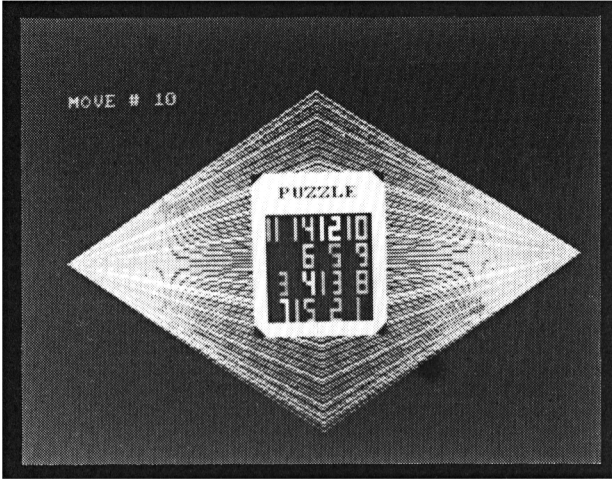


# FIFTEEN PUZZLE



## CLASSIFICATION: Educational

Use the cursor movement keys to arrange the numbers into order with the minimum number of moves. Press 'Q' to quit the game.

## PROGRAM

### Variables

CHAR\$(16)	Defines 16 character strings for the numbers
XCOORD(16), YCOORD(16)	Each number's coordinates
POSITION(16)	The number contained in each position
DISPLAY	Flag for displaying move number
FEEDBACK	Flag for audio feedback each move
WIN	Can win if random set-up
R1, R2	Random numbers
SPACE	Blank position
COL(16)	Colours for each number
COUNT	Count of moves
T, A, B, C, D	Temps

## Program Structure

Lines	Function/Activity
40	Call initialisation
80 — 190	Main loop
230 — 280	Games won
320 — 890	Character/variable initialisation
900 — 1240	Screen/other initialisation
1270 — 1340	Character block print
1380 — 1390	Game over

FIFTEEN FUZZLE

Call initialisation routine

40 GOSUB 320 : COUNT = 1

Main loop

```

50 :
80 A$ = INKEY$ : IF A$ = "" THEN 80
90 IF A$ = "Q" OR A$ = "q" THEN 1380
100 IF DISPLAY THEN PEN 2 : LOCATE 1,1 : PRINT "MOVE_#" : C
    UNT
110 IF ASC(A$) = 240 AND SPACE > 4 THEN POSITION(SPACE) = P
    OSITION(SPACE - 4) : POSITION(SPACE - 4) = 16 : SPACE =
    SPACE - 4 : Z = POSITION(SPACE) : X = XCOORD(SPACE) : Y =
    YCOORD(SPACE) : GOSUB 1270 ELSE 130
120 Z = POSITION(SPACE + 4) : X = XCOORD(SPACE + 4) : Y = YC
    OOR(SPACE + 4) : GOSUB 1270
130 IF ASC(A$) = 241 AND SPACE < 13 THEN POSITION(SPACE) =
    POSITION(SPACE + 4) : POSITION(SPACE + 4) = 16 : SPACE =
    SPACE + 4 : Z = POSITION(SPACE) : X = XCOORD(SPACE) : Y
    = YCOORD(SPACE) : GOSUB 1270 ELSE 150
140 Z = POSITION(SPACE - 4) : X = XCOORD(SPACE - 4) : Y = YC
    OOR(SPACE - 4) : GOSUB 1270
150 IF ASC(A$) = 242 AND (SPACE <> 1 AND SPACE <> 5 AND SPA
    CE <> 9 AND SPACE <> 13) THEN POSITION(SPACE) = POSITION
    (SPACE - 1) : SPACE = SPACE - 1 : POSITION(SPACE) = 16 E
    LSE 170
160 Z = POSITION(SPACE + 1) : X = XCOORD(SPACE + 1) : Y = YC
    OOR(SPACE + 1) : GOSUB 1270 : Z = POSITION(SPACE) : X =
    XCOORD(SPACE) : Y = YCOORD(SPACE) : GOSUB 1270
170 IF ASC(A$) = 243 AND (SPACE <> 4 AND SPACE <> 8 AND SPA
    CE <> 12 AND SPACE <> 16) THEN POSITION(SPACE) = POSITIO
    N(SPACE + 1) : SPACE = SPACE + 1 : POSITION(SPACE) = 16
    ELSE 80
180 Z = POSITION(SPACE - 1) : X = XCOORD(SPACE - 1) : Y = YC
    OOR(SPACE - 1) : GOSUB 1270 : Z = POSITION(SPACE) : X =
    XCOORD(SPACE) : Y = YCOORD(SPACE) : GOSUB 1270
190 COUNT = COUNT + 1 : FOR T = 1 TO 16 : IF POSITION(T) =
    T AND WIN = 1 THEN NEXT T : GOTO 230 ELSE 80

```

Player wins

```

200 :
230 MODE 0 : SOUND 1, 200, 100, 15, 1, 1, 1
240 LOCATE 3, 8 : PEN 7 : PRINT "CONGRATULATIONS!"
250 PEN 10 : LOCATE 14, 10 : PRINT "You did it in"
260 PRINT COUNT; "MOVES."
270 FOR T = 1 TO 3000 : NEXT T
280 RUN

```

Character and variable initialisation

```

290      ;
320  MODE 1
330  BORDER 0
340  PAPER 0
350  INK 0, 0
360  INK 1, 18
370  INK 2, 15
380  INK 3, 24
390  SYMBOL 240, 0, 0, 96, 96, 96, 96, 96, 96
400  SYMBOL 241, 0, 0, 3, 3, 3, 3, 3, 3
410  SYMBOL 242, 0, 0, 99, 99, 99, 99, 99, 99
420  SYMBOL 243, 96, 96, 96, 96, 96, 96, 96, 96
430  SYMBOL 244, 99, 99, 99, 99, 99, 99, 99, 99
440  SYMBOL 245, 0, 0, 248, 248, 0, 0, 0, 0
450  SYMBOL 246, 0, 0, 248, 248, 24, 24, 24, 24
460  SYMBOL 247, 0, 0, 24, 24, 24, 24, 24, 24
470  SYMBOL 248, 248, 248, 24, 24, 24, 24, 24, 24
480  SYMBOL 249, 248, 248, 0, 0, 0, 0, 248, 248
490  SYMBOL 250, 24, 24, 24, 24, 24, 24, 248, 248
500  SYMBOL 251, 248, 248, 24, 24, 24, 24, 248, 248
510  DIM CHAR$(16)
520  FOR T = 1 TO 16
530  READ A, B, C, D
540  CHAR$(T) = CHR$(A) + CHR$(B) + CHR$(C) + CHR$(D)
550  NEXT T
560  DATA 241, 32, 209, 32
570  DATA 32, 246, 209, 249
580  DATA 32, 246, 32, 251
590  DATA 241, 247, 32, 248
600  DATA 241, 245, 32, 251
610  DATA 241, 245, 209, 251
620  DATA 32, 246, 32, 149
630  DATA 241, 246, 209, 251
640  DATA 241, 246, 32, 251
650  DATA 242, 246, 244, 250
660  DATA 242, 32, 244, 32
670  DATA 240, 246, 244, 249
680  DATA 240, 246, 243, 251
690  DATA 242, 247, 243, 248
700  DATA 242, 245, 243, 251
710  DATA 32, 32, 32, 32
720  DIM XCOORD(16), YCOORD(16), POSITION(16)
730  FOR T = 1 TO 16 : POSITION(T) = T : NEXT T
740  FOR T = 1 TO 4
750  FOR N = 1 TO 4
760  XCOORD(4 * (T - 1) + N) = N * 2 + 15
770  YCOORD(4 * (T - 1) + N) = 1 * 2 + 8
780  NEXT N : NEXT T
790  PEN 2
800  PRINT TAB(10) "FIFTEEN_PUZZLE"
810  PEN 1
820  LOCATE 4,9 : PRINT "DISPLAY_MOVE_NUMBER_(Y/N)_?"
830  A$ = INKEY$: IF A$ = "" THEN 830
840  IF A$ = "Y" OR A$ = "v" THEN DISPLAY = 1
850  PRINT : PRINT TAB(4) : "AUDIO_FEEDBACK_ON_(Y/N)_?"
860  A$ = INKEY$: IF A$ = "" THEN 860
870  IF A$ = "Y" OR A$ = "v" THEN FEEDBACK = 1
880  PRINT : PRINT TAB(4) "RANDOM_SETUP_(Y/N)_?"
890  A$ = INKEY$: IF A$ = "" THEN GOTO 890 ELSE IF A$ = "Y"
      OR A$ = "v" THEN WIN = 1 ELSE WIN = 0

```

Screen and other initialisation

```

895 :
900 MODE 1
910 FOR T = 1 TO 400 STEP 5
920 MOVE 0, 200
930 DRAW 320, T, RND(1) * 2 + 1
940 MOVE 639, 200
950 DRAW 321, T, RND(0) * 2 + 1
960 NEXT
970 LOCATE 16, 7
980 PEN 3
990 PRINT CHR$(214);
1000 FOR T = 1 TO 8
1010 PRINT CHR$(143);
1020 NEXT T
1030 PRINT CHR$(215)
1040 LOCATE 16, 8
1050 PRINT STRING$( 10, CHR$(143))
1060 LOCATE 16, 9
1070 PRINT STRING$( 10, CHR$(143))
1080 FOR T = 10 TO 17 : LOCATE 16, T : PRINT CHR$(143) + "▲▲
▲▲▲▲▲" + CHR$(143) : NEXT T
1090 LOCATE 16, 18 : PRINT CHR$(213);
1100 PRINT STRING$( 8, CHR$(143)); CHR$(212)
1110 PAPER 3 : PEN 0 : LOCATE 18, 8 : PRINT "PUZZLE" : PAPER
0 : PEN 1
1120 IF WIN = 0 THEN GOTO 1210
1130 FOR T = 1 TO 30
1140 R1 = CINT( RND(1) * 15 + 1)
1150 R2 = CINT( RND(1) * 15 + 1)
1160 O1 = POSITION(R1)
1170 O2 = POSITION(R2)
1180 POSITION(R1) = O2
1190 POSITION(R2) = O1
1200 NEXT T
1210 FOR T = 1 TO 16 : IF POSITION(T) = 16 THEN SPACE = T EL
SE NEXT T
1220 DIM COL(16)
1230 FOR T = 1 TO 16 : COL(T) = CINT( RND(1) * 2 + 1) : NEXT
T
1240 FOR T = 1 TO 16 : Z = POSITION(T) : X = XCOORD(T) : Y =
YCOORD(T) : GOSUB 1270 : NEXT T

```

Character block print

```

1250 :
1270 PEN COL(Z)
1280 COUNT = COUNT + 0.5
1290 IF FEEDBACK THEN PRINT CHR$(7) ;
1300 LOCATE X, Y
1310 PRINT LEFT$( CHAR$(Z), 2 )
1320 LOCATE X, Y + 1
1330 PRINT RIGHT$( CHAR$(Z), 2 )
1340 RETURN

```

Game over

```
1350 :  
1380 LOCATE 1,3 : PRINT "bye_for_now"  
1390 END
```

## ChexSum Tables

40 = 1075	540 = 3880	970 = 307
50 = 0	550 = 433	980 = 236
80 = 1863	560 = 812	990 = 860
90 = 2175	570 = 875	1000 = 991
100 = 3005	580 = 814	1010 = 789
110 = 15026	590 = 871	1020 = 433
120 = 6268	600 = 863	1030 = 802
130 = 15067	610 = 917	1040 = 308
140 = 6271	620 = 820	1050 = 1268
150 = 12661	630 = 918	1060 = 309
160 = 11742	640 = 864	1070 = 1268
170 = 12593	650 = 917	1080 = 4027
180 = 11745	660 = 812	1090 = 1189
190 = 6737	670 = 923	1100 = 1922
200 = 0	680 = 915	1110 = 2030
230 = 1170	690 = 924	1120 = 1536
240 = 1999	700 = 916	1130 = 1024
250 = 2020	710 = 708	1140 = 1816
260 = 1356	720 = 2476	1150 = 1817
270 = 1624	730 = 2985	1160 = 1631
280 = 202	740 = 987	1170 = 1633
290 = 0	750 = 1013	1180 = 1632
320 = 220	760 = 2914	1190 = 1632
330 = 176	770 = 2903	1200 = 433
340 = 232	780 = 861	1210 = 4445
350 = 266	790 = 235	1220 = 664
360 = 296	800 = 1740	1230 = 3634
370 = 294	810 = 234	1240 = 6087
380 = 304	820 = 2366	1250 = 0
390 = 1610	830 = 1848	1270 = 894
400 = 987	840 = 2953	1280 = 1710
410 = 1630	850 = 2501	1290 = 1856
420 = 1827	860 = 1878	1300 = 704
430 = 1852	870 = 2968	1310 = 1465
440 = 1491	880 = 2229	1320 = 963
450 = 1632	890 = 5757	1330 = 1469
460 = 1185	895 = 0	1340 = 201
470 = 1704	900 = 220	1350 = 0
480 = 2013	910 = 1421	1380 = 1620
490 = 1706	920 = 489	1390 = 152
500 = 2155	930 = 1525	
510 = 718	940 = 630	
520 = 1010	950 = 1525	
530 = 1189	960 = 176	
		TOTAL = 257869