

01918D Program Description I

Program Title KENO SIMULATION

Contributor's Name MARK ESTES

Address 764 EAST TWAIN #5B

City LAS VEGAS

State NEVADA

Zip Code 89109

Program Description, Equations, Variables KENO IS A LOTTERY FORM OF GAMBLING WHICH IS POPULAR IN NEVADA CASINOS. IT IS CHARACTERIZED BY GIANT PAYOFFS FOR COMPARATIVELY SMALL BETS. THE PLAYER SELECTS TEN "LUCKY" NUMBERS BETWEEN ONE AND EIGHTY. TWENTY NUMBERS IN THE SAME RANGE ARE THEN SELECTED AT RANDOM BY THE HOUSE. IF FIVE OR MORE OF THE PLAYERS NUMBERS MATCH THE HOUSES NUMBERS HE IS PAID. IF THE PLAYER HAPPENS TO "HIT" ALL TEN OF HIS SELECTIONS HE IS PAID \$20000 FOR A \$1 WAGER! I WOULDN'T SUGGEST RUNNING OFF TO VEGAS TO BET KENO HOWEVER-- THE FAIR PAYOFF ON THIS WAGER IS \$1.5 MILLION!

PAYOFF SCHEDULE

<u>HITS</u>	<u>PAYOFF (\$1 WAGER)</u>
<u>5</u>	<u>\$ 2.00</u>
<u>6</u>	<u>20.00</u>
<u>7</u>	<u>140.00</u>
<u>8</u>	<u>1000.00</u>
<u>9</u>	<u>3800.00</u>
<u>10</u>	<u>20000.00</u>

Operating Limits and Warnings THE KENO PROGRAM TAKES APPROXIMATELY TWELVE MINUTES TO PLAY ONE GAME. COINCIDENTLY THIS IS ABOUT THE LENGTH OF TIME BETWEEN GAMES IN VEGAS. DESPITE THE HEALTHY APPEARING PAYOFF FIGURES THIS PARTICULAR TICKET YIELDS A 29% EDGE TO THE HOUSE. TO MODIFY THE PROGRAM FOR A QUICKER GAME AND ONE WITH FAIR PAYOFFS (0% HOUSE EDGE) SEE PAGE 7.

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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Program Description, Equations, Variables THE PLAYER ENTERS A SEED FOR THE PSEUDORANDOM NUMBER GENERATOR, ENTERS HIS WAGER, AND HIS SELECTIONS. TWENTY NUMBERS BETWEEN ONE AND EIGHTY ARE THEN GENERATED AT RANDOM AND WITHOUT REPLACEMENT. THESE NUMBERS ARE COMPARED WITH THE PLAYER SELECTIONS TO FIND THE NUMBER OF HITS. THE PAYOFF SCHEDULE IS THAT OF AN ACTUAL LAS VEGAS CASINO. THE OUTPUT CONSISTS OF ① THE PLAYERS TEN SELECTIONS; ② THE HOUSES 20 NUMBERS; ③ THE NUMBER OF HITS; ④ THE PLAYERS WAGER; ⑤ THE PLAYERS WIN FOR THE CURRENT GAME; ⑥ THE CURRENT GAME NUMBER; ⑦ THE RUNNING TOTAL OF WINNINGS; ⑧ THE RUNNING SUM OF WAGERS, AND; ⑨ THE CURRENT AMOUNT UP OR DOWN.

THERE IS A PROVISION FOR PLAYING ANOTHER GAME USING THE NUMBERS SELECTED FOR THE PREVIOUS GAME. THERE IS ALSO A PROVISION FOR CONTINUOUS PLAY. USING THIS OPTION THE PROGRAM IS SENT INTO A LOOP PLAYING KENO GAMES AND RECORDING RESULTS WITH NO OPERATOR ATTENTION.

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01918D Program Description II

Sketch(es)

Sample Problem(s) PRACTICE GAME:

HOW WILL THE PLAYER FARE USING A
SEED OF .5738221; A BET SIZE OF FIVE;
AND THE FOLLOWING GUESSES?

9

65

16

68

59

36

15

5

14

37

PLAYER

SELECTIONS

65. ***
16. ***
68. ***
59. ***
36. ***
15. ***
5. ***
14. ***
37. ***

HOUSE

SELECTIONS

9. ***
27. ***
65. ***
8. ***
41. ***
16. ***
75. ***
47. ***
36. ***
15. ***
52. ***
33. ***
3. ***
23. ***
53. ***
59. ***
77. ***
68. ***
66. ***
58. ***

Solution(s) KEYSTROKES

[F][E]

(CLEARS ALL REGISTERS)

.5738221 [E]

(ENTERS SEED; INITIALIZE)

5 [R]

(BET SIZE; START)

9 [R/S] 65 [R/S] 16 [R/S] 68 [R/S] 59 [R/S] (PLAYER

36 [R/S] 15 [R/S] 5 [R/S] 14 [R/S] 37 [R/S] GUESSES)

PLAYER HITS SEVEN NUMBERS AND WINS

$\$140 \times 5 = \700 (PAYOFF \times BET SIZE)

HITS

WAGER

WIN

7. ***
5. ***
700. ***

GAME #

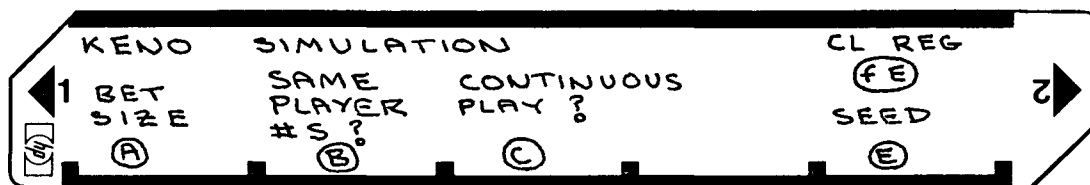
TOTAL WIN

TOTAL BET

TOTAL TOR-

1. ***
700. ***
5. ***
695. ***

Reference(s) CASTAWAYS CASINO KENO
BOOKLET



STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	LOAD SIDES 1 AND 2		<input type="text"/> <input type="text"/>	
2	OPTIONAL: SELECT CONTINUOUS KENO MODE (0=1GAME; 1=CONTINUOUS)		<input type="text"/> <input type="text"/>	
			C <input type="text"/>	0./1.
3	CLEAR REGISTERS		f <input type="text"/> E <input type="text"/>	
4	INPUT SEED [SEE NOTE]*	U ₀	E <input type="text"/>	1.
5	INPUT BET SIZE	BET	A <input type="text"/>	
6	INPUT PLAYER SELECTION 1\$SEL\$80	SEL	R/S <input type="text"/>	1,2,...,107
7	REPEAT STEP 6 TEN TIMES (SIX TIMES FOR MODIFIED VERSION)		<input type="text"/> <input type="text"/>	~ 12 MIN.
8	TO PLAY ANOTHER GAME USING THE SAME SELECTIONS AS THE PREVIOUS GAME	BET	B <input type="text"/>	PLAYER SELECTIONS HOUSE SELECTION HITS WAGER WIN GAME # TOTAL WIN TOTAL BET TOTAL TOR-
9	TO MAKE NEW SELECTIONS AND PLAY ANOTHER GAME GO TO STEP 5.		<input type="text"/> <input type="text"/>	
10	CONTINUOUS KENO CAN BE SELECTED AFTER ANY GAME. SIMPLY PRESS [C] SO THAT A ONE APPEARS IN DISPLAY. GO TO STEP 7 IF YOU WANT TO USE THE SAME SELECTIONS AS THE PREVIOUS GAME OR STEP FIVE IF YOU WISH TO MAKE NEW PICKS.		<input type="text"/> <input type="text"/>	
	* NOTE: U ₀ (SEED) MUST BE A 7 DIGIT NUMBER BETWEEN 0 AND 1. THE LEAST SIGNIFICANT DIGIT (FURTHEST RIGHT) MUST BE A 1, 3, 7, OR 9.		<input type="text"/> <input type="text"/>	

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	---	---	INITIALIZE REGISTERS FOR ENTERING PLAYERS PICKS	058	FAL	11 15	
002	CL1	10 22 01		059	STOE	35 15	
003	RCL1	36 15		060	8	08	
004	DSP0	-63 00		061	0	00	
005	CLRG	16-53		062	X	-35	
006	*LBL4	21 16 11	ENTRY FOR USING SAME PLAYERS #'S AS THE PREVIOUS GAME	063	INT	16 34	
007	STOE	35 15		064	1	01	
008	R4	-31		065	STOI	35 46	
009	STOA	35 11		066	+	-55	
010	CF2	16 22 02		067	STOC	35 13	
011	F19	16 23 01		068	*LBL4	21 04	
012	GT02	22 02		069	1	01	
013	5	05		070	STOB	35 00	
014	STOI	35 46		071	STO9	35 09	
015	*LBL0	21 00	ENTER PLAYERS NUMBERS	072	*LBL5	21 05	
016	0	00		073	RCL1	36 45	
017	STOB	35 00		074	STOB	35 12	
018	*LBL1	21 01		075	*LBL6	21 06	
019	2	02		076	RCLB	36 12	
020	ST-0	35-45 00		077	EEX	-23	
021	1	01		078	2	02	
022	ST+9	35-55 09		079	X	-35	
023	RCL9	36 09		080	FRC	16 44	
024	R/S	51		081	STOB	35 12	
025	PRTX	-14	STORES FIVE PLAYER SELECTIONS IN BOTH REG 5 AND REG 6	082	LSTX	16-63	
026	RCL0	36 00		083	INT	16 34	
027	10*	16 33		084	RCLC	36 13	
028	X	-35		085	X#Y?	16-32	
029	ST+i	35-55 45		086	GT07	22 07	
030	1	01		087	F2?	16 23 02	
031	0	00		088	GT09	22 09	
032	CHS	-22		089	GT03	22 03	
033	RCL0	36 00		090	*LBL7	21 07	
034	X#Y?	16-32		091	RCL9	36 09	
035	GT01	22 01		092	RCL7	36 07	
036	5	05		093	X=Y?	16-33	
037	RCL1	36 46		094	GT08	22 08	
038	X#Y?	16-32		095	1	01	
039	SPC	16-11	IF 10 PLAYER #'S ARE ENTERED GO TO 2	096	ST+0	35-55 00	
040	X#Y?	16-32		097	ST+9	35-55 09	
041	GT02	22 02		098	6	06	
042	ISZ1	16 26 46		099	RCL0	36 00	
043	GT00	22 00		100	X#Y?	16-32	
044	*LBL2	21 02		101	GT06	22 06	
045	1	01		102	1	01	
046	ST+7	35-55 07		103	ST00	35 00	
047	RCL7	36 07		104	ISZ1	16 26 46	
048	2	02	IF 20 #'S HAVE BEEN CHOSEN GO TO FC	105	GT05	22 05	
049	1	01		106	*LBL8	21 08	
050	X=Y?	16-33		107	F2?	16 23 02	
051	GT06	22 16 13		108	ST06	22 16 12	
052	*LBL3	21 03		109	RCL0	36 00	
053	RCL1	36 15	GENERATE A PSEUDORANDOM NUMBER	110	2	02	
054	9	09		111	2	02	
055	0	00					

IF F2 IS CLEAR
THIS SECTION
COMPARES THE
LAST RANDOM
NUMBER WITH ALL
PREVIOUSLY CHOSEN
#'S. IF THERE
IS A MATCH:
THIS # IS DIS-
CARDED AND A
NEW # SELECTED.
IF A MATCH IS
NOT FOUND THIS
NUMBER IS
STORED AS A
KENO PICK.

IF F2 IS SET
THIS SECTION
COMPARES THE
NEW KENO PICK
WITH THE PLAYER
SELECTIONS. IF
THERE IS A MATCH
HITS = HITS + 1. IF
ALL THE PLAYERS
NUMBERS ARE
COMPARED WITH
NO MATCH F2
IS CLEARED AND
A NEW RANDOM
IS GENERATED

REGISTERS

0 COUNTS TO FIVE	1 STORAGE	2 FOR KENO NUMBERS	3	4	5 PLAYER	6 GUESSES	7 COUNTS TO TWENTY	8 # OF HITS	9 COUNTER
S0 GAMES PLAYED	S1 STORAGE	S2 FOR PAYOFF FIGURES	S3	S4	S5	S6	S7 TOTAL MONEY WON	S8 TOTAL MONEY WAGERED	S9
A BET SIZE	B TEMPORARY STORAGE	C KENO NUMBER	D TEMPORARY STORAGE	E RANDOM NUMBER	I REGISTER CONTROL				

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
114	KLLC	36 13		170	RTN	24	
115	PRTX	-14		171	*LBLc 21 16 15		
116	X	-35		172	CLRG	16-53	CLEAR EVERYTH
117	ST+1	35-55 45		173	P2S	16-51	
118	SF2	16 21 02	SETS FLAG 2	174	CLRG	16-53	
119	5	05	FOR COMPARING	175	P2S	16-51	
120	ST01	35 46	PLAYER PICKS	176	RTN	24	
121	RCL7	36 07	TEMPORARILY	177	*LBLB 21 12		
122	ST00	35 14	STORES # OF	178	SF1	16 21 01	
123	1	01	KENO #S GENERATED	179	RCL6	36 15	
124	0	00	IN REG D	180	RCL6	36 06	USE SAME PLAYER
125	ST07	35 07		181	RCL5	36 05	GUESSES FOR
126	GT04	22 04		182	CLRG	16-53	NEXT GAME
127	*LBL9	21 09		183	ST05	35 05	
128	1	01	ADDS ONE TO	184	R4	-31	
129	ST+8	35-55 08	PLAYER HITS	185	ST06	35 06	
130	*LBLb 21 16 12			186	R4	-31	
131	RCLD	36 14		187	GT0a 22 16 11		
132	ST07	35 07		188	*LBLC 21 13		
133	GT02	22 02		189	F0?	16 23 00	TOGGLE FLAG 0
134	*LBLc 21 16 13			190	GT00	22 14	FOR CONTINUOUS
135	RCL8	36 08		191	1	01	KENO
136	SPC	16-11	PRINT RESULTS	192	SF0	16 21 00	
137	PRTX	-14	# HITS	193	RTN	24	
138	P2S	16-51		194	*LBLD 21 14		
139	4	04		195	0	00	
140	-	-45	DOES PLAYER	196	CF0	16 22 00	
141	ST01	35 46	RECIEVE A	197	RTN	24	
142	X>0?	16-44	PAYOFF?	198	*LBLc 21 15		
143	RCL1	36 45		199	ST0E	35 15	
144	X>0?	16-44		200	P2S	16-51	STORE PAYOFF
145	GT0d 22 16 14			201	2	02	FIGURES
146	0	00		202	ST01	35 01	
147	*LBLd 21 16 14			203	2	02	
148	RCLA	36 11	PRINT BETSIZE	204	0	00	
149	PRTX	-14		205	ST02	35 02	
150	ST+8	35-55 08		206	1	01	
151	X	-35		207	4	04	
152	PRTX	-14	PRINT MONEY WON	208	0	00	
153	ST+7	35-55 07		209	ST03	35 03	
154	1	01		210	EEX	-23	
155	ST+0	35-55 00		211	3	03	
156	SPC	16-11		212	ST04	35 04	
157	*RCL0:	36 00		213	2	02	
158	PRTX	-14	GAME #	214	0	00	
159	RCL7	36 07		215	X	-35	
160	PRTX	-14	WINNINGS TOTAL	216	ST06	35 06	
161	RCL8	36 08		217	3	03	
162	PRTX	-14	BET TOTAL	218	8	08	
163	-	-45		219	0	00	
164	PRTX	-14	MONEY + OR -	220	0	00	
165	P2S	16-51		221	ST05	35 05	
166	SPC	16-11		222	P2S	16-51	
167	RCLA	36 11					

LABELS				FLAGS		SET STATUS		
A START	B SAME GUESSES	C PLAY CONTINUOUS?	D CLEARS F1	E SEED + PAYOFFS	F CONTINUOUS PLAY IF SET	FLAGS	TRIG	DISP
a USED IN START	b STORES REG 1 IN REG D	c STARTS PRINT	d PRINTS RESULTS	e CLEARS ALL REGISTERS	f USE SAME PICKS IF SET	0 <input type="checkbox"/> <input checked="" type="checkbox"/>	DEG <input type="checkbox"/>	FIX <input checked="" type="checkbox"/>
0 STORES 0 IN REG 0	1 INPUT PLAYER #S	2 STARTS KENO #S	3 GENERATE RANDOM #	4 STARTS COMPARE	2 COMPARE MODE	1 <input type="checkbox"/> <input checked="" type="checkbox"/>	GRAD <input type="checkbox"/>	SCI <input type="checkbox"/>
5 STORES REG(1) IN REG 8	6 RETRIVES STORED #S	7 END OF COMPARE?	8 ENTER # IN STORAGE	9 # OF PLAYER HITS	3	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. 0

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Sketch(es)

MINI-KENO

THE MODIFICATION BELOW ALLOWS FOR A FASTER GAME AND HAS PAYOFFS WHICH GIVE THE HOUSE NO ADVANTAGE. IN THIS VERSION THE PLAYER SELECTS SIX NUMBERS INSTEAD OF TEN. HIS SELECTIONS ARE MADE BETWEEN ONE AND 40 (NOT 80). THE HOUSE SELECTS 12 NUMBERS (NOT 20) IN THIS SMALLER RANGE. TO MODIFY THE PROGRAM SWITCH TO **PRGM** THEN ENTER THE FOLLOWING

Sample Problem(s) KEY STROKES. [NOTE THE PERIOD BETWEEN THE GTO AND THE ADDRESS (GTO. xxx)]

- ① GTO. 214, f DEL, f DEL
- ② GTO. 211, f DEL, f DEL, 1, 0, 3, 7
- ③ GTO. 208, f DEL, f DEL, f DEL, 4, 3
- ④ GTO. 204, f DEL, f DEL, 5
- ⑤ GTO. 201, f DEL, 1
- ⑥ GTO. 139, f DEL, 2
- ⑦ GTO. 124, f DEL, f DEL, 6
- ⑧ GTO. 098, f DEL, 4
- ⑨ GTO. 060, f DEL, 4
- ⑩ GTO. 049, f DEL, f DEL, 1, 3
- ⑪ GTO. 031, f DEL, f DEL, 6

Solution(s) THE PAYOFF SCHEDULE FOR MINI-KENO IS:

HITS	PAYOFF (\$1 WAGER)
3	\$1.00
4	\$5.00
5	\$43.00
6	\$1,037.00

A MINI-KENO GAME IS RUN IN JUST UNDER 5 MIN..

Reference(s)