

A 0-- 0 0 0
 B 1-- 0 0 1
 X 2-- 0 0 2
 ADD -0- 0 0 3
 SUB -1- 2 0 0
 LOAD -2- 3 7 7
 STORE -3-
 OR A 3 0 -
 NOOP 3 1 -
 AND A 3 2 -
 LNEG A 3 3 -
 IMMED --3
 MEMORY --4
 INDIRECT --5
 INDEXED --6
 IND/XED --7

A
 B
 X
 P
 OUTPUT
 INPUT

PROGRAM HI-LO

VERSION 1 REV 1 DATE 19/12/2019

PROGRAMMER C. PARMIGIANI

NOTES: At start, push B7 button 3 times to generate a pseudorandom number. input number and press store.

~~ERROR~~ LLL -> Your guess is too ~~low~~ low >>>

		LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
A 0--	0 0 0	003	033			Prog. starts at 033
B 1--	0 0 1	004	103	COUNT	ADD B +1	ADD B Value=1
X 2--	0 0 2	005	001			
ADD -0-	0 0 3	006	372		SKP 1 bit7 (377)	
SUB -1-	2 0 0	007	377			
LOAD -2-	3 7 7					
STORE -3-						
OR A 3 0 -						
NOOP 3 1 -						
AND A 3 2 -						
LNEG A 3 3 -						
IMMED --3						
MEMORY --4						
INDIRECT --5						
INDEXED --6						
IND/XED --7						
A 0--	0 10	010	344		JPD UNC COUNT	
B 1--	0 11	011	004			
X 2--	0 12	012	213		SUB X C=1	
UNC 3--	0 13	013	001			
JPD -4-	0 14	014	244		JPD X=0 HAVE NUM	
JPI -5-	0 15	015	027			
JMD -6-	0 16	016	371		ROT L B3	
JMI -7-	0 17	017	072	CLEAR	SET 0 B7 (377)	
≠0 --3	0 20	020	377			
=0 --4	0 21	021	272		SKP 0 Bit7 (377)	
<0 --5	0 22	022	377			
≥0 --6	0 23	023	344		JPD UNC CLEAR	
>0 --7	0 24	024	017			
SET 0 0 B 2	0 25	025	344		JPD UNC COUNT	
SET 1 1 B 2	0 26	026	004			
SKIP 0 2 B 2	0 27	027	134	HAVE NUM	STORE B (204)	
SKIP 1 3 B 2	0 30	030	204			
B: BIT POSITION	0 31	031	344		JPD UNC DIV	
RT SFT 0-1	0 32	032	101			
RT ROT 1-1	0 33	033	223	START	LOAD X G=3	
LFT SFT 2-1	0 34	034	003			
LFT ROT 3-1	0 35	035	344		JPD UNC CLEAR	
1 PLC -1-	0 36	036	017			
2 PLC -2-	0 37	037	023	PLAY	LOAD A with φ	
3 PLC -3-	0 40	040	000			
4 PLC -0-	0 41	041	033		STORE B (377)	
B REG +4	0 42	042	377			
NOOP 2 0 0						
HALT 0 0 0						
OF B0						
CA B1						
A 2 0 1						
B 2 0 2						
X 2 0 3						

taken from "laboratory exercises"
 KENBAK-1 COMPUTER
 Exercise 30-3, page 154

clear input

A	0--	0 0 0	A	PROGRAM	HI-LO	
B	1--	0 0 1	B	VERSION	1 REV 1 DATE 19/12/2019	
X	2--	0 0 2	X	PROGRAMMER	C. PARMIGIANI	
ADD	-0-	0 0 3	P	NOTES:	LLLLLLLL → your guess is too HIGH	
SUB	-1-	2 0 0	OUTPUT		All lights on → you win!	
LOAD	-2-	3 7 7	INPUT			
STORE	-3-					
OR A	3 0-					
NOOP	3 1-					
AND A	3 2-					
LNEG A	3 3-					
IMMED	--3					
MEMORY	--4					
INDIRECT	--5					
INDEXED	--6					
IND/XED	--7					
		LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
		043	000			
		044	024		LOAD A (377)	Read input from switches
		045	377			
		046	014		SUB A (204)	(204) contains the number.
		047	204			
A	0--	050	044		JPD ZERO WIN	
B	1--	051	060			
X	2--	052	045		JPD LOW LOW	< φ
UNC	3--	053	065			
JPD	-4-	054	047		JPD > HIGH	
JPI	-5-	055	073			
JMD	-6-	056	344		JPD UNC PLAY	
JMI	-7-	057	037			
≠0	--3	060	023	WIN	LOAD A VALUE 377	→ All LEDs on = WIN!
=0	--4	061	377			
<0	--5	062	034		STORE A (200)	→ print to output
≥0	--6	063	200			
>0	--7	064	000		NOOP	ENDGAME
SET 0	0 B 2	065	023	LOW	LOAD A VALUE 360	→ LLLLLLLL
SET 1	1 B 2	066	360			
SKIP 0	2 B 2	067	034		STORE A (200)	→ light up 4 leftmost LEDs
SKIP 1	3 B 2	070	200			
B: BIT POSITION		071	344		JPD UNC PLAY	
RT SFT	0-1	072	037			
RT ROT	1-1	073	023	HIGH	LOAD A VALUE 07	→ LLLLLLLL
LFT SFT	2-1	074	017			
LFT ROT	3-1	075	034		STORE A (200)	→ light up 4 rightmost LEDs
1 PLC	-1-	076	200			
2 PLC	-2-	077	344		JPD UNC PLAY	
3 PLC	-3-	100	037	LOW		
4 PLC	-0-	101	051	DIV	RIGHT B SHIFTR	Divide by 2
B REG	+4	102	134		STORE B (204)	pseudo random number
NOOP	2 0 0					
HALT	0 0 0					
OF B0						
CA B1						
A	2 0 1					
B	2 0 2					
X	2 0 3					

A 0-- 0 0 0
 B 1-- 0 0 1
 X 2-- 0 0 2
 ADD -0- 0 0 3
 SUB -1- 2 0 0
 LOAD -2- 3 7 7

A
 B
 X
 P
 OUTPUT
 INPUT

PROGRAM H1-LOVERSION 1 REV 1 DATE 18/12/2019PROGRAMMER C. PARMIGIANINOTES: see previous sheets.

RESET P to 033 to play again.

003 033

		LOC	DATA	SYMBOLIC ADDRESS	CONTENTS	COMMENTS
OR A	30-	103	204			
NOOP	31-	104	344		JPD UNC PLAY	
AND A	32-	105	037			
LNEG A	33-					
IMMED	--3					
MEMORY	--4					
INDIRECT	--5					
INDEXED	--6					
IND/XED	--7					
A	0--					
B	1--					
X	2--					
UNC	3--					
JPD	-4-					
JPI	-5-					
JMD	-6-					
JMI	-7-					
≠0	--3					
=0	--4					
<0	--5					
≥0	--6					
>0	--7					
SET 0	0 B 2					
SET 1	1 B 2					
SKIP 0	2 B 2					
SKIP 1	3 B 2					
B: BIT POSITION						
RT SFT	0-1					
RT ROT	1-1					
LFT SFT	2-1					
LFT ROT	3-1					
1 PLC	-1-					
2 PLC	-2-					
3 PLC	-3-					
4 PLC	-0-					
B REG	+4					
NOOP	200					
HALT	000					
OF B0						
CA B1						
A	201					
B	202					
X	203					