

@QED.

*READ FROM /INV BOWL.

757 WORDS.

*1,\$/

*

* GLOBALS FOR INVERSE-BOWLING PROBLEM

*

MACRO MOD ← REM

*

SCALAR BMIN; * MINIMUM BALLS IN SUCCESSFUL GAME SO FAR

SCALAR SG0AL; * DESIRED SCORE

END

&L

```

FUNCTION INVBOWL()
*
* SOLVE THE INVERSE BOWLING PROBLEM ( E. W. DIJKSTRA )
*
  CRLF ( 1 )
  SGØAL ← 1
  WHILE SGØAL > 0 DØ
    SØUT ( "A SCORE ØF " )
    SGØAL ← IIN()
    IF SGØAL > 0 DØ
      BMIN ← 25
      NØRMAL ( 0, 0, 0, 0, 0 )
      IF BMIN < 25 DØ
        SØUT ( " REQUIRES AT LEAST " )
        IØUT ( BMIN )
        SØUT ( " BALLS. " )
      ELSE DØ
        SØUT ( " IS IMPØSSIBLE." )
      ENDIF
    CRLF ( 2 )
  ENDIF
ENDWHILE
SØUT ( " MEANS 'GØØDBYE' ... " )
CRLF ( 4 )
RETURN
END
&L

```

FUNCTION NORMAL (F, R, DR, N, B)

*

* PREVIOUS FRAME WAS NEITHER STRIKE NOR SPARE

*

IF B < BMIN AND F <= SGØAL DØ

IF N = 10 DØ

INVESTIGATE (F, R, DR, B)

ELSE DØ

STRIKE (F+10, R, DR, N+1, B+1)

SPARE (F+10, R, DR, N+1, B+2)

NØRMAL (F, R+9, DR, N+1, B+2)

ENDIF

ENDIF

RETURN

END

&L

FUNCTION SPARE (F, R, DR, N, B)

*

* PREVIOUS FRAME WAS A SPARE

*

IF B < BMIN-1 AND F <= SGOAL DO

IF N = 10 DO

INVESTIGATE (F, R+9, DR, B+1)

ELSE DO

STRIKE (F+20, R, DR, N+1, B+1)

SPARE (F+10, R+9, DR, N+1, B+2)

NORMAL (F, R+18, DR, N+1, B+2)

ENDIF

ENDIF

RETURN

END

&L

FUNCTION STRIKE (F, R, DR, N, B)

*

* PREVIOUS FRAME WAS A STRIKE, BUT FRAME BEFORE THAT WAS NOT

*

IF B < BMIN-2 AND F <= SG0AL D0

IF N = 10 D0

INVESTIGATE (F, R+20, DR, B+2)

ELSE D0

EXTRA (F+20, R, DR, N+1, B+1)

SPARE (F+20, R, DR, N+1, B+2)

NORMAL (F, R, DR+9, N+1, B+2)

ENDIF

ENDIF

RETURN

END

&L

FUNCTION EXTRA (F, R, DR, N, B)

*

* PREVIOUS TWO FRAMES WERE BOTH STRIKES

*

IF B < BMIN-2 AND F <= SC0AL D0

IF N = 10 D0

INVESTIGATE (F, R+30, DR, B+2)

ELSE D0

EXTRA (F+30, R, DR, N+1, B+1)

SPARE (F+20, R+9, DR, N+1, B+2)

N0RMAL (F, R, DR, N+1, B+2)

N0RMAL (F+2, R+25, DR, N+1, B+2)

ENDIF

ENDIF

RETURN

END

&L

FUNCTION INVESTIGATE (F, R, DR, B)

*

* PREVIOUS FRAME WAS "CLOSING RITUAL" .. INVESTIGATE POSSIBLE SCORES

*

IF F <= SG0AL AND SG0AL <= F + R + 2*DR D0

IF R > 0 OR (SG0AL - F) MOD 2 = 0 D0

BMIN ← B; * B < BMIN IF THIS ROUTINE REACHED

ENDIF

ENDIF

RETURN

END

*FINISHED.

WRITE OUT!

@LOGOUT UCB1.

TIME USED 0:0:57 IN 0:34:51

11/27/73 1223:53