

program for "inverse bowling problem"
written by D. Redell

SEP 11 1973

```
*  
* GLOBALS FOR INVERSE BOWLING PROBLEM  
*  
  SCALAR BMIN; * MINIMUM BALLS IN SUCCESSFUL GAME SO FAR  
  *  
  SCALAR SGOAL; * DESIRED SCORE  
END
```

SEP 11 1973

```
FUNCTION INVBOWL()
*
* SOLVE THE INVERSE BOWLING PROBLEM
*
  CONSTANT TTY ← 2
  *
  CRLF ( 1, TTY )
  SGOAL ← 1
  WHILE SGOAL > 0 DO
    SOUT ( "FOR A SCORE OF ", TTY )
    SGOAL ← IIN ( TTY )
    BMIN ← 25
    NORMAL ( 0, 0, 0, 0, 0 )
    SOUT ( "THE MINIMUM NUMBER OF BALLS IS ", TTY )
    IOUT ( BMIN, TTY, 10, -1, ' ' )
    CRLF ( 2, TTY )
  ENDWHILE
  SOUT ( "YOU FIGURE IT OUT" )
  CRLF ( 4, TTY )
  RETURN
END
```

SEP 11 1973

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

*

* PREVIOUS FRAME WAS NEITHER STRIKE NOR SPARE

*

IF B < BMIN AND F <= SGOAL DO

IF N = 10 DO

INVESTIGATE (F, R, DR, B)

ELSE DO

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

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

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

ENDIF

ENDIF

RETURN

END

SEP 11 1973

```
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
```

SEP 11 1973

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

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

IF B < BMIN - 2 AND F <= SGOAL DO

IF N = 10 DO

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

ELSE DO

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

SEP 11 1973

```
FUNCTION EXTRA ( F, R, DR, N, B )  
*  
* PREVIOUS TWO FRAMES WERE BOTH STRIKES  
*  
  IF B < BMIN - 2 AND F <= SGOAL DO  
    IF N = 10 DO  
      INVESTIGATE ( F, R+30, DR, B+2 )  
    ELSE DO  
      EXTRA ( F+30, R, DR, N+1, B+1 )  
      SPARE ( F+20, R+9, DR, N+1, B+2 )  
      NORMAL ( F, R, DR, N+1, B+2 )  
      NORMAL ( F+2, R+25, DR, N+1, B+2 )  
    ENDIF  
  ENDIF  
  RETURN  
END
```

SEP 11 1973

FUNCTION INVESTIGATE (F, R, DR, B)

*

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

*

IF F <= SGOAL AND SGOAL <= F + R + 2*DR DO

IF R > 0 OR (SGOAL - F) MOD 2 = 0 DO

BMIN ← B

ENDIF

ENDIF

RETURN

END