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10 INK 0,0:PAPER 0:INK 1,24:PEN 1:BORDER 0:MODE 1:
LOCATE 1,11:PRINT" ENTER DATA CASSETTE TO LOAD REC
ORDS.":PRINT
20 OPENIN "":FOR I=3 TO 5:INPUT#9,RE$(I),RES$(I):N
EXT I:CLOSEIN
30 DIM B(3,5)
40 INK 0,0:INK 1,24:INK 2,13
50 INK 3,15
60 PAPER 0:PEN 1:BORDER 0
70 LET MI=0:LET SEC=0
80 MODE 1
90 LET A=1
100 PEN 2
110 PEN 1:LOCATE 13,2:PRINT"TOWERS OF HANOI":PRINT
:PRINT"THE OBJECT IS TO MOVE THE RINGS TO NO.3"
120 FOR J=20 TO 21
130 PEN 2
140 FOR I=2 TO 38:LOCATE I,J:PRINT CHR$(143):NEXT
I,J
150 FOR I=8 TO 38 STEP 12:FOR J=14 TO 19
160 LOCATE I,J:PRINT CHR$(143):NEXT J:PEN 1:LOCATE
I,21:PRINT RIGHT$(STR$(A),1):A=A+1:PEN 2:NEXT I
170 PEN 1
180 LOCATE 1,25:INPUT"HOW MANY RINGS (3-5) ";RING$
190 IF VAL(RING$)<3 OR VAL(RING$)>5 THEN GOTO 180
ELSE LET RING=VAL(RING$)
200 FOR I=1 TO 3:FOR J=1 TO 5:LET B(I,J)=0:NEXT J,
I
210 LOCATE 11,23:PRINT"RECORD ";RE$(RING);" BY ";R
ES$(RING)
220 LOCATE 1,25:PRINT SPC(38)
230 LET A=6-RING
240 PEN 3
250 FOR I=3 TO 11 STEP 2
260 LET B(1,A)=I
270 LET A=A+1
280 IF A<6 THEN NEXT I
290 LET A=5
300 FOR J=19 TO 20-RING STEP-1

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310 LOCATE ((B(1,A)-1)/2)+(9-B(1,A)),J
320 FOR I=1 TO B(1,A):PRINT CHR$(143);:NEXT I
330 LET A=A-1:IF A>5-RING THEN NEXT J
340 PEN 1:LOCATE 1,25:PRINT"SEE THE SOLUTION ? (Y
OR N)"
350 LET Q$=INKEY$:IF Q$="" THEN GOTO 350
360 IF Q$="Y" THEN LET SOL=1
370 IF Q$="N" THEN LET SOL=0
380 IF Q$<>"Y" AND Q$<>"N" THEN GOTO 350
390 LOCATE 1,25:PRINT "
"
400 IF RING=3 THEN RESTORE 1540
410 IF RING=4 THEN RESTORE 1560
420 IF RING=5 THEN RESTORE 1580
430 LOCATE 14,25:PEN 1:PRINT"TIME: 0:00"
440 EVERY 50 GOSUB 1770
450 FOR I=1 TO 20:LET Q$=INKEY$:NEXT I
460 DI:LOCATE 1,6:LOCATE 1,7:PRINT " ":LOCAT
E 1,8:PRINT " "
470 PEN 1:LOCATE 1,6:PRINT"FROM: ":LOCATE 6,6:EI
480 IF SOL=1 THEN READ Q:LET Q$=RIGHT$(STR$(Q),1):
GOTO 520
490 LET Q$=INKEY$:IF Q$="" THEN GOTO 490
500 IF Q$="Q" THEN GOTO 1700
510 IF VAL(Q$)<1 OR VAL(Q$)>3 THEN GOTO 470
520 DI:LOCATE 6,6:PRINT Q$:EI
530 LET Q=VAL(Q$)
540 FOR I=1 TO 5
550 IF B(Q,I)<>0 THEN GOTO 610
560 NEXT I
570 DI:LOCATE 1,9:PRINT"THESE ARE NO RINGS THERE."
:EI
580 FOR I=1 TO 1600:NEXT I
590 DI:LOCATE 1,9:PRINT SPC(25):EI
600 GOTO 450
610 DI:LOCATE 1,7:PRINT" TO: ":LOCATE 6,7:EI
620 IF SOL=1 THEN READ P:LET Q$=RIGHT$(STR$(P),1):
GOTO 660
630 LET Q$=INKEY$:IF Q$="" THEN GOTO 610
640 IF Q$="Q" THEN GOTO 1770
650 IF VAL(Q$)<1 OR VAL(Q$)>3 OR VAL(Q$)=Q THEN GO
TO 610
660 DI:LOCATE 6,7:PRINT Q$:EI
670 LET W=VAL(Q$)
680 FOR D=1 TO 5
690 IF D<6 AND B(W,D)=0 THEN NEXT D:GOTO 710
700 IF B(W,D)<B(Q,I) THEN DI:LOCATE 1,8:PRINT"ILLE
GAL MOVE.":FOR K=1 TO 1600:NEXT K:LOCATE 1,7:PRINT
" ":LOCATE 1,8:PRINT " ":EI:GOTO 45
0
710 DI:GOSUB 810

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120 IF W-Q=1 THEN GOSUB 960
730 IF W-Q=2 THEN GOSUB 1340
740 IF W-Q=-1 THEN GOSUB 1060
750 IF W-Q=-2 THEN GOSUB 1440
760 GOSUB 1160
770 EI
780 IF W=3 THEN GOSUB 1600
790 GOTO 450
800 END
810 REM **MOVE PIECE UP**
820 IF Q=1 THEN LET X=9-B(Q,I)
830 IF Q=2 THEN LET X=21-B(Q,I)
840 IF Q=3 THEN LET X=33-B(Q,I)
850 FOR I=1 TO 5
860 IF B(Q,I)<>0 THEN GOTO 880
870 NEXT I
880 FOR J=20-(7-I) TO 10 STEP -1
890 PEN 3
900 LOCATE ((B(Q,I)-1)/2)+X,J
910 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
920 LOCATE ((B(Q,I)-1)/2)+X,J+1:PRINT SPC(B(Q,I))
930 IF J>12 THEN PEN 2:LOCATE 8+(12*(Q-1)),J+1:PRI
NT CHR$(143):PEN 3
940 NEXT J
950 RETURN
960 REM **RIGHT ONE PLACE**
970 PEN 3
980 FOR J=((B(Q,I)-1)/2)+X TO ((B(Q,I)-1)/2)+X+11
990 IF J>5 THEN LET P=J-4 ELSE P=J-2
1000 LOCATE P,10:PRINT "          ":LOCATE J+1,10
1010 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
1020 FOR L=1 TO 10:NEXT L
1030 NEXT J
1040 LET X=J+(((B(Q,I)-1)/2)-2)
1050 RETURN
1060 REM **LEFT ONE PLACE**
1070 PEN 3
1080 FOR J=X TO ((B(Q,I)-1)/2)+X-12 STEP -1
1090 IF J>5 THEN LET P=J-4 ELSE P=J-2
1100 LOCATE J+B(Q,I)+1,10:PRINT "          ":LOCATE J+1
,10
1110 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
1120 FOR L=1 TO 10:NEXT L
1130 NEXT J
1140 LET X=J+(((B(Q,I)-1)/2)-1)
1150 RETURN
1160 REM **MOVE PIECE DOWN**
1170 IF W=1 THEN LET X=9-B(Q,I)
1180 IF W=2 THEN LET X=21-B(Q,I)
1190 IF W=3 THEN LET X=33-B(Q,I)
1200 LET X=((B(Q,I)-1)/2)+X

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1210 FOR S=1 TO 5
1220 IF B(W,S)<>0 THEN GOTO 1240
1230 NEXT S
1240 FOR J=10 TO 20-(7-S)
1250 LOCATE X,10:PRINT SPC(15)
1260 PEN 3
1270 LOCATE X,J
1280 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
1290 LOCATE X,J-1:PRINT SPC(B(Q,I))
1300 IF J>14 THEN PEN 2:LOCATE 8+(12*(W-1)),J-1:PR
INT CHR$(143):PEN 3
1310 NEXT J
1320 LET B(W,S-1)=B(Q,I):LET B(Q,I)=0
1330 RETURN
1340 REM **TWO PLACES RIGHT**
1350 PEN 3
1360 FOR J=12-B(Q,I) TO 33-B(Q,I)-(5-B(Q,I))+2
1370 IF J>5 THEN LET P=J-4 ELSE P=J+2
1380 LOCATE P,10:PRINT "          ":LOCATE J+1,10
1390 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
1400 FOR L=1 TO 10:NEXT L
1410 NEXT J
1420 LET X=J-1
1430 RETURN
1440 REM **TWO PLACES LEFT**
1450 PEN 3
1460 FOR J=33-B(Q,I)-(5-B(Q,I)) TO 9-B(Q,I)+((B(Q,
I)-1)/2)-1 STEP -1
1470 IF J>5 THEN LET P=J-4 ELSE P=J-2
1480 LOCATE J+B(Q,I)+1,10:PRINT "          ":LOCATE J+1
,10
1490 FOR K=1 TO B(Q,I):PRINT CHR$(143);:NEXT K
1500 FOR L=1 TO 10:NEXT L
1510 NEXT J
1520 LET X=J+1
1530 RETURN
1540 REM **RING=3**
1550 DATA 1,3,1,2,3,2,1,3,2,1,2,3,1,3
1560 REM
1570 DATA 1,2,1,3,2,3,1,2,3,1,3,2,1,2,1,3,2,3,2,1,
3,1,2,3,1,2,1,3,2,3
1580 REM
1590 DATA 1,3,1,2,3,2,1,3,2,1,2,3,1,3,1,2,3,2,3,1,
2,1,3,2,1,3,1,2,3,2,1,3,2,1,2,3,1,3,2,1,3,2,3,1,2,
1,2,3,1,3,1,2,3,2,1,3,2,1,2,3,1,3
1600 REM **CHECK FOR COMPLETE PUZZLE**
1610 FOR D=(5-RING)+1 TO 5
1620 IF B(3,D)=0 THEN RETURN
1630 LET A(D)=B(3,D)
1640 IF A(D)>A(D-1) THEN NEXT D ELSE RETURN
1650 LET D=REMAIN(0):LOCATE 1,6:PEN 1:PRINT"PUZZLE

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COMPLETE"
1660 IF (MI*60)+SEC>((VAL(LEFT$(RE$(RING),1)))*60)
+(VAL(RIGHT$(RE$(RING),2))) THEN GOTO 1700
1670 IF SOL=1 THEN GOTO 1700
1680 LET RE$(RING)=RIGHT$(STR$(MI),1)+": "+RIGHT$(S
TR$(SEC),2)
1690 LOCATE 1,7:PRINT"YOU HAVE THE RECORD.":INPUT"
ENTER YOUR NAME.(3 LETTERS) ";RE$(RING):LET RE$(
RING)=LEFT$(RE$(RING),3)
1700 LET D=REMAIN(0):LOCATE 1,6:PRINT"PUZZLE COMPL
ETE":PRINT"                                ":LOCATE 1,8:P
RINT"PLAY AGAIN ? (Y OR N)                                "
1710 LET Q$=INKEY$:IF Q$="" THEN GOTO 1710
1720 IF Q$="Y" THEN GOTO 70
1730 IF Q$="N" THEN GOTO 1740 ELSE GOTO 1710
1740 MODE 1:LOCATE 1,11:PRINT" ENTER DATA CASSETTE
TO SAVE RECORDS.":PRINT
1750 OPENOUT "RECORDS":FOR I=3 TO 5:PRINT#9,RE$(I)
:PRINT#9,RE$(I):NEXT I:CLOSEOUT
1760 END
1770 REM **TIMER**
1780 PEN 1
1790 LET SEC=SEC+1:IF SEC=60 THEN LET SEC=0:LET MI
=MI+1
1800 LOCATE 20,25:PRINT USING"#";MI;:PRINT ""::PR
INT USING"##";SEC
1810 IF SEC<10 THEN LOCATE 22,25:PRINT"0"
1820 IF SEC=0 AND MI=10 THEN LOCATE 1,6:PRINT"OUT
OF TIME.":GOTO 1700
1830 RETURN

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FILE CREATION PROGRAM

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10 MODE 1:LOCATE 1,11:PRINT" ENTER DATA CASSETTE T
O SAVE RECORDS.":PRINT
20 OPENOUT "RECORDS"
30 FOR I=1 TO 6:READ A$:PRINT #9,A$:NEXT I
40 CLOSEOUT
50 DATA "0:44","SJL","1:30","SJL","2:50","SJL"

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