

Program Title CHECKERS

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Program Description, Equations, Variables

ty 8.83838383 "Cal" selects and moves its army of
 7.38383838 checker pieces on the 8x8 board. It isn't a
 6.83838383 very good player, though and sometimes moves
 5.08080808 into jumps that could (temporarily) be
 4.80808080 avoided. Your men are 1's, Cal's are 3's.
 3.18181818 Crowned pieces have doubled value, respectively.
 2.81818181 Cal crowns pieces at the appropriate time.
 1.18181818 Multiple jumps are made one step at a
 12345678x, time. You must give Cal a hand here, and not
 cheat him out of his extra jumps.

The board is illustrated at upper left. Pieces are shown in initial positions, on "black" squares. "Red" squares are indicated by 8's. Board will be printed on HP-97 and reviewed on HP-67 after each move.

Your moves are input as YsXs.YeXe: Ys-starting row number, Xs-starting file number; Ye-ending row number, Xe-ending file number.

Since Cal's moves are dependent on the order in which it reviews the pieces, the Loader Program "randomizes" the review.

Operating Limits and Warnings For Cal's multiple jumps, a non-negative number must be stored in R0, i.e.: CLx, STO 0. If Cal manages to get a piece crowned, and returned to its back row, it forgets about the game and moves the piece back-and-forth, estatically.

This program has been verified only with respect to the numerical example given in *Program Description II*. User accepts and uses this program material AT HIS OWN RISK, in reliance solely upon his own inspection of the program material and without reliance upon any representation or description concerning the program material.

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03288D Program Description II

Sketch(es)

Sample Problem(s) USE SEED: $e^2/10$, verify registers:

R0= 0	In the list of moves below, Cal's moves are in paren-	
R1=0.181818184	theses(Note that Odd X & Y, or Even X & Y specify	
R2=0.818181814	coordinates of pieces).	
R3=0.181818184	35.44 15.26 33.42	Board after Cal's first move:
R4=0.808080804	(64.55)(73.64)(55.46)	8.83838383
R5=0.080808084	37.48 55.73 35.57	7.38383838
R6=0.838383834	(55.46)(84.75)(68.46)	6.83808383
R7=0.383838384	26.37 73.84 84.73	5.08083808
R8=0.838383834	(46.35)(75.64)(62.53)	4.80818080
R9=6.4 S9=6.2	24.46 53.75 42.64	3.18180818
S0=7.5 RA=6.8	(75.64)(86.64)(71.62)	2.81818181
S1=7.3 RB= 0	31.42 26.35 73.51	1.18181818
S2=8.8 RC= 0	(64.55)(66.57)(46.57)	
S3=8.2 RD=6.2	46.64 48.66 28.46	HAVE FUN!
S4=7.7 RE= 10	(73.55)(77.55)	
S5=8.4 RI= 19	42.53 44.66	
S6=6.6	(55.46)(88.77)	
S7=8.6	37.55 66.88	
S8=7.1	(82.73)(64.55)	

Solution(s)

Reference(s)

03288D

Program Listing I

Page 4 of 7

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001 *	f LBL B	31 25 12	Loader Program		4	04	
	f CL REG	31 43			-	51	
	f P&S	31 42			g x=y	32 51	
	f CL REG	31 43		060	h SF 3	35 51 03	
	h CF 3	35 61 03			RCL D	34 14	
	f x=0	31 51			.	83	
	h π	35 73			2	02	
	g FRAC	32 83			h F? 2	35 71 02	
	STO E	33 15			f GSB 4	31 22 04	
010	1	01			h F? 3	35 71 03	
	1	01			f GSB 5	31 22 05	
	h ST I	35 33			-	51	
	8	08			STO D	33 14	
	.	83		070	f DSZ I	31 33	
	8	08			GTO 0	22 00	
	STO D	33 14			2	02	
*	f LBL 0	31 25 00			0	00	
	g GSB fb	32 22 12			h ST I	35 33	
	1	01		*	f LBL 2	31 25 02	
020	0	00			RCL(i)	34 24	
	x	71			f x=0	31 51	
	f INT	31 83			GTO 3	22 03	
	h LST x	35 82			f DSZ I	31 33	
	g FRAC	32 83		080	GTO 2	22 02	
	1	01		*	f LBL 3	31 25 03	
	0	00			RCL D	34 14	
	x	71			STO(i)	33 24	
	f INT	31 83			.	83	
	2	02			1	01	
030	x	71			0	00	
	+	61			1	01	
	2	02			0	00	
	1	01			1	01	
	g x=y	32 71		090	0	00	
	GTO 0	22 00			1	01	
	h R↓	35 53			STO 1	33 01	
	9	09			STO 3	33 03	
	g x>y	32 81			1	01	
	GTO 0	22 00			0	00	
040	h R↓	35 53			STO E	33 15	
	h X=I	35 24			+	81	
	RCL(i)	34 24			STO 2	33 02	
	f x=0	31 51			3	03	
	GTO 1	22 01		100	x	71	
	h R↓	35 53			STO 8	33 08	
	h X=I	35 24			STO 6	33 06	
	GTO 0	22 00			1	01	
*	f LBL 1	31 25 01			0	00	
	h R↓	35 53			x	71	
050	RCL D	34 14			STO 7	33 07	
	STO(i)	33 24			3	03	
	h X=I	35 52			+	81	
	h ST I	35 33			8	08	
	8	08		110	x	71	
	g x=y	32 51			STO + 2	33 61 02	
	h SF 2	35 51 02			STO + 4	33 61 04	

REGISTERS

0	1	2	3	4	5	6	7	8	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	I				

[illegible]

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	8	08			g x=y	32 51	
	h ST I	35 33			GTO 4	22 04	
*	f LBL 0	31 25 00			h R↑	35 54	
	h RC I	35 34		060	h RC I	35 34	
	RCL(i)	34 24			g GSB fe	32 22 15	Extend move for possible jump
	+	61			h F? 3	35 71 03	
	f -x-	31 84	Display board line by line		GTO 5	22 05	
	f DSZ I	31 33			g GSB fc	32 22 13	Check if square occupied
	GTO 0	22 00			f x≠0	31 61	
010	h RTN	35 22			GTO 4	22 04	
*	f LBL 1	31 25 01	Remove jumped piece from board		h R↑	35 54	
	RCL B	34 12			CHS	42	Lock out other moves
	RCL C	34 13			f GSB 7	31 22 07	
	+	61		070	GTO 6	22 06	
	2	02		*	f LBL 4	31 25 04	
	+	81			h R↓	35 53	
	g GSB fc	32 22 13		*	f LBL 5	31 25 05	
	RCL D	34 14			h X≥Y	35 52	
	+	81			h ST I	35 33	Restore index
020	STO-(i)	33 51 24		*	f LBL 6	31 25 06	
	h RTN	35 22			h F? 1	35 71 01	T o s
*	f LBL E	31 25 15	Start Cal's move		GTO 4	22 04	g e
	2	02			h SF 1	35 51 01	g l
	0	00		080	GTO 5	22 05	l e
	h ST I	35 33		*	f LBL 4	31 25 04	c t
	h CF 3	35 61 03			h CF 1	35 61 01	s t
*	f LBL 2	31 25 02			h CF 0	35 61 00	o r
	RCL(i)	34 24		*	f LBL 5	31 25 05	m o
	g GSB fc	32 22 13	Get piece from location		h F? 1	35 71 01	v e
030	h X≥Y	35 52			GTO 3	22 03	
	h X≥I	35 24			h F? 2	35 71 02	
	h X≥Y	35 52			h SF 0	35 51 00	
	f x=0	31 51	Piece jumped? -		h F? 0	35 71 00	
	STO(i)	33 24	Delete location	090	GTO 3	22 03	
	6	06			h RC I	35 34	
	g x=y	32 51	Piece crowned?		f x<0	31 71	
	h SF 2	35 51 02			CHS	42	
*	f LBL 3	31 25 03			h ST I	35 33	
	RCL(i)	34 24			f DSZ I	31 33	
040	f x=0	31 51			h RC I	35 34	
	GTO 6	22 06			9	09	
	g GSB fe	32 22 15	Generate move		g x≤y	32 71	
	h F? 3	35 71 03	Off board?		GTO 2	22 02	
	GTO 6	22 06		100	RCL 0	34 00	
	g GSB fc	32 22 13	Check if square occupied		h ST I	35 33	
	f x≠0	31 61			RCL B	34 12	
	GTO 4	22 04			RCL C	34 13	
	h X≥Y	35 52			STO(i)	33 24	
	f GSB 7	31 22 07	Vacant? Store move		GTO fa	22 31 11	
050	GTO 6	22 06		*	f LBL 7	31 25 07	
*	f LBL 4	31 25 04			RCL 0	34 00	
	3	03			f x<0	31 71	Check for jump found
	g x=y	32 51			h SF 3	35 51 03	
	GTO 4	22 04		110	h R↓	35 53	
	2	02			h X≥I	35 24	
	x	71			h F? 3	35 71 03	

REGISTERS

0 used	1 Row 1	2 Row 2	3 Row 3	4 Row 4	5 Row 5	6 Row 6	7 Row 7	8 Row 8	9 Loc.#1
S0 Loc.#2	S1 Loc.#3	S2 Loc.#4	S3 Loc.#5	S4 Loc.#6	S5 Loc.#7	S6 Loc.#8	S7 Loc.#9	S8 Loc.#10	S9 Loc.#11
A Loc.#12	B Y.X (from)	C Y.X (to)	D Factor	E 10	I Index				

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS	
	h RTN	35 22			+	81		
	STO C	33 13		170	STO B	33 12		
	RCL(1)	34 24			RCL 0	34 00		
	STO B	33 12			g FRAC	32 83		
	h RC I	35 34			RCL E	34 15		
	STO 0	33 00			x	71		
	h RTN	35 22			STO C	33 13		
120 *	f LBL 8	31 25 08		*	g LBL fa	32 25 11		
	.	83			f INT	31 83		
	2	02			h X \leq Y	35 52		
	-	51			f INT	31 83		
	h RTN	35 22		180	-	51		
*	g LBL fc	32 25 13			h ABS	35 64		
	h X \leq I	35 24			2	02		
	h RC I	35 34	Get piece from board		g x=y	32 51	Check for jump.	
	g FRAC	32 83			h SF 2	35 51 02		
	RCL E	34 15			RCL C	34 13		
130	x	71			f INT	31 83		
	f x \neq 0	31 61			1	01		
	g 10*	32 53			g x=y	32 51	Crown piece?	
	STO D	33 14			h SF 0	35 51 00		
	RCL(i)	34 24		190	h R \downarrow	35 53		
	x	71			8	08		
	f INT	31 83			g x=y	32 51	Crown piece?	
	RCL E	34 15			h SF 0	35 51 00		
	+	81			RCL B	34 12		
	g FRAC	32 83			g GSB fc	32 22 13		
140	RCL E	34 15			2	02		
	x	71			g x=y	32 51	Already crowned?	
	h RTN	35 22			h CF 0	35 61 00		
*	g LBL fe	32 25 15			h R \downarrow	35 53		
	1	01		200	6	06		
	.	83			g x=y	32 51		
	1	01			h CF 0	35 61 00		
	h F? 1	35 71 01			h R \downarrow	35 53		
	f GSB 8	31 22 08			RCL D	34 14		
	h F? 0	35 71 00			+	81		
150	CHS	42			STO-(i)	33 51 24	Remove from old location	
	-	51			RCL C	34 13		
	g FRAC	32 83			h X \leq I	35 24		
	f x=0	31 51	Off board?		g FRAC	32 83		
	h SF 3	35 51 03		210	h RC I	35 34		
	h LST x	35 82			g FRAC	32 83		
	f INT	31 83			-	51		
	f x=0	31 51	Off board?		RCL E	34 15		
	h SF 3	35 51 03			x	71		
	9	09			g 10*	32 53	Horiz. comp. of move	
160	g x \leq y	32 71	Off board?		x	71		
	h SF 3	35 51 03			h F? 0	35 71 00		
	h R \downarrow	35 53			2	02		
	+	61			h F? 0	35 71 00		
	h RTN	35 22		220	x	71	Crown piece.	
*	f LBL A	31 25 11			h CF 0	35 61 00		
	STO 0	33 00			STO+(i)	33 61 24	Place in new location	
	f INT	31 83			h F? 2	35 71 02		
	RCL E	34 15			f GSB 1	31 22 01		
LABELS				FLAGS		SET STATUS		
A move	B load	C	D	E move	0 used	FLAGS	TRIG	DISP
a used	b used	c used	d	e used	1 used	ON OFF		
0 used	1 used	2 used	3 used	4 used	2 used	0 <input type="checkbox"/> <input checked="" type="checkbox"/>	DEG <input checked="" type="checkbox"/>	FIX <input checked="" type="checkbox"/>
5 used	6 used	7 used	8 used	9	3 used	1 <input type="checkbox"/> <input checked="" type="checkbox"/>	GRAD <input type="checkbox"/>	SCI <input type="checkbox"/>
						2 <input type="checkbox"/> <input checked="" type="checkbox"/>	RAD <input type="checkbox"/>	ENG <input type="checkbox"/>
						3 <input type="checkbox"/> <input checked="" type="checkbox"/>		n <u>8</u>