

Program Description I

Program Title CRACK THE VAULT

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Program Description, Equations, Variables A VAULT ^{IN} A BANK CONTAINS
MILLIONS OF DOLLARS. YOU ARE THE HEAD TELLER, AND ~~THE~~ A TELLER
ACCIDENTALLY LOCKED THE VAULT.

THE VAULT'S LOCK IS REALLY A SERIES OF LOCKS, EACH OF
WHICH HAS A COMBINATION ON IT. IF TURNED TO THE RIGHT
~~THE~~ NUMBER, THE LOCK OPENS. TO OPEN THE VAULT, ALL LOCKS
MUST BE OPENED

YOU KNOW THE BOSS WILL FIRE YOU IF HE ~~SEES THE~~ LOCKED
~~THE~~ VAULT. UNFORTUNATELY, HE IS COMING DOWN FROM HIS OFFICE
AND WILL SOON REACH THE VAULT. SO YOU HAVE ABOUT 1 MINUTE
TO OPEN IT. YOU CAN ONLY SPEND SO MUCH TIME ON ANY ONE
LOCK; THUS, YOU MUST OPEN EACH LOCK IN A SPECIFIED NUMBER
OF ~~THE~~ ATTEMPTS

GOOD LUCK.

YOU SPECIFY THE NUMBER OF LOCKS TO BE PICKED AND THE
NUMBER OF ATTEMPTS (2,3,OR 4) YOU MAY TAKE.

Operating Limits and Warnings BE SURE ~~D~~ $R_D \geq 0$ BEFORE YOU START.

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Sketch(es)

Sample Problem(s) ① TRY SEED .0381426, WITH 5 LOCKS, 3 TRIES A LOCK.

FIRST LOCK: TRY 5, 2, 0. ON 0 IT OPENS

SECOND LOCK: TRY 5, 7. ON 7 IT OPENS

THIRD LOCK: TRY 6, 8, 7. ON 7 IT OPENS

FOURTH LOCK: TRY 5, 6. ON 6 IT OPENS

FIFTH LOCK: TRY 9, 7. ON 7 IT OPENS.

HENCE THE COMBINATION IS 07767. YOU WIN.

Solution(s) ① [C].0381426 [T] 5 [A] → 3, ON PAUSES, OFF.

ENTER	AND SEE (PRINT PAUSE)	THEN	ENTER	AND SEE (PRINT)	THEN
5	4614	2	7	45 LOCK 3 IS ALSO 7	3
2	4614	1	5	*07	2
0	45, LOCK 1 IS 0	3	6	45 LOCK 4 IS also 6	3
5	*07,	2	9	4614	2
7	45, LOCK 2 IS 7	3	7	45 LOCK 5 IS 7.	12
6	07	2		TOTAL NUMBER OF GUESSES: 12.	
8	4614	1			

Reference(s)

Sketch(es)

Sample Problem(s) ② TRY 3 LOCKS, WITH A SEED OF 0.110326, AND 3 TURNS A LOCK

FIRST LOCK: TRY 5,7,9, LOCK OPENS ON 9

SECOND LOCK: TRY 5,1,0 LOCK OPENS ON 0

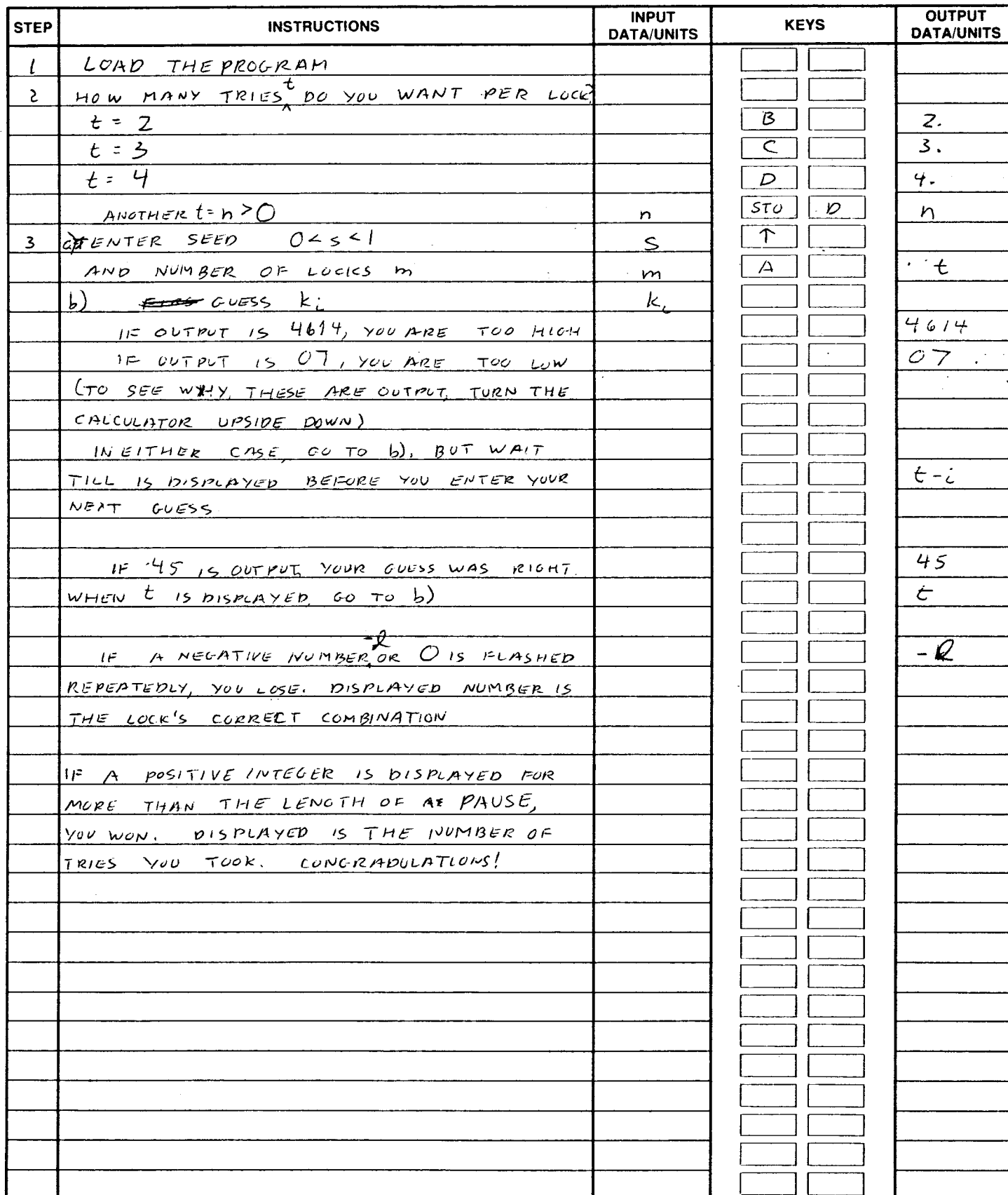
THIRD LOCK: TRY 3,5,7, LOCK DOESN'T OPEN ON THEM.

LOCK OPENS ON 8. YOU LOSE.

Solution(s) ② [C] .110326 [1] 3 [A] → 3 ON PAUSES

ENTER	AND SEE(PRINT)	THEN	ENTER	AND SEE(PRINT)	THEN
5	07	2	5	07	1
7	07	1	7	07	
9	45 (FIRST LOCK: 9)	3		SEE - 8 DISPLAYED	
5	4614	2		REPEATEDLY.	
1	4614	1			
0	45 (SECOND LOCK: 0)	3			
3	07	2			

Reference(s)



01497D

PROGRAM LISTING I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	f LBL A	31 25 11			f LBL 3	31 25 03	INDICATE CORRECT. OUTPUT '45'
	h STI	35 33	#OF LOCKS $\rightarrow R_1, R_0$		4	04	
	STO O	33 00			5	05	
	h xzy	35 52	SEED $\rightarrow R_6$	060	f -x-	31 84	GO TO NEXT LOCK.
	STO E	33 15			f DSZ	31 33	
	f LBL C	31 25 00	GENERATE NUMBERS TO BE COMBO OF LOCKS		GTO 1	22 01	
	RCL E	34 15			RCL O	34 00	YOU WIN. OUTPUT NUMBER OF GUESSES.
	q	09			h RTN	35 22	
	q	09	$n_L \rightarrow R_L$		f LBL 5	31 25 05	INDICATE GUESS IS TOO LOW.
010	7	07			0	00	
	x	71			7	07	
	g FRAC	32 83			f -x-	31 84	
	STO E	33 15			GTO 6	22 06	
	1	01		070	f LBL B	31 25 12	2 TRIES PER LOCK
	0	00			2	02	
	x	71			STO D	33 14	
	f INT	31 83			h RTN	35 22	
	STO (i)	33 24			f LBL C	31 25 13	3 TRIES PER LOCK
	f DSZ	31 33			3	03	
020	GTO O	22 00			STO D	33 14	
	RCL O	34 00	INITIALIZE FOR OPENING		h RTN	35 22	
	h STI	35 33			f LBL D	31 25 14	4 TRIES PER LOCK
	0	00	NUMBER OF ROLLS		4	04	
	STO O	33 00		080	STO D	33 14	
	f LBL 1	31 25 01	NUMBER OF TRIES PER LOCK.		h RTN	35 22	
	RCL D	34 14	DEFAULT VALUE = 3				
	f x=0	31 51					
	3	03					
	STO E	33 15					
030	f LBL 2	31 25 02					
	h PSE	35 72	INPUT				
	1	01	NO. INPUTS NO. INPUTS+1				
	STO + O	33 61 00					
	h xzy	35 52		090			
	RCL (i)	34 24	IF GUESS IS TOO RIGHT LOW , GO TO 3				
	g x=y	32 51					
	GTO 3	22 03					
	g x>y	32 81	IF GUESS IS TOO LOW, OUTPUT '07'				
	GTO 5	22 05					
040	4	04	OTHERWISE GUESS IS TOO HIGH. OUTPUT '4514'				
	6	06					
	1	01					
	4	04					
	f -x-	31 84		100			
	f LBL 6	31 25 06	REDUCE #OF TRIES LEFT BY 1.				
	RCL E	34 15					
	1	01					
	-	51					
	STO E	33 15					
050	f x=0	31 61	IF #OF TRIES LEFT IS 0, YOU LOSE. ELSE, TRY AGAIN.				
	GTO 2	22 02					
	f LBL 8	31 25 08					
	RCL (i)	34 24					
	CHS	42	LOSING LOOP	110			
	f -x-	31 84					
	GTO 8	22 08					

REGISTERS

USED	1	2	3	4	5	6	7	8	9
	LOCKS	IN $R_1 - R_7$	X	IS $x - R_1$	REGISTER	INPUT			
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	F	G	H	I	J
			# TRIES PER LOCK	USED				REGISTER CONTROL, COUNTER	

[illegible]