1)<>"Y" THEN 6250 GOTO 310 6240 6250 STOP 6260 PRINT "GOOD WORK ";N\$;"!!! YOU GOT THEM ALL!!!" PRINT "PROMOTION AND COMMENDATIONS WILL BE GIVEN IMMEDIATELY !!!" 6270 6280 GOTD 6210 6290 REM \*\*\* ISLAND DATA \*\*\* 6300 6310 6320 END

Ok



You are the commander of a fleet of ships operating in enemy territory. Your task force consists of 9 ships, and the enemy has 9 ships. Whoever sinks all of the opponent's ships first wins the campaign.

You, as the commander, must provide the angle of elevation at which the guns will be fired, neglecting air resistance. Your instruments will read the range to the target, and the initial velocity is held constant at about 675 meters per second. SEAWAR will help you learn about

SEAWAR will help you learn about the paths of projectiles and what happens as the angle of elevation varies.

- First, what do you think the path of the projectile looks like. Make a sketch. (If you're still not sure, do some research in the library—it will help you win the battle, commander!)
  - a. What angle of elevation do you think will give the maximum range?
  - b. What will happen if you fire the guns at 0°?
  - c. What will happen to the projectile if you fire it straight up?
- 2. After becoming proficient at winning the battle, change the initial velocity of the projectile. How does this affect the range?

The original SEAWAR had a timing function that allowed only about 7 seconds to make your next move. If your computer has a timer, this would be a neat addition.

The origin of SEAWAR is unknown. It was revised and submitted to us by David S. Paxton. It was further revised and the writeup prepared by Mary T. Dobbs, Mathematics and Science Center, Glen Allen, Virginia. It first appeared in *Creative Computing*, May/Jun 1975. RUN

#### SEAWAR CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

YOU COMMAND A FLEET OF SHIPS OPERATING IN EWENY TERRITORY!!! DO YOU WEED AWY ASSISTANCE? YES YOU TELL YOUR OUW CREWS THE ELEVATION TO SET THEIR GUNS. ELEVATION IS IN DEGREES FROM 0 TO 360. YOUR TASK FORCE CONSISTS OF 3 DESTROYCRS, 2 CRUISERS, 2 BATTLESHIPS, AND 2 MEAVY AIRCRAFT CARRIERS. THE EMENY MAS 9 SHIPS FOR HIS DEFENSE. IF YOU SUCCEED IN SINKING ALL HIS SHIPS BEFORE HE SINKS YOURS, YOU HAVE WON. HOWEVER, IF WE SINKS ALL YOUR SHIPS BEFORE YOU HAVE DEFEATED HIM, YOU HAVE LOST!! LET US BEGIN!!!

YOUR FLAGSHIP HAS DETECTED A U-BOAT APPROACHING AT 5 PHANTOMS. YOUR SUBMARINE DETECTION EQUIPMENT READS THE RANGE TO THE TARGET AS 39481 METERS. THE U-BOAT HAS COMMENCED FIRING TORPEDDES AT YOUR SHIPS. HIS FIRST TORPEDD EXPLODED 281 METERS BEHIND YOUR SHIP. WHAT ELEVATION \*\* ? 38

----FIRE!!! DEPTH CHARGE EXPLODED 5637 METERS AFT OF TARGET. THE ENEMY U-BOAT SANK ONE OF YOUR DESTROYERS!! WHAT ELEVATION \*\* ? 32.4

-----FIRE!!! DEPTH CHARGE EXPLODED 2592 METERS AFT OF TARGET. THE ENEMY U-BOAT SANK YOUR HEAVY CRUISER!! WHAT ELEVATION \*\* ? 29.9

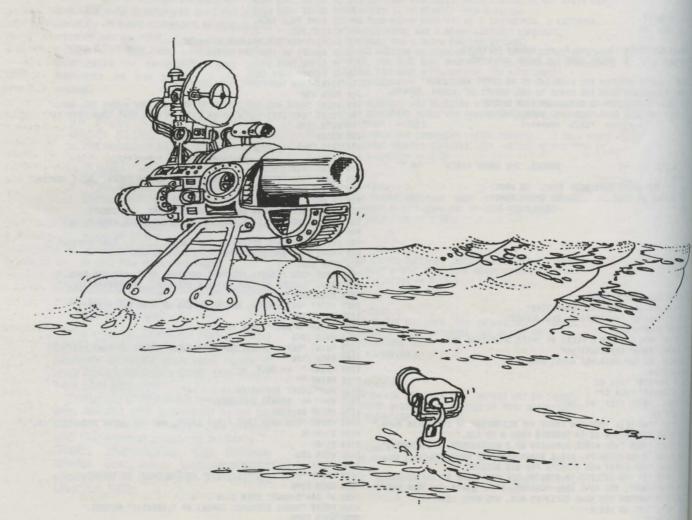
----FIRE!!! DEPTH CHARGE EXPLODED 707 METERS AFT OF TARGET. THE ENEMY TORPEDO EXPLODED 103 METERS IN FRONT OF YOUR SHIP. WHAT ELEVATION \*\* ? 29.2

-----FIRE!!! DEPTH CHARGE EXPLODED 123 METERS AFT OF TARGET. THE ENEMY U-BOAT SANK ANOTHER OF YOUR DESTROYERS!! WHAT ELEVATION \*\* ? 29.07

-----FIRE!!! DEPTH CHARGE EXPLODED RIGHT ON TOP OF THAT BABY!!!

TARGET DESTROYED!!! \*\* 5 \*\* ROUNDS EXPENDED. YOU "AVE LOST 3 SHIPS, AND THE ENEMY HAS LOST 1.

TUR FLAGSHIP REPORTS THE SIGHTING OF AN ENEMY 210 MM SHORE GUN 220 READ Z\$ TUR INSTRUMENTS READ THE RANGE TO THE TARGET AS 41020 METERS. 230 A=A+1 THE ENEMY 210 MM SHORE GUN IS FIRING ON YOUR SHIPS! 240 GOTO 320 HIS FIRST ROUND FELL 113 METERS SHORT. 250 RESTORE WHAT ELEVATION \*\* ? 32 260 IF 0=9 OR A=9 THEN 840 270 FOR X=1 TO A 280 READ Z\$ ----FIRE!!! 290 NEXT X SHELL OVERSHOT TARGET BY 773 METERS. 300 READ Z\$ THE ENEMY 210 MM SHORE GUN SANK ONE OF YOUR BATTLESHIPS !! 310 A=A+1 WHAT ELEVATION \*\* ? 31.27 320 IF Z\$="AIRCRAFT CARRIER" THEN 390 330 IF Z\$="U-BOAT" THEN 2000 340 IF ZS="TORPEDO BOAT" THEN 360 -----FIRE!!! 350 P=1 SHELL OVERSHOT TARGET BY 240 METERS. 360 GOTO 405 THE ENEMY 210 MM SHORE GUN SANK YOUR LAST DESTROYER !! **390 RESTORE** WHAT ELEVATION \*\* ? 31./\/\07 405 PRINT: PRINT "YOUR FLAGSHIP REPORTS THE SIGHTING OF AN ENEMY ":Z\$ 410 T=43000.-30000\*RND(0)+(RND(0)\*10)\*.987654+102 420 IF T<10000 THEN 410 -----FIRE!!! 430 S=0:P2=0 \*\* BOOM \*\* 440 T=INT(T) 450 IF 7\$="U-BOAT" THEN 2030 TARGET DESTROYED!!! \*\* 3 \*\* ROUNDS EXPENDED. 460 PRINT "YOUR INSTRUMENTS READ THE RANGE TO THE TARGET AS ";T;" METERS YOU HAVE LOST 5 SHIPS, AND THE ENEMY HAS LOST 2 . 480 IF P=1 THEN 1480 YOUR FLAGSHIP REPORTS THE SIGHTING OF AN ENEMY 70,000 TON CRUISER 490 IF S>4 THEN 510 YOUR INSTRUMENTS READ THE RANGE TO THE TARGET AS 41009 METERS. THE ENEMY 70,000 TON CRUISER IS FIRING ON YOUR SHIPS! 500 GOTO 540 510 PRINT "ALL RIGHT, BAD SHOT, THE TARGET HAS MOVED OUT OF" 520 PRINT "RANGE !!! LET'S TRY IT AGAIN !!!" IN FACT, HE JUST SANK YOUR AIRCRAFT CARRIER!! WHAT ELEVATION \*\* ? 32 525 S1=S1+S 530 GOTO 320 540 PRINT "WHAT ELEVATION \*\* "; -----FIRE!!! 550 INPUT B SHELL OVERSHOT TARGET BY 784 METERS. 551 PRINT THE ENEMY 70,000 TON CRUISER SANK YOUR LIGHT CRUISER !! 570 PRINT "" WHAT ELEVATION \*\* ? 31.1 590 PRINT "----FIRE!!!" 600 S=S+1 620 IF B>360 THEN 1410 --FIRFIII 630 IF B<0 THEN 750 SHELL OVERSHOT TARGET BY 123 METERS. 640 IF B=0 THEN 770 THE ENEMY 70,000 TON CRUISER SANK YOUR LAST AIRCRAFT CARRIER !! 650 IF B=90 THEN 980 WHAT FLEVATION \*\* 7 30.9 660 IF B>330 THEN 770 670 IF B>180 THEN 1370 680 IF B>150 THEN 1300 -----FIRE!!! 690 IF B>90 THEN 1020 \*\* BOOM \*\* 700 V1=675.285 705 E=INT(T-(V1^2/9.80665\*SIN(2\*B/57.3))) \*\* 3 \*\* ROUNDS EXPENDED. TARGET DESTROYED!!! 710 IF ABS(E) <= 100 THEN 1050 YOU HAVE LOST 8 SHIPS, AND THE ENERY HAS LOST 3 . 720 IF E>100 THEN 1200 730 IF EK-100 THEN 1250 YOUR FLAGSHIP REPORTS THE SIGHTING OF AN ENEMY BATTLESHIP 750 PRINT "GUN BACKFIRED, KILLING CREW!" YOUR INSTRUMENTS READ THE RANGE TO THE TARGET AS 42864 METERS. 760 GOTO 820 THE ENEMY BATTLESHIP IS FIRING ON YOUR SHIPS! 770 PRINT "WHAT ARE YOU TRYING TO DO? KILLSOME FISH? THE SHELL" 780 PRINT "EXPLODED UNDER WATER FIFTY METERS FROM YOUR SHIP!!!" IN FACT, HE JUST SANK YOUR LAST BATTLESHIP!! \*\*\*\*\*\*\* PEACE \*\*\*\*\*\*\* 790 GOTO 1590 820 PRINT " ADMIRAL PLEASE !!!!" 830 GOTO 1590 840 PRINT " \*\*\*\*\*\*\*\* PEACE \*\*\*\*\*\*\*\* YOU FIRED ROUNDS. THE ENEMY FIRED 10 11 870 PRINT:PRINT:PRINT ROUNDS. 890 PRINT "YOU FIRED ",S1," ROUNDS. THE ENEMY FIRED ",S2," ROUNDS." ALL OF YOUR SHIPS HAVE BEEN SUNK. SO SORRY 900 IF 0=9 THEN 920 THE BATTLE IS OVER ..... THE ENEMY WINS! 910 IF A=9 THEN 950 OK 920 PRINT "ALL OF YOUR SHIPS HAVE BEEN SUNK. SO SORRY" 930 PRINT "THE BATTLE IS OVER.....THE ENEMY WINS!" 940 GOTO 2220 950 PRINT "YOU HAVE DECIMATED THE ENEMY ..... ... THAT'S NICE" 960 PRINT "THE BATTLE IS OVER......YOU WIN!!!!! 970 GOTO 2220 LIST 980 PRINT "YOU IDIOT !! YOU SHOT STRAIGHT UP !!, AND THE SHELL" 990 PRINT "LANDED ON YOUR OWN GUN POSITION, DESTROYING IT !!!" 5 PRINT TAB(26);"SEAWAR" 1000 GOTO 1590 6 PRINT TAB(20); "CREATIVE COMPUTING" 1020 PRINT "HEY STUPID, YOU'RE FIRING ON YOUR OWN SHIPS!!!" 7 PRINT TAB(18) "MORRISTOWN, NEW JERSEY" 1030 GOTO 1590 1050 IF Z\$="U-BOAT" THEN 1070 9 PRINT: PRINT: PRINT 10 PRINT "YOU COMMAND A FLEET OF SHIPS OPERATING IN" 1060 GDTD 1090 15 PRINT "ENEMY TERRITORY !!! 1070 PRINT "DEPTH CHARGE EXPLODED RIGHT ON TOP OF THAT BABY !!!" 20 PRINT "DO YOU NEED ANY ASSISTANCE"; 1080 GOTO 1100 40 INPUT QS 1090 PRINT " \*\* BOOM \*\*" 1100 PRINT "" 50 IF Q\$="YES" THEN 90 60 IF Q\$="NO" THEN 170 1110 MS="TARGET DESTROYED!!! 1120 NS=" \*\* ROUNDS EXPENDED." 70 PRINT "INPUT 'YES' OR 'NO'" 1130 PRINT MS:S:NS 80 GOTO 40 1142 PRINT "YOU HAVE LOST ";0;" SHIPS, AND THE ENEMY HAS LOST ";A;"." 90 PRINT "YOU TELL YOUR GUN CREWS THE ELEVATION TO SET THEIR GUNS." 100 PRINT "ELEVATION IS IN DEGREES FROM 0 TO 360." 1150 S1=S1+S 119 PRINT "YOUR TASK FORCE CONSISTS OF 3 DESTROYERS, 2 CRUISERS," 1160 PI=0 120 PRINT "2 BATTLESHIPS, AND 2 HEAVY AIRCRAFT CARRIERS." 1190 GOTO 250 1200 IF Z\$="U-BOAT" THEN 2130 1210 PRINT "SHOT FELL ";ABS(E);" METERS SHORT OF TARGET." 130 PRINT "THE ENEMY HAS 9 SHIPS FOR HIS DEFENSE." 140 PRINT "IF YOU SUCCEED IN SINKING ALL HIS SHIPS BEFORE HE SINKS" 150 PRINT"YOURS, YOU HAVE WON. HOWEVER, IF HE SINKS ALL YOUR SHIPS" 1230 GOTO 1590 1250 IF Z\$="U-BOAT" THEN 2160 160 PRINT "BEFORE YOU HAVE DEFEATED HIM, YOU HAVE LOST !!" 170 PRINT "LET US BEGIN!!!" 1260 PRINT "SHELL OVERSHOT TARGET BY ";ABS(E);" METERS." 210 PRINT "" 1280 GOTO 1590



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1310 PRINT " YOU SHOT A PROJECTILE, INTO THE AIR,"1790 GOTO 4901320 PRINT " IT FELL TO THE WATER, YOU KNOW NOT WHERE."1800 R2=11330 PRINT "BUT I DO, YOU IDIOT, YOU JUST SANK YOUR OWN FLEET TANKER!!"1810 GOSUB 1850
1340 S1=S1+1
1350 IF P=1 THEN 1590
1360 GOTO 490
1370 PRINT "WHAT ARE YOU TRYING TO DO?? DRILL A NEW HATCH?? THE SHELL"
1380 PRINT "EXPLODED IN YOUR SHIP, DESTROYING IT!!!"
1385 0=0+1
1386 IF 0=9 THEN 840
1390 IF P=1 THEN 1590
1400 GOTO 820
1410 PRINT "WHERE DID U LEARN TO TYPE? ";B;"DEGREES EXCEEDS 360 BY"
1420 PRINT B-360;" DEGREES."
1430 S1=S1+1
1440 IF P=1 THEN 1590
1450 GOTO 490
1480 PRINT "THE ENENY ";Z$;" IS FIRING ON YOUR SHIPS!"
1490 P4=1234*RND(RND(0))+(RND(0)*10)
1500 IF P4>500 THEN 1490
1510 IF P2=1 THEN 1600
1520 IF INT(P4)<100 THEN 1800
1530 IF Z$="U-BOAT" THEN 2100
1540 PRINT "HIS FIRST ROUND FELL ";INT(P4);" HETERS SHORT."
1560 S2=S2+1
1570 GOTO 490
1590 IF P2=1 THEN 1490
1600 P1=1250*RND(RND(0))+(RND(0)*10)
1610 IF P1>P4 THEN 1600
1620 IF P1<(P4-400) THEN 1600
1630 IF P1<100 THEN 1710
1640 P4=P1
1650 S2=S2+1
1660 IF Z$="U-BOAT" THEN 2190
1670 PRINT "THE ENEMY ROUND FELL ";INT(P1);" METERS SHORT."
1700 GOTO 490
1710 S2=S2+1
1720 P2=1
1730 GOSUR 1850
1750 PRINT "THE ENEMY ";Z$;" SANK ";D$
1760 0=0+1
1770 IF 0=9 THEN 840
1780 IF D$="YOUR LAST BATTLESHIP!!" THEN 840
```

```
1820 PRINT "IN FACT, HE JUST SANK ";D$
1830 0=0+1
1840 GDTO 1770
1850 RESTORE
1860 FOR C=1 TO (9+0)
1870 READ D$
1880 NEXT C
1890 READ D$
1920 DATA "U-BOAT","210 MM SHORE GUN","70,000 TON CRUISER"
1930 DATA "BATTLESHIP","TORPEDO BOAT","HEAVYFRIGATE"
1940 DATA "E-TYPE DESTROYER","GUIDED-HISSLE SHIP","AIRCRAFT CARRIER"
1950 DATA "ONE OF YOUR DESTROYERS!!", "YOUR HEAVY CRUISER!!"
1960 DATA "ANOTHER OF YOUR DESTROYERS!!", "ONE OF YOUR BATTLESHIPS!!"
1970 DATA "YOUR LAST DESTROYER!!", "YOUR AIRCRAFT CARRIER!!"
1975 DATA "YOUR LIGHT CRUISER!!", "YOUR LAST AIRCRAFT CARRIER!!"
1980 DATA "YOUR LAST BATTLESHIP!!"
1990 RETURN
2000 PRINT "YOUR FLAGSHIP HAS DETECTED A U-BOAT APPROACHING AT 5 ";
2005 PRINT "PHANTOMS."
2010 P=1
2020 GOTO 410
2030 PRINT "YOUR SUBMARINE DETECTION EQUIPMENT READS THE RANGE TO THE 2031 PRINT " TARGET"
2040 T=INT(T-1500)
2050 IF T<0 THEN 410
2060 PRINT "AS ";T;" METERS."
2080 PRINT "THE U-BOAT HAS COMMENCED FIRING TORPEDDES AT YOUR SHIPS."
2090 GOTO 1490
2100 PRINT "HIS FIRST TORPEDO EXPLODED ";(INT(P4)-50);" METERS BEHIN
2105 PRINT " YOUR SHIP."
2120 GOTO 1560
2130 PRINT "DEPTH CHARGE EXPLODED "; ABS(E);" METERS SHORT OF TARGET.
2150 GOTO 1590
2160 PRINT "DEPTH CHARGE EXPLODED ";ABS(E);" METERS AFT OF TARGET."
2180 GOTO 1590
2190 PRINT "THE ENEMY TORPEDO EXPLODED ";(INT(P1)-50);"METERS IN"
2201 PRINT "FRONT OF YOUR SHIP."
2210 GOTO 490
2220 END
DK
```

Shoot

The scene is some time in the near future. You and another individual on the other side of the planet are the only survivors of a total atomic war. (Yes, I know it's corny.) This war was fought totally with ground based atomic missiles. Both you and the surviving enemy have found the last missile bases left from each side. Fortunately (for me anyway), these missile grids are made and operated identically.

Each player moves on and is restricted to a 10 by 10 missile matrix. Every co-ordinate on the grid corresponds to a mini-missile base. At every base, there is a terminal tied into the main scanner computer, located safely many miles away. From each terminal, the player obtains information relevant to the current situation. Because of the way the missiles are constructed, the area left after lift-off is exposed to high doses of raw radiation and may not be occupied by life. The same is true of an area that has been struck by a missile, it is extremely lethal and would kill anything entering the vicinity.

Due to the fact that everyone else is dead, all machinery must be operated manually. This means that the players must set the target co-ordinates and latch the fuse for the missile to be shot off. After that, the players must flee the area. This is done in a small shuttle car. equipped with sensor devices to avoid dangerous areas. But due to its limited power reserves, it can go only two units in any direction, up, down, or diagonally, and no more or less. The danger involved is that while in flight, the player is away from a scanner computer terminal and will not know where the enemy missile is aimed to land.

In the time it takes to move to the new base, the missiles will be at the apex of their flight above the earth. There the computer will give out tracking information as to whether you hit the enemy, or he hit you, or both. If the missile is coming down to hit the player, there is no escape. The time required to recharge the shuttle car is longer than the time it takes for the missile to hit the ground. If either player is unfortunate enough to get trapped into a corner, the seeping radiation will eventually kill him.

So it is plainly a game of kill or be killed. However, don't be misled into thinking that it is simply a game of luck, several different strategies may be applied to destroy the enemy.

#### Line by line explanation.

Lines 440-490. I assemble three commonly used print strings. S\$ becomes a string of fourteen spaces.

Lines 500-530. Here is the dimensioning of the four matrices, and the start-up and circle check data. The matrices "I" and "H" stand for player and enemy playing fields (I and HE). the "T" matrix is a temporary list for use by the enemy, and is part of the "smart" algorithm. It is loaded up during each pass with the possible places he could move to, or looking at the possible places where the player could move. The "P" matrix is filled with the eight possible co-ordinates that one may move to. I might say here that the program may be modified for a longer and more challenging game by changing the data in line 530. Change all the twos to ones and the two players may move only one unit away from their previous position, instead of the two used now.

Lines 540-730. I set up a random number to decide which pair of corner co-ordinates the enemy will be started in. I then proceed to set the pair from 550 to 570. I then digress to zero my matrices. Picking up where I left off, lines 640 to 680 peel away any unused, but unwanted data, keying on the unique first number of the last pair. From there the remaining data is dumped into "P."

Lines 740-820. Make the report that the enemy has been "fooling around." The starting co-ordinates for the player are then obtained and checked. From there the valid loop switch is set, a map is printed, and the program is thrust headlong into the main routine. Lines 830-920. Here the co-ordinates for the missile and the new spot to sit on are obtained and verified of their validity.

Lines 930-1080. "Enemy" decides where player might be going from last position, and aims his missile in that direction.

Lines 1090-1280. The "enemy" looks for place to go. If he has cornered himself, say so, prepare him for his execution, and make it look like he hasn't fired a missile. Otherwise, he chooses a new co-ordinate to rest upon.

Lines 1290-1480. Now we move everyone around (where we can), and start to find out who got who, if anyone at all. Then from 1430-1480 there is a check to discover whether the player has a place to go or not. If not, another message is printed and player will die quietly after output.

Lines 1490-1780. Here the printing of the two matrices is done. A value of one or zero is tested for making the proper symbol. After the output is complete "Z" is checked to see if anyone died on the way. If no one had, return for another pass, else terminate the program.

I spent a lot of time debugging this program. After I finally got it to work, I found that it became somewhat addictive. The tension does seem to build when the game reaches the final possible moves. I found there are two different useful strategies that may be applied.

My favorite is building a fence around the enemy with missile shots. The idea is to cut off his movements while trying to keep out of his way. The other method is the one the enemy uses. Here the player shoots at where he thinks the opponent may be each time. Quite often the game is ended early, the odds of being hit become too great.

Any method you use, or another you may think of, will lend long hours of enjoyment. Have fun!

The program and description were written by David Spencer.

#### RUN

#### SHOOT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

DO YOU WANT INSTRUCTIONS? NO SCANNER COMPUTER: ENEMY ACTIVITY ON GRID AT 1 , 1

#### YOUR STARTING CO-ORDINATES? 2,5

| YOUR TERRITORY | ENENY TERRITORY |
|----------------|-----------------|
|                |                 |
| 12345678910    | 12345678910     |
| 1 :::::::::    | 1 **********    |
| 2 ::::*:::::   | 2               |
| 3              | 3               |
| 4              | 4               |
| 5              | 5               |
| 6 :::::::::    | 6               |
| 7 :::::::::    | 7               |
| 8 :::::::::    | 8               |
| 9 :::::::::    | 9               |
| 10             | 10              |

#### MISSILE CO-ORDINATES? 4,1 WHERE TO MOVE TO? 2,7

| Y  | DUR TERRITORY | ENEMY | TERRITOR  |
|----|---------------|-------|-----------|
|    | 12345678910   | 12    | 345678910 |
| 1  |               | 1 *:  |           |
| 2  |               | 2 ::  |           |
| 3  |               | 3 ::  |           |
| 4  | ::*::::::     | 4 *:  |           |
| 5  |               | 5 ::  |           |
| 6  |               | 6 ::  |           |
| 7  |               | 7 ::  |           |
| 8  |               | 8 ::  |           |
| 9  |               | 9 ::  |           |
| 10 |               | 10 :: |           |
|    |               |       |           |

MISSILE CO-ORDINATES? 1,5 WHERE TO MOVE TO? 2,9

YOUR TERRITORY

#### ENEMY TERRITORY

|    | 12345678910 |    | 12345678910 |
|----|-------------|----|-------------|
| 1  |             | 1  | *:*:*:::::  |
| 2  | ::::*:*:*:  | 2  |             |
| 3  |             | 3  |             |
| 4  | ::*::::::   | 4  | *:::::::::  |
| 5  |             | 5  |             |
| 6  |             | 6  |             |
| 7  |             | 7  |             |
| 8  |             | 8  |             |
| 9  |             | 9  |             |
| 10 |             | 10 |             |
|    |             |    |             |

MISSILE CO-ORDINATES? 3,4 WHERE TO MOVE TO? 3,9 WHERE TO MOVE TO? 4,9

#### YOUR TERRITORY ENEMY TERRITORY 12345678910 12345678910 1 ...... 1 \*:\*:\*::::: 2 ::::\*:\*:\*: 2 ...... 3 ......... 3 :::\*\*::::: 4 ::\*:::\*::: 4 \*::::::::: 5 ....... 5 ......... 6 ......... 6 ......... ......... ..... 8 ..... 8 ..... 9 ......... 9 ........

MISSILE CO-ORDINATES? 5,5 WHERE TO MOVE TO? 6,9

10 ::::::::::

#### SCANNER COMPUTER: HEY! YOU GOT HIN!! SCANNER COMPUTER: YOU HOVED RIGHT UNDER HIS MISSILE!! YOUR TERRITORY ENEMY TERRITORY

10 :::::::::

|    | 12345678910 | 12345678910  |
|----|-------------|--------------|
| 1  |             | 1 *:*:*::::: |
| 2  | 1111*1*1*:  | 2 *********  |
| 3  |             | 3 ::***::::: |
| 4  | ::*:::*:*:  | 4 ********** |
| 5  |             | 5 ::::*::::: |
| 6  |             | 6 *********  |
| 7  |             | 7            |
| 8  |             | 8            |
| 9  |             | 9            |
| 10 |             | 10 ::::::::: |
|    |             |              |

RUN

#### SHOOT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

#### DO YOU WANT INSTRUCTIONS? YES

IT IS THE FINAL HOUR OF MAN. YOU AND A WARRING NATION HAVE ENTERED INTO A LAST CONTEST. ALL THE LIFE NOW LEFT ON EARTH ARE YOU AND YOUR EMEMY. BOTH HE AND YOU HAVE FOUND THE LAST REMAINING ATOMIC MISSILE SILO MATRICES ESTABLISHED BY THE NOU-DEAD SUPERPOWERS. HE, LIKE YOU, WISHES NOT TO DIE BUT TO LIVE IN PEACE.

HOWEVER IT HAS BECOME APPARENT THAT HE FEELS HIS PEACE THREATENED AND IS PREPARING AN ATTACK. BOTH YOU AND HE HAVE SCANNERS THAT WILL WARN YOU OF HIS MOVEMENTS AND TRACK THE FLIGHT OF HIS ATOMIC MISSILES, THUS HE IS WORKING SLOWLY. THE ENEMY, LIKE YOURSELF, HAS A MISSILE GRID NEARLY IDENTICAL IN STRUCTURE AND OPERATION TO YOURS, BECAUSE YOU ARE THE ONLY ONE LEFT, IT WILL BE NECESSARY TO FIRE ALL YOUR MISSILES MANUALLY. ONCE THE FUSE IS SET, YOU MUST FLEE THE AREA AND GET TWO GRID UNITS AWAY. YOU MAY NEVER RETURN TO THIS SPOT, OR A SPOT WHERE A MISSILE HAS LANDED; THE RADIATION IS INTENSE AND WOULD MEAN AN INSTANT, PAINFUL DEATH.

SO THE STAGE HAS BEEN SET. THERE IS PEACE UNTIL THE SIGN THAT THE ENEMY HAS NOVED TO HIS MISSILE RANGE. HE WILL FIRE EVERY TIME YOU WILL, AND DO SO UNTIL ONE OF YOU IS DESTROYED.

EACH TIME A ROUND OF MISSILES HAS BEEN FIRED, THE SCANNERS WILL REPORT THE STATUS OF BOTH YOUR'S AND THE ENEMY'S GRID TERRITORY. IT WILL SHOW ALL AREAS THAT HAVE HAD EITHER A MISSILE HIT OR A MISSILE FIRED FROM IT. WITH THIS CONTINUALLY UPDATED MAP, YOU MAY BE ABLE TO INDUCTIVELY DISCOVER OR TRAP YOUR OPPONENT. BEWARE, HE WILL BE TRYING TO DO THE SAME TO YOU.

ENEMY TERRITORY

SCANNER COMPUTER: ENEMY ACTIVITY ON GRID AT 10 , 1

#### YOUR STARTING CO-ORDINATES? 3,3

#### YOUR TERRITORY

|    | 12345678910 | 12345678910   |
|----|-------------|---------------|
| 1  |             | 1             |
| 2  |             | 2 ::::::::::  |
| 3  |             | 3             |
| 4  |             | 4             |
| 5  |             | 5             |
| 6  |             | 6             |
| 7  |             | 7             |
| 8  |             | 8             |
| 9  |             | 9             |
| 10 |             | 10 *::::::::: |
|    |             |               |

#### MISSILE CO-ORDINATES? 10,4 WHERE TO MOVE TO? 3,5

#### SCANNER COMPUTER: HEY! YOU GOT HIM!! YOUR TERRITORY ENEMY TERRITORY

| 12345678910 | 12345678910  |
|-------------|--------------|
| ::::*:::::  | 1            |
|             | 2            |
|             | 3            |
|             | 4            |
|             | 5            |
|             | 6            |
|             | 7            |
|             | 8            |
|             | 9            |
| 1111111111  | 10 *::*::::: |
|             |              |

```
940 FOR X=1 TO 8
                                                                               950 IF P(X,1)+E>10 OR P(X,1)+E<1 OR P(X,2)+F>10 OR P(X,2)+F<1 GOTO 1000
 PRINT TAB(26): "SHOOT"
                                                                               960 IF I(P(X,1)+E,P(X,2)+F)=1 GOTO 1000
 PRINT TAB(20); "CREATIVE COMPUTING"
PRINT TAB(18); "HORRISTOWN, NEW JERSEY"
                                                                               970 T(L,1)=P(X,1)+E
                                                                              980 T(L,2)=P(X,2)+F
 PRINT: PRINT: PRINT
  INPUT "DO YOU WANT INSTRUCTIONS";A$
                                                                               990 1=1+1
 IF LEFT$ (A$,1) <> "Y" GOTO 440
                                                                              1000 NEXT X
 PRINT
                                                                               1010 L=L-1
 PRINT " IT IS THE FINAL HOUR OF MAN. YOU AND A WARRING NATION"
                                                                               1020 IF L<>1 GOTO 1060
 PRINT "HAVE ENTERED INTO A LAST CONTEST. ALL THE LIFE NOW LEFT ON"
                                                                               1030 C=T(L,1)
                                                                               1040 D=T(L,2)
 PRINT "EARTH ARE YOU AND YOUR ENEMY. BOTH HE AND YOU HAVE FOUND THE"
  PRINT "LAST REMAINING ATOMIC MISSILE SILO MATRICES ESTABLISHED BY"
                                                                               1050 GOTO 1090
  PRINT "THE NOW-DEAD SUPERPOWERS. HE, LIKE YOU, WISHES NOT TO DIE"
                                                                               1060 G=INT(RND(1)*L+1)
  PRINT "BUT TO LIVE IN PEACE."
                                                                               1070 C=T(G,1)
 PRINT " HOWEVER IT HAS BECOME APPARENT THAT HE FEELS HIS PEACE"
                                                                               1080 D=T(6,2)
 PRINT "THREATENED AND IS PREPARING AN ATTACK. BOTH YOU AND HE HAVE"
                                                                              1090 L=1
 PRINT "SCANNERS THAT WILL WARN YOU OF HIS MOVEMENTS AND TRACK THE"
                                                                               1100 FOR X=1 TO 8
 PRINT "FLIGHT OF HIS ATOMIC MISSILES, THUS HE IS WORKING SLOWLY."
                                                                               1110 IF P(X,1)+A>100RP(X,1)+A<1 OR P(X,2)+B>100RP(X,2)+B<1 GOT0 1160
 PRINT "THE ENEMY, LIKE YOURSELF, HAS A MISSILE GRID NEARLY"
                                                                               1120 IF H(P(X,1)+A,P(X,2)+B)=1 GOTO 1160
 PRINT "IDENTICAL IN STRUCTURE AND OPERATION TO YOURS, BECAUSE YOU"
                                                                               1130 T(L,1)=P(X,1)+A
 PRINT "ARE THE ONLY ONE LEFT, IT WILL BE NECESSARY TO FIRE ALL YOUR"
                                                                               1140 T(L,2)=P(X,2)+B
 PRINT "MISSILES MANUALLY. ONCE THE FUSE IS SET, YOU MUST FLEE THE"
                                                                               1150 L=L+1
 PRINT "AREA AND GET TWO GRID UNITS AWAY. YOU MAY NEVER RETURN TO"
                                                                               1160 NEXT X
 PRINT "THIS SPOT, OR A SPOT WHERE A MISSILE HAS LANDED; THE"
                                                                              1170 L=L-1
 PRINT "RADIATION IS INTENSE AND WOULD MEAN AN INSTANT, PAINFUL"
                                                                               1180 IF LOO GOTO 1220
 PRINT "DEATH."
                                                                               1190 PRINT C$;"THE ENENY HAS CORNERED HIMSELF IN !! "
 PRINT " SO THE STAGE HAS BEEN SET. THERE IS PEACE UNTIL THE"
                                                                               1200 Z=0
 PRINT "SIGN THAT THE ENEMY HAS MOVED TO HIS MISSILE RANGE. HE WILL"
                                                                              1204 C=E
 PRINT "FIRE EVERY TIME YOU WILL, AND DO SO UNTIL ONE OF YOU IS"
                                                                               1207 D=F
 PRINT "DESTROYED."
                                                                               1210 GOTO 1290
 PRINT " EACH TIME A ROUND OF MISSILES HAS BEEN FIRED, THE"
                                                                               1220 IF L<>1 GOTO 1260
PRINT "SCANNERS WILL REPORT THE STATUS OF BOTH YOUR'S AND THE ENEMY"
                                                                              1230 J=T(1,1)
                                                                               1240 K=T(1,2)
                                                                               1250 GOTO 1290
PRINT "GRID TERRITORY. IT WILL SHOW ALL AREAS THAT HAVE HAD EITHER"
PRINT "A HISSILE HIT OR A HISSILE FIRED FROM IT. WITH THIS"
                                                                               1260 G=INT(RND(1)*L+1)
N PRINT "CONTINUALLY UPDATED MAP, YOU MAY BE ABLE TO INDUCTIVELY"
                                                                               1270 J=T(6,1)
PRINT "DISCOVER OR TRAP YOUR OPPONENT. BEWARE, HE WILL BE TRYING TO"
                                                                              1280 K=T(6,2)
                                                                               1290 I(E,F)=1
M PRINT "DO THE SAME TO YOU."
N PRINT
                                                                              1300 H(A,B)=1
0 6$=" -12345678910"
                                                                               1310 I(C,D)=1
U CS="SCANNER COMPUTER: "
                                                                               1320 H(M,N)=1
                                                                               1330 IF MOJ OR DOT GOTO 1390
1 S$=""
                                                                               1340 PRINT C$;"HEY! YOU GOT HIM!!"
W FOR X=1 TO 14
                                                                               1350 Z=0
10 S$=S$+"
                                                                              1360 IF C<>S OR D<>T GOTO 1390
N NEXT X
MILIA 10,10),H(10,10),T(8,2),P(8,2)

DIN I(10,10),H(10,10),T(8,2),P(8,2)

DATA 10,10, 1,1, 10,1, 1,10, 10,9, 9,10, 1,2, 2,1

M DATA -2,-2, 0,-2, 2,-2, 2,0, 2,2, 0,2, -2,2, -2,0

M R=INT(RND(1)*8+1)
                                                                               1370 PRINT C$; "YOU MOVED RIGHT UNDER HIS MISSILE !!"
                                                                              1380 Z=0
                                                                              1390 E=S
                                                                               1400 F=T
TO FOR X=1 TO R
                                                                              1410 A=J
HO READ A.B
                                                                              1420 B=K
D NEXT X
                                                                              1430 FOR X=1 TO 8
10 FOR X=1 TO 10
                                                                               1440 IF P(X,1)+E>100RP(X,1)+E<1 OR P(X,2)+F>100RP(X,2)+F<1 GOTO 1460
HO FOR Y=1 TO 10
                                                                              1450 IF I(P(X,1)+E,P(X,2)+F)=0 GOTO 1490
10 I(X,Y)=0
                                                                              1460 NEXT X
10 H(X,Y)=0
                                                                              1470 PRINT C$; "FOOL! YOU HAVE BOXED YOURSELF INTO A CORNER!!"
                                                                              1480 Z=0
20 NEXT Y
                                                                              1490 PRINT " YOUR TERRITORY ", "ENEMY TERRITORY"
10 NEXT X
                                                                               1500 PRINT
#0 IF A=2 GOTO 690
                                                                              1510 PRINT 6$;5$;6$
50 FOR X=1 TO 8
40 READ C.D
                                                                               1520 FOR X=1 TO 10
10 IF C=2 GOTO 690
                                                                              1530 IF X=10 GOTO 1560
HO NEXT X
                                                                              1540 PRINT X;
                                                                              1550 GOTO 1570
10 FOR X=1 TO 8
                                                                              1560 PRINT "10 "
10 FOR Y=1 TO 2
IN READ P(X,Y)
                                                                               1570 FOR Y=1 TO 10
                                                                              1580 IF I(X,Y)=1 GDTO 1610
1590 PRINT ":";
TO NEXT Y
NEXT X
10 PRINT C$;"ENEMY ACTIVITY ON GRID AT";A;",";B
                                                                              1600 GOTO 1620
150 PRINT
                                                                               1610 PRINT "*":
W INPUT "YOUR STARTING CO-ORDINATES"; E.F
                                                                              1620 NEXT Y
TO IF E<1 OR E>10 OR F<1 OR F>10 GOTO 760
                                                                              1630 PRINT " ";5$;
180 7=1
                                                                              1640 IF X=10 GOTO 1670
190 I(E,F)=1
                                                                              1650 PRINT X;
800 H(A,B)=1
                                                                              1660 GOTO 1680
810 PRINT
                                                                              1670 PRINT "10 ":
820 GOTO 1490
                                                                              1680 FOR Y=1 TO 10
10 INPUT "MISSILE CO-ORDINATES";M,N
                                                                               1690 IF H(X,Y)=1 GOTO 1720
HO IF H<1 OR H>10 OR N<1 OR N>10 GOTO 830
                                                                              1700 PRINT ":";
50 INPUT "WHERE TO MOVE TO";S,T
                                                                               1710 GOTO 1730
HO IF S<1 OR S>10 OR T<1 OR T>10 GOTO 850
                                                                              1720 PRINT "*";
#70 IF I(S,T)=1 GOTO 850
                                                                               1730 NEXT Y
880 FOR X=1 TO 8
                                                                              1740 PRINT
80 IF P(X,1)+E=S AND P(X,2)+F=T GOTO 920
                                                                               1750 NEXT X
                                                                              1760 PRINT
900 NEXT X
910 GOTO 850
                                                                               1770 IF Z=1 60T0 830
120 PRINT
                                                                              1780 END
930 L=1
                                                                              OK
```

# Smash

This game is a one-lap jalopy race. There is one big problem: you don't know the shape of the course or the safe speed with which you can go around the corners. Consequently you're likely to smash up fairly frequently or else go so slowly that you don't earn a good placing among the winners. However, after four or five plays of the game you'll begin to get the hang of it and you'll be able to whip around the course in grand fashion. The instructions in the program are quite detailed. Have fun!

SMASH was written by Scott Byron

RUN

SMASH CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

#### DO YOU NEED INSTRUCTIONS? YES

THIS IS SMASH--THE GAME THAT SIMULATES A CAR RACE. YOU WILL RESPOND WITH ONE OF THE FOLLOWING MANUEVERS WHEN A '?' IS TYPED. THE POSITION NUMBERS REFER TO THE POINT AT WHICH YOU ARE ON THE TRACK-THEY GO AS FOLLOWS:

1-THE START LINE 2-MID STRAIGHT-AWAY 3-COHING UP ON A LEFT TURN 4-MID LEFT TURN 5-COHING UP ON A RIGHT TURN 6-MID-RIGHT TURN 7-THE FINISH LINE

HANEUVERS 1-FLOOR IT 2-ACCELERATE(HODERATE) 3-BRAKE SLIGHT 4-JAH ON THE BRAKES 5-SHARP RIGHT 6-MODERATE RIGHT 7-SHARP LEFT B-MODERATE LEFT

| TIME(SEC)  | MILES TO GO      | M.P.H.    | POSITION | MOVE |
|------------|------------------|-----------|----------|------|
| 0          | 10               | 0         | 1        | ? 1  |
| 30         | 9.77167          | 27.4      | 4        | 2 2  |
| 60         | 9.32917          | 53.1      | 3        | 72   |
| 90         | 8.55292          | 93.15     | 4        | 73   |
| 120        | 7.9012           | 78.2062   | 2        | 7 1  |
| SMASHYOU   | WENT RIGHT INTO  | THE WALL! |          |      |
| DO YOU WAN | T TO PLAY AGAIN? | YES       |          |      |
| TIME(SEC)  | MILES TO GO      | M.P.H.    | POSITION | HOVE |
| 0          | 11               | 0         | 1        | ? 1  |
| 30         | 10.8217          | 21.4      | 2        | ? 1  |
| 60         | 10.1008          | 86.5      | 2        | ? 1  |
| SMASHYOU   | WENT RIGHT INTO  | THE WALL! |          |      |

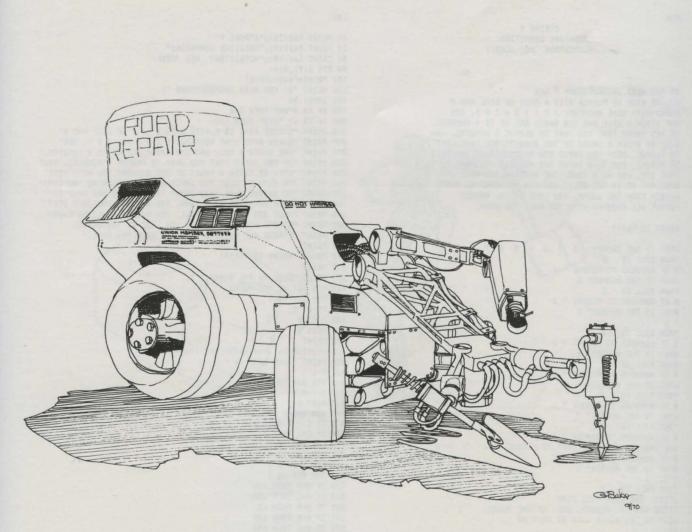
#### DO YOU WANT TO PLAY AGAIN? YES

| TIME(SEC)    | MILES TO GO     | H.P.H.    | POSITION | MOVI |
|--------------|-----------------|-----------|----------|------|
| 0            | 13              | 0         | 1        | ? 1  |
| 30           | 12.7742         | 27.1      | 3        | ? 2  |
| 60           | 12.3688         | 48.65     | 4        | ? 2  |
| 90           | 11.6623         | 84.775    | 5        | 76   |
| 120          | 10.9521         | 85.2287   | 6        | 76   |
| 150          | 10.3235         | 75.4221   | 6        | 72   |
| 180          | 9.31159         | 121.433   | 3        | ? 3  |
| 210          | 8.44864         | 103.554   | 4        | 78   |
| 240          | 7.56004         | 106.632   | 2        | 7 2  |
| 270          | 6.14713         | 169.549   | 3        | ? 3  |
| 300          | 4.93168         | 145.855   | 4        | 27   |
| 330          | 4.10717         | 98.9407   | 2        | 7 2  |
| 360          | 2.77708         | 159.611   | 3        | ? 3  |
| 390          | 1.63575         | 136.96    | 4        | 27   |
| 420          | .737833         | 107.75    | 2        | 72   |
| 435.387      | 0               | 172.625   | 7        |      |
| THAT ENDS TH | HE RACE, YOU PI | LACED # 2 |          |      |
|              | E SPEED WAS 10  |           |          |      |
|              | TO PLAY AGAIN   |           |          |      |
| Dk           | is isn't nonzh  |           |          |      |

LIST 10 PRINT TAB(26);"SMASH" 20 PRINT TAB(20);"CREATIVE COMPUTING" 30 PRINT TAB(18);"HORRISTOWN, NEW JERSEY" 40 PRINT: PRINT: PRINT 50 DIM A(7), J(6) 70 PRINT"DO YOU NEED INSTRUCTIONS"; 80 INPUT ZS 90 PRINT 100 FOR X=1 TO 7:READ A(X):NEXT X 105 FDR X=1 TO 6:READ J(X):NEXT X 120 IF LEFT\$(2\$,1)="N" THEN 350 130 PRINT"THIS IS SMASH--THE GAME THAT SIMULATES A CAR RACE." 140 PRINT"YOU WILL RESPOND WITH ONE OF THE FOLLOWING HANUEVERS" 150 PRINT "WHEN A '?' IS TYPED. THE POSITION NUMBERS REFER TO THE" 160 PRINT"POINT AT WHICH YOU ARE ON THE TRACK-THEY GO AS FOLLOWS:" 170 PRINT 180 PRINT " 1-THE START LINE" 2-MID STRAIGHT-AWAY" 190 PRINT " 200 PRINT " 3-COMING UP ON A LEFT TURN" 210 PRINT " 4-MID LEFT TURN" 220 PRINT " 5-COMING UP ON A RIGHT TURN" 230 PRINT " 6-MID-RIGHT TURN" 240 PRINT " 7-THE FINISH LINE" 250 PRINT 260 PRINT" MANEUVERS" 270 PRINT" 1-FLOOR IT" 280 PRINT" 2-ACCELERATE(MODERATE)" 290 PRINT" 3-BRAKE SLIGHT' 300 PRINT" 4-JAH ON THE BRAKES" 310. PRINT" 5-SHARP RIGHT" 320 PRINT" 6-MODERATE RIGHT" 330 PRINT" 7-SHARP LEFT" 340 PRINT" 8-MODERATE LEFT" 350 PRINT 360 PRINT"TIME(SEC)", "MILES TO GO", "M.P.H.", "POSITION", "MOVE" 370 LET A=INT(10+RND(1)+5):Y=A 380 LET B=0:T=0 390 LET C=1 400 6010 420 410 LET C=(INT(2+RND(1)+5))

420 PRINT T,A,B,C, 430 INPUT D 440 IF DOINT(D) THEN 470 450 IF D>8 THEN 470 460 IF D>=1 THEN 490 470 PRINT"ONE THRU EIGHT ONLY" 480 GOTO 420 490 IF D<>1 THEN 510 500 LET B=3\*B+20+INT(10+RND(1)\*91)/10 510 IF D<>2 THEN 530 520 LET B=3\*B/2+7+INT(10+RND(1)\*61)/10 530 IF D<>3 THEN 550 540 LET B=7\*B/8-6+INT(10+RND(1)\*41)/10 550 IF D<>4 THEN 570 560 LET B=4\*B/7-26+INT(10+RND(1)\*81)/10 570 IF D=7 THEN 590 580 IF D<>5 THEN 600 590 LET B=9\*B/10\*(.7+RND(1)\*.6) 600 IF D=8 THEN 620 610 IF D<>6 THEN 630 620 LET B=13\*B/14\*(.7+RND(1)\*.6) 630 IF B>0 THEN 650 640 LET B=0 650 IF A-B/120>0 THEN 730 660 LET T=T+A\*3600/B 670 PRINT T.O.B.7 680 PRINT T.O.B.7 680 PRINT"THAT ENDS THE RACE, YOU PLACED H"INT(T/(20\*Y)+.5) 690 PRINT"YOUR AVERAGE SPEED WAS"Y\*3600/T"M.P.H." 700 IF INT(T/(20\*Y)+.5)<>1 THEN 980 710 PRINT"THAT WAS A PERFECT RACE, CHAMP!" 720 GOTO 980

730 IF C<>2 THEN 760 740 IF D=7 THEN 960 750 IF D=5 THEN 960 760 IF C=3 THEN 780 770 IF C<>4 THEN 800 780 IF D=5 THEN 960 790 IF D=6 THEN 960 800 IF C=6 THEN 820 810 IF C<>5 THEN 840 820 IF D=7 THEN 960 830 IF D=8 THEN 960 840 IF B>J(C) THEN 970 850 IF INT(1+RND(0)\*77)<>40 THEN 880 860 PRINT"SMASH--YOU HAVE BEEN HIT BY ANOTHER CAR!!" 870 GOTO 980 880 LET T=T+30 890 LET A=A-B/120 900 IF C=1 THEN 410 910 IF C=4 THEN 410 920 IF C=2 THEN 410 930 IF C=6 THEN 410 940 LET C=C+1 950 GDT0 420 960 PRINT"BAD MOVE!" 970 PRINT "SMASH--YOU WENT RIGHT INTO THE WALL!" 980 PRINT"DO YOU WANT TO PLAY AGAIN"; 990 INPUT Z\$ 1000 IF LEFT\$(Z\$,1)="Y" THEN 350 1020 DATA 2,3,5,2,3,5,2,200,240,180,170,180,170 1030 END Ok





This is a simple game based on the numbers 1 through 9, and a pair of dice. First, the computer rolls a random number for your "dice." Then you must take that number from the total of your board numbers 1-9. To win you must remove all of your board numbers. With each roll you must remove the total number of that roll from the board or you lose.

One strategy is to remove the largest numbers possible with each roll, or you can try to get the most numbers removed. For example, if the roll is 10, you might want to remove the 1, 2, 3 and 4 instead of the 1 and 9.

You may want to have competition and players can alternate with rolls. Then the player who can't remove all numbers from his/her roll loses.

Strike 9 was conceived by Bruce Grembowski and first appeared in *Creative Computing*, Jan/Feb 1977.

RUN

STRIKE 9 CREATIVE COMPUTING MORRISTOWN NEW JERSEY

DO YOU NEED INSTRUCTIONS ? YES STRIKE NIME IS PLAYED WITH A PAIR OF DICE AND A BOARD WITH NIME NUMBERS: 1 2 3 4 5 6 7 8 9. YOU ARE GIVEN A ROLL AND CAN KNOCK OFF UP TO 4 NUMBERS. IF YOU INPUT THAT YOU WANT TO REMOVE 5 NUMBERS, YOU WILL BE GIVEN A CHART OF THE NUMBERS YOU HAVE LEFT TO REMOVE. NEXT YOU INPUT HOW MANY NUMBERS YOU WANT TO REMOVE. AND THEN INPUT THE NUMBERS YOU WANT TO TAKE OFF, ONE AT A TIME. THE NUMBERS YOU WANT TO TAKE OFF, ONE AT A TIME. THE NUMBERS YOU WANT TO NUMBER FROM THE BOARD. YOU LOSE IF YOU CANNOT REMOVE ALL NUMBERS WITH THE ROLL YOU HAVE.

READY TO PLAY?

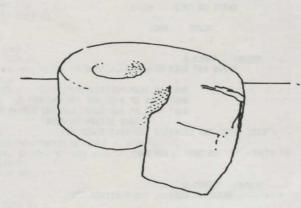
HERE IS THE BOARD: 1 2 3 4 5 6 7 8 9 YOUR ROLL IS 8 # OF NUMBERS TO REMOVE ? 1 WHAT IS THE NUMBER? 8 YOUR ROLL IS 3 # OF NUMBERS TO REMOVE ? 2 WHAT IS THE NUMBER? 2 YOUR ROLL IS 6 # OF NUMBERS TO REMOVE ? 1 WHAT IS THE NUMBER? 6 YOUR ROLL IS 9 # OF NUMBERS TO REMOVE ? 1 WHAT IS THE NUMBER? 9 YOUR ROLL IS 7 # OF NUMBERS TO REMOVE ? 1 WHAT IS THE NUMBER? 7 YOUR ROLL IS 9 # OF NUMBERS TO REMOVE ? 5 THE NUMBERS YOU HAVE LEFT TO REMOVE ARE: 3 4 5 # DF NUMBERS TO REMOVE ? 2 WHAT IS THE NUMBER? 5 7 4 YOUR ROLL IS SORRY, YOU LOST THIS TIME. THERE ARE 1 NUMBERS LEFT ON THE BOARD: 3 WANT TO TRY AGAIN (TES OR NO)? NO OK

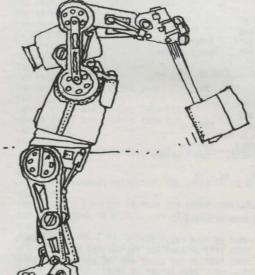
#### LIST

10 PRINT TAB(25);"STRIKE 9" 20 PRINT TAB(19);"CREATIVE COMPUTING" 30 PRINT TAB(18);"MORRISTOWN NEW JERSEY" 90 DIM A(9), D(4) 110 PRINT:PRINT:PRINT 170 PRINT "DO YOU NEED INSTRUCTIONS "; 180 INPUT RS 190 IF R\$ ="NO" THEN 340 200 IF R\$ <> "YES" THEN 170 210 PRINT "STRIKE NIME IS PLAYED WITH A PAIR OF DICE AND A" 220 PRINT "BOARD WITH NINE NUMBERS: 1 2 3 4 5 6 7 8 9. YOU" 230 PRINT "ARE GIVEN A ROLL AND CAN KNOCK OFF UP TO 4 NUMBERS." 240 PRINT "IF YOU INPUT THAT YOU WANT TO REMOVE 5 NUMBERS, YOU" 250 PRINT "WILL BE GIVEN A CHART OF THE NUMBERS YOU HAVE LEFT" 260 PRINT "TO REMOVE. NEXT YOU INPUT HOW MANY NUMBERS YOU WANT" 270 PRINT "TO REMOVE, AND THEN IMPUT THE NUMBERS YOU WANT TO " 280 PRINT "TAKE OFF, ONE AT A TIME. THE NUMBERS YOU TAKE OFF" 290 PRINT "MUST ADD UP TO THE ROLL. YOU WIN BY REMOVING EVERY" 300 PRINT "NUMBER FROM THE BOARD. YOU LOSE IF YOU CANNOT" 310 PRINT "REMOVE ALL NUMBERS WITH THE ROLL YOU HAVE." 320 PRINT 340 PRINT "READY TO PLAY?" 350 PRINT 355 PRINT "HERE IS THE BOARD: ": 360 REM SET UP THE BOARD 370 FOR B=1 TO 9 380 PRINT B; 390 A(B)=B 400 NEXT B 405 PRINT 410 C=INT(RND(1)\*6+1)+INT(RND(1)\*6+1) 420 PRINT "YOUR ROLL IS ",C 430 T=0 440 FOR X=1 TO 9 450 T=T+A(X) 460 NEXT X 465 REM CHECK FOR LOSS 470 IF C > T THEN 950 480 IF C=T THEN 1120 490 FOR K=1 TO 9 500 FOR L=1 TO 9 510 FOR M=1 TO 9 520 FOR N=1 TO 9 530 IF N=K THEN 630 540 IF N=L THEN 630 550 IF N=M THEN 630 C60 IF M=K THEN 640 570 IF M=L THEN 640

```
580 IF L=K THEN 650
590 IF C-A(K)=0 THEN 680
600 IF C-A(K)=A(N) THEN 680
610 IF C-A(K)-A(L)=A(N) THEN 680
620 IF C-A(K)-A(M)=A(N) THEN 680
630 NEXT N
640 NEXT M
650 NEXT L
660 NEXT K
670 GOTO 950
680 FOR X=1 TO 4
690 D(X)=0
700 NEXT X
710 PRINT "# OF NUMBERS TO REMOVE ";
720 INPUT E
730 IF INT(E) <> E THEN 760
740 IF E < 1 THEN 760
750 IF E>4 THEN 880
755 GOTO 770
760 PRINT "ANSWER 1, 2, 3, OR 4 (5 FOR THE BOARD)"
765 GOTO 710
770 PRINT "WHAT IS THE NUMBER";
780 FOR F=1 TO E
790 INPUT D(F)
800 IF A(D(F)) <> 0 THEN 825
810 PRINT "YOU REMOVED IT BEFORE, TRY AGAN."
820 GOTO 710
825 NEXT F
830 IF C <> D(1)+D(2)+D(3)+D(4) THEN 870
835 FOR F=1 TO E
840 A(D(F))=0
850 NEXT F
860 GOTO 410
870 PRINT "THOSE NUMBERS DON'T ADD UP TO YOUR ROLL, TRY AGAIN"
```

```
875 GOTO 710
G30 PRINT "THE NUMBERS YOU HAVE LEFT TO REMOVE ARE: ";
8%0 FOR B=1 TO 9
900 IF A(B)=0 THEN 920
910 PRINT A(B);
920 NEXT B
930 PRINT
940 GOTO 710
950 PRINT "SORRY, YOU LOST THIS TIME."
960 T=0
970 FOR B=1 TO 9
980 IF A(B)=0 THEN 1000
990 T=T+1
1000 NEXT B
1010 PRINT "THERE ARE ";T;" NUMBERS LEFT ON THE BOARD: ";
1020 FOR X=1 TO 9
1030 IF A(X)=0 THEN 1050
1040 PRINT A(X);
1050 NEXT X
1060 PRINT
1070 PRINT "WANT TO TRY AGAIN (YES OR NO)";
1080 INPUT 6$
1090 IF 6$="YES" THEN 170
1100 IF 6$ <> "NO" THEN 1070
1110 END
1120 PRINT "# # * CONGRATULATIONS * * *"
1130 PRINT "* YOU WON *"
1140 PRINT
1150 PRINT
1160 PRINT "PLAY ANOTHER GAME (YES OR NO)";
1170 INPUT H$
1180 IF H$="YES" THEN 170
1190 IF H$ <> "NO" THEN 1160
1200 END
OK
```







Tennis is, as its name implies, a tennis match. In this game you have several options available to you as the position on the court that you wish to play from, the placement of your shot that you're trying for, and the speed or type of shot. As in normal tennis, you don't always make the shot that you try for. The program lets you play, more or less, at the intermediate level. If you think that it allows you to play too well or too poorly, you could always change some of the random factors that determine how often a shot is missed.

Tennis was written by Victor Nahigian and David Ahl.

RUN

TENNIS MATCH CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY

THERE ARE SEVERAL OPTIONS AVAILABLE TO YOU AS TO POSITION, PLACEMENT OF SHOT, AND SPEED (TYPE) OF SHOT. THE KEY THAT YOU WILL USE IS...

POSITION(PLACEMENT, TOD): L.BACKCOURT(1);R.BACK-COURT(2); L. FORECDURT(3); R. FORECOURT(4). SPEED (TYPE) OF SHOT: FAST-SLAM(S);SLOWLOB(L).

SPEED (TYPE) OF SHOT: FAST-SLAM(S);SLOWLOB(L). BACKHANDS AND FOREMANDS WILL MERELY BE ASSUMED AS YOU SNOOT FROM A CERTAIN SECTION OF THE COURT. ON SERVES, YOU CANNOT HAVE PLACEMENT OPTIONS, BUT YOU WILL BE ABLE TO ALTER THE SPEED OF IT. BY THE WAY, YOU WILL BE ALLOWED TO SERVE FIRST IN ALL GAMES. ARE YOU READY?... HERE WE GO!!!

SERVE! TYPE? S SERVE IS BAD SERVE AGAIN!! TYPE? S SERVE IS BAD... DOUBLE FAULT!

SCORE LOVE15

SERVE! TYPE? S SERVE IS BAD SERVE AGAIN!! TYPE? S LET SERVE... TAKE 1 SERVE AGAIN!! TYPE? S SERVE IS GODD... CAN'T RETURN IT!!

SCORE 15 - 15

SERVE! TYPE? S SERVE HAS BEEN RETURNED...

> WHAT IS YOUR POSITION?? 1 WHAT TYPE OF SHOT ARE YOU MAKING? S WHAT PART OF THE COURT ARE YOU AIMING FOR? 3 YOUR RETURN IS GOOD! COMPUTER'S RETURN IS GOOD!

> WHAT IS YOUR POSITION?? 1 WHAT TYPE OF SHOT ARE YOU MAKING? S WHAT PART OF THE COURT ARE YOU AIMING FOR? 2 Your Return is good! Computer's Return is good!

WHAT IS YOUR POSITION?? 2 NICE TRY-YOU WERE UNABLE TO REACH THAT SHOT-COURT # 3

SCORE 15 - 30

SERVE! TYPE? S SERVE IS BAD SERVE AGAIN!! TYPE? S SERVE IS GOOD... CAN'T RETURN IT!!

SCORE DUCE

SERVE! TYPE? S SERVE IS GODD... CAN'T RETURN IT!!

SCORE ADD IN

SERVE! TYPE? S SERVE IS BAD SERVE AGAIN!! TYPE? S 9ERVE IS BAD... DOUBLE FAULT!

SCORE DUCE

SERVE! TYPE? S SERVE IS BAD SERVE AGAIN!! TYPE? S SERVE IS BAD... DOUBLE FAULT!

SCORE ADD OUT

SERVE! TYPE? S SERVE HAS BEEN RETURNED...

WHAT IS YOUR POSITION?? 1 WHAT TYPE OF SHOT ARE YOU MAKING? L WHAT PART OF THE COURT ARE YOU AIMING FOR? 4 YOUR RETURN IS GOOD! NICE SHOT- THE COMPUTER COULDW'T REACH IT

SCORE DUCE

SERVE! TYPE? S SERVE 15 BAD SERVE AGAIN!! TYPE? S SERVE 15 BAD... DOUBLE FAULT!

SCORE ADD OUT

SERVE! TYPE? S SERVE IS GOOD ... ACE!!

SCORE DUCE

SERVE! TYPE? S SERVE HAS BEEN RETURNED...

> WHAT IS YOUR POSITION?? 1 WHAT TYPE OF SHOT ARE YOU MAKING? S WHAT PART OF THE COURT ARE YOU AIMING FOR? 3 Your Return Is good!

NICE SHOT- THE COMPUTER COULDN'T REACH IT

SCORE ADD IN

SERVE! TYPE? S SERVE IS GOOD... CAN'T RETURN IT!!

SCORE GAME ----- GAME OVER ------SCORE-GAMES YOU...ME 1 0

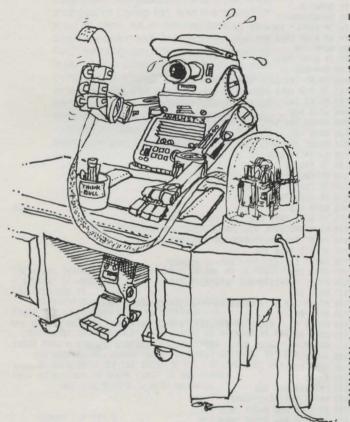
SERVE! TYPE? S LET SERVE...TAKE 2 SERVE! TYPE? S SERVE IS GODD... CAN'T RETURN IT!!

SCORE 15 - LOVE

```
76 IF B$="L" THEN 81
                                                                               77 N=61
                                                                              78 IF K<N THEN 85
                                                                              79 PRINT TAB(10); " SERVE IS GOOD ... CAN'T RETURN IT!!"
                                                                              80 GOTO 128
                                                                              81 N=76
                                                                              82 GOTO 78
                                                                              85 PRINT TAB(10); "SERVE HAS BEEN RETURNED ....
                                                                              86 PRINT
                                                                              87 D=INT (4*RND(1))+1
                                                                              88 PRINT TAB(20); "WHAT IS YOUR POSITION?";
                                                                              89 INPUT D
                                                                              90 IF 0+0=5 THEN 124
                                                                              91 PRINT TAB(20); "WHAT TYPE OF SHOT ARE YOU MAKING";
                                                                              92 INPUT C$
                                                                              93 PRINT TAB(20); "WHAT PART OF THE COURT ARE YOU AIMING FOR";
                                                                              94 INPUT R
                                                                              95 S=100*RND(1)
                                                              000000
                                                                              96 IF C$="L" THEN 99
                                                             00
                                                                              97 IF S<81 THEN 107
                                                                              98 GOTO 100
                                                                              99 IF S<91 THEN 107
                                                                              100 U=4*RND(1)
                                                                              101 PRINT TAB(30); "YOUR RETURN IS BAD .... "
                                                                              102 IF U<2 THEN 105
                                                                              103 PRINT TAB(33);"HIT OUT-OF-BOUNDS"
                                                                              104 GOTO 130
                                                                              105 PRINT TAB(33);"HIT INTO NET"
                                                                              106 GOTO 130
                                                                              107 PRINT TAB(30); "YOUR RETURN IS GOOD!"
                                                                              108 A1=INT(4*RND(1))
                                                                              109 IF R+A1=5 THEN 127
                                                                              110 W=100*RND(1)
                                                                              111 IF C$="L" THEN 112
                                                                              112 IF W<84 THEN 122
                                                                              113 GOTO 115
                                                                              114 IF W<84 THEN 122
                                                                              115 C1=4*RND(1)
LIST
1 PRINT TAB(30)"TENNIS MATCH"
                                                                              116 PRINT TAB(30); "COMPUTER'S RETURN IS BAD"
2 PRINT TAB(15)"CREATIVE COMPUTING, MORRISTOWN, NEW JERSEY"
                                                                              117 IF B<2 THEN 120
10 PRINT:PRINT:PRINT
                                                                              118 PRINT TAB(33);"HIT OUT-OF-BOUNDS"
21 PRINT "THERE ARE SEVERAL OPTIONS AVAILABLE TO YOU AS TO POSITION,"
                                                                              119 GOTO 128
22 PRINT "PLACEMENT OF SHOT, AND SPEED (TYPE) OF SHOT. THE KEY THAT "
                                                                              120 PRINT TAB(33);"HIT INTO NET"
23 PRINT "YOU WILL USE IS ...
                                                                              121 GOTO 128
                                                                              122 PRINT TAB(30);"COMPUTER'S RETURN IS GOOD!"
24 PRINT TAB(5)"POSITION(PLACEMENT, TOO): L.BACKCOURT(1);R.BACK-
25 PRINT "COURT(2); L. FORECOURT(3); R. FORECOURT(4)."
26 PRINT TAB(5)"SPEED (TYPE) OF SHOT: FAST-SLAM(S);SLOWLOB(L)."
                                                                              123 GOTO 86
                                                                              124 PRINT "
                                                                                              NICE TRY-YOU WERE UNABLE TO REACH THAT SHOT-COURT #"O
27 PRINT TAB(3) "BACKHANDS AND FOREHANDS WILL MERELY BE ASSUMED AS YOU "
                                                                              125 GOTO 130
                                                                              127 PRINT
28 PRINT "SHOOT FROM A CERTAIN SECTION OF THE COURT."
                                                                                              NICE SHOT- THE COMPUTER COULDN'T REACH IT"
29 PRINT TAB(5) "ON SERVES, YOU CANNOT HAVE PLACEMENT OPTIONS, BUT YOU"
                                                                              128 Y=Y+1
30 PRINT "WILL BE ABLE TO ALTER THE SPEED OF IT. BY THE WAY, YOU"
                                                                              129 GOTO 131
31 PRINT "WILL BE ALLOWED TO SERVE FIRST IN ALL GAMES."
                                                                              130 Z=Z+1
32 PRINT TAB(10); "ARE YOU READY?... HERE WE GO!!!"
                                                                               131 PRINT: GOSUB 200
                                                                              132 PRINT TAB(15);"SCORE
35 Y=0
                                                                                                            "S$
                                                                              134 IF Y>=4 AND Y>Z+1 THEN 137
36 Z=0
                                                                              135 IF Z>=4 AND Z>Y+1 THEN 139
38 PRINT
39 PRINT
                                                                              16 GOTO 38
40 PRINT "
               SERVE!
                       TYPE":
                                                                              137 Y1=Y1+1
41 INPUT AS: IF AS<>"L" AND AS<>"S" THEN PRINT "'L' OR 'S'": GOTO 40
                                                                              138 GOTO 140
42 A=100*RND (1)
                                                                              139 Z1=Z1+1
43 IF A$="L" THEN 52
                                                                              140 PRINT".
                                                                                                       -- GAME OVER -
                                                                              141 PRINT TAB(15);"SCORE-GAMES
44 C=6
                                                                                                                    YOU...ME"
45 D=51
                                                                              142 PRINT TAB(32); Y1;"
                                                                                                          ";Z1
46 IF A<C THEN 50
                                                                              143 IF Y1>=6 AND Y1>Z1+1 THEN 146
47 IF ACD THEN 70
                                                                              144 IF Z1>=6 AND Z1>Y1+1 THEN 149
48 PRINT TAB(10); "SERVE IS BAD"
                                                                              145 GOTO 35
49 GOTO 55
                                                                              146 PRINT
                                                                              147 PRINT "*****CONGRATULATIONS...YOU WON*****
50 PRINT TAB(10);"LET SERVE...TAKE 2"
51 GOTO 40
                                                                              148 GOTO 151
52 C=4
                                                                              149 PRINT
53 D=66
                                                                              150 PRINT "*****AS PREDICTED, THE COMPUTER IS AGAIN TRIUMPHANT!*****
54 GOTO 46
                                                                              151 PRINT
55 PRINT TAB(10); "SERVE AGAIN!!
                                  TYPE";
                                                                              152 PRINT"
                                                                                           I'D LIKE TO PLAY YOU AGAIN SOMETIME, BUT RIGHT NOW, I"
56 INPUT BS: IF BS<>"L" AND BS<>"S" THEN PRINT "'L' OR 'S'": GOTO 55
                                                                              153 PRINT "HAVE TO REST.....BYE!!!
57 E=100*RND(1)
                                                                              154 PRINT
58 IF B$="L" THEN 67
                                                                              200 IF Y>=2 AND Z>=2 THEN 300
59 G=5
                                                                              210 IF Y=4 OR Z=4 THEN S$="GAME": GOTO 400
60 H=41
                                                                              220 IF Y=0 THEN YS="LOVE"
61 IF EKG THEN 65
                                                                              230 IF Y=1 THEN Y$="15 -
62 IF EKH THEN 70
                                                                              240 IF Y=2 THEN YS="30
63 PRINT TAB(10); "SERVE IS BAD ... DOUBLE FAULT!"
                                                                              245 IF Y=3 THEN YS="40
64 GOTO 130
                                                                              250 IF Z=0 THEN Z$="LOVE"
65 PRINT TAB(10); "LET SERVE... TAKE 1"
                                                                              255 IF Z=1 THEN Z$="15"
                                                                              260 IF Z=2 THEN Z$="30"
66 GOTO 55
67 G=3
                                                                              265 IF Z=3 THEN Z$="40"
                                                                              270 S$=Y$+Z$:60T0 400
68 H=76
                                                                              300 IF Y=Z THEN S$="DUCE":GOTO 400
69 GOTO61
                                                                              310 IF Y=Z+1 THEN S$="ADD IN ": GOTO 400
320 IF Y=Z-1 THEN S$="ADD OUT": GOTO 400
70 I=100 # RND(1)
71 IF I>6 THEN 74
                                                                              330 IF Y=Z+2 OR Z=Y+2 THEN S$="GAME"
72 PRINT TAB(10); "SERVE IS GOOD ... ACE!!"
                                                                              400 RETURN
73 GOTO 128
74 K=100*RND (1)
                                                                              500 END
                                                                              Ok
```

```
75 IF A$="L" THEN 81
```

# Tickertape



LIST

5 PRINT TAB(24);"TICKERTAPE" 6 PRINT TAB(20); "CREATIVE COMPUTING" 7 PRINT TAB(18); "HORRISTOWN, NEW JERSEY" 9 PRINT: PRINT: PRINT 10 INPUT AS: GOSUB BO 20 FOR N=1 TO LEN(AS) 25 B=ASC(MID\$(A\$,N,1)) 30 IF 8>90 THEN 47 33 IF B<65 THEN 40 35 B=B-64 37 BOTO 50 40 IF B>57 OR B<48 THEN 47 43 B=B-20 45 GOTO 50 47 B=27 50 FOR S=0 TO (B-1)\*5:READ A:NEXT S 60 FOR S=1 TO 5:READ A:PRINT CHR\$(A)::NEXT S 65 PRINT CHR\$(0);:RESTORE 70 NEXT N 75 GOSUB 80:END 80 FOR N=1 TO 30:PRINT CHR\$(0);:NEXT N 90 RETURN 110 DATA 0,254,9,9,9,254,255,137,137,137,118,126,129,129,129,129 120 DATA 255,129,129,129,126,255,137,137,137,137,255,9,9,9,1 130 DATA 126,129,129,145,243,255,8,8,8,255,129,129,255,129,129 130 DATA 126,129,129,145,243,255,8,8,8,255,129,129,255,129,129
140 DATA 96,128,129,127,1,255,8,20,34,193,255,128,128,128,128,128
150 DATA 255,2,12,2,255,255,2,60,64,255,126,129,129,129,126
160 DATA 255,25,41,73,134,134,137,137,137,113,1,1,255,1,1
180 DATA 127,128,128,128,127,63,96,192,96,63,127,128,112,128,127
215 DATA 195,36,24,36,195,3,4,248,4,3,193,161,145,137,135
220 DATA 0,0,0,0,0,126,161,137,133,126,132,130,255,128,128,194,161,145
230 DATA 137,134,66,137,137,137,118,12,10,137,255,136,199,137,137,137
240 DATA 248,126,137,137,137,114,1,1,249,5,2,118,137,137,137,118 250 DATA 70,137,137,137,126 OK

This program inputs a line of characters from a Teletype, and then punches the shape of each letter on paper tape. This program can handle all of the letters and numbers and the space, but there is no reason why it could not be modified to handle various symbols also.

The operation of this program is fairly straightforward. After each character is converted to a number equivalent to its place in the alphabet (A=1, B=2, Z=26, space=27), a simple table look-up is performed to find the correct numbers to punch onto the tape. These numbers are stored in the DATA statements.

The original program was designed for a PDP-8; the one here runs in Microsoft Basic, however it would not be difficult to modify the program for virtually any Basic-speaking computer.

Written by Bill Gardner and Jim Larus, Tickertape first appeared in *Creative Computing*, May/Jun 1977.

| <br>: :: | ••••   |    | <br> |
|----------|--------|----|------|
| <br>: :: | ••••   |    |      |
|          |        |    |      |
| <br>     |        |    |      |
| <br>     | •••••• |    |      |
| <br>     | ::     |    |      |
|          |        | •• | <br> |
|          |        |    |      |
| <br>:::: |        |    | <br> |
|          |        |    | <br> |



This program automatically devises plots for television shows or series guaranteed to appeal to the masses and win high Nielsen ratings. By substituting appropriate words in the various parts of the program it could be easily modified for many other useful purposes such as devising names for new breakfast cereals, preparing PhD theses, or naming government agencies and their corresponding projects.

This program was originally written in FOCAL by Mary Cole and converted to BASIC by David Ahl.

RUN

#### TVPLOT CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM AUTOMATICALLY COMES UP WITH TELEVISION SHOWS GUARANTEED TO APPEAL TO THE MASSES AND WIN HIGH NEILSEN RATINGS.

HERE IS THE FIRST PLOT:

THE SPECIAL IS ABOUT A HILARIOUS LAWYER WHO IS A WHIZ AT SOLVING CRIMES AND WHO STOPS THE FLOOD.

ANOTHER (YES OR NO)? YES

THE PROGRAM IS ABOUT A THOUGHTFUL COLLIE WHO IS A FLOP AT HERDING ELEPHANTS AND WHO CONFESSES.

ANDTHER (YES OR NO)? YES

THE PROGRAM IS ABOUT A SENSITIVE SECRET AGENT WHO IS A WHIZ AT TWO-FISTED DRINKING AND WHO STOPS THE FLOOD.

ANDTHER (YES OR NO)? YES

THE SPECIAL IS ABOUT A DEDICATED LITTLE BOY WHO IS A FLOP AT COOKING HEALTH FOOD AND WHO HELPS THE DOG.

ANDTHER (YES OR ND)? YES

THE SERIES IS ABOUT A DODDERING LAWYER WHO IS A WHIZ AT HERDING ELEPHANTS AND WHO STOPS THE FLOOD.

ANDTHER (YES OR ND)? YES

THE SPECIAL IS ABOUT A HENPECKED LAWYER WHO IS A FLOP AT FIGHTING FIRES AND WHO DESTROYS THE CITY.

ANOTHER (YES OR NO)? YES

THE STORY IS ABOUT A SENSITIVE GIRL COWHAND WHO IS A FLOP AT SOLVING CRIMES AND WHO RECOVERS THE JEWELS.

ANOTHER (YES OR NO)? NO

O.K. HOPE YOU HAVE A SUCCESSFUL TV SHOW!! Dk LIST 10 PRINT TAB(26);"TVPLOT" 20 PRINT TAB(20); "CREATIVE COMPUTING" 40 PRINT TAB(18); "NORRISTOWN, NEW JERSEY" 50 PRINT:PRINT:PRINT 55 PRINT "THIS PROGRAM AUTOMATICALLY COMES UP WITH TELEVISION" 60 PRINT "SHOUS BUARANTEED TO APPEAL TO THE MASSES AND WIN" 70 PRINT "HIGH NEILSEN RATINGS.":PRINT 80 PRINT "HERE IS THE FIRST PLOT:" 100 PRINT: GOSUB 800 110 ON X 60TO 120,130,140,150,160,120,130,140,150,160 120 AS="PROGRAM" . 60TO 120 130 AS="REPORT": 60T0 170 140 A\$="SPECIAL":60T0 170 150 AS="SERIES":60TO 170 160 A\$="STORY" 170 GOSUB 800 180 DN X 60T0 190,200,210,220,230,240,250,260,270,280 190 B\$="SWINGING":60T0 290 200 B\$="BRILLIANT":60T0 290 210 B\$="SALTY": 60T0 290 220 B\$="HILARIOUS":60TD 290 230 B\$="SENSITIVE":GOTO 290 240 B\$="DODDERING":6010 290 250 B\$="HENPECKED":GOTO 290 260 BS="DEDICATED":GOTO 290 270 B\$="THOUGHTFUL":60T0 290 280 B\$="HEAVY" 290 605UR 800 300 DN X 60T0 310,320,330,340,350,360,370,380,390,400 310 C\$="6IRL COWHAND":60T0 410 320 CS="LITTLE BOY": GOTO 410 330 C\$="SCIENTEST":GOTO 410 340 CS="LAWYER": 60TO 410 350 CS="TOWN MARSHALL": 60TO 410 360 CS="DENTIST": GOTD 410 370 CS="BUS DRIVER":GOTO 410 380 CS="JUNGLE MAN": GOTO 410 390 CS="SECRET AGENT": 60TO 410 400 C\$="COLLIE" 410 GOSUB 800 420 DN X GOTO 430,440,450,460,470,430,440,450,460,470 430 DS="A WHIZ": 60T0 480 440 DS="A FLOP": 60T0 480 450 DS="MEDIOCRE":GOTO 440 460 DS="A SUCCESS":GOTO 440 470 DS="A DISASTER" 480 60SUB 800 490 ON X GOTO 500,510,520,530,540,550,560,570,580,590 500 ES="SOLVING CRIMES":GOTO 600 510 ES="ROPING CONS":60TO 600 520 ES="COOKING HEALTH FOOD":GOTO 600 530 ES="PITCHING WOO":GOTO 600 540 ES="PROTECTING ECOLOGY":GOTO 600 550 ES="HELPING CHILDREN":GOTO 600 560 ES="TWO-FISTED DRINKING":GOTO 600 570 ES="FIGHTING FIRES": GOTO 600 580 ES="HERDING ELEPHANTS": GOTO 600 590 ES="WINNING RACES": GOTO 600 600 GOSUB 800 610 DN X GOTO 620,630,640,650,660,670,680,690,700,710 620 F\$="RECOVERS THE JEWELS": GOTD 720 630 FS="FOILS THE SPIES":GOTO 720 640 FS="DESTROYS THE CITY":60T0 720 650 FS="FINDS LOVE": GOTO 720 660 F\$="SAVES THE ANIMALS": GOTO 720 670 FS="CONFESSES": GOTO 720 680 F\$="DISCOVERS THE SECRET":GOTO 720 690 FS="STOPS THE FLOOD":60TO 720 700 FS="HELPS THE DOG":GOTO 720 710 FS="MAKES THE SACRIFICE" 720 PRINT "THE ";A\$;" IS ABOUT A ";B\$;" ":C\$;" WHO IS ":D\$:" AT" 730 PRINT ES;" AND WHO ";FS". ": PRINT: PRINT 740 INPUT "ANOTHER (YES OR NO)";AS 750 IF AS="NO" THEN 999 760 GOTO 100 800 X=INT(10\*RND(1)+1):RETURN C99 PRINT:PRINT "C.K. HOPE YOU HAVE A SUCCESSFUL TV SHOW!!":EN" Ok



The computer will set up a 15x15 playing field in which you are randomly located. Also inside the field is an objective square, 30 blocked squares (walls), 22 relocation squares, and 1 super special new maze square, and, of course, the Twonky (which is no relation to a creme-filled cupcake).

To win the game, you must reach the objective square before the Twonky gets you, by moving one square at a time, forward, backward, right or left. Unfortunately, you are hindered by several things:

RELOCATION squares, when moved on, cause you to be randomly transported to another position in the maze.

WALLS; you can't move into these squares, and lose your turn when you hit one.

SUPER-MAZE-SQUARE; essentially an instant loss, since when you move here a completely new maze is set up.

TWONKY; after every move, the Twonky moves toward you. (He is impervious to all traps, even walls). When he gets too close to you (2 or fewer squares), you lose. However, you are equipped with a de-materializing ray gun. You have the option of using this on your turn. If you hit the Twonky he de-materializes and then re-materializes on a different square of the maze to resume his quest after you. (CAUTION: he could be dropped into your lap!).

After each move pair (you and Twonky), your distance from both the Twonky and the objective square are printed. There is no board printout — you play blind. However, using the distances, you can home in to the approximate position of both Twonky and objective.

When shooting at the Twonky, you do *not* have a shot if the distance he is from you is not an integer. For example: If the Twonky is 2.23606 units away, you don't have a direct shot. If he is 4 units away, you do have a shot. Exceptions to this rule are distances of 5, 10, 13, and 17. (A review of the Pythagorean Theorem will show why this is true.) Hence, if the distance is 5, 10, or 13 (but not 17), you may or may not have a direct shot. Likewise, this set of rules applies to the direction of the objective.

If you watch your distances before and after moving, you should be able to tell where the Twonky is in relation to you, e.g., forward and to the right, or backward and to the left. Take the distance you are from the Twonky, square it, say  $2.23606^2 = 4.999998$  approx. = 5. Then find two integers that when squared and added together equal this (2 and 1). If the Twonky is forward and to the right, you now know that he is either up 2, over 1, or up 1, over 2.

The thing that makes Twonky unique, is that it can be played on two levels, one in which you play for fun, moving haphazardly; or you can play while figuring out exact positions, and calculating moves in advance for a challenging (as well as fun) game.

Twonky was written by Mark Capella and first appeared in *Creative Computing*, May/Jun 1977.

RUN

INDNKY CREATIVE COMPUTING MORRISTOWN NEW JERSEY

DO YOU WANT INSTRUCTIONS (Y/N)? Y

THIS IS THE GAME OF TWONKY. YOU HAVE LANDED OM THE PLANET OF TWINKY AND ITS KING (KONG:THEIR KING IS KING KONG) HAS CAPTURED YOU. HE HAS PUT YOU IN A MAZE THAT IS 15 \* 15 UNITS LONG. YOU ARE IN THE DARK AND CANNOT SEE... YOU MUST GET TO THE OBJECTIVE SQUARE AND BE SET FREE.

HAZARDS INCLUDE: SSUARES THAT YOU CANNOT GO INTO (30). SQUARES THAT RANDOMLY THROW YOU AROUND THE MAZE (22). SQUARE THAT SETS UP A NEW MAZE AND ALL THAT'S IN IT (1) MOMSTER CALLED TWONKY THAT CHASES YOU AND WILL ABSORB YOU IF THE DISTANCE IT IS FROM YOU FALLS BELOW 2 UNITS. \* TWONKY IS ALSO IMMUNE TO ALL TRAPS INCLUDING WALLS.

YOU CAN:

MOVE ONE SQUARE AT A TIME TO FIND THE OBJECTIVE OR ESCAPE FROM THE TWONKY.

SHOOT AT THE TWONKY ONE DIRECTION AT A TIME. IF THE TWONKY IS HIT, HE WILL BE REPLACED IN THE MAZE RANDOMLY.

IF THE TWONKY ABSORBS YOU...YOU LOSE. IF YOU LAND ON THE OBJECTIVE SQUARE YOU WIN.

GOOD LUCK!

THE TWONKY IS 8.06226 UNITS AWAY. THE DBJECTIVE IS 9.48683 UNITS AWAY.

MOVE OR SHOOT (H/S)? H WHICH WAY (F/B/R/L)? F HOVE ALLOWED.

THE TWONKY IS 7.2111 UNITS AWAY. THE DBJECTIVE IS 8.54401 UNITS AWAY.

TWONKY MOVES ....

THE TWONKY IS 6.70821 UNITS AWAY. THE DBJECTIVE IS 8.54401 UNITS AWAY.

MOVE OR SHOOT (H/S)? M WHICH WAY (F/B/R/L)? R MOVE ALLOWED.

THE TWONKY IS 7.2111 UNITS AWAY. THE OBJECTIVE IS 8.94428 UNITS AWAY.

TWONKY MOVES ....

THE TWOMKY IS 6.70821 UNITS AWAY. THE OBJECTIVE IS 8.94428 UNITS AWAY. NOVE OR SHOOT (H/S)? M WHICH WAY (F/B/R/L)? L MOVE ALLOWED.

THE TWONKY IS 6.32456 UNITS AWAY. THE OBJECTIVE IS 8.54401 UNITS AWAY.

#### TWONKY MOVES ....

THE TWONKY IS 6.08276 UNITS AWAY. THE OBJECTIVE IS 8.54401 UNITS AWAY.

MOVE OR SHOOT (M/S)? M WHICH WAY (F/B/R/L)? F MOVE ALLOWED.

THE TWONKY IS 5.09902 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

TWONKY MOVES ....

THE TWONKY IS 5 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

MOVE OR SHOOT (M/S)? S WHICH WAY (F/B/R/L)? F Z A P --Z A P --Z A P --Z A P --BLAST!!!! YOU HIT WALL. SHOT MISSED.

THE TWONKY IS 5 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

#### TWONKY MOVES ....

THE TWONKY IS 4 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

MOVE OR SHOOT (H/S)? S WHICH WAY (F/B/R/L)? B Z A P --Z A P --FIZZLE... SHOT LEFT MAZE. SHOT MISSED.

THE TWONKY IS 4 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

TWONKY MOVES ....

THE TWONKY IS 3 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

MOVE OR SHOOT (M/S)? S WHICH WAY (F/B/R/L)? R Z A P --Z A P --FIZZLE... SHOT LEFT MAZE. SHOT MISSED.

THE TWONKY IS 3 UNITS AWAY. THE DBJECTIVE IS 7.61577 UNITS AWAY.

TWONKY MOVES ....

THE TWONKY IS 2 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

MOVE OR SHOOT (M/S)? S WHICH WAY (F/B/R/L)? L Z A P --Z A P --Z A P --Z A P --BLAST!!!! YOU HIT WALL. SHOT MISSED.

THE TWONKY IS 2 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

#### TWONKY MOVES ....

THE TWONKY IS 1 UNITS AWAY. THE OBJECTIVE IS 7.61577 UNITS AWAY.

>>> Schloorp !!! < < < The twonky just absorbed you !! you lose.

TRY AGAIN (Y/N)? N OK

#### LIST

10 PRINT TAB(24); "TWONKY" 20 PRINT TAB(18); "CREATIVE COMPUTING" 30 PRINT TAB(16); "MORRISTOWN NEW JERSEY" 40 PRINT:PRINT:PRINT 140 GOSUB 2250 150 DIM A(15.15) 160 LET R9=0 170 GOSUB 1830 180 PRINT " 190 PRINT 200 GOSUB 1450 210 PRINT 220 PRINT "HOVE OR SHOOT (M/S)": 230 INPUT 08\$ 240 IF 08\$="H" THEN 270 250 IF Q8\$="S" THEN 950 260 GOTO 210 270 PRINT "WHICH WAY (F/B/R/L)"; 280 INPUT DS 290 IF QS="F" THEN 340 300 IF QS="B" THEN 370 310 IF Q\$="L" THEN 400 320 IF QS="R" THEN 430 330 GOTO 210 340 LET X5=X 350 LET Y5=Y-1 360 GOTO 460 370 LET X5=X 380 LET Y5=Y+1 390 GOTO 460 400 LET X5=X-1 410 LET Y5=Y 420 GOTO 460 430 LET X5=X+1 440 LET Y5=Y 450 GOTO 460 460 IF X5<1 THEN 510 470 IF X5>15 THEN 510 480 IF Y5<1 THEN 510 490 IF Y5>15 THEN 510 500 GOTO 540 510 PRINT "THAT MOVE TAKES YOU OUT OF THE MAZE." 520 PRINT "HOVE NOT ALLOWED." 530 GOTO 1430 540 DN (A(X5,Y5)+1) GOTO 550,620,630,660,760,800,920 550 REM \*\*\* EMPTY SPACE 560 LET A(X,Y)=0 570 LET A(X5, Y5)=1 580 LET X=X5 590 LET Y=Y5 600 PRINT "NOVE ALLOWED." 610 GOTO 1430 620 REM \*\*\* IMPOSSIBLE TO GET HERE 630 REM \*\*\* BLOCKED SPACE ROUTINE. 640 PRINT "THAT SPACE IS BLOCKED." 650 GOTO 1430 660 REM \*\*\* RELOCATION ROUTINE. 670 PRINT "YOU'VE BEEN RELOCATED !!!" 680 GOSUB 2710 690 IF A(Z, W)>2 THEN 540 700 IF A(Z, W) <> 0 THEN 680 710 LET A(Z, W)=1 720 LET A(X,Y)=0 730 LET X=Z 740 LET Y=W 750 GOTO 1430 760 REM \*\*\* CHANGE ALL, SUPER TRAP. 770 PRINT " YOU HIT THE SUPER TRAP!! YOU GET A NEW MAZE." 780 GOSUB 1830 790 GOTO 1430 800 REN \*\*\* HE WON! 810 PRINT 820 PRINT "I DON'T BELIEVE IT BUT YOU WON THE GAME!" 830 PRINT "YOU GOT TO THE OBJECTIVE BEFORE" 840 PRINT " THE TWONKY GOT YOU!!"

850 PRINT

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860 PRINT
870 PRINT "TRY AGAIN (Y/N)";
880 INPUT QS
890 IF QS="Y" THEN 160
900 IF Q$="N" THEN 2750
910 GOTO 870
920 REM *** HE LANDED ON TWONKY!]
930 PRINT "YOU STEPPED ON THE TWONKY!"
940 GOTO 1790
950 REM *** SHOOT ROUTINE
960 PRINT "WHICH WAY (F/B/R/L)";
970 INPUT QS
980 IF Q$="F" THEN 1030
990 IF QS="B" THEN 1060
1000 IF Q$="R" THEN 1120
1010 IF Q$="L" THEN 1090
1020 GOTO 210
1030 LET S1=0
1040 LET S2=-1
1050 GOTO 1140
1060 LET S1=0
1070 LET S2=1
1080 GOTO 1140
1090 LET S1=-1
1100 LET S2=0
1110 GOTO 1140
1120 LET S1=1
1130 LET S2=0
1140 LET R1=X
1150 LET R2=Y
1160 LET R1=R1+S1
1170 LET R2=R2+S2
1180 PRINT "Z A P --";
1190 IF R1 < 1 THEN 1240
1200 IF R1 > 15 THEN 1240
1210 IF R2 < 1 THEN 1240
1220 IF R2 > 15 THEN 1240
1230 GOTO 1280
1240 PRINT "FIZZLE..."
1250 PRINT "SHOT LEFT MAZE."
1260 PRINT "SHOT MISSED."
1270 GOTO 1430
1280 IF A(R1,R2) <>2 THEN 1330
1290 PRINT "BLAST!!!!"
1300 PRINT "YOU HIT WALL."
1310 PRINT "SHOT MISSED."
1320 GOTO 1430
1330 IF A(R1,R2) <> 6 THEN 1160
1340 PRINT " DUCH!!"
1350 PRINT "TWONKY RETREATES."
1360 LET A (R1,R2)=R9
1370 GOSUB 2710
1380 IF A(Z, W) <> 0 THEN 1370
1390 LET A(Z, W)=6
1410 LET X1=Z
1420 LET Y1=W
1430 GOSUB 1450
1440 GOTO 1570
1450 REM *** PRIBNT TWONKY AND OBJECTIVE DISTANCE
1455 PRINT
1460 PRINT "THE TWONKY IS ";
1470 D=(SQR(ABS((X1-X)^2+(Y1-Y)^2)))
1490 PRINT D;
1500 PRINT " UNITS AWAY."
1510 PRINT "THE OBJECTIVE IS ";
1520 D1=(SQR(ABS(X2-X)^2+(Y2-Y)^2))
1530 PRINT D1;
1540 PRINT " UNITS AWAY."
1550 PRINT
1560 RETURN
1570 REM *** TWONKYS LOGIC
1580 IF D<2 THEN 1790
1590 LET Z2=Y1
1600 LET Z1=X1
1610 IF X < X1 THEN 1680
1620 IF X > X1 THEN 1700
1630 IF Y < Y1 THEN 1660
1640 LET Z2=Y1+1
1650 GOTO 1710
1660 LET Z2=Y1-1
1670 GOTO 1710
1680 LET Z1=X1-1
1690 GOTO 1710
1700 LET Z1=X1+1
1710 LET A(X1, Y1)=R9
1720 LET R9=A(Z1,Z2)
1730 LET A(Z1,Z2)=6
1740 LET X1=Z1
1750 LET Y1=Z2
1760 PRINT "TWONKY MOVES .....
1770 GOSUB 1450
1780 IF D >= 2 THEN 210
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1790 PRINT
1800 PRINT "> > > SCHLOORP !!! < < <"
1810 PRINT "THE TWONKY JUST ABSORBED YOU !! YOU LOSE."
1820 GOTO 850
1830 REM *** SET UP NEW MAZE ROUTINE
1840 REM *** 1=PLAYER, 2=BLOCKED SPACES
1850 REM *** 3=RELOCATIONS, 4=SUPER TRAP
1860 REM *** 5=OBJECTIVE, 6=TWONKY
1870 REM *** 0=EMPTY SPACES
1880 REM *** CLEAR MAZE
1883 FOR BO=1 TO 15
1885 FOR B1=1 TO 15
1890 LET A(BO, B1)=0
1893 NEXT B1
1895 NEXT B0
1910 FOR I=1 TO 30
1920 GOSUB 2710
1930 IF A(Z,W) <> 0 THEN 1920
1940 LET A(Z, U)=2
1950 NEXT I
1960 REM *** PLACE RELOCATIONS
1970 FOR I=1 TO 22
1980 GOSUB 2710
1990 IF A(Z,W) <> 0 THEN 1980
2000 LET A(Z, W)=3
2010 NEXT I
2020 REN *** PLACE THE SPECIAL TRAP
2030 GOSUB 2710
2040 IF A(Z,W) <> 0 THEN 2030
2050 LET A(Z,W)=4
2060 REM *** PLACE THE PLAYER
2070 GOSUB 2710
2080 IF A(Z,W) <> 0 THEN 2070
2090 LET A(Z,W)=1
2100 LET X=Z
2110 LET Y=W
2120 REM *** PLACE THE OBJECTIVE
2130 GOSUB 2710
2140 IF A(Z, W) <> 0 THEN 2130
2150 LET A(Z,W)=5
2160 LET X2=Z
2170 LET Y2=W
2180 REM *** PLACE THE TWONKY
2190 GOSUB 2710
2200 IF A(Z,W) <> 0 THEN 2190
2210 LET A(Z,W)=6
2220 LET X1=Z
2230 LET Y1=W
2240 RETURN
2250 REM
2310 PRINT "DO YOU WANT INSTRUCTIONS (Y/N)":
2320 INPUT Q$
2330 IF Q$="N" THEN 2700
2340 IF Q$ <> "Y" THEN 2310
2350 PRINT: PRINT: PRINT
2380 PRINT "THIS IS THE GAME OF TWONKY."
2410 PRINT "YOU HAVE LANDED ON THE PLANET OF TWINKY AND"
2420 PRINT "ITS KING (KONG: THEIR KING IS KING KONG) HAS "
2430 PRINT "CAPTURED YOU. HE HAS PUT YOU IN A MAZE THAT IS"
2440 PRINT "15 * 15 UNITS LONG. YOU ARE IN THE DARK AND CANNOT"
2450 PRINT "SEE... YOU MUST GET TO THE OBJECTIVE SQUARE AND"
2460 PRINT "BE SET FREE."
2470 PRINT
2480 PRINT "
                   HAZARDS INCLUDE:"
2490 PRINT "SQUARES THAT YOU CANNOT GO INTO (30)."
2500 PRINT "SQUARES THAT RANDONLY THROW YOU AROUND THE MAZE (22)."
2510 PRINT "SQUARE THAT SETS UP A NEW MAZE AND ALL THAT'S IN IT (1)"
2520 PRINT "HONSTER CALLED TWONKY THAT CHASES YOU AND WILL"
2530 PRINT " ABSORB YOU IF THE DISTANCE IT IS FROM YOU FALLS"
2540 PRINT " BELOW 2 UNITS."
2550 PRINT "
                  TWONKY IS ALSO IMMUNE TO ALL TRAPS INCLUDING"
2560 PRINT "
                    HALLS."
2570 PRINT
2590 PRINT "
2600 PRINT "HOVE ONE SQUARE AT A TIME TO FIND THE OBJECTIVE"
2610 PRINT " OR ESCAPE FROM THE THOMPY "
2620 PRINT "SHOOT AT THE TWONKY ONE DIRECTION AT A TIME."
2630 PRINT " IF THE TWONKY IS HIT, HE WILL BE REPLACED IN THE"
                       MAZE RANDOMLY.
2640 PRINT "
2645 PRINT
2650 PRINT "IF THE TWONKY ABSORBS YOU ... YOU LOSE."
2660 PRINT " IF YOU LAND ON THE OBJECTIVE SQUARE YOU WIN."
2670 PRINT
2680 PRINT "GOOD LUCK!"
2690 PRINT
2700 RETURN
2710 REM *** SUBROUTINE TO GET 2 RANDOM NUMBERS
2720 LET Z=INT(RND(1)*15+1)
2730 LET W=INT(RND(1)+15+1)
2740 RETURN
2750 END
OK
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Two-to-Ten is a game of chance played with a special deck of cards with only the cards 2-10. The game is similar to blackjack in that you are drawing cards and trying to come as close as possible to a goal number (chosen at random before each round) without going over it. You must come within a certain number of points of the goal number determined by a "lucky-limit" card. The catch to the game is that you are not given the exact value of the goal number but rather a clue that is only within 15% of the goal.

Can you think of a way to make Twoto-Ten more interesting? Perhaps playing it against the computer as an opponent?

Two-to-Ten appeared in *Creative Computing*, Nov/Dec 1976.

#### TWO TO TEN CREATIVE COMPUTING MORRISTOWN NEW JERSEY

WELCOME TO THE GAME OF TWO TO TEN. THAT NAME COMES FROM THE SPECIAL 'DECK OF CARDS' USED. THERE ARE NO FACE CARDS - ONLY THE CARDS 2-10. THIS GAME IS EASY AND FUN TO PLAY IF YOU UNDERSTAND WHAT YOU ARE DOING SO READ THE INSTRUCTIONS CAREFULLY.

AT THE START OF THE GAME, YOU BET ON WINNING. TYPE IN ANY NUMBER BETWEEN 0 AND 200. I THEN PICK A RANDOM NUMBER YOU ARE TO REACH BY THE SUM TOTAL OF MORE CARDS CHOSEN. BECAUSE OF THE RARE CHANCE OF YOU GETTING TO THAT NUMBER EXACTLY, YOU ARE GIVEN AN ALLOWANCE CARD. THE OBJECT OF THE GAME OF TO BET THE. TOTAL OF CARDS WITHIN THE MYSTERY NUMBER WITHOUT GOING OVER.

YOU ARE GIVEN A HINT AS TO WHAT THE NUMBER IS. THIS IS NOT THE EXACT NUMBER ONLY ONE CLOSE. ALL YOU DO IN THIS GAME IS DECIDE WHEN TO STOP. AT THIS POINT YOUR TOTAL IS COMPARED WITH THE NUMBER AND YOUR WINNINGS ARE DETERMINED.

PLACE YOUR BET . . . YOU HAVE \$ 200 TO SPEND .? 50

YOUR 'LUCKY LIMIT' CARD IS A 8 You must come within 8 without soing over to win.

HERE WE GO

CARD # 1 IS A 3 .YOU ARE TRYING TO COME NEAR 28 YOUR TOTAL IS 3 DO YOU WANT TO CONTINUE? YES

CARD # 2 IS A 3 YOU ARE TRYING TO COME NEAR 28 YOUR TOTAL IS 6 DO YOU WANT TO CONTINUE? YES

CARD N 3 IS A 9 .YOU ARE TRYING TO COME NEAR 28 Your Total IS 15 DO YOU WANT TO CONTINUE? YES

CARD # 4 IS A 6 YOU ARE TRYING TO COME NEAR 28 YOUR TOTAL IS 21 DO YOU WANT TO CONTINUE? YES

CARD # 5 IS A 10 .YOU ARE TRYING TO COME NEAR 28 Your Total IS 31 DO YOU WANT TO CONTINUE? NO

YOU WIN! THE NUMBER WAS 32 YOUR GUESS TOTAL WAS 31 WITHIN YOUR LIMIT CARD. YOU NOW HAVE \$ 250 IN CASH TO BET IN THE NEXT GAME! WOULD YOU LIKE TO PLAY THE NEXT GAME? NO HOPE YOU HAD FUN. 10 PRINT TAB(28);"TWO TO TEN" 20 PRINT TAB(15);"CREATIVE COMPUTING MORRISTOWN NEW JERSEY" 30 PRINT 40 PRINT 50 PRINT 60 PRINT "WELCOME TO THE GAME OF TWO TO TEN. THAT NAME COMES FROM THE" 70 PRINT "SPECIAL 'DECK OF CARDS' USED. THERE ARE NO FACE CARDS - ONLY" 80 PRINT "THE CARDS 2-10. THIS GAME IS EASY AND FUN TO PLAY IF YOU" 90 PRINT "UNDERSTAND WHAT YOU ARE DOING SO READ THE INSTRUCTIONS" 100 PRINT "CAREFULLY." 110 PRINT "AT THE START OF THE GAME, YOU BET ON WINNING. TYPE IN ANY" 120 PRINT "NUMBER BETWEEN O AND 200. I THEN PICK A RANDOM NUMBER" 130 PRINT "YOU ARE TO REACH BY THE SUM TOTAL OF MORE CARDS CHOSEN." 140 PRINT "BECAUSE OF THE RARE CHANCE OF YOU GETTING TO THAT NUMBER" 150 PRINT "EXACTLY, YOU ARE GIVEN AN ALLOWANCE CARD. THE OBJECT OF" 160 PRINT "THE GAME OF TO GET THE TOTAL OF CARDS WITHIN THE HYSTERY" 170 PRINT "NUMBER WITHOUT GOING OVER." 180 PRINT "YOU ARE GIVEN A HINT AS TO WHAT THE NUMBER IS. THIS IS NOT" 190 PRINT "THE EXACT NUMBER ONLY ONE CLOSE. ALL YOU DO IN THIS GAME IS" 200 PRINT "BECIDE WHEN TO STOP. AT THIS POINT YOUR TOTAL IS COMPARED" 210 PRINT "WITH THE NUMBER AND YOUR WINNINGS ARE DETERMINED." 220 M=200 223 D=0 225 T=0 227 0=INT(10\*RND(1))+25 229 N=INT(0\*RND(1))+0 230 R=(INT(15\*RND(1))+1)/100 250 S=INT(2\*RND(1)+1) 260 IF S <> 1 THEN 270 262 E=INT(N-(N\*R)) 265 GOTO 280 270 E=INT(N+(N\*R)) 280 A=INT(9\*RND(11)+2) 283 PRINT 285 PRINT "PLACE YOUR BET . . . YOU HAVE \$";M;" TO SPEND."; 287 INPUT B 288 PRINT 289 IF B < 0 THEN 297 290 IF H >= B THEN 300 293 PRINT "YOU CAN'T BET HORE THAT YOU'VE GOT!" 295 GOTO 285 297 PRINT "YOU MAY NOT BET AGAINST YOURSELF." 298 GOTO 285 300 PRINT "YOUR 'LUCKY LIMIT' CARD IS A ";A 310 PRINT "YOU MUST COME WITHIN ";A;" WITHOUT GOING OVER TO WIN." 315 PRINT 320 PRINT "HERE WE GO" 322 PRINT 324 PRINT 340 D=D+1 350 C=INT(9\*RND(1)+2) 360 PRINT "CARD #";D;" IS A ";C;".YOU ARE TRYING TO COME NEAR ";E 365 T=T+C 370 IF T <= N THEN 380 375 PRINT "YOUR TOTAL IS OVER THE NUMBER";N;" AN AUTOMATIC LOSS!" 377 GOTO 570 380 PRINT "YOUR TOTAL IS ";T;" DO YOU WANT TO CONTINUE"; 385 INPUT QS 387 PRINT 390 IF LEFTs(Q\$,1)="Y" THEN 322 410 IF T < N-A OR T > N THEN 550 500 PRINT "YOU WIN! THE NUMBER WAS ";N;" YOUR GUESS TOTAL WAS";T 510 PRINT "WITHIN YOUR LIMIT CARD." 520 M=M+B 540 GOTO 600 550 PRINT "YOU BLEW IT! THE NUMBER WAS ";N;", OUTSIDE YOUR LIMIT BY "; 560 PRINT (N-A)-T 565 PRINT 570 M=M-R 600 PRINT "YOU NOW HAVE \$";" IN CASH TO BET IN THE NEXT GAME!" 605 IF M <= 0 THEN 655 610 PRINT "WOULD YOU LIKE TO PLAY THE NEXT GAME"; 615 INPUT DS 620 IF LEFTS(Q\$,1)="Y" THEN 223 630 PRINT "HOPE YOU HAD FUN." 640 GOTO 999 650 PRINT 655 PRINT CHR\$(7): 660 PRINT "YOU ARE BROKE!! YOU MAY NOT PLAY ANYMORE!!" 999 END Ok



UFO is a strategy game in which you play against the computer in a life-anddeath struggle for superiority of space. It takes place after a space war with another planet in which both earth and the attacker's planet are destroyed. Both planets—basically similar in strength, social structure, and scientific awareness—realizing they are doomed, launch a "lifeboat" into space. The lifeboats are equally armed and powered.

However, the aliens are much better marksmen, hitting once out of every two shots (in lines 880-890, the computer's odds are set). The reason is as follows. The enemy ship's decision is made by the program; the enemy will only retreat if he feels you are ramming and will approach only if you are running and/or his fuel is running out (smaller weaponry eats up less fuel). He will only use option 6 (no move but gains fuel) if his energy is below a certain point. In other words, you can think, while he cannot. You have the advantage of your mind, so the alien has been given the advantage of a good steady aim.

The game is set in the future: civilization is destroyed, 150 people are left, and you are in command. The enemy has never truly been seen, as many enemies are never truly seen, but nevertheless you must destroy him or be destroyed. Your weapons are explained and the game begins. In your command ship is a control which will not allow you to make an illegal move. This control waits after you fire for the shot to reach the other ship and for the explosion reports to reach the ship. It then gives a full report of power drain of both ships. If your power is not negative you are still in the game but once it drops below zero your crew dies (the energy level is the amount of energy left to counteract the attack. If more energy hits the ship than was repulsed, the ship is destroyed. If the amounts are equal then the ship had exactly the same amount of energy as the attack drained.) If in any game you can get close enough to your enemy to use your heavy guns without frightening off the enemy (5000-11000), the game will last for quite a long time. Theoretically this game will last forever if played logically.

Written by Raymond J. Kernay, UFO first appeared in *Creative Computing* in Jul/Aug 1977. A modified version called Star Wars appeared in Sep/Oct 1978. RUN

5

#### UFO CREATIVE COMPUTING MORRISTOWN NEW JERSEY

DO YOU WANT INSTRUCTIONS? YES YOU ARE ABOUT TO RECEIVE HIGH SECURITY INFORMATION PLEASE EAT THE COMPUTER READ OUT AFTER READING

THIS IS THE YEAR 2000...CIVILIZATION AS YOU KNOW IT HAS BEEN DESTROYED...NATIONS HAVE BEEN REDUCED TO RUBBLE IN A MASSIVE SPACE WAR YOU ARE ONBOARD A SPACE SHIP WHOSE SOLE PURPOSE IS TO SAFE GUARD THE 150 PEOPLE ON YOUR SHIP...THE SOLE SURVIVORS...YOUR MISSION: FIND A PLANET SUITABLE FOR YOUR COLOWISTS.....PROBLEM: THE ENEMY OF EARTH STILL EXISTS. STRANGE CREATURES NEVER SEEN BY MAN

BY THE TIME YOU READ THIS EARTH WILL NO LONGER EXIST..... HERE IS YOUR VITAL DATUM: YOU ARE EQUIPT WITH 10000 UNITS OF ENERGY UHEN YOU RUN OUT THE ALIENS WILL DESTROY YOU

WEAPONRY

- TYPE DESCRIPTION CAPACITY FUEL DRAIN
- 1 HEAVY GUNS 0-11000 10 UNITS
- 2 WARHEADS 10000-100000 100 UNITS
- 3 LASER 10000-20000 1000 UNITS

|  |  |  | S |
|--|--|--|---|
|  |  |  |   |
|  |  |  |   |

- 4 APPROACH -----100 UNITS
  - RETREAT -----100 UNITS
- 6 BY TYPING 6 YOU CAN PASS AND GAIN 100 UNITS (LABORERS WORK TO PRODUCE POWER)

#### ENENY

THE ENEMY HAS THE SAME CAPABILITIES THAT YOU HAVE EACH TIME A SHIP IS HIT ITS ENERGY DRAIN IS EQUAL TO THE AMOUNT OF ENERGY SPENT+10 (EXCEPT LASER WHICH EQUALS THE AMOUNT SPENT+3 UNITS) BOTH SHIPS ARE ON THE SAME MISSION, DESTINATION AND BOTH ARE ON EQUAL TERMS UNFORTUNATLY YOU MUST KILL EACH OTHER TO WIN

YOUR MAXIMUM SPEED IS A JUMP OF 50000 UNITS, HOWEVER SPEEDS VARY BETWEEN 10000-50000 WARHEADS TRAVEL AT 35000 FEET PER SEC...SHELLS 1000 PER SECOND THIS MESSAGE WAS RECORDED EARTH IS DEAD...GODD LUCK

THIS IS COMPUTER CONTROL WHAT IS YOUR NAME? BRUCE B. S. VERY GOOD BRUCE B. S. LEAVING PLANETARY ORBIT BRUCE B. S. SHIP APPROACHING AT 180025 MILES WHAT ARE YOUR ORDERS BRUCE B. S.? 2 LETS NOT CRACK UNDER PRESSURE WHAT ARE YOUR ORDERS BRUCE B. S.? 3 LASER FIRED DIRECT HIT....EMEMY SHIP'S POWER DOWN ENEMY SHIP REPORT RANBE= 180025 POWER= 7000 EMEMY FIRES LASER

DIRECT HIT ..... POWER DOWN

RANGE= 180025 POWER SUPPLY= 6000 440 PRINT "YOUR MAXIMUM SPEED IS A JUMP OF 50000 UNITS, HOWEVER" WHAT ARE YOUR ORDERS BRUCE B. S.? 3 450 PRINT "SPEEDS VARY BETWEEN 10000-50000" 460 PRINT "WARHEADS TRAVEL AT 35000 FEET PER SEC...SHELLS 1000"; 465 PRINT " PER SECOND" LASER FIRED DIRECT HIT ..... ENEMY SHIP'S POWER DOWN ENENY SHIP REPORT 470 PRINT "THIS MESSAGE WAS RECORDED EARTH IS DEAD...GOOD LUCK" 480 PRINT:PRINT:PRINT:PRINT "THIS IS COMPUTER CONTROL WHAT IS YOUR NAME"; RANGE= 180025 POWER= 3000 ENEMY FIRES LASER 490 INPUT AS:PRINT "VERY GOOD ";AS DIRECT HIT ..... POWER DOWN 500 P=10000:P(1)=10000:A=RND(1)\*200000 510 PRINT "LEAVING PLANETARY ORBIT ";A\$;B\$;C\$;" SHIP APPROACHING AT"; 512 PRINT STATUS OF SHIP 515 PRINT A; "MILES" RANGE= 180025 POWER SUPPLY= 2000 520 PRINT "WHAT ARE YOUR ORDERS ";A\$;B\$;C\$;:INPUT C WHAT ARE YOUR ORDERS BRUCE B. S.? 3 530 D=INT(RND(1)\*2)+ LASER FIRED 540 DN C GOTO 570,650,710,750,780,820 MISSED TOO BAD 560 PRINT "LETS NOT CRACK UNDER PRESSURE": GOTO 520 ENEMY SHIP REPORT 570 IF A>11005 THEN 560 RANGE= 180025 POWER= 2000 580 P=P-10 590 PRINT "GUNS FIRED": ENEMY FIRES LASER DIRECT HIT ..... POWER DOWN 595 FOR X=1 TO A\*2 STEP 1000 600 NEXT X 610 IF 0=1 THEN 630 STATUS OF SHIP 620 PRINT "MISSED TO BAD":GOTO 830 630 PRINT "DIRECT HIT.....ENEMY SHIP'S POWER DOWN" RANGE= 180025 POWER SUPPLY=-2000 ENEMY IS VICTOR LIFE SUPPORT FADING CREW DYING 640 P(1)=P(1)-100:GOTO 830 650 IF A > 100000 THEN 560 655 IF A < 10000 THEN 560 660 P=P-100:PRINT "WARHEAD LAUNCHED":FOR X=1 TO A\*2 STEP 35000 PLAY AGAIN? NO 670 NEXT X DK 680 IF 0=1 THEN 690:PRINT "MISSED TOO BAD":GOTO 830 690 PRINT "DIRECT HIT ..... ENEMY SHIP'S POWER DOWN" 700 P(1)=P(1)-1000 705 GOTO 830 710 IF A < 100000 THEN 560 714 P=P-1000 716 PRINT "LASER FIRED" 720 IF 0=1 THEN 730 725 PRINT "MISSED TOO BAD":GOTO 830 730 PRINT "DIRECT HIT ..... ENEMY SHIP'S POWER DOWN" 740 P(1)=P(1)-3000:GOTO 830 750 B=RND(1)\*40000+10000:A=A-B:P=P-100:IF A<1 THEN 770 LIST 760 GOTO 830 770 PRINT "\*\*\*COLLISION\*\*\*":PRINT "BOTH SHIPS DESTROYED":GOTO 1080 10 PRINT TAB(26); "UFO" 780 B=RND(1)\*40000+10000:A=A+B:P=P-100:IF A > 200050 THEN 800 20 PRINT TAB(19); "CREATIVE COMPUTING" 790 GOTO 830 30 PRINT TAB(18); "HORRISTOWN NEW JERSEY" 800 PRINT A\$;" YOUR RANGE IS ";A;"BUT WE CANNOT RUN, RANGE IS NOW "; 805 PRINT "200000" 40 PRINT:PRINT:PRINT 60 DIM P(1) 810 A=200000:GOTO 830 80 REM UFO 820 P=P+100 90 PRINT " DO YOU WANT INSTRUCTIONS"; 830 PRINT "ENEMY SHIP REPORT":PRINT "RANGE=":A:" POWER=":P(1) 100 INPUT AS 840 IF P(1) < 1 THEN 1110 850 IF P(1) < 500 THEN 1040 102 IF LEFT\$(A\$,1)="N" THEN 480 104 IF LEFT\$ (A\$,1)="Y" THEN 110 860 IF A < 5000 THEN 1070 106 GOTO 90 870 R=INT(RND(1)\*3)+1:0=INT(RND(1)\*2+1) 110 PRINT "YOU ARE ABOUT TO RECEIVE HIGH SECURITY INFORMATION" 880 ON R GOTO 970,920 120 PRINT "PLEASE EAT THE COMPUTER READ OUT AFTER READING" 885 IF R=2 THEN 130 PRINT:PRINT:PRINT 890 IF A < 100000 THEN 870 140 PRINT "THIS IS THE YEAR 2000...CIVILIZATION AS YOU KNOW IT HAS" 892 P(1)=P(1)-1000 150 PRINT "BEEN DESTROYED...NATIONS HAVE BEEN REDUCED TO RUBBLE" 894 PRINT "ENEMY FIRES LASER" 894 PRINI "EMENT FIRES LASER" 900 IF O=1 THEN 910: PRINT "HISSED...WHEW!!":GOTO 1010 910 PRINT "DIRECT HIT.... POWER DOWN": P=P-3000:GOTO 1010 920 IF A > 100000 THEN 870: IF A < 10000 THEN 870 930 P(1)=P(1)-100: PRINT "ENEMY WARHEAD FIRED" 160 PRINT "IN A MASSIVE SPACE WAR" 170 PRINT "YOU ARE ONBOARD A SPACE SHIP WHOSE SOLE PURPOSE" 180 PRINT "IS TO SAFE GUARD THE 150 PEOPLE ON YOUR SHIP...THE" 190 PRINT "SOLE SURVIVORS...YOUR MISSION: FIND A PLANET SUITABLE" 200 PRINT "FOR YOUR COLONISTS..... PROBLEM: THE ENEMY OF EARTH STILL" 940 FOR D=1 TO A STEP 35000: NEXT D 950 IF D=1 THEN 960: PRINT "MISSED... WHEW!":60TO 1010 960 P=P-1000: PRINT "DIRECT HIT!...POWER DOWN":60TO 1010 210 PRINT "EXISTS. STRANGE CREATURES NEVER SEEN BY MAN":PRINT 220 PRINT "BY THE TIME YOU READ THIS EARTH WILL NO LONGER EXIST ...... 980 F=P-1000: PRINT "DIRECT HITS...POWER DOWN :BOTO TOTO 970 IF A > 11000 THEN 870: (1)=P(1)-10:PRINT "ENEMY FIRES SHELL" 980 FOR D=1 TO A STEP 1000: NEXT D 990 IF 0=1 THEN 1000:PRINT "HISSED...WHEW!":GOTO 1010 1000 PRINT "DIRECT HIT .....POWER DOWN":P=P-100 1010 PRINT:PRINT:PRINT TAB(10); "STATUS OF SHIP" 1020 PRINT "POWER SUBJECT SUBJECT". F. P.1 THEN 1130 230 PRINT "HERE IS YOUR VITAL DATUM:" 240 PRINT TAB(10); "YOU ARE EQUIPT WITH 10000 UNITS OF ENERGY" 250 PRINT TAB(10); "WHEN YOU RUN DUT THE ALIENS WILL DESTROY YOU" 260 PRINT:PRINT:PRINT:PRINT TAB(25): "WEAPONRY" 270 PRINT "TYPE"; TAB(5); "DESCRIPTION"; TAB(17); "CAPACITY"; TAB(26); 275 PRINT "FUEL DRAIN" 1020 PRINT "RANGE=";A; "POWER SUPPLY=";P: IF P<1 THEN 1130 280 PRINT " 1";TAB(5);"HEAVY GUNS";TAB(17);"0-11000";TAB(27); 1030 GOTO 520 285 PRINT "10 UNITS" 1040 P(1)=P(1)+100: PRINT "ENEMY SHIP RESTING":GOTO 1010 290 PRINT " 2";TAB(5);"WARHEADS";TAB(14);"10000-100000";TAB(27); 1050 B=INT(RND(1)\*40000+10000:A=A-B:PRINT "ENEMY SHIP APPROACHING ":A\$; B\$; 295 PRINT "100 UNITS" 1055 PRINT C\$ 300 PRINT " 3";TAB(5);"LASER";TAB(13);"10000-20000";TAB(27); 1060 GOTO 1010 305 PRINT "1000 UNITS" 1070 B=RND(1) #40000+10000:A=A+B:PRINT "ENEMY SHIP RETREATING":GOTO 1010 310 PRINT:PRINT:PRINT TAB(25);"OPTIONS" 1080 PRINT "THAT WAS A PRETTY DUMB THING TO DO ";A\$;B\$;C\$ 320 PRINT " 4";TAB(5);"APPROACH";TAB(17);"-----";TAB(26); 1090 PRINT "YOUR MISSION IS TO PROTECT YOUR PASSENGERS NOT DESTROY" 325 PRINT "100 UNITS" 1100 GOTO 1140 327 PRINT " 5";TAB(5);"RETREAT";TAB(17);"-----";TAB(26); 1110 PRINT "ENEMY SHIPS POWER GONE NO LIFE PRESENT" 328 PRINT "100 UNITS" 1120 PRINT "MISSION SUCCESSFUL":GOTO 1210 330 PRINT " 6"; TAB(5); "BY TYPING 6 YOU CAN PASS AND GAIN 100 UNITS" 1130 PRINT "ENEMY IS VICTOR LIFE SUPPORT FADING CREW DYING" 350 PRINT TAB(5);"(LABORERS WORK TO PRODUCE POWER)" 1140 REM 360 PRINT: PRINT: PRINT TAB(25); "ENEMY" 1150 PRINT 370 PRINT:PRINT "THE ENEMY HAS THE SAME CAPABILITIES THAT YOU HAVE" 380 PRINT "EACH TIME A SHIP IS HIT ITS ENERGY DRAIN IS EQUAL TO" 1160 PRINT 1170 PRINT 390 PRINT "THE AMOUNT OF ENERGY SPENT\*10 (EXCEPT LASER WHICH EQUALS" 1180 PRINT "PLAY AGAIN";

430 PRINT "UNFORTUNATLY YOU MUST KILL EACH OTHER TO WIN"

STATUS OF SHIP

400 PRINT TAB(30); "THE AMOUNT SPENT\*3 UNITS)"

420 PRINT "ARE ON EQUAL TERMS"

410 PRINT "BOTH SHIPS ARE ON THE SAME MISSION, DESTINATION AND BOTH"

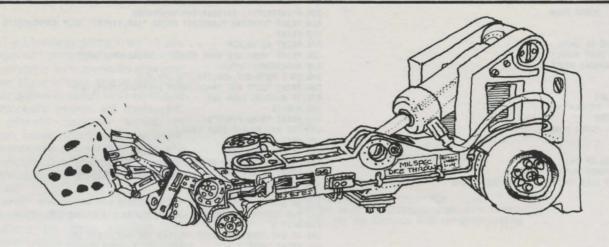
169

1190 INPUT AS

1210 END

1200 IF LEFT\$(A\$,1)="Y" THEN 80

# **Under & Over**



This is a funny little dice game in which you're betting on the outcome of rolling two dice. You may bet on any number from two to twelve. If your number is exactly the same as shown on the sum of the dice, you win at four to one odds. If your number is under seven and the roll of the dice is under seven, you win even money. If your number is over seven and the roll of the dice is over seven, you also win even money. Only a bet on seven itself can win at four to one. The program goes on until you run out of money or until you interrupt it.

RUN

#### UNDER OR OVER CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS IS A GAME OF UNDER AND OVER. IF YOU PICK UNDER OR OVER SEVEN, YOU WILL WIN EVEN MONEY. IF YOU PICK EVEN YOU WILL WIN MONEY AT FOUR TO ONE ODDS. YOU HAVE \$100 TO START WITH. GOOD LUCK!

WHAT NUMBER DO YOU WISH TO PLAY AND HOW MUCH DO YOU WANT TO BET ON THE NUMBER? 4,10

THE DICE HAVE NOW BEEN THROWN, THE RESULTS ARE AS FOLLOWS: DIE #1 DIE #2 SUM YOURW 2 5 7 4

TOSS

EVEN

IIIIIYOU LOSEIIIII THE AMOUNT YOU NOW HAVE IS 100

WHAT NUMBER DO YOU WISH TO PLAY AND HOW MUCH Do you want to bet on the Number? 4,10

| THE DICE HA | VE NOU | BEEN | THROWN. THE | RESULTS |       |
|-------------|--------|------|-------------|---------|-------|
| ARE AS FOLL | OWS:   |      |             |         |       |
| DIE #1      | DIE    | #2   | SUM         | YOUR#   | TOSS  |
| 1           | 4      |      | 5           | 4       | UNDER |



| WHAT NUMBER DO YOU WISH T<br>Do you want to bet on the      | the state three branch   | NUCH       |               | WHAT NUMBER DO YOU WISH TO PLAY AND HOW MUCH<br>Do you want to bet on the Number? 4,2250  |
|---|--------------------------|------------|---------------|---|
| THE DICE HAVE NOW BEEN TH                                   | ROWN. THE RESU           | LTS        |               | THE DICE HAVE NOW BEEN THROWN. THE RESULTS  |
| ARE AS FOLLOWS:<br>DIE #1 DIE #2<br>5 6                     | SUM<br>11                | YOUR#<br>7 | TOSS<br>Over  | ARE AS FOLLOWS:<br>DIE #1 DIE #2 SUM YOUR# TOSS<br>1 5 6 4 UNDER  |
| THE AMOUNT YOU NOW HAVE I                                   | IYOU LOSEIIIII<br>IS 90  |            |               | ******YOU WIN EVEN MONEY*******<br>The amount you now have is 4500  |
| WHAT NUMBER DO YOU WISH T<br>Do you want to bet on the      |                          | MUCH       |               | WHAT NUMBER DO YOU WISH TO PLAY AND HOW MUCH<br>Do you want to bet on the Number? 7,4500  |
| THE DICE HAVE NOW BEEN TH<br>ARE AS FOLLOWS:                | ROWN. THE RESU           | LTS        |               | THE DICE HAVE NOW BEEN THROWN. THE RESULTS ARE AS FOLLOWS:  |
| DIE #1 DIE #2<br>2 1  | SUM<br>3                 | YOUR#<br>8 | TOSS<br>UNDER | DIE #1 DIE #2 SUM YOUR# TOSS<br>3 5 8 7 OVER  |
| THE AMOUNT YOU NOW HAVE I                                   | YOU LOSEIIIII<br>Is 80   |            |               | IIIIIYOU LOSEIIIII<br>The Akount you now have is o  |
| HAT NUMBER DO YOU WISH T<br>TO YOU WANT TO BET ON THE       |                          | NUCH       |               | THE GAME IS OVER AND YOU ARE FLAT BROKE. SORRY CHARLIE<br>THIS PROVES THAT IT IS NOT GOOD TO GAMBLE   |
| HE DICE HAVE NOW BEEN TH                                    | ROWN. THE RESUL          | LTS        |               | DO YOU WANT TO PLAY AGAIN? NO<br>Ok   |
| DIE #1 DIE #2<br>2 1  | SUM<br>3                 | YOUR#<br>9 | TOSS<br>UNDER |   |
| IIIII<br>HE AMOUNT YOU NOW HAVE I                           | YOU LOSEIIIII<br>S 60    |            |               |   |
| HAT NUMBER DO YOU WISH T<br>O YOU WANT TO BET ON THE        |                          | MUCH       |               |   |
| HE DICE HAVE NOW BEEN TH                                    | ROWN. THE RESUL          | LTS        |               |   |
| RE AS FOLLOWS:<br>DIE #1 DIE #2<br>5 5                      | SUM<br>10                | YOUR#      | TOSS<br>OVER  |   |
|   | YOU LOSE!!!!!            |            | 1 200 5       |   |
| HAT NUMBER DO YOU WISH T<br>O YOU WANT TO BET ON THE        | O PLAY AND HOW           | MUCH       |               |   |
| HE DICE HAVE NOW BEEN TH                                    |                          | LTS        |               | 100 PRINT TAB(22);"UNDER OR OVER"<br>110 PRINT TAB(20);"CREATIVE COMPUTING"<br>120 PRINT TAB(18);"MORRISTOWN, NEW JERSEY"   |
| RE AS FOLLOWS:<br>DIE #1 DIE #2<br>4 2                      | SUM<br>6                 | YOUR#      | TOSS          | 130 PRINT:PRINT:PRINT<br>140 PRINT"THIS IS A GAME OF UNDER AND OVER. IF YOU PICK"   |
| *****<br>HE AMOUNT YOU NOW HAVE I                           | ****YOU WIN 4 TO         | ] 1******  |               | 150 PRINT"UNDER OR OVER SEVEN, YOU WILL WIN EVEN MONEY."<br>160 PRINT"IF YOU PICK EVEN YOU WILL WIN MONEY AT FOUR TO ONE"<br>170 PRINT"ODDS. YOU HAVE \$100 TO START WITH. GOOD LUCK!":PRIN |
| HAT NUMBER DO YOU WISH T<br>O YOU WANT TO BET ON THE        | O PLAY AND HOW           | NUCH       |               | 180 A=100<br>190 RESTORE<br>200 REM   |
| HE DICE HAVE NOW BEEN TH                                    |                          | LTS        |               | 210 READ A\$, B\$, C\$<br>220 DATA "UNDER", "OVER", "EVEN"  |
| RE AS FOLLOWS:<br>DIE #1 DIE #2<br>5 3                      | SUM                      | YOUR#      | TOSS          | 230 PRINT"WHAT NUMBER DO YOU WISH TO PLAY AND HOW MUCH"<br>240 PRINT"DO YOU WANT TO BET ON THE NUMBER";:INPUT B,C<br>250 PRINT:PRINT"THE DICE HAVE NOW BEEN THROWN. THE RESULTS"            |
| *****   | 8                        | 8          | OVER          | 260 PRINT"ARE AS FOLLOWS:"<br>270 Q=INT(6*RND(1)+1):R=INT(6*RND(1)+1)<br>280 PRINT " DIE #1","DIE #2","SUM","YOUR#","TOSS"  |
| HE AMOUNT YOU NOW HAVE I                                    |                          | MICH       |               | 290 IF 0+R/7 THEN 320   |
| HAT NUMBER DO YOU WISH T<br>D YOU WANT TO BET ON THE        |                          | NULH       |               | 300 PRINT Q,R,Q+R,B,A\$:PRINT<br>303 IF B=Q+R THEN 350  |
| HE DICE HAVE NOW BEEN TH<br>RE AS FOLLOWS:                  | ROWN. THE RESUL          | LTS        |               | 305 IF B<7 THEN 380<br>307 6010 410   |
| DIE #1 DIE #2<br>6 1  | SUM<br>7                 | YOUR#<br>7 | TOSS          | 310 PRINT Q,R,Q+R,B,B\$:PRINT<br>313 IF B=Q+R THEN 350<br>315 IF B>7 THEN 380   |
| *****<br>He amount you now have i                           | ****YOU WIN 4 TH         | ) 1******  |               | 317 GOTO 410<br>320 PRINT Q,R,Q+R,B,C\$:PRINT   |
| HAT NUMBER DO YOU WISH T                                    | O PLAY AND HOW           |            |               | 330 IF B=0+R THEN 350<br>340 GOTO 420<br>350 A=A+(4*C)  |
| YOU WANT TO BET ON THE                                      |                          |            |               | 360 PRINT TAB(20)"********YOU WIN 4 TO 1********"<br>370 PRINT"THE AMOUNT YOU NOW HAVE IS" A :PRINT:GOTO 440  |
| HE DICE HAVE NOW BEEN TH<br>RE AS FOLLOWS:<br>DIE #1 DIE #2 | SUM                      | YOUR#      | TOSS          | 380 A=A+C<br>390 PRINT TAB(20)"*******YOU WIN EVEN MONEY********  |
| 6 1   | 7                        | 4          | EVEN          | 400 PRINT"THE AMOUNT YOU NOW HAVE IS" A :PRINT:GOTO 440<br>410 A=A-C<br>420 PRINT TAB(20)"!!!!!YOU LOSE!!!!!"   |
| HE AMOUNT YOU NOW HAVE I                                    | YOU LOSE!!!!!!<br>S 2250 |            |               | 430 PRINTTHE AMOUNT YOU NOW HAVE IS" A :PRINT<br>440 IF A>0 THEN 190  |
|   |                          |            |               | 450 PRINT"THE GAME IS OVER AND YOU ARE FLAT BROKE. SORRY CHAR<br>460 PRINT"THIS PROVES THAT IT IS NOT GOOD TO GAMBLE"<br>470 PRINT"DO YOU WANT TO PLAY AGAIN";:INPUT W\$                    |
|   |                          |            |               | 480 IF LEFT\$(W\$,1)="Y" THEN 180   |



VAN GAM is a simple game with an interesting solution set. The winning sequence pairs are formed by certain mutually exclusive *sequences*, using the golden mean,

$$1 + \sqrt{5}$$

as an irrational

generator. See explanation, lines 40-130.

IF T = 
$$\frac{1 + \sqrt{5}}{2}$$
  
and X = T + 1, Y =  $\frac{1}{T}$  + 1

then for integers N the winning sequence generators are

INT (N \* X) 2 5 7 10 13 ....

INT (N \* Y) 134 6 8...

It is interesting to note that the union of these sequences is the set of integers, and their intersection is empty. That is the case, in fact, for any irrational generator, but only T will produce winning VAN GAM pairs. The game is not much fun in that the average user will never be able to beat the computer in non-trivial cases, unless he has been taught the winning sequences.

This program by Alan Brown first appeared in *Creative Computing*, Jan/Feb 1978.

RUN

#### VANGAM CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

| ORI               |                           |                  |         |          |  |                              | ATCHES, EACH CONTAINING 100<br>ITH ME, AND OUR MOVES CONSIST |    |
|-------------------|---------------------------|------------------|---------|----------|--|------------------------------|--|----|
| OF:               |                           |                  |         |          |  |                              |  |    |
|                   |                           |                  |         |          |  |                              | ORE MATCHES FROM ONE PILE ONLY,                              | OR |
|                   |                           |                  |         |          | Contraction of the Contraction of the second | - 90 E. 1200                 | ME NUMBER FROM EACH PILE.                                    |    |
| 12001000          |                           |                  |         |          | AWAT THE                                     |                              | MATCH OF ALL WINS.   |    |
| CHI               | EK TU                     |                  | 200.0   |          |  |                              | FROM LEFT PILE   |    |
|                   |                           | 1000             |         |          | 1 2 2 1 1 2 1 1 2 1 1 2 1 1 1 2 1 1 1 1      |                              | REE FROM RIGHT PILE  |    |
|                   |                           |                  |         |          |  |                              | E FROM EACH PILE   |    |
|                   |                           | 51               | , -     | 13       | BUIN) IN                                     | KE FIV                       | E FRUM EACH FILE   |    |
|                   |                           |                  |         |          |  |                              |  |    |
|                   |                           |                  |         |          |  |                              |  |    |
|                   |                           |                  |         |          |  |                              |  |    |
| DES               | 1850                      | P 71 F           |         | 7750     | (NUMPER                                      | NUMBE                        | 817 17 22  |    |
|                   |                           |                  |         |          |  |                              | R)? 17,22  |    |
|                   |                           |                  |         |          | S (NUMBER<br>FIRST? YI                       | ES                           | R)? 17,22  |    |
|                   |                           |                  |         |          |  | ES                           |  |    |
|                   |                           |                  |         |          |  | ES<br>LEFT                   | RIGHT  |    |
| DO                |                           | ANT              | TO      | 60       |  | ES<br>LEFT                   | RIGHT  |    |
| DO                | YOU WI                    | ANT              | TO      | 60       |  | ES<br>LEFT<br>17             | RIGHT<br>22  |    |
| DO<br>YOU         | YOU WI                    | ANT              | 70<br>? | 60<br>3L | FIRST? Y                                     | ES<br>LEFT<br>17<br>14       | RIGHT<br>22  |    |
| DO<br>YOU         | YOU WI<br>R MOVI          | ANT              | 70<br>? | 60<br>3L | FIRST? Y                                     | ES<br>LEFT<br>17<br>14       | RIGHT<br>22<br>22  |    |
| DO<br>YOUI<br>HM. | YOU WI<br>R MOVI          | ANT<br>E:<br>AKE | ?       | 3L<br>2B | FIRST? Y                                     | ES<br>LEFT<br>17<br>14       | RIGHT<br>22<br>22  |    |
| DO<br>YOUI<br>HM. | YOU W<br>R MOVI<br>. I TI | ANT<br>E:<br>AKE | ?       | 3L<br>2B | FIRST? Y                                     | ES<br>LEFT<br>17<br>14<br>12 | RIGHT<br>22<br>22  |    |

| YOUR  | H  | DVE: | ?   | 5R  |         |       |       |    |         |
|-------|----|------|-----|-----|---------|-------|-------|----|---------|
|       |    |      |     |     | LEAVING | 9     | 10    |    |         |
| HH    | I  | TAKE | :   | 3L  | LEAVING | 6     | 10    |    |         |
| YOUR  | MC | DVE: | ?   | 3B  |         |       |       |    |         |
|       |    |      |     |     | LEAVING | 3     | 7     |    |         |
| HH    | 1  | TAKE | :   | 2R  | LEAVING | 3     | 5     |    |         |
| YOUR  | MC | VE:  | ?   | 3R  |         |       |       |    |         |
|       |    |      |     |     | LEAVING | 3     | 2     |    |         |
| HM    | I  | TAKE | :   | 2L  | LEAVING | 1     | 2     |    |         |
| YOUR  | MC | VE:  | ?   | 1R  |         |       |       |    |         |
|       |    |      |     |     | LEAVING | 1     | 1     |    |         |
| HM    | 1  | TAKE | :   | 1 B | LEAVING | 0     | 0     |    |         |
| SORRY |    | IUI  | EN. | DO  | NT FEEL | BADLY | - 1'H | AN | EXPERT. |
| DO YO | U  | WANT | TO  | PLA | AGAIN?  | YES   |       |    |         |
|       |    |      |     |     |         |       |       |    |         |

DESIRED PILE SIZES (NUMBER.NUMBER)? 26,16 DO YOU WANT TO GO FIRST? NO

|        |        |   |     |         | LEFT | RIGHT |
|--------|--------|---|-----|---------|------|-------|
|        |        |   |     |         | 25   | 16    |
| I TA   | KE :   |   | 1L  | LEAVING | 25   | 16    |
| YOUR   | HOVE:  | ? | 2B  |         |      |       |
|        |        |   |     | LEAVING | 23   | 14    |
| ни     | I TAKE | : | 11  | LEAVING | 22   | 14    |
| YOUR   | MOVE:  | ? | 2B  |         |      |       |
|        |        |   |     | LEAVING | 20   | 12    |
| ни     | I TAKE | : | 1L  | LEAVING | 19   | 12    |
| YOUR   | HOVE:  | ? | 1B  |         |      |       |
|        |        |   |     | LEAVING |      | 11    |
| Нй     | I TAKE | : | 1L  | LEAVING | 17   | 11    |
| YOUR   | MOVE:  | ? | 28  |         |      | -     |
|        |        |   |     | LEAVING | 15   | 9     |
| Нй     | I TAKE | : | 1L  | LEAVING | 14   | 9     |
| YOUR   | MOVE:  | ? | 1B  |         |      |       |
|        |        |   |     | LEAVING | 13   | 8     |
| НМ     | I TAKE | : | 1L  | LEAVING | 12   | 8     |
| YOUR   | HOVE:  | ? | 28  |         |      |       |
|        |        |   |     | LEAVING | 10   | 6     |
| HH     | I TAKE | : | 1L  | LEAVING | 9    | 6     |
| YOUR   | MOVE:  | ? | 28  |         |      |       |
|        |        |   |     | LEAVING | 7    | 4     |
| HM     | I TAKE | : | 1L  | LEAVING |      | 4     |
| YOUR   | MOVE:  | ? | 18  |         |      |       |
|        |        |   |     | LEAVING | 5    | 3     |
| нж     | I TAKE | : | 1L  | LEAVING | 4    | 3     |
| YOUR   | MOVE:  | ? | 2B  |         |      |       |
|        |        |   |     | LEAVING | 2    | 1     |
| H#     | I TAKE | : | 1L  | LEAVING | 1    | 1     |
| YOUR   | MOVE:  | ? | 1 B |         |      |       |
|        |        |   |     | LEAVING | 0    | 0     |
| H#     |        |   |     |         |      |       |
| Y011 1 |        |   |     |         |      |       |

YOU WIN!!

CONGRADULATIONS. YOU ARE A VERY CLEVER VAN WYTHOFF'S GAMESHAN.

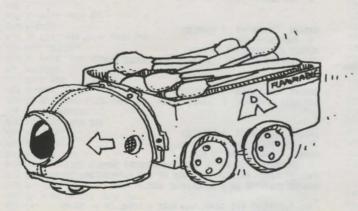
DO YOU WANT TO PLAY AGAIN? NO

O.K. BYE NOW.

LIST

5 PRINT TAB(26);"VANGAN" 6 PRINT TAB(20);"CREATIVE COMPUTING" 7 PRINT TAB(18);"MORRISTOWN, NEW JERSEY" 8 PRINT: PRINT: PRINT 10 DIM Q(200) 15 X=(1+SQR(5))/2:Y=1+1/X:X=1+X 16 FOR J=0 TO 99 17 Q(I\*2)=INT(I\*X):Q(I\*2+1)=INT(I\*Y) 18 NEXT I:T=0 20 PRINT "VAN WYTHOFF'S GAME: DO YOU WANT INSTRUCTIONS": 30 INPUT B\$: IF LEFT\$(B\$,1)="N" THEN 130 40 PRINT "YOU ARE TO CREATE TWO PILES OF MATCHES, EACH CONTAINING 100" 50 PRINT "OR LESS. YOU PLAY ALTERNATELY WITH ME, AND OUR MOVES CONSIST" 60 PRINT "OF:" 65 PRINT TAB(10);"(A) TAKING AWAY 1 OR MORE MATCHES"; 67 PRINT " FROM ONE PILE ONLY, OR" 70 PRINT TAB(10);"(B) TAKING AWAY THE SAME NUMBER FROM EACH PILE." 80 PRINT "THE ONE WHO TAKES AWAY THE LAST MATCH OF ALL WINS. 90 PRINT "ENTER YOUR MOVES IN THIS MANNER:" 100 PRINT TAB(10);"2L - (2 LEFT) TAKE TWO FROM LEFT PILE" 110 PRINT TAB(10);"3R - (3 RIGHT) TAKE THREE FROM RIGHT PILE" 120 PRINT TAB(10);"5B - (5 BOTH) TAKE FIVE FROM EACH PILE" 130 PRINT:PRINT:PRINT 200 INPUT "DESIRED PILE SIZES (NUMBER, NUMBER)"; S1, S2 210 L=S1:R=S2 220 IF L+R>5 THEN 240 230 PRINT "OH, YOU'RE A SPORT, YOU ARE." 240 INPUT "DO YOU WANT TO GO FIRST";B\$ 255 PRINT TAB(27);"LEFT RIGHT" 257 PRINT TAB(27);L;TAB(33);R 260 P=L+2: IF L>R THEN 400 270 P=R\*2 400 IF LEFT\$(B\$,1)="N" THEN 690 405 IF L=R THEN PRINT "YOU LIKE SITTING DUCKS, DON'T YOU?" 410 PRINT: INPUT "YOUR HOVE: ";B\$ 415 FOR X=1 TO LEN(B\$) 420 IF ASC(HID\$(B\$,X,1))<48 OR ASC(HID\$(B\$,X,1))>57 THEN 425 423 NEXT X 425 S3=VAL(HID\$(B\$,1,X-1)) 427 IF S3=0 THEN 460 427 IF 53-0 THEM 100 430 IF MID\$(B\$,X,1)="L" THEN 550 440 IF MID\$(B\$,X,1)="R" THEN 570 450 IF MID\$(B\$,X,1)="B" THEN 590 460 T=T+1:IF T>2 THEN 1940 470 PRIMT:PRIMT "IMPROPER ENTRY, STOP FOOLING AROUND.":GOTO 410 550 IF S3>L THEN 460 555 L=L-S3:GOTO 610 570 IF S3>R THEN 460 575 R=R-S3:GOTO 610 570 IF S3>L THEN 460 600 L=L-S3:GOTO 570 510 PRINT TAB(19); "LEAVING"; TAB(27); L; TAB(33); R 514 PRINT "HM.. "; 515 FOR I=1 TO 500:A=A+I:NEXT I 520 IF L+R>0 THEN 690 530 PRINT:PRINT:PRINT "YOU WIN!!":PRINT 335 PRINT "CONGRADULATIONS. YOU ARE A VERY CLEVER VAN WYTHOFF'S" 537 PRINT "GAMESMAN." 540 GOTO 1900

690 I=0:M=0 700 IF Q(I)=L THEN 760 710 IF Q(I+1)=L THEN 780 720 IF Q(I)=R THEN 800 730 IF Q(I+1)=R THEN 820 740 I=I+2:GOTO 700 760 L1=I:L2=1:IF M=1 THEN 840 770 M=1:60T0 720 780 L1=I:L2=0:IF M=1 THEN 840 790 M=1:60T0 720 800 R1=I:R2=1:IF M=1 THEN 840 810 M=1: GOTO 740 820 R1=I:R2=0:IF M=1 THEN 840 830 M=1: GOTO 740 840 IF L=R THEN 895 845 IF R1=L1 THEN 1080 850 IF L1>R1 THEN 900 860 P=L1+L2 880 IF Q(P)>R THEN 940 890 H=R-Q(P):R=Q(P):A\$="R":60T0 1110 895 M=L:L=0:R=0:A\$="B":GOTO 1110 900 P=R1+R2 920 IF Q(P)>L THEN 940 930 M=L-Q(P):L=Q(P):A\$="L":GOTO 1110 940 M=0:A\$="B" 950 P=L1:IF R1<L1 THEN P=R1 960 P=P-2:6=0 965 M=M+1:L=L-1:R=R-1 970 FOR I=P TO 0 STEP -2 990 IF Q(I)=L THEN 1040 1000 IF Q(I+1)=L THEN 1050 1010 IF Q(I)=R THEN 1060 1020 IF Q(I+1)=R THEN 1070 1030 NEXT I:GOTO 965 1040 IF Q(I+1)=R THEN 1110 1045 GOTO 1075 1050 IF Q(I)=R THEN 1110 1055 GOTO 1075 1060 IF Q(I+1)=L THEN 1110 1065 GOTO 1075 1070 IF Q(I)=L THEN 1110 1075 IF G=1 THEN 960 1077 G=1:60T0 965 1080 IF L>R THEN 1100 1090 R=R-1:M=1:A\$="R":GOTO 1110 1100 L=L-1:M=1:A\$="L" 1110 B\$="":IF M>9 THEN 1930 1113 B\$=CHR\$(H+48) 1114 B\$=B\$+A\$ 1115 PRINT "I TAKE :"; TAB(14); B\$; TAB(19); "LEAVING"; TAB(27); L; TAB(33); R 1120 IF L+R>0 THEN 410 1130 PRINT:PRINT "SORRY - I WIN. DON'T FEEL BADLY - I'M AN EXPERT." 1900 PRINT: INPUT "DO YOU WANT TO PLAY AGAIN": B\$ 1910 IF LEFT\$(B\$,1)="Y" THEN 130 1920 GOTO 1970 1930 B\$=CHR\$(INT(H/10)+48):B\$=B\$+CHR\$(M-INT(H/10)+10+48) 1935 GOTO 1114 1940 PRINT:PRINT "LOOK, YOU JUST WON'T STOP FOOLING ABOUT. BUZZ OFF." 1945 GOTO 1970 1970 PRINT: PRINT "O.K. BYE NOW." 1980 END





**DK** 



In this game, you're the commander of an American submarine with a mission to seek out and destroy as many Japanese ships as possible during World War II.

You may up your periscope to search for Japanese ships, you may launch your torpedoes, or you may dive to avoid Japanese ships that are attacking you.

For the most part, this is a game of random probabilities. To make it more interesting, you might wish to introduce a skill factor in terms of aiming your submarine or distance away from an enemy ship, size of the enemy ship, and so on.

Warfish was written by Randy Wit.

RUN

#### WARFISH CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

DO YOU DESIRE THE RULES OF WARFISH ? YES

YOU COMMAND AN AMERICAN SUBMARINE THAT BEEN SENT OUT TO ATTACK JAPANESE SHIPS AT SEA DURING WORLD WAR TWO

THE ORDERS THAT CAN BE GIVEN ARE THE FOLLOWING: PERISCOPE - TO SEARCH FOR JAPANESE SHIPS TORPEDO - TO LAUNCH TORPEDDES AT JAPANESE SHIPS DIVE - TO ESCAPE JAPANESE SHIPS THAT ARE ATTACKING

THESE ARE SOME HISTORIC U.S. NAVY SUBMARINES -TAUTOG, SILVERSIDES, CAVALLA, BLUEFISH, THRESHER SWORDFISH, FLASHER, TROUT, ARCHER SELECT ONE OF THE ABOVE, OR USE A NAME OF YOUR CHOICE PRINT THE MAME OF YOUR SUBMARINE ? TROUT

JAPANESE TORPEDO BOAT IS ATTACKING

ORDERS, COMMANDER ? DIVE DISTANCE OF JAPANESE TORPEDO BOAT DEPTH OF USS TROUT 1500 YARDS 0 FEET 1250 YARDS 25 FEET 1000 YARDS 50 FEET 750 YARDS 75 FEFT SCO YARDS 100 FFFT 250 YARDS **125 FEET** 0 YARDS 150 FEET THE USS TROUT IS UNHURT

ORDERS, COMMANDER ? PERISCOPE JAPANESE FREIGHTER - 7500 TONS

ORDERS, COMMANDER ? TORPEDO 26 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 2 2 TORPEDOES FIRED - 0 HITS

ORDERS, COMMANDER ? TORPEDO 24 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 3 3 TORPEDOES FIRED - 0 HITS ORDERS, COMMANDER ? TORPEDO 21 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 3 3 TORPEDOES FIRED - 1 HITS -FREIGHTER SUNK

ORDERS, COMMANDER ? PERISCOPE JAPANESE TRANSPORT - 11500 TONS

ORDERS, COMMANDER ? TORPEDO 18 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 3 3 TORPEDOES FIRED - 2 HITS -TRANSPORT SUNK

ORDERS, COMMANDER ? PERISCOPE JAPANESE AMMUNITION SHIP - 9650 TONS

ORDERS, COMMANDER ? TORPEDO 15 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 2 2 TORPEDOES FIRED - 0 HITS

ORDERS, COMMANDER ? TORPEDO 13 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 3 3 TORPEDOES FIRED - 2 HITS -AMMUNITION SHIP SUNK

ORDERS, COMMANDER ? PERISCOPE JAPANESE ANNUNITION SHIP - 9650 TONS

ORDERS, COMMANDER ? TORPEDO 10 TORPEDDES LEFT NUMBER OF TORPEDDES TO FIRE? 2 2 TORPEDDES FIRED - 1 HITS -AMMUNITION SHIP SUNK

ORDERS, COMMANDER ? PERISCOPE JAPANESE FREIGHTER - 9100 TONS

ORDERS, COMMANDER ? TORPEDO 8 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 2 2 TORPEDOES FIRED - 0 HITS

ORDERS, COMMANDER ? TORPEDO 6 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 3 3 TORPEDOES FIRED - 0 HITS

ORDERS, COMMANDER ? TORPEDO 3 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 2 2 TORPEDOES FIRED - 2 HITS -FREIGHTER SUNK

ORDERS, COMMANDER ? PERISCOPE JAPANESE TRANSPORT - 11500 TONS

ORDERS, COMMANDER ? TORPEDO 1 TORPEDOES LEFT NUMBER OF TORPEDOES TO FIRE? 1 1 TORPEDOES FIRED - 1 HITS -TRANSPORT SUNK THE USS TROUT HAS EXPENDED ALL OF ITS TORPEDOES CONGRATULATIONS ON A SUCCESSFUL DEPLOYMENT

THE SUBMARINE USS TROUT HAS SUNK A TOTAL OF 6 SHIPS THE ENEMY TONNAGE SUNK IS 57900 TONS

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LIST
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```
1 PRINT TAB(25) "WARFISH"
 2 PRINT TAB(20) "CREATIVE COMPUTING"
 3 PRINT TAB(18) "MORRISTOWN, NEW JERSEY"
5 PRINT
6 PRINT
7 PRINT
8 PRINT
9 DIM A$(72)
10 Q0=RND(1)
30 PRINT"DO YOU DESIRE THE RULES OF WARFISH ":
40 INPUT XS
50 IF X$="NO" THEN 200
51 IF X$="YES" THEN 60
52 PRINT"YES OR NO ONLY, PLEASE."
53 GOTO 30
60 PRINT
70 PRINT"YOU COMMAND AN AMERICAN SUBMARINE THAT BEEN SENT OUT"
80 PRINT"TO ATTACK JAPANESE SHIPS AT SEA DURING WORLD WAR TWO"
90 PRINT
100 PRINT" THE ORDERS THAT CAN BE GIVEN ARE THE FOLLOWING:"
110 PRINT"PERISCOPE - TO SEARCH FOR JAPANESE SHIPS"
120 PRINT"TORPEDO - TO LAUNCH TORPEDDES AT JAPANESE SHIPS"
130 PRINT "DIVE - TO ESCAPE JAPANESE SHIPS THAT ARE ATTACKING"
140 PRINT
150 PRINT"THESE ARE SOME HISTORIC U.S. NAVY SUBMARINES -"
160 PRINT"
               TAUTOG, SILVERSIDES, CAVALLA, BLUEFISH, THRESHER"
SWORDFISH, FLASHER, TROUT, ARCHER"
170 PRINT"
180 PRINT"SELECT ONE OF THE ABOVE, OR USE A NAME OF YOUR CHOICE"
200 PRINT"PRINT THE NAME OF YOUR SUBMARINE ":
210 INPUT AS
220 T=26
230 D=INT(RND(1)*10)
240 IF D<6 THEN 330
250 IF D<>6 AND D<> 7 THEN 270
255 R$="DESTROYER"
260 W=2100
270 IF D<>8 THEN290
271 R$="DESTROYER ESCORT"
280 W=1350
290 IF D<>9 THEN 310
291 R$="TORPEDO BOAT"
300 ₩=70
310 IF D=6 OR D=7 THEN 313
311 0=1
312 GOTO 314
313 0=2
314 PRINT
315 PRINT
 320 PRINT"JAPANESE ";R$;" IS ATTACKING"
 330 IF D>= 6 THEN 340
 335 A=INT(RND(1)*10)
 340 PRINT
 350 PRINT
 360 PRINT"ORDERS, COMMANDER ";
 370 INPUT C$
 371 C$=MID$(C$,1,1)
 380 IF C$="P" THEN 420
 390 IF C$="T" THEN 780
 400 IF C$="D" THEN 990
 410 GOTO 360
 420 IF D>5 OR Q>0 THEN 760
 430 IF A>=4 THEN 470
 435 RS="FREIGHTER"
 440 IF A<>0 AND A<>1 THEN 450
 445 W=6500
 450 IF A > 2 THEN 460
 455 W=7500
 460 IF A<>3 THEN 470
 465 W=8100
 470 IF ACOT AND ACOS THEN 490
 475 R$="TANKER"
 480 IF A<>8 THEN 485
 481 W=10000
 482 GOTO 490
 485 W=9500
  490 IF A >4 AND A >5 THEN 510
 491 R$="TRANSPORT"
 500 IF A<>5 THEN 505
 501 W=11500
 502 GOTO 510
 505 W=8800
 510 IF AC26 THEN 530
 515 R$="AMMUNITION SHIP"
 520 W=9650
 530 IF A>=9 OR A=6 THEN 540
 535 0=1
 540 IF A<>6 THEN 550
```

```
545 Q=1
550 IF A<9 THEN 760
560 E=INT(RND(1)*10)
570 IF E >0 THEN 590
575 RS="BATTLESHIP"
580 W=33500
590 IF EC1 THEN 610
595 R$="AIRCRAFT CARRIER"
600 W=25700
610 IF E<>2 THEN 630
615 R$="HEAVY CRUISER"
620 W= 9900
630 IF E 3 THEN 650
635 R$="LIGHT CRUISER"
640 W=9600
650 IF E 4 AND E 5 THEN 670
655 R$="DESTROYER"
660 W=2100
670 IF E<>6 AND E<>7 THEN 690
675 R$="SUBMARINE"
680 W=1500
690 IF E 8 AND E 9 THEN 710
700 W=1350
710 IF E<=5 THEN 720
715 0=1
720 IF E 4 ANDE 5 THEN 730
725 0=2
730 IF E<>2 AND E<>3 THEN 740
735 Q=3
740 IF E<>1 THEN 750
745 W=4
750 IFE(>0 THEN 760
755 Q=6
760 PRINT"JAPANESE ";R$;" - ";W;" TONS"
770 GOTO 340
780 IF Q>=1 THEN 800
785 PRINT" NO JAPANESE SHIPS IN SIGHT - JUST OCEAN"
790 IF Q<1 THEN 360
800 PRINT T:" TORPEDDES LEFT"
810 PRINT"NUMBER OF TORPEDOES TO FIRE";
820 INPUT R
830 IF R<0 OR T-R<0 THEN 810
840 IF R<>INT(R) THEN 810
850 T=T-R
860 S=INT(RND(1)*10)
870 IF S>R THEN 860
880 Q=Q-S
890 IF Q<=0 THEN 900
895 Q$="DAMAGED"
900 IF Q>=1 THEN 930
905 Q$="SUNK"
910 D=0+W
920 L=L+1
930 PRINT R;" TORPEDOES FIRED -";S;" HITS";
940 IF S<>0 THEN 950
945 PRINT
950 IF S<=0 THEN 960
955 PRINT" -"; R$;" ";Q$
960 IF D>5 AND Q>0 THEN 1140
970 IF T<1 THEN 1160
980 IF Q<1 THEN 230
985 GOTO 340
990 IF D>=6 THEN 1000
995 PRINT" THEN USS ";A$;" IS NOT UNDER ATTACK"
1000 IF D<6 THEN 360
1010 U=INT(RND(1)*10)*250+500
1020 PRINT "DISTANCE OF JAPANESE ";R$;"
                                                     DEPTH OF USS ";AS
1030 PRINT U; "YARDS
                                                       ":7:"FEET"
1040 U=U-250
1050 7=7+25
1060 IF U>-250 THEN 1030
1070 IF R$="TORPEDD BOAT " THEN 1100
1080 N=INT(RND(1)*10)*25+50
1090 IF N+26>Z AND N-26<Z THEN 1120
1099 IJ=Z=0
1100 PRINT"THE USS ";A$;" IS UNHURT"
1110 @=0
1111 GOTO 230
1120 PRINT"THE USS ";A$;" HAS BEEN SUNK BY DEPTH CHARGES"
1130 GOTO 1180
1140 PRINT"THE USS "A$;" HAS BEEN SUNK BY GUNFIRE"
1150 GOTO 1180
1160 PRINT"THE USS ";A$;" HAS EXPENDED ALL OF ITS TORPEDOES"
1170 IF O<=0 THEN 1180
1175 PRINT"CONGRATULATIONS ON A SUCCESSFUL DEPLOYMENT"
1180 PRINT
1190 PRINT" THE SUBMARINE USS ";A$;" HAS SUNK A TOTAL OF";L;" SHIPS"
1200 PRINT" THE ENEMY TONNAGE SUNK IS ":0:" TONS"
```

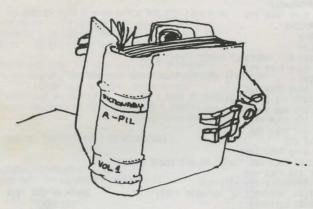
1210 END

OK

## **Word Search Puzzle**

This program generates the immensely popular word-search puzzles containing names of Presidents, states, types of animals, fish, and every manner of objects. It asks you the length and width of the puzzle you wish generated and then the number of words to be hidden in the puzzle. As the instructions note, occasionally the computer may find that it can't hide a particular word in the puzzle and will ask you if it should start over or if you want that particular word deleted. If you start over, try giving it fewer words or larger puzzle dimensions. The program hides the words fairly efficiently although you can usually improve on it slightly when you get the final puzzle out. Since you're probably just using this program for fun, it's generally more than adequate.

This word search puzzle generator was originated by Leor Zolman.



HOW MANY COLUMNS DOES YOUR PRINTER HAVE? 72 DO YOU WANT A SOLUTION PRINTOUT? YES WHAT IS TO BE THE WIDTH OF THE PUZZLE? 15 THE LENGTH? 15 WHAT IS THE MAXIMUM NUMBER OF WORDS IN THE PUZZLE? 10 NOW ENTER A HEADING THAT WILL BE PRINTED OVER THE PUZZLE: ( 72 CHARACTERS MAXIMUM! ) ? COMPUTER LANGUAGES OK . . . ENTER A WORD AT EACH QUESTION MARK. TO REDO THE PREVIOUS WORD, TYPE A HYPHEN (-). WHEN YOU RUN OUT OF WORDS, TYPE A PERIOD (.). ? BAS#&"Z\$ IC -basic-? FOR) (#STRAN -fortran-? P L I -pli-? C O B O L++='; -cobol-? ASSEMBNLER -assembnler-REDG assembnler. . . 7 ASSEMBLER -assembler-? RPG -rpg-? ALGOL -algol-? LISP -lisp-? SNOBOL -snobol-? PILOT -pilot-THAT'S IT... 10 WORDS. NOW LET ME PONDER THIS..... HOW MANY COPIES OF THIS PUZZLE DO YOU WANT? 1 FOR EACH COPY, HIT RETURN TO BEGIN PRINTING...

#### COMPUTER LANGUAGES

| B | I | U | R | ¥ | I | Х | N | R | S | K | A | T | T | Z |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| 0 | 6 | ٥ | M | L | G | S | L |   | Ε | P | A | ۵ | Y | S |  |
| Y | ٧ | Y | P | F |   | A | Z | 0 | I | Z | K | С | F | P |  |
| P | Ħ | T | T | R | H | P | P | L | G | 0 | S | S | S | Y |  |
| Z | S | R | I | H | B | S | 0 | J | Y | L | N | B | X | X |  |
| Ε | A | C | Ε | K | R | T | Н | S | I | 0 | A | H | F | N |  |
| D | F | 0 | I | L | U | K | K | 0 | B | B | F | B | R | J |  |
| D | L | Q | T | S | B | ٧ | A | 0 | Η | ч | W | F | G | С |  |
| 0 | I | L | Y | D | A | H | L | K | U | P | 0 | V | P | A |  |
| K | X | P | 0 | G | Z | B | E | X | M | R | R | F | U | D |  |
| Ħ | V | С | S | B | P | S | Y | S | T | I | L | X | S | U |  |
| I | I | I | B | I | 0 | R | G | R | S | ۷ | A | Y | T | Y |  |
| Ε | H | N | D | A | L | 3 | A |   | U | A | Ζ | W | J | K |  |
| L | A | C | R | Y | L | N | ۷ | К | T | F | Z | 0 | W | C |  |
| F | ٧ | Q | Y | U | A | 1 | F |   | G | P | 0 | J | B | V |  |

FIND THESE HIDDEN WORDS IN THE ABOVE PUZZLE:

| algol | assembler | basic | cobol | fortran |
|-------|-----------|-------|-------|---------|
| lisp  | pilot     | pli   | rpg   | snobol  |

RUN

WORD SEARCH PUZZLE CREATIVE COMPUTING MORRISTOWN, NEW JERSEY

THIS PROGRAM IS A WORD SEARCH PUZZLE GENERATOR!! THE PROGRAM TAKES A SET OF INPUT STRINGS, PURGES ALL NON-ALPHABETIC CHARACTERS OUT OF THEM, AND INCORPORATES THEM INTO A WORD SEARCH PUZZLE.

IN THE COURSE OF MAKING THE PUZZLE, THE MACHINE MAY FIND THAT IT CAN'T PUT A PARTICULAR WORD ANYWHERE, AND SO WILL ASK YOU IF IT SHOULD START THE WHOLE PUZZLE OVER. IF YOU DON'T WANT IT TO START OVER, TYPING 'NO' WILL THROW AWAY THAT PARTICULAR WORD. IF THIS PERSISTS, TRY EITHER GIVING LESS WORDS OR BIGGER PUZZLE DIMENSIONS!

|   |   |   |   |   | I |   |   |   |   |   |   |   |  |  |
|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
|   |   | • |   | L |   |   | L |   |   | P |   |   |  |  |
|   |   |   | P |   |   |   |   | 0 | I |   |   |   |  |  |
|   |   |   |   |   |   |   |   | L | G |   |   | S |  |  |
| • |   | R |   |   | • |   | 0 |   |   | L | N |   |  |  |
|   |   | С | Ε |   |   | T |   |   |   | 0 | A |   |  |  |
|   |   |   | I | L |   |   |   |   | B |   |   |   |  |  |
|   |   |   |   | S | B |   |   | 0 |   |   |   | F |  |  |
|   |   | L |   |   | A | M | L |   |   |   | 0 |   |  |  |
|   |   | P | 0 | G |   | B | Ε |   |   | R |   |   |  |  |
|   |   |   | S | B | P |   |   | S | T |   |   |   |  |  |
|   |   |   |   | I | 0 | R |   | R | S |   |   |   |  |  |
|   |   |   |   |   | L | С | A |   |   | A |   |   |  |  |
|   |   |   |   |   |   | N |   |   |   |   |   |   |  |  |
|   | • |   |   | • |   |   |   |   |   |   |   |   |  |  |
|   |   |   |   |   |   |   |   |   |   |   |   |   |  |  |

| FIND | THESE | HIDDEN | UORDS | TN | THE | AROUF | PUZZLE: |  |
|------|-------|--------|-------|----|-----|-------|---------|--|
|      |       |        |       |    |     |       |         |  |

| algol | assembler | basic | cobol | fortran |
|-------|-----------|-------|-------|---------|
| lisp  | pilot     | pli   | rpg   | snobol  |

LIST 10 PRINT TAB(20);"WORD SEARCH PUZZLE" 20 PRINT TAB(20); "CREATIVE COMPUTING" 30 PRINT TAB(18); "MORRISTOWN, NEW JERSEY" 40 PRINT:PRINT:PRINT 50 PRINT " THIS PROGRAM IS A WORD SEARCH PUZZLE GENERATOR !!" 60 PRINT "THE PROGRAM TAKES A SET OF INPUT STRINGS, PURGES ALL" 70 PRINT "NON-ALPHABETIC CHARACTERS OUT OF THEM, AND INCORPORATES" 80 PRINT "THEM INTO A WORD SEARCH PUZZLE." 90 PRINT 100 PRINT ' IN THE COURSE OF MAKING THE PUZZLE, THE MACHINE MAY" 110 PRINT "FIND THAT IT CAN'T PUT A PARTICULAR WORD ANYWHERE, AND" 120 PRINT "SO WILL ASK YOU IF IT SHOULD START THE WHOLE PUZZLE" 130 PRINT "OVER. IF YOU DON'T WANT IT TO START OVER, TYPING 'NO'" 140 PRINT "WILL THROW AWAY THAT PARTICULAR WORD. IF THIS PERSISTS," 150 PRINT "TRY EITHER GIVING LESS WORDS OR BIGGER PUZZLE DIMENSIONS!" 160 PRINT:PRINT 280 CLEAR 3000 300 DEF FNA(Z)=INT(RND(1)\*Z+1) 310 INPUT "HOW MANY COLUMNS DOES YOUR PRINTER HAVE": TW 320 INPUT "DO YOU WANT A SOLUTION PRINTOUT";X\$ 330 INPUT "WHAT IS TO BE THE WIDTH OF THE PUZZLE";W:MD=W 340 IF W#2<=TW THEN 345 343 PRINT "THAT WILL NOT FIT IN"; TW; " COLUMNS. ": GOTO 330 345 IF W<1 THEN 330 350 INPUT "THE LENGTH";L:IF L>W THEN MD=L 355 IF L<1 THEN 350 360 INPUT "WHAT IS THE MAXIMUM NUMBER OF WORDS IN THE PUZZLE"; H 370 IF M>=2 THEN 380 375 PRINT "SORRY; THERE MUST BE AT LEAST 2 WORDS.": 60T0 360 380 PRINT 390 DIM A\$(L,W), W\$(M) 400 DIM W(M, 3), DXY(8,2), DD(28) 410 PRINT "NOW ENTER A HEADING THAT WILL BE PRINTED OVER THE PUZZLE:" 420 PRINT "(";TW;"CHARACTERS MAXIMUM! )" 430 INPUT XYS 440 PRINT "OK . . ENTER A WORD AT EACH QUESTION MARK." 450 PRINT "TO REDO THE PREVIOUS WORD, TYPE A HYPHEN (-)." 460 PRINT "WHEN YOU RUN OUT OF WORDS, TYPE A PERIOD (.)." 470 FOR I=1 TO M 480 INPUT T\$:IF T\$="-" THENI=I-1:PRINT "REDO ";W\$(I);". . .":GOTO 480

490 IF T\$="." THEN M=I-1:GOTO 660

500 IF LEN(T\$)=0 THEN PRINT "INPUT ERROR; REDO:":GOTO 480 510 J=1 520 TE\$=HID\$(T\$, J, 1): IF TE\$>="a" AND TE\$<="z" THEN 525 IF TE\$<"A" OR TE\$>"Z" THEN 530 527 T\$=LEFT\$(T\$, J-1)+CHR\$(ASC(MID\$(T\$, J, 1))+32)+RIGHT\$(T\$, LEN(T\$)-J) 530 IF TES=TS THEN TS="": GOTO 500 S:60T0570 540 IF J=LEN(T\$) THEN T\$=LEFT\$(T\$, J-1):GOTO 580 550 IF J=1 THEN T\$=RIGHT\$(T\$,LEN(T\$)-1):J=J-1:GOTO 570 560 T\$=LEFT\$(T\$, J-1)+RIGHT\$(T\$, LEN(T\$)-J): J=J-1 570 J=J+1:IF J<=LEN(T\$) THEN 520 580 PRINT "-";T\$;"-600 IF LEN(T\$) <= MD THEN 610 605 PRINT "THAT'S TOO LONG, I'M AFRAID."; 607 PRINT " TRY ANOTHER ONE: ": GOTO 480 610 FOR IZ=1 TO I-1: IF W\$(IZ) ()T\$ THEN NEXT: 60TO 630 620 PRINT "YOU ENTERED THAT ONE ALREADY. TRY ANOTHER: ": 60TO 480 630 M\$(T)=T\$ 640 NEXT I 650 PRINT "THAT'S IT...";N;"WORDS." 660 PRINT "NOW LET ME PONDER THIS....." 680 FOR I=1 TO M-1 685 FOR J=I+1 TO M 690 IF LEN(U\$(I)) < LEN(U\$(J)) THEN HZ\$=U\$(I):U\$(I)=U\$(J):U\$(J)=HZ\$ 700 NEXT:NEXT 710 FOR I=1 TO 8:READ DXY(I,1), DXY(I,2):NEXT 720 FOR I=1 TO 28:READ DD(I):NEXT 730 DATA 0,1,1,1,1,0,1,-1,0,-1,-1,-1,-1,0,-1,1 740 DATA 2,4,6,8,2,4,6,8,2,4,6,8,2,4,6,8,2,4,6,8,2,4,6,8,2,4,6,8,1,3,5,7 750 FOR I=1 TO M 760 LN=LEN(U\$(I)) 770 NT=0 790 SD=DD(FNA(28)) 800 SX=FNA(W):X1=SX+(LN-1)\*DXY(SD,1):IF X1<1 OR X1>W THEN 790 810 SY=FNA(L):X1=SY+(LN-1)\*DXY(SD,2):IF X1<1 OR X1>L THEN 790 820 NT=NT+1:IF NT<>W#L#2 THEN 850 830 PRINT "COULDN'T FIT '";W\$(I);"' IN TH 832 INPUT "DO YOU WANT ME TO START OVER";A\$ 834 IF LEFT\$(A\$,1)="y" THEN 750 IN THE PUZZLE." 836 W\$(I)="":60TO 950 850 J=SY:K=SX 860 FOR P=1 TO LN 870 IF LEN(A\$(J,K)) AND A\$(J,K)<>HID\$(U\$(I),P,1) THEN 790 880 J=J+DXY(SD,2):K=K+DXY(SD,1):NEXT P 900 J=SY:K=SX 910 FOR P=1 TO LN:A\$(J,K)=HID\$(U\$(I),P,1) 920 J=J+DXY(SD,2):K=K+DXY(SD,1):NEXT 940 W(I,1)=SX:W(I,2)=SY:W(I,3)=SD 950 NEXT I 970 FOR I=1 TO L 975 FOR J=1 TO W 980 IF A\$(I,J)="" THEN A\$(I,J)=CHR\$(FNA(26)+96) 990 NEXT:NEXT 1010 FOR I=1 TO M-1:FOR J=I+1 TO M 1020 IF W\$(I)<=W\$(J) THEN 1030 1021 HZ\$=W\$(I):W\$(I)=W\$(J):W\$(J)=HZ\$ 1025 FOR K=1 TO 3:HZ=W(I,K):W(I,K)=W(J,K):W(J,K)=HZ:NEXT K 1030 NEXTJ:NEXT 1040 INPUT "HOW MANY COPIES OF THIS PUZZLE DO YOU WANT";N 1050 PRINT "FOR EACH COPY, HIT RETURN TO BEGIN PRINTING... 1060 FOR C=1 TO N:GOSUB 1070:NEXT:GOTO 1230 1070 INPUT AS:PRINT 1080 T=(TW-2\*W)/2:PRINT 1090 PRINT 1100 PRINT TAB((TW-LEN(XY\$))/2);XY\$ 1110 PRINT:PRINT 1120 FOR J=1 TO L:PRINT TAB(T); 1130 FOR K=1 TO W:IF A\$(J,K)="." THEN PRINT ". ";:GOTO 1140 1135 PRINT CHR\$(ASC(A\$(J,K))-32);" "; 1140 NEXT:PRINT:NEXT 1150 PRINT:PRINT 1160 PRINT "FIND THESE HIDDEN WORDS IN THE ABOVE PUZZLE:" 1170 PRINT 1180 FOR J=1 TO M: IF LEN(W\$(J))=0 THEN 1210 1190 IF POS(0) + LEN(U\$(J)) > TW-2 THEN PRINT 1200 PRINT W\$(J). 1210 NEXT:PRINT:PRINT:PRINT:PRINT 1220 RETURN 1230 IF LEFT\$(X\$,1)="Y" OR LEFT\$(X\$,1)="y" THEN 1250 1240 END 1250 REM 1260 FOR I=1 TO L:FOR J=1 TO W:A\$(I,J)=".":NEXTJ:NEXTI 1270 FOR I=1 TO M 1280 LN=LEN(W\$(I)):J=W(I,2):K=W(I,1) 1290 FOR P=1 TO LN 1300 A\$(J,K)=MID\$(W\$(I),P,1) 1310 J=J+DXY(W(I,3),2):K=K+DXY(W(I,3),1):NEXT P 1320 NEXT I 1330 XY\$="HERE IS THE ANSWER KEY:" 1340 GOSUB 1070 1350 PRINT:PRINT 1360 END

Dk



#### The Genesis of Wumpus

Two years ago I happened by People's Computer Company (PCC) and saw some of their computer games – such as Hurkle, Snark, and Mugwump. My reaction was: "EECH!!" Each of these games was based on a  $10 \times 10$  grid in Cartesian co-ordinates and three of them was too much for me. I started to think along the lines of: "There has to be a hide and seek computer game without that (exp. deleted) grid!!" In fact, why not a topological computer game – imagine a set of points connected in some way and the player moves about the set via the interconnections.

That afternoon in meditation the phrase "Hunt the Wumpus" arrived, and Wumpus was born. He's still a bit vague in physical detail as most dedicated Wumpus hunters know, but appearances are part of the game. (If you like, send me a picture of your version of a Wumpus. Perhaps friendly Dave, our editor, will publish the best one in *Creative Computing*.) The grid I chose was the vertices of a dodecahedron — simply because it's my favorite Platonic solid and once, ages ago, I made a kite shaped like one. The edges became the connecting tunnels between the caves which were the set of points for the game.

My basic idea at this time was for the player to approach the Wumpus, back off, and come up to him by going around the dodecahedron. To my knowledge, this has never happened . . . most players adopt other strategies rather than this cold-blooded approach.

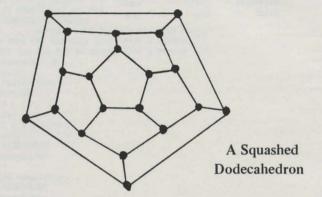
Anyway... how to get the Wumpus! How about an arrow which could turn corners as it goes from room to room. Let the hunter tell the arrow where to go and let it fly. The shortest round trip without reversals is 5 caves – and thus the Crooked Arrow.

Hmmm... How does one sense the Wumpus? It's dark in yonder cave, and light would wake him up. If one got one cave away, the wumpus's distinct smell would serve as a warning. So far, so good ... but Wumpus is still too easy, so let's find some appropriate hazards for the caves.

Bottomless pits were easy. Any imaginary cave would have a few of those around the place. Superbats were harder to come by. It took me a day or two to get that idea. The Superbats are a sort of rapid transit system gone a little batty (sorry about that one). They take you a random distance to a random cave and leave you there. If that's a pit or a Wumpus, well, you are in Fate's hands.

Around this time, I saw that Map-making would be a regular activity of Wumpus-hunters. I numbered the caves and made the scheme fixed in the hopes a practised player might notice this and make himself a permanent map of the caverns. (Another unrealised hope – as an exercise, make yourself such a map on a Squashed Dodecahedron).

To start the game fairly, Wumpus, Hazards, and Hunter are located on different points at the start of the game. Each game starts with random choices of location, but the



hunter may restart with the same set-up if he chooses. This allows re-plays if the hunter, say, fell into a pit on the first move.

Wumpus was nearly done in my mind... (hint to a games-writer: Have a clear notion of your game before you start coding it. This saves MUCH confusion.) yet I felt it was a bit dull. Once you found the Wumpus all you had to do was shoot it. To fix this, the Wumpus was given a little life. If you shot an arrow or moved into his cave, he woke up and chose to move to a neighboring room or to the same room (one of 4 choices). If you and the Wumpus were in the same room after he moved, he ATE YOU UP!!

Around here I noticed that the pits and the bats didn't affect the Wumpus. To explain this, I added some color by making him heavy and with the legendary sucker feet. After all, evolution works in strange ways!! If you are a Wumpus fiend, make a version of Wumpus in which he avoids pits and superbats can carry him only one room (with the possibility of being dumped into your cave). This can be done by making the wumpus moving procedure a subroutine.

I wrote Wumpus and dropped it off at PCC. Then I went home and dreamed up Wumpus 2.

#### The Birth of Wumpus

Around a month later, I went to the Synergy conference at Stanford, where many of the far-out folk were gathered to share their visions of improving the world. PCC had a few terminals running in a conference room and I dropped by. To my vast surprise, all of the terminals were running Wumpus and scraps of paper on the floor with scrawled numbers and lines testified that much dedicated Wumpushunting was in progress. I had spawned a hit computer game!!!

Later, PCC published Wumpus in its newsletter, and *Creative Computing* published it in their Sep/Oct 1975 issue.

Wumpus and this writeup are the products of the talented and creative Gregory Yob.

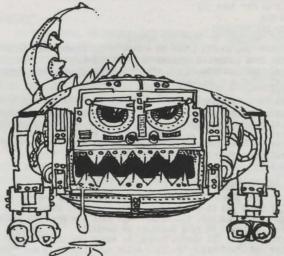
INSTRUCTIONS (Y-N)? Y WELCOME TO 'HUNT THE WUMPUS' SHOOT OR MOVE (S-M)? M THE WUMPUS LIVES IN A CAVE OF 20 ROOMS. EACH ROOM WHERE TO? 3 HAS 3 TUNNELS LEADING TO OTHER ROOMS. (LOOK AT A DODECAHEDRON TO SEE HOW THIS WORKS-IF YOU DON'T KNOW I FEEL A DRAFT! WHAT A DODECHADRON IS, ASK SOMEONE) YOU ARE IN ROOM 3 TUNNELS LEAD TO 2 4 12 HAZARDS: BOTTOMLESS PITS - TWO ROOMS HAVE BOTTOMLESS PITS IN THEM SHOOT OR MOVE (S-M)? M IF YOU GO THERE, YOU FALL INTO THE PIT (& LOSE!) WHERE TO? 12 SUPERBATS - TWO OTHER ROOMS HAVE SUPER BATS. IF YOU GO THERE, A BAT GRABS YOU AND TAKES YOU TO SOME OTHER I SMELL A WUMPUS! ROOM AT RANDOM. (WHICH MIGHT BE TROUBLESOME) WUMPUS: THE WUMPUS IS NOT BOTHERED BY THE HAZARDS (HE HAS SUCKER SHOOT OR MOVE (S-M)? S HEET AND IS TOO BIG FOR A BAT TO LIFT). USUALLY HE IS ASLEEP. TWO THINGS THAT WAKE HIM UP: YOUR ENTERING NO. OF ROOMS(1-5)? 1 ROOM #? 11 HIS ROOM OR YOUR SHOOTING AN ARROW. If the wumpus wakes, he moves (P=.75) one room AHA! YOU GOT THE WUMPUS! OR STATS STILL (P=\_25). AFTER THAT, IF HE IS WHERE YOU ARE, HE EATS YOU UP (& YOU LOSE!) YOU: EACH TURN YOU MAY MOVE OR SHOOT A CROOKED ARROW HOVING: YOU CAN GO ONE ROOM (THRU ONE TUNNEL) ARROWS: YOU HAVE 5 ARROWS. YOU LOSE WHEN YOU RUN OUT. Each Arrow Can 60 From 1 to 5 rooms. You aim by telling THE COMPUTER TTHE ROOMNS YOU WANT THE ARROW TO GO TO. IF THE ARROW CAN'T GO THAT WAY (IE NO TUNNEL) IT MOVES AT RANDOM TO THE NEXT ROOM. IF THE ARROW HITS THE WUMPUS, YOU WIN. IF THE ARROW HITS YOU, YOU LOSE. WARNINGS: WHEN YOU ARE ONE ROOM AWAY FROM WUMPUS OR HAZARD, THE COMPUTER SAYS: 'I SHELL A WUMPUS' WUMPUS-BATS NEARBY BAT 'I FEEL A DRAFT' PIT HUNT THE WUNPUS BATS NEARBY! YOU ARE IN ROOM 7 TUNNELS LEAD TO 6 8 17 SHOOT OR MOVE (S-M)? M LIST WHERE TO? 8 ZAP--SUPER BAT SNATCH! ELSEWHEREVILLE FOR YOU! 22 PRINT I FEEL A DRAFT! 24 PRINT YOU ARE IN ROOM 20 26 PRINT TUNNELS LEAD TO 13 16 19 40 INPUT IS SHOOT OR MOVE (S-M)? M 50 IF IS="N" THEN 60 WHERE TO? 13 55 GOSUB 1000 YOU ARE IN ROOM 13 70 DIM S(20.3) TUNNELS LEAD TO 12 14 20 80 FOR J=1 TO 20 90 FOR K=1 TO 3 SHOOT OR MOVE (S-M)? M 100 READ S(J,K) WHERE TO? 14 110 NEXT K 120 NEXT J YOU ARE IN ROOM 14 TUNNELS LEAD TO 4 13 15 SHOOT OR MOVE (S-M)? M WHERE TO? 15 I FEEL A DRAFT! YOU ARE IN ROOM 15 TUNNELS LEAD TO. 6 14 16 220 DIM L(6), M(6) SHOOT OR MOVE (S-M)? 6 230 FOR J=1 TO 6 SHOOT OR MOVE (S-M)? M 240 L(J)=FNA(0) WHERE TO? 6 260 M(J)=L(J) 270 NEXT J YOU ARE IN ROOM 6 TUNNELS LEAD TO 5 7 15 290 FOR J=1 TO 6 300 FOR K=J TO 6 SHOOT OR MOVE (S-M)? 5 310 IF J=K THEN 330 SHOOT OR MOVE (S-M)? M WHERE TO? 5 330 NEXT K

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YOU ARE IN ROOM 5
TUNNELS LEAD TO 1 4 6
```

YOU ARE IN ROOM 4 TUNNELS LEAD TO 3 5 14

YOU ARE IN ROOM 12 TUNNELS LEAD TO 3 11 13

HEE HEE HEE - THE WUMPUS'LL GETCHA NEXT TIME !!



10 PRINT TAB(33); "WUMPUS" 20 PRINT TAB(15); "CREATIVE COMPUTING MORRISTOWN, NEW JERSEY" 30 PRINT "INSTRUCTIONS (Y-N)": 60 REM- SET UP CAVE (DODECAHEDRAL NODE LIST) 130 DATA 2,5,8,1,3,10,2,4,12,3,5,14,1,4,6 140 DATA 5,7,15,6,8,17,1,7,9,8,10,18,2,9,11 150 DATA 10,12,19,3,11,13,12,14,20,4,13,15,6,14,16 160 DATA 15, 17, 20, 7, 16, 18, 9, 17, 19, 11, 18, 20, 13, 16, 19 170 DEF FNA(X)=INT(20\*RND(1))+1 180 DEF FNB(X)=INT(3\*RND(1))+1 190 DEF FNC(X)=INT(4\*RND(1) )+1 200 REM- LOCATE L ARRAY ITEMS 210 REM- 1-YOU, 2-WUMPUS, 314-PITS, 586-BATS 280 REM- CHECK FOR CROSSOVERS (IE L(1)=L(2) ETC) 320 IF L(J)=L(K) THEN 240 340 NEXT J 350 REM- SET# ARROS

```
360 A=5
365 L=L(1)
370 REM- RUN THE GAME
375 PRINT "HUNT THE WUNPUS"
380 REM- HAZARD WARNINGS & LOCATIONS
390 GOSUB 2000
400 REM- MOVE OR SHOOT
410 GOSUB 2500
420 ON 0 GOTO 440,480
430 REM- SHOOT
440 GOSUB 3000
450 IF F=0 THEN 390
460 GOTO 500
470 REM- MOVE
480 GOSUB 4000
490 IF F=0 THEN 390
500 IF F>0 THEN 550
510 REM- LOSE
520 PRINT "HA HA HA - YOU LOSE!"
530 GOTO 560
540 REM- WIN
550 PRINT "HEE HEE HEE - THE WUMPUS'LL GETCHA NEXT TIME !!"
560 FOR J=1 TO 6
570 L(J)=#(J)
580 NEXT J
590 PRINT "SAME SET-UP (Y-N)";
600 INPUT IS
610 IF IS <> "Y" THEN 230
620 GOTO 360
1000 REM- INSTRUCTIONS
1010 PRINT "WELCOME TO 'HUNT THE WUMPUS'"
1020 PRINT " THE WUMPUS LIVES IN A CAVE OF 20 ROOMS. EACH ROOM"
1030 PRINT "HAS 3 TUNNELS LEADING TO OTHER ROOMS. (LOOK AT A"
1040 PRINT "DODECAHEDRON TO SEE HOW THIS WORKS-IF YOU DON'T KNOW"
1050 PRINT "WHAT A DODECHADRON IS, ASK SOMEONE)"
1060 PRINT
1070 PRINT "
                  HAZARDS:"
1080 PRINT "BOTTOMLESS PITS - TWO ROOMS HAVE BOTTOMLESS PITS IN THEM"
1090 PRINT " IF YOU GO THERE, YOU FALL INTO THE PIT (& LOSE))"
1100 PRINT "SUPERBATS - TWO OTHER ROOMS HAVE SUPER BATS. IF YOU"
1110 PRINT "
                  GO THERE, A BAT GRABS YOU AND TAKES YOU TO SOME";
1115 PRINT "
             OTHER"
1120 PRINT "
                 ROOM AT RANDOM. (WHICH MIGHT BE TROUBLESOME)"
1130 PRINT
1140 PRINT "
                  WUMPUS:"
1150 PRINT "THE WUMPUS IS NOT BOTHERED BY THE HAZARDS (HE HAS SUCKER"
1160 PRINT "FEET AND IS TOO BIG FOR A BAT TO LIFT). USUALLY"
1170 PRINT "HE IS ASLEEP. TWO THINGS THAT WAKE HIM UP: YOUR ENTERING"
1180 PRINT "HIS ROOM OR YOUR SHOOTING AN ARROW."
1190 PRINT " IF THE WUMPUS WAKES, HE MOVES (P=.75) ONE ROOM"
1200 PRINT "OR STAYS STILL (P=.25). AFTER THAT, IF HE IS WHERE YOU"
1210 PRINT "ARE, HE EATS YOU UP (& YOU LOSE!)"
1220 PRINT
1230 PRINT "
                  YOU:"
1240 PRINT "EACH TURN YOU MAY MOVE OR SHOOT A CROOKED ARROW"
1250 PRINT "
                  MOVING: YOU CAN GO ONE ROOM (THRU ONE TUNNEL)"
1260 PRINT "
                  ARROWS: YOU HAVE 5 ARROWS. YOU LOSE WHEN YOU RUN OUT."
1270 PRINT "
                  EACH ARROW CAN GO FROM 1 TO 5 ROOMS. YOU AIM BY ":
1275 PRINT "TELLING"
1280 PRINT "
                  THE COMPUTER TTHE ROOM#S YOU WANT THE ARROW TO GO TO ...
1290 PRINT "
                  IF THE ARROW CAN'T GO THAT WAY (IE NO TUNNEL) IT ";
1295 PRINT "MOVES"
1300 PRINT "
                  AT RANDOM TO THE NEXT ROOM."
1310 PRINT "
                    IF THE ARROW HITS THE WUMPUS, YOU WIN."
1320 PRINT
                    IF THE ARROW HITS YOU, YOU LOSE."
1330 PRINT
1340 PRINT "
                  WARNINGS:"
1350 PRINT "
                   WHEN YOU ARE ONE ROOM AWAY FROM WUMPUS OR HAZARD,"
1360 PRINT "
                  THE COMPUTER SAYS:'
1370 PRINT "WUMPUS-
                       'I SMELL A WUMPUS'"
1380 PRINT "BAT
                       "BATS NEARBY"
                  -
1390 PRINT "PIT
                  - 'I FEEL A DRAFT'"
1400 PRINT
1410 RETURN
2000 REM- PRINT LOCATION & HAZARD WARNINGS
2010 PRINT
2020 FOR J= 2 TO 6
2030 FOR K=1 TO 3
2040 IF S(L(1),K) CL(J) THEN 2110
2050 DN J-1 GOTO 2060,2080,2080,2100,2100
2060 PRINT "I SMELL A WUMPUS!"
2070 GOTO 2110
2080 PRINT "I FEEL A DRAFT!"
2090 GOTO 2110
2100 PRINT "BATS NEARBY!"
2110 NEXT K
2120 NEXT J
2130 PRINT "YOU ARE IN ROOM ";L(1)
2140 PRINT "TUNNELS LEAD TO ";S(L,1);S(L,2);S(L,3)
2150 PRINT
2160 RETURN
2500 REM- CHOOSE OPTION
```

```
2510 PRINT "SHOOT OR MOVE (S-M)":
2520 INPUT IS
2530 IF IS <> "S" THEN 2560
2540 0=1
2550 RETURN
2560 IF IS <> "M" THEN 2510
2570 0=2
2580 RETURN
3000 REM- ARROW ROUTINE
3010 F=0
3020 REM- PATH OF ARROW
3030 L=L(1)
3040 PRINT "NO. OF ROOMS(1-5)";
3050 INPUT J9
3060 IF J9<1 OR J9>5 THEN 3040
3070 FOR K=1 TO J9
3080 PRINT "ROOM #";
3090 INPUT P(K)
3095 IF K <= 2 THEN 3115
3100 IF P(K) <> P(K-2) THEN 3115
3105 PRINT "ARROWS AREN'T THA TCORRKED - TRY ANOTHER ROOM"
3110 GOTO 3080
3115 NEXT K
3120 REM- SHOOT ARROW
3140 FOR K=1 TO J9
3150 FOR K1=1 TO 3
3160 IF S(L,K1)=P(K) THEN 3295
3170 NEXT K1
3180 REM- NO TUNNEL FOR ARROW
3190 L=S(L,FNB(1))
3200 GOTO 3300
3210 NEXT K
3220 PRINT "MISSED"
3225 L=L(1)
3230 REM- MOVE WUMPUS
3240 GOSUB 3370
3250 REM- AMMO CHECK
3255 A=A-1
3260 IF A>0 THEN 3280
3270 F=-1
3280 RETURN
3290 REM- SEE IF ARROW IS AT L(1) OR L(2)
3295 L=P(K)
3300 IF L <> L(2) THEN 3340
3310 PRINT "AHA! YOU GOT THE WUMPUS!"
3320 F=1
3330 RETURN
3340 IF L <> L(1) THEN 3210
3350 PRINT "OUCH! ARROW GOT YOU!"
3360 GOTO 3270
3370 REM- MOVE WUMPUS ROUTINE
3380 K=FNC(0)
3390 IF K=4 THEN 3410
3400 L(2)=S(L(2),K)
3410 IF L(2) <> L THEN 3440
3420 PRINT "TSK TSK TSK - WUMPUS GOT YOU!"
3430 F=-1
3440 RETURN
4000 REM- MOVE ROUTINE
4010 F=0
4020 PRINT "WHERE TO";
4030 INPUT L
4040 IF L<1 OR L>20 THEN 4020
4050 FOR K=1 TO 3
4060 REM- CHECK IF LEGAL MOVE
4070 IF S(L(1),K)=L THEN 4130
4080 NEXT K
4090 IF L=L(1) THEN 4130
4100 PRINT "NOT POSSIBLE -";
4110 GOTO 4020
4120 REM- CHECK FOR HAZARDS
4130 L(1)=L
4140 REM- WUMPUS
4150 IF L <> L(2) THEN 4220
4160 PRINT "... DOPS! BUMPED A WUMPUS!"
4170 REM- MOVE WUMPUS
4180 GOSUB 3380
4190 IF F=0 THEN 4220
4200 RETURN
4210 REM- PIT
4220 IF L \diamondsuit L(3) AND L \diamondsuit L(4) THEN 4270 4230 PRINT "YYYIIIIEEEE . . . FELL IN PIT"
4240 F=-1
4250 RETURN
4260 REM- BATS
4270 IF L <> L(5) AND L <> L(6) THEN 4310
4280 PRINT "ZAP--SUPER BAT SNATCH! ELSEWHEREVILLE FOR YOU!"
4290 L=FNA(1)
4300 GOTO 4130
4310 RETURN
5000 END
Dk
```



Hark!! The weary Wumpus hunter, wan from 50 days in the Terminal Caverns, exhausted and with all of his arrows expended -- (A groaning Teletype roars at a sleepy student. Maps litter the floor covered with circles and integers. With callused fingers, the immortal Wumpus player looks up with bloodshot eyes and implores: "How do I get out of here?")

I suspected that the dodecahedron may prove a bit boring after a few thousand games, so I wrote Wumpus 2 to extend your pleasure. Some of the more mathematical minded may have noticed there are lots of ways to link caves with three tunnels apiece. Some of these patterns are topologically interesting ....

Wumpus 2 is the same old Wumpus in different settings – including those of your own design. As you play in the different caves, you will notice that the game changes in difficulty and strategy. Now to a description of the various caves in Wumpus 2.

#### CAVE 0 (Dodecahedron)

This is the same old Wumpus with which you are familiar.

#### CAVE 1 (Mobius Strip)

Since my original vision was topological, here is the first wonder of topology, the Mobius strip. Take a strip of paper, give it a half-twist and join the ends into a loop. The result has just one side and one edge (if you disbelieve, take a pencil and go around the thing).

A perceptive player will note that the placement of the pits influence the game. Two pits placed just right (around 5% of the games have this) will force a detour back around the strip in certain cases. Getting around is slower than in Cave 0, but it is easier to search the place.

#### CAVE 2 (String of Beads)

See the diagram for this one. Here, placement of the pits will often make parts of the caves inaccessible except by bat-express. (Can you see why?) Play in this cave is frustrating until you have gone to the trouble of making a reference map; otherwise you keep coming back to your starting point. (Look at the diagram and see how this may be so.)

#### CAVE 3 (Hex Network)

This is my attempt at a torus (doughnut). If you can visualise a hexagon net like a honeycomb or a tile floor and stretch it onto a doughnut, you've got it!! The drawing tries to show this, but if you prefer, think of it as a complicated molecule of some sort. Play in this one is very similar to CAVE 0.

#### CAVE 4 (Dendrite)

Up to now, each tunnel leads to another cave and only one tunnel connects a pair of caves. This need not be a strict rule and the next two caves illustrate variations on this. The dendrite is a branching pattern like a tree or a plant. At the ends of the plant are "leaves" which are caves leading to themselves or multiple tunnels. This cave is especially susceptible to severance by pits and getting stuck in corners near the wumpus. A nice thing is that you often will know exactly where the Wumpus is when you come near him.

#### CAVE 5 (one way streets)

This is the extreme example of all tunnels are one-way. You will find that getting about this cave is like travel in Los Angeles – much going to get to the neighbor's house. If you overshoot, you must travel all the way around, just like missing a freeway offramp.

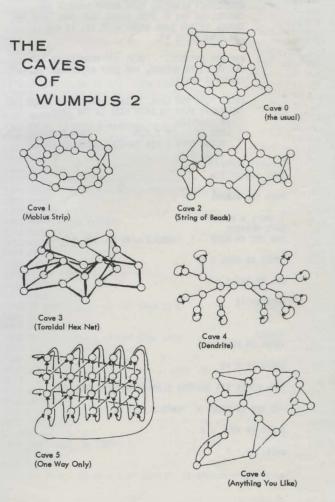
#### CAVE 6 (Do Your OWN)

Draw up a map of caves, each cave with tunnels GOING TO three (exactly three) caves (same or different). Then the computer will ask you for the numbers of the destination tunnels for each of the 20 caves in Wumpus. When you have it entered, play Wumpus on your own caves. Let me know of your favorite ones, and your most frustrating ones!!!

#### FINIS

In any case, Wumpus has spawned several versions and spread about the computer games-dom really nicely. For myself, the soul of the game is in the idea and fun of it rather than the program or the computer which hosts it. I feel that all really good games will turn programmers on enough for them to write it for their system from the idea alone and encourage games writers to think carefully on the art and esthetics of their games before writing a line of code.

Wumpus-2 and this description are products of Gregory Yob. They appeared previously in *Creative Computing*, Jan/Feb 1976 and the game in *People's Computer Co*.



```
WUMPUS 2
                    CREATIVE COMPUTING
                  MORRISTOWN NEW JERSEY
                                                                     BATS NEARBY!
                                                                     YOU ARE IN ROOM 4 TUNNELS LEAD TO 4 6 1
INSTRUCTIONS? YES
                                                                     SHOOT OR MOVE ? M
WELCOME TO WUMPUS II
THIS VERSION HAS THE SAME RULES AS 'HUNT THE WUMPUS'.
                                                                     WHERE TO ? 4
HOWEVER, YOU NOW HAVE A CHOICE OF CAVES TO PLAY IN.
SOME CAVES ARE EASIER THAN OTHERS. ALL CAVES HAVE 20
ROOMS AND 3 TUNNELS LEADING FROM ONE ROOM TO OTHER ROOMS.
                                                                     BATS NEARBY!
THE CAVES ARE:
                                                                     YOU ARE IN ROOM 4 TUNNELS LEAD TO 4 6 1
  0 - DODECAHEDRON
                       THE ROOMS OF THIS CAVE ARE ON A
        12-SIDED OBJECT, EACH FORMING A PENTAGON.
THE ROOMS ARE AT THE CORNERS OF THE PENTAGONS.
                                                                     SHOOT OR NOVE ? M
        EACH ROOM HAVING TUNNELS THAT LEAD TO 3 OTHER ROOMS
                                                                     WHERE TO ? 6
  1 - MOBIUS STRIP THIS CAVE IS TWO ROOMS
        WIDE AND 10 ROOMS AROUND (LIKE A BELT)
                                                                     YOU ARE IN ROOM 6 TUNNELS LEAD TO 4 7 5
        YOU WILL NOTICE THERE IS A HALF TWIST
        SOMEWHERE.
                                                                     SHOOT OR MOVE ? M
  2 -
        STRING OF BEADS
                           FIVE BEADS IN A CIRCLE.
                                                                     WHERE TO ? 5
        EACH BEAD IS A DIAMOND WITH A VERTICAL
        CROSS-BAR. THE RIGHT & LEFT CORNERS LEAD
        TO NEIGHBORING BEADS. (THIS ONE IS DIFFICULT
                                                                     YOU ARE IN ROOM 5 TUNNELS LEAD TO 2 7 3
        TO PLAY)
                                                                     SHOOT OR MOVE ? M
  3 - HEX NEWORK
                      IMAGINE A HEX TILE FLOOR. TAKE
        A RECTANGLE WITH 20 POINTS (INTERSECTIONS)
                                                                     WHERE TO ? 2
        INSIDE (4X4). JOIN RIGHT & LEFT SIDES TO MAKE A CYLINDER. THEN JOIN TOP & BOTTOM TO FORM A
        TORUS (DOUGHNUT).
                                                                     YOU ARE IN ROOM 2 TUNNELS LEAD TO 2 5 3
        HAVE FUN INAGINING THIS ONFIL
                                                                     SHOOT OR HOVE ? M
  CAVES 1-3 ARE REGULAR IN A SENSE THAT EACH ROOM
GOES TO THREE OTHER ROOMS & TUNNELS ALLOW TWO-
WAY TRAFFIC. HERE ARE SOME 'IRREGULAR' CAVES:
                                                                     WHERE TO 7 3
                                                                     YOU ARE IN ROOM 3 TUNNELS LEAD TO 3 6 4
        DENDRITE WITH DEGENERACIES
                                     PULL A PLANT FROM
        THE GROUND. THE ROOTS & BRANCHES FORM A
        DENDRITE - IE., THERE ARE NO LOOPING PATHS
                                                                     SHOOT OR HOVE ? M
        DEGENERACY MEANS A) SOME ROOMS CONNECT TO
        THEMSELVES AND B) SOME ROOMS HAVE MORE THAN ONE
                                                                     WHERE TO ? 6
        TUNNEL TO THE SAME OTHER ROOM IE, 12 HAS
        TWO TUNNELS TO 13.
                                                                     YOU ARE IN ROOM 6 TUNNELS LEAD TO 4 7 5
  5
    -
        ONE WAY LATTICE
                            HERE ALL TUNNELS GO ONE
        WAY ONLY. TO RETURN, YOU MUST GO AROUND THE CAVE
                                                                     SHOOT OR MOVE ? M
        (ABOUT 5 MOVES).
                                                                     WHERE TO ? 7
        ENTER YOUR OWN CAVE
                              THE COMPUTER WILL ASK YOU
  6
        THE ROOMS NEXT TO EACH ROOM IN THE CAVE.
          FOR EXAMPLE:
                                                                     YOU ARE IN ROOM 7 TUNNELS LEAD TO 6 10 8
                                     - YOUR REPLY OF 2,3,4
           R00# #1
                       ? 2,3,4
            MEANS ROOM 1 HAS TUNNELS GOING TO ROOMS:
                                                                     SHOOT OR MOVE ? M
            2, 3, & 4.
  HAPPY HUNTING!
                                                                     WHERE TO 7 10
CAVE #(0-6) ? 4
HUNT THE WUMPUS
                                                                     I FEEL A DRAFT!
                                                                     YOU ARE IN ROOM 10 TUNNELS LEAD TO 9 11 10
I SMELL A WUMPUS!
BATS NEARBY
                                                                     SHOOT OR MOVE ? M
YOU ARE IN ROOM 11 TUNNELS LEAD TO 13 14 12
                                                                     WHERE TO ? 11
SHOOT OR HOVE ? S
NO. OF ROOMS ? 1
                                                                     I SMELL A WUMPUS!
                                                                     BATS NEARBY!
ROOM #? 13
                                                                     YOU ARE IN ROOM 11 TUNNELS LEAD TO 13 14 12
                                                                     SHOOT OR MOVE ? S
MISSED
SHOOT OR NOVE ? M
                                                                     NO. OF ROOMS ? 1
WHERE TO ? 13
                                                                     R008 #? 12
ZAP--SUPER BAT SNATCH! ELSEWHERESVILLE FOR YOU!
                                                                     AHA! YOU GOT THE WUMPUS! HE WAS IN ROOM 12
                                                                     HEE HEE HEE - THE WUMPUS'LL GET YOU NEXT TIME !!
YOU ARE IN ROOM 6 TUNNELS LEAD TO 4 7 5
                                                                     PLAY AGAIN? NO
SHOOT OR HOVE ? M
                                                                     Ok
WHERE TO 7 4
```

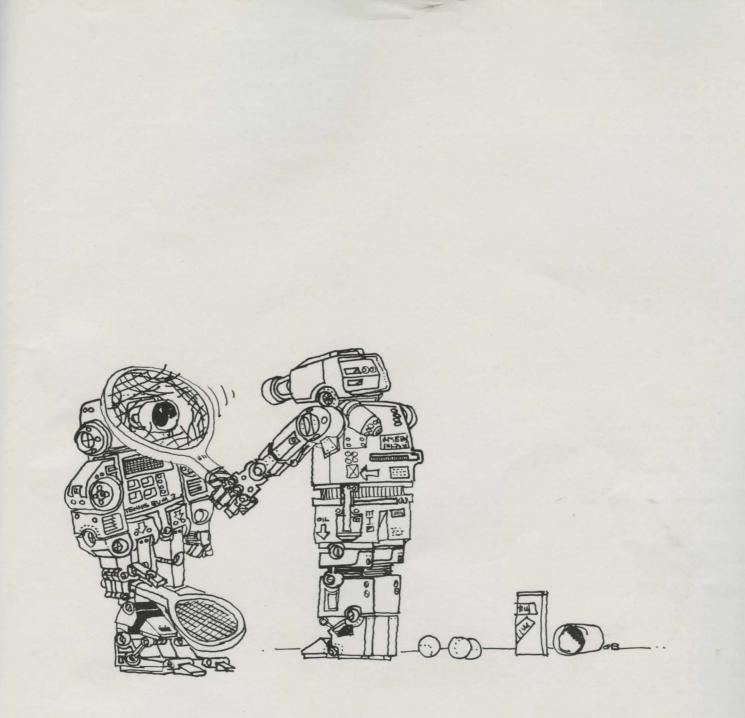
RUN

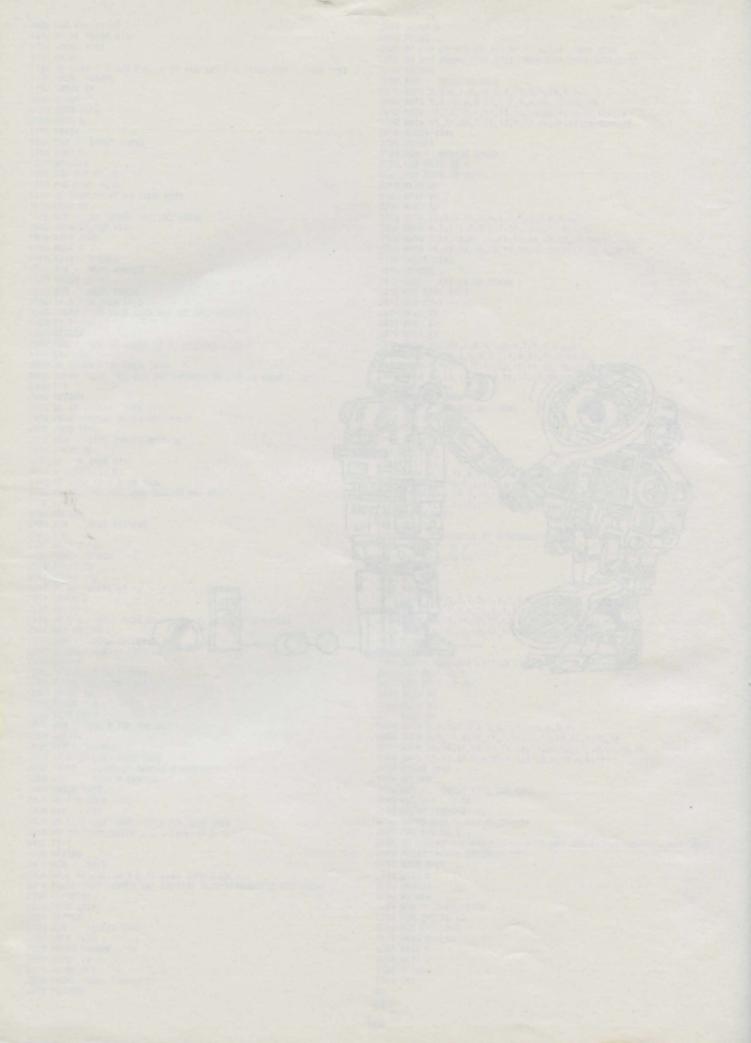
```
LIST
3 PRINT TAB(25);"WUMPUS 2"
4 PRINT TAB(20); "CREATIVE COMPUTING"
5 PRINT TAB(18); "HORRISTOWN NEW JERSEY"
7 PRINT
10 PRINT
15 PRINT
20 REM- WUMPUS VERSION 2
30 DIM S(20,3)
40 DIM L(6), M(6), P(5)
50 PRINT "INSTRUCTIONS";
60 INPUT IS
70 PRINT
80 IF LEFT$(I$,1) <> "Y" THEN 130
100 GOSUB 700
110 REM- CHOOSE AND SET UP CAVE
130 GOSUB 2530
140 DEF FNA(X)=INT(20*RND(1))+1
150 DEF FNB(X)=INT(3*RND(1))+1
160 DEF FNC(X)=INT(4*RND(1))+1
170 REM LOCATE L ARRAY ITEMS
180 REM 1-YOU, 2-WUMPUS, 384-PITS, 586-BATS
210 FOR J=1 TO 6
220 L(J)=FNA(0)
230 H(J)=L(J)
240 NEXT J
250 REM CHECK FOR CROSSOVERS (IE 1(1)=1(2) ETC)
260 FOR 1=1 TO 6
270 FOR K=J TO 6
280 IF J=K THEN 300
290 IF L(J)=L(K) THEN 210
300 NEXT K
310 NEXT J
320 REM SET # ARROWS
330 A=5
340 L=L(1)
350 REM- RUN THE GAME
360 PRINT "HUNT THE WUMPUS"
370 REM-HAZARDS WARNINGS AND LOCATION
380 GOSUB 1230
390 REM MOVE OR SHOOT
400 GOSUB 1400
410 ON 0 GOTO 430,470
420 REM SHOOT
430 GOSUB 1550
440 IF F=0 THEN 400
450 GOTO 490
460 REM MOUE
470 GOSUB 2150
480 IF F=0 THEN 380
490 IF F > 0 THEN 540
500 REM LOSE
510 PRINT "HA HA HA - YOU LOOSE!"
520 GOTO 550
530 REM WIN
540 PRINT "HEE HEE HEE - THE WUMPUS'LL GET YOU NEXT TIME !!"
550 FOR J=1 TO 6
560 L(J)=M(J)
570 NEXT J
580 PRINT "PLAY AGAIN";
590 INPUT IS
595 PRINT
600 PRINT
620 IF LEFT$(I$,1) <> "Y" THEN 3310
640 PRINT "SAME SET-UP ";
650 INPUT IS
660 PRINT
670 IF LEFT$(1$,1) <> "Y" THEN 130
680 GOTO 330
700 REM- INSTRUCTIONS
710 PRINT "WELCOME TO WUMPUS II"
720 PRINT "THIS VERSION HAS THE SAME RULES AS "HUNT THE WUMPUS"."
730 PRINT "HOWEVER, YOU NOW HAVE A CHOICE OF CAVES TO PLAY IN."
740 PRINT "SOME CAVES ARE EASIER THAN OTHERS. ALL CAVES HAVE 20"
750 PRINT "ROOMS AND 3 TUNNELS LEADING FROM ONE ROOM TO OTHER ROOMS."
760 PRINT "THE CAVES ARE:"
770 PRINT " 0
                    DODECAHEDRON
                -
                                    THE ROOMS OF THIS CAVE ARE ON A"
                    12-SIDED OBJECT, EACH FORMING A PENTAGON."
THE ROOMS ARE AT THE CORNERS OF THE PENTAGONS."
780 PRINT "
790 PRINT
800 PRINT "
                    EACH ROOM HAVING TUNNELS THAT LEAD TO 3 OTHER ROOMS"
805 PRINT
810 PRINT "
                    MOBIUS STRIP
                                    THIS CAVE IS TWO ROOMS'
820 PRINT "
                    WIDE AND 10 ROOMS AROUND (LIKE A BELT)"
830 PRINT "
                     YOU WILL NOTICE THERE IS A HALF TWIST"
840 PRINT
                    SOMEWHERE."
```

```
850 PRINT
860 PRINT "
             2 -
                     STRING OF BEADS
                                         FIVE BEADS IN A CIRCLE."
870 PRINT "
                     EACH BEAD IS A DIAMOND WITH A VERTICAL"
880 PRINT
                     CROSS-BAR. THE RIGHT & LEFT CORNERS LEAD"
890 PRINT "
                     TO NEIGHBORING BEADS. (THIS ONE IS DIFFICULT"
900 PRINT "
                     TO PLAY)"
910 PRINT
920 PRINT "
             3
                     HEX NEWORK
                                    IMAGINE A HEX TILE FLOOR, TAKE"
930 PRINT "
                     A RECTANGLE WITH 20 PDINTS (INTERSECTIONS)"
                     INSIDE (4X4). JOIN RIGHT & LEFT SIDES TO MAKE A"
CYLINDER. THEN JOIN TOP & BOTTOM TO FORM A"
940 PRINT
950 PRINT "
960 PRINT "
                     TORUS (DOUGHNUT).
                     HAVE FUN IMAGINING THIS ONE !!"
970 PRINT "
980 PRINT
990 PRINT "
              CAVES 1-3 ARE REGULAR IN A SENSE THAT EACH ROOM"
1000 PRINT "GOES TO THREE OTHER ROOMS & TUNNELS ALLOW TWO-"
1010 PRINT "WAY TRAFFIC. HERE ARE SOME 'IRREGULAR' CAVES:"
1020 PRINT
1030 PRINT
                      DENDRITE WITH DEGENERACIES
                                                     PULL A PLANT FROM"
1040 PRINT "
                      THE GROUND. THE ROOTS & BRANCHES FORM A "
1050 PRINT
                      DENDRITE - IE., THERE ARE NO LOOPING PATHS"
1060 PRINT
                      DEGENERACY MEANS A) SOME ROOMS CONNECT TO"
1070 PRINT
                      THEMSELVES AND B) SOME ROOMS HAVE MORE THAN ONE"
1080 PRINT
                      TUNNEL TO THE SAME OTHER ROOM IE, 12 HAS "
1090 PRINT
                      TWO TUNNELS TO 13."
1100 PRINT
1110 PRINT "
              5
                      ONE WAY LATTICE
                                           HERE ALL TUNNELS GO ONE"
                      WAY ONLY. TO RETURN, YOU MUST GO AROUND THE CAVE"
1120 PRINT "
1130 PRINT
                      (ABOUT 5 MOVES)."
1140 PRINT
1160 PRINT
                     ENTER YOUR DWN CAVE
               6
                                               THE COMPUTER WILL ASK YOU"
1170 PRINT
                      THE ROOMS NEXT TO EACH ROOM IN THE CAVE."
1180 PRINT
                        FOR EXAMPLE:"
                          ROOM #1 ? 2,3,4 - YOUR REPLY OF
MEANS ROOM 1 HAS TUNNELS GOING TO ROOMS:"
1190 PRINT
                         R00M #1
                                                      - YOUR REPLY OF 2,3,4
1200 PRINT
              2, 3, & 4."
HAPPY HUNTING!"
1210 PRINT
1220 PRINT "
1225 RETURN
1230 REM
1240 PRINT
1250 FOR J=2 TO 6
1260 FOR K=1 TO 3
1270 IF S(L(1),K) <> L(J) THEN 1340
1280 DN J-1 GOTO 1290, 1310, 1310, 1330, 1330
1290 PRINT "I SMELL A WUMPUS!"
1300 GDTO 1340
1310 PRINT "I FEEL A DRAFT!"
1320 GOTO 1340
1330 PRINT "BATS NEARBY!"
1340 NEXT K
1350 NEXT J
1360 PRINT "YOU ARE IN ROOM ";L(1);
1370 PRINT " TUNNELS LEAD TO ";S(L,1);S(L,2);S(L,3)
1380 PRINT
1390 RETURN
1400 REM- CHOOSE OPTION
1410 GOTO 1450
1420 PRINT "ERROR
                     .....
1430 INPUT Z9
1440 PRINT "":
1450 PRINT "SHOOT OR HOVE ";
1460 INPUT IS
1470 PRINT
1490 IF LEFT$(I$,1) <> "S" THEN 1520
1500 0=1
1510 RETURN
1520 IF LEFT$(I$,1) <> "M" THEN 1420
1530 0=2
1540 RETURN
1550 REM- ARROW ROUTINE
1560 F=0
1570 REM- PATH OF ARROW
1590 GOTO 1630
1600 PRINT "ERROR
                     ":
1610 INPUT Z9
1620 PRINT
1630 PRINT "NO. OF ROOMS ";
1640 INPUT J9
1650 PRINT
1670 IF J9 < 1 OR J9 > 5 OR INT(J9) <> ABS(J9) THEN 1600
```

```
1680 FOR K=1 TO J9
1690 PRINT "ROOM #";
1700 INPUT P(K)
1710 PRINT
1730 IF P(K) > 0 AND P(K) < 21 AND INT(P(K))=ABS(P(K)) THEN 1780
1740 PRINT "ERROR ";
1750 INPUT Z9
1760 PRINT ""
1770 GOTO 1690
1780 NEXT K
1790 PRINT
1800 REM - SHOOT ARROW
1810 A=A-J9
1820 A9=L(1)
1830 FOR K=1 TO J9
1840 FOR K1=1 TO 3
1850 IF S(A9,K1)=P(K) THEN 1990
1860 NEXT K1
1870 REM - NO TUNNEL FOR THE ARROW
1880 A9=S(A9,FNB(1))
1890 GOTO 2000
1900 NEXT K
1910 PRINT "MISSED"
1920 REM - MOVE WUMPUS
1930 GOSUB 2070
1940 REM - ANNO CHECK
1950 IF A > 0 THEN 1970
1955 PRINT "YOU HAVE USED ALL OF YOUR ARROWS."
1960 F=-1
1970 RETURN
1980 REM - SEE IF ARROW IS AT LE11 OT LE21
1990 A9=P(K)
2000 IF A9 <> L(2) THEN 2040
2010 PRINT "AHA! YOU GOT THE WUMPUS! HE WAS IN ROOM";L(2)
2020 F=1
2030 RETURN
2040 IF A9 <> L(1) THEN 1900
2050 PRINT "DUCH! ARROW GOT YOU!"
2060 GOTO 1960
2070 REM - MOVE WUMPUS ROUTINE
2080 K=FNC(0)
2090 IF K=4 THEN 2140
2100 L(2)=S(L(2),K)
2110 IF L(2) <> L THEN 2140
2120 PRINT "TSK TSK TSK- WUMPUS GOT YOU!"
2130 F=-1
2140 RETURN
2150 REM - MOVE ROUTINE
2160 F=0
2170 GOTO 2210
2180 PRINT "ERROR
2190 INPUT Z9
2200 PRINT "":
2210 PRINT "WHERE TO ";
2220 INPUT L
2230 PRINT
2240 IF L < 1 OR L > 20 OR ABS(L) <> INT(L) THEN 2180
2250 FOR K=1 TO 3
2260 REM - CHECK IF LEGAL MOVE
2270 IF S(L(1),K)=L THEN 2350
2280 NEXT K
2290 IF L=L(1) THEN 2350
2300 PRINT "NOT POSSIBLE - ";
2310 INPUT Z9
2320 PRINT ""
2330 GOTO 2210
2340 REM - CHECK FOR HAZARDS
2350 L(1)=L
2360 REM - WUMPUS
2370 IF L <> L(2) THEN 2430
2380 PRINT "... DOPS! BUMPED A WUMPUS!"
2390 REM - MOVE A WUMPUS
2400 GOSUB 2080
2410 IF F=0 THEN 2430
2420 REM - PIT
2430 IF L <> L(3) AND L <> L(4) THEN 2480
2440 PRINT "YYYIIIEEEE . . . FELL IN A PIT"
2450 F=-1
2460 RETURN
2470 REM - BATS
2480 IF L <> L(5) AND L <> L(6) THEN 2520
2490 PRINT "ZAP--SUPER BAT SNATCH! ELSEWHERESVILLE FOR YOU!"
2500 L=FNA(1)
2510 GOTO 2350
2520 RETURN
2530 REM - SELECT CAVE
2540 GOTO 2580
2550 PRINT "ERROR
2560 INPUT Z9
2570 PRINT "";
2580 PRINT "CAVE #(0-6) ";
2585 RESTORE
```

```
2590 INPUT N
2600 PRINT
2620 IF N<O OR N>6 OR INT(N) <> ABS(N) THEN 2550
2630 DN N+1 GOSUB 2750,2730,2810,2890,2970,3050,3130
2640 RETURN
2650 REM - DODECAHEDRON
2670 DATA 2,5,8,1,3,10,2,4,12,3,5,14,1,4,6
2680 DATA 5,7,15,6,8,17,1,7,9,8,10,18,2,9,11
2690 DATA 10,12,19,3,11,13,12,14,20,4,13,15,6,4,16
2700 DATA 15,17,20,7,16,18,9,17,19,11,18,20,1316,19
2710 GOSUB 3240
2720 RETURN
2730 REM - MOBIUS STRIP
2735 FOR B1=1 TO 1
2737 FOR B2=1 TO 60
2740 READ BO
2742 NEXT B2
2744 NEXT B1
2750 DATA 20,2,3,19,1,4,1,4,5,2,3,6,3,6,7
2760 DATA 4,5,8,5,8,9,6,7,10,7,10,11,8,9,12
2770 DATA 9,12,13,10,11,14,11,14,15,12,13,16,12,16,17
2780 DATA 14,15,18,15,18,19,16,17,20,2,17,20,1,18,19
2790 GOSUB 3240
2800 RETURN
2810 REM - STRING OF BEADS
2815 FOR B1=1 TO 2
2817 FOR B2=1 TO 60
2820 READ BO
2822 NEXT B2
2824 NEXT B1
2830 DATA 2,3,20,1,3,4,1,2,4,2,3,5,4,6,7
2840 DATA 5,7,8,5,6,8,6,7,9,8,10,11,9,11,12
2850 DATA 9,10,12,10,11,13,12,14,15,13,15,16,13,14,16
2860 DATA 14,15,17,16,18,19,17,19,20,17,18,20,1,18,19
2870 GOSUB 3240
2880 RETURN
2890 REM - HEX NUT ON TORUS
2895 FOR B1=1 TO 3
2897 FOR B2=1 TO 60
2900 READ BO
2902 NEXT B2
2904 NEXT B1
2910 DATA 6,10,16,6,7,17,7,8,18,8,9,19,9,10,20
2920 DATA 1,2,15,2,3,11,3,4,12,4,5,13,5,6,14
2930 DATA 7,16,20,8,16,17,9,17,18,10,18,19,6,19,20
2940 DATA 1,11,12,2,12,13,3,13,14,4,14,15,5,11,15
2950 GOSUB 3240
2960 RETURN
2970 REM - DENDRITE W/ DEGENERACIES
2975 FOR B1=1 TO 4
2977 FOR B2=1 TO 60
2980 READ BO
2982 NEXT B2
2984 NEXT B1
2990 DATA 1,1,5,2,2,5,3,3,6,4,4,6,1,2,7
3000 DATA 3,4,7,5,6,10,8,9,9,8,8,10,7,9,11
3010 DATA 10,13,14,12,13,13,11,12,12,11,15,16,14,17,18
3020 DATA 14,19,20,15,17,17,15,18,18,16,19,19,16,20,20
3030 GOSUB 3240
3040 RETURN
3050 REM - ONE WAY LATTICE
3055 FOR B1=1 TO 5
3057 FOR B2=1 TO 60
3060 READ BO
3062 NEXT B2
3064 NEXT B1
3070 DATA 5,4,8,1,5,6,2,6,7,3,7,8,8,9,12
3080 DATA 5,9,10,6,10,11,7,11,12,12,13,16,9,13,14
3090 DATA 10,14,15,11,15,16,16,17,20,13,17,18,14,18,19
3100 DATA 15,19,20,1,4,20,1,2,17,2,3,18,3,4,19
3110 GOSUB 3240
3120 RETURN
3130 REM - INPUT YOUR OWN CAVE
3140 FOR J=1 TO 20
3150 PRINT "ROOM #"; J;
3160 INPUT S(J,1),S(J,2),S(J,3)
3170 FOR K=1 TO 3
3180 IF S(J,K) > 0 AND S(J,K) < 21 AND ABS(S(J,K))=ABS(S(J,K)) THEN3210
3190 PRINT "***** ERROR!!!!!"
3200 GOTO 3150
3210 NEXT K
3220 NEXT J
3230 RETURN
3240 REM - INPUT CAVE
3250 FOR J=1 TO 20
3260 FOR K=1 TO 3
3270 READ S(J.K)
3280 NEXT K
3290 NEXT J
3300 RETURN
3310 END
Ok
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From the editor of the best-selling book Basic Computer Games

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