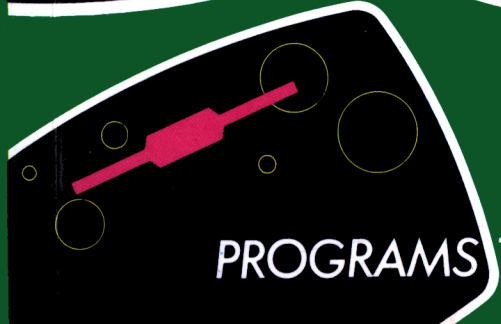
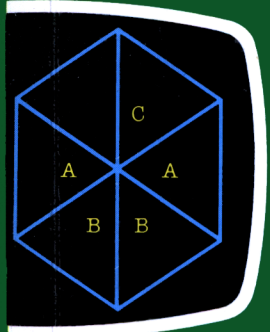
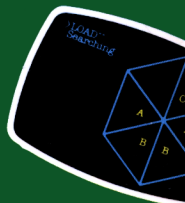
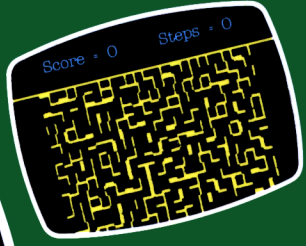
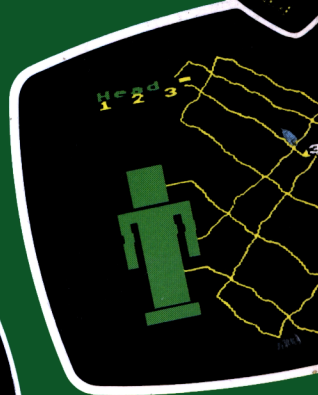
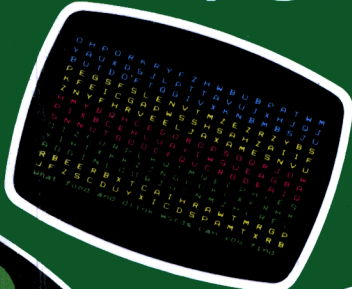


BRAINTEASERS

FOR THE AMSTRAD

G. LUDINSKI



PROGRAMS TO PUZZLE AND AMUSE

**Brain teasers
for the
Amstrad**

Brain teasers for the Amstrad

Geneviève Ludinski
B.Sc.(Hons) A.M.B.C.S.

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INTRODUCTION

Before you dive into this book, here are a few tips you may find useful when keying in the programs.

You may miss out all the REM statements except the first two. These statements are just to help you understand how the program works.

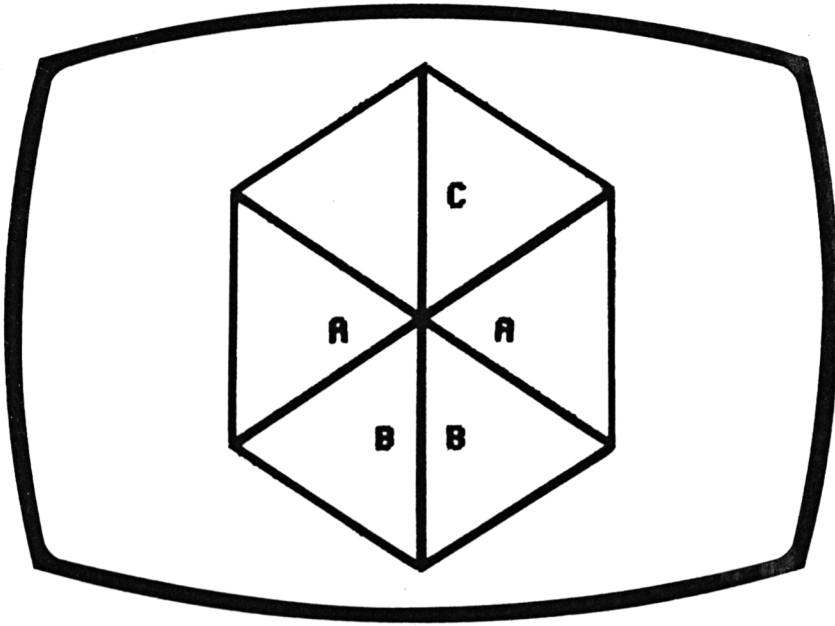
You can also omit the spaces between the line number and the start of the statement. However BASIC is rather pedantic about spaces elsewhere, so I advise you to copy the rest of the statement exactly. Also, to be safe, always put a space before words OR and AND. Any spaces within quotation marks must also be copied exactly.

Remember also to put in all punctuation exactly as it appears. If you miss out a comma, the program may not work. If the program still does not work after you have corrected the errors reported by the computer, check the following. See whether you have confused any zeros for the letter O, or alternatively ones and the letter I. Check, also, that you have not missed any program lines. This is easily done if program lines look similar. Most program line numbers go up by ten at a time, so read your line numbers to find this one.

You may find some of the procedures useful, and you are welcome to put these in any programs you write for your own use. You may not, of course, sell or give them away.

I hope you enjoy the book, and that your brain is not teased too heavily.

HEXAGON PUZZLE



You are really up against the clock on this one as you must solve as many puzzles as possible. A series of numbers, or letters, will be positioned around five of the sides of a hexagon and you will be asked to provide the missing letter or number. The relationship between the numbers or letters may be with their corresponding number or letter on the opposite side of the hexagon, or it may follow in sequence from an adjacent number.

The decision is yours.

The program will give you eleven puzzles, so see how many you can solve.

How to play

Key in the number, or letter, of your choice and press ENTER key.

Programming hints

One change to make the puzzle easier, is to reduce the size of the numbers used. S(2) on line 150 is the value of the first number in the sequence if the pattern is a sequence of numbers going around the hexagon. IC on line 160 is related to the interval between the numbers going round the hexagon. So if the 9 in line 150 is changed to a smaller number and IC is always 1 this will make the puzzle easier.

If you wish to make the puzzle more difficult (and you must be brave or a genius to want to do so), then you could either increase the possible values of S(2) or IC or increase the number of different types of sequence. At present there are five different types of sequences depending on whether W is 0 to 4. If you allow W to become 5 or larger in line 170, you could add a new sequence type for W=5 after line 230.

The Program

```

10 REM
20 REM (C) 1984 G. LUDINSKI
30 DIM S(8)
50 CLS
70 TE=0:CR=0
80 MODE 2
90 TE=TE+1
100 IF TE=11 THEN GOTO 670
110 REM
120 REM WORK OUT SEQUENCE
130 REM
140 S(1)=0
150 S(2)=INT(RND(1)*9+1)
160 IC=INT(RND(1)*4+1)
170 W=INT(RND(1)*5)
175 IF W=2 AND S(2)>2 THEN GOTO 170
180 FOR I=3 TO 8
190 IF W=0 THEN S(I)=2*S(I-1)-S(I-2)+IC:
M$="The interval increases by "+STR$(IC)
+" each time"

```

```

200 IF W=1 THEN S(I)=S(I-1)+S(I-2)+IC:M$
="Each number is the sum of the previous
  two plus "+STR$(IC)
210 IF W=2 THEN S(I)=S(2)^(I-1):M$="Each
  number is "+STR$(S(2))+ " to the power o
  f 2,3,4,5,6 and 7"
220 IF W=3 AND I>5 THEN S(3)=S(2):S(4)=I
C:S(5)=INT((S(2)+IC)/2):S(I)=S(2)*S(I-3)
:M$="Each number is "+STR$(S(2))+ " times
  the number
  opposite it."
230 IF W=4 AND I>5 THEN S(3)=S(2):S(4)=I
C:S(5)=INT((S(2)+IC)/2):S(I)=IC*S(11-I):
M$="The numbers on the left hand side of
  the wheel a
  re "+STR$(IC)+" times the numbers on the
  right hand side"
240 NEXT I
250 FOR I=1 TO 13:PRINT:NEXT I
260 REM
270 REM DISPLAY NUMBER WHEEL
280 REM
290 PLOT 200,200:DRAWR 96,-36:DRAWR 0,-9
6:DRAWR -96,-36:DRAWR -96,36:DRAWR 0,96:
DRAWR 96,36:DRAWR 0,-168:DRAWR -96,36
300 DRAWR 192,94:DRAWR 0,-96:DRAWR -192,
95
400 REM PRINT NUMBERS OR LETTERS
410 IF S(8)>26 OR S(7)>26 OR S(6)>26 THE
N LE=0:LOCATE 29,15:PRINT S(3):LOCATE 33
,18:PRINT S(4):LOCATE 29,21:PRINT S(5):L
OCATE 21,21:
PRINT S(6):LOCATE 15,18:PRINT S(7)
420 IF S(8)<=26 THEN LE=1:LOCATE 29,15:F
RINT CHR$(64+INT(S(3))):LOCATE 33,18:PRI
NT CHR$(64+INT(S(4))):LOCATE 29,21:PRINT
  CHR$(64+INT
  (S(5))):LOCATE 21,21:PRINT CHR$(64+INT(S
  (6))):LOCATE 15,18:PRINT CHR$(64+INT(S(7
  )))
430 REM
440 REM input answers
450 REM
455 INPUT I$:GOTO 500
459 END
460 IX=1

```

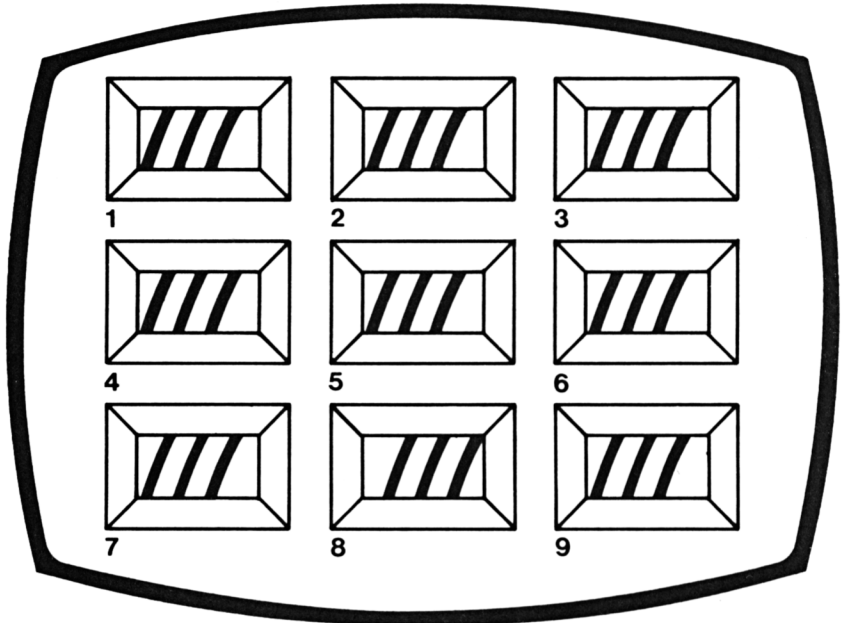
```

480 LOCATE 4,IX+12:PRINT P$(IX):IX=IX+1
482 P$(IX)=INKEY$
483 IF INKEY$<>" " THEN GOTO 483
484 IF INKEY$="" THEN GOTO 484
485 INPUT P$(IX):LOCATE 4,IX+12:PRINT P$
  (IX)
486 P$(IX)=INKEY$:IF P$(IX)="" THEN GOTO
  486
488 IF P$(IX)<>CHR$(13) THEN GOTO 480
489 P$(IX)=INKEY$
490 I$="O":FOR I=1 TO IX-1:I$=I$+P$(I):N
EXT I
500 REM
510 REM CHECK ANSWER
520 REM
530 REM
535 IF LE=1 THEN GOTO 550
540 IF LE=0 AND VAL(I$)=S(8) THEN LOCATE
  19,5:PRINT"?":CR=CR+1:GOTO 610
550 IF LE=1 AND (I$=CHR$(64+S(8))) THEN
LOCATE 5,19:PRINT"?":CR=CR+1:GOTO 610
560 LOCATE 14,1:PRINT"NO. The answer = "
  ;
570 IF LE=0 THEN PRINT S(8)
580 IF LE=1 THEN PRINT CHR$(64+S(8))
590 IF LE=1 THEN PRINT:PRINT"Replace eac
h letter by its position number e.g. 1 f
or A, 2 for B etc."
600 PRINT M$
610 LOCATE 21,10:PRINT"Press <RETURN> to
  continue"
620 INPUT A$
630 GOTO 80
640 REM
650 REM SCORE SHEET
660 REM
670 CLS:PRINT
680 PRINT"Number of puzzles completed ";
  TE
690 PRINT:PRINT"Number correct =";CR
710 IQ=INT(CR*100/5.3)
720 PRINT:PRINT"Your IQ level (numeracy)
  =";IQ
730 PRINT
740 IF CR>=7 THEN PRINT"This is classed
  as SUPERIOR (upper 10%):GOTO 770

```

```
750 IF CR>=6 THEN PRINT"This is classed  
as GOOD      (upper 20%)":GOTO 770  
760 IF CR=5 THEN PRINT"This is classed a  
s FAIR      (upper 60%)":GOTO 770  
770 END
```

ODD ONE OUT



Nine pictures are displayed on the screen and you are given only a few seconds to compare them and identify the odd one out.

A score sheet will be displayed, showing the number of puzzles completed, number correct and the time and average time taken.

How to play

Each of the pictures on the screen will be identified by a number, and you must key in the appropriate number as your guess.

If you get the answer wrong, you will be told the correct answer, to the accompaniment of a low pitched little tune. Get it right, however, and you will hear a pleasant little tune.

After each attempt you will be asked if you wish more (Y for Yes) or wish to stop (N for No).

Remember to press ENTER.

Programming hints

If you decide to make the arcs of the rainbow thicker then increase the 2 in line 720.

The Program

```

10 REM ODD ONE OUT
20 REM (C) 1984 G. LUDINSKI
30 BORDER 7
40 MODE 1
80 DIM A(3),S(3),Z(3),D(9)
90 NU=0:CR=0
100 T1=TIME
110 REM
120 CLS
130 NU=NU+1
140 PT=0
150 REM
160 REM DRAW WINDOWS
170 REM
180 W=132:H=60:FOR Y=280 TO 112 STEP -82
:FOR X=20 TO 512 STEP 170
190 PLOT X,Y:DRAWR W,0:DRAWR 0,H:DRAWR -
W,0:DRAWR 0,-H
200 DRAWR 10,10:DRAWR W-20,0:DRAWR 10,-1
0:DRAWR -10,10:DRAWR 0,H-20:DRAWR 10,10:
DRAWR -10,-10:DRAWR -W+20,0:DRAWR -10,10
:DRAWR 10,-1
0:DRAWR 0,-H+20
210 NEXT X
220 NEXT Y
230 REM
240 REM GENERATE RAINBOWS
250 REM
260 WH=INT(RND(1)*9+1)

```

```

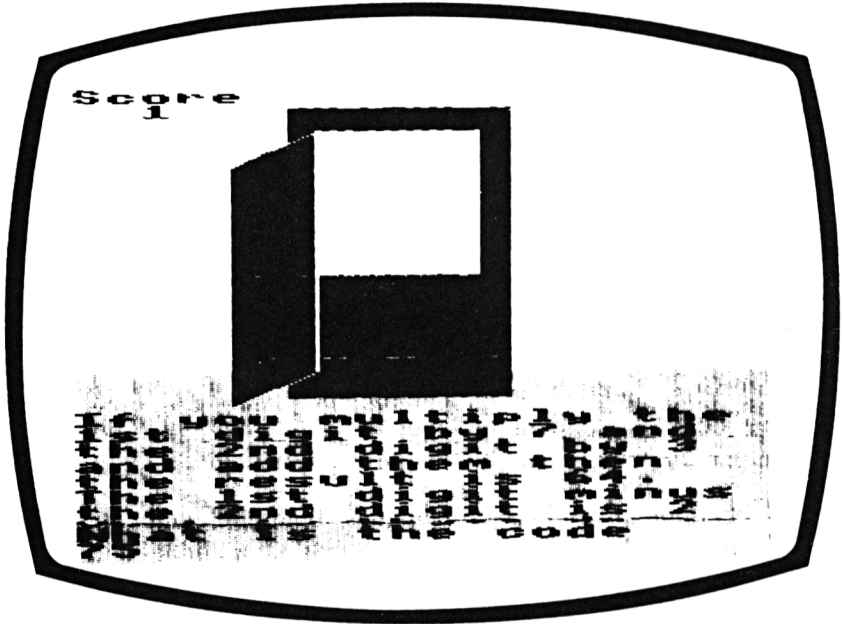
270 HI=H-10
280 A(3)=SIN(HI/(W-10)):A(2)=SIN(HI/(W-25)):A(3)=SIN(HI/(W-40))
290 FOR I=1 TO 3:S(I)=1-COS(A(I)):Z(I)=HI:
NEXT I
300 REM
310 REM DRAW RAINBOWS
320 REM
330 X=30:Y=290
340 FOR I=1 TO 9
350 D(I)=10
360 NEXT I
370 D(WH)=40
380 GOSUB 640
390 REM
400 REM QUESTION
410 REM
420 LOCATE 17,1:PRINT"    Which window is
different"
430 I$="":I=0
440 I$=INKEY$:IF I$="" AND I<400 THEN I=
I+1:GOTO 440
450 IF I$<>"" AND (I$<"1" OR I$>"9") THE
N GOTO 440
460 IF I$="" THEN GOTO 480
470 IF VAL(I$)=WH THEN LOCATE 5,23:PRINT
"Yes, You are right":SOUND 1,100:CR=CR+1
:GOTO 490
480 LOCATE 5,23:PRINT"NO, ";WH;" is diff
erent":SOUND 1,200
490 PRINT:PRINT"Do you want more (Y/N)";
500 INPUT R$
510 IF R$<>"n" AND R$<>"N" THEN GOTO 120
520 REM
530 REM SCORE SHEET
540 REM
550 CLS
560 PRINT"                ODD ONE OUT"
570 LOCATE 1,10:PRINT"TESTS COMPLETED ="
;NU
590 TM=INT((TIME-T1)/100)
600 PRINT"TESTS CORRECT = ";CR
610 PRINT" TIME TAKEN    = ";TM
620 IF CR<>0 THEN PRINT:PRINT"Time per t
est = ";INT(TM/CR)
630 END

```



```
640 REM RAINBOW SUBROUTINE
650 WI=W-10
660 PT=PT+1
670 PAPER 1:PEN 0:FOR K=9 TO 19 STEP 5:F
OR Q=6 TO 26 STEP 10:LOCATE Q,K:PRINT PT
:PT=PT+1:NEXT Q:NEXT K:PAPER 0:PEN 1
680 XX=X+1
690 CV=0
700 FOR G=XX+30 TO XX STEP -15
710 CV=CV+1
720 FOR J=0 TO 2
730 RA=WI+X-(G+J)
740 PLOT G+J+D(1),Y:DRAWR RA*S(CV),Z(CV)
750 PLOT G+J+170+D(2),Y:DRAWR RA*S(CV),Z
(CV)
760 PLOT G+J+340+D(3),Y:DRAWR RA*S(CV),Z
(CV)
770 PLOT G+J+D(4),Y-84:DRAWR RA*S(CV),Z(
CV)
780 PLOT G+J+170+D(5),Y-84:DRAWR RA*S(CV
),Z(CV)
790 PLOT G+J+340+D(6),Y-84:DRAWR RA*S(CV
),Z(CV)
800 PLOT G+J+D(7),Y-168:DRAWR RA*S(CV),Z
(CV)
810 PLOT G+J+170+D(8),Y-168:DRAWR RA*S(C
V),Z(CV)
820 PLOT G+J+340+D(9),Y-168:DRAWR RA*S(C
V),Z(CV)
830 NEXT J
840 NEXT G
850 RETURN
```

SAFECRACKER



Are you a quick-thinker or a deep thinker? I hope you are one or the other, or you will never be able to crack open someone else's safe!

This game can be played two different ways, depending on whether you are a quick or deep thinker. If you are not sure which you are, then I suggest you play it both ways, and find out which way gives you the highest score.

In all cases, a closed safe is displayed and you are given two clues about the secret code that opens it. If you work out the exact answer before keying in the code, you are given 2 minutes to do it. If you make guesses, then you are only allowed 16 seconds. Wrong answers are ignored.

If you take too long you are surprised by the caretaker who switches on the light. He then presses the alarm button and you hear the police sirens wailing and you know all is lost.

If you do manage to crack the code in time, the safe opens, revealing gold bullion.

How to play

You are given two clues such as those shown above. The code is always a two digit number. Key in the number (you need not press ENTER).

To end the program, press BREAK.

Programming hints

To reduce the number of digits allowed, reduce the number inside the RND brackets for XX and YY in line 340.

If you find the game too easy then do the opposite.

The Program

```

10 REM SAFE CRACKER
20 REM (C) 1984 G. LUDINSKI
30 SC=0
40 REM
50 MODE 1
60 LOCATE 1,2:PRINT"SCORE :";SC
70 REM
80 REM DRAW SAFE CLOSED
90 REM
100 PLOT 158,318:DRAWR 218,0:DRAWR 0,-19
2:DRAWR -218,0:DRAWR 0,192:PLOT 176,302:
DRAWR 186,0:DRAWR 0,-160:DRAWR -186,0:DR
AWR 0,160
110 GOSUB 330

```

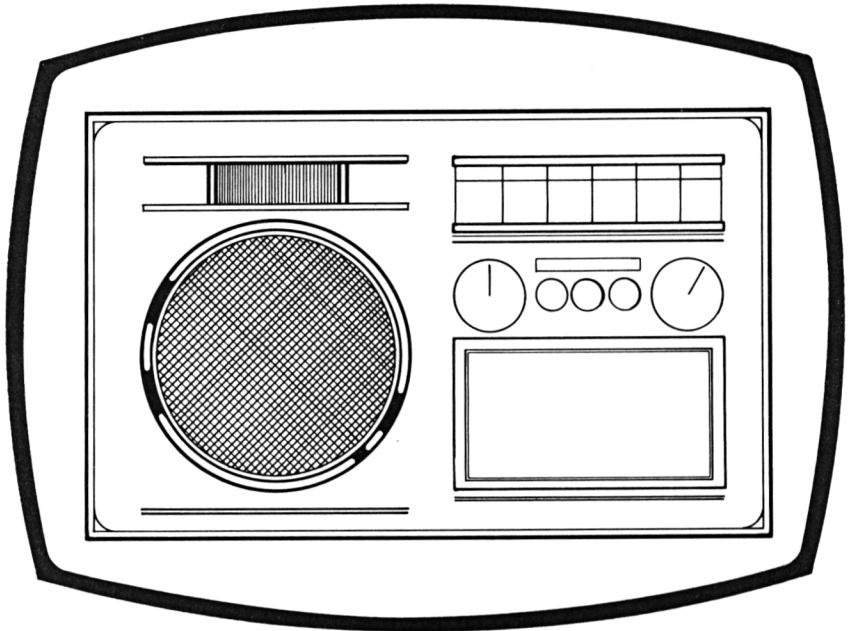
```

120 LOCATE 15,2:PRINT"If you multiply th
e first digit by ";"INT(A1);" and the sec
ond digit by ";"ABS(INT(B1));" and ";"S$;"
the result
is ";"INT(C1);"."
130 LOCATE 2,20:PRINT"The 1st digit ";"V$
;" ";
140 PRINT"the 2nd digit is ";"INT(C2):INP
UT"WHAT IS THE CODE ?";I$
150 FOR I=1 TO 200:NEXT I
160 IF LEFT$(I$,1)=MID$(A$,2,1) AND I$<>
"E" THEN GOTO 190
170 IF I$="E" THEN GOTO 530
180 PRINT I$
190 IF MID$(I$,2,1)=MID$(A$,4) THEN GOTO
210
200 FOR I=1 TO 200:NEXT I:GOTO 300
210 PRINT LEFT$(I$,2)
220 Z$=LEFT$(I$,2):A$=MID$(A$,2,1)+RIGHT
$(A$,1)
230 IF Z$=A$ THEN SC=SC+1:GOSUB 490:GOTO
40
240 PRINT " No the code is ";"ABS(VAL(A$)
)
250 FOR I=1 TO 200:NEXT I
260 GOTO 40
270 REM
280 REM SWITCH ON LIGHT AND SOUND SIREN
290 REM
300 PRINT"No, the code is ";"A$:FOR I=1 T
O 6:SOUND 1,100:SOUND 1,130:NEXT I
310 IF INKEY$="" THEN GOTO 310 ELSE GOTO
40
320 REM
330 REM QUESTION
340 A1=INT(RND(1)*8)+2:B1=INT(RND(1)*8)+
2:XX=INT(RND(1)*10):YY=INT(RND(1)*10)
350 W1=-1:IF RND>0.5 THEN GOTO 370
360 W1=1
370 W2=-1:IF RND>0.5 THEN GOTO 390
380 W2=1
390 B1=B1*W1
400 C1=(A1*XX)+(B1*YY)
410 C2=XX+(W2*YY)
420 S$="Add them then":IF W1=-1 THEN S$=
"Subtract them"

```

```
430 V$="plus":IF W2=-1 THEN V$="minus"
440 A$=STR$(ABS(XX))+STR$(ABS(YY))
450 RETURN
460 REM
470 REM DRAW SAFE OPEN
480 REM
490 PLOT 158,318:DRAWR 218,0:DRAWR 0,-19
2:DRAWR -218,0:DRAWR 0,14:PLOT 158,318:D
RAWR 0,-18:PLOT 176,302:DRAWR 186,0:DRAW
R 0,-160:DRA
WR -186,0:DRAWR 0,160
500 LOCATE 9,21:PRINT " ":PLOT 176,302:DR
AWR -160,-32:DRAWR 0,-160:DRAWR 160,32
510 FOR I=1 TO 800:NEXT I
520 RETURN
530 END
```

SAINTS TO SINNERS



Here is a musical test for the members of your family who have a keen ear for a tune.

The object of the game is to guess the tune being played and to make it easy, to begin with, we have allowed your computer to play the entire tune. After the first ten 'numbers' you will only hear a short snatch from the tune.

We have included a very large selection of tunes suitable for 'saints and sinners'.

How to play

When you think that you have guessed, correctly, the title of the tune being played, type in the full title press ENTER and find out if your ear is musical, or tin.

Programming hints

Lines 210-300 contains the procedure that plays the tune. The notes of the tune are held as data from line 310 onwards.

The obvious alteration that can be made, are that when you know the names of the tunes you will want to change them. If you wish to increase the number of tunes that can be played then you must increase the maximum value of W held in line 90. You could then include your tune after line 505 ensuring that the tune is skipped over if the value of W is not the correct one. You could then work out the tune you require on an instrument, or else you could copy a musical score. If you are copying a musical score then you should refer to the User Guide, but if you are doing it for fun then I recommend a child's musical instrument which usually just has the octave that starts with middle C should be used.

The Program

```

10 REM SAINTS TO SINNERS
20 REM (C) 1984 G. LUDINSKI
30 RESTORE 570
40 DIM NOTE(30)
50 FOR L=1 TO 30:READ NOTE(L):NEXT L
60 BORDER 3:MODE 2
70 LOCATE 2,6:PRINT"SAINTS TO SINNERS"
80 GOSUB 510
90 W=INT(RND(1)*5)+1
100 GOSUB 210
110 A$="":FOR I=1 TO LEN(M$) STEP 2:A$=A
    $+CHR$(VAL(MID$(M$,I,2))):NEXT I
120 REM INPUT AND CHECK ANSWER
130 LOCATE 5,1:PRINT"What is the tune ca
    lled ?"
140 INPUT I$
150 IF I$<>M$ THEN GOTO 165
160 LOCATE 5,1:PRINT"Yes, you are right
    ":GOTO 170
165 PRINT:PRINT"No, it is called ";M$
170 INPUT"Do you want more (Y/N) ?";E$

```

```

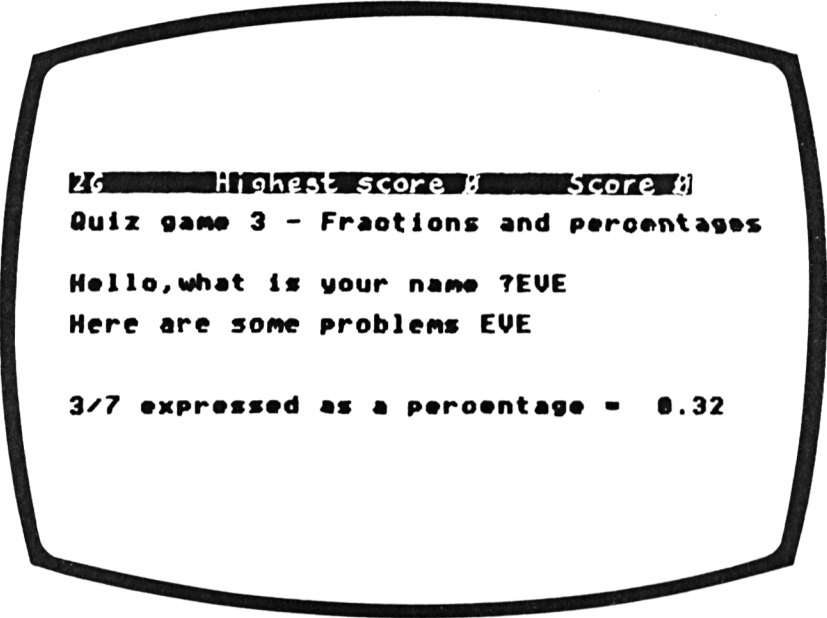
180 IF E$<>"Y" AND E$<>"N" AND E$<>"y" A
ND E$<>"n" THEN GOTO 170
190 IF E$="Y" OR E$="y" THEN GOTO 60
200 GOTO 560
210 RESTORE
220 IF W=1 THEN GOTO 260
230 READ M$
240 READ DUR,PIT:IF PIT<>-1 THEN GOTO 24
0
250 W=W-1:GOTO 220
260 READ M$
270 READ DUR,PIT
280 IF DUR=-1 THEN RETURN
290 SOUND 1,NOTE(PIT+10)*2,DUR*50
300 GOTO 270
310 DATA "FRERE GUSTAV"
320 DATA 1,0,1,2,.5,3,.5,2,1,0
330 DATA 1,0,1,2,.5,3,.5,2,1,0
340 DATA 1,3,1,5,2,7,1,3,1,5,2,7,.75,7,.
25,8,.5,7,.5,5,.5,3,.5,2,1,0
350 DATA .75,7,.25,8,.5,7,.5,5,.5,3,.5,2
,1,0
360 DATA 1,0,1,-5,2,0,1,0,1,-5,2,0,-1,-1
370 DATA "THE FIRST NOEL"
380 DATA .5,4,.5,2,.7,0,.2,4,.5,5,.5,7,.
7,9,.3,11,.5,12,.5,11,.5,9
390 DATA .5,7,.5,9,.5,11,.5,12,.5,7,.5,5
,.5,4,.2,4,.4,2,.5,0
400 DATA .5,2,.5,4,.5,5,.5,7,.5,9,.5,11,
.5,12,.5,9,.5,7,.5,9,.5,11,.5,12,.5,11,.
5,9,.5,7,.5,9,.5,11,.5,12,.5,5,.5,4
410 DATA -1,-1
420 DATA "ONCE IN ROYAL"
430 DATA .5,5,0.5,9,0.5,10,0.2,10,0.5,10
,0.5,10,0.5,9,0.5,10,0.5,11,0.5,11,0.5,1
0,0.5,10,0.7,14,0.7,16,0.3,14,0.3,12,0.5
,11,0.5,10,0
.5,9,0.5,7
440 DATA -1,-1
450 DATA "GOOD KING WENCESLAS"
460 DATA .5,5,.5,5,.5,5,.5,7,.5,5,.7,5,.
5,0,.5,2,.5,0,.5,2,.6,4,.7,5,.5,5,.5,5,.
5,5,.5,5,.5,5,.7,7,.4,5,.4,5,.4,0,.4,2,.
6,0,.7,2,.5,
4,.5,5,.5,5
470 DATA -1,-1

```



```
480 DATA "MORNING HAS BROKEN"
490 DATA .5,0,.5,4,.4,7,.5,12,.5,14,.5,1
1,.5,9,.5,7,.5,9,.5,7,.5,0,.5,2,.5,4,.5,
7,.5,9
500 DATA .5,7,.5,4,.5,0,.5,2,.5,0,.5,4,.
5,7,.5,12,.5,14,.5,11,.5,9,.5,7,.5,9,.5,
7,.5,0,.5,2,.5,4,.5,7,.5,9,.5,4,.5,0,.5,
2,.5,0
505 DATA -1,-1
510 REM DRAW RADIO
520 PLOT 127,127:DRAWR 192,0:DRAWR 0,-11
2:DRAWR -192,0:DRAWR 0,112:DRAWR 0,-16:D
RAWR 192,0:DRAWR 0,-16:DRAWR -192,0
530 PLOT 206,78:DRAWR 80,0:DRAWR 0,-48:D
RAWR -80,0:DRAWR 0,48
540 RETURN
550 REM
560 END
570 DATA 149,145,141,137,133,129,125,121
,117,113,109,105,101
580 DATA 97,93,89,85,81,77,73,69,65,61,5
7,53
590 DATA 49,45,41,37,33,29,25
```

FRACTIONS AND PERCENTAGES



```

% Highest score # Score #
Quiz game 3 - Fractions and percentages

Hello, what is your name ?EVE
Here are some problems EVE

3/7 expressed as a percentage = 0.32

```

If you have trouble converting percentages to fractions and vice versa then this is for you.

How to play

The playing instructions are the same as those in the Profit and Loss program which is to be found elsewhere in this book.

Programming hints

The conversion from fraction to percentage routine expects the percentage value to be entered to two places of decimals i.e. it expects the player to key in 66.66 not 66.7. The trick to write a number to a certain number of decimal places is to multiply it by 10

to the power of the number of decimal places you require, then find the integral part, then divide by the same number. In the program the fraction F/G is multiplied by a further 100 before conversion as the number is a percentage.

Even though the answer is given to a certain number of decimal places any answer, provided it is within 1 of the correct answer is accepted. This is so that the answer is marked correct however inaccurate the method used to obtain it.

Different types of problems can be added as described in Profit and Loss.

The Program

```

10 REM QUIZ
20 REM (C) 1984 G. LUDINSKI
30 DEF FNR$(L$,N)=LEFT$(L$,N)
35 DEF FNT$(L$,M)=MID$(L$,M)
40 MODE 2
50 S$=""
   "
60 H$=""      Highest Score ":K$=""      SCO
RE"
70 PRINT H$:PRINT:PRINT"Quiz game 3 - Fr
actions and Percentages"
80 PRINT:PRINT
90 INPUT"Hello, what is your name ";n$:P
RINT:PRINT"Here are some problems ";:IF
n$<>"NO SOUND" THEN PRINT n$
100 W=1:C=0:T=1:I$="" ":P=0:MX=0
102 P=P+1
104 GOSUB 248
106 CLS:LOCATE 1,6
110 PRINT:PRINT Q$;"="";GOSUB 560:PRINT:
IF W=-1 THEN INPUT I$:PRINT " / ";:IN
PUT V$:GOTO 130
115 IF W=1 THEN INPUT I$:GOTO 140
130 IF LEN(STR$(J))=2 THEN U=1:S=3
131 IF LEN(STR$(J))=3 THEN U=2:S=4
135 IF W=-1 AND VAL(I$)=J AND VAL(V$)=HU
THEN GOTO 160

```

```

140 IF W=1 AND VAL(I$)=VAL(A$) THEN GOTO
 160
150 GOTO 180
160 PRINT:PRINT"Yes, congratulations ":C
=C+1:PRINT:PRINT:IF N$="NO SOUND" THEN G
OTO 210
170 SOUND 1,60:SOUND 1,80:SOUND 1,100:SO
UND 1,50:SOUND 1,75:SOUND 1,100
171 IF INKEY$="" THEN GOTO 171 ELSE GOTO
 220
180 IF T=1 THEN PRINT"No, ";H$;" try ag
ain":T=2:GOTO 110
190 PRINT"Sorry, the answer is = ";L$;M$
195 IF INKEY$<>"" THEN GOTO 195
196 IF INKEY$="" THEN GOTO 196
200 PRINT C$
220 IF P=10 THEN GOTO 610
221 PRINT:PRINT"Do you want more ? (Y/N)
 ";
222 I$=INKEY$
230 IF I$="" THEN GOTO 222
235 IF I$<>"N" AND I$<>"n" AND I$<>"Y" A
ND I$<>"y" THEN GOTO 222
240 IF I$="Y" OR I$="y" OR I$="" THEN T=
1:CLS:GOTO 102
244 END
248 REM QUESTION
250 L$="":M$="":C$=""
260 W=-W:F=INT(RND(1)*9)+1
270 G=INT(RND(1)*9)+1:J1=INT(RND(1)*19)+
 1
280 IF F=G OR F/G=INT(F/G) OR G/F=INT(G/
F) THEN GOTO 260
290 IF F<G THEN E=INT(F/G*100):J=J1*5
300 IF G<F THEN E=INT(G/F*100):H=G:G=F:F
=H:J=J1*2
310 E$=FNT$(STR$(E),2):F$=FNT$(STR$(F),2
):G$=FNT$(STR$(G),2):J$=FNT$(STR$(J),2)
320 IF W=1 THEN GOTO 410
330 Q$=J$+"% converted into a fraction"
340 H$="P% IS P/100. If top and bottom o
f the fraction are exactly divisible by
the numbers, then divide by these nu
mbers."
350 HU=100:FOR I=1 TO 8

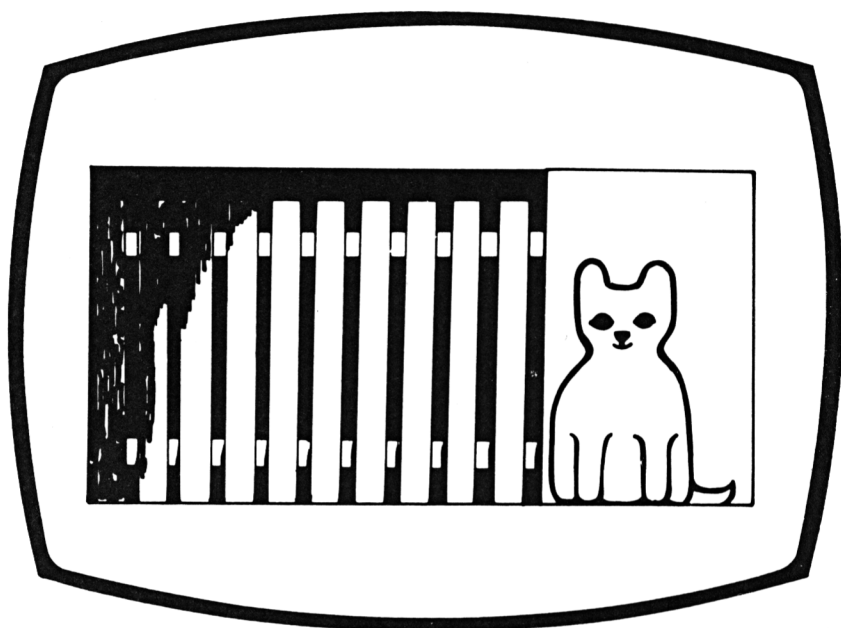
```

```

360 IF J/5=INT(J/5) AND HU/5=INT(HU/5) T
HEN J=J/5:HU=HU/5
370 IF J/2=INT(J/2) AND HU/2=INT(HU/2) T
HEN J=J/2:HU=HU/2
380 NEXT I:A$=STR$(J)+"/"+STR$(HU)
390 L$=A$
400 M$="as "+j$+"/100 = "+A$
410 IF W=-1 THEN GOTO 460
420 Q$=F$+"/"+G$+" expressed as a percen
tage"
430 H$="F/Q is (F/Q)*100%"
440 A$=STR$(INT(F*10000/G)/100):L$=A$+"%
"
450 M$="as ("+F$+"/"+G$+")x100="+A$
460 RETURN
560 REM
570 I=1:VP=0:HP=10
572 P$(I)=INKEY$:IF P$(I)="" THEN LOCATE
  2,10:PRINT " ";H$:MX;K$:C
590 I$="":FOR X=1 TO I-1:I$=I$+P$(I):NEX
T X
600 RETURN
610 REM SCORE
620 CLS
630 PRINT:PRINT"Number of problems compl
eted =";P
640 PRINT:PRINT"Number correct =";C
670 IF C>MX THEN MX=C
680 P=0:C=0
690 GOTO 220
700 REM

```

DON'T PAINT THE CAT



Seems a strange title for a program. I mean, who would want to emulsion paint the family mogg anyway?

Well you see, the family have decided that you have to paint the garden fence. You lost the draw — it might have been your sister instead who had to do it, but never mind there is always next time. Across the fence from you and your fantastic paint brush, is your neighbour's transistor. As a mental challenge you have decided to paint the fence according to the high/low pitch of your neighbour's music.

Look out for your cat, it's parked at the end of the fence.

How to play

As the game begins you will hear just two notes to compare but, everytime you get the answer correct the next tune will have an extra note.

You will be told which two notes to compare, and you must key in H or L for High or Low.

If you take too long to answer, the cat will wind up getting covered in paint.

Press the ENTER key when you want a new tune.

The Program

```
1 REM
9 REM DON'T PAINT THE CAT
10 REM
11 REM (C) 1984 G. LUDINSKI
12 REM
13 REM DEFINE GRAPHIC
14 RESTORE:GOSUB 800
30 REM
32 SYMBOL AFTER 240
33 GOSUB 790
35 REM CLEAR SCREEN
36 REM
40 CLEAR:DIM N(11)
50 BORDER 1:MODE 2
140 REM
150 REM START GAME
160 REM
170 FOR J=2 TO 9
180 REM
190 REM DRAW FENCE
195 REM
200 GOSUB 600
300 REM
310 REM CHOOSE WHICH NOTES
```

```

320 REM
340 W=INT(RND(1)*J)+1:A=INT(RND(1)*J)+1:
IF W=A THEN GOTO 340
350 F$="th":IF W=1 THEN F$="st"
360 G$="th":IF A=1 THEN G$="st"
370 IF W=2 THEN F$="nd"
380 IF A=2 THEN G$="nd"
390 IF W=3 THEN F$="rd"
400 IF A=3 THEN G$="rd"
410 LOCATE 1,1:PRINT"Is the ";W;F$;" not
e in the tune higher or lower than the "
;A;G$;" note.":PRINT "Press H or L":FOR
L=1 TO 100:
NEXT L
440 REM
450 REM PLAY THE TUNE
460 REM
465 FOR K=1 TO J
470 N(K)=INT(RND(1)*100)+100:IF K=1 THEN
GOTO 490
475 REM
476 REM ENSURE NO NOTE IS REPEATED
477 REM
480 FOR Q=K-1 TO 1 STEP -1:IF N(K)=N(Q)
THEN GOTO 470
485 NEXT Q
490 SOUND 1,N(K),20
500 NEXT K
501 REM
502 REM CALCULATE CORRECT ANSWER
503 REM
505 IF N(W)<N(A) THEN A$="H"
510 IF N(W)>N(A) THEN A$="L"
515 REM
516 REM PAINT FENCE
517 REM
520 GOSUB 845
525 REM
526 REM CHECK ANSWER
527 REM
530 IF (A$="H" AND (I$="H" OR I$="h")) O
R (A$="L" AND (I$="L" OR I$="l")) THEN L
OCATE 1,21:PRINT"Yes, you are correct":F
OR W=1 TO 10
O:NEXT W:LOCATE 5,22:PRINT"<RETURN> to c
ontinue":INPUT t$:NEXT j:GOTO 2000

```



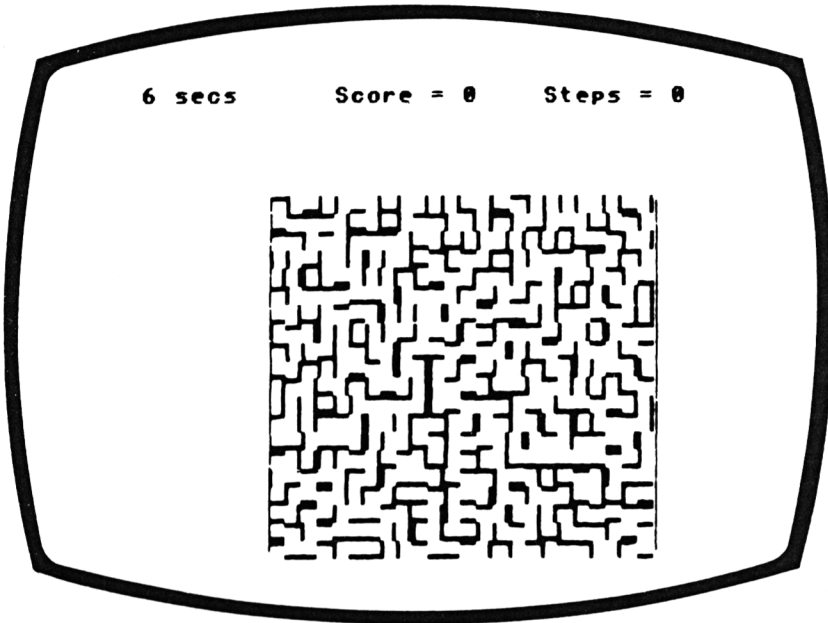
```

540 LOCATE 1,21:PRINT"You are incorrect.
    The answer was ; """;a$;""""
550 INPUT A$:GOTO 10
598 REM
599 REM DRAW FENCE
600 REM
601 CLS
602 FOR X=30 TO 338 STEP 32
605 Y=318:Z=16:Q=208
610 PLOT X,Y:DRAWR Z,O:DRAWR O,-Q:DRAWR
    -Z,O:DRAWR O,Q
612 NEXT X
620 FOR A=46 TO 302 STEP 32:B=286:C=270:
    D=158:E=142
630 PLOT A,B:DRAWR 16,O:NEXT A
635 FOR A=46 TO 302 STEP 32:B=286:C=270:
    D=158:E=142
640 PLOT A,C:DRAWR 16,O:NEXT A
645 FOR A=46 TO 302 STEP 32:B=286:C=270:
    D=158:E=142
650 PLOT A,D:DRAWR 16,O:NEXT A
655 FOR A=46 TO 302 STEP 32:B=286:C=270:
    D=158:E=142
660 PLOT A,E:DRAWR 16,O:NEXT A
670 LOCATE 55,15:PRINT CHR$(240)
704 REM
705 REM DRAW BORDER
706 REM
710 PLOT 0,0
720 DRAWR 514,0:DRAWR 0,350:DRAWR -514,0
    :DRAWR 0,-350
730 RETURN
790 REM
791 REM DEFINE GRAPHIC
792 REM
800 SYMBOL 240,0,36,60,60,60,25,62,60
840 RETURN
844 REM
845 REM PAINT FENCE
846 REM
851 FOR X=30 TO 318 STEP 32
860 FOR Y=110 TO 318 STEP 4:R=16
861 REM
862 REM CHECK FOR ANSWER
863 REM
865 I$=INKEY$:IF I$<>"" THEN GOTO 900 F

```

```
870 PLOT X,Y:DRAW R,O:NEXT Y:NEXT X
880 LOCATE 55,15:PAPER 1:PEN 0:PRINT CHR
$(240):PAPER 0:PEN 1:GOTO 1000
900 IF I$<>"L" AND I$<>"1" AND I$<>"H" A
ND I$<>"h" THEN.GOTO 870
910 RETURN
990 REM
995 REM CAT PAINTED
996 REM
1000 LOCATE 1,21:PRINT"Too late! The cor
rect answer was : """;A$;""""
1010 FOR W=1 TO 300:NEXT W:INPUT "again
(Y/N) ?";R$:IF r$<>"N" AND R$<>"n" THEN
RUN
1020 END
1990 REM
1995 REM ALL 8 CORRECT
1996 REM
2000 LOCATE 3,12:PRINT"A MUSICIAN SHOULD
N'T BE PAINTING FENCES !":END
```

A-MAZE-ING



You are at the bottom of a complicated maze, and your objective is to reach the top in the quickest possible time, but also with the fewest number of moves possible.

Don't rush headlong into this one, as a little forward planning can save you time and points.

Every step counts as a point and every time you try to cross a barrier counts as a point.

You must aim for the nearest exit at the top.

How to play

You are represented by a dot in the lower left hand side of the maze, and you move by using the ARROW cursor keys. Do not press the shift key, just the keys with the arrows on.

Your score will be displayed at the top of the screen. The number of steps taken has a greater effect on your final score than the time factor.

We hope you make it, as there are plenty of other 'Brainteasers' waiting for you on the outside.

Programming hints

The maze is created of cells, each of which have one side blocked off. The cell shapes are drawn using user-defined graphics.

You could increase the size of the maze by changing 21 and 25 in lines 160 and 190. The maze shown is 24 columns wide by 20 rows. The maze array m must be DIMensioned 2 columns and 2 rows larger than the actual array to allow for checking for the $(x+1)$ th and $(x-1)$ th columns, and $(y+1)$ th and $(y-1)$ rows. If you want the maze in the centre on the screen then change line 170.

The lines drawn down the side of the maze in lines 240 and 250 would have to be changed, so would the start position of the dot in lines 260 and 270. In a 20 row maze the 21st row is the row the dot starts on, so special conditions apply to this row in lines 310 to 340. If a different number of rows is chosen this 21 and 22 must be changed. The 21st row of the maze is represented by the 22nd row of the array m. It was made this way to allow the top and bottom row to be checked.

The Program

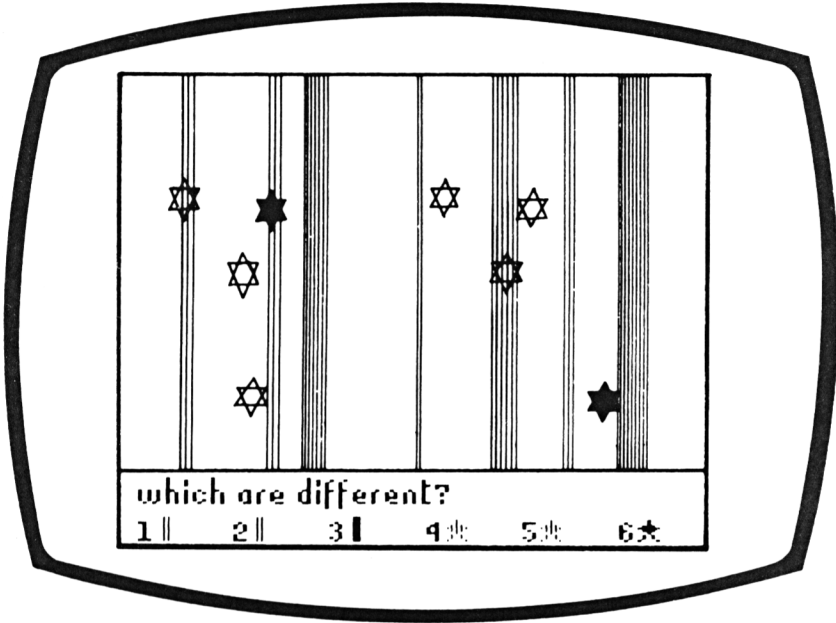
```

10 REM A-maze-ing
20 REM (C) 1984 G. LUDINSKI
30 DIM M(26,33)
40 BORDER 7:MODE 1
50 L$=CHR$(242):R$=CHR$(243):D$=CHR$(241)
   :U$=CHR$(240)
60 DEF FNU=INT(TIME/500)
70 RESTORE
80 SYMBOL 240,3,3,3,3,3,3,3,3
90 SYMBOL 241,0,0,0,0,0,0,255,255
100 SYMBOL 242,192,192,192,192,192,192,192,1
    92,192
110 SYMBOL 243,255,255,0,0,0,0,0
120 SYMBOL 244,3,3,3,27,27,3,3,3
130 SYMBOL 245,0,0,0,24,24,0,255,255
140 SYMBOL 246,192,192,192,216,216,0,255
    ,255
150 SYMBOL 247,255,255,0,24,24,0,0,0
160 FOR I=2 TO 21
170 PRINT:PRINT"    ";
180 M(1,I)=0
190 FOR J=2 TO 25
200 M(J,I)=INT(RND(1)*4)
210 PRINT CHR$(240+M(J,I));
220 NEXT J
230 NEXT I
240 PLOT 62,368:DRAWR 0,-320
250 PLOT 448,368:DRAWR 0,-320
260 ST=0:X=2:Y=22:X1=2:Y1=22:T1=FNU
270 LOCATE X+3,Y:PRINT ". ";CHR$(8);
280 SC=ST+INT((FNU-T1)/5)
290 I$=INKEY$:IF I$="" OR I$<CHR$(240) O
   R I$>CHR$(243) THEN LOCATE 1,1:PRINT INT
   (FNU-T1);" secs    SCORE = ";SC;" steps
   = ";st;:GOT
   O 290
300 IF (X=2 AND I$=L$) OR (X=25 AND I$=R
   $) OR (Y=2 AND I$=U$) OR (Y=22 AND I$=D$
   ) THEN GOTO 280
310 IF I$=L$ AND ((M(X-1,Y)<>0 AND M(X,Y
   )<>2) OR Y=22) THEN X=X-1

```

```
320 IF I#=R$ AND ((M(X+1,Y)<>2 AND M(X,Y)
<>0) OR Y=22) THEN X=X+1
330 IF I#=D$ AND ((M(X,Y+1)<>3 AND M(X,Y)
<>1) OR Y=22) THEN Y=Y+1
340 IF I#=U$ AND ((M(X,Y-1)<>1 AND M(X,Y)
<>3) OR Y=22) THEN Y=Y-1
350 ST=ST+1
360 IF Y1=22 THEN LOCATE X1+3,22:PRINT"
";
370 IF Y=22 THEN LOCATE X+3,22:PRINT". ";
380 IF Y1<>22 THEN LOCATE X1+3,Y1:PRINT
CHR$(240+M(X1,Y1));CHR$(8);
390 IF Y<>22 THEN LOCATE X+3,Y:PRINT CHR
$(244+M(X,Y));CHR$(8);
400 IF X=X1 AND Y=Y1 AND ST<>0 THEN SOUN
D 1,200,30
410 IF Y=2 AND M(X,Y)<>3 THEN FOR J=1 TO
5:FOR I=100 TO 200 STEP 10:SOUND 1,I,7:
NEXT I:FOR I=200 TO 100 STEP -10:SOUND 1
,I,3:NEXT I:
NEXT J:RUN
420 X1=X:Y1=Y
430 GOTO 280
```

SPOT THE DIFFERENCE



I suppose that this could have been called Star and Stripe, the difference as you will see when you run this colourful eye test.

Two pictures, composed of stars and stripes, in red, green and blue appear on the screen, and you will be asked to identify which of the items is different.

How to play

Items are keyed as follows:

Blue stripe	1
Green stripe	2
Red stripe	3

Blue star	4
Green star	5
Red star	6

Identify the differences and key in the number and press ENTER. If you are correct you will hear a high pitched tune, but if you are wrong your answer will be crossed.

To help you, numbers previously keyed in are displayed in brackets. When all the numbers required have been keyed in a further tune will be played. Just hope that it is high pitched for a correct answer.

To continue, or stop, press Y or N and ENTER.

At conclusion you will see your score sheet showing tries, correct answers, and time/average taken.

Programming hints

You might find the routine `star` useful in your non-commercial programs as it draws a star. You just have to specify the bottom left-hand corner of the star (x,y), the width of the bottom of the star (w), the height of the star (h) and the colour that it is to be displayed in (c).

You could make the puzzle easier by increasing the range of possible values for the shapes that are going to be different. The function `FNm (n,m)` is used to define the minimum and maximum value of any shape. Remember if you increase the maximum value m you must reduce the minimum value n by the same value, or the picture will extend beyond the allocated area.

The Program

```
10 REM SPOT THE DIFFERENCE
20 REM (c) 1984 G. LUDINSKI
40 BORDER 7:MODE 1
50 DEF FNU=INT(TIME/500)
80 DIM W(6),B$(6)
90 T1=FNU:CR=0:NQ=0
100 REM
120 DEF FNM(N,M)=INT((M-N)*RND(1)+N)
130 RESTORE
190 CLS
200 NQ=NQ+1
210 PLOT 0,90:DRAWR 510,0
220 DRAWR 0,260:DRAWR -510,0:DRAWR 0,-26
0
230 PLOT 254,90:DRAWR 0,260
240 NZ=0
250 FOR I=1 TO 6
260 W(I)=INT(RND(1)*2)
270 IF W(I)=1 THEN NZ=NZ+1
280 NEXT I
290 IF NZ=0 THEN GOTO 250
300 FOR J=1 TO 3
310 X=40*(J-1)+7
320 W=FNM(5,10)
330 IJ=J
340 CL=J:IF J=2 THEN CL=4
350 IF J=3 THEN CL=2
360 GOSUB 780
370 X=X+127:W=W+(W(IJ)*FNM(5,10)):GOSUB
780
380 X=40*(J-1)+27:H=FNM(W,2*W):W=5:Y=FNM
(45,175-H)
390 IJ=J+3
400 CL=J:IF J=2 THEN CL=4
410 IF J=3 THEN CL=2
420 GOSUB 840
430 X=FNM(X+127,40*(J-1)+154):W=W+(W(IJ)
*FNM(3,6)):H=H-(W(IJ)*FNM(H/4,3*H/4)):GO
SUB 840
440 NEXT J
```

```

450 LOCATE 1,21:PRINT"      Which shapes a
re different"
460 PRINT"1      2      3"
470 PRINT"      4      5      6"
480 GOSUB 900
490 REM
500 R$=""
510 FOR I=1 TO (LEN(A$)+1)/2
520 I$=INKEY$:IF I$="" THEN GOTO 520
530 LOCATE 1,24:PRINT"
":LOCATE 1,24:PRINT I
$;" (" ;R$;" )";
540 KI=0
550 FOR K=1 TO NA
560 IF I$=B$(K) THEN B$(K)="O":KI=1:SOUN
D 1,120,30:R$=R$+I$
570 NEXT K
580 IF KI=0 THEN PRINT " X":GOTO 600
590 PRINT
600 IF INKEY$<>"" THEN GOTO 600
610 NEXT I
620 FOR I=1 TO NA
630 IF B$(I)<>"O" THEN GOTO 660
640 NEXT I
650 GOTO 670
660 LOCATE 1,21:PRINT"
":LOCATE 1,21:PRIN
T"No, answer =" ;A$:SOUND 1,100,30:SOUND
1,40,20:GOTO
680
670 LOCATE 12,22:PRINT"Yes, you are righ
t":SOUND 13,3:CR=CR+1
680 LOCATE 1,22:PRINT"Do you want more (
Y/N)      ";
690 INPUT I$
700 IF I$<>"N" THEN GOTO 190
710 CLS:PRINT:PRINT"      Spot the differ
ence"
720 LOCATE 1,6:PRINT"Puzzles attempted =
";nq
730 LOCATE 1,8:PRINT"Puzzles correct  =
";CR
740 TM=FNU-t1
750 PRINT:PRINT"Time taken =" ;TM
760 IF CR<>0 THEN PRINT:PRINT"Time taken
per puzzle =" ;INT(TM*100/CR)/100

```

```
770 GOTO 1080
780 REM STRIPE SUBROUTINE
790 PEN CL
800 FOR I=X TO X+W
810 PLOT I*2,90:DRAWR 0,260
820 NEXT I
830 RETURN
840 REM STAR SUBROUTINE
850 PEN CL
860 X0=X:Y0=Y:X1=X+(W/2):Y1=Y+(H/3):X2=X
+(W/2):Y2=Y+H:GOSUB 980
870 X0=X+W:Y0=Y:GOSUB 980
880 X1=X-W/2:Y1=Y+(2*H/3):X0=X+W/2:Y0=Y+
H/3:X2=X+(3*W/2):Y2=Y+(2*H/3):GOSUB 1030
890 RETURN
900 REM ANSWER SUBROUTINE
910 A$="":IM=0
920 FOR L=1 TO 6
930 IF W(L)=1 THEN IM=IM+1:B$(IM)=CHR$(L
+48):A$=A$+B$(IM)+", "
940 NEXT L
950 A$=LEFT$(A$,LEN(A$)-1)
960 NA=IM
970 RETURN
980 REM TRIANG SUBROUTINE
990 FOR P=Y1-Y0 TO Y2-Y0
1000 PLOT 2*X0,2*Y0:DRAWR 2*(X1-X0),2*P
1010 NEXT P
1020 RETURN
1030 REM HTRIANG
1040 FOR P=X1-X0 TO X2-X0
1050 PLOT 2*X0,2*Y0:DRAWR 2*P,2*(Y1-Y0)
1060 NEXT P
1070 RETURN
1080 REM END
```

PROFIT AND LOSS

If a shopkeeper buys chocolates for 49 pence and sells them for 52 pence. His profit as a percentage of his cost price

=
7
?6

Yes, congratulations

How much do you know about profit and loss?

Do you know how much you would make if you sold your car, or even your bike?

How to play

You will be given five minutes to answer as many questions as possible, and you may press P and ENTER for pass if you cannot work out an answer.

You will not be penalised for 'passes'.

At the end of five minutes, or sooner if you enter N for NO in answer to the question “do you want any more”, your score sheet showing tries, correct answers and average time per answer will appear. If you wish to proceed, then press Y and ENTER and the program will continue to ask you questions.

You can have two tries at each question if you wish. After the first attempt, you will be given a hint as to the correct answer. If your second answer is wrong, you will be told the solution and how it was obtained.

If you cannot work out an answer then press ? and ENTER and your computer will turn into a calculator and you can then use the normal mathematical symbols on the keyboard. To clear the calculator from the screen press AC and ENTER. For the calculators answer press = and ENTER. To return to the main game press ? and ENTER. Always remember to press ENTER after each required response.

Programming hints

This program includes a useful procedure that enables a programmer to fit a sentence, or string, of any length onto a screen of any size, without splitting a word between one screen line and another, i.e. wraparound, and is found on line 530.

Assign the string, or sentence in quotes, to variable FL\$. B holds the number of characters on the screen in the case of Mode 2 it is 80. On exit the field FL\$ contains the string, or sentence, re-formatting so no words are split between one 80 column line and another.

You may want to add some different types of problems on profit and loss. To do this, instead of W alternating between -1 and +1, it should be allowed to take a random value between 0 and one more than the number of problem types you are going to add. The details of the problem must be put in the QUESTION subroutine. Q\$ holds the question, H\$ the hint, A and A\$ the answer and L\$, M\$ and N\$ the answer and explanation.

Programming hints

```

10 REM PROFIT AND LOSS
20 REM (C) 1984 G. LUDINSKI
30 DEF FNE$(A$,N)=MID$(A$,N,1)
32 DEF FNV$(A$,M)=MID$(A$,M)
35 DEF FNZ$(A$,B)=LEFT$(A$,B)
40 BORDER 6:MODE 2
50 S$="          "
60 C$="Highest score ":K$=" Score "
70 LOCATE 1,5:PRINT" QUIZ GAME 1 - PROFIT AND LOSS"
80 LOCATE 1,7
90 INPUT"Hello, what is your name   ";N$
:PRINT:PRINT"Here are some problems";:IF
  N$="NO SOUND" THEN PRINT N$
100 P=0:MX=0:C=0:W=1
110 T=1:I$=""
120 P=P+1
130 GOSUB 320
140 REM
150 CLS:LOCATE 1,8:PRINT Q$;" = ";
160 GOSUB 740
180 IF ABS(VAL(I$)-A)<X AND I$<>"" THEN
GOTO 200
190 GOTO 220
200 LOCATE 1,18:PRINT"Yes, congratulatio
ns":C=C+1:IF N$="NO SOUND" THEN GOTO 250
210 SOUND 1,20,40:SOUND 1,50,100:SOUND 1
,100,60:SOUND 1,50,25:SOUND 1,50,30:GOTO
  260
220 IF T=1 THEN LOCATE 1,18:PRINT"NO, ";
H$::FOR F=1 TO 5000:NEXT F:PRINT"TRY AGA
IN":FOR F=1 TO 75:NEXT F:T=2:CLS:PRINT:G
OTO 150
230 LOCATE 1,18:PRINT"SORRY, The answer
is = ";L$;"          ";M$
240 PRINT J$
260 INPUT"Do you want more (Y/N) ?";I$:I
F I$="Y" OR I$="y" THEN CLS:GOTO 110
270 IF I$="N" OR I$="n" THEN CLS:GOTO 80
O

```

```

310 REM
320 REM QUESTION
330 L$="":M$="":J$="":B=40:X=1
340 E=INT(RND(1)*B)+1:F=INT(RND(1)*90)+1
0:E#=CHR$(E+48):F#=STR$(F):F#=RIGHT$(F$,
LEN(F$)-1)
350 W=-W
360 IF W=1 THEN GOTO 430
370 R$="If a shopkeeper buys chocolate f
or "+F$+" pence and sells it for"+STR$(E
+F)+ " pence. His profit as a percentage
of his cost
price"
380 Q$=R$:GOSUB 530
390 H$="Percentage profit = ((sell - co
st)/cost) x 100%
      where sell = selling price and
      cost = cost
      price"
400 A=INT(E/F*100):A#=STR$(A):A#=RIGHT$(
A$,LEN(A$)-1)
410 L$=A$+" %"
420 M$="as (("+STR$(E+F)+" - "+F$+
$+)"x100% = "+STR$(INT(E/F*100))
430 IF W=-1 THEN GOTO 520
440 V=INT(E*100):V#=STR$(V):V#=RIGHT$(V$
,LEN(V$)-1)
450 R$="A dealer wishes to make a profit
of "+F$+"%. If a car costs him "+V$+" th
en his selling price must be"
460 q$=r$:GOSUB 530
470 H$="Find the profit in money terms,
then add it to the cost price"
480 A=INT(V+(F*E)):A#=STR$(A):A#=RIGHT$(
A$,LEN(A$)-1):Y#=STR$(INT(F*E)):Y#=RIGHT
$(Y$,LEN(Y$)-1)
490 L$=A$
500 M$="as profit =("+f$+"/100)x"+V$+"="
+L$
510 J$="so selling price ="+v$+"+"+y$+"=
"+l$
520 RETURN
530 REM FITIN
540 LF=LEN(R$):IF LF<=B THEN GOTO 620
550 FOR I=1 TO INT(LF/40)

```

```

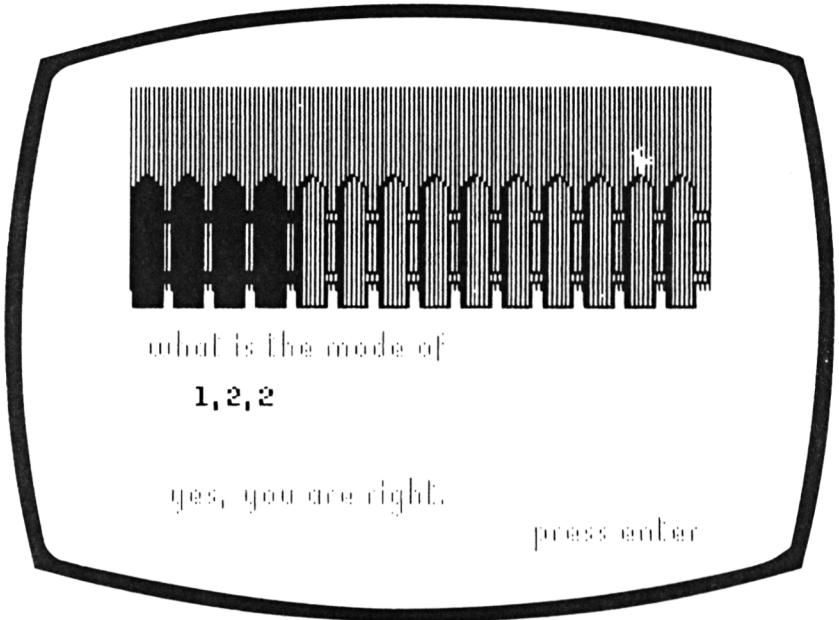
560 EL=B*I
570 IF FNE$(R$,EL)="" THEN GOTO 610
580 IF FNE$(R$,EL+1)="" THEN R$=FNZ$(R$,
EL)+FNV$(R$,LF-EL-1):LF=LF-1:GOTO 610
590 K=0
592 K=K+1:IF K>30 THEN GOTO 610
595 IF FNE$(R$,EL-K)=" " THEN R$=FNZ$(R$,
,EL-K)+FNV$(S$,K)+FNV$(R$,LF-EL+K):LF=LF
+K:GOTO 610
600 GOTO 592
610 NEXT I
620 RETURN
630 END
640 REM CALC
650 INPUT Z$:IF Z$="?" THEN LOCATE 1,16:
RETURN
660 LOCATE 1,22:PRINT" "
:LOCATE 1,22:PRINT INT((VAL(Z$)*100)/100
):GOTO 650
740 REM KEYIN
750 X=1
760 P$(X)=INKEY$:IF P$(X)="" THEN GOTO 7
60
761 IF P$(X)=" " THEN LOCATE 2,1:PRINT"
";C$:MX;K$:C:GOTO 760
763 LOCATE 1,22:PRINT" "
:LOCATE 1,22:FOR I=1 TO X:PRINT P$(I);:N
EXT I
764 IF ASC(P$(X))=127 THEN P$=""
":X=1:LOCATE 1,22:PRINT P$:GOTO 760
765 IF P$(X)="?" THEN P$(X)=" ":GOSUB 64
0:GOTO 760
770 IF ASC(P$(X))=13 THEN P$(X)=" ":GOTO
780
772 IF P$(X)<"0" OR P$(X)>"9" THEN P$(X)
=" ":GOTO 760
775 X=X+1:GOTO 760
780 I$="":FOR I=1 TO X-1:I$=I$+P$(I):NEX
T I
790 RETURN
800 REM SCORE
810 LOCATE 1,8:PRINT"Number of problems
completed=";P:LOCATE 1,9:PRINT"Number co
rrect=";C:LOCATE 1,12:PRINT N$;"'s succe
ss rate=";IN

```



```
T(C/P*100); "%": IF C>MX THEN MX=C
B20 P=0:C=0:INPUT"Play again (Y/N) ";i$
B30 IF LEFT$(I$,1)="Y" OR LEFT$(I$,1)="y
" THEN GOTO 110
B40 END
```

STATS PAINTER



You are the director of Rockets Unlimited, and yesterday you were very pleased in the way the company was going. Then these officious accountants came, studied the figures and reckoned you were making a loss.

All weekend the sales figures are preying on your mind. Even while you are painting the fence you are trying to find out where the accountants went wrong. Sometimes you get so lost in thought that you end up painting the bird on the fence. If you can work accurately and quickly, you will find out where the accountants went wrong, and you will be able to prove to them that Rockets Unlimited is the success you always knew it was.

How to play

The questions are on the modes or medians of a given set of numbers. The mode of a set of numbers is the number occurring most frequently. The median of a set of numbers is the middle number. The numbers are arranged in ascending order. Just key in the answer without pressing ENTER.

If you are right you may move on to the next question by pressing ENTER. If you are wrong, or take too long to answer, the bird ends up by getting painted. After nine consecutive correct answers you find out where the accountants went wrong.

Programming hints

If you wish to use the graphics but to set different types of questions, replace routines at lines 400, 590 and 640. Assign the question to Q\$ and the answer to A\$ and the hint to H\$. Questions in this program must have answers one digit or letter long.

The Program

```

10 REM STATS PAINTER
20 REM (C) 1984 G. LUDINSKI
30 REM
40 DIM D(15),C(5)
50 MODE 2
90 DEF FNX$(D$,N)=LEFT$(D$,N)
95 DIM G(10)
100 DEF FNB$(N$,N)=MID$(N$,N,1)
160 REM
170 REM BIRD SHAPE
180 REM
190 SYMBOL 240,48,248,60,30,14,11,9,8
230 REM DRAW FENCE
232 BORDER 2
238 FOR M=1 TO 9
240 R=32:Z=112:Y=142

```

```

245 FOR X=14 TO 446 STEP 48
250 PLOT X,Y:DRAW R,0:DRAW O,Z:DRAW -
R,0:DRAW O,-Z:NEXT X
260 IF X<>494 THEN GOTO 270
265 FOR P=0 TO 446 STEP 48:O=158:U=174:T
=222:E=238
266 IF P<>494 THEN PLOT P,0:DRAW 14,0:P
LOT P,U:DRAW 14,0:PLOT P,T:DRAW 14,0:P
LOT P,E:DRAW 14,0
267 IF P<>480 THEN NEXT P:GOTO 266
270 LOCATE 58,9:PRINT CHR$(240)
280 GOSUB 400
285 REM PRINT QUESTION AND CHECK ANSWER
290 LOCATE 1,19:PRINT Q$
300 I=0:I$="":ID=0
309 GOTO 710
310 REM
320 IF I$=A$ AND ID<2 THEN PRINT"Yes, yo
u are right":GOTO 360
330 ID=ID+1:IF ID=1 THEN GOTO 350 ELSE G
OTO 725
340 FOR J=1 TO 3:SOUND 1,100,10:SOUND 1,
230,20:SOUND 1,150,20:NEXT J
350 LOCATE 1,20:PRINT"No, ";h$:GOTO 725
355 LOCATE 1,20:PRINT"Too late, ";H$
360 LOCATE 1,22:PRINT"Press enter for mo
re ";:INPUT R$:CLS
370 IF I$<>A$ THEN GOTO 230
380 NEXT M
390 LOCATE 1,16:PRINT"Eureka! you found
it. Get on the phone quick":GOTO 810
400 REM STAT
410 MC=0:DN=1:MO=0:W=INT(RND(1)*2)+1
420 FOR I=1 TO 5
430 C(I)=INT(RND(1)*4):IF C(I)=MC THEN G
OTO 430
440 IF C(I)>MC THEN MC=C(I):MO=1
450 IF C(I)=0 THEN GOTO 500
460 FOR L=DN TO DN+C(I)-1
470 D(L)=I
480 NEXT L
490 DN=DN+C(I)
500 NEXT I
510 IF DN/2=INT(DN/2) THEN DN=DN+1:D(DN)
=6

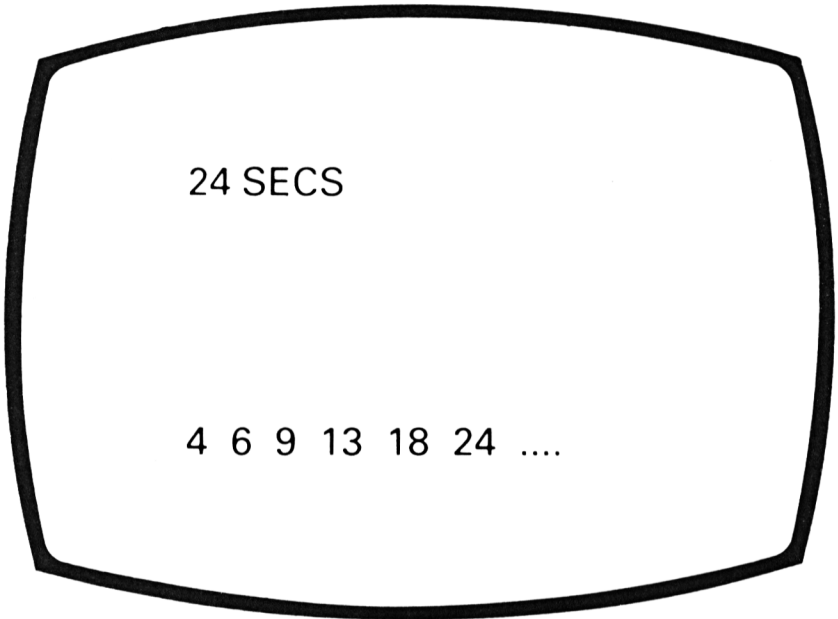
```

```

520 D$="":FOR I=1 TO DN:D$=D$+STR$(D(I))
+"," :NEXT I:D$=FNX$(D$, (DN*3)-1)
530 T$="th":M=INT(DN/2)+1:IF M=1 THEN T$
="st"
540 IF M=2 THEN T$="nd"
550 IF M=3 THEN T$="rd"
560 IF W=1 THEN GOSUB 590
570 IF W=2 THEN GOSUB 640
580 RETURN
590 REM CALCULATE MODE
600 Q$="What is the mode of "+d$
610 FOR F=1 TO 10:G(F)=0:NEXT F:R=0:E=0
611 FOR F=1 TO DN:G(D(F))=G(D(F))+1:NEXT
F
612 E=1:FOR F=1 TO 10:IF G(F)>E THEN E=F
613 NEXT F
614 A$=STR$(E):A$=RIGHT$(A$,LEN(A$)-1)
620 H$="there are more "+A$+"s"
630 RETURN
640 REM CALCULATE MEDIAN
650 Q$="What is the median of "+d$
660 A=D(1+INT(DN/2)):A$=STR$(A):A$=RIGHT
$(A$,LEN(A$)-1)
670 H$=A$+" is middle no."
680 RETURN
690 END
700 REM PAINT FENCE
710 X=14
715 R=32
720 Y=142
725 I=I+1:I$=INKEY$:IF I$<>" " THEN GOTO
310
730 PLOT X,Y:DRAW R,0
740 Y=Y+2:IF Y<256 THEN GOTO 725
750 X=X+48:IF X<=446 THEN GOTO 720
760 PAPER 1:PEN 0:LOCATE 58,9:PRINT CHR$
(240);:PAPER 0:PEN 1:SOUND 1,100,10:SOUN
D 1,200,40:SOUND 1,140,20:SOUND 1,100,75
770 GOTO 355

```

SEQUENCE COUNTDOWN



Six numbers, or letters, will be displayed on the screen and it is up to you to provide the next logical item to complete the series.

How to play

When you have worked out your answer, type in your item and press ENTER.

A wrong answer will bring you the correct result from your computer, and then you will be handed back to the next sequence. If you wish to PASS on a question then press P and ENTER and you will be taken on to the next question.

After 11 attempts your score sheet will be displayed showing the number of sequences tried, correct answers, your time, and your IQ level for adaptability.

Programming hints

One change you could make, is to add new sequences. To do this allow W to have a larger maximum value in line 170. The sequence must then be defined after line 210. The sequence is held in S(2), S(3), S(4), S(5), S(6), S(7) and S(8). S(2) is defined in line 150 and is fixed for all sequences. IC is another random value which may be useful when defining a sequence. The message saying how the sequence is created is held in M\$. If the last number in sequence S(8) is less than 26 then the sequence is converted to letters.

The Program

```

10 REM SEQUENCE COUNTDOWN
20 REM (C) 1984 G. LUDINSKI
30 REM
40 DIM S(8)
50 MODE 2
70 TE=0:CR=0
80 CLS
85 LOCATE 1,7:PRINT"SEQUENCE COUNTDOWN"
86 LOCATE 2,4:PRINT"What is the next num
ber in the sequence ?"
90 TE=TE+1
100 IF TE=11 THEN GOTO 510
110 REM
120 REM WORK OUT SEQUENCE
130 REM
140 S(1)=0
150 S(2)=INT(RND(1)*9)+1
160 IC=INT(RND(1)*9)+1
170 W=INT(RND(1)*3)
180 FOR I=3 TO 8
190 IF W=0 THEN S(I)=2*S(I-1)-S(I-2)+IC:
M$="The interval increases by "+STR$(IC)
+" each time"

```

```

200 IF W=1 THEN S(I)=S(I-1)+S(I-2)+IC:M$
="Each number is the sum of the previous
  two plus "+STR$(IC)
210 IF W=2 THEN S(I)=S(2)^(I-1):M$="Each
  number is "+STR$(S(2))+ " to the power o
  f 2,3,4,5,6 and 7"
220 NEXT I
230 REM
240 REM
250 REM DISPLAY SEQUENCE
260 REM
270 IF S(8)>26 THEN LOCATE 2,9:PRINT STR
$(S(2));" ";STR$(S(3));" ";STR$(S(4));"
";STR$(S(5));" ";STR$(S(6));" ";STR$(S(7
));".....";
LE=0
280 IF S(8)<=26 THEN LE=1:LOCATE 2,9:PRI
NT CHR$(64+S(2));" ";CHR$(64+S(3));" ";C
HR$(64+S(4));" ";STR$(64+S(5));" ";STR$(
64+S(6));" "
;STR$(64+S(7));" .....";
290 REM
300 REM INPUT ANSWER
310 REM
320 I=0
350 I$="":FOR A=1 TO I-1:I#=I#+P$(A):NEX
T A
360 REM
370 REM CHECK ANSWER
380 REM
390 INPUT D$
400 IF LE=0 AND VAL(D$)-S(8)=0 THEN PRIN
T"Yes, correct - well done":CR=CR+1:GOTO
  450
405 IF LE=0 THEN GOTO 440
410 IF D$=CHR$(64+S(8)) THEN PRINT"Yes,
correct - well done":CR=CR+1:GOTO 450
420 PRINT:PRINT:PRINT"no the answer =" ;S
(8)
430 IF LE=1 THEN PRINT:PRINT"Replace eac
h letter by its position number e.g. 1 f
or A, 2 for B etc."
440 PRINT:PRINT M$
450 PRINT:PRINT"Press ENTER to continue"
460 INPUT B$

```



```
470 GOTO 80
480 REM
490 REM SCORE SHEET
500 REM
510 CLS
520 LOCATE 1,2:PRINT"Number of sequences
  completed =";TE
530 IQ=INT(CR*100/53)
560 PRINT:PRINT"Your IQ level (adaptabil
ity) =";IQ
570 PRINT
580 IF CR>=7 THEN PRINT"This is classed
as superior (UPPER 10%):END
585 IF CR=6 THEN PRINT"This is classed a
s good (UPPER 20%):END
590 IF CR=5 THEN PRINT"This is classed a
s fair (UPPER 60%):END
595 END
```

ELEMENTARY STATISTICS

Quiz game 4 - Elementary Statistics

Hello, what is your name? GORDON

Here are some Problems GORDON

Length of histogram rectangle of mark 2
where marks are 3,2,1,2,2,3,4,3,4 = 1

No, length is number of scores with mark
2, try again

Length of histogram rectangle of mark 2
where marks are 3,2,1,2,2,3,4,3,4 = 2

Sorry, the answer is =

3

as there are 3 scores of mark 2



Could you draw a bar chart (histogram) of a given set of numbers?

Could you understand a bar chart which someone else had written? Here you can test your knowledge on bar charts and means by answering as many questions on these subjects as possible, in five minutes.

This program has an added feature which is that the bar chart will be drawn, by the computer, at the end of the problem. In addition an explanation will be provided.

How to play

You will be given five minutes to answer as many questions as possible, and you may press P and ENTER for pass if you cannot work out an answer.

You will not be penalised for 'passes'.

At the end of five minutes, or sooner if you enter N for NO in answer to the question "do you want any more", your score sheet showing tries, correct answers and average time per answer will appear. If you wish to proceed then press Y and ENTER and the program will continue to ask you questions.

You can have two tries at each question if you wish. After the first attempt you will be given a hint as to the correct answer. If your second answer is wrong you will be told the solution and how it was obtained.

If you cannot work out an answer then press ? and ENTER and your computer will turn into a calculator and you can then use the normal mathematical symbols on the keyboard. Do not type = at the end of your calculation. For the calculator's answer press ENTER. To return to the main game press ? and ENTER. Always remember to press ENTER after each required response.

Programming hints

The box chart is drawn using solid squares. These are user defined characters with all the pixels filled in and are created at the beginning of the program using VDU 2 3. The bar chart is held in N(0) and N(1). The number of each of the marks are held in the array F and the bar chart is drawn from this.

You could increase the number of scores. To do this you must increase the maximum value of J in line 260. The array D would have to be reDIMensioned in line 30. Remember also, if more scores are used then the sum or the marks must be divided by a number larger than 9 in line 340 to get the correct mean value.

The maximum number of any particular mark would also be greater than 9 so the maximum value of I in line 500 would have to be increased.

The Program

```

10 REM ELEMENTARY STATS
20 REM (C) 1984 G. LUDINSKI
25 MX=0
30 DIM F(4),D(9)
40 DEF FND$(G$,N)=LEFT$(G$,N)
50 S$=" "
51 V=0:Y=0
52 Y$="Highest Score ":K$=" Score "
60 MODE 2:BORDER 3:PRINT"QUIZ GAME 4 ELE
MENTARY STATISTICS"
70 PRINT:PRINT
80 INPUT"Hello, what is your name "
;A$:PRINT:PRINT"Here are some problems f
or you ";A$
90 W=1:C=0:T=1:I$="":P=0
100 P=P+1
110 GOSUB 252
120 REM
125 CLS
130 LOCATE 1,6:PRINT Q$;" = ":GOSUB 612
136 IF V=2 THEN P=P-1:GOTO 200
142 IF A=0 AND I$<>"0" THEN GOTO 190
145 IF I$=L$ THEN GOTO 170
150 IF (ABS(VAL(I$)-A)<=X) AND I$<>" TH
EN GOTO 170
160 GOTO 190
170 LOCATE 1,4:PRINT"Yes, congratulation
s ";C=C+1:PRINT:IF A$="NO
SOUND" THEN GOTO 220
180 SOUND 1,100,10:SOUND 1,200,40:SOUND
1,140,60:SOUND 1,160,100:GOTO 230
190 IF T=1 THEN LOCATE 1,14:PRINT"No, ";
H$;", try again ";T=2:GOTO 13
0
200 PRINT"Sorry, the answer is = ";PRIN
T L$:PRINT M$

```

```

210 LOCATE 1,22:PRINT"          0      1
      2      3      "
215 FOR J=1 TO 4:H=20:FOR K=20 TO (20-D(
J)) STEP -1:LOCATE J*6+1,H+1:PRINT "++++
+":H=H-1:NEXT K:NEXT J
230 LOCATE 1,24:PRINT "Do you want more
(Y/N) "
235 I$=INKEY$
240 IF I$<>"Y" AND I$<>"y" AND I$<>"n" A
ND I$<>"N" THEN GOTO 235
250 IF I$="Y" OR I$="y" THEN T=1:CLS:GOT
O 100
251 GOTO 670
252 REM QUESTION
260 L$="":M$="":N$="      ":S=0:F(1)=0:F(2)=
0:F(3)=0:F(4)=0:G$="      ":FOR J=1 TO 9
270 D(J)=INT(RND(1)*4):G$=G$+STR$(D(J))+
",":S=(S+D(J))
280 FOR K=0 TO 3:IF D(J)=K THEN F(K)=F(K
)+1
290 NEXT K:NEXT J:W=-W
300 Z$=" where values are "+G$
310 IF W=1 THEN X=0
320 IF S/9=INT(S/9) THEN GOTO 380
330 INC=9*INT(S/9)+9-S
340 D(9)=D(9)+INC
350 G$=G$+STR$(D(9))
360 S=S+INC
370 Q$="Mean value scored where values a
re "+G$
380 H$="mean = total values scored divid
ed by number of scores":A=INT(S/9)
390 L$=STR$(A)+" as sum of ("+G$+)/9 =
"+STR$(A)
400 IF W=1 THEN M$="":GOTO 510
410 X=0:P$=STR$(INT(RND(1)*4)):A=F(VAL(P
$))
420 Q$="Height of histogram rectangle of
value "+P$+Z$
430 H$="Height is number of scores with
value "+P$+" "
440 L$=STR$(A):M$="as there are "+STR$(A
)+" scores of value "+P$:IF A=0 THEN M$=
"as there is one score of value "+P$
450 N$(1)="":N$(2)=" "
460 FOR I=9 TO 1 STEP -1:FOR K=1 TO 4

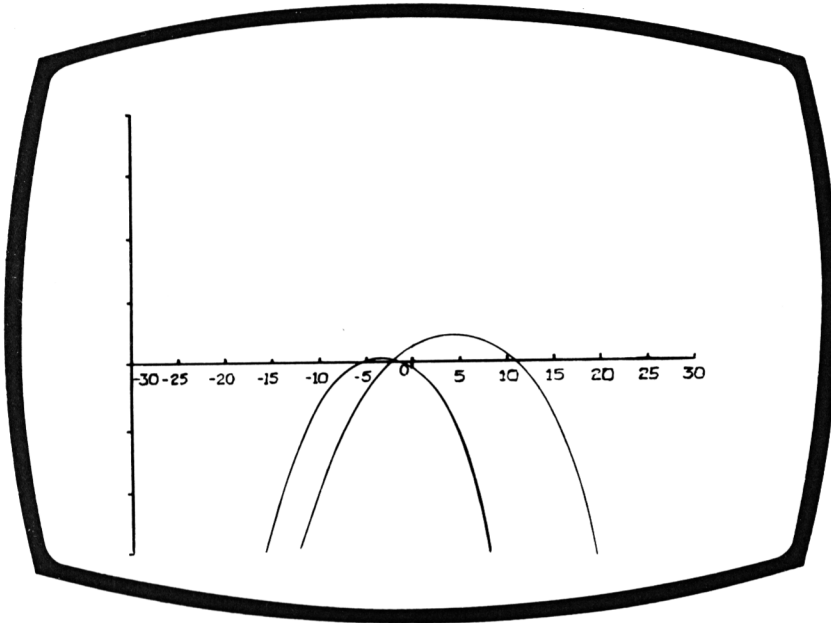
```

```

470 N$=N$+"      "
490 NEXT K:NEXT I
500 N$=N$+"      1      2      3      4"
510 RETURN
612 REM KEYIN
620 G=1:VP=21:HP=0
625 LOCATE 1,2:PRINT"      ";Y$;MX;K$;C
630 O$=INKEY$:IF O$<>" " THEN GOTO 640
632 Y=Y+1:IF Y=8200 THEN P=P-1:GOTO 670
634 GOTO 630
640 IF ASC(O$)=13 THEN V=2:RETURN
650 IF O$="?" THEN GOSUB 8000:GOTO 630
655 I$=O$
660 RETURN
670 REM SCORE
680 CLS
700 PRINT"Number of problems completed =
      ";INT(P)
710 PRINT:PRINT"Number correct = ";INT(C
)
740 IF C>MX THEN MX=C
750 P=0:C=0
760 INPUT"Again (Y/N) ";B$:IF LEFT$(B$,1
)<>"Y" AND LEFT$(B$,1)<>"y" THEN END
770 RUN
8000 INPUT U$:IF U$="?" THEN LOCATE 1,22
:PRINT"
      ";:RETURN
8001 LOCATE 1,22:PRINT"
      ";VAL(U$):GOTO 8000
9999 REM

```

NAME THE GRAPH



This is a game of logic. You have an aim, to find the equation of the graph that is drawn on the screen. You key in numbers to represent an equation. You can see straight away whether you are getting closer to your goal as the graph of the equation you keyed in is drawn on the screen.

By making the three numbers required larger and smaller, positive and negative, you can see how it effects the graph and hopefully, you can watch your graph getting closer and closer to the target graph until you hit it.

If you give up you will be told the answer, but don't cheat.

How to play

All graphs drawn are of the type

$$y = Ax^2 + Bx + C$$

Where A, B and C are constants (that is numbers that can be positive or negative). For example, the equation might be

$$y = -2x^2 + 3x - 5$$

and in this case A would be equal to -2, B equal to 3 and C to -5.

You must key in three numbers all at once on the same line and separated by commas. Press ENTER only after you have keyed in all three numbers. In the example above you would key in

-2, ENTER, 3, ENTER, -5 then ENTER

Then the graph of this expression is drawn and you must make another guess. If you cannot guess the answer key in

WHAT, ENTER, IS, ENTER, IT then ENTER

and you will be given the answer and the program ends.

If you guess the answer correctly then press the escape key and a new graph will be drawn.

It is more fun if you find out how to do it by trial and error, but if you want a hint to get you started then this is it. (Skip the next paragraph if you do not want to know)

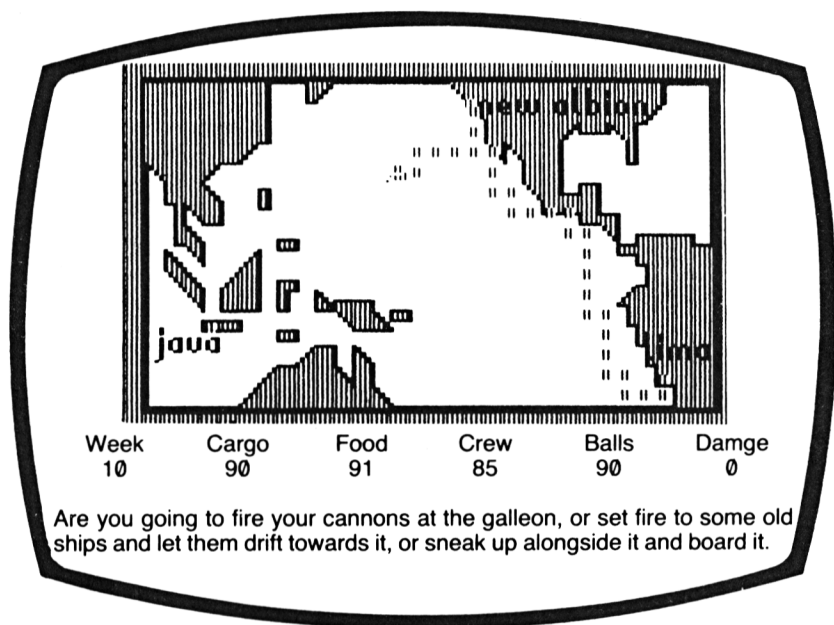
If the first number (A) is positive, the graph will point upwards (u shape), and if it is negative the graph will point downwards (n shape).

The Program

```
10 REM NAME THE GRAPH
20 REM (C) 1984 G. LUDINSKI
30 REM
40 BORDER 5:MODE 2
50 REM
60 REM DRAW AXES
61 REM
70 SYMBOL 240,30,16,16,16,16,16,16,16
80 SYMBOL 241,0,128,128,128,255,0,0,0
100 FOR X=1 TO 22:LOCATE 1,X:PRINT CHR$(
240);:NEXT X
110 FOR X=1 TO 32:LOCATE X,12:PRINT CHR$(
241);:NEXT X
120 REM
130 REM DRAW TARGET GRAPH
140 REM
150 A=INT(2*RND(1)+1.1):D=INT(5*RND(1)+2
.1)
160 C=INT(RND(1)*20)
170 FOR H=1 TO RND(1)*4+1:A=-A:D=-D:C=-C
:NEXT H
180 P=A:Q=D:R=C
190 AA=A:BB=D:CC=C
200 GOSUB 1000
210 REM
220 REM INPUT AND DRAW GUESSED GRAPH
230 REM
240 G=0
245 G=G+1:IF G=11 THEN CLS:PRINT "The an
swer was :";A;",";D;",";C;"          again (
Y/N) ";:INPUT Q$:IF LEFT$(Q$,1)<>"Y" AND
LEFT$(Q$,1)
<>"y" THEN END
246 IF G=11 THEN RUN
250 IF G<>1 THEN LOCATE 1,1:PRINT"Guess
";g;" Last guess = ";A$;",";B$;",";C$:IN
PUT A$;B$;C$:GOTO 270
255 LOCATE 1,1:PRINT"  Y=AX^2+BX+C      G
UESS A,B and C"
260 INPUT A$,B$,C$
```

```
270 IF A$="WHAT" AND B$="IS" AND C$="IT"
  THEN G=10:GOTO 245
280 J=VAL(A$):K=VAL(B$):L=VAL(C$)
295 AA=J:BB=K:CC=L
300 GOSUB 1000
305 IF J=A AND K=D AND L=C THEN CLS:PRINT
  "CORRECT":FOR F=0 TO 999:NEXT F:RUN
310 LOCATE 1,1:PRINT" Please wait
      ":GOSUB 1000
320 GOTO 250
1000 REM
1010 REM GRAPH
1020 REM
1040 FOR X=0 TO 300 STEP 3
1050 Y=(AA*X^2)/400+(BB*X)/10+CC+110
1060 IF Y>167 OR Y<0 THEN GOTO 1095
1090 PLOT 2*X,2*Y
1095 NEXT X
1100 RETURN
```

FRANCIS DRAKE ADVENTURE GAME



This is by far and away the most ambitious, interesting and testing program in this book.

This is an authentic historical adventure game based on Francis Drake's circumnavigation of the world, from 1577 to 1580. As you travel in the footsteps of the greatest of Elizabeth the First's free-booting adventurers, you will encounter the same problems and challenges as Drake.

Drake sailed in search of the elusive North West Passage that would allow him access to the Pacific, and the galleons of the Spanish Empire. As history books will already have told you, he did not find the object of his quest, but he did find much more, and so will you as you sail into the Francis Adventure Game.

How to play

First you will hear the gentle lapping of waves against the shore and you will see title. Then a map is displayed.

On the map you will see your position marked by a white sailing ship, docked near the port of Lima.

Everytime you use this game, the dangers and treasures will be located in different parts of the ocean, so do not think that you can predict your moves too easily. We didn't feel it was fair, however, to move the rocks and reefs during the game so try and remember their locations. It will help you considerably.

You **must** follow Drake's route by first travelling to the port known as New Albion and thence onward, past Java, to the bottom left hand corner of the map.

Your aim is to reach the bottom of the map with, at least, four times the amount of the cargo with which you began.

If you achieve this feat of daring then you will, naturally, be rewarded by the gift of a knighthood from your grateful, and avaricious, Queen.

You move using the ARROW cursor keys unshifted. That is, do **not** press the CAPS SHIFT key.

If the computer does not understand you, you will hear a beep. This also occurs when you run into a reef or rock.

At intervals you will be told the situation at sea and asked which action you would like to take, from the choice shown.

Remember to consider your options carefully as to the amounts of cargo, food, cannon balls and crew conditions.

Damage rating is based on a 1 to 10 scale. If you are damaged to the level of 10 then I'm afraid that it's into the sea for you, as the Golden Hind settles gently below your feet.

Do your best, as the present Government is emptying the coffers more quickly than you are filling them.

Hints and changes you can make

One of the problems of displaying a map on the screen, is how to reduce the memory required and the number of lines needed to describe the map. This is done here by defining a string array `m`, with the number of elements being equal to the number of rows on the map. Standard shapes that are not available from the keyboard are then defined. The shapes are as shown below. Each is assigned to an element of array `g$`.

131	140	133	138	212	214	213	215	143
								
<code>g\$(1)</code>	<code>g\$(2)</code>	<code>g\$(3)</code>	<code>g\$(4)</code>	<code>g\$(5)</code>	<code>g\$(6)</code>	<code>g\$(7)</code>	<code>g\$(8)</code>	<code>g\$(9)</code>

Each row of the map is assigned to an element of `m$` using the above shapes, and zero (to represent blanks).

If you find the adventure too easy, then reduce the cargo (`ca`), food (`su`), crew (`cr`), and/or cannon balls (`ba`) that you start with. They are on line 1130. If you find that knighthood escapes you, then reduce the 400 in line 1180.

The Program

```

10 REM Francis Drake Adventure Game
20 REM (C) 1984 G. LUDINSKI
30 MODE 1:BORDER 0
40 GOSUB 2550
70 REM
80 DIM M$(17),G$(9)
90 CLS:PEN 3:PAPER 1
100 CLS
110 G$(1)=CHR$(131)
120 G$(2)=CHR$(140)
130 G$(3)=CHR$(133)

```

```

140 G$(4)=CHR$(138)
150 G$(5)=CHR$(212)
160 G$(6)=CHR$(214)
170 G$(7)=CHR$(213)
180 G$(8)=CHR$(215)
190 G$(9)=CHR$(143)
290 M$(1)=" 999999304500000007999999999990
00 "
300 M$(2)=" 999999300000000000799999999950
00 "
310 M$(3)=" 99999930000000000009999517300
00 "
320 M$(4)=" 99999500000000000007799000300
00 "
330 M$(5)=" 7995000000000000000099000000
00 "
340 M$(6)=" 09980030000000000000079290000
00 "
350 M$(7)=" 0479000000000000000001192000
00 "
360 M$(8)=" 04800002000000000000000007022
20 "
370 M$(9)=" 0870060000000000000000000199
99 "
380 M$(10)=" 0780690200000000000000000004
999 "
390 M$(11)=" 0070990308220000000000000069
999 "
400 M$(12)=" 0002200000798100000000000049
999 "
410 M$(13)=" 0000000100000000000000000009
999 "
420 M$(14)=" 0000000069080000000000000004
999 "
430 M$(15)=" 0000006999890000000000000000
999 "
440 M$(16)=" 0000069999998000000000000000
099 "
450 FOR J=1 TO 16:PRINT CHR$(64+J); " ";
FOR I=2 TO 31:P=VAL(MID$(M$(J),I,1)):IF
P=0 THEN PRINT " ";:GOTO 470
460 PRINT G$(P);
470 NEXT I
480 PRINT
490 NEXT J

```

```

500 PAPER 0:PEN 1:LOCATE 20,1:PRINT".New
  Albio";:PAPER 1:PEN 0:PRINT"n":PEN 2:LO
  CATE 26,15:PRINT"Lima";:PEN 1:PAPER 0:PR
  INT".":PEN 2
  :PAPER 1:LOCATE 3,13:PRINT"Java"
520 PEN 3:PAPER 0:PLOT 30,94:DRAWR 480,0
  :DRAWR 0,256:DRAWR -46,0:PLOT 30,94:DRAW
  R 0,256:DRAWR 272,0
522 PAPER 3:PEN 0:LOCATE 1,17:PRINT"Fran
  cis Drake left Plymouth in 1577 to sear
  ch for the North-West passage to thePaci
  fic.He encou
  ntered stormy weather inthe Straits of M
  agellan and lost two  ships.Then the w
  ind dropped "
740 S$=" "
780 AL=0
790 DEF FNR(N)=INT(RND(1)*N+1)
800 SYMBOL 240,&10,&5A,&5B,&52,&57,&FE,&
  7E,&3E
860 H$=CHR$(240)
870 L$=CHR$(242):T$=CHR$(243):D$=CHR$(24
  1):U$=CHR$(240)
1020 M$(15)=" 00000069999890000000000000"+S
  TRING$(4,CHR$(240))+"999 "
1030 M$(16)=" 00000699999980000000000000"+S
  TRING$(5,CHR$(240))+"99 "
1040 FOR Y=1 TO 16
1050 FOR X=2 TO 31
1060 C$=MID$(M$(Y),X,1)
1070 IF C$="9" THEN GOTO 1120
1080 IF C$="0" THEN IS=INT(7*RND(1)):GOS
  UB 2170:GOTO 1120
1090 IF C$=CHR$(240) THEN IS=4:GOSUB 217
  0:GOTO 1120
1100 IF (X>4 AND X<15 AND Y>7 AND Y<14)
  THEN IS=INT(2*RND(1)+7):GOSUB 2170:GOTO
  1120
1110 IS=10:GOSUB 2170
1120 NEXT X:NEXT Y
1130 CA=100:SU=100:CR=85:BA=100:DA=0:WK=
  1
1140 EN=0
1150 X=29:Y=16:X1=29:Y1=16
1160 IF WK=1 THEN PAPER 0:PEN 3:LOCATE X
  +2,Y:PRINT H$

```

```

1170 PAPER 2:PEN 0:LOCATE 1,17:PRINT "We
ek Cargo Food Crew Balls Damg.
";
1172 IF WK=1 THEN GOSUB 1710
1180 IF X=1 AND Y=16 THEN PAPER 0:LOCATE
1,19:PRINT"You have survived the unknow
n and now know you are the first fleet
commander
to sail around the world.":IF CA>=400 T
HEN PRINT"Arise Sir Francis":GOTO 2210
1190 IF X=1 AND Y=16 THEN EN=1
1200 IF (X=17 AND Y=1) OR (X=18 AND Y=2)
OR (X=19 AND Y=4) THEN AL=1
1210 IF X<15 AND AL=0 THEN GOSUB 1710:LO
CATE 1,19:PRINT "Go back to New Albion"
1220 IF SU<=0 THEN GOSUB 1710:LOCATE 1,1
9:PRINT"Your food has been used up so yo
ur crew mutinies, and kills you":SU=0:EN
=1
1230 IF CR<=0 THEN GOSUB 1710::LOCATE 1,
19:PRINT"Your crew have all been killed
or have died of scurvy,typhus or dysent
ery. You are
stranded without them.":CR=0:EN=1
1240 IF DA>10 THEN GOSUB 1710:LOCATE 1,1
9:PRINT"Your ship has filled with water
and sunk":EN=1
1250 IF BA<0 THEN BA=0
1270 PEN 0:PAPER 2:LOCATE 1,18:PRINT WK:
LOCATE 6,18:PRINT CA:LOCATE 12,18:PRINT
SU:LOCATE 17,18:PRINT CR:LOCATE 22,18:PR
INT BA:LOCAT
E 28,18:PRINT DA
1272 IF EN=1 THEN GOTO 2210
1280 I$=INKEY$:IF I$="" THEN GOTO 1280
1290 GOSUB 1710
1300 IF (X=1 AND I$=L$) OR (X=30 AND I$=
T$) OR (Y=1 AND I$=U$) OR (Y=16 AND I$=D
$) OR (I$<>U$ AND I$<>D$ AND I$<>L$ AND
I$<>T$) THEN
GOTO 1280
1310 IF I$=L$ THEN IF MID$(M$(Y),X-1,1)<
>"0" AND MID$(M$(Y),X-1,1)<>"9" AND MID$
(M$(Y),X,1)<>"2" THEN X=X-1

```



```

1320 IF I$=T$ THEN IF MID$(M$(Y),X+1,1)<
>"2" AND MID$(M$(Y),X+1,1)<>"9" AND MID$(
M$(Y),X,1)<>"0" THEN X=X+1
1330 IF I$=D$ AND (MID$(M$(Y+1),X,1)<>"3
" AND MID$(M$(Y+1),X,1)<>"9" AND MID$(M$(
Y),X,1)<>"1") THEN Y=Y+1
1340 IF I$=U$ THEN IF (MID$(M$(Y-1),X,1)
<>"1" AND MID$(M$(Y-1),X,1)<>"9" AND MID
$(M$(Y),X,1)<>"3") THEN Y=Y-1
1350 WK=WK+1
1360 IF DA<>0 THEN DA=DA+1
1370 SU=SU-1
1380 PAPER 0:PEN 3:LOCATE X1+2,Y1:PRINT
". ";
1390 LOCATE X+2,Y:PRINT H$
1400 IF X=X1 AND Y=Y1 AND WK<>1 THEN SOU
ND 1,100,30:GOSUB 1570:GOTO 1470
1410 IF MID$(M$(Y),X,1)="A" AND DA<>0 TH
EN DA=0:GOSUB 1710:LOCATE 1,19:PRINT"You
  have arrived at a port, so you can now
  get your sh
ip repaired":GOTO 1470
1420 MM$=MID$(M$(Y),X,1)
1425 IF MM$="4" THEN GOSUB 1710:GOTO 147
0
1430 IF MM$="5" THEN GOSUB 1750
1440 IF MM$="6" THEN GOSUB 1850
1450 IF MM$="7" THEN GOSUB 2110
1460 IF MM$="8" THEN GOSUB 2140
1470 X1=X:Y1=Y
1480 GOTO 1170
1490 REM INSTR SUBROUTINE
1500 P=INSTR(R$,C$)
1560 RETURN
1570 REM REEF SUBROUTINE
1580 W=INT(RND(1)*2)
1590 IF X<15 THEN E$="REEF":GOTO 1610
1600 E$="ROCK"
1610 GOSUB 1710
1620 IF W=0 THEN LOCATE 1,19:PRINT"There
  is a ";E$;" ahead.Turn around":GOTO 170
0

```

```

1630 LOCATE 1,19:PRINT"You have run agro
und on a ";E$;". Are you going to thro
w cargo and guns overboard,or put out an
chor to wind
ward"
1640 LOCATE 1,23:INPUT R$:C$="OVERB":GOS
UB 1500:IF P<>0 THEN R$=C$:GOTO 1670
1650 C$="ANCH":GOSUB 1500:IF P<>0 THEN R
$=C$:GOTO 1670
1660 SOUND 1,100,30:GOTO 1640
1670 IF R$="OVERB" THEN GOSUB 1710:CA=CA
-FNR(20):GOTO 1700
1680 W2=INT(RND(1)*2):GOSUB 1710:IF W2=0
THEN LOCATE 1,19:PRINT"You have broken
free without any significant dama
ge":GOTO 170
0
1690 LOCATE 1,19:PRINT>Your ship,the Gol
den Hind, is holed. Return to dry lan
d at once or it will sink":DA=
DA+1
1700 RETURN
1710 REM BLANK SUBROUTINE
1720 PAPER 0:LOCATE 1,19:PRINT SPACE$(16
0);
1730 PEN 2
1740 RETURN
1750 REM NAMESHIP SUBROUTINE
1760 GOSUB 1710
1770 IF RND(1)>0.5 THEN LOCATE 1,19:PRIN
T"You see a Spanish galleon,the Cacafueg
o.Are you going to attack it or ignore i
t":GOTO 1790
1780 LOCATE 1,19:PRINT>You see a Spansih
galleon,the Esprito Santo.Are you goi
ng to attack it or ignore it"
1790 LOCATE 1,22:INPUT R$:C$="ATTACK":GO
SUB 1500:IF P<>0 THEN R$=C$:GOTO 1820
1800 C$="IGNORE":GOSUB 1500:IF P<>0 THEN
R$=C$:GOTO 1820
1810 SOUND 1,100,30:GOTO 1790

```

```

1820 IF R$="ATTACK" AND BA<=0 THEN GOSUB
  1710:LOCATE 1,19:PRINT"You draw alongsi
de the galleon and then find you have no
cannonballs
left, so the spanish win the battle a
nd leave you to die":EN=1:GOTO 1840
1830 IF R$="ATTACK" THEN GOSUB 1710:LOCA
TE 1,19:PRINT"You fight a fierce battle
and finally take command of the galleo
n and transf
erits cargo to the hold of your ship":CA
=CA+FNR(20):BA=BA-FNR(20)
1840 RETURN
1850 REM SHIP SUBROUTINE
1860 GOSUB 1710
1870 LOCATE 1,19:PRINT"You see a Spanish
galleon. Are you going to attack it or i
gnore it"
1880 LOCATE 1,22:INPUT R$:C$="ATTACK":GO
SUB 1500:IF P<>0 THEN R$=C$:GOTO 1910
1890 C$="IGNORE":GOSUB 1500:IF P<>0 THEN
R$=C$:GOTO 1910
1900 SOUND 1,100,30:GOTO 1880
1910 IF R$="IGNORE" THEN RETURN
1920 GOSUB 1710
1930 LOCATE 1,19:PRINT"Are you going to
fire cannons at the galleon or set fi
re to some old ships and let them drif
t towards it
, or sneak up and board it"
1940 LOCATE 1,23:INPUT R$:C$="CANNON":GO
SUB 1500:IF P<>0 THEN R$=C$:GOTO 1980
1950 C$="FIRE":GOSUB 1500:IF P<>0 THEN R
$=C$:GOTO 1980
1960 C$="SNEAK":GOSUB 1500:IF P<>0 THEN
R$=C$:GOTO 1980
1970 SOUND 1,100,30:GOTO 1940
1980 GOSUB 1710
1990 IF R$<>"CANNON" THEN GOTO 2020
2000 IF RND(1)>0.5 THEN LOCATE 1,19:PRIN
T"Your ship gets holed and some of your
crew are shot.Return to dry land at on
ce":DA=DA+1:
BA=BA-FNR(20):CR=CR-FNR(10):GOTO 2020

```

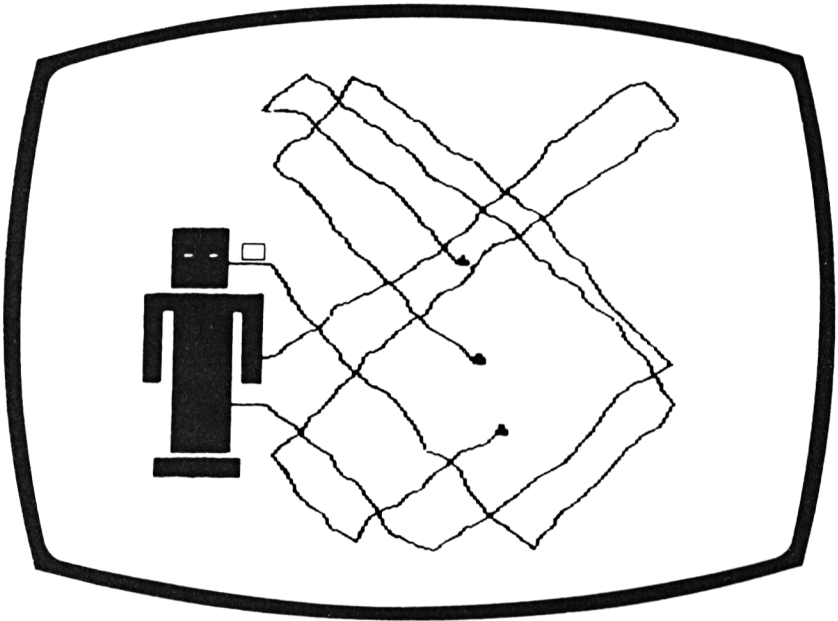
```

2010 LOCATE 1,19:PRINT"As your ship is s
maller and lower than the galleon, you
manage to put it out of action and board
it":CA=CA+F
NR(20):SU=SU+FNR(20):BA=BA+FNR(20)
2020 IF R$((">"FIRE)) THEN GOTO 2060
2030 GOSUB 1710
2040 IF RND(1)>0.5 THEN LOCATE 1,19:PRIN
T"The wind changes direction and the
burning ships move towards you setting
the mizzen
mast alight.Return to port atonce":DA=D
A+1:GOTO 2060
2050 LOCATE 1,19:PRINT"The burning ships
drift towards the galleon setting i
t alight. The captain surrenders and yo
u transfer h
is cargo to your hold":CA=CA+FNR(20):SU=S
U+FNR(20):BA=BA+FNR(20)
2060 IF R$((">"SNEAK)) THEN GOTO 2100
2070 GOSUB 1710
2080 IF RND(1)>0.5 THEN LOCATE 1,19:PRIN
T"They see you approaching and open fire
, shooting some of your crew and damagin
g your ship.
Return to port at once":BA=BA-FNR(20):D
A=DA+1:CR=CR-FNR(10):GOTO 2100
2090 LOCATE 1,19:PRINT"They assume you a
re Spanish as English ships have never
been this far before,so you board the gal
leon and cap
ture it":CA=CA+FNR(20):SU=SU+FNR(20):BA=
BA+FNR(20)
2100 RETURN
2110 REM TRADE SUBROUTINE
2120 GOSUB 1710:LOCATE 1,19:PRINT"You bu
y cloves cheaply from the islanders":CA=
CA+FNR(20):SU=SU+FNR(20)
2130 RETURN
2140 REM HOSTILE SUBROUTINE
2150 GOSUB 1710:LOCATE 1,19:PRINT"Hostil
e islanders pelt you with stones killing
some of your crew":CR=CR-FNR(20)
2160 RETURN
2170 REM SUBROUTINE

```

```
2180 IF IS<>10 THEN MID$(M$(Y),X,1)=CHR$(
  (IS+48):GOTO 2200
2190 MID$(M$(Y),X,1)="A"
2200 RETURN
2210 END
2550 REM TITLE SUBROUTINE
2560 CLS
2570 LOCATE 1,10
2580 PRINT"          FRANCIS DRAKE":LOC
  ATE 1,11
2590 LOCATE 1,20
2600 PAPER 2:PEN 0:PRINT "  COPYRIGHT (C
  ) 1984 G. LUDINSKI":PAPER 0:PEN 3
2605 IF INKEY$<>" " THEN GOTO 2605
2607 IF INKEY$="" THEN GOTO 2607
2610 RETURN
2670 RETURN
```

WIRE MAZE



Well at last you have your own robot to cut the grass, clean the car, wash the windows and take the dog for a walk. There is one snag, however.

Your robot has been wired up incorrectly. It must have been Friday afternoon when the other robots put your model together. At the moment, if you press the arm-control button the robot's legs move. You, I'm afraid, are going to have to rewire your new family friend.

How to play

As the program begins, your robot will be drawn on the screen. When the robot shape is completed, the screen will go black and the wiring will be added along with the control buttons. The robot,

complete with wires and buttons will reappear and you will then have to trace the wiring.

Control buttons are:

Red	1
Yellow	2
White	3

At the top of the screen will appear the word Head and the three colour buttons. You must decide which of these buttons is connected to the head and press the corresponding number key and ENTER. One wrong try means you must try again, and a subsequent wrong guess will cause your computer to give you the correct answer. If you think about it, if you have guessed two wrong from three, you should know the answer by now anyway.

You continue for the arms, legs.

To play again, with a different maze, press RUN.

Programming hints

You might find the wire maze too easy. It can be made more difficult by increasing the length of each wire by increasing the larger number in line 420.

The Program

```

10 REM WIRE MAZE
20 REM (C) 1984 G. LUDINSKI
30 DIM X(3),Y(3),W(3)
75 BORDER 5
80 MODE 2
90 REM
100 REM DRAW ROBOT
110 REM
130 A=70:B=550:C=125:D=125:GOSUB 680

```

```

140 A=0:B=500:C=275:D=35:GOSUB 680
150 A=0:B=350:C=35:D=150:GOSUB 680
160 A=240:B=350:C=39:D=150:GOSUB 680
170 A=75:B=350:C=125:D=150:GOSUB 680
180 A=75:B=200:C=125:D=150:GOSUB 680
190 A=35:B=150:C=200:D=35:GOSUB 680
200 REM
220 REM DECIDE WHICH CONTROLS CONNECT TO
    WHICH PARTS
230 REM
240 FOR I=1 TO 3
250 W(I)=INT(RND(1)*3)+1
260 IF (I=2 AND W(I)=W(1)) OR (I=3 AND (
W(I)=W(2) OR W(I)=W(1))) THEN GOTO 250
270 NEXT I
280 REM
290 REM DRAW WIRES
300 REM
320 X(1)=300:Y(1)=600:PLOT 40,100:DRAWR
X(1)/5-40,Y(1)/6-100
330 X(2)=300:Y(2)=400:PLOT 275/5,400/6:D
RAWR X(2)/5-275/5,Y(2)/6-400/6
340 X(3)=300:Y(3)=300:PLOT 40,50:DRAWR X
(3)/5-40,Y(3)/6-50
350 X1=1:Y1=1
390 FOR I=1 TO 3
400 X1=-X1:Y1=-Y1:XS=X1:YS=Y1
410 PLOT X(I)/5,Y(I)/6
420 FOR J=1 TO 100
430 DX=XS*INT(RND(1)*30+10)
440 IF ((X(I)+DX)<300 OR (X(I)+DX)>1200)
    THEN XS=-XS:GOTO 430
450 X(I)=X(I)+DX
460 DY=YS*INT(RND(1)*20+10)
470 IF ((Y(I)+DY)<80 OR (Y(I)+DY)>960) T
HEN YS=-YS:GOTO 460
480 Y(I)=Y(I)+DY
490 DRAWR DX/5,DY/6
500 NEXT J
510 REM
520 REM DRAW BUTTONS
530 REM
540 A=X(I):B=Y(I):C=20:D=10:GOSUB 680:A=
X(I)+5:B=Y(I)+10:C=10:D=10:GOSUB 680
550 LOCATE INT((X(I)/32)+1),26-INT(Y(I)/
68):PRINT W(I);

```

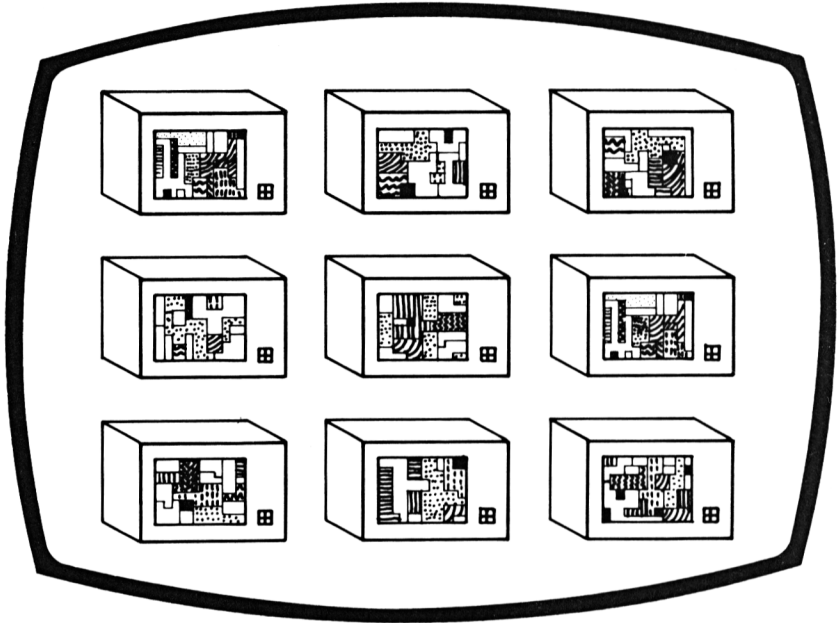


```

560 NEXT I
570 REM
580 REM WRITE QUESTIONS
650 REM
660 FOR I=1 TO 3:GOSUB 730:NEXT I
670 END
680 REM BLOCK SUB
690 A=A/5:B=B/6:C=C/5:D=D/6
700 PLOT A,B:DRAWR C,0:DRAWR 0,D:DRAWR -
C,0:DRAWR 0,-D
720 RETURN
730 REM QUESTION SUB
740 IF I=1 THEN P$="HEAD"
750 IF I=2 THEN P$="ARM "
760 IF I=3 THEN P$="LEG "
770 LOCATE 1,3:PRINT P$;" = 1 2 3"
780 LOCATE 1,5:PRINT"          ":PRINT"
"
790 T=1
800 INPUT A$:A$=LEFT$(A$,1):IF A$<"1" OR
A$>"3" THEN LOCATE 1,5:PRINT"No.":GOTO
800
810 IF VAL(a$)=w(i) THEN LOCATE 1,5:PRIN
T"yes          ":GOTO 840
820 LOCATE 1,5:PRINT"No, try again":IF T
=1 THEN T=2:GOTO 800
830 IF T=2 THEN LOCATE 1,5:PRINT"answer
= ";W(I);"          ";
835 FOR Z=1 TO 500:NEXT Z
840 RETURN

```

PATTERN PAIRS



If you have tried Odd One Out in this book, then you will find this following puzzle a little more difficult.

There are nine patterns displayed on the screen, in a range of colours, and you have only a few seconds to compare them and nominate the pair, you believe, are a match.

How to play

Identify your pair, note the numbers alongside and key in your answer. You don't have to key in your answer in strict chronological order. Just punch in your numbers and wait. Correct responses will be awarded with a pleasant little high pitched tune, but wrong answers will be faced with a low pitched little dirge.

To continue, press Y for Yes and to stop, press N for No, remembering to press ENTER after your response.

A score sheet will appear at the end showing your tries, results, time and average time.

Programming hints

Each of the patterns is slightly different except for the matching pair. This is done by displaying rows of graphic characters with different INK and PAPER colours.

To reduce the time allowed to spot the matching pair reduce the 600 in line 430.

The Program

```

10 REM PATTERN PAIRS
20 REM (C) 1984 G. LUDINSKI
30 BORDER 7:MODE 1
50 DEF FNR(Z)=INT(RND(1)*Z+1)
60 DEF FNT=INT(TIME/500)
90 DIM C(2,9),G(16)
100 REM
110 NU=0:CR=0
120 T1=FNT
130 CLS
140 NU=NU+1
150 FT=1
160 REM
170 REM DRAW TELEVISION
180 REM
190 W=112:H=54:FOR Y=276 TO 108 STEP -80
:FOR X=20 TO 510 STEP 176
200 PLOT X,Y:DRAWR W+20,0:DRAWR 0,H:DRAW
R -W-20,0:DRAWR 0,-H
210 PLOT X+10,Y+10:DRAWR W-36,0:DRAWR 0,
H-20:DRAWR -W+36,0:DRAWR 0,-H+20
220 PLOT X,Y:DRAWR -10,10:DRAWR 0,H:DRAW
R 10,-10:DRAWR -10,10:DRAWR W+20,0:DRAWR
10,-10

```

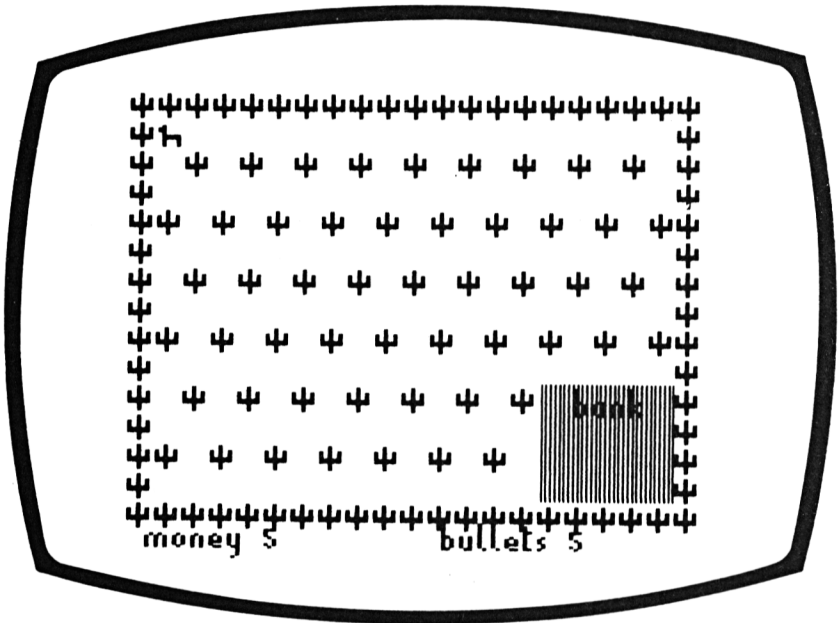
```

230 NEXT X
240 NEXT Y
250 REM
260 REM GENERATE TESTCARDS
270 REM
280 W1=FNR(9)
290 W2=FNR(9):IF W2=W1 THEN GOTO 280
300 W$=CHR$(W1+48)+CHR$(W2+48)
310 V$=CHR$(W2+48)+CHR$(W1+48)
320 RD=INT(RND(19*47)+11)
330 REM
340 REM DRAW TESTCARDS
350 REM
360 GOSUB 640
370 REM
380 REM QUESTION
390 REM
400 LOCATE 1,20:PRINT"      Which two are
the same"
410 R$="":I=0:IC=0
420 IF INKEY$<>" " THEN GOTO 420
430 I$=INKEY$:IF (I$="" OR I$<"1" OR I$>
"9") AND I<600 THEN I=I+1:GOTO 430
435 IF I=600 THEN GOTO 480
440 PRINT I$;
450 IF IC=0 THEN IC=IC+1:R$=I$:GOTO 420
460 R$=R$+I$
470 IF R$=W$ OR R$=V$ THEN PRINT:PRINT"Y
es, you are right":SOUND 1,120,20:CR=CR+
1:GOTO 490
480 PRINT:PRINT"No, ";W1;" and ";W2;" are
the same":SOUND 1,50,10:SOUND 1,40,5
490 PRINT:PRINT"Do you want more (Y/N)"
500 INPUT R$
510 IF R$<>"n" AND R$<>"N" THEN GOTO 130
520 REM
530 REM SCORE SHEET
540 REM
550 CLS
560 LOCATE 10,4:PRINT"PATTERN PAIRS"
570 LOCATE 1,11
580 PRINT"Tests completed = ";NU
590 TM=FNT-T1
600 PRINT:PRINT"Tests correct = ";CR
610 PRINT:PRINT"Time taken = ";tm

```

```
620 IF CR<>0 THEN PRINT:PRINT"Time per t
est = ";INT(TM/CR)
630 GOTO 800
640 REM TESTCARD SUBROUTINE
650 FOR Q=9 TO 19 STEP 5
660 FOR K=3 TO 33 STEP 11
670 LOCATE K+6,Q-4:PRINT CHR$(PT+48);:PE
N 2:PAPER 5:LOCATE K+6,Q-2:PRINT "?"
680 CS=PT+RD:GS=PT:IF PT=W1 OR PT=W2 THE
N CS=RD:GS=0
690 FOR T=1 TO 2
700 FOR B=0 TO 3
710 CS=CS+1:IF CS>66 THEN CS=11
720 GS=GS+1:IF GS>16 THEN GS=1
730 QQ=INT(CS/10):PEN QQ:PAPER CS-10*QQ:
LOCATE K+B,Q-T-1:PRINT CHR$(127+GS)
740 NEXT B
750 NEXT T
760 PEN 1:PAPER 0:PT=PT+1
770 NEXT K
780 NEXT Q
790 RETURN
800 REM END
```

WESTERN ADVENTURE GAME



Your rough, tough and ready desperado colleagues have fled into the scrubland, dropping their guns and the loot.

Well we all know that a man, or a Calamity Jane, has got to do what ever it is. So, you are on your own outside the bank and you have to make it to the horses, which some idiot left on the outskirts of town.

On the way you can collect money and guns with bullets and then decide, if you run into the Sheriff's posse, whether to bribe or blast your way to freedom. Obviously your aim is to reach the horses with some bullets and some money.

We are not advocating here that crime pays — that is up to you.

How to play

Use the ARROW keys to make your moves. However you need not press the SHIFT key with the ARROW keys. When you have read each message on the screen press ENTER.

Your footsteps will appear on the screen as you move toward the horse in the top left hand corner of the screen.

Your progress will be recorded on the bottom of the screen, and you will, in your progress, be told that you have run into the posse, and you will then be asked if you intend to shoot or bribe your way out.

Key in 'shoot' or 'bribe' then press the ENTER key.

Should you run out of bullets I'm afraid that a lynching is your fate, as the posse were playing poker when you robbed the bank, and the Sheriff had a Royal Flush.

If you key in an incorrect response a note is played. This is different to the shooting noise that you hear after you shoot someone or get shot.

Programming hints

You can increase the number of events in the adventure by allowing w on line 440, to be larger.

A subroutine describing the event, and the effect of it, on the money and bullets can be written.

The new subroutines can be called after line 480 and included after any of the subroutines.

Remember that

bu is number of bullets

mo is money

x is the random amount to increase/decrease

The Program

```

10 REM WESTERN ADVENTURE GAME
20 REM (C) 1984 G. LUDINSKI
30 BORDER 6:MODE 1
40 X0=25:Y0=17
70 REM
80 CLS
90 REM
100 REM CACTUS AND HORSE
110 REM
120 SYMBOL 240,&DB,&DB,&DB,&FF,&FF,&18,&
18,&18
130 SYMBOL 241,0,0,&60,&70,&5F,&1F,&11,&
11
190 PEN 1:FOR I=1 TO 570:IF RND(1)>0.9 T
HEN PRINT CHR$(240); ELSE PRINT " ";
192 NEXT I
200 LOCATE 2,2:PRINT CHR$(241)
210 REM
260 REM DRAW BLANK
270 REM
280 PAPER 0:PEN 3:LOCATE 28,16:PRINT "
":LOCATE 28,17:PRINT"BANK":LOCATE 38,1
8:PRINT"      ":PEN 1
290 REM
300 REM
310 BU=5:MO=5:DD=1
320 GOSUB 710:LOCATE 1,20:PRINT DD;" ) Mo
ney = ";MO;" Bullets = ";BU
330 IF BU<=0 THEN GOSUB 740:PRINT"You ge
t shot.You have travelled ";DD;" yds>":G
OTO 780
340 IF X0=1 AND Y0=1 THEN GOTO 780
350 X=INT(RND(1)*5+2)
360 T$=INKEY$:IF T$="" THEN GOTO 360
370 IF T$<CHR$(240) OR T$>CHR$(243) THEN
SOUND 1,200,10:GOTO 360
380 IF T$=CHR$(242) AND X0<>0 THEN X0=X0
-1

```



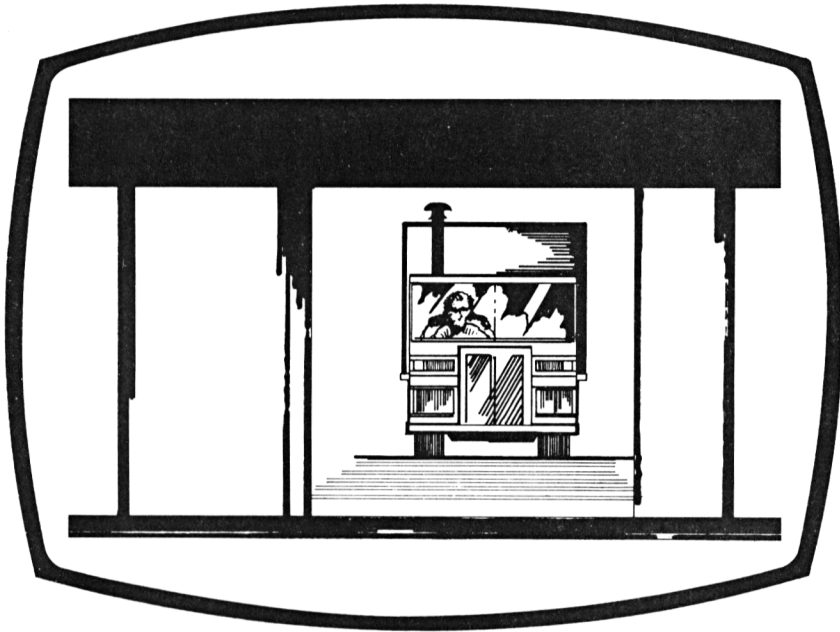
```

390 IF T#=CHR$(243) AND XO<>39 THEN XO=X
O+1
400 IF T#=CHR$(240) AND YO<>0 THEN YO=YO
-1
410 IF T#=CHR$(241) AND YO<>17 THEN YO=Y
O+1
420 LOCATE XO+1,YO+1:PRINT CHR$(241)
430 DD=DD+1
440 W=INT(RND(1)*4+1)
450 PEN 2
460 IF W=1 THEN GOSUB 510
470 IF W=2 THEN GOSUB 610
480 IF W=3 THEN GOSUB 660
490 GOTO 320
500 REM
510 REM POSSE SUBROUTINE
520 LOCATE 1,21:PRINT"You meet one of th
e sherriff's posse. Do you shoot or brib
e ?"
530 INPUT i$
540 IF I$<>"SHOOT" AND I$<>"BRIBE" AND I
$<>"shoot" AND i$<>"bribe" THEN SOUND 1,
220,10:GOTO 530
550 IF (I$="bribe" OR I$="BRIBE") AND MO
<=0 THEN SOUND 1,220,10:GOTO 530
555 IF (I$="SHOOT" OR i$="shoot") AND BU
<=0 THEN SOUND 1,220,10:GOTO 530
560 IF I$="SHOOT" OR I$="shoot" THEN GOS
UB 740:BU=BU-X
570 IF I$="BRIBE" OR I$="bribe" THEN MO=
MO-X
580 IF BU<0 THEN BU=0
590 IF MO<0 THEN MO=0
600 RETURN
610 REM BULLETS ROUTINE
620 LOCATE 1,21:PRINT"You find ";X;" bul
lets that your gang has left behind"
630 BU=BU+X
640 IF INKEY$<>" " THEN GOTO 640
645 IF INKEY$="" THEN GOTO 645
650 RETURN
660 REM MONEY SUBROUTINE
670 LOCATE 1,21:PRINT"You find ";X;" bag
s of money that your gang has left behin
d"

```

```
680 MD=MD+X
690 IF INKEY$<>" THEN GOTO 690
695 IF INKEY$="" THEN GOTO 695
700 RETURN
710 REM BLANK SUBROUTINE
720 LOCATE 1,20:PRINT "
";
730 RETURN
740 REM GUNSHOT NOISE SUBROUTINE
750 SOUND 130,0,35,15,2,0,15
760 RETURN
780 REM GAME FINISHED
790 END
```

FRACTION CAR CHASE



We might have named this program 'Duel' after the film of the same name as, like the hero of the film, you are being chased by a juggernaut driver.

As you turn right, the juggernaut turns right; turn left and it still follows you.

Coming up in the near distance is an archway. You **must** escape through the arch before the lumbering truck rolls over you.

Your only answer is to work out how far across the road the centre of the arch is. Guess wrongly and you hit the arch damaging your car. Too many wrong guesses and your car will be immobilised leaving you the defenceless victim of the fast approaching juggernaut.

How to play

The computer will think of a number whose numerator (top half) and denominator (bottom half) are both less than ten. You must guess the correct fraction and enter it in using the / symbol (eg 2/3) and ENTER. If your guess is too big, or small, you will be told. The guess closest to the correct answer, will be displayed on the arch. The lower guess will be shown on the left hand pillar and the higher guess, closest to the correct answer, will be shown on the right hand pillar.

If your answer is displayed on the arch then you know that you are almost correct. You have nine lives.

This is more difficult than it sounds, after all do you know which is the larger, 3/8 or 4/9? You will be amazed at what you find out about fractions. A hint is that to make a fraction bigger, increase its numerator (top half) or reduce its denominator (bottom half) or both. Do the opposite to make a fraction smaller.

Programming hints

To make the game easier, reduce the range of fractions allowed. This is done by reducing the tens in line 255. To make it more difficult you may increase these numbers to maximum values of 99 each.

If you want to allow more guesses, increase the 9 in line 300.

The Program

```

10 REM FRACTION CAR CHASE
20 REM (C) 1984 G. LUDINSKI
30 DEF FND$(I$,N)=LEFT$(I$,N)
40 DEF FNE$(I$,N)=MID$(I$,N)
50 BORDER 13:MODE 1
60 DEF FNB$(N$,N,A)=MID$(N$,N,A)

```

```

70 TF=0
80 FOR L=0 TO 7
90 TF=TF*(2^L)*VAL(FNB$(N$,8-L,1))
100 NEXT L
130 SYMBOL 240,0,0,126,66,255,255,255,66
150 CLS:MX=10:MN=0:A$=CHR$(240):M$="0":B
$=" ":X$="1":Z$=" "
160 REM DRAW ARCH
170 REM
190 X=94:FOR Y=94 TO 318 STEP 2:R=80
200 PLOT X,Y:DRAWR R,0:NEXT Y
210 X=366:FOR Y=94 TO 318 STEP 2:R=80
220 PLOT X,Y:DRAWR R,0:NEXT Y:IF Y=318 T
HEN GOTO 230
230 X=174:FOR Y=254 TO 318 STEP 2:R=192
240 PLOT X,Y:DRAWR R,0:NEXT Y:IF Y=318 T
HEN GOTO 230
250 REM THINK OF A FRACTION
255 F=INT(RND(1)*9+1):G=INT(RND(1)*9)+1
260 GOSUB 820
270 IF F/G>1 OR F/G=INT(F/G) OR G/F=INT(
G/F) THEN GOTO 255
280 IF G<F THEN H=G:G=F:F=H
290 LOCATE 17,16:PRINT A$
300 FOR T=1 TO 9
310 REM
320 LOCATE 1,22:PRINT"Guess the fraction
. Use /      "
330 INPUT I$:IF I$="" THEN GOTO 330
340 REM CHECK ENTRY
350 FOR I=1 TO 3
360 C$=FNB$(I$,I,1)
370 IF I=2 AND C$<>"/" THEN GOTO 400
375 IF (I=1 OR I=3) AND (C$<"1" OR C$>"9
") THEN GOTO 400
380 NEXT I
390 K$=FND$(I$,1):D$=FNE$(I$,3):GOTO 420
400 SOUND 1,100,3:SOUND 1,230,5:SOUND 1,
40,7:LOCATE 1,22:PRINT"ERROR, WRONG FORM
AT USE ""a/b"":FOR Q=1 TO 1000:NEXT Q:G
OTO 320
420 REM
430 REM DISPLAY FRACTION BETWEEN ARCH
440 REM
450 LOCATE 17,10:PRINT K$:LOCATE 16,11:F
RINT"---":LOCATE 17,12:PRINT D$

```

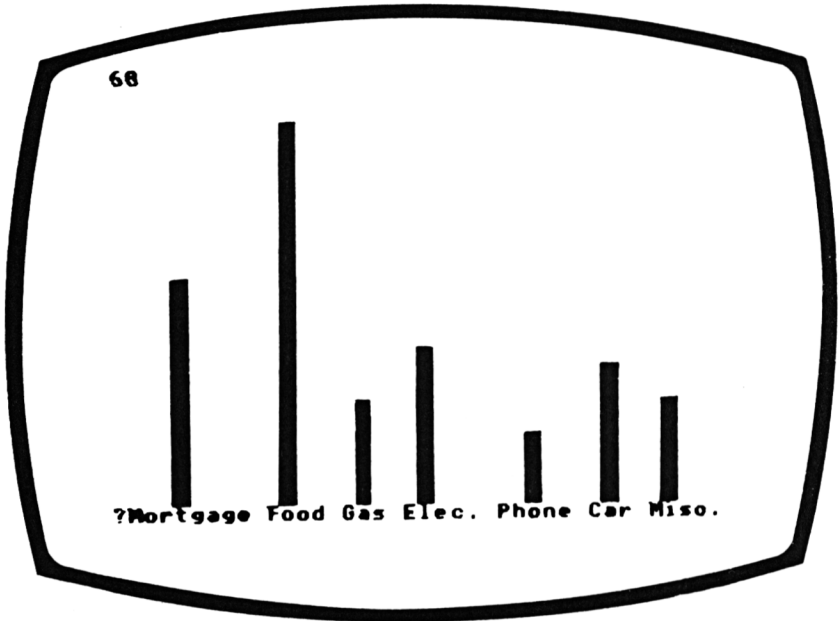
```

460 LOCATE 13,1:PRINT "Guess ";T
470 IF VAL(K$)=F AND VAL(D$)=G THEN LOCA
TE 11,2:PRINT"That's right":GOSUB 790:GO
TO 600
490 REM SET V TO THE VALUE OF THE I$ FRA
CTION
491 II=INSTR(I$,"/"):IF II=0 THEN GOTO 3
20
492 XI=VAL(LEFT$(I$,II-1))
493 YI=VAL(MID$(I$,II+1))
495 V=XI/YI
510 IF V<F/G THEN LOCATE 13,2:PRINT"Too
small":P$=A$:O$=" ":U$=" ":GOSUB 790
520 IF V>F/G THEN LOCATE 13,2:PRINT"Too
big ":P$=" ":O$=" ":U$=A$:GOSUB 790
530 IF V<MX AND V>F/G THEN MX=V:X$=K$:Z$
=D$:GOTO 570
540 IF V>MN AND V<F/G THEN MN=V:M$=K$:B$
=D$
550 LOCATE 9,12:PRINT M$
560 LOCATE 8,13:PRINT"----":LOCATE 9,14:P
RINT B$:GOTO 630
570 LOCATE 26,12:PRINT X$
580 LOCATE 25,13:PRINT"----":LOCATE 26,14
:PRINT Z$
590 GOTO 630
600 LOCATE 1,21:PRINT "
":LOCATE 1,22:PRINT"You
  escaped - Phew!
":GOTO 700
610 INPUT"Another guess (Y/N) ";r$
620 IF R$="N" OR R$="n" THEN GOTO 680
630 NEXT T
650 REM
660 REM END OF GUESSES
670 REM
680 LOCATE 1,21:PRINT"
":LOCATE 1,22:PRINT"The juggern
aut closes in
"
690 PRINT"The fraction is ";F$;"/";G$;
"
700 INPUT"Do you want more (Y/N) ";r$
710 IF R$<>"N" AND R$<>"n" THEN GOTO 150
720 GOTO 870
730 END

```

```
790 REM CAR
800 LOCATE 9,16:PRINT F$:LOCATE 17,16:PR
INT O$:LOCATE 26,16:PRINT U$
810 RETURN
820 REM REDUCE
830 FOR I=2 TO 9
840 IF F/I=INT(F/I) AND G/I=INT(G/I) THE
N F=F/I:G=G/I:GOTO 840
850 NEXT I
860 RETURN
870 END
```

BAR CHARTER



This is a versatile program that will enable you to record your expenses, club accounts or any collections you have. You could also use the printouts to impress the boss. It is easy to use and allows a maximum of 32 bars to be drawn. As you key in data you watch the bar chart grow.

How to use it

First you are asked for the labels of the bars in the bar chart. There may be any number but all the labels must fit on one display line. When you have keyed in a line of labels press ENTER once. Then you use the left and right ARROW keys to move a pointer at the bottom of the screen. When the pointer (symbol ↑ is positioned under the label you wish to point to, press 7 and the bar above that

label will increase in height. Press ↓ and the bar will decrease in height. Press 'K' to save the charts as a SCREEN\$. Press 'Z' to copy the screen via the printer and press 'H' to give height of column marked with arrow. Remember to use Caps. Shift.

The Program

```

10 REM BAR CHARTER
20 REM (C) 1984 G. LUDINSKI
30 REM
40 BORDER 8:MODE 1
50 DIM Y(32)
60 X=16:FOR F=1 TO 19:Y(F)=0:NEXT F
70 REM
80 REM INPUT LABELS
90 REM
100 INPUT"What are the Labels          ";A$
110 LOCATE 2,21:PRINT A$
120 LOCATE X+1,22:PRINT"^"
130 CLS
140 FOR F=1 TO 20:LOCATE 1,F:PRINT"-":NEXT F
150 REM KEY IN DATA
160 REM
170 FOR Q=1 TO 300:NEXT Q
180 B$=INKEY$:IF B$="" THEN GOTO 180
190 IF B$=CHR$(242) OR B$=CHR$(243) THEN
  GOSUB 320:GOTO 150
200 IF B$<>CHR$(240) THEN GOTO 230
210 Y(X)=Y(X)+1:IF Y(X)>19 THEN Y(X)=Y(X)-1:LOCATE 1,22:PRINT"COLUMN TOO HIGH ":
GOTO 150
220 GOSUB 410:GOTO 150
230 IF B$<>CHR$(241) THEN GOTO 260
240 Y(X)=Y(X)-1:IF Y(X)<0 THEN Y(X)=Y(X)+1:GOTO 150
250 GOSUB 410:GOTO 150
260 REM
270 IF B$="H" THEN GOSUB 460
280 GOTO 150
290 REM

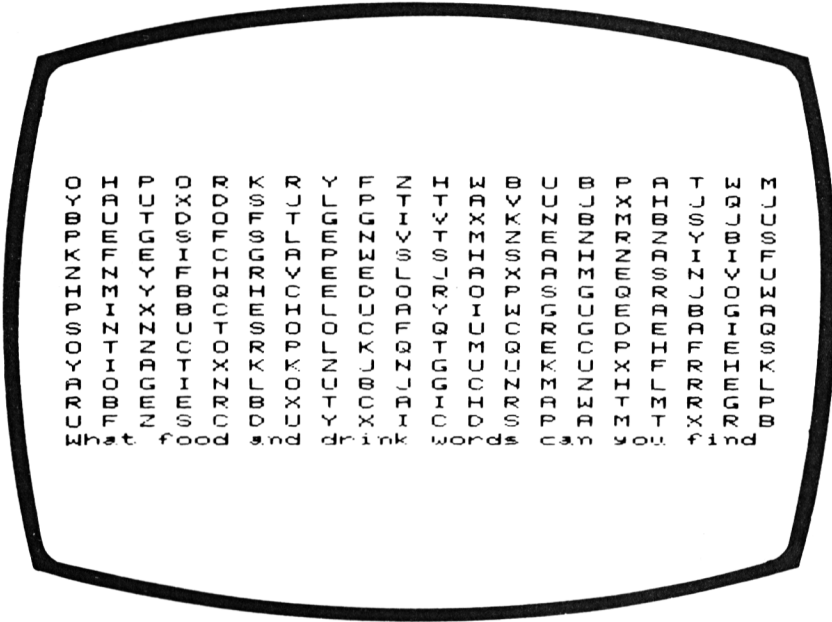
```

```

300 REM MOVE ARROW
310 REM
320 IF B#=CHR$(242) AND X=1 THEN RETURN
330 IF B#=CHR$(243) AND X=31 THEN RETURN
340 IF B#=CHR$(242) THEN X=X-1
350 IF B#=CHR$(243) THEN X=X+1
360 LOCATE 1,22:PRINT SPC(39)
370 LOCATE X+1,22:PRINT"^"
380 IF INKEY$("<>") THEN GOTO 380
390 IF INKEY$="" THEN GOTO 390
400 RETURN
410 REM
420 REM DRAW COLUMN
430 REM
440 FOR F=19 TO 20-Y(X) STEP -1:LOCATE X
+1,F+1:PRINT " ":NEXT F
450 FOR F=(19-Y(X)) TO 0 STEP -1:LOCATE
X+1,F+1:PRINT " ":NEXT F:RETURN
460 REM
470 REM GIVE COLUMN HEIGHT
480 REM
490 LOCATE 1,22:PRINT"HEIGHT OF """;MID$
(A$,X,1);""="";Y(X);" UNITS ( hit ""C""
)"
500 RETURN

```

WORD SEARCH



This is a brainteaser you have probably come across in puzzle magazines, but that doesn't make it any easier.

The words which are hidden in the screen spaghetti are all four letter — related to food or drink.

How to play

When you have found one of the twenty words on the screen, key it in and press ENTER.

If your guess is correct your word will be ticked, if wrong it will be crossed. Your score will be displayed at the top.

To change the screen key in NEXT and press ENTER.

Programming hints

Two methods are used to reduce the memory required in this program. First, all the numerical arrays are integer arrays. Secondly the possible words are stored one after another in a string, instead of an array.

Another change that you could make is to alter the words that can be found. There are 57 of them in order to make the puzzles as random as possible. These words are stored in the variable W\$ on line 70. If you think of other four-letter words to do with food and drink, then just replace some of the words with those you have chosen. If you want to put in words on a different subject, then think of a subject and replace words in W\$ with your words all joined together. Remember there must be 57 of them, and they must all have four letters.

If you wish to use longer or shorter words, all words must still be of the same length as each other. Change the words in W\$ so the total number of letters is still the same.

The Program

```
10 REM WORD SEARCH
20 REM (C) 1984 G. LUDINSKI
30 MODE 1
40 DIM L$(24,18):DIM C$(20,14)
50 DIM E$(80):DIM D$(4)
60 DIM F$(20)
```

```

70 W$="FISHMEATCAKESOUPPEASSALTCHOPCORNW
INEBEERLIMEBRANBEANVEALROLLHAKEPIKEROCKS
PAMMALTROLLMINTLAMBPOPKBEEFTARTCANENUTST
UNARICESAKIS
AGOLOAFGAMEHERBPEARMLKLRDCHIPSTEWQATSP
ATESAGEMACECRABMASHCOLAPITHPEELSOYALEEKD
UCKDILLYOLKBALMSUETSODA"
80 P$=CHR$(240)+SPACE$(19)
90 REM
100 REM GENERATE LETTERS
110 REM
120 CLS
130 E$=SPACE$(80)
140 CR=0
150 FOR I=1 TO 14
160 FOR J=1 TO 20
170 L$(J,I)=" "
180 C$(J,I)=CHR$(0)
190 NEXT J
200 NEXT I
210 FOR I=1 TO 20
220 D=INT(RND(1)*3+1)
230 R=INT(RND(1)*10+1):IF D=2 THEN R=INT
(RND(1)*14+1)
240 C=INT(RND(1)*16+1):IF D=1 THEN C=INT
(RND(1)*20+1)
250 ID=4*INT(RND(1)*57)+1
260 FOR Q=0 TO I-1:IF ID=ASC(MID$(P$,Q+1
,1)) THEN GOTO 250
270 NEXT Q
280 MID$(P$,I,1)=CHR$(ID)
290 D$=MID$(W$,ID,4)
300 IF D=1 AND L$(C,R)=" " AND L$(C,R+1)
=" " AND L$(C,R+2)=" " AND L$(C,R+3)=" "
THEN FOR K=0 TO 3:L$(C,R+K)=MID$(D$,K+1
,1):C$(C,R+K
)=CHR$(I):NEXT K:GOTO 340
310 IF D=2 AND L$(C,R)=" " AND L$(C+1,R)
=" " AND L$(C+2,R)=" " AND L$(C+3,R)=" "
THEN FOR K=0 TO 3:L$(C+K,R)=MID$(D$,K+1
,1):C$(C+K,R
)=CHR$(I):NEXT K:GOTO 340
320 IF D=3 AND L$(C,R)=" " AND L$(C+1,R+
1)=" " AND L$(C+2,R+2)=" " AND L$(C+3,R+
3)=" " THEN FOR K=0 TO 3:L$(C+K,R+K)=MID
$(D$,K+1,1):

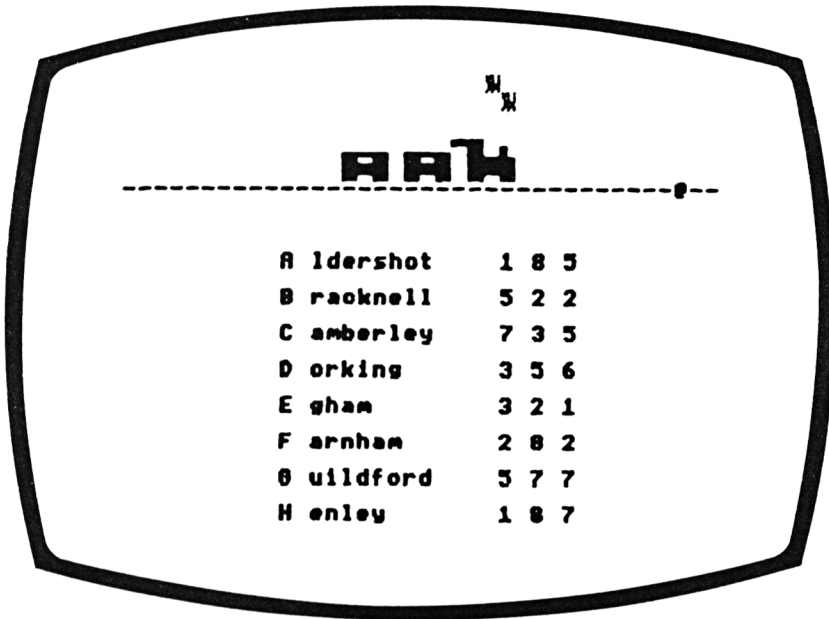
```

```

C$(C+K,R+K)=CHR$(I):NEXT K:GOTO 340
330 GOTO 220
340 MID$(E$,I*4-3,4)=D$
350 NEXT I
360 REM
370 REM DISPLAY LETTERS
380 REM
390 FOR I=1 TO 14
400 FOR J=1 TO 20
410 IF L$(J,I)=" " THEN LOCATE J,I:PRINT
CHR$(65+INT(RND(1)*26));:GOTO 430
420 LOCATE J,I:PRINT L$(J,I);
430 NEXT J
440 NEXT I
450 REM
460 REM CHECK ANSWER
470 REM
480 FOR N=1 TO 20
490 LOCATE 1,20:PRINT"What food and drink
k words can you find"
500 PRINT"          ":LOCATE 1,21:INPU
T I$
510 LOCATE 1,20:PRINT"
          "
520 IF I$="NEXT" THEN GOTO 120
530 FOR M=1 TO 77 STEP 4
540 IF I$<>MID$(E$,M,4) THEN GOTO 630
550 LOCATE 24,11:PRINT"CORRECT":LOCATE 2
6,13:PRINT I$;:CR=CR+1:LOCATE 24,6:PRINT
"SCORE :";CR;
560 FOR I=1 TO 14
570 FOR J=1 TO 20
580 IF C$(J,I)=CHR$( (M+3)/4) THEN LOCATE
J,I:PRINT " ";
590 NEXT J
600 NEXT I
610 MID$(E$,M,4)="          "
620 GOTO 660
630 NEXT M
640 LOCATE 24,11:PRINT"WRONG  "":LOCATE
25,13:PRINT"          "
650 GOTO 490
660 NEXT N
670 END

```

DECISIVE HERO



The wicked Baron has captured your love, Loretta, and tied her to the railroad track. Only you can save her from a grisly fate, but you will have to think fast and act even quicker. Wherever the Baron has taken her, you can be sure it will be in a town far away from you, and you must work out the three possibilities, key in your answers and stop the train.

Please act quickly, as the thought of losing Loretta is too terrible to contemplate.

How to play

The names of eight towns will be displayed on the screen with letters A to H. Against each of the letters you will be shown a combination of numbers.

You must decide which three series of numbers are the highest, type them in and stop the train.

Example: from the screen shown above you will see that the correct answer is c, g and b. You don't have to key in your answers in alphabetical order, just key them in correctly and quickly. If you stop the train or, unfortunately for Loretta, the train reaches the end of the screen, you will be asked if you wish to continue or end the program.

Press c and ENTER to continue, or e and ENTER to end the game.

Skill rating

When the game ends, a score sheet will be displayed showing your total, giving a qualitative rating and an IQ level of your decisiveness. This is not a true IQ level as intelligence is made up of reasoning ability, memory etc. but this result will be an indication of your IQ decisiveness level.

Classifications below Fair are omitted, as I know that if you are using this book you are above average!

Programming hints

If you wish to increase the time allowed to guess the answers then increase the distance the smoke travels. To do this increase the 3 in line 960 to a maximum of 12.

After thinking about this, you may decide to **reduce** the distance travelled by the smoke and thereby decrease your thinking time.

The Program

```
10 REM DECISIVE HERO
20 REM (C) 1984 G. LUDINSKI
30 DIM A$(3),X(12),Y(12),N(3,8),S(8),T$(
8),T(8),W(50)
60 MODE 1:BORDER 7
70 S$=SPACE$(35)
80 REM
90 REM STORE TOWN NAMES AND TRAIN SHAPE
100 REM
110 GOSUB 1190
120 FOR I=1 TO 8:READ T$(I):NEXT I
130 A$(1)=" "+STRING$(3,CHR$(240)):A$(1)
=A$(1)+A$(1)+" "+CHR$(250)+CHR$(251)+CHR
$(240)
140 A$(2)=" "+STRING$(3,CHR$(240)):A$(2)
=A$(2)+A$(2)+" "+CHR$(240)+CHR$(241)+CHR
$(240)
150 A$(3)=" "+STRING$(3,CHR$(240))+"-"+S
TRING$(3,CHR$(240))+"-"+STRING$(3,CHR$(2
40))
160 REM
170 REM STORE POSITIONS OF SMOKE
180 REM
190 FOR I=1 TO 2
200 X(I)=12-I
210 Y(I)=2-I
220 NEXT I
230 FOR I=3 TO 12
240 Y(I)=2
250 X(I)=13-I
260 NEXT I
270 TE=0:ER=0:CR=0
280 REM
290 REM THE ACTION STARTS HERE
300 REM
310 CLS
320 TE=TE+1
330 REM
340 REM STORE LISTS OF NUMBERS AND THEIR
SUM
```

```

350 REM
360 FOR K=1 TO 7:S(K)=0:NEXT K
370 FOR J=1 TO 8
380 FOR I=1 TO 3
390 N(I,J)=INT(RND(1)*9+1)
400 S(J)=S(J)+N(I,J)
410 NEXT I
420 NEXT J
430 FOR I=1 TO 8:T(I)=I:NEXT I
440 REM
450 REM BUBBLE SORT OF THE SUMS OF EACH
LIST
460 REM
470 FOR J=1 TO 7
480 FOR I=1 TO 7
490 IF S(I)<S(I+1) THEN TP=S(I):S(I)=S(I
+1):S(I+1)=TP:TP=T(I):T(I)=T(I+1):T(I+1)
=TP
500 NEXT I
510 NEXT J
520 REM
530 REM CHECK FOR ANY DUPLICATES
540 REM
550 TWN=3:FOR I=4 TO 8
560 IF S(I)=S(1) OR S(I)=S(2) OR S(I)=S(
3) THEN TWN=I
570 NEXT I
580 REM
590 REM DISPLAY PROBLEM
600 REM
610 LOCATE 1,7
620 PRINT STRING$(29,"=");:PEN 2:PRINT C
HR$(240);:PEN 3:PRINT "="
630 LOCATE 1,10
640 FOR J=1 TO 8
650 PRINT LEFT$(S$,6);LEFT$(T$(J),1);" "
;MID$(T$(J),2);" ";
660 FOR I=1 TO 3
670 PRINT STR$(N(I,J));" ";
680 NEXT I
690 PRINT
700 NEXT J
710 PRINT
720 CR1=0:IX=0:W(1)=0:W(2)=0:W(3)=0
730 LOCATE 1,1:GOSUB 840
740 SOUND 1,200,80:SOUND 1,220,75

```

```

750 FOR H=1 TO 10:Z$=INKEY$:NEXT H
760 LOCATE 1,22:PRINT"Press 'C' to conti
nue or 'E' to end":INPUT C$
770 IF LEFT$(C$,1)="C" OR LEFT$(C$,1)="c
" THEN GOTO 310
780 GOSUB 1050
790 GOTO 1450
800 REM
810 REM SMOKE SUBROUTINE
820 LOCATE X(I)+2,Y(I)+1:PRINT CHR$(242)
;
830 RETURN
840 REM TRAIN SUBROUTINE
850 SOUND 1,180,25:SOUND 1,0,4,0:SOUND 1
,180,50
860 FOR L=1 TO 30
870 I$=INKEY$
880 IF I$="" THEN GOTO 930
890 J=1
900 IF I$=CHR$(64+T(J)) AND I$<>CHR$(W(1
)+64) AND I$<>CHR$(W(2)+64) AND I$<>CHR$(
(W(3)+64) THEN CR1=CR1+1:IX=IX+1:W(IX)=T
(J):SOUND 1,
130,20:GOTO 930
910 J=J+1:IF J<TWN+1 THEN GOTO 900
920 ER=ER+1
930 IF CR1=3 THEN CR=CR+1:GOTO 1040
940 PEN 1:LOCATE 2,4:PRINT A$(1):LOCATE
2,5:PRINT A$(2):LOCATE 2,6:PRINT A$(3)
950 I=1:PEN 0:GOSUB 810
960 FOR I=2 TO 3
970 PEN 0:GOSUB 810
980 I=I-1:PEN 3:GOSUB 810
990 I=I+1:PEN 0:GOSUB 810
1000 NEXT I
1010 I=I-1:PEN 3:GOSUB 810
1020 NEXT L
1030 SOUND 1,180,25:SOUND 1,0,4,0:SOUND
1,180,50
1040 RETURN
1050 REM IQ SUBROUTINE
1060 CLS
1070 PRINT:PRINT"Number of tests complet
ed = ";TE
1080 PRINT:PRINT"Number of tests correct
= ";CR

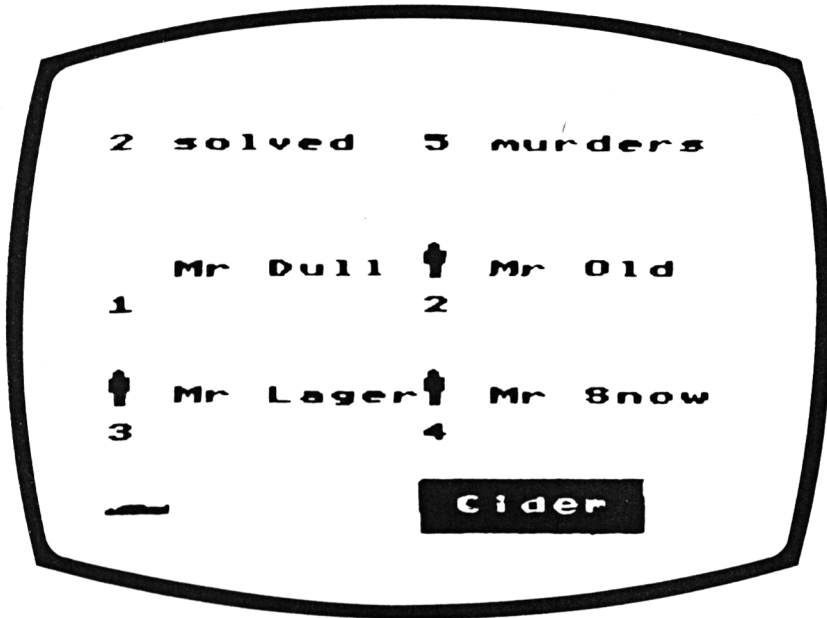
```

```

1090 PRINT:PRINT"Number of wrong answers
      = ";ER
1100 SC=INT(((ER*3)+((TE-CR)*10))/TE)
1110 PRINT
1120 IF SC<5 THEN PRINT"This is classed
as SUPERIOR      (upper 10%):GOTO 1150
1130 IF SC<7 THEN PRINT"This is classed
as GOOD          (upper 30%):GOTO 1150
1140 IF SC<9 THEN PRINT"This is classed
as FAIR          (upper 60%):GOTO 1150
1150 IF SC=0 THEN IQU=150:GOTO 1170
1160 IQU=INT(760/SC):IF IQU>150 THEN IQU
=150
1170 PRINT:PRINT"Your I.Q. level (decisi
veness) =";IQU
1180 RETURN
1190 REM SHAPES SUBROUTINE
1200 RESTORE
1220 EN=&42:GN=&FF:E1=&C:E2=&18
1230 SYMBOL 250,O,O,GN,GN,E1,E1,E1,E1
1290 SYMBOL 240,E1,E1,E1,E1,GN,GN,GN,GN
1330 SYMBOL 251,O,O,&FO,&FO,E2,E2,E2,E2
1370 SYMBOL 241,E2,E2,E2,E2,GN,GN,GN,GN
1410 SYMBOL 242,&7E,GN,GN,GN,GN,GN,&7
E
1430 RETURN
1440 DATA "Aldershot ","Bracknell ","Cam
berley ","Dorking  ","Egham      ","Farn
ham    ","Guildford ","Henley    "
1450 REM END

```

WHO DUNNIT



Looking through the window you see him standing in his study. Then you hear a gun shot and he falls to the ground. You walk into the house and go into his study.

There are four men there. You know their names. You find a note which he must have written before he died. This is a clue to the murderer. You must decide which of the four men is the murderer before they slip out the room.

How to play

The victim's note is by the man lying down. You must work out which of the names of the other men has some connection with this word. For example, in the screen shown above, Mr Lager is the murderer as Lager and Cider are both drinks. Alternatively

words that are related may have the same or opposite meanings. For example, Big and Large, also Hot and Cold are related.

Key in the number below the suspected murderer, (3 in this case) before the four men disappear off the screen.

If you are right, you hear police sirens as the police cars approach. If you are wrong or too late, you do not. The score is given on the top line. Press ENTER to play again.

Programming hints

If you want to add more words to the game, add some more DATA statements at the end of the program. Put in sets of three words that are related. Read the other words in lines 740 to 760 for ideas. Make sure that each set is not related to the other words in those lines. When you have added the extra words, count up the total number of sets of words from line 740 and assign it to TT in line 310.

The Program

```

10 REM WHODUNNIT
20 REM (C) 1984 G. LUDINSKI
30 MODE 1
35 BORDER 7
40 DIM W$(30,3),N(5),X(4),Y(4),P$(2),Q$(
2)
50 X(1)=0:Y(1)=7:X(2)=10:Y(2)=7:X(3)=0:Y
(3)=14:X(4)=10:Y(4)=14
60 SC=0:TU=0
70 GOTO 200
180 REM SHAPES OF MEN
190 REM
200 REM
210 SYMBOL 240,&10,&38,&38,&10,&7C,&7C,&
7C,&7C
220 SYMBOL 241,&7C,&7C,&38,&38,&38,&38,&
38,&38

```

```

230 SYMBOL 242,0,0,0,0,&F,&5F,&FF,&FF
240 SYMBOL 243,0,0,0,0,&C1,&FF,&FF,&FF
250 V$=CHR$(242)+CHR$(243)
260 BL=0:RD=1:YE=2:WH=3
265 INK BL,0:INK RD,6:INK YE,12:INK WH,2
6
270 PAPER BL:PEN WH
280 REM
290 REM READ WORDS
300 RESTORE
305 REM
310 TT=25
315 FOR J=1 TO TT
320 READ T$:W$(J,1)=T$:READ T$:W$(J,2)=T
$:READ T$:W$(J,3)=T$
330 NEXT J
360 REM
370 REM UPRIGHT MAN AND GUN SHOT
380 REM
390 CLS:PAPER BL:PEN WH:LOCATE 1,21:PRIN
T CHR$(240):PRINT CHR$(241);
410 REM
420 FOR I=1 TO 4
430 N(I)=INT(RND(1)*TT+1)
440 NEXT I
450 IF N(1)=N(2) OR N(1)=N(3) OR N(1)=N(
4) OR N(2)=N(3) OR N(2)=N(4) OR N(3)=N(4
) THEN GOTO 390
460 REM
470 REM DRAW PEOPLE AND NAMES
480 REM
490 TU=TU+1
500 SN=INT(RND(1)*4)+1
510 FOR I=1 TO 2
520 P$(I)=W$(N((2*I)-1),INT(RND(1)*3)+1)
:Q$(I)=W$(N(2*I),INT(RND(1)*3+1))
530 PEN WH:LOCATE 1,7*I+1:PRINT CHR$(240
):LOCATE 1,7*I+2:PRINT CHR$(241);:PEN Y
E:PRINT " Mr ";P$(I);:PEN WH:LOCATE 11,7*
I+1:PRINT CH
R$(240):LOCATE 11,7*I+2:PRINT CHR$(241);
:PEN YE:PRINT " Mr ";Q$(I)
540 LOCATE 1,7*I+4:PRINT 2*I-1:LOCATE 11
,7*I+4:PRINT 2*I
550 NEXT I

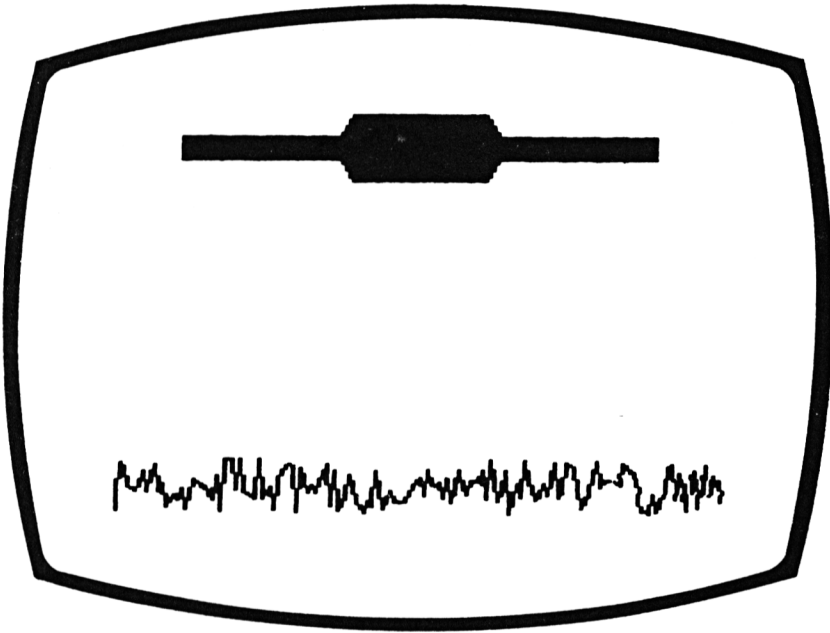
```

```

560 Z$=W$(N(SN),INT(RND(1)*3+1)):IF Z$=P
$(1) OR Z$=P$(2) OR Z$=Q$(1) OR Z$=Q$(2)
  THEN GOTO 560
570 U$=" "+Z$+" "
580 LOCATE 1,22:PRINT " ";
590 PEN WH:LOCATE 1,21:PRINT V$:PAPER WH
: PEN WH:LOCATE 11,20:PRINT U$;:PEN RD:LO
CATE 11,21:PRINT U$;:PEN WH:LOCATE 11,22
:PRINT U$:PA
PER BL
600 K=1
610 F=0
611 I$=INKEY$:IF I$>="1" AND I$<="4" THE
N GOTO 620
612 F=F+1:IF F<>80 THEN GOTO 611
615 LOCATE X(K)+1,Y(K)+1:PRINT " ":LOCATE
  X(K)+1,Y(K)+2:PRINT " ";
618 K=K+1:I$="0":IF K<5 THEN GOTO 610
620 REM
630 REM POLICE SIREN
640 REM
650 IF VAL(I$)=SN THEN FOR K=1 TO 4:SOUN
D 1,80,50:SOUND 1,100,50:NEXT K:SC=SC+1
660 REM
670 REM SCORE
680 REM
690 PEN WH:LOCATE 1,2:PRINT SC;" SOLVED
";TU;:IF TU>1 THEN PRINT" MURDERS":GOTO
700
695 PRINT" MURDER"
700 PEN WH:LOCATE 1,3:PRINT"PRESS <ENTER
> TO CONTINUE":INPUT R$:GOTO 390
710 REM
720 REM DATA
730 REM
740 DATA BIG,SMALL,LARGE,FAT,THIN,PLUMP,
QUIET,LOUD,NOISY,WET,DRY,DAMP
750 DATA HOT,COLD,WARM,A,Z,ALPHA,GOOD,BA
D,NICE,MAD,CRAZY,SANE,DULL,SHINY,MATT,SE
E,HEAR,FEEL,OLD,YOUNG,AGED
755 DATA LAUGH,CRY,WEEP,KID,CHILD,ADULT,
AM,PM,NOON,BIRD,FOWL,BEAST,SNOW,ICE,SLEE
T,BEER,LAGER,CIDER
760 DATA KING,QUEEN,JACK,GIVE,TAKE,GRASP
,BBC,ITV,CH4,ILL,WELL,SICK,GYM,PT,PE,RED
,AMBER,GREEN,LOAD,SAVE,RUN,EYE,I,AYE

```


CLOSE ENCOUNTERS OF THE FOURTH KIND



The aliens have sneaked into this book after all — but we believe they are friendly. It's up to you to find out.

Hovering above a field, lights rotating around it's outer edge, is a flying saucer. From the saucer comes a sequence of notes which may contain a message of peace. To find out you must repeat the notes in the same sequence as the aliens have transmitted them.

Every time you repeat the notes properly, the saucer will descend one level towards the ground. Try and bring them in carefully as the last time we succeeded the space vessel blew up after landing.

How to play

The number keys 0 to 9 represent a note in the octave starting with middle C.

Key in S to indicate the start of a tune.

You can either try guessing by starting with S or you can play with the keyboard until you have found the correct note.

The saucer will first emit one note and, if you copy correctly, descends slightly before sounding its next tone which will be a tune of two notes and so on. Each time you have guessed the sequence correctly the saucer will descend. Remember to start each guess with S.

If you can't find the correct note press G and ENTER and a new tune sequence will begin.

Programming hints

You could increase the number of possible notes in the tunes by changing the maximum value of N(L) in line 250. Then add lines for larger values of NT after line 800

The Program

```
10 REM CLOSE ENCOUNTERS OF THE FOURTH KI  
ND  
20 REM COPYRIGHT (C) 1985 G. LUDINSKI  
30 DEFINT A-Z  
40 MODE 0  
50 CL=1  
60 DIM N(7)  
70 CLS  
80 Q=70  
90 REM
```

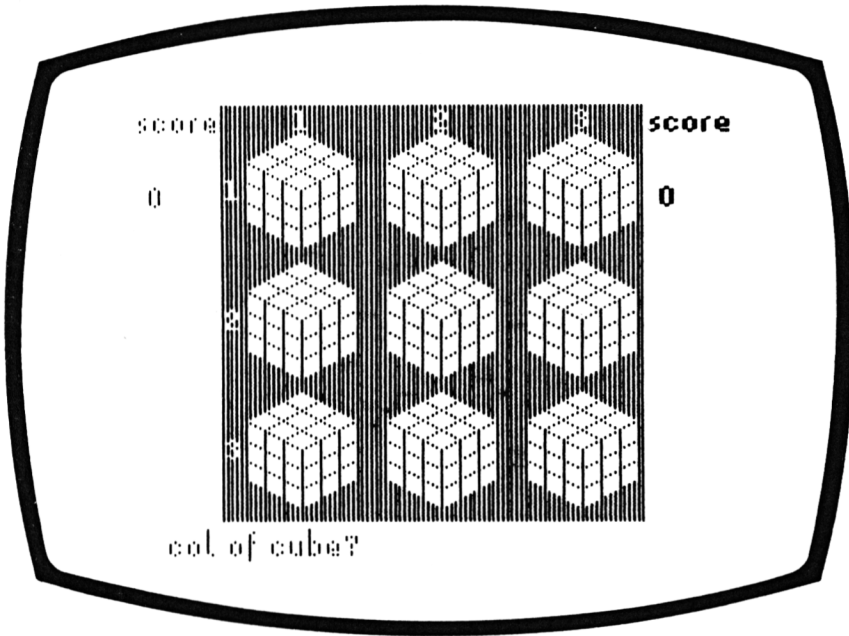
```

100 REM DRAW SPACE SHIP AND GROUND
110 REM
120 INK 2,9
130 HT=320
140 CL=15:GOSUB 520
150 PEN 2
160 MOVE 0,0
170 FOR X=0 TO 640 STEP 5
180 DRAW X,RND(1)*33
190 NEXT X
200 REM
210 REM GENERATE NOTES
220 REM
230 FOR J=1 TO 7
240 FOR L=1 TO J
250 N(L)=INT(8*RND(1)+1)
260 IF L=1 THEN GOTO 280
270 IF N(L)=N(L-1) THEN GOTO 250
280 NT=N(L):GOSUB 720
290 NEXT L
300 REM
310 REM PLAY NOTES
320 REM
330 EF=0
340 I=140
350 FOR K=1 TO J
360 I$=INKEY$:IF I$<>"G" AND I$<>"S" AND
(I$="" OR I$<"1" OR I$>"9") THEN I=I+20
:GOSUB 660:GOTO 360
370 IF I$="G" THEN K=J:GOTO 410
380 IF I$="S" THEN K=1:GOTO 360
390 NT=VAL(I$):GOSUB 720
400 IF VAL(I$)<>N(K) THEN EF=1
410 NEXT K
420 IF I$="G" THEN GOTO 240
430 IF EF=0 THEN CL=0:GOSUB 520:HT=HT-40
:CL=3:GOSUB 520:GOSUB 820:GOTO 450
440 GOTO 330
450 NEXT J
460 REM
470 REM EXPLOSION
480 REM
490 END
500 FOR I=1 TO 100:INK 0,1:INK 0,3:NEXT
I:GOTO 860
510 REM

```

```
520 REM SHIP DRAWING
530 A=46:B=HT-6:C=333:D=13:GOSUB 600
540 MOVE 153,HT
550 DRAW 167,HT-20:DRAW 167,HT+20:DRAW 1
53,HT
560 MOVE 273,HT
570 DRAW 260,HT-20:DRAW 260,HT+20
580 A=167:B=HT-20:C=93:D=40:GOSUB 600
590 RETURN
600 REM BLOCK DRAWING SUBROUTINE
610 FOR AA=A TO A+C STEP SGN(C)*2
620 MOVE AA,B
630 DRAWR 0,D,CL
640 NEXT AA
650 RETURN
660 REM LIGHTS SUBROUTINE
670 IF I>330 THEN I=70
680 CL=RND(1)*8:A=I:B=HT-6:C=16:D=13:GOS
UB 600
690 CL=1
700 REM
710 RETURN
720 REM PLAY SUBROUTINE
730 IF NT=1 THEN SOUND 1,478,30
740 IF NT=2 THEN SOUND 1,426,30
750 IF NT=3 THEN SOUND 1,379,30
760 IF NT=4 THEN SOUND 1,358,30
770 IF NT=5 THEN SOUND 1,319,30
780 IF NT=6 THEN SOUND 1,284,30
790 IF NT=7 THEN SOUND 1,253,30
800 IF NT=8 THEN SOUND 1,239,30
810 RETURN
820 REM ROTATE SUBROUTINE
830 REM
840 FOR D=1 TO 3:I=I+50:GOSUB 660:NEXT D
850 RETURN
860 CLS:PRINT:END
```

3D BRAINSTORM



If you feel like some brainstorming, how about this three-dimensional game for two players. It is like three-dimensional noughts and crosses, except it has the advantage that all faces can be seen at a glance.

Nine cubes are displayed on the screen and each face of each cube is divided into nine squares. Your aim is to colour in a row or column of squares of any face of a cube, or to have a row or column of cubes in which you have coloured in the same square. For example, in the screen shown above, the red player has coloured in a row of squares on the top left hand cube. Also the yellow player has coloured in all the top left-hand squares on the faces on the front of the central cubes, so he has both a row and column of squares coloured in.

How to play

Players should take turns to colour in a square. The first player will colour in red, and the second in yellow. Squares are coloured in by moving the cursor (flashing underline symbol) to point to the correct square using the arrow keys.

If the square is on the front or top face of a cube, it is pointed to by putting the cursor under the square. If it is on the side of a cube it is pointed to by putting the cursor in the centre of the square. When the correct square has been selected, the space bar must be pressed and the appropriate square will be coloured in.

The score is shown at the bottom of the screen. The colour of the square between the titles indicates whose turn it is to play.

If you complete a row or column the computer makes an arcade-like warbling sound. If you try to colour in a square that does not exist a low constant note sounds.

Programming hints

The logic for a game like this is more complicated than you would expect because of the number of possible moves. The program is made more comprehensible and the program length reduced by using functions. These functions however, do not deal with numbers but with logical operators. For example, in line 170 `FNX` will be true if `XX` is less than 0 or greater than 20. This is a check that regularly has to be done to see if the X-coordinate of the object would fit on the screen.

You could make this into a one player game by allowing the computer to make random guesses. You would do this by putting `IF T = -1 THEN` in front of line 550. You may also add the extra line `IF T = THEN PS = RND(21)-1 : VP = RND(24)`

The Program

```

10 REM 3D BRAINSTORM
20 REM COPYRIGHT (C) 1985 G. LUDINSKI
30 MODE 1
40 DEFINT A-Z
50 DIM L(20,24),M(20,24),SC(2),R(6,2)
60 REM
70 REM LOGICAL FUNCTION DEFINITIONS
80 REM
90 DEF FNL1(I)=(PS=0+I OR PS=1+I OR PS=2
+I OR PS=7+I OR PS=8+I OR PS=9+I OR PS=1
4+I OR PS=15+I OR PS=16+I)
100 DEF FNL2(I)=(VP=7+I OR VP=8+I OR VP=
9+I OR VP=14+I OR VP=15+I OR VP=16+I OR
VP=21+I OR VP=22+I OR VP=23+I)
110 DEF FNL7(P,I)=(P=I OR P=I+7 OR P=I+1
4)
120 DEF FNL7P(I,J)=(PS=I AND VP=J)
130 DEF FNF=(FNL1(0) AND FNL2(0))
140 DEF FNT=((FNL1(0) AND (VP=6 OR VP=13
OR VP=20)) OR (FNL1(1) AND (VP=5 OR VP=
12 OR VP=19)) OR (FNL1(2) AND (VP=4 OR V
P=11 OR VP=1
8)))
150 DEF FNE=(FNL7(PS,6) OR FNL7(VP,10) O
R (FNL7(PS,0) AND (FNL7(VP,4) OR FNL7(VP
,5))) OR (FNL7(PS,1) AND FNL7(VP,4)) OR
(PS<0 OR PS>
20 OR VP<4 OR VP>24))
160 DEF FNE2=((FNL7(PS,3) OR FNL7(PS,4)
OR FNL7(PS,5)) AND FNL7(VP,9)) OR ((FNL
7(PS,4) OR FNL7(PS,5)) AND FNL7(VP,8)) O
R (FNL7(PS,5
) AND FNL7(VP,7))
170 DEF FNXX=(XX<0 OR XX>20)
180 DEF FNY=(YY<4 OR YY>24)
190 DATA 1,2,1,-1,-1,-2,7,14,7,-7,-7,-14
200 FOR I=1 TO 6:READ R(I,1):READ R(I,2)
:NEXT I

```

```

210 REM
220 REM SHAPE DEFINITIONS
230 REM
240 SYMBOL 240, &1, &2, &4, &8, &10, &20, &40, &
FF
250 SYMBOL 241, 1, 2, 4, 8, 16, 32, 64, 128
260 SYMBOL 242, &FF, 0, 0, 0, 0, 0, 0, 0
270 SYMBOL 243, &81, &82, &84, &88, &90, &A0, &
C0, &80
280 SYMBOL 244, &80, &80, &80, &80, &80, &80, &
80, &80
290 SYMBOL 245, &FF, &81, &81, &81, &81, &81, &
81, &FF
300 SYMBOL 246, &1, &3, &5, &9, &11, &21, &41, &
81
310 SYMBOL 247, &82, &83, &85, &89, &91, &A1, &
C1, &81
320 SYMBOL 248, &FF, &FE, &FC, &F8, &FO, &EO, &
CO, &80
330 SYMBOL 249, &1, &3, &7, &F, &1F, &3F, &7F, &
FF
340 SYMBOL 250, &FF, &FF, &FF, &FF, &FF, &FF, &
FF, &FF
350 L$=CHR$(240):D$=CHR$(241):T$=CHR$(24
2):V$=CHR$(243):U$=CHR$(244):S$=CHR$(245
)
360 DU$=CHR$(246):VU$=CHR$(247):D1$=CHR$(
248):D2$=CHR$(249):F$=CHR$(250)
370 FOR J=4 TO 24:FOR I=0 TO 20:L(I,J)=0
:M(I,J)=0:NEXT I:NEXT J
380 BL=0:RD=3:WH=1:YE=2
390 INK BL,0:INK WH,25:INK YE,12:INK RD,
6
400 REM
410 REM DRAW CUBES
420 REM
430 PAPER BL:FEN WH:CLS
440 FOR YO=3 TO 17 STEP 7
450 FOR XO=0 TO 14 STEP 7
460 GOSUB 840
470 NEXT XO
480 NEXT YO
490 LOCATE 4,3:CX=4:CY=3
500 T=1:SC(0)=0:SC(2)=0
510 REM
520 REM MAIN CYCLE

```



```

530 REM
540 CALL &BB81
550 I$=INKEY$:IF I$="" THEN GOTO 550
560 IF I$=" " THEN GOTO 700
570 DX=0:DY=0
580 IF I$=CHR$(240) THEN DY=-1
590 IF I$=CHR$(241) THEN DY=1
600 IF I$=CHR$(242) THEN DX=-1
610 IF I$=CHR$(243) THEN DX=1
620 IF DX=0 AND DY=0 THEN GOTO 550
630 CX=CX+DX:CY=CY+DY
640 IF CX=0 THEN CX=22
650 IF CY=0 THEN CY=24
660 IF CX=23 THEN CX=1
670 IF CY=25 THEN CY=1
680 LOCATE CX,CY
690 GOTO 550
700 PS=CX-1:VP=CY-1
710 IF FNE OR FNE2 THEN SOUND 1,50,30:GOTO 550
720 IF ABS(M(PS,VP))=1 THEN SOUND 1,50,30:GOTO 550
730 T=-T:IF T=-1 THEN PEN RD ELSE PEN YE
740 IF FNF THEN C#=F$:GOSUB 930:GOTO 770
750 IF FNT THEN C#=D2$:GOSUB 930:PS=PS+1:C#=D1$:GOSUB 930:PS=PS-1:GOTO 770
760 C#=D2$:GOSUB 930:VP=VP+1:C#=D1$:GOSUB 930:VP=VP-1:GOTO 770
770 M(PS,VP)=T:CX=4:CY=3
780 GOSUB 1010:PEN 1+(-T+1)/2:LOCATE 25,10:PRINT F$;
790 PEN RD:LOCATE 22,4:PRINT "Red";:PEN YE:LOCATE 22,6:PRINT"Yellow"
800 PEN RD:LOCATE 25,5:PRINT SC(0);:PEN YE:LOCATE 25,7:PRINT SC(2)
810 LOCATE CX,CY
820 GOTO 550
830 REM
840 REM CUBE SUBROUTINE
850 LOCATE X0+1,Y0+1:PRINT "   ___"
860 LOCATE X0+1,Y0+2:PRINT "  ";L$;L$;L$;DU$
870 LOCATE X0+1,Y0+3:PRINT " ";L$;L$;L$;D$;VU$
880 LOCATE X0+1,Y0+4:PRINT L$;L$;L$;D$;V$;VU$

```

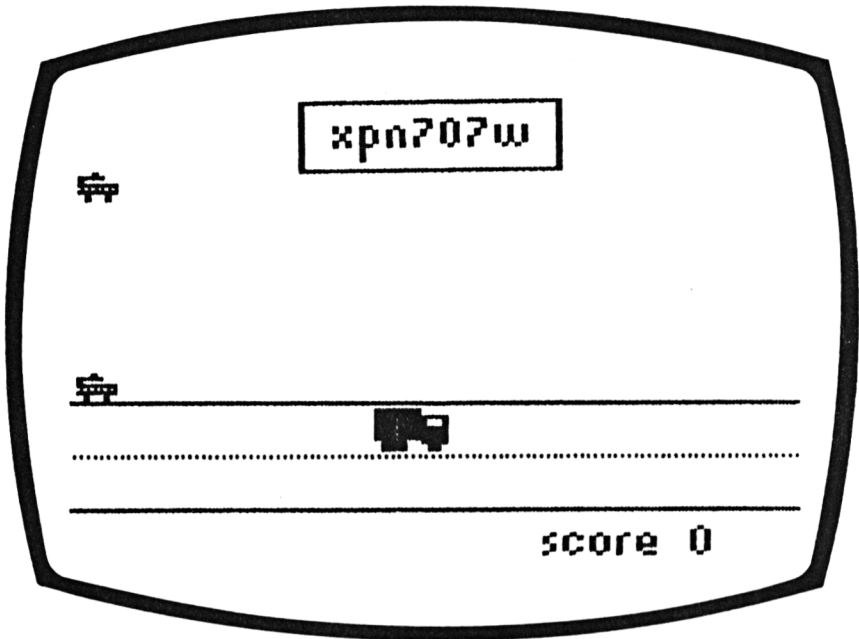
```

890 LOCATE X0+1,Y0+5:PRINT S$;S$;S$;V$;V
$;V$
900 LOCATE X0+1,Y0+6:PRINT S$;S$;S$;V$;V
$
910 LOCATE X0+1,Y0+7:PRINT S$;S$;S$;V$;
920 RETURN
930 REM PUT SUBROUTINE
940 PRINT CHR$(22);CHR$(1);
950 IF L(PS,VP)=0 THEN PAPER BL ELSE PAF
ER 1+(L(PS,VP)+1)/2
960 LOCATE PS+1,VP+1:PRINT C$;
970 IF L(PS,VP)=0 THEN L(PS,VP)=T
980 PAPER BL
990 PRINT CHR$(22);CHR$(0);
1000 RETURN
1010 REM TEST SUBROUTINE
1020 FOR J=4 TO 6
1030 GOSUB 1200:GOSUB 1240
1040 NEXT J
1050 IF NOT FNF THEN GOTO 1090
1060 FOR J=1 TO 3
1070 GOSUB 1200:GOSUB 1240
1080 NEXT J
1090 IF NOT FNT THEN GOTO 1140
1100 FOR J=1 TO 3
1110 GOSUB 1280
1120 GOSUB 1200
1130 NEXT J
1140 IF FNF OR FNT OR FNE OR FNE2 THEN G
OTO 1190
1150 FOR J=1 TO 3
1160 GOSUB 1280
1170 GOSUB 1240
1180 NEXT J
1190 RETURN
1200 REM CHECKX SUBROUTINE
1210 IF FNX(PS+R(J,1)) OR FNX(PS+R(J,2))
THEN GOTO 1230
1220 IF M(PS+R(J,1),VP)=M(PS+R(J,2),VP)
AND M(PS+R(J,2),VP)=T THEN SC(T+1)=SC(T+
1)+1:GOSUB 1320
1230 RETURN
1240 REM CHECKY SUBROUTINE
1250 IF FNY(VP+R(J,1)) OR FNY(VP+R(J,2))
THEN GOTO 1270

```

```
1260 IF M(PS,VP+R(J,1))=M(PS,VP+R(J,2))
AND M(PS,VP+R(J,2))=T THEN SC(T+1)=SC(T+
1)+1:GOSUB 1320
1270 RETURN
1280 REM CHECKXY SUBROUTINE
1290 IF FNX(PS+R(J,1)) OR FNY(VP-R(J,1))
OR FNX(PS+R(J,2)) OR FNY(VP-R(J,2)) THE
N GOTO 1310
1300 IF M(PS+R(J,1),VP-R(J,1))=M(PS+R(J,
2),VP-R(J,2)) AND M(PS+R(J,2),VP-R(J,2))
=T THEN SC(T+1)=SC(T+1)+1:GOSUB 1320
1310 RETURN
1320 REM SOUND SUBROUTINE
1330 SOUND 1,100,35
1340 RETURN
```

DETECTIVE



Could you solve the cases and survive the perils of being a detective. Find out by playing this game.

Firstly, you are briefed on the correct number-plates for the cars and trucks you are likely to see. Then you are stationed near a main road, watching cars and lorries travel past.

You are looking for a stolen vehicle whose plates have been changed. When you see a car or lorry you suspect, you must call up, by radio, the two squad cars in the area, and tell them to set up a road-block.

If you time it right, the suspected vehicle, which veers off the road when it sees you are interested, will be caught. If your suspected vehicle was stolen and you catch it, the driver comes quietly and your score increases. If however, you catch a vehicle which has

not been stolen, the driver dresses you down, and your score decreases. If you do not catch the suspected vehicle, then you are told whether your suspicions were correct but your score is unchanged.

How to play

Press C when you have read which cars and lorries have which number plates. Then you see cars and lorries travel by with the number plates they have attached to them displayed below the road. When you see a vehicle which you suspect has the wrong number plate, then press A to get the white car at the top of the screen to set up a road block, or Z to have the other white car set up a trap. You may do this continuously, by trying to set up the road block just as the suspected vehicle passes by.

If you catch the vehicle you will hear police-car sirens as the other squad cars approach. Then you are told the result. Press the ENTER key to play again.

Programming hints

The cars and lorries are made up of two user-defined characters next to each other. They are animated, or made to travel along the road, in line 360. They are animated by PRINTing them in successive positions along the road, preceded by a space to erase the back half of the previously-drawn vehicle.

You can make the game more difficult by making the vehicles whizz past faster. To do this reduce the value of K in line 310.

The Program

```
10 REM DETECTIVE
20 REM COPYRIGHT (C) 1985 G. LUDINSKI
30 MODE 1
40 DIM V$(6),C(6),P$(6),VM$(6)
50 B=128:BL=0:RD=3:GR=2:WH=1:SC=0
60 INK RD,12:INK GR,15:INK WH,25
70 GOTO 110
80 REM
90 REM CAR AND LORRY SHAPES
100 REM
110 SYMBOL 240,15,8,8,255,255,255,255,12
120 SYMBOL 241,240,16,16,255,255,255,255
,6
130 SYMBOL 242,192,&F8,&C8,&CF,&FF,&FF,&
FF,&CE
140 SYMBOL 243,&FF,&FF,&FF,&FF,&FF,&FF,&
FF,&71
150 CA$=CHR$(240)+CHR$(241):LD$=CHR$(243
)+CHR$(242)
160 C(1)=WH:P$(1)=" "+CA$:C(2)=RD:P$(2)=
" "+CA$:C(3)=GR:P$(3)=" "+CA$
170 FOR I=1 TO 3:C(I+3)=C(I):P$(I+3)=" "
+LD$:NEXT I
180 GOSUB 600
190 REM
200 REM DRAW FIELDS,ROAD,POLICE CARS
210 REM
220 PAPER BL:PEN WH:CLS
230 C=GR:X=0:Y=0:W=640:H=400:GOSUB 550
240 C=BL:X=0:Y=100:W=640:H=20:GOSUB 550
250 GOSUB 720
260 PAPER GR:PEN WH:LOCATE 1,8:PRINT CA$
:LOCATE 1,15:PRINT CA$:PEN BL:LOCATE 1,2
2:PRINT CA$:LOCATE 11,24:PRINT "Score ";
SC
270 PEN WH:LOCATE 1,25:PRINT"Call up car
s A or Z "
280 REM
290 REM LET CARS TRAVEL ALONG ROAD
300 REM
```

```

310 PEN BL:K=20
320 J=INT(RND(1)*6+1)
330 FOR I=0 TO 17
340 IF I=0 THEN PEN C(J):PAPER 3-C(J):LO
CATE I+1,22:PRINT P$(J):PAPER BL:PEN WH:
LOCATE 7,23:PRINT _VM$(J):FOR D=1 TO 5000
:NEXT D
350 PEN C(J)
360 I$=INKEY$:IF I$="" THEN LOCATE I+1,2
2:PRINT P$(J):GOTO 390
370 IF I$="H" THEN GOSUB 600:GOTO 220
380 GOTO 420
390 FOR D=1 TO K:NEXT D
400 NEXT I:PEN BL:LOCATE 18,22:PRINT"
";
410 PEN WH:GOTO 320
420 GOSUB 790
430 REM
440 REM FINAL MESSAGE AND POLICE SIREN
450 REM
460 PEN BL
470 IF EN=1 AND (VN$=VM$(A) OR VN$=VM$(B
B)) THEN SC=SC+1:LOCATE 1,25:PRINT"It's
a fair cop,guv.":GOTO 510
480 IF EN=1 THEN LOCATE 1,25:PRINT"I'll
sue you,you naughty policeman":SC=SC-1:G
OTO 510
490 IF VN$=VM$(A) OR VN$=VM$(BB) THEN LO
CATE 1,25:PRINT "Stolen car has gone":GO
TO 510
500 LOCATE 1,25:PRINT"Chasing wrong car
"
510 REM
520 FOR I=1 TO 4:SOUND 1,109,50:SOUND 1,
138,48:NEXT
530 LOCATE 1,25:PRINT"Press <RETURN> ";
:INPUT RB$:GOTO 180
540 REM
550 REM BLOCK DRAWING SUBROUTINE
560 FOR QQ=Y TO Y+H STEP SGN(H-Y)*2
570 MOVE X,QQ:DRAWR W,O,C
580 NEXT QQ
590 RETURN
600 REM START SUBROUTINE
610 PAPER BL:CLS
620 FOR I=1 TO 6

```

```

630 V$(I)=CHR$(65+INT(RND(1)*26))+CHR$(65+INT(RND(1)*26))+CHR$(65+INT(RND(1)*26))+CHR$(48+INT(RND(1)*10))+CHR$(48+INT(RND(1)*10))+CHR$(48+INT(RND(1)*10))+CHR$(65+INT(RND(1)*26))
640 NEXT I
650 FOR I=1 TO 6 STEP 2
660 PEN C(I):LOCATE 4,11+4*INT((I-1)/2):PRINT P$(I);:PEN C(I+1):LOCATE 13,11+4*INT((I-1)/2):PRINT P$(I+1)
670 PEN C(I):PRINT:PRINT " ";V$(I);" ";:PEN C(I+1):PRINT V$(I+1):PRINT
680 NEXT I
690 PEN WH:LOCATE 1,25:PRINT"Press 'C' to continue"
700 RB$=INKEY$:IF RB$="" THEN GOTO 700
710 RETURN
720 REM MIX-up SUBROUTINE
730 A=INT(RND(1)*6+1):BB=INT(RND(1)*6+1):IF BB=A THEN GOTO 730
740 FOR I=1 TO 6
750 VM$(I)=V$(I)
760 NEXT I
770 WK$=VM$(A):VM$(A)=VM$(BB):VM$(BB)=WK$
780 RETURN
790 REM CHASE SUBROUTINE
800 PAPER BL:LOCATE 1,22:PRINT"
";
810 PAPER GR
820 CL=C(J):VT$=RIGHT$(P$(J),2):VN$=VM$(J)
830 X=2:Y=19:GO=0:X1=X:Y1=Y:EN=0
840 PEN WH:LOCATE 1,8:PRINT CA$
850 LOCATE 1,15:PRINT CA$
860 I$=INKEY$
870 IF I$="A" THEN L=7:GOSUB 1000
880 IF I$="Z" THEN L=14:GOSUB 1000
890 IF EN=1 THEN GOTO 990
900 PEN CL:LOCATE X+1,Y+1:PRINT VT$;
910 LOCATE X1+1,Y1+1:PRINT " ";
920 Y1=Y:X1=X
930 I$=INKEY$
940 IF I$="A" THEN L=7:GOSUB 1000
950 IF I$="Z" THEN L=14:GOSUB 1000

```



```
960 X=X+1:IF X>18 THEN X=2
970 Y=Y-INT(2*INT(RND(1)+1)):IF Y<0 THEN
  Y=19
980 GO=GO+1:IF GO<50 THEN GOTO 860
990 RETURN
1000 REM ROAD SUBROUTINE
1010 PEN WH:LOCATE 1,L+1:PRINT CA$;"-----
-----"
1020 FOR D=1 TO 100:NEXT D
1030 LOCATE 1,L+1:PRINT CA$;"
      "
1040 IF Y=L THEN EN=1
1050 RETURN
```

CONCENTRATION TEST

1 2

	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8											
A	4	4	8	2	0	2	1	4	4	2	3	0	1	9	1	4	6	2	0	6	0	1	9	0	8	2	A		
B	1	8	3	0	8	8	5	2	1	8	4	3	6	2	3	0	8	2	4	5	0	8	1	9	8	1	3	6	B
C	8	3	4	9	3	9	5	4	6	2	3	1	1	3	8	9	9	5	0	0	8	2	2	7	4	9	8	7	C
D	0	4	6	8	0	9	3	6	4	8	2	3	4	8	4	5	7	3	7	3	8	9	4	2	9	5	2	5	D
E	2	9	8	2	1	5	2	5	5	2	7	3	6	3	4	1	3	7	1	6	2	3	2	0	8	6	3	9	E
F	4	6	1	1	4	1	4	1	5	0	8	2	6	8	1	8	6	4	1	4	3	3	7	0	0	2	7	7	F
G	8	9	7	7	7	4	6	3	4	6	9	6	1	3	6	4	6	6	0	7	2	0	1	4	9	9	5	4	G
H	9	5	3	9	0	8	4	8	8	6	6	0	6	1	6	2	0	2	5	6	5	3	7	4	8	4	9	5	H
I	8	0	8	0	6	5	6	6	7	0	5	2	9	6	1	9	9	7	6	2	7	9	3	9	8	4	4	I	
J	5	7	2	5	1	2	1	4	8	8	6	1	8	7	1	5	3	1	3	6	9	8	2	4	5	1	2	2	J
K	4	3	8	6	4	2	3	3	2	1	6	4	7	8	0	2	1	6	0	9	8	6	7	3	6	4	0	7	K

KEY IN ROW/COL , ROW/COL

This time we have given a little longer to work out your answers, because we think you'll need all the brainpower at your command.

On the screen will be displayed 18 rows of 35 numbers and you have 'eight' minutes to find as many pairs of adjacent numbers, whose sum is 10, as possible.

These pairs must be in the same row.

How to play

When you have found the matching pairs, key in the row number followed by the column number of each, and then press ENTER. Example A3, A4. Always place a comma between each entry. If your pair of numbers is correct they will be displayed in the same colour on the screen.

You may key in the pairs in any order and, if you cannot find any 'missing' pairs before your time is up, type in NO, MORE followed by ENTER. Again, there must be a comma between the words.

This ending of the game will cause your score sheet to be displayed. If you fail to complete in the allotted time the score sheet will automatically appear.

Your score sheet will give a classification and an IQ rating on your powers of concentration.

Programming hints

Lines 100-230 draw out the matrix of numbers and the row and column labels. Note that the letters are displayed in a loop by referring to their ASCII values. As the letter A has ASCII value of 65, B has a value of 66 etc so CHR\$(64+J) where J is 1,2,3 etc. will display the letters A,B,C etc.

I would not advise any alterations as the scoring and IQ levels were determined by scientific testing, and any changes would make the scores and IQ level incorrect.

The Program

```

10 REM CONCENTRATION TEST
20 REM COPYRIGHT (C) 1985 G. LUDINSKI
30 REM
40 MODE 1
50 DIM A$(35,18)
60 CLS
70 NU=0
80 TT=TIME
90 ER=0
100 REM
110 REM DRAW MATRIX
120 REM
130 PRINT
140 PRINT"          1          2
    3"
```

```

150 PRINT" 1234567890123456789012345678
9012345"
160 FOR J=1 TO 18
170 PRINT:PRINT CHR$(64+J);" ";
180 FOR I=1 TO 35
190 A$(I,J)=RIGHT$(STR$(INT(RND(1)*10)),
1)
200 PRINT A$(I,J);
210 NEXT I
220 PRINT" ";CHR$(64+J);
230 NEXT J
240 REM
250 REM QUESTION
260 REM
270 LOCATE 1,23:PRINT"Type row col. comm
a row col. so X+Y=10 ";
280 PRINT"                ":LOCAT
E 1,24
290 LINE INPUT C$:IF C$="" THEN GOTO 270
300 Q0=INSTR(C$," ")
310 IF Q0=0 THEN GOTO 290
320 D$=MID$(C$,Q0+1):IF D$="" THEN GOTO
290
330 C$=LEFT$(C$,Q0-1):IF C$="" THEN GOTO
290
340 REM
350 REM CHECK INPUT
360 REM
370 IF TT-TIME>48000 THEN GOTO 540
380 IF C$="NO" AND D$="MORE" THEN GOTO 5
40
390 IF LEN(C$)<2 OR LEN(D$)<2 THEN GOSUB
750:GOTO 290
400 J=ASC(LEFT$(C$,1))-64
410 I=VAL(MID$(C$,2,LEN(C$)-1))
420 K=ASC(LEFT$(D$,1))-64
430 L=VAL(MID$(D$,2,LEN(D$)-1))
440 IF I<1 OR I>35 OR J<1 OR J>18 OR L<1
OR L>35 OR K<1 OR K>18 THEN GOSUB 750:G
OTO 290
450 IF J<>K THEN GOSUB 750:GOTO 290
460 IF ABS(I-L)<>1 THEN GOSUB 750:GOTO 2
90
470 IF VAL(A$(I,J))+VAL(A$(L,K))<>10 THE
NER=ER+1:GOSUB 750:GOTO 290
480 PAPER 1:PEN 0:LOCATE I+2,J+4:PRINT A

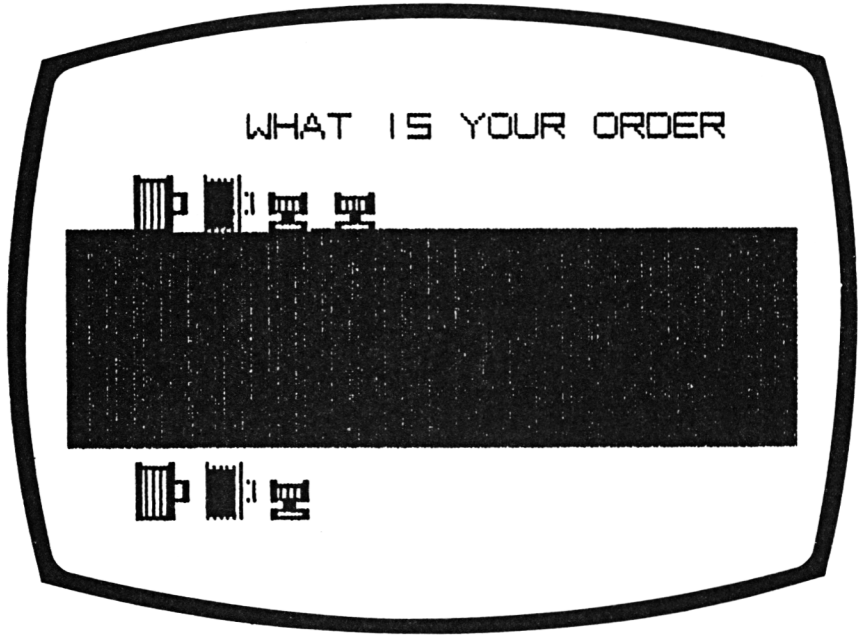
```

```

$(I,J)::LOCATE L+2,K+4:PRINT A$(L,K)::PA
PER 0:PEN 1
490 NU=NU+1
500 LOCATE 1,25:PRINT"          ";CHR$(
(11);CHR$(11);CHR$(11)::GOTO 270
510 REM
520 REM SCORE SHEET
530 REM
540 CLS:PRINT:PRINT:PRINT"You found ";NU
;" pairs"
550 MX=0
560 FOR J=1 TO 18
570 FOR I=1 TO 34
580 IF VAL(A$(I,J))+VAL(A$(I+1,J))=10 TH
EN MX=MX+1
590 NEXT I
600 NEXT J
610 SCORE=MX-NU+ER
620 PRINT:PRINT"Your score is ";SCORE:PR
INT
630 AV=MX*0.6:IQ=INT((NU/AV)*100)
640 IF IQ>150 THEN IQ=150
650 IF IQ<0.6*SCORE THEN PRINT"You are c
lassed as SUPERIOR (upper 10%":GOTO 680
660 IF IQ<0.9*SCORE THEN PRINT"You are c
lassed as GOOD (upper 30%":GOTO 680
670 IF IQ<1.1*SCORE THEN PRINT"You are c
lassed as FAIR (upper 60%":GOTO 680
680 PRINT:PRINT"Your IQ level (concentra
tion) = ";IQ
690 PRINT:PRINT"Do you want more (Y/N) ?
"
700 INPUT I$
710 IF I$<>"Y" AND I$<>"N" THEN PRINT CH
R$(11)::GOTO 700
720 IF I$="Y" THEN GOTO 60
730 GOTO 780
740 REM
750 REM ERROR SUBROUTINE
760 LOCATE 1,23:PRINT"Error:Type row,col
, comma row col. so=10";
770 RETURN
780 CLS
790 PRINT"Goodbye"
800 PRINT"-----"
810 END

```

WHAT'S YOURS



Do you know that awful feeling when you have been put in charge of the drinks purchase at your friend's wedding?

You can be sure that you will get a soft drink for the big fellow in the corner or, even worse, a double whisky with pint chaser for someone's grandmother.

Anyway, it's your turn to buy the drinks and the order is on the bar. If you remember to get everyone the correct drink you will receive a whisky from each of them as they will be so pleased with your effort. If you get the **total** round correct, they will all pitch in and pay for the drinks themselves.

All the drinks are £1 each, so everytime you get the round right you make £1 per drink for yourself.

Oh, we almost forgot, everytime you get it right someone else joins your circle of friends.

How to play

Five different types of drinks can be ordered as follows:-

Beer	Red Mug	B
Lager	Yellow Mug	L
Red Wine	Red Glass	R
White Wine	White Glass	W
Whisky	Yellow Glass	—

Look at the order detail on the bar and key in your copy. As you key in your order, the drinks will appear on the screen. When you finish the first round, a second will appear in a different order and, if the last round was correct, an additional member will be added to your group.

When the drink runs out, you can go home — by taxi.

Programming hints

This program is a good example of the use of user-defined graphics. Just two shapes are defined, a glass and a mug shape, but as they are displayed in many different colours there appears to be a large number of shapes. Remember to use PEN for user-defined graphics, as they are handled in the same way as text.

The Program

```

10 REM What's yours ?
20 REM COPYRIGHT (C) 1985 G. LUDINSKI
30 MODE 1
40 INK 1,16:INK 3,25:INK 2,12
50 DIM W(20)
60 REM

```

```

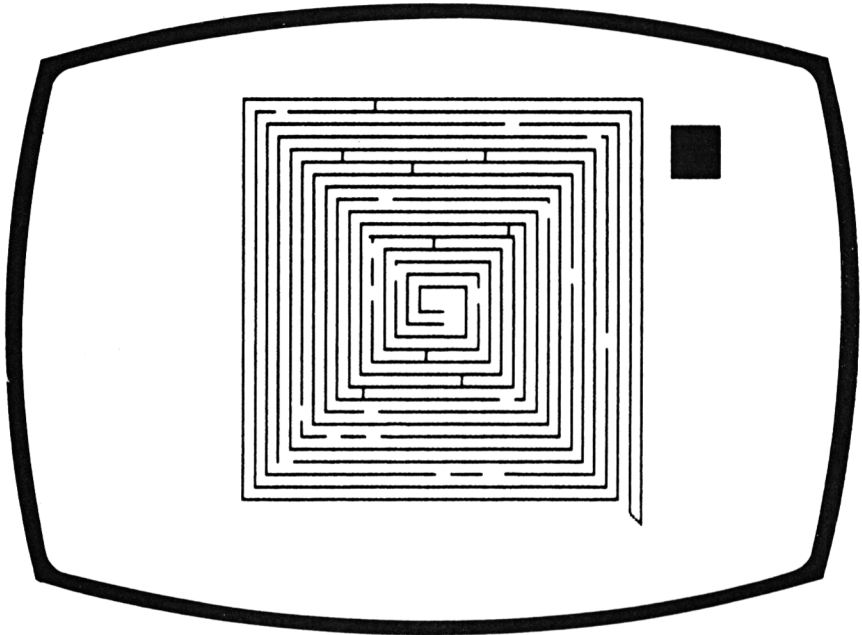
70 REM DEFINE GLASS AND BEER MUG SHAPES
80 REM
90 SYMBOL 240, &3E, &3E, &3E, &1C, &8, &8, &8, &
3E
100 SYMBOL 241, &78, &78, &7E, &7A, &7A, &7A, &
7E, &78
110 MG$=CHR$(241):GL$=CHR$(240)
120 REM
130 REM DRAW BAR AND NOTE PADS
140 REM
150 CLS
160 CL=1: X=0: Y=260: W=639: H=120: GOSUB 600
170 CL=3: X=125: Y=0: W=127: H=140: GOSUB 600
180 X=377: Y=0: W=135: H=140: GOSUB 600
190 PEN 0: PAPER 1: LOCATE 10, 20: PRINT "Bi
11": LOCATE 25, 20: PRINT "Back": LOCATE 11, 2
2: PRINT "#": LOCATE 26, 22: PRINT "#": PEN 3: P
APER 0
200 REM
210 REM DRAW DRINKS ORDERED
220 REM
230 M=0: OW=0
240 FOR J=2 TO 20
250 FOR I=1 TO J
260 W(I)=INT(RND(1)*4)
270 IF W(I)=0 THEN CL=1: C$=GL$
280 IF W(I)=1 THEN CL=1: C$=MG$
290 IF W(I)=2 THEN CL=2: C$=MG$
300 IF W(I)=3 THEN CL=3: C$=GL$
310 PEN CL: LOCATE I, 8: PRINT C$: LOCATE I
, 17: PRINT " ";
320 NEXT I
330 EP=0
340 PEN 3: PAPER 0: LOCATE 1, 10: PRINT "Wha
t is your order B=BEER L=LAGER R=R
ED & .W=WHITE WINE"
350 OW=OW+J
360 REM
370 REM DRAW DRINKS BOUGHT
380 REM
390 FOR K=1 TO J
400 I$=INKEY$: IF I$="" THEN GOTO 400
410 IF K=1 THEN LOCATE 1, 8: PRINT STRING$
(20, " ");
420 IF I$<>"B" AND I$<>"L" AND I$<>"R" A
ND I$<>"W" THEN GOTO 400

```



```
430 IF I$="R" THEN PEN 1:LOCATE K,8:PRIN
T GL$:IP=0
440 IF I$="W" THEN PEN 3:LOCATE K,8:PRIN
T GL$:IP=3
450 IF I$="B" THEN PEN 1:LOCATE K,8:PRIN
T MG$:IP=1
460 IF I$="L" THEN PEN 2:LOCATE K,8:PRIN
T MG$:IP=2
470 IF IP=W(K) THEN PEN 2:LOCATE K,16:PR
INT GL$::M=M+1:GOTO 490
480 EP=1
490 PEN 0:PAPER 1:LOCATE 12,22:PRINT OW;
:LOCATE 27,22:PRINT M:PAPER 0
500 NEXT K
510 IF EP=0 THEN M=M+J:PEN 0:PAPER 2:LOC
ATE 27,22:PRINT M:PAPER 0
520 Q=50*J
530 RB$=INKEY$:Q=Q-1
540 IF RB$="" AND Q<>0 THEN GOTO 530
550 REM
560 IF EP=1 THEN GOTO 250
570 NEXT J
580 LOCATE 1,17:PRINT"You did it ! you w
ill need a real drink after that ";
590 REM
600 REM BLOCK DRAWING SUBROUTINE
610 FOR YY=Y TO Y+H STEP SGN(H)*2
620 MOVE X,YY:DRAWR W,0
630 NEXT YY
640 RETURN
```

SPIRAL MAZES



Because you forgot to doff your cap to the local tyrant, you have been thrown into his dungeons.

On the floor, scratched by a previous resident, is a map so now is your chance to escape. Rather than rush headlong into the maze, however, it would be wise to trace your way through in advance. Try drawing a continuous line from where you are to the outside of the dungeons.

By the way, if you make it to the outside, don't forget about doffing the cap next time.

How to play

A maze will be drawn on the screen. At first glance it may appear to be a simple spiral but it may be an optical illusion.

Your position, at the centre, is marked by a red line and you move by pressing the ARROW keys.

Like Dorothy, in the Wizard of Oz, your path will be shown as a yellow line.

When you have decided whether or not your escape is possible press Y for Yes and N for No.

Programming hints

If you wish to change the direction in which the spiral is wound, then you may change the initial values of XS and YS in line 120.

If you wish to make the end wall, which blocks off the outside of the maze, run at right angles, then you should change line 320 from DRAWR, XC, YC to two alternative lines.

```

and          320 DRAWR O, YC: DRAWR XC, O
              325 DRAWR XC, O: DRAWR O, YC
  
```

You will have to remember to separate the conditions in lines 280 to 310 to determine in which order the PLOT statements occur.

The Program

```

10 REM SPIRAL MAZE
20 REM COPYRIGHT (C) 1985 G. LUDINSKI
30 MODE 1
40 CLS
50 WH=INT(RND(1)*2)
60 PA=(2*INT(RND(1)*8))+8
70 L=10:W=10:X=200:Y=156
  
```

```

80 REM
90 REM DRAW MAZE
100 REM
110 FOR J=1 TO 2
120 XS=1:YS=-1
130 PEN 1:MOVE X-5,Y-5:DRAWR 10,0:PEN 3
140 IF J=1 THEN MOVE X,Y:SP=-1:XT=X:YT=Y
150 IF J=2 THEN MOVE X,Y:DRAWR -W,0:DRAW
R 0,W:SP=1
160 FOR I=1 TO PA
170 IF WH=1 AND J=2 AND I>=(PA-3) THEN I
=PA:GOTO 220
180 IF I/2=INT(I/2) THEN YP=YS*(L+(2*INT
((I+SP)/2))*W):DRAWR 0,YP:YS=-YS
190 IF I/2=INT(I/2) AND J=1 THEN YT=YT+Y
P
200 IF I/2<>INT(I/2) THEN XP=(L+(2*INT((
I+SP)/2))*W)*XS:DRAWR XP,0:XS=-XS
210 IF I/2<>INT(I/2) AND J=1 THEN XT=XT+
XP
220 NEXT I
230 NEXT J
240 REM
250 REM BLOCK OFF END OF MAZE
260 REM
270 XC=0:YC=0
280 IF (WH=0 AND XT>X) OR (WH=1 AND XT<X)
THEN XC=-W
290 IF (WH=0 AND XT<X) OR (WH=1 AND XT>X)
THEN XC=W
300 IF (WH=0 AND YT>Y) OR (WH=1 AND YT<Y
) THEN YC=-W
310 IF (WH=0 AND YT<Y) OR (WH=1 AND YT>Y
) THEN YC=W
320 DRAWR XC,YC
330 LOCATE 1,2:PRINT"Can you escape Y/
N ?"
340 REM
350 REM DRAW PATH THROUGH MAZE
360 REM
370 GOSUB 470
380 REM
390 REM CHECK ANSWER
400 REM
410 PRINT U$

```

```
420 IF (TU$="Y" AND WH=0) OR (TU$="N" AN
D WH=1) THEN PRINT"You are right":GOTO 4
40
430 PRINT"You are wrong"
440 REM
450 GOTO 630
460 REM
470 REM ARROW SUBROUTINE
480 MOVE X-7,Y-5
490 PEN 2
500 REM
510 TU$=INKEY$:IF TU$="" THEN GOTO 510
520 IF TU$="Y" OR TU$="N" THEN GOTO 610
530 XO=0:YO=0
540 IF TU$<CHR$(240) OR TU$>CHR$(243) TH
EN GOTO 510
550 IF TU$=CHR$(240) THEN YO=5
560 IF TU$=CHR$(241) THEN YO=-5
570 IF TU$=CHR$(242) THEN XO=-5
580 IF TU$=CHR$(243) THEN XO=5
590 DRAWR XO,YO
600 GOTO 510
610 PEN 3
620 RETURN
630 PRINT"Goodbye..."
640 PRINT"======"
650 END
```


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THE AUTHOR

Genevieve Ludinski is a widely experienced programmer and technical author and has her own software company specialising in educational material.

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