5111 Program Description I

Program Title 67- TWONKY

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Program Description, Equations, Variables

HP-67 sets up a 15x15 game board in which you are randomly located. Inside the field is an objective, 15 blocked squares (walls), 15 relocation squares and one super special new maze square, and, of course, the Twonky. To win the game, you must reach the objective before Twonky gets you, by moving one square at a time, forward, backward, right or left. Unfortunately you are hindered by several things:

1. Relocation squares: when moved on, cause you to be randomly transported to another position in the maze.
2. Walls: you can't move into these squares, and lose your turn when you hit one.
3. Super-Maze-Square: essentially an instant loss, since when you move here, a complete new maze is set up.
4 Twonky: after every move, the Twonky moves toward you (He is impervious to all traps even walls). When he gets too close to you (2 or fewer squares), you lose. However, you are equipped with a dematerializing ray gun. You have the option of using this on your turn. If you hit the Twonky, he dematerializes and then re-materializes on a different square of the maze to resume his quest after you (Caution: he could be dropped into your lap!).

After each move pair (yours and Twonky's), your distances from both the Twonky and the objective are displayed. There is no board printout - you play blind. However, using the distances, you can home into the approximate position of both, Twonky and objective.

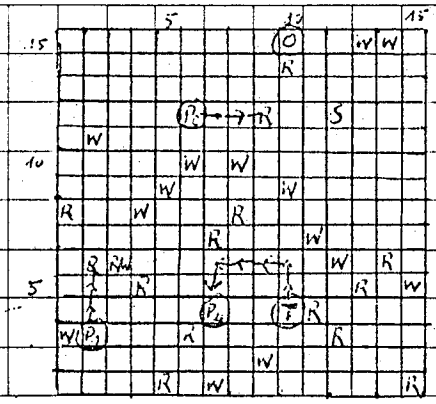
When shooting at the Twonky, you do not have a shot if the distance he is from you is not an integer! Exceptions to this rule are distances of 5, 10, 13 and 17. If the distance is 5, 10 or 13 (not 17!) you may or may not have a direct shot.

Operating Limits and Warnings

This game may be played at two levels. First it is a random game and amazing. At a higher level you can calculate your strategy and so it becomes a challenge to your brain.

Program Description II

Sketch(es)



P_0, P_1, P_2 : Positions of Player
T : Twonky
O : objective
S : Super Trap
R : Relocation Squares
W : Walls

Sample Problem(s) Initialize: 258147369 E 3. setup the maze

(after 2 min:)		5.00000	8.94427
1. Move:	4 A	4.24264	7.61577
2. Move:	4 A	3.60555	6.32456
3. Move:	4 A	1.	you've been relocated!
		14.42221	7.61577
4. Move:	1 A	13.60147	6.32456
5. Move:	1 A	12.80625	5.09902
6. Move:	1 A	1.	you've been relocated!
		0 flashing	You are absorbed by Twonky!

Solution(s) The above maze, corresponding to the sample problem, I have step by step recalled from the registers for a better illustration what happens on the board.

Reference(s) Capella, Mark. Twonky (in Creative Computing Vol 3, No 3 pp 110-112)

User Instructions

Twonky

1 ◀ ▶ 2

A	B	C	D	E
Move	Shot			Init

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	Initialize (seed between 0 and 1)	(seed)	E		3
	(after ca. 2min)				Δ1
					Δ2
2	Move (m=1,2,3 or 4)	m	A		(n)
	n=0: You are out of the maze				Δ1
	1: You've been relocated				Δ2
	2 blocked space				
	3 change all, supertrap				
	0 flashing: Twonky has just absorbed you!				
	1 flashing: You got the objective!				
	for a new move goto step 2.				
	If Δ2 is even you may goto step 3				
3	Shot (allowed if Δ2 is even)	s	B		n
	(s=1,2,3 or 4)				Δ1
	n=0: shot missed				Δ2
	1: Twonky is hit and will replaced randomly				
	for a new move goto step 2				
4	for a new game goto step 1				
	(Δ1 = distance from objective				
	Δ2 = distance from Twonky)				
	(m or s = 1: forward }				
	2 left } move or shot				
	3 backward }				
	4 right)				

Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS
001	f LBL A	31 25 11	MOVE
	DSP 0	23 00	
	f GSB 9	31 22 09	new position
	f GSB 8	31 22 08	
	f x=0	31 51	move not allowed
	GTO 6	22 06	
	RCL E	34 15	
	RCL A	34 11	
	g x=y	32 51	you hit the supertrap.
010	GTO f d	22 31 14	
	RCL B	34 12	
	RCL E	34 15	
	g x=y	32 51	you've got the objective
	GTO f e	22 31 15	
	h STI	35 33	
	g FRAC	32 83	
	f GSB C	31 22 13	
	RCL (i)	34 24	you've been relocated
	f INT	31 83	
020	g x=y	32 51	
	GTO 3	22 03	
	RCL (i)	34 24	
	g FRAC	32 83	
	RCL E	34 15	
	g FRAC	32 83	blocked space
	g x=y	32 51	
	GTO 1	22 01	
	RCL E	34 15	
	STO D	33 14	no traps
	GTO 6	22 06	
	f LBL 1	31 25 01	
	2	02	blocked space
	f -x-	31 84	
	f LBL 6	31 25 06	
	RCL D	34 14	
	f INT	31 83	
	RCL C	34 13	
	f INT	31 83	
	—	51	
040	↑	41	
	h ABS	35 64	Twonky's move
	RCL D	34 14	
	g FRAC	32 83	
	RCL C	34 13	
	g FRAC	32 83	
	—	51	
	f GSB C	31 22 13	
	h ABS	35 64	
	h LSTX	35 82	
050	h R↓	35 53	
	g x?y	32 81	
	GTO 1	22 01	
	h R↓	35 53	
	÷	81	
	GTO 2	22 02	
	f LBL 1	31 25 01	

STEP	KEY ENTRY	KEY CODE	COMMENTS
	h R↑	35 54	
	÷	81	
	f GSB D	31 22 14	
060	f LBL 2	31 25 02	
	RCL C	34 13	
	+	61	
	STO C	33 13	
	f LBL 7	31 25 07	distance to objective and
	RCL C	34 13	
	f GSB 5	31 22 05	
	STO E	33 15	
	2	02	
	g x?y	32 81	
070	GTO f c	22 31 13	distance to Twonky
	RCL B	34 12	
	f GSB 5	31 22 05	
	DSP 5	23 05	
	f -x-	31 84	
	RCL E	34 15	
	f -x-	31 84	
	h RTN	35 22	
	f LBL B	31 25 12	SHOT
	DSP 0	23 00	
080	f GSB 9	31 22 09	
	g LBL f b	32 25 12	
	RCL C	34 13	
	g x=y	32 51	
	GTO 1	22 01	
	h R↓	35 53	
	f GSB 3	31 22 08	shot missed
	f x=0	31 51	
	GTO 6	22 06	
	RCL E	34 15	
090	h RCI	35 34	you hit the Twonky!
	+	61	
	STO E	33 15	
	GTO f b	22 31 12	
	f LBL 1	31 25 01	
	1	01	Twonky is relocated
	f -x-	31 84	
	f GSB 2	31 22 02	
	STO C	33 13	
	GTO 7	22 07	
100	f LBL 3	31 25 03	
	1	01	you've been relocated
	f -x-	31 84	
	f GSB 2	31 22 02	
	STO D	33 14	
	GTO 6	22 06	
	f LBL E	31 25 15	INITIALIZE
	g FRAC	32 83	
	STO 0	33 00	
	g LBL f d	32 25 14	
110	1	01	
	5	05	
	h STI	35 33	

REGISTERS

0 RND	1 RS. W_1	2 RS. W_2	3 RS. W_3	4 RS. W_4	5 RS. W_5	6 RS. W_6	7 RS. W_7	8 RS. W_8	9 RS. W_9
S0 RS. W_{10}	S1 RS. W_{11}	S2 RS. W_{12}	S3 RS. W_{13}	S4 RS. W_{14}	S5 RS. W_{15}	S6 —	S7 —	S8 —	S9 —

A Super Trap	B Objective	C Twonkey	D Player	E used	I used

STEP	KEY ENTRY	KEY CODE	COMMENTS
	3	03	
	f -x-	31 84	
	g LBL f a	32 25 11	places relocation squares and walls
	f GSB 2	31 22 02	
	STO (i)	33 24	
	f DSZ	31 33	
	GTO f a	22 31 11	
120	f GSB 2	31 22 02	places objective
	STO A	33 11	
	f GSB 2	31 22 02	places supertrap
	STO B	33 12	
	f GSB 2	31 22 02	places Twonky
	STO C	33 13	
	f GSB 2	31 22 02	places the Player
	STO D	33 14	
	GTO 7	22 07	
	f LBL 2	31 25 02	set the squares
130	f GSB 0	31 22 00	
	f GSB 0	31 22 00	
	f GSB D	31 22 14	
	+	61	
	h RTN	35 22	
	f LBL 0	31 25 00	random number generator
	RCL 0	34 00	
	h π	35 73	
	+	61	
	8	08	
140	h y^x	35 63	
	g FRAC	32 83	
	STO 0	33 00	
	1	01	
	5	05	
	x	71	
	1	01	
	+	61	
	f INT	31 83	
	h RTN	35 22	
150	g LBL f e	32 25 15	you won!
	1	01	
	h PAUSE	35 72	
	GTO f e	22 31 15	
	g LBL f c	32 25 13	Twonky has absorbed you!
	0	00	
	h PAUSE	35 72	
	GTO f c	22 31 13	
	f LBL 8	31 25 08	Test, whether you leave the maze (or the shot)
	f INT	31 83	
160	h LSTX	35 82	
	g FRAC	32 83	
	f GSB C	31 22 13	
	1	01	
	6	06	
	g x=y	32 51	
	GTO 1	22 01	
	h R↓	35 53	
	h x⇄y	35 52	
	h R↑	35 54	
170	g x=y	32 51	
	GTO 1	22 01	
	h R↓	35 53	
	x	71	
	f x≠0	31 61	
	h RTN	35 22	
	f LBL 1	31 25 01	you leave the maze (or the shot)
	0	00	
	f -x-	31 84	
	h RTN	35 22	
180	f LBL 9	31 25 09	Calculates new position of the player or the shot
	h STI	35 33	
	1	01	
	GTO (i)	22 24	
	f LBL 1	31 25 01	
	f GSB D	31 22 14	
	GTO 1	22 01	
	f LBL 2	31 25 02	
	CHS	42	
	GTO 1	22 01	
190	f LBL 3	31 25 03	
	f GSB D	31 22 14	
	CHS	42	
	GTO 1	22 01	
	f LBL 4	31 25 04	
	f LBL 1	31 25 01	
	h STI	35 33	
	RCL D	34 14	
	+	61	
	STO E	33 15	
200	h RTN	35 22	
	f LBL 5	31 25 05	calculates the distances
	h STI	35 33	
	f INT	31 83	
	RCL D	34 14	
	f INT	31 83	
	−	51	
	h RCI	35 34	
	g FRAC	32 83	
	RCL D	34 14	
210	g FRAC	32 83	
	−	51	
	f GSB C	31 22 13	
	g R→P	32 72	
	h RTN	35 22	
	f LBL C	31 25 13	subroutines for formate
	EEX	43	
	2	02	
	x	71	
	h RTN	35 22	
220	f LBL D	31 25 14	
	EEX	43	
	2	02	
	÷	81	
	h RTN	35 22	

LABELS

A Move	B Shot	C used	D used	E INIT
a places RS+W	b used	c Lose	d Relocated	e Won
0 RND	1 used	2 used	3 used	4 used.
5 Distances	6 Twonky's Move	7 Distances	8 Test	9 New Position

FLAGS

Flag	
0	–
1	–
2	–
3	–

SET STATUS

FLAGS	ON	OFF	TRIG		DISP	
0	☐	☒	DEG	☒	FIX	☒
1	☐	☒	GRAD	☐	SCI	☐
2	☐	☒	RAD	☐	ENG	☐
3	☐	☒			n	0