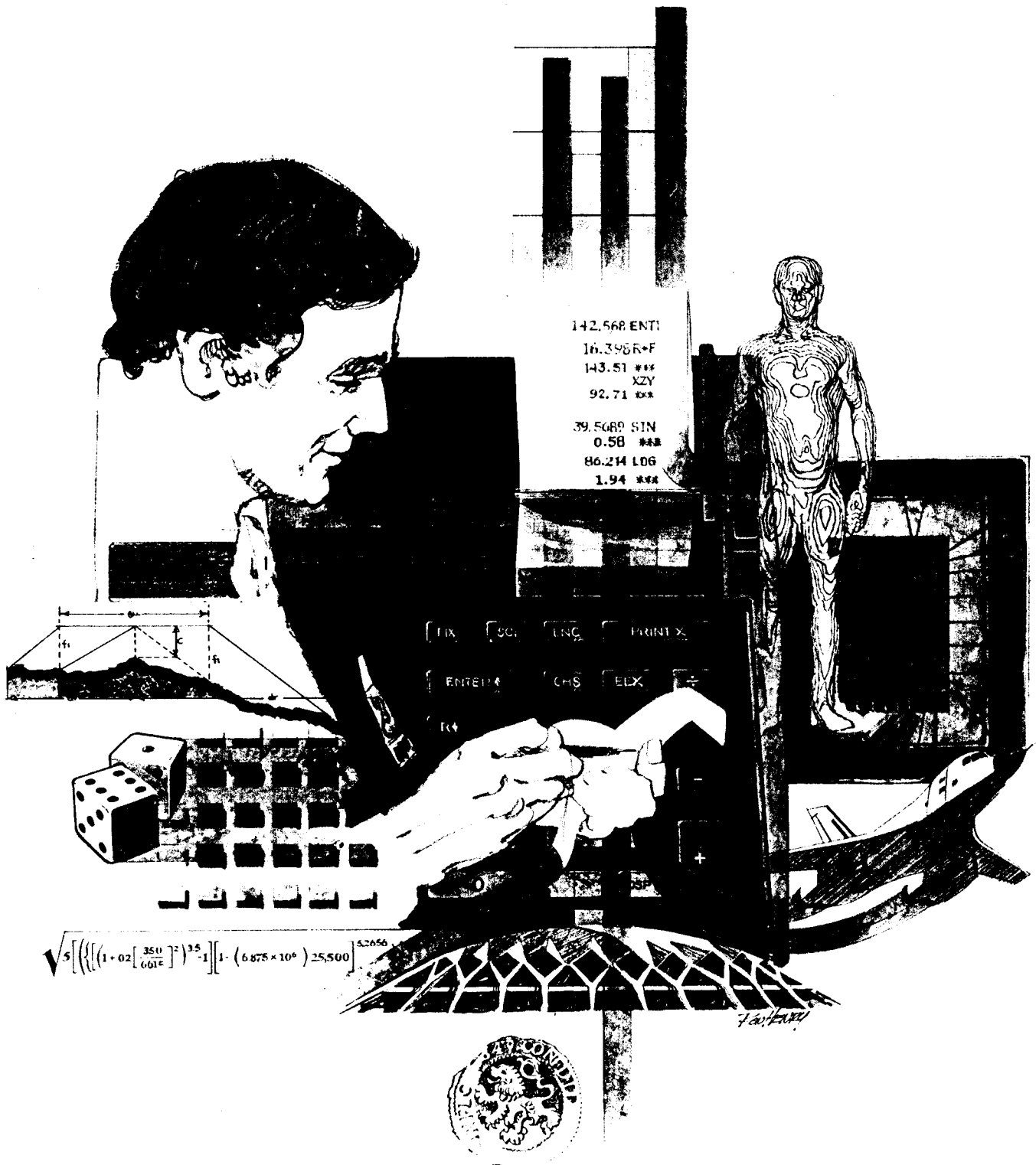


HEWLETT-PACKARD

HP-67/HP-97

Users' Library Solutions

Games



INTRODUCTION

In an effort to provide continued value to its customers, Hewlett-Packard is introducing a unique service for the HP fully programmable calculator user. This service is designed to save you time and programming effort. As users are aware, Programmable Calculators are capable of delivering tremendous problem solving potential in terms of power and flexibility, but the real genie in the bottle is program solutions. HP's introduction of the first handheld programmable calculator in 1974 immediately led to a request for program solutions — hence the beginning of the HP-65 Users' Library. In order to save HP calculator customers time, users wrote their own programs and sent them to the Library for the benefit of other program users. In a short period of time over 5,000 programs were accepted and made available. This overwhelming response indicated the value of the program library and a Users' Library was then established for the HP-67/97 users.

To extend the value of the Users' Library, Hewlett-Packard is introducing a unique service—a service designed to save you time and money. The Users' Library has collected the best programs in the most popular categories from the HP-67/97 and HP-65 Libraries. These programs have been packaged into a series of low-cost books, resulting in substantial savings for our valued HP-67/97 users.

We feel this new software service will extend the capabilities of our programmable calculators and provide a great benefit to our HP-67/97 users.

A WORD ABOUT PROGRAM USAGE

Each program contained herein is reproduced on the standard forms used by the Users' Library. Magnetic cards are not included. The Program Description I page gives a basic description of the program. The Program Description II page provides a sample problem and the keystrokes used to solve it. The User Instructions page contains a description of the keystrokes used to solve problems in general and the options which are available to the user. The Program Listing I and Program Listing II pages list the program steps necessary to operate the calculator. The comments, listed next to the steps, describe the reason for a step or group of steps. Other pertinent information about data register contents, uses of labels and flags and the initial calculator status mode is also found on these pages. Following the directions in your HP-67 or HP-97 **Owners' Handbook and Programming Guide**, "Loading a Program" (page 134, HP-67; page 119, HP-97), key in the program from the Program Listing I and Program Listing II pages. A number at the top of the Program Listing indicates on which calculator the program was written (HP-67 or HP-97). If the calculator indicated differs from the calculator you will be using, consult Appendix E of your **Owner's Handbook** for the corresponding keycodes and keystrokes converting HP-67 to HP-97 keycodes and vice versa. No program conversion is necessary. The HP-67 and HP-97 are totally compatible, but some differences do occur in the keycodes used to represent some of the functions.

A program loaded into the HP-67 or HP-97 is not permanent—once the calculator is turned off, the program will not be retained. You can, however, permanently save any program by recording it on a blank magnetic card, several of which were provided in the Standard Pac that was shipped with your calculator. Consult your **Owner's Handbook** for full instructions. A few points to remember:

The Set Status section indicates the status of flags, angular mode, and display setting. After keying in your program, review the status section and set the conditions as indicated before using or permanently recording the program.

REMEMBER! To save the program permanently, **clip** the corners of the magnetic card once you have recorded the program. This simple step will protect the magnetic card and keep the program from being inadvertently erased.

As a part of HP's continuing effort to provide value to our customers, we hope you will enjoy our newest concept.

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See who has the larger total after playing a few rounds of this gambling game against the machine. You can select the personality of the machine.	
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See if you can beat the dealer in this familiar game also known as the Game of 21.	
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Program Description I

1

Program Title Risk

Contributor's Name Dick Jenssen

Address Meteorology Department/Melbourne University

City Parkville State Victoria Zip Code 3052 AUSTRALIA

Program Description, Equations, Variables A gambling game. Current player is given a digit (2 through 5: probability of N is $N/15$). He may accept this as his score for current round or add to it by requesting more digits. If digit selected is same as first digit, score goes to zero and move ends. Winner is player with highest sum of scores after R rounds. Personality of machine and number of rounds may be selected by player. The personality (P) varies between 0 and 5. When $P = 0$, the machine is rash, optimistic and impulsive; when $P = 5$, the machine is cautious, negative and dull. If P and R are not set by human, default values are $P = 2.5$, $R = 5$.

Operating Limits and Warnings

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Program Description II

Sketch(es)

Sample Problem(s) WIN A STANDARD GAME (P = 2.5, R = 5)

PRESS	COMMENT	OUTPUT	COMMENT
(A)	Begin	4.	Base number is 4.
(R/S)	I want another number.	5.4 E09	New # is 5; total score is 9
(R/S)	Get another number.	2.4 E11	New # is 2; total score is 11.
(CHS)	Stop.	11.11	Score is 11; last player got 11.
			Since score > 0 human is winning.
		4.	This display is automatic
			Machine's base number is 4. Then
		3.4 E07	This display is also
			automatic. New # is 3, total score is 7
		4.4 E00	New # is 4. This is same as the
			initial #, so machine bombs out. Then:
		11.00	Score is 11, last player score
			is zero. Human still winning. Then:
		5.	Base # for human is 5.
(R/S)	Another	2.5 E07	
(R/S)	Another	3.5 E10	
(CHS)	Stop	21.10	Score is 21, last player 10.
		5.	Machine's number.
		5.5 E00	Machine bombs again.
		21.00	Score is 21, last player 0
		3.	Human base number.

AND SO ON: BUT THE NEXT GAME...!

REFERENCES: This is a version of the HP-65 program "Game of Not-one", #03452A.

3

(P, R) : Go

[illegible]

97 Program Listing I

STEP	KEY ENTRY	KEY CODE
001	*LBLA	21 11
002	F3?	16 23 03
003	GT09	22 09
004	2	02
005	.	-62
006	5	05
007	ENT↑	-21
008	5	05
009	*LBL9	21 09
010	INT	16 34
011	LN	32
012	R↓	-31
013	LSTX	16-63
014	STOA	35 11
015	9	09
016	÷	-24
017	SIN↑	16 41
018	R↓	-31
019	JX	54
020	LSTX	16-63
021	2	02
022	+	-55
023	1	01
024	0	00
025	÷	-24
026	LN	32
027	ST09	35 09
028	LSTX	16-63
029	.	-62
030	3	03
031	+	-55
032	SIN↑	16 41
033	0	00
034	ST08	35 08
035	7	07
036	ENT↑	-21
037	5	05
038	Y*	31
039	ST0D	35 14
040	2	02
041	3	03
042	9	09
043	ST0B	35 12
044	1	01
045	7	07
046	ST0C	35 13
047	*LBL0	21 00
048	CF0	16 22 00
049	GSBC	23 13
050	*LBL1	21 01
051	R/S	51
052	X<0?	16-45
053	GT03	22 03
054	GSBB	23 12
055	F2?	16 23 02
056	GT03	22 03

COMMENTS

STEP

KEY ENTRY

KEY CODE

COMMENTS

057	GT01	22 01
058	*LBL3	21 03
059	GSBD	23 14
060	GSBC	23 13
061	PSE	16 51
062	SF1	16 21 01
063	1	01
064	RCLA	36 11
065	X#Y?	16-32
066	GT09	22 09
067	CF1	16 22 01
068	RCL8	36 08
069	X>0?	16-44
070	GT08	22 08
071	0	00
072	GT07	22 07
073	*LBL8	21 08
074	EEX	-23
075	2	02
076	GT07	22 07
077	*LBL9	21 09
078	RCL9	36 09
079	RCL6	36 06
080	1	01
081	4	04
082	÷	-24
083	1	01
084	-	-45
085	CHS	-22
086	LN	32
087	÷	-24
088	*LBL7	21 07
089	INT	16 34
090	ST0I	35 46
091	SF0	16 21 00
092	X=0?	16-43
093	GT04	22 04
094	*LBL2	21 02
095	F1?	16 23 01
096	GT09	22 09
097	RCL8	36 08
098	RCL7	36 07
099	X>Y?	16-34
100	GT04	22 04
101	*LBL9	21 09
102	GSBB	23 12
103	F2?	16 23 02
104	GT04	22 04
105	PSE	16 51
106	DSZI	16 25 46
107	GT02	22 02
108	*LBL4	21 04
109	GSBD	23 14
110	RCLA	36 11
111	1	01
112	-	-45

REGISTERS

REGISTERS										
0	1	2	3	4	5	6	7	8	9	
S0	S1	S2	S3	S4	S5	S6 N	S7 SS	S8 GG	S9 $\ln(P)$	
A R		B 239		C 17		D 16807		E Random #		I Used

97 Program Listing II

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
113	STOA	35 11		169	F0?	16 23 00	
114	X#0?	16-42		170	CHS	-22	
115	GT00	22 00		171	ST+8	35-55 08	
116	CF3	16 22 03		172	ABS	16 31	
117	DSP0	-63 00		173	EEX	-23	
118	R↓	-31		174	2	02	
119	X>0?	16-44		175	÷	-24	
120	GT09	22 09		176	RCL8	36 08	
121	5	05		177	X>0?	16-44	
122	5	05		178	GT09	22 09	
123	1	01		179	CHS	-22	
124	7	07		180	+	-55	
125	8	08		181	CHS	-22	
126	RTN	24		182	GT08	22 08	
127	*LBL9	21 09		183	*LBL9	21 09	
128	7	07		184	+	-55	
129	7	07		185	*LBL8	21 08	
130	3	03		186	DSP2	-63 02	
131	4	04		187	FIX	-11	
132	RTN	24		188	PRTX	-14	
133	*LBLB	21 12		189	RTN	24	
134	CF2	16 22 02		190	*LBLB	21 15	
135	GSBE	23 15		191	DSP1	-63 01	
136	SCI	-12		192	FIX	-11	
137	ST+7	35-55 07		193	RCLB	36 15	
138	RCL6	36 06		194	X=0?	16-43	
139	X#Y?	16-32		195	RCLC	36 13	
140	GT08	22 08		196	RCLD	36 14	
141	1	01		197	x	-35	
142	.	-62		198	RCLB	36 12	
143	1	01		199	÷	-24	
144	x	-35		200	FRC	16 44	
145	0	00		201	RCLB	36 12	
146	ST07	35 07		202	x	-35	
147	R↓	-31		203	RND	16 24	
148	PSE	16 51		204	STOE	35 15	
149	SF2	16 21 02		205	RCLC	36 13	
150	RTN	24		206	÷	-24	
151	*LBL8	21 08		207	INT	16 34	
152	.	-62		208	2	02	
153	1	01		209	-	-45	
154	x	-35		210	X<0?	16-45	
155	+	-55		211	GT09	22 09	
156	RCL7	36 07		212	3	03	
157	10*	16 33		213	-	-45	
158	x	-35		214	X<0?	16-45	
159	RTN	24		215	GT09	22 09	
160	*LBLC	21 13		216	4	04	
161	GSBE	23 15		217	-	-45	
162	ST07	35 07		218	X<0?	16-45	
163	ST06	35 06		219	GT09	22 09	
164	DSP0	-63 00		220	5	05	
165	FIX	-11		221	-	-45	
166	RTN	24		222	*LBL9	21 09	
167	*LBLD	21 14		223	LSTX	16-63	
168	RCL7	36 07		224	RTN	24	

LABELS					FLAGS	SET STATUS		
A	B	C	D	E	Machine	ON OFF		DISP
Go	Player sum	Get B	Display	Random # Generator	Move	0	☐ ☒	FIX ☒
a	b	c	d	e	Finite Mach. Move	1	☒ ☐	GRAD ☐
0	LOOP	2 LOOP	3 JUMP	4 JUMP	2 N = B	2	☐ ☒	RAD ☐
5	6	7 JUMP	8 JUMPS	9 JUMPS	3 Manual P, R	3	☐ ☒	ENG ☐

Program Description I

Program Title BLACK JACK WITH A PERMANENT BANK
 Contributor's Name MOSHE M BREINER
 Address DEPT OF MATHEMATICS HARVARD UNIVERSITY
 City CAMBRIDGE State MASS Zip Code 02138

Program Description, Equations, Variables BLACK JACK IS A GAME OF CARDS. BEFORE THE DEAL BEGINS THE PLAYER BUYS SOME CHIPS (C) AND PACES A BET (B), THEN THE DEALER GIVES HIM A CARD FACE DOWN, TAKES ONE CARD FACE UP FOR HIMSELF, GIVES ANOTHER CARD FACE DOWN TO THE PLAYER AND TAKES A SECOND CARD FACE DOWN FOR HIMSELF. COUNTING ANY ACE 1 OR 11, AS HE WISHES, ANY FACE CARD AS 10 AND THE OTHER CARDS AT THEIR PIP VALUES, THE PLAYER AND THE BANK TRY TO GET A COUNT AS NEARLY AS POSSIBLE TO 21, WITHOUT GOING OVER 21 (BUST). A BLACK JACK IS A COUNT OF 21 WITH THE FIRST TWO CARDS (A+10 OR A+FACE CARD). IF THE PLAYER OR THE DEALER HAVE A BLACK JACK (B.J.) THE DEALER DISPLAYS HIS SECOND CARD AND PROCEEDS TO THE LIQUIDATION: IF DEALER HAS B.J. AND YOU DON'T, YOU LOOSE THE BET, IF BOTH HAVE B.J. IT'S A PUSH, IF ONLY THE PLAYER HAS A B.J., HE WINS 1 1/2 TIMES THE BET. IF NOBODY HAS B.J. THE HP6T DISPLAYS 0.0 AND IT IS YOUR TURN TO PLAY. YOU CAN (1) SPLIT YOUR PAIR (2) HIT (3) STAND
 (1) IF YOUR FIRST TWO CARDS ARE OF THE SAME DENOMINATION (TWO 5'S, TWO ACES AS 2) YOU CAN CHOOSE NOW AND ONLY NOW TO TREAT THEM AS TWO SEPARATE HANDS (SEE NOTE BELOW).
 (2) YOU CAN ASK FOR ANOTHER CARD AS MANY TIMES AS YOU WISH. IN THE CASE OF THE SPLITTING PAIRS YOU CAN ASK CARDS FOR THE FIRST OR THE SECOND HAND IN ANY ORDER, UNTIL YOU DECIDE TO
 (3) STAND. NOW THE DEALER SHOWS HIS FIRST CARD AGAIN (PAUSE) AND PRINT ITS SECOND CARD (THE ONE LEFT FACE DOWN). THE STRATEGY OF THE DEALER IS NOT FREE: IF HIS TOTAL IS 17 OR MORE IT MUST STAND. IF IT IS 16 OR LESS IT MUST TAKE ANOTHER CARD

Operating Limits and Warnings THE COMPUTED DISPLAYS ERROR IF
 1) $C \leq 0$ 2) $B > C$ 3) $B \leq 0$
 4) YOU PUSH [B], THE SPLITTING PAIR KEY, WHEN YOU DON'T HAVE A PAIR TO SPLIT, OR YOU HAVE ASKED ALREADY FOR A CARD PRESSING [C], OR IF $2B > 2$ (YOU CANNOT AFFORD A DOUBLE LOSS)
 5) YOU PUSH [D], ASKING FOR A CARD IN THE SECOND HAND, WHILE YOU HAVE NOT SPLIT THE PAIR.

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 I

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Program Title

Contributor's Name

Address

City

State

Zip Code

Program Description, Equations, Variables IF HE HAS, FOR INSTANCE, A 3 4, HE IS NOT ALLOWED TO COUNT THE ACE AS 1, AND MUST STAY. WHEN THE DEALER STAYS, IT COMPUTES YOUR NEW SUM IN CHIPS, ACCORDING TO THE FOLLOWING RULE

- 1) THE CASE OF B.J. HAS BEEN ALREADY DISCUSSED
- 2) YOU WIN THE BET IF YOUR TOTAL IS ≤ 21 AND 3) HIGHER OF THE TOTAL OF THE DEALER OR 6) THE DEALER BUSTS
- 3) YOU ARE A STAND OFF IF YOUR TOTAL IS ≤ 21 AND EQUAL TO THE TOTAL OF THE DEALER
- 4) YOU LOOSE THE BET IF YOU BUST OR IF YOUR TOTAL IS ≤ 21 BUT THE DEALER HAS A HIGHER TOTAL ≤ 21

5) IN THE CASE OF SPLITTING PAIR THE TWO HANDS ARE COMPARED SEPARATELY. THE PROGRAM AUTOMATICALLY GIVES TO THE HANDS THE MOST CONVENIENT TOTAL, COUNTING ACES 1 OR 11.

ALL CARDS ARE DISPLAYED IN THE MODE FIX 1. THE INTEGER PART IS THE CARD (A=1, K=13, Q=12, J=11, OTHER CARDS ARE PP VALUES) THE FRACTIONAL PART IS .0 IF THE CARD BELONGS TO THE DEALER, .1 IF THE CARD BELONGS TO THE FIRST HAND, .2 IF THE CARD BELONGS TO THE SECOND HAND (SPLITTING PAIR ONLY) WHEN THE TOTAL C APPEARS, THE MANTISSA IS .1 FOR THE FIRST PLAYER AND .2 FOR THE SECOND PLAYER

Operating Limits and Warnings

BET WHOLE EVEN DOLLARS ONLY (= YOU PLAY AN ODD DOLLAR YOU LOSE 50c. IN THE CASE YOU GET A BLACKJACK)

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Program Description II

Sketch(es)	FIRST GAME		SECOND GAME			
	K		FIRST HAND	SECOND HAND	DEALER'S HAND	
		8	9	9	2	
	A		5	8	2	
		Q			7	
					5	
					J	

Sample Problem(s) EXAMPLE OF A GAME : HUSBAND AND WIFE START WITH \$1000. LOAD PRO

1000 [FA] WAIT SOME 30 SECONDS [R/S] IGNORE OUTPUT

TO REPRODUCE EXAMPLE BELOW STORE .1453826 IN REGISTER 0

HUSBAND PLAYS FIRST AND BETS \$100

100 [A] —→	18.1	HUSBAND GETS A K
	3.0	DEALER GETS AN 8
	1.1	HUSBAND GETS AN A BLACK JACK! DEALER SHOWS
	12.0	A QUEEN AND PAYS 1½ TIMES THE BET:
	1150.1	HUSBAND HAS NOW \$1150

NOW WIFE PLAYS

[FC]	1200.2	SHE STARTS WITH \$1000, AND BETS 100
100 [A] —→	9.1	WIFE'S FIRST CARD IS A 9
	2.0	DEALER'S FIRST CARD IS A 2
	9.1	WIFE'S SECOND CARD IS A 9

Solution(s) 0.0 NO BLACK JACK, DEALER'S SECOND CARD IS FACE DOWN

WIFE DECIDES TO SPLIT HER PAIRS.

[B] —→	0.0	IGNORE THIS OUTPUT (IT IS ALWAYS 0.0)
[C] —→	5.1	FIRST HAND GETS A 5
[D] —→	8.2	SECOND HAND GETS AN 8, WIFE STANDS
[E] —→	2.0	SECOND CARD DEALER WAS A 2
	7.0	III CARD DEALER
	5.0	IV CARD DEALER
	11.0	V CARD DEALER : DEALER BUSTS AND PAYS:
	1200.2	WIFE HAS NOW \$1200

Reference(s) OFFICIAL RULES OF CARD GAMES 56 EDITION PAGES 228-230

HP 67-97 PROGRAM E A101A

9

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	LOAD PRGM (PART 1 AND 2)				
2	ENTER YOUR INITIAL CAPITAL IN CHIPS	C	F	A	
	THE COMPUTER NOW SHUFFLES. WAIT APPROX.				
	30 SECOND, THEN		R/S		IGNORE OUTPUT
3	ENTER YOUR BET (INTEGER EVEN #)	B	A		1 st CARD player
					1 st CARD dealer
					2 nd CARD player
	IF NEITHER DEALER NOR PLAYER HAVE B, J.				0.0
	IF ANY OF THEM HAVE B, J				2 nd CARD dealer
					YOUR NEW C
4	IF YOU CAN AND WANT TO SPLIT YOUR PAIR		B		0.0
5	HIT FOR FIRST HAND		C		CARD .1
	OR HIT FOR SECOND HAND (IN THE CASE OF SPLITTING				
	PAIRS ONLY)		D		CARD .2
6	REPEAT STEPS 4 & 5 AS MANY TIMES AS				
	YOU PLEASE IN ANY ORDER, THEN				
7	STAND		E		1 st CARD DEALER
					2 nd CARD DEALER
					SUCCESSIVE CARD
					DEALER
					YOUR NEW C
8	FOR A NEW GAME OF THE SAME PLAYER				
	GO TO STEP 3				
	YOU MAY SHUFFLE THE DECK AT ANY MOMENT				
	BY PRESSING		F	E	
	WAIT SOME TIME		R/S		IGNORE OUTPUT
	OR YOU CAN PUT YOUR PET-SEED IN REG. C,				
	PLEASE 0 < SEED < 1				
9	IF TWO PEOPLE ARE PLAYING, PUSH		F	C	CHIPS 2 nd player
	TO LET THE SECOND PLAYER PLAY HIS GAME.				
	NOW GO TO STEP 3				

91 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLA	21 15 11		057	X>0?	16-44	
002	ST03	35 09		058	5	05	
003	ST07	35 07		059	0	00	
004	LN	32		060	%	55	
005	.	-52		061	INT	16 34	
006	1	01		062	ST+9	35-55 09	
007	ST+7	35-55 07		063	RCL9	36 09	
008	ST+7	35-55 07		* 064	RTN	24	
009	ST+9	35-55 09	ENTER INITIAL	065	*LBLB	21 12	SPLIT PAIRS
010	2	02	AMOUNT OF	066	F1?	16 23 01	IS SPLITTING PAIRS LEGAL?
011	LN	32	CHIPS	067	GT07	22 07	
012	ST00	35 00		068	RCLC	36 13	
013	*LBLA	21 16 15	SHUFFLE	069	RCLD	36 14	
014	GSB0	23 00		070	X#Y?	16-32	
015	GT0e	22 16 15		071	GT07	22 07	
016	*LBLA	21 11	GAME BEGINS	072	RCL9	36 05	
017	SF0	16 21 00		073	RCL8	36 08	IS PLAYER COVERED
018	RCL9	36 09		074	2	02	AGAINST A DOUBLE
019	X#Y	-41		075	X	-35	LOSS?
020	X#Y?	16-34		076	X#Y?	16-34	
021	GT07	22 07		077	GT07	22 07	
022	ST08	35 08		078	RCL6	36 06	
023	LN	32		079	ST04	35 04	
024	CLX	-51		080	RCL5	36 05	
025	ST01	35 01		081	ST03	35 03	
026	ST02	35 02		082	CLX	-51	
027	ST03	35 03		083	CF0	16 22 00	
028	ST04	35 04		084	RTN	24	
029	GSB0	23 13	CARD FOR PLAYER	085	*LBLC	21 13	CARD FOR FIRST
030	ST0C	35 13		086	SF1	16 21 01	HAND
031	R4	-31		087	RCL3	36 03	
032	ST05	35 05		088	RCL4	36 04	
033	R4	-31		089	GSBd	23 16 14	
034	ST06	35 06		090	ST+4	35-55 04	
035	GSB4	23 04	CARD FOR DEALER	091	X#Y	-41	
036	ST0A	35 11		092	ST+3	35-55 03	
037	PRTX	-14		093	RCLC	36 15	
038	GSBC	23 13	CARD FOR PLAYER	094	.	-62	
039	CF1	16 22 01		095	1	01	
040	ST0D	35 14		096	+	-55	
041	GSB4	23 04	CARD FOR DEALER	097	PRTX	-14	
042	ST0B	35 12		098	RTN	24	
043	RCL4	36 04		099	*LBLD	21 14	CARD FOR SECOND
044	RCL2	36 02		100	F0?	16 23 00	HAND
045	X#Y?	16-35		101	GT07	22 07	
046	X#Y	-41		102	RCL5	36 05	
047	2	02		103	RCL6	36 06	
048	1	01		104	GSBd	23 16 14	
049	-	-45		105	ST+6	35-55 06	
050	0	00		106	X#Y	-41	
051	X#Y?	16-32	ANY B.J. AROUND?	107	ST+5	35-55 05	
052	RTN	24	NO: STOP	108	RCLC	36 15	
053	RCLB	36 12	YES: GAME IS	109	.	-62	
054	PRTX	-14	OVER: CASH OR PAY	110	2	02	
055	RCL4	36 04		111	+	-55	
056	GSB3	23 03		112	PRTX	-14	

REGIS.

0 SEND	1 LITTLE TOTAL DEALER	2 BIG TOTAL DEALER	3 LITTLE TOTAL FIRST HAND	4 BIG TOTAL FIRST HAND	5 LITTLE TOTAL SECOND HAND	6 BIG TOTAL SECOND HAND	7 IDLE PLAYER	8 BET	9 ACTIVE PLAYER
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A FIRST CARD DEALER	B SECOND CARD DEALER	C FIRST CARD PLAYER	D SECOND CARD PLAYER	E LAST CARD DEALER	F	G	H	I	J

97 Program Listing II

11

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
113	RTN	24		169	*LBL4	21 04	CARD FOR DEALER
114	*LBL5	21 15	STAND: DEALER PLAYS.	170	RCL1	36 01	
* 115	RCLA	36 11		171	RCL2	36 02	
* 116	PSE	16 51		172	GSB4	23 16 14	
117	RCLB	36 12		173	ST+2	35-55 02	
118	PRTX	-14		174	XZY	-41	
119	*LBL1	21 01		175	ST+1	35-55 01	
120	RCL2	36 02		176	RCL5	36 15	
121	RCL1	36 01		177	RTN	24	
122	SF3	16 21 03		178	*LBL5	21 05	
123	GSB2	23 02	IS TOTAL DEALER	179	RCL2	36 02	
124	1	01	BIGGER THAN 17?	180	RCL1	36 01	
125	7	07		181	CF3	16 22 03	
126	XZY?	16-35	MRS: SETTLE	182	GSB2	23 02	
127	GT05	22 05	NO: HIT A CARD	183	X=0?	16-43	FOR DEALER
128	GSB4	23 04		184	1	01	BUST = TOTAL 1
129	PRTX	-14		185	ST02	35 02	
130	GT01	22 01		186	RCL4	36 04	
131	*LBL0	21 00	CARD GENERATOR (SUBROUTINE OF)	187	RCL3	36 03	
132	9	09		188	*LBL6	21 06	
133	9	09		189	GSB2	23 02	
134	7	07		190	GSB3	23 03	
135	RCL0	36 00		191	RCL9	36 09	
136	X	-35		192	F0?	16 23 00	
137	FRC	16 44		* 193	RTN	24	
138	ST00	35 00		194	SF0	16 21 00	
139	1	01		195	RCL6	36 06	
140	3	03		196	RCL5	36 05	
141	A	-35		197	GT06	22 06	
142	INT	16 34		198	*LBL4	21 16 14	CARD GENERATOR
143	RTN	24		199	XZY?	16-32	
144	*LBL2	21 02	BEST TOTAL	200	SF2	16 21 02	
145	1	01	A=1 OR A=11	201	GSB0	23 00	
146	2	02		202	X#0?	16-42	
147	XZY?	16-34		203	SF2	16 21 02	
148	R4	-31		204	1	01	
149	R4	-31		205	+	-55	
150	F3?	16 23 03		206	ST0E	35 15	
151	RTN	24		207	1	01	
152	2	02	BUST COUNTS AS 0	208	0	00	
153	1	01		209	XZY?	16-34	
154	XZY	-41		210	XZY	-41	
155	XZY?	16-34		211	ENT?	-21	
156	CLX	-51		212	F2?	16 23 02	
157	RTN	24		213	RTN	24	
158	*LBL3	21 03	SETTLEMENT	214	1	01	
159	RCL2	36 02		215	0	00	
160	-	-45		216	+	-55	
161	ENT?	-21		217	RTN	24	
162	ABS	16 31		218	*LBL6	21 16 13	OTHER PLAYER COMES IN
163	X#0?	16-42		219	RCL7	36 07	
164	÷	-24		220	RCL9	36 09	
165	RCL8	36 08		221	ST07	35 07	
166	X	-35		* 222	XZY	-41	
167	ST+3	35-55 05		223	ST09	35 09	
168	RTN	24		* 224	RTN	24	

LABELS

SET STATUS

A	B	C	D	E	F	G	H	I
BET	SPLIT PAIRS	CARD (1)	CARD (2)	STAND	PAIRS SPIT	FLAGS	TRIG	DISP
INITIALIZE	0	OTHER PLAYER	CARD GENERATOR	SHUFFLE	1 SPLIT PAIR INITIAL	ON OFF	DEG	FIX
0 USED	1 USED	2 USED	3 USED	4 USED	2 USED A=1/11	0 ☐ ☒	GRAD	SCI
5 USED	6 USED	7 ERROR	8	9	3 BLACK JACK	1 ☐ ☒	RAD	ENG
						2 ☐ ☒	WESENTIAL	n
						3 ☐ ☒		

Program Description II

Sketch(es)

Sample Problem(s)

POSSIBLE MODIFICATION

IF YOU HAPPEN TO BE BLESSED WITH AN HP 97, YOU DON'T NEED TO REVIEW THE FIRST CARD OF THE DEALER, BUT YOU MAY PREFER HAVING YOUR FINAL \$ PRINTED. ~~THIS IS NOT~~

I SUGGEST YOU, IN THIS CASE, THE FOLLOWING CHANGE:

DELAY STEPS 115 RCLA AND 116 PSE

SUBSTITUTE STEPS 064 RTN AND 193 RTN WITH 064 GTO FC AND 193 GTO FC

INSERT THE ORDER PRTX BETWEEN STEPS 221 STO 7 AND 222 ~~RTN~~ 4

INSERT THE ORDER SPACE BETWEEN STEPS 223 STO 9 AND 224 RTN.

(THE PLACES ABOVE MENTIONED ARE MARKED WITH A * IN THE LISTING)

IF YOU MAKE THIS MODIFICATION, AFTER EACH GAME THE HP 97 IS GOING TO LEAVE A BLANK SPACE AND WILL BE READY FOR THE SECOND PLAYER. IT WILL PRINT \$ OF THE PLAYER THAT JUST FINISHED HIS GAME AND DISPLAY \$ OF THE ONE WHO IS GOING TO PLAY NEXT GAME. THE LAST WILL START IMMEDIATELY WITHOUT

Solution(s) PUSHING THE KEY FC, AS DESCRIBED AT STEP 9 OF USER'S INSTRUCTION.

ON THE CONVERSE IF THE SAME PLAYER WANTS TO PLAY TWO CONSECUTIVE GAMES, YOU HAVE TO PRESS FC.

Reference(s)

Program Description I

Program Title

*** BELL-FRUIT (MILLS STANDARD) ***

Contributor's Name

Mr. Craig A. Pearce

(Member # 311 of the

Address

2529 S. Home Avenue

HP-65 Users Club)

City

Berwyn,

State

Illinois

Zip Code

60402

Program Description, Equations, Variables This program will simulate a Mills brand, 10¢ slot-machine, not only in the standard payoffs, but by also duplicating, precisely, the same odds that any particular combination of symbols will occur.

Most slot machines contain 3 wheels on which about seven different symbols are distributed, making up 20 positions on each wheel. The wheels stop randomly (they are not rigged), but the selection of symbol combinations on each wheel places the odds with the house. For example, wheel two contains no lemon symbols, making 3-of-a-kind, or two-of-a-kind-and-a-bar (each \$1 payoffs) impossible to get with lemons (hence the origin of the saying, "getting a lemon"). Also, the mechanical payoff system disregards some apparent winning combinations. Thus, two cherries and a bar is treated like only two cherries (50¢ payoff) then the normal 2-of-a-kind-and-a-bar, \$1.00 payoff. Two watermelons and a bar is considered just a losing combination with no payoff.

To create the same affects on the HP-67, each of the seven symbols has been assigned a number (see next page) and their frequency has been recorded in registers 4 through 9. Each pair of registers (4 & 5, 6 & 7, and 8 & 9) contains the actual, encoded symbols for each wheel of a slot machine. When run, a digit is selected from each pair of registers and stored in registers 3, 2, and 1. Then, the digits are compared to see if any winning combinations have occurred. If so, the correct amount is paid into the "pot" (register 0), and then a dime is deducted for the play. The winning combination (or losing, as the case may be) is displayed, one digit at a time, to the right of the decimal point. (Ignore the "0" to the left of the point). After the last digit is displayed, the display will flicker once more before coming out of program. Wait until the program is completely stopped before pressing any keys.

Winning combinations and their estimated frequency are listed on the next pages. As a whole, however, Bell-Fruit will pay back \$525.00 for each \$800.00 fed in (it keeps about 34.88%). This means you lose 3.44 cents on each play!

Operating Limits and Warnings At no time clear the primary registers. Should this happen, refeed in side two of the program card. You can reinitialize with a new seed if desired, at this point.

Remember, all previous winnings or debts will be cleared by this process.

IMPORTANT:

When inputting data, be sure and fill the primary registers as indicated on the bottom of page 6.

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 II

Sketch(es)



(bar)



(cherry)

2



(lemon)

3



(plum)

4



(orange)

5



(bell)

6



(watermelon)

DISPLAY:

SYMBOLS:

NAMES:

ODDS:*

PAYOFFS:

0.1XX



(cherry-anything-anything)

780 out of 8000

20¢

0.11X



(cherry-cherry-anything)

420 out of 8000

50¢

0.333



(plum-plum-plum)

42 out of 8000

\$1.00

0.330



(plum-plum-bar)

21 out of 8000

\$1.00

0.444



(orange-orange-orange)

20 out of 8000

\$1.00

0.440



(orange-orange-bar)

20 out of 8000

\$1.00

0.555



(bell-bell-bell)

32 out of 8000

\$1.00

0.550



(bell-bell-bar)

4 out of 8000

\$1.00

*** JACKPOTS ***

0.000



(bar-bar-bar)

1 out of 8000

\$10.00

0.666



(three watermelons)

1 out of 8000

\$10.00

*--NOTES ON ODDS:

Because each wheel can stop in any one of 20 positions, there are some 8000 different ways all three wheels could stop (20x20x20). Of those 8000 positions, 1341 of them produce winners. The break downs are given above. Thus, assuming that each possible combination comes up, randomly in those 8000 tries, the above results are possible.

Program Description II

Sketch(es)

Sample Problem(s) Lets have a sample game:

Load in program and data (sides one and two)

We can input new seed, or use the one already stored. To key in a

new seed proceed as follows:

.8573608925*

☐ E ▶ 0.00

Play the first round:

☐ A ▶ 0.3

▶ 0.31

▶ 0.315

Check the pot:

☐ B ▶ -0.10

(Down by ten cents. Try again)

Play next round:

☐ A ▶ 0.1

▶ 0.16

▶ 0.165

One cherry...a winner. Review pot:

☐ B ▶ 0.00

(Pot is zero because you've played twice (down by 20¢), but

you've just won 20¢ by getting a cherry. So, you've broken even).

Solution(s)

*--NOTE: Seed may be any number between 0 and one, not including those two numbers. When input, it is best to use a many digit seed as opposed to one with only a few digits.

Reference(s)

SPECIAL INSTRUCTIONS IN RECORDING THE CARD!:

When recorded correctly, this card will have the program recorded on side two, and the data recorded on side one. It should be recorded in such a way that feeding in side one first will cause a "Crđ" prompting display to let the user know that side two must also be fed in.

To accomplish this, an item will be stored in one of the secondary registers and then the data recorded on side one. This will place a "Crđ" prompt command on the card and cause the display to show the same. However, following directions below, do not record the remaining data registers on side two. Just clear the display, having already recorded the program on the second side.

When loaded from a card, the display will show "Crđ" when side one is read, and clear when side two (the program side) is read.

INSTRUCTIONS:

- I. Load program into HP-67 in usual manner.
- II. Load in data and set flags and display mode.
- III. Switch to write program (W/PRGM) mode and feed in SIDE 2 of the card.
- IV. Switch back to run (RUN) mode and clear the stack: CLX, ENTER↑, ENTER↑, ENTER↑
- V. Press $\Sigma +$ key. (Causes a "1" to be stored in R₅₉).
- VI. Press the following keys: CLX, f, W/DATA.
- VII. Feed in SIDE 1 of the card.
- VIII. Ignore the "Crđ" display, which should be cleared by pressing CLX.

The card is now recorded correctly, and can be used in the standard manner, as described on the next page.

17

[illegible]

LABELS					FLAGS	SET STATUS		
A	B	C	D	E	0	FLAGS	TRIG	DISP
PLAY	RCL POT			(SEED)	3 way match	ON OFF		
a	b	c	d	e	1	0 ☐ ☒	DEG ☒	FIX ☒
				RND # sub.		1 ☐ ☒	GRAD ☐	SCI ☐
0	1	2	3	4	2	2 ☐ ☒	RAD ☐	ENG ☐
payoff sub	cherries	used	dsp loop	used		3 ☐ ☒		n <u>2</u>
5	6	7	8	9	3			
used				used				

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS		
001 *	f LBL A	31 25 11	Initialize loop	*	f LBL 4	31 25 04	Test FLG 0. If on, jackpot. Input 9. Pay dsp into pot		
	3	03			h F? 0	35 71 00			
	h ST I	35 33			9	09			
*	f LBL 9	31 25 09		060	f GSB 0	31 22 00			
	g GSBf e	32 22 15	Obtain register select number.	*	f LBL 3	31 25 03	Clr flg 0 and init. dsp loop.		
	2	02			h CF 0	35 61 00			
	x	71			3	03			
	h RC I	35 34			h ST I	35 33			
	2	02	Exchange X & I and recall indirectly, the correct reg. Restore original I.		0	00	Display digits one at a time.		
010	x	71		*	f LBL 5	31 25 05			
	2	02			RCL (i)	34 24			
	+	61			4	04			
	+	61	Obtain digit select number.		h RC I	35 34	Input -10¢		
	h X↔I	35 24		070	—	51			
	RCL (i)	34 24			h X↔I	35 24			
	h X↔Y	35 52			DSP (i)	23 24			
	h ST I	35 33	Obtain correct digit.		h X↔I	35 24	Pay subroutine. Adds display to pot.		
	h R↓	35 53			g 10 ^X	32 53			
	g GSBf e	32 22 15			÷	81			
020	RCL A	34 11			+	61			
	x	71	Store indirectly. Is loop done? No-go to LBL 9		h PAUSE	35 72	Routine used to test for cherries.		
	f INT	31 83			f DSZ	31 33			
	g 10 ^X	32 53			GTO 5	22 05			
	x	71		080	RCL B	34 12			
	g FRAC	32 83	Is first digit "1"	*	f LBL 0	31 25 00	LBL B-used to recall pot.		
	RCL A	34 11			STO + 0	33 61 00			
	x	71			h R↓	35 53			
	f INT	31 83			h RTN	35 22			
	STO (i)	33 24	Yes-go to LBL 1	*	f LBL 1	31 25 01	Subroutine "e"-used to generate random number.		
030	f DSZ	31 33			.	83			
	GTO 9	22 09			2	02			
	1	01			f GSB 0	31 22 00			
	RCL 3	34 03	Else test. Are 1st 2 digits different?		RCL 2	34 02	LBL E-used to store seed and clear pot register.		
	g X=Y	32 51		090	g X≠Y	32 61			
	GTO 1	22 01			GTO 3	22 03			
	RCL 2	34 02			RCL C	34 13			
	g X≠Y	32 61	Yes-go to LBL 3		f GSB 0	31 22 00	(LBL E halts with R/S in step 113)		
	GTO 3	22 03			GTO 3	22 03			
	RCL 1	34 01		*	f LBL B	31 25 12			
	g X≠Y	32 61			DSP 2	23 02			
040	GTO 2	22 02	Else test if 2nd & 3rd digits differ.		RCL 0	34 00	Subroutine "e"-used to generate random number.		
	1	01			h RTN	35 22			
	f GSB 0	31 22 00		*	g LBLf e	32 25 15			
	h SF 0	35 51 00		100	RCL E	34 15			
	6	06	Set FLG 0 for 3 way match.		RCL D	34 14	LBL E-used to store seed and clear pot register.		
	h X↔Y	35 52			x	71			
	g X=Y	32 51			g FRAC	32 83			
	GTO 4	22 04			STO E	33 15			
*	f LBL 2	31 25 02	If so, jackpot. Go to 4.		h RTN	35 22	LBL E-used to store seed and clear pot register.		
050	f X≠0	31 61		*	f LBL E	31 25 15			
	GTO 3	22 03			STO 0	33 00			
	6	06			STO - 0	33 51 00			
	RCL 3	34 03	last digit=0? No-go to 3. Else test if 1st digit=6.		g FRAC	32 83	(LBL E halts with R/S in step 113)		
	g X=Y	32 51		110	g X ²	32 54			
	GTO 3	22 03			STO E	33 15			
	1	01			CLX	44			
REGISTERS									
0 POT	1 DIGIT 3	2 DIGIT 2	3 DIGIT 1	4 .52354 25653	5 .25250 25252	6 .13141 53514	7 .16351 04154	8 .26313 42341	9 .03454 31343
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9 1 (see page 4)
A 10	B -.1	C .3	D 997	E .5284163 SEED	F	G	H	I USED	

Program Description I

Program Title

Turn the Die Game

Contributor's Name

Howard B. KUTNER, CPA

Address

370 Lexington Avenue - Rm 909

City

New York

State N.Y.

Zip Code

NY 10017

Program Description, Equations, Variables

In this game The user chooses a point Total between 10 and 99 and determines whether he or the computer shall move first. User and Computer then alternate in turning a single die $1/4$ Turn and the new top face number is added To an accumulating total. The player who makes the total equal the point, (or who forces his opponent To exceed it) Wins.

Since the user controls the choice of the point and the choice of first or second move he can obviously beat the computer. However, the computer plays flawlessly and does not Tolerate cheating.

STRATEGY

Try To make The digital root of The accumulating Total equal To the digital root of The point — or prevent the computer from doing so if you are unable To.

"Digital root" of a number is the sum of The digits in the number and if That sum has more Than one digit it is the sum of Those digits. It may be determined for any number by pressing Key "D"

Operating Limits and Warnings

Valid entries are integers between 1 and 6 but both previous Top face and previous bottom face are invalid. ie: Die must be given only $1/4$ Turn

Flashing Display (computer win indication) may be Terminated by depressing R/S Key (or any Key during cycling)

Error display may be cleared by depressing any Key without disturbing progress of The game

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 II

Sketch(es)

Note: When using Key B To allow Computer To make first move it must not be preceded by an entry from the Keyboard. If an entry is made simply press Key B Twice

Sample Problem(s)

(a)		
point	<u>18</u>	
HP97 (First) (Key B)	1	<u>TOTAL</u>
user (Key A)	4	5
HP97	1	6
user (Key A)	3	9
HP97	1	10
user (Key A)	4	14
HP97	1	15
user (Key A)	3	18
user	wins	

(b)		
point	<u>22</u>	
user (First) (Key A)	5	<u>TOTAL</u>
HP97	4	9
user (Key A)	2	11
HP97	1	12
user (Key A)	2	14
HP97	4	18
user (Key A)	2	20
HP97	1	21
user	must exceed point	
22. ***	HP97 wins	

Solution(s)

18. ***
 1. ***
 1. ***
 4. ***
 5. ***
 1. ***
 6. ***
 3. ***
 9. ***
 1. ***
 10. ***

5. ***
 5. ***
 4. ***
 5. ***
 2. ***
 11. ***
 1. ***
 12. ***
 2. ***
 14. ***
 4. ***
 18. ***

Reference(s)

4. ***
 14. ***
 1. ***
 15. ***
 3. ***
 18. ***
 9.99999999+95 ***

2. ***
 20. ***
 1. ***
 21. ***
 23. ***
 22. ***
 22.22222222 ***

97 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLA	21 15	INITIATE STORE CONSTANTS	057	SPC	16-11	User move Test Validity 0 entry forfeits user move Test entry for "hidden" faces
002	DSF0	-63 00		058	SPC	16-11	
003	CF3	16 22 03		059	RTN	24	
004	STOA	35 11		060	*LBLA	21 11	
005	.	-62		061	CF3	16 22 03	
006	1	01		062	STOE	35 15	
007	2	02		063	7	07	
008	STO0	35 00		064	X≤Y?	16-35	
009	STO9	35 09		065	SIN ⁻¹	16 41	
010	.	-62		066	R4	-31	
011	4	04		067	X<0?	16-45	
012	1	01		068	IX	54	
013	STO8	35 08		069	X=0?	16-43	
014	STO4	35 04		070	GTOB	22 12	
015	.	-62		071	RCLC	36 13	
016	4	04		072	X=Y?	16-33	
017	2	02		073	GTO2	22 02	
018	STO7	35 07		074	CLX	-51	
019	.	-62		075	RCLD	36 14	
020	6	06		076	X=Y?	16-33	
021	3	03		077	GTO2	22 02	
022	STO6	35 06		078	X≠Y	-41	
023	.	-62		079	RCLB	36 12	
024	5	05		080	+	-55	
025	1	01		081	RCLA	36 11	
026	STO5	35 05		082	X=Y?	16-33	
027	.	-62		083	GTO3	22 03	
028	6	06		084	X≤Y?	16-35	
029	3	03		085	GTO4	22 04	
030	1	01		086	GSB9	23 09	
031	STO3	35 03		087	*LBLB	21 12	
032	.	-62		088	F3?	16 23 03	
033	2	02		089	RTN	24	
034	1	01		090	RCLA	36 11	
035	STO2	35 02		091	RCLB	36 12	
036	.	-62	092	-	-45		
037	5	05	093	GSBD	23 14		
038	1	01	094	STOI	35 46		
039	2	02	095	RCLB	36 12		
040	STO1	35 01	096	+	-55		
041	P2S	16-51	097	RCLA	36 11		
042	RCLA	36 11	098	P2S	16-51		
043	CLRG	16-53	099	RCLi	36 45		
044	1	01	100	P2S	16-51		
045	0	00	101	STOi	35 45		
046	X>Y?	16-34	102	*LBL6	21 06		
047	SIN ⁻¹	16 41	103	RCLi	36 45		
048	CLX	-51	104	1	01		
049	EEX	-23	105	0	00		
050	2	02	106	x	-35		
051	X≤Y?	16-35	107	FRC	16 44		
052	SIN ⁻¹	16 41	108	STOi	35 45		
053	X≠Y	-41	109	LSTX	16-63		
054	INT	16 34	110	INT	16 34		
055	STOA	35 11	111	X=0?	16-43		
056	PRTX	-14	112	GTOo	22 16 13		

REGISTERS

0	1	2	3	4	5	6	7	8	9
S0 .12	S1 .512	S2 .21	S3 .631	S4 .41	S5 .51	S6 .63	S7 .42	S8 .41	S9 .12
A Point		B Accumulating Total		C Last Face		D Last Bottom		E Last Try	
F difference in digital roots									

INITIATE

STORE

CONSTANTS

Test Point for
Validity
Store and
Print it

User move

Test Validity

0 entry forfeits user move

Test entry for
"hidden" faces

User WIN

HP-97 WIN
Print Routine

HP97 move

obtain digital root

Recall appropriate constant

Store in primary register

Store remainder

Try
No useable constant
display error

97 Program Listing II

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS	
113	RCLC	36 13	if Try is not useable return for another Try	169	PRTX	-14	generate user win DISPLAY	
114	X=Y?	16-33		170	7	07		
115	GT06	22 06		171	5	05		
116	CLX	-51		172	N!	16 52		
117	RCLD	36 14		173	PRTX	-14		
118	X=Y?	16-33		174	*LBLD	21 14		
119	GT06	22 06		175	9	09		
120	R↓	-31		176	÷	-24		
121	STOE	35 15		177	FRC	16 44		
122	RCLB	36 12		178	9	09		
123	+	-55	recover Try and store new Total point	179	x	-35	Digital Root Generator	
124	RCLA	36 11		180	.	-62		
125	XZY	-41		181	1	01		
126	X>Y?	16-34		182	+	-55		
127	GT06	22 06		183	INT	16 34		
128	GSB9	23 09		184	RTN	24		
129	SPC	16-11						
130	RCLA	36 11						
131	XZY?	16-32						
132	RTN	24						
133	*LBL4	21 04	HP-97 WIN Print Generate HP-97 WIN DISPLAY	190				
134	XZY	-41						
135	PRTX	-14						
136	XZY	-41						
137	PRTX	-14						
138	SPC	16-11						
139	RCLA	36 11						
140	EEX	-23						
141	2	02						
142	x	-35						
143	9	09	Flash WIN DISPLAY	200				
144	9	09						
145	÷	-24						
146	DSP9	-63 09						
147	PRTX	-14						
148	*LBL8	21 08						
149	DSP9	-63 09						
150	PSE	16 51						
151	GT08	22 08						
152	*LBL9	21 09						
153	7	07	recall Try store new face store new bottom	210				
154	RCLC	36 15						
155	PRTX	-14						
156	STOC	35 13						
157	-	-45						
158	STOD	35 14						
159	LSTX	16-63						
160	RCLB	36 12						
161	+	-55						
162	STOB	35 12						
163	PRTX	-14	accum Total User WIN	220				
164	RTN	24						
165	*LBL3	21 03						
166	RCLC	36 15						
167	PRTX	-14						
168	XZY	-41						
LABELS				FLAGS		SET STATUS		
A User move	B HP-97 move first	C	D Digital Root	E Reset Point	0	FLAGS	TRIG	DISP
a	b	c ERROR	d	e	1	ON OFF		
0	1	2 ERROR	3 User WIN	4 HP97 WIN	2	0 ☐ ☒	DEG ☒	FIX ☒
5	6 LOOP	7	8 LOOP	9 PRINT	3 Data ENTRY	1 ☐ ☒	GRAD ☐	SCI ☐
						2 ☐ ☒	RAD ☐	ENG ☐
						3 ☐ ☒		n 0

Program Description I

Program Title WORD ENCODER

Contributor's Name JOHN R RAUSCH

Address 402 VIRGINIA AVE

City FRANKLIN

State OHIO

Zip Code 45005

Program Description, Equations, Variables THIS PROGRAM IS USED TO ENCODE WORDS INTO A STRING OF UP TO 50 POSITIONS AND WRITE THIS STRING ONTO A DATA CARD TO BE USED BY WORD GAMES LIKE HANG-MAN, WORD BAGLES, AND PROBE. THE WORD GAME SUBROUTINE (ALSO IN THE LIBRARY) SHOULD BE USED IF YOU INTEND TO WRITE YOUR OWN WORD GAMES USING THIS PROGRAM TO ENCODE THE WORDS. ANY WORD FROM ONE TO TEN LETTERS CAN BE ENCODED. THE STRING IS CONSTRUCTED INTO REGISTERS 50 THRU S9. EACH POSITION IN THE STRING USES TWO DIGITS. THE FIRST POSITION IN THE STRING CONTAINS THE WORD COUNT. ALL WORDS ARE STORED VARIABLE LENGTH WITH A LETTER COUNT IN THE POSITION PRECEEDING THEM. AN ALPHA OVERLAY IS USED TO ENTER LETTERS. THIS METHOD RESULTS IN THE FOLLOWING TWO-DIGIT CODE FOR THE ALPHABET:

A=07	E=17	I=27	M=05	Q=15	U=19	Y=03
B=16	F=26	J=04	N=14	R=24	V=02	Z=12
C=25	G=09	K=13	O=23	S=01	W=11	BLANK=21
D=08	H=18	L=22	P=06	T=10	X=20	

Operating Limits and Warnings WORD GAME ARE CONTAGIOUS!

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 II

Sketch(es)

ABC ☐	DEF ☐	GHI ☐
JKL ☐	MNO ☐	PQR ☐
STU ☐	VWX ☐	YZCLK ☐

TO MAKE OVERLAY, COPY THIS PAGE, THEN COVER OVERLAY WITH CLEAR TAPE OR BETTER - COVER FRONT AND BACK WITH CLEAR PLASTIC SHEET AVAILABLE AT OFFICE SUPPLY STORES. CUT OUT ON LINES.

Sample Problem(s) ENCODE THE WORDS "CREATIVE" AND "MINDS" AND WRITE THEM ONTO A DATA CARD. THE DATA CARD IS USED IN ALL OTHER WORD GAMES BY THIS AUTHOR AS OF 9-1-76 THAT ARE IN THE USERS' LIBRARY FOR SAMPLE ILLUSTRATION - SAVE IT IF YOU ARE GOING TO TEST ANY OF THEM.

Solution(s) 1) LOAD SIDE 1 AND SIDE 2, THEN INITIALIZE BY PRESSING ☐ ☐ .
 DISPLAY FLASHES 49 (THE POSITIONS REMAINING)
 2) ENTER NUMBER OF LETTERS IN "CREATIVE" - 8 ☐ ☐ → 1 (FIRST LETTER)
 3) ENTER LETTERS - 7 ☐ , 6 ☐ , 8 ☐ , 7 ☐ , 1 ☐ , 9 ☐ , 2 ☐ , 8 ☐ →
 DISPLAY FLASHES 40 (THE POSITIONS REMAINING)
 4) ENTER NUMBER OF LETTERS IN "MINDS" - 5 ☐ ☐ → 1 (FIRST LETTER)
 5) ENTER LETTERS - 5 ☐ , 9 ☐ , 5 ☐ , 8 ☐ , 1 ☐ → DISPLAY
 FLASHES 34 (THE POSITIONS REMAINING)
 6) WRITE DATA CARD (EVEN THOUGH IT WILL HOLD MORE) ☐ ☐ - 49 (AUTO-INIT)

Reference(s) 65 NOTES, VOL. 2 NO. 3 PUBLISHED BY HP-65 USERS CLUB, 2541 W. CAMDEN PLACE, SANTA ANA, CALIFORNIA 92704.

User Instructions

WORD ENCODER

Write #LETTERS LEFT CENTER RIGHT Initialize Reset

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	LOAD SIDE 1 AND SIDE 2		☐ ☐	
2	PLACE ALPHA OVERLAY OVER KEYS 1-9		☐ ☐	
3	INITIALIZE PROGRAM - DISPLAY FLASHES STRING POSITIONS AVAILABLE		☐ f ☐ E	-49-
4	ENTER NUMBER OF LETTERS IN WORD. A WORD REQUIRES 1 POSITION FOR EACH LETTER PLUS 1 FOR A LETTER COUNT. IF THE NUMBER OF LETTERS YOU ENTER WILL NOT FIT, THE DISPLAY WILL AGAIN FLASH THE POSITIONS AVAILABLE, IF THE DISPLAY SHOWS 1 YOU CAN GO TO STEP 5 AND ENTER THE LETTERS. IF THE DISPLAY SHOWS "error" SWITCH TO W/PRGM AND NOTE THE STEP NUMBER TO DETERMINE THE CAUSE. STEP 004 - NOT INITIALIZED STEP 006 - PREVIOUS WORD INCOMPLETE STEP 020 - LETTERS < 1 STEP 025 - LETTERS > 10	1 to 10	☐ A ☐	1 or Positions
5	ENTER LETTERS AND/OR BLANKS. A LETTER IS ENTERED BY PRESSING THE DIGIT KEY THAT HAS THE REQUIRED LETTER ABOVE IT, FOLLOWED BY [B] IF IT IS THE LEFT OF THE THREE LETTERS, [C] IF IT IS THE CENTER, OR [D] IF IT IS THE RIGHT. IF THE WORD HAS BEEN COMPLETED, THE DISPLAY WILL FLASH THE POSITIONS THAT ARE AVAILABLE OR "crd" IS 1 OR LESS POSITIONS REMAIN. IN THIS CASE EITHER GO TO STEP 4 FOR ANOTHER WORD OR WRITE THE DATA CARD (IN WHICH CASE AN AUTOMATIC INITIALIZATION WILL OCCUR). IF THE WORD HAS NOT BEEN COMPLETED, THE DISPLAY WILL SHOW THE NUMBER OF THE NEXT LETTER TO BE ENTERED. IF THE DISPLAY SHOWS "error" SWITCH TO W/PRGM AND NOTE THE STEP NUMBER TO DETERMINE THE CAUSE. STEP 043 - PROGRAM IS EXPECTING THE NUMBER	1-9	☐ B ☐ -OR- ☐ ☐ C ☐ -OR- ☐ ☐ D ☐	see text

- CONTINUED -

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[illegible]

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS		
001	* F L B L A	312511	NUMBER OF LETTERS. SAVES CURRENT REG CONTENT FOR RESET. CHECKS FOR CORRECT NUMBER, THEN INSERTS IT INTO STRING.		EEX	43			
	h F?0	357100			1	01			
	h F?2	357102			0	00			
	GTO fd	223114		060	÷	81			
	h F?1	357101			STO (.)	3324			
	GTO fd	223114			CLX	44			
	STO 8	3308			STO 5	3305			
	h RCT	3534			STO 6	3306			
	STO 2	3302			f ISZ	3134			
010	RCL 5	3405			* F L B L O	312500		CHECK FOR WORD COMPLETE. IF COMPLETE, DIS- PLAY POSITIONS OR WRITE DATA CARD	
	STO 3	3303			RCL 8	3408			
	RCL 6	3406			RCL 7	3407			
	STO 4	3304			9X≠Y	3261			
	CLX	44		070	GTO 1	2201			
	STO 7	3307			h CFI	356101			
	RCL 0	3400		1	01				
	RCL 8	3408		STO+1	336101				
	1	01		RCL 0	3400				
	9X>Y	3281		9X≤Y	3271				
020	GTO fd	223114		GTO f2	223111				
	+	61		f -x-	3184				
	1	01		h RTN	3522				
	2	02		* F L B L 1	312501	DISPLAYS NEXT LETTER NUMBER.			
	9X≤Y	3271		080	1		01		
	GTO fd	223114		STO+7	336107				
	h R↓	3553		RCL 7	3407				
	-	51		h RTN	3522				
	f X<0	3171		* F L B L E	312515	RESET. RESTORE REGISTERS.			
	GTO 2	2202		h F?1	357101				
030	STO 0	3300		h F?2	357102				
	RCL 8	3408		GTO fd	223114				
	h SFI	355101		CFI	356101				
	GTO B	2212		RCL 2	3402				
	* F L B L D	312514	RIGHT	090	h STI		3533		
	9	09		RCL 3	3403				
	+	61		STO 5	3305				
	* F L B L C	312513	CENTER	RCL 4	3404				
	9	09		STO 6	3306				
	+	61		RCL 8	3408				
040	* F L B L B	312512	LEFT. INSERTS LETTER INTO STRING IF CURRENT WORK AREA IS FULL IT IS ADJUSTED TO FRACTION AND NEXT REGISTER IS MADE AVAILABLE		1	01	WRITE DATA CARD. ADJUSTS LAST REG- ISTER AND WRITES DATA AFTER INSERT- ING WORD COUNT.		
	h F?1	357101			+	61			
	h F?2	357102			STO+0	336100			
	GTO fd	223114			* F L B L 2	312502			
	RCL 5	3405		100	RCL 0	3400			
	EEX	43			f -x-	3184			
	2	02			h RTN	3522			
	X	71			* 9 L B L a	322511			
	+	61			h F?1	357101			
	STO 5	3305			GTO fd	223114			
050	1	01			RCL 5	3405			
	STO+6	336106			RCL 6	3406			
	RCL 6	3406			2	02			
	5	05			X	71			
	9X≠Y	3261			110	9 10*		3253	
	GTO 0	2200		÷	81				
	RCL 5	3405		STO (.)	3324				
REGISTERS									
0 POSITIONS REMAINING	1 WORD COUNT	2 SAVE INDEX	3 SAVE WORK AREA	4 SAVE POSITION	5 WORK AREA	6 REGISTER POSITION	7 LETTER COUNTER	8 LETTERS IN WORD	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
WORD				STRING					
A		B		C		D		E	
								INDEX TO WORD STRING REG.	

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[illegible]

Program Description I

Program Title WORD GAME SUBROUTINE

Contributor's Name JOHN R. RAUSCH

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City FRANKLIN

State OHIO

Zip Code 45005

Program Description, Equations, Variables THE PURPOSE OF THIS SUBROUTINE IS TO INTERFACE WORD GAME PROGRAMS WITH DATA-CARD WORDS CREATED BY THE WORD ENCODER PROGRAM. WHEN CALLED, THE NEXT WORD IN THE STRING WILL BE CONSTRUCTED IN A PAIR OF REGISTERS (BEGINNING WITH THE REGISTER NUMBER STORED IN REGISTER 8 WHEN CALLED) AND THE NUMBER OF LETTERS IN THE WORD WILL BE PLACED IN REGISTER B. IF NO WORDS REMAIN, A PAUSE LOOP WITH A ZERO DISPLAY WILL BE EXECUTED UNTIL A WORD CARD IS READ. UPON RETURN, THE FIRST FIVE OR LESS LETTERS OF THE WORD WILL BE IN THE FIRST REGISTER OF THE PAIR AND THE SIXTH THRU TENTH LETTERS (IF PRESENT) WILL BE IN THE SECOND REGISTER. THE LETTERS ARE STORED AS A FRACTION FOR SIMPLE EXTRACTION. FOR EXAMPLE, THE WORD "CREATIVE" WOULD APPEAR AS THE NUMBER .2524170710 IN THE FIRST REGISTER AND .270217 IN THE SECOND. EACH LETTER OCCUPIES TWO DIGITS. THE NUMBER STORED IN REGISTER 8 PRIOR TO CALLING THE SUBROUTINE MUST BE SIX OR LESS, OR EQUAL TO TWENTY-FOUR. THE ENTRY POINT TO THE SUBROUTINE IS LABEL 3. TO CALL THE SUBROUTINE, YOUR PROGRAM MUST DO THE FOLLOWING INSTRUCTIONS: n(REGISTER), STO B, fGSB 3. YOUR PROGRAM SHOULD USE THE ALPHA OVERLAY SHOWN IN FIGURE #1 OF THE SKETCHES COMBINED WITH THE CODE SHOWN IN FIGURE #2 FOR LETTER ENTRY. THIS WILL MAKE YOUR PROGRAM CONFORM TO METHOD USED BY THE WORD ENCODER PROGRAM

(CONTINUED)

Operating Limits and Warnings THIS SUBROUTINE USES REGISTERS 8, 9, A, B, C, AND I, AS WELL AS ALL TEN SECONDARY REGISTERS TO STORE THE WORD STRING. HOWEVER, REGISTERS 8 AND I CAN BE USED BY YOUR PROGRAM BETWEEN CALLS. LABELS 3 THRU 9 ARE USED. HOWEVER, LABELS 4 AND 6 ARE THE ONLY LABELS BRANCHED TO, THAT WILL CAUSE A SEARCH THAT WOULD LOOP THRU MEMORY. THEREFORE, THEY SHOULD NOT BE USED. YOU CAN USE ANY OTHER LABEL THAT CAN BE LOCATED BY A DOWNWARD SEARCH PRIOR TO ENCOUNTERING THIS SUBROUTINE. KEEP IN MIND (CONTINUED)

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 I

Program Title _____

Contributor's Name _____

Address _____

City _____

State _____

Zip Code _____

Program Description, Equations, Variables AS WELL AS ALL OF THE WORD GAME PROGRAMS THAT HAVE BEEN WRITTEN AS OF 9-1-76. USING THIS METHOD, LETTER ENTRY IS ACCOMPLISHED BY PRESSING THE DIGIT KEY THAT HAS THE DESIRED LETTER ABOVE IT FOLLOWED BY B IF IT IS THE LEFT LETTER OF THE THREE, C IF IT IS THE CENTER, OR D IF IT IS THE RIGHT. FOLLOWING LABEL B YOUR PROGRAM CAN PROCESS THE SINGLE LETTER THAT HAS BEEN ENTERED. SUPPOSE YOU WANTED TO ENTER AN "R". YOU WOULD PRESS 6 FOLLOWED BY D. AT LABEL B THE NUMBER IN X WOULD BE 24 WHICH CORRESPONDS WITH THE SECOND LETTER IN "CREATIVE" THE EXAMPLE SHOWN ON PAGE 1. $(6 + 9 + 9 = 24)$.

USING THIS SUBROUTINE IN CONJUNCTION WITH THE WORD ENCODER PROGRAM ALLOWS YOU TO CONCENTRATE ON THE PROGRAMMING OF THE GAME YOU ARE CREATING WITHOUT HAVING TO PROGRAM THE WORD ENCODING AND THE SUBSEQUENT ENTRY OF WORDS INTO YOUR PROGRAM. AT THE SAME TIME THIS SHOULD ILLUSTRATE TO THOSE OF YOU WHO ARE NEW TO PROGRAMMING THE ADVANTAGES OF GENERALIZED SUBROUTINES -- EVEN THOUGH A SUBROUTINE OF THIS TYPE OFTEN USES MORE STEPS AND/OR TAKES MORE TIME TO EXECUTE THAN A DEDICATED ROUTINE WRITTEN INTO YOUR PROGRAM. PROGRAMMING THE HP-67 WITH ITS INCREASED STORAGE OVER THE HP-65 BRINGS US CLOSER TO THE TECHNIQUES USED ON LARGER COMPUTERS.

Operating Limits and Warnings THAT YOU WILL BE USING LABEL 3 TO CALL THIS SUBROUTINE. THIS SUBROUTINE MAKES CALLS TO SUBROUTINES ONE LEVEL DEEP. ANYTIME A WORD HAS FIVE OR LESS LETTERS, THE SECOND REGISTER WILL BE ZERO. REGISTER A MUST BE ZERO THE FIRST TIME THIS SUBROUTINE IS CALLED.

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 II

Sketch(es)		
	TO MAKE OVERLAY, COPY	f LBL D
	THIS PAGE THEN COVER	9
	OVERLAY WITH CLEAR TAPE OR	+
	BETTER - COVER FRONT AND	f LBL C
	BACK WITH CLEAR PLASTIC	9
	SHEET AVAILABLE AT OFFICE	+
	SUPPLY STORES. CUT ON LINES.	f LBL B
	- FIGURE #1 -	- FIGURE #2 -

Sample Problem(s) THE SAMPLE SERVES ONLY TO INDICATE THAT THE SUBROUTINE IS FUNCTIONING PROPERLY. YOU MUST FIRST RUN THE SAMPLE OF THE WORD ENCODER PROGRAM TO CREATE A WORD CARD.

WRITE THE FOLLOWING PROGRAM INTO MEMORY BEGINNING AT STEP 001:

f LBL A, 3, STO 8, f GSB 3, h RTN.

NOW FOLLOW THE USER INSTRUCTIONS ON PAGE 4 FOR LINKING THE SUBROUTINE TO THE ABOVE PROGRAM.

YOU ARE NOW READY TO TEST THE SOLUTION BELOW.

- Solution(s)**
1. [A] ----- SEE PAUSE LOOP WITH ZERO DISPLAY
 2. READ IN WORD CARD - PROGRAM WILL RUN A FEW SECONDS - IGNORE DISPLAY
 3. [RCL] [8] ----- SEE 8, THE NUMBER OF LETTERS IN THE WORD
 4. [RCL] [3] ----- SEE .2524170710, THE FIRST FIVE LETTERS OF "CREATIVE"
 5. [RCL] [4] ----- SEE .270217, THE LAST THREE LETTERS OF "CREATIVE"
 6. [A] ----- PROGRAM WILL RUN A FEW SECONDS - IGNORE DISPLAY
 7. [RCL] [8] ----- SEE 8, THE NUMBER OF LETTER IN THE WORD
 8. [RCL] [3] ----- SEE .0527140801, THE WORD "MINDS"
 9. [RCL] [4] ----- SEE 0, ONLY FIVE LETTERS

Reference(s) 65 NOTES, Vol. 2 No. 3 Published by HP-65 Users Club, 2541 W. Camden Place, Santa Ana, California 92704. Other word game programs that use this subroutine in the Users Library are: 1) HANGMAN WORD GAME, 2) WORD BAGLES, AND 3) PROBE WORD GAME.

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[illegible]

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS		
001	* f LBL 3	312503	ENTRY POINT		f X<0	3171			
	RCLA	3411	IF REGISTER A IS NOT		RCLB	3408			
	f X#0	3161	ZERO, THIS ROUTINE		f X>0	3181			
	GTO 5	2205	IS BYPASSED.	060	f GSB 9	312209			
	9	09	INITIALIZE INDEX IN 9.		h RTN	3522			
	h STI	3533	SWAP REGISTERS.		* f LBL 7	312507	EXTRACT NEXT		
	STO 9	3309	MERGE REGISTERS 0		RCLC	3413	LETTER FROM WORD		
	f PZS	3142	TO 9 FROM WORD CARD.		f X#0	3161	STRING. ALSO		
	h CE3	356103	WHEN DATA RECEIVED,		GTO 8	2208	CALLED TO EXTRACT		
010	DSP 0	2300	SWAP BACK REGISTERS,		RCL 9	3409	WORD COUNT AND		
	CLX	44	EXTRACT NUMBER OF		h XZT	3524	LETTER COUNT. IF		
	STO C	3313	WORDS AND STORE IN		f ISZ	3134	WORK AREA IS ZERO		
	* f LBL 4	312504	REGISTER A.		RCL (i)	3424	NEXT REGISTER IN		
	9MERGE	3241		070	STO C	3313	STRING IS PUT IN		
	h PAUSE	3572			h XZY	3552	WORK AREA.		
	h F?3	357103			h XZT	3524			
	h F?3	357103			STO 9	3309			
	GTO 4	2204			RCLC	3413			
	f PZS	3142			* f LBL 8	312508			
020	f GSB 7	312207			EEX	43			
	STO A	3311			2	02			
	* f LBL 5	312505	START NEXT WORD.		X	71			
	1	01	DECREMENT WORD		9 FRAC	3283			
	-	51	COUNT, EXTRACT THE	080	STO C	3313			
	STO A	3311	LETTER COUNT FROM		h LSTX	3582			
	f GSB 7	312207	STRING AND STORE IN		f INT	3183			
	STO B	3312	REGISTER B, CLEAR		h RTN	3522			
	RCL 8	3408	REGISTER 8 FOR USE		* f LBL 9	312509	ADJUST X TO A FRAC-		
	h STI	3533	AS LETTER COUNTER.		2	02	TION		
030	CLX	44			X	71			
	STO (i)	3324			9 10*	3253			
	f ISZ	3134			STO÷(i)	338124			
	STO (i)	3324			f ISZ	3134			
	f DSZ	3133		090	h RTN	3522			
	CLX	44							
	STO 8	3308							
	* f LBL 6	312506	BUILD WORD LOOP.						
	f GSB 7	312207	EXECUTED ONCE FOR						
040	RCL (i)	3424	EACH LETTER IN WORD.						
	EEX	43	WORD IS BUILT AS AN						
	2	02	INTEGER IN REGISTER						
	X	71	SPECIFIED IN 8, AND						
	+	61	IN REGISTER FOLLOWING						
	STO (i)	3324	WHEN FIRST REGISTER	100					
	1	01	IS FULL (FIVE LETTERS).						
	STO+8	336108	LABEL 9 IS CALLED TO						
	5	05	ADJUST FULL REGISTER						
	RCL 8	3408	TO A FRACTION. WHEN						
	9 X=Y	3251	WORD IS COMPLETED,						
050	f GSB 9	312209	LABEL 9 IS CALLED						
	RCL B	3412	AGAIN IF WORD HAS						
	RCL 8	3408	MORE THAN FIVE						
	9 X#Y	3261	LETTERS.	110					
	GTO 6	2206							
	5	05							
	-	51							
REGISTERS									
0	1	2	3	4	5	6	7	8 #CF FIRST	9 INDEX TO
S0	S1	S2	S3	S4	S5	S6	S7	WORD REG	WORD STRING
				WORD	STRING				
A WORDS REMAINING		B LETTERS IN		C WORK AREA		D		E	
IN STRING		CURRENT WORD						I USED	

Program Description I

Program Title HANGMAN WORD GAME

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State OHIO

Zip Code 45005

Program Description, Equations, Variables THIS PROGRAM USES WORDS ON A DATA CARD CREATED BY THE WORD ENCODER PROGRAM TO PLAY HANGMAN WITH YOU. AFTER THE PROGRAM SELECTS A WORD, YOU ARE TOLD THE NUMBER OF LETTERS IN IT. YOU THEN TRY TO GUESS THE WORD BY GUESSING ONE LETTER AT A TIME. AFTER EACH GUESS YOU ARE TOLD THE POSITIONS THAT THE LETTER APPEARS IN THE WORD ALONG WITH THE NUMBER OF WRONG GUESSES MADE SO FAR. THE ORIGINAL GAME OF HANGMAN DIDN'T COUNT WRONG GUESSES BUT ADDED ONE FEATURE TO A HANGED STICK FIGURE UNTIL IT WAS COMPLETED -- AT WHICH POINT THE GUESSER LOST. LESS PROFICIENT PLAYERS OFTEN ADDED TOES, FINGERS, HAIR, AND OTHER BODY PARTS TO KEEP FROM LOSING. THIS PROGRAM MAKES NO ATTEMPT TO HANG YOU, BUT IF YOU KEEP TRACK OF YOUR WRONG GUESSES, YOU WILL FIND THAT EVEN "EDUCATED" ADULTS CAN IMPROVE THEIR RECOGNITION OF A WORD WHEN ONLY A FEW LETTERS ARE EXPOSED AFTER SEVERAL SESSIONS OF HANGMAN. HANGMAN IS AN EXCELLENT GAME FOR SCHOOL CHILDREN, BUT --- YOU MAY NEVER SEE YOUR CALCULATOR AGAIN. USE ALPHA OVERLAY FOR ENTRY.

Operating Limits and Warnings WORD CAN HAVE FROM 1 TO 10 LETTERS. THIS PROGRAM WILL NOT FUNCTION WITHOUT THE WORD GAME SUBROUTINE (IN USER'S LIBRARY)

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 II

Sketch(es)

ABC	DEF	GHI
JKL	MNO	PQR
STU	VWX	YZ _{OLK}

TO MAKE OVERLAY, COPY THIS PAGE, THEN COVER OVERLAY WITH CLEAR TAPE OR BETTER - COVER FRONT AND BACK WITH CLEAR PLASTIC SHEET AVAILABLE AT OFFICE SUPPLY STORES. CUT OUT ON LINES.

Sample Problem(s) USE THE SAMPLE CARD CREATED BY THE WORD ENCODER PROGRAM TO PLAY A GAME OF HANGMAN.

NOTE: IN STEP 2 BELOW, THE DISPLAY WILL ENTER A PAUSE LOOP WITH A ZERO DISPLAY UNTIL YOU READ IN THE DATA CARD.

Solution(s) 1) LOAD SIDE 1 AND SIDE 2, THEN INITIALIZE BY PRESSING
 2) SELECT NEXT WORD → DISPLAY FLASHES 8 (NUMBER OF LETTERS IN WORD)
 3) GUESS "R" - 6 → 2.00 ("R" IS IN SECOND POSITION)
 4) GUESS "B" - 7 → 0.01 (NO "B", 1 WRONG GUESS)
 5) GUESS "E" - 8 → 38.01 ("E" IS IN THIRD & EIGHTH POSITIONS)
 6) GUESS "O" - 5 → 0.02 (NO "O", 2 WRONG GUESSES)
 7) GUESS "A" - 7 → 4.02 ("A" IS IN FORTH POSITION)
 THE WORD IS "CREATIVE". YOU CAN CONTINUE IF YOU WANT.

Reference(s) 65 NOTES, VOL. 2 NO. 3 PUBLISHED BY HP-65 USERS CLUB, 2541 W. CAMDEN PLACE, SANTA ANA, CALIFORNIA 92704.

SEE WORD GAME SUBROUTINE FOR DOCUMENTATION ON HOW IT FUNCTIONS

77 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	* f LBLA	312511	SELECT NEXT WORD.		RCL 4	3404	
	h F? 0	357100	CALLS WORD GAME		RCL 5	3405	
	GTO fd	223114	SUBROUTINE FOR		f X=0	3151	
	CLX	44	WORD. CLEARS	060	h R↓	3553	
	STO 4	3304	WRONG GUESS COUNT.		+	61	
	STO 8	3308			9 FRAC	3283	
	f GSB3	312203			STO 4	3304	
	h SFO	355100			DSP 2	2302	
	DSP 0	2300			h LSTX	3582	
010	RCL B	3412			h RTN	3522	
	f X-	3184		*	f LBL0	312500	UPDATES POSITION
	h RTN	3522			1	01	CLUE. POSITION
*	f LBLD	312514	RIGHT		0	00	10 REQUIRES
	9	09		070	9 X²	3254	SPECIAL ATTENTION
	+	61			h LSTX	3582	
*	f LBLC	312513	CENTER		RCL 6	3406	
	9	09			9 X=Y	3251	
	+	61			h R↓	3553	
*	f LBLB	312512	LEFT. STORES		CLX	44	
020	STO 3	3303	GUESS LETTER IN		RCL 5	3405	
	CLX	44	REGISTER 3 THEN		X	71	
	STO 5	3305	LOOPS THRU WORD		RCL 6	3406	
	STO 6	3306	LOOKING FOR A		+	61	
	2	02	MATCH. CALLS LBL	080	STO 5	3305	
	3	03	0 WHEN A MATCH		h RTN	3522	
	CHS	42	OCCURS TO UPDATE	*	9 LBL e	322515	INITIALIZE
	h STI	3533	THE POSITION CLUE.		f CL REG	3143	
	RCL 0	3400	IF CLUE IS ZERO	*	f LBL E	312515	RESET.
	STO 2	3302	WHEN FINISHED,		h CEO	356100	
030	1	01	ADDS TO WRONG		CLX	44	
	STO+6	336106	GUESS COUNTER.		h RTN	3522	
	RCL 6	3406					WORD GAME SUB-
	6	06					ROUTINE MUST BE
	9 X=Y	3251		090			LINKED INTO
	h SF2	355102					STEP 88.
	RCL 1	3401					
	h F? 2	357102					
	STO 2	3302					
	RCL 2	3402					
040	EEX	43					
	2	02					
	X	71					
	9 FRAC	3283					
	STO 2	3302		100			
	h LSTX	3582					
	f INT	3183					
	RCL 3	3403					
	9 X=Y	3251					
	f GSB 0	312200					
050	RCL 6	3406					
	RCL B	3412					
	9 X≠Y	3261					
	GTO (1)	2224					
	.	83		110			
	0	00					
	1	01					

REGISTERS

0 WORD 1-5	1 WORD 6-10	2 WORK AREA	3 GUESS LETTER	4 WRNG GUESSES	5 CLUE	6 LOOP CONTROL	7	8	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	INDIRECT GTO				

Program Description I

Program Title	<i>Pro Football Simulation</i>		
Contributor's Name	<i>James S. Hayden</i>		
Address	<i>P.O. Box 345</i>		
City	<i>Edwards</i>	State	<i>CA</i>
		Zip Code	<i>93523</i>

Program Description, Equations, Variables 1. Description: Program is an expanded HP-67 adaption of HP-65 program 01313A "Pro Football Simulation. The program simulates the play of a football game using 13 (expandable to 17) offensive and 4 defensive plays. Outcomes are formulated to be consistent with professional statistics but may be modified by user. 2. Plays: Each play is defined by a set of three groups of numbers (G1, G2, G3) called from storage by a play number (1 to 13; 17 max). Four defenses (pressure & containment against both passes and runs) are provided. The value of G3 determines the spread of a pseudo random number generator (LBL d) adapted from HP-67 standard pac program 13. The number generated, R, is between 0 and (G3-1). G2=0 denotes a running play and G2>0 a passing play. The value of G2 is also used to bias yardage spreads when the two pass defenses (LBLC & LBLD) are used. Values of G1>5 are treated as negative in the program. G1 biases the yardage spread against run defenses (LBL A & LBL B) and determines the incomplete pass and missed kick probabilities. 3. Algorithms: The yardage outcome from each offense/defense combination is determined as follows: a. LBLA: $R - 3G1$; b. LBLB: $R - G1$; c. LBLC: $R - 3G2$; d. LBL D: $R - G2$; e. Prob. of incompletion or missed field goal = $1/G1$; f. Prob. of interception or blocked field goal = $1/9$; g. Prob. of fumble, blocked punt or penalty on kick-off = $1/40$. NOTE: Outcomes simulate pro statistics but user may alter by changing the algorithms and/or play codes.

Operating Limits and Warnings

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Program Description II

Sketch(es) 1. Rules of Play: Basic rules of pro football apply. Suggested duration is 25 plays per quarter. (Total playcount is in S8.) 2. Field Layout: Field position is denoted in yards measured from offensive teams goal line. i.e., 0= offensive goal, 50 = 50 yd line, 100 = defenders goal line, etc. 3. Score Requirements: a. Runs, position ≥ 100 ; b. Passes, position $\geq 100 \leq 110$ (> 110 is incomplete); c. Kicks, position ≥ 110 (zero gain is missed kick.).

Sample Problem(s) Arbitrary starter No selected by looser of coin toss: Key Sample 9, fB. No. 1 team to kick off, No. 2 team to receive. Key status Position 35: Down 0 Team 1, and Reset fa. (Reset should be performed after each first down, turnover, or score.)

Play	Defense	Outcome	Status	Situation	Reset
		-Gain-			
10	*	59	94.11	Ball on No. 2 6 yd line	6.02
13	*	30	36.12	Runback to 36. 1st and 10	
3	B	4	40.22	2nd and 6 on 40	
6	B	-1	39.32	3rd and 7 on 39	
9	D	25	64.42	1st and 10 on No 1's 36 yd line	64.12
5	C	28	92.22	1st and 10 on No 1's 8 yd line	92.12
7	B	14	106.22	Touchdown for No. 2	97.12

* Stunt defense is automatically used against kicks & runbacks(i.e., Play No. >9).

** Punts out of play may be put in play at the receivers 20 or runback from status position

Solution(s) 1. Interpretation of "error" display: Recall -Gain- and status by Keying fC. a. Run, fumble lost at status position. No runback; b. Pass, interception if gain >0 ; Ball to be runback. Fumble if gain ≤ 0 ; treat as a. above; c. Kick, blocked; ball lost at line of scrimmage; d. Kick-off, illegal procedure, repeat kick-off with 5 yd penalty. 2. Bookkeeping: It is recommended that each player keep a record of play, status, first downs and score.

Reference(s) 1. HP-65 Program 01313A "Pro Football Simulation" by Leonard Kings.
2. HP-67 Standard Pac Program 13.

User Instructions

PRO FOOTBALL SIMULATION

1 Reset Start Status 2

STUNT PRO BLITZ NICKEL PLAY

[illegible]

97 Program Listing I

43

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLB	21 15	Play	057	GT00	22 00	Go to Run
002	ST01	35 46		058	*LBLD	21 14	Nickel
003	5	09	Set Flag	059	RCLB	36 12	
004	X=1	-41	for	060	ST0D	35 14	
005	X>Y?	16-34	auto	061	GT0B	22 13	Go to Pro
006	SF2	16 21 02	Stunt	062	*LBLC	21 13	Blitz
007	RCL1	36 45	Set up Play	063	RCLB	36 12	
008	INT	16 34	Codes in	064	ST0D	35 14	
009	LSTX	16-63	Stack	065	GT0A	22 11	Go to stunt
010	FRC	16 44		066	*LBLd	21 16 14	Pseudo Random
011	1	01		067	RCL0	36 00	Number
012	0	00		068	9	09	Generator
013	X=1	-41		069	9	09	
014	X	-35		070	7	07	
015	INT	16 34		071	X	-35	
016	LSTX	16-63		072	FRC	16 44	
017	FRC	16 44		073	ST00	35 00	
018	EEX	-23		074	RCLC	36 13	
019	2	02		075	X	-35	
020	X	-35		076	INT	16 34	
021	GSBe	23 16 15		077	RTN	24	
022	RTN	24		078	*LBL0	21 00	Turnovers
023	*LBLB	21 16 15	Store Play codes	079	F1?	16 23 01	Go to Pass
024	SF1	16 21 01	Set Pass Flag	080	GT01	22 01	Run
025	ST0A	35 11		081	4	04	
026	5	05		082	0	00	
027	X=1	-41		083	ST0C	35 13	
028	X>Y?	16-34		084	GSBd	23 16 14	
029	CH5	-22		085	X=0?	16-43	Error - Fumble
030	ST0D	35 14		086	=	-24	
031	R+	-31		087	GSBe	23 16 15	
032	R+	-31		088	RTN	24	
033	ST0B	35 12		089	*LBL1	21 01	Pass
034	X=0?	16-43		090	RCLA	36 11	
035	CF1	16 22 01	Clear Pass flag for	091	ST0C	35 13	
036	R+	-31	Run	092	GSBd	23 16 14	
037	ST0C	35 13		093	X=0?	16-43	
038	CLA	-51		094	RTN	24	Incomplete
039	F2?	16 23 02	Test auto stunt flag	095	9	09	
040	GT0A	22 11	Go to Stunt	096	ST0C	35 13	
041	RTN	24		097	GSBd	23 16 14	
042	*LBLB	21 12	Pro	098	X=0?	16-43	
043	GSBd	23 16 14		099	=	-24	Error-Intercept or
044	RCLD	36 14		100	GSBe	23 16 13	Fumble
045	-	-45		101	RTN	24	
046	ST0E	35 15	Outcome	102	*LBLc	21 16 13	Status
047	GT00	22 00	Go to Run	103	F2S	16-51	
048	*LBLA	21 11	Stunt	104	1	01	
049	GSBd	23 16 14		105	ST+6	35-55 00	
050	2	02		106	RCLC	36 15	Outcome
051	X	-35		107	ENT1	-21	
052	RCLD	36 14		108	ENT1	-21	
053	3	03		109	RCL9	36 09	Old Status
054	X	-35		110	+	-55	Add outcome
055	-	-45		111	.	-62	
056	ST0E	35 15	Outcome	112	1	01	

REGISTERS

0 Seed/ RANDOMNo	1 QB Sneak	2 Plunge/ Dive	3 Slant/ Ride	4 Draw	5 Flow/ Counter	6 Screen Pass	7 Look-In Pass	8 Sideline Pass	9 Deep Pass
S0 Kick-Off	S1 Punt	S2 Field G.	S3 Extra Pt.	S4 Runback	S5	S6	S7	S8 Play Counter	S9 Status
A G1	B G2	C G3	D G1, G1 ≤ 5 -G1, G > 5	E Gain	I Used				

97 Program Listing II

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
113	+	-55	Add Down				
114	ST09	35 09		170			
115	XZY	-41					
116	PRTX	-14	Flash Outcome				DATA
117	R+	-31					
118	P+S	16-51					
119	RTN	24	Show new status				P
120	*LBLa	21 16 11	Reset				0.5284138
121	P+S	16-51					2.000
122	ST09	35 09					5.001
123	P+S	16-51	Start				9.002
124	RTN	24		180			12.003
125	*LBLb	21 16 12					15.004
126	ST01	35 46					17.105
127	*LBL2	21 02					21.404
128	RCL0	36 00					24.503
129	9	09					26.802
130	9	09					0.000
131	7	07					0.000
132	x	-35					0.000
133	FRC	16 44					0.000
134	ST00	35 00		190			0.000
135	DSZ1	16 25 46					
136	GT02	22 02					S
137	RTN	24					17.013
138	R/S	51					19.303
							17.106
							25.002
							0.000
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				200			0.000
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				210			0.000
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				220			0.000
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Program Description I

Program Title *ELECTRONIC CONTRACT BRIDGE SCORE PAD*

Contributor's Name *WERNER ENGELHAIER*

Address *23 GUNTHER ST*

City *MENDHAM*

State *N.J.*

Zip Code *07945*

Program Description, Equations, Variables

THIS PROGRAM AUTOMATICALLY SCORES CONTRACT BRIDGE. THE PROGRAM KEEPS TRACK OF ABOVE AND BELOW LINE SCORES, DOUBLED AND REDOUBLED CONTRACTS, HONORS, VULNERABILITY, GAME STATUS, AND THE TOTAL "WE" AND "THEY" SCORE. AFTER THE CONTRACT IS INPUT, THE PROGRAM PROMPTS FOR DOUBLING, HONORS, AND OUTCOME AND THEN CALCULATES UNDERTRICK PENALTIES, BELOW LINE SCORE, ABOVE LINE SCORE, INSULTS, OVERTRICK PREMIUMS, SLAM BONUSES, AND RUBBER BONUSES. IF DESIRED, THE PROGRAM CALCULATES PREMIUMS FOR UNFINISHED RUBBERS AND PARTIAL GAMES. THE PROGRAM PROPERLY ACCOUNTS FOR DOUBLED OR REDOUBLED CONTRACTS AND FOR VULNERABILITY. THE ABOVE LINE SCORES FOR "WE"(X) AND "THEY"(Y) ARE DISPLAYED IN THE FORMAT XXXXX.YYYYYY FOLLOWED BY THE BELOW LINE SCORE IN THE FORMAT XXX.ØØYYY. A VARIETY OF FLASHING DISPLAY MODES INDICATE VULNERABILITY. THE PROGRAM CAN ALSO KEEP RECORD OF THE SCORES OF UP TO 20 INDIVIDUAL PLAYERS. INDIVIDUAL PLAYER SCORES (Z) ARE DISPLAYED IN THE FORMAT NNØØØZZZZZ. FOR EACH PLAYER NUMBER (N).

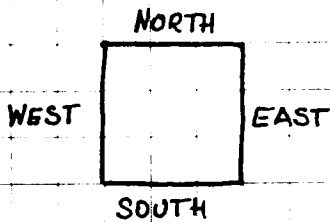
Operating Limits and Warnings *THE PROGRAM CAN HANDLE SCORES UP TO 99999.*

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 IIa

Sketch(es)



NORTH & SOUTH $\Rightarrow$ "WE"
 WEST & EAST $\Rightarrow$ "THEY"

Sample Problem(s) FOUR PLAYERS ARE PLAYING CONTRACT BRIDGE, CHANGING POSITIONS EVERY 4 HANDS. INITIALLY NO.1 SITS WEST, NO.2 NORTH, NO.3 EAST, AND NO.4 SOUTH. FOR HANDS 5 THROUGH 8, THE POSITIONS ARE: NO.4 AT W, NO.2 N, NO.3 E, AND NO.1 S.

Solution

LOAD CARD ① [f][A] $\rightarrow$ 0.00000

LOAD CARD ② $\rightarrow$ 0.00000

HAND No.1: "THEY" 3 SPADES

3 [CHS][B] $\rightarrow$ 22222.22222 DOUBLED? NO

[R/S] $\rightarrow$ 33333.33333 HONORS? NO

[R/S] $\rightarrow$ 44444.44444 OUTCOME? MADE 4

4 [R/S] $\rightarrow$ 0.00030*** ABOVE LINE = "THEY" 30

0.00090 BELOW LINE = "THEY" 90, NONE VULNERABLE

HAND No.2: "WE" 5 CLUBS

5 [A] $\rightarrow$ 22222.22222 DOUBLED? NO

Solution(s) [R/S] $\rightarrow$ 33333.33333 HONORS? YES, 100

100 [R/S] $\rightarrow$ 44444.44444 OUTCOME? DOWN 1

1 [CHS][R/S] $\rightarrow$ 100.00080*** ABOVE LINE = "WE" 100, "THEY" 80

0.00090 BELOW LINE = "THEY" 90, NONE VULNERABLE

HAND No.3: "WE" 3 NOTRUMP

3 [C] $\rightarrow$ 22222.22222 DOUBLED? YES

1 [R/S] $\rightarrow$ 33333.33333 HONORS? NO

[R/S] $\rightarrow$ 44444.44444 OUTCOME? MADE 3

3 [R/S] $\rightarrow$ 350.00170*** ABOVE LINE = "WE" 350, "THEY" 170

Reference(s)

0.00000 $\rightarrow$ NOTHING BELOW LINE

1111.1111 $\rightarrow$ "WE" VULNERABLE

Program Description IIb

Sketch(es) HAND NO. 4: "WE" 6 HEARTS

[R/S] 6 [B]

→ 22222.22222 DOUBLED? YES, AND REDDOUBLED

2 [R/S]

→ 33333.33333 HONORS? YES, 150

150 [R/S]

→ 44444.44444 OUTCOME? MADE 6.

6 [R/S]

→ 99999.99999 RUBBER COMPLETE

LOAD CARD ① [A]

→ 2720.00170 ABOVE LINE = "WE" 2720, "THEY" 170

RECORD INDIVIDUAL SCORES

1[ENT+]2[ENT+]3[ENT+]4[E] → 0.00000

Sample Problem(s) LOAD CARD ②

→ 0.00000

HAND NO. 5: "WE" 5 DIAMONDS

5 [A]

→ 22222.22222 DOUBLED? YES

1 [R/S]

→ 33333.33333 HONORS? NO

[R/S]

→ 44444.44444 OUTCOME? DOWN 2

2 [CHS] [R/S]

→ 0.00300*** ABOVE LINE = "THEY" 300

0.00000 NOTHING, BELOW, NONE VULNERABLE

HAND NO. 6: "THEY" 2 HEARTS

2 [CHS] [B]

→ 22222.22222 DOUBLED? NO

[R/S]

→ 33333.33333 HONORS? NO

[R/S]

→ 44444.44444 OUTCOME? MADE 3

3 [R/S]

→ 0.00330*** ABOVE LINE = "THEY" 330

0.00060 BELOW LINE = "THEY" 60, NONE VULNERABLE

HAND NO. 7: "THEY" 4 CLUBS

Solution(s) 4 [CHS] [A]

→ 22222.22222 DOUBLED? NO

[R/S]

→ 33333.33333 HONORS? NO

[R/S]

→ 44444.44444 OUTCOME? MADE 5

5 [R/S]

→ 0.00490*** ABOVE LINE = "THEY" 490

0.00000 } NOTHING, BELOW LINE

22222.22222 } "THEY" VULNERABLE

HAND NO. 8: "WE" 3 SPADES

[R/S] 3 [B]

→ 22222.22222 DOUBLED? NO

[R/S]

→ 33333.33333 HONORS? NO

Reference(s)

[R/S]

→ 44444.44444 OUTCOME? MADE 3

3 [R/S]

→ 0.00490*** ABOVE LINE = "THEY" 490

90.00000 } BELOW LINE = "WE" 90

22222.22222 } "THEY" VULNERABLE

Program Description IIc

~~Sketch(es)~~ OBTAIN SCORES FOR UNFINISHED RUBBER AND PARTIAL GAME

[R/S]

→ 22222.22222

LOAD CARD ① [A]

→ 140.00790 ABOVE LINE = "WE" 140, "THEY" 790

RECORD INDIVIDUAL SCORES

4[ENT] 2[ENT] 3[ENT] 1[LE] → 0.00000

DISPLAY INDIVIDUAL SCORES

[B]

→ 100000310.*** PLAYER No.1 HAS 310 POINTS
200002860.*** PLAYER No.2 HAS 2860 POINTS

~~Sample Problem(s)~~

300000960.*** PLAYER No.3 HAS 960 POINTS

400003510.*** PLAYER No.4 HAS 3510 POINTS

500000000.*** PLAYER No.5

⋮

THROUGH

} No SCORE

2000000000.*** PLAYER No.20

20.

~~Solution(s)~~

~~Reference(s)~~

User Instructions a

49

CONTRACT BRIDGE

SCORING-CARD ①

NEW RUBBER
 RUBBER → INDIVID.

2

(W#↑N#↑
E#↑S#↑)

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS		OUTPUT DATA/UNITS
1	LOAD SIDE 1 AND SIDE 2 OF CARD ①				
2	INITIALIZE		f	A	0.00000
3	OPTIONAL: INPUT PREVIOUS ABOVE LINE SCORE	XXXXX.YYYYY	STO	Ø	XXXXX.YYYYY
4	LOAD SIDE 1 AND SIDE 2 OF CARD ②				XXXXX.YYYYY
5	INPUT NUMBER OF CONTRACT TRICKS:				
	"WE" CONTRACT	#			#.
OR	"THEY" CONTRACT	#	CHS		-#.
6	INPUT CONTRACT SUIT: *				
	CLUBS OR DIAMONDS		A		22222.22222
OR	HEARTS OR SPADES		B		22222.22222
OR	NOTRUMP		C		22222.22222
7	IS CONTRACT DOUBLED? * No		R/S		33333.33333
OR	YES		1	R/S	33333.33333
OR	YES, AND REDOUBLED		2	R/S	33333.33333
8	HONORS? * No		R/S		44444.44444
OR	YES, 100	100	R/S		44444.44444
OR	YES, 150	150	R/S		44444.44444
9	INPUT CONTRACT OUTCOME:				
	LOSS - NUMBER TRICKS DOWN	#	CHS	R/S	OUTPUT
OR	WIN - NUMBER TRICKS MADE (EXCLUDING BOOK)	#	R/S		OUTPUT
10	IF OUTPUT:				
	XXXXX.YYYYY *** ABOVE LINE SCORE				
	XXX.ØØYYY BELOW LINE SCORE, NONE				
	VULNERABLE				
OR	XXXXX.YYYYY *** ABOVE LINE SCORE				
	XXX.ØØYYY ALTERNATING } BELOW LINE SCORE,				
	11111.11111 } DISPLAY "WE" VULNERABLE				
OR	XXXXX.YYYYY *** ABOVE LINE SCORE				
	XXX.ØØYYY ALTERNATING } BELOW LINE SCORE,				
	22222.22222 } DISPLAY "THEY" VULNERABLE				
OR	XXXXX.YYYYY *** ABOVE LINE SCORE				
	"XXX.ØØYYY" FLASHING - BELOW LINE SCORE,				
	BOTH VULNERABLE				
11	STOP FLASHING OUTPUT DISPLAY, GO TO STEPS 5 THROUGH 10 FOR NEW HAND		R/S		
12	OPTIONAL: ADD PREMIUMS FOR UNFINISHED RUBBER AND/OR PARTIAL GAME. LOAD SIDE 1 AND SIDE 2 OF CARD ① AND KEY		A		XXXXX.YYYYY

6/ Program Listing I - Card ①

51

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	★ LBLA	31 25 11	RUBBER SCORE		5	05	
	RCLS	34 05			X	71	
	RCL6	34 06			X=Y?	32 51	
	→P	32 72		060	GTOα	22 31 11	NO PARTIAL GAME
	4	04			X>Y?	32 81	WINNER
	X=Y	35 52			GTO9	22 09	
	X=Y?	32 51			RCL9	34 09	
	GT05	22 05	700 RUBBER		ST+0	33 61 00	"WE" PARTIAL GAME
	X>Y?	32 81			GTOα	22 31 11	
010	GT06	22 06	500 RUBBER		★ LBL9	31 25 09	
	GT0d	22 31 14	UNFINISHED RUBBER		RCL9	34 09	
	★ LBL5	31 25 05	700 RUBBER		EEX	43	
	7	07			5	05	
	GT05	22 05		070	÷	81	
	★ LBL6	31 25 06	500 RUBBER		ST+0	33 61 00	"THEY" PARTIAL GAME
	5	05			★ LBLα	32 25 11	
	★ LBL5	31 25 05			0	00	
	RCL8	34 08			ST01	33 01	
	X	71			ST03	33 03	
020	GT0b	22 31 12			ST05	33 05	
	★ LBLc	32 25 13	CONVERT TO		ST06	33 06	
	EEX	43	"THEY" FORMAT		5	05	
	5	05			0	00	
	÷	81		080	ST09	33 09	50
	RTN	35 22			ST08	33 08	
	★ LBLb	32 25 12	SCORE		ST+8	33 61 08	100
	CF2	35 61 02	"WE" OR "THEY"		9	09	
	RCL4	34 04			1/X	35 62	
	X<0?	31 71			EEX	43	
030	SF2	35 51 02			5	05	
	R4	35 53			X	71	
	F2?	35 71 02			ST0C	33 13	1111.1111
	GSBC	32 22 13			ENT4	41	
	ST+0	33 61 00		090	+	61	
	GT0a	22 31 11			ST0D	33 14	2222.2222
	★ LBLd	32 25 14	UNFINISHED RUBBER		2	02	
	1	01	AND/OR PARTIAL		X	71	
	5	05	GAME		ST0E	33 15	4444.4444
	0	00			RCL0	34 00	
040	ST07	33 07			R/S	84	
	RCLS	34 05			★ LBLE	31 25 15	INDIVIDUAL SCORE
	X	71			ST0A	33 11	SOUTH-PLAYER NO.
	ST+0	33 61 00	"WE" 300		R4	35 53	
	RCL7	34 07		100	ST0C	33 13	EAST-PLAYER NO.
	EEX	43			R4	35 53	
	5	05			ST0B	33 12	NORTH-PLAYER NO.
	÷	81			R4	35 53	
	RCL6	34 06			ST0D	33 14	WEST-PLAYER NO.
	X	71			2	02	
050	ST+0	33 61 00	"THEY" 300		0	00	
	RCL1	34 01			ST1	35 33	
	ST+0	33 61 00	BELW TO ABOVE LINE		RCL0	34 00	
	INT	31 83	SCORE		ST0E	33 15	
	RCL1	34 01		110	P2S	31 42	
	FRAC	32 83			★ LBLE	32 25 15	INDIVIDUAL
	EEX	43			1	01	FORMATING

REGISTERS

0 ABOVE LINE SCORE	1 BELOW LINE SCORE	2	3 USED	4 (-) IF "THEY" CONTRACT	5 USED	6 USED	7 150	8 100	9 50
S0 SCORE No.1 & No.11	S1 SCORE No.2 & No.12	S2 SCORE No.3 & No.13	S3 SCORE No.4 & No.14	S4 SCORE No.5 & No.15	S5 SCORE No.6 & No.16	S6 SCORE No.7 & No.17	S7 SCORE No.8 & No.18	S8 SCORE No.9 & No.19	S9 SCORE No.10 & No.20
A USED	B USED	C USED / 1111.1111	D USED / 2222.2222	E USED / 4444.4444	F USED				

67 Program Listing II - Card (1)

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
	0	00			PAS	31 42	
	RCLi	34 24		170	0	00	
	X<Y?	32 71			STI	35 33	
	QTO0	22 00	PLAYER NO. < 10		STO0	33 00	
	2	02			QTO0	22 31 11	
	1	01			*LBLB	31 25 12	INDIVIDUAL
	RCI	35 34			DSP0	23 00	PLAYER SCORE
120	X<Y?	32 71			1	01	
	QTO1	22 01	NOR S, No. > 10		0	00	
	RCLF	34 15			STI	35 33	
	FRAC	32 83			*LBL7	31 25 07	
	QTO2	22 02	W OR E, No. > 10	180	INT	31 83	SEPARATION
	*LBL0	31 25 00			RCLi	34 24	OF TIGHT PACKED
	2	02			EEX	43	DATA - PLAYER
	1	01			8	08	NOS. 1 THROUGH 10
	RCI	35 34			÷	81	
	X<Y?	32 71			RCI	35 34	
130	QTO3	22 03	NOR S, No. < 10		9	09	
	RCLF	34 15			-	51	
	FRAC	32 83			+	61	
	EEX	43			EEX	43	
	5	05		190	8	08	
	X	71			X	71	
	QTO4	22 04	W OR E, No. < 10		-X-	31 84	DISPLAY
	*LBL3	31 25 03			ISZ	31 34	NN00000000.
	RCLF	34 15			RCI	35 34	
	INT	31 83			2	02	
140	QTO4	22 04	NOR S, No. < 10		0	00	
	*LBL1	31 25 01			X>Y?	32 81	
	RCLF	34 15			QTO7	22 07	
	INT	31 83			RCI	35 34	
	EEX	43		200	1	01	
	5	05			0	00	
	÷	81			-	51	
	*LBL2	31 25 02	NOR S, No. > 10		STI	35 33	
	RCLi	34 24	CONSOLIDATION		*LBL8	31 25 08	SEPARATION
	1	01	OF INDIVIDUAL		RCLi	34 24	OF TIGHT PACKED
	0	00	SCORES OF		FRAC	32 83	DATA - PLAYER
150	-	51	20 PLAYERS INTO		EEX	43	NOS. 11 THROUGH 20
	STOI	33 24	10 SECONDARY		3	03	
	R+	35 53	REGISTERS		÷	81	
	*LBL4	31 25 04		210	RCI	35 34	
	RCLi	34 24			1	01	
	1	01			+	61	
	-	51			+	61	
	X=I	35 24			EEX	43	
	X=Y	35 52			8	08	
160	ST+i	33 61 24			X	71	
	R+	35 53			-X-	31 84	DISPLAY
	X=I	35 24			ISZ	31 34	NN00000000.
	ISZ	31 34			RCI	35 34	
	2	02		220	2	02	
	3	03			0	00	
	RCI	35 34			X>Y?	32 81	
	X<Y?	32 71			QTO8	22 08	
	QTOE	22 31 15			RTN	35 22	
LABELS				FLAGS		SET STATUS	
A RUBBER SCORE	B INDIVIDUAL PLAYER SCORE	C	D	E INDIVIDUAL SCORE RECORD	0 USED	FLAGS	TRIG
a INITIALIZE NEW RUBBER	b SCORE "WE" OR "THEY"	c "THEY" FORMAT	d UNFINISHED RUBBER/GAME	e INDIVIDUAL FORMAT	1 USED	ON OFF	DISP
0 "THEY" NO. 10 FORMAT	1 "WE" NO. 10 FORMAT	2 CONSOLIDATION	3 "WE" NO. 10 FORMAT	4 SEQUENCING	2 "THEY" CONTRACT	0 ☐ ☒	DEG ☒
5 700 RUBBER	6 500 RUBBER	7 1 TO 10 SEPARATION	8 11 TO 20 SEPARATION	9 PARTIAL GAME-FORMAT	3	1 ☐ ☒	GRAD ☐
						2 ☐ ☒	RAD ☐
						3 ☐ ☒	ENG ☐
							n <u>5</u>

67 Program Listing I - Card ②

53

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	* LBL6	32 25 12	SCORE		* LBLB	31 25 12	HEARTS & SPADES
	F2?	35 71 02	"NE" OR "THEY"		3	03	
	GSBC	32 22 13			0	00	
	ST+i	33 61 24		060	* LBLa	32 25 11	
	RTN	35 22			STOA	33 11	
	* LBLc	32 25 13	CONVERT TO "THEY" FORMAT		R+	35 53	
	RCL4	34 04			CF2	35 61 02	
	X<Y?	31 71			X<0?	31 71	
	SF2	35 51 02			SF2	35 51 02	"THEY" CONTRACT
010	R+	35 53			STO4	33 04	
	EX	43			ABS	35 64	
	S	05			STO3	33 03	# CONTRACT TRICKS
	÷	81			RCL4	34 04	
	RTN	35 22		070	RCL5	34 05	
	* LBL0	31 25 00	DISPLAY ABOVE LINE		X	71	
	0	00	PREMIUMS / TOTAL		X>0?	31 81	
	STOB	33 12			SF0	35 51 00	"NE" CONTRACT & VULNERABLE
	STO2	33 02			RCL4	34 04	
	RCL0	34 00	ABOVE LINE		RCL6	34 06	
020	-X-	31 84	5 SEC DISPLAY		X	71	
	RCL5	34 05	DISPLAY		X<0?	31 71	
	X+0?	31 61	BELOW LINE, VULNERABILITY		SF1	35 51 01	"THEY" CONTRACT & VULNERABLE
	GT07	22 07			CF3	35 61 03	
	RCL6	34 06		080	RCLD	34 14	DISPLAY
	X+0?	31 61			R/S	84	22222.22222
	GT09	22 09			F3?	35 71 03	DOUBLED?
	RCL1	34 01	NONE VULNERABLE		STO2	33 02	DOUBLED - 1
	R/S	84	BELOW LINE POINTS		RCLC	34 13	REDOUBLED - 2
	* LBL7	31 25 07	XX.000YY		3	03	
030	RCL6	34 06			X	71	DISPLAY
	X+0?	31 61			R/S	84	33333.33333
	GT08	22 08			F3?	35 71 03	HONORS? → 100/150
	RCL1	34 01	"WE" VULNERABLE		GSBB	32 22 12	
	PSE	35 72	XX.000YY	090	RCLC	34 15	DISPLAY
	RCLC	34 13	11111.11111		R/S	84	44444.44444
	PSE	35 72	ALTERNATING DISPLAY		STO7	33 07	OUTCOME?
	GT07	22 07			RCL3	34 03	WIN → # TRICKS MADE
	* LBL8	31 25 08	BOTH VULNERABLE		X<Y?	32 71	DOWN → #(-) DOWN
	RCL1	34 01	"XX.000YY"		GTOD	22 14	WIN
040	PSE	35 72	FLASHING DISPLAY		RCL2	34 02	UNDERTRICK
	GT08	22 08			X+0?	31 81	PENALTY
	* LBL9	31 25 09	"THEY" VULNERABLE		GT01	22 01	DOUBLED
	RCL1	34 01	XX.000YY	100	RCL7	34 07	
	RCLD	34 14	11111.11111		ENT+	41	LOSER
	PSE	35 72	ALTERNATING DISPLAY		F0?	35 71 00	VULNERABLE?
	GT09	22 09	CLUBS & DIAMONDS		+	61	
	* LBLA	31 25 11			F1?	35 71 01	
	2	02			+	61	
050	0	00			RCL9	34 09	
	GT0a	22 31 11			X	71	
	* LBLc	31 25 13	NOTRUMP		GTOD	22 31 14	
	1	01			* LBL1	31 25 01	DOUBLED CONTRACT
	0	00			2	02	UNDERTRICK
	STOB	33 12		110	F0?	35 71 00	PENALTY
	X2Y	35 52			3	03	LOSER
					F1?	35 71 01	VULNERABLE?
REGISTERS							
0 ABOVE LINE SCORE	1 BELOW LINE SCORE	2 DOUBLED 0/1/2	3 # CONTRACT TRICKS	4 (-) IF "THEY" CONTRACT	5 "2" IF "WE" VULNERABLE	6 "2" IF "THEY" VULNERABLE	7 # MADE/(-) # DOWN
S0	S1	S2	S3	S4	S5	S6	S7
USED FOR INDIVIDUAL SCORES							
A SUIT VALUE	B NOTRUMP CONTRACT → 10	C 11111.11111	D 22222.22222	E 44444.44444	100"-ABOVE" LINE 11"-BELOW" SCORE		

67 Program Listing II-Card (2)

STEP KEY ENTRY KEY CODE			COMMENTS	STEP KEY ENTRY KEY CODE			COMMENTS	
	3	03			STI	35 33		
	RCL8	34 08		170	RCL7	34 07	OVERTRICK PREMIUMS	
	X	71			RCL8	34 08		
	RCL7	34 07			X	71		
	X	71			RCL2	34 02		
	RCL8	34 08			X	71		
	+	61			ENT	41		
120	RCL2	34 02			F0?	35 71 00	WINNER	
	X	71			+	61	VULNERABLE?	
	GTOD	22 31 14			F1?	35 71 01		
	★ LBLD	32 25 14	"THEY" OR "WE"		+	61		
	F2?	35 71 02	DEFEATED CONTRACT	180	RCL7	34 07		
	GTOP	22 31 15			RCLA	34 11		
	EEX	43			X	71		
	S	05			XSY?	32 71	DOUBLED?	
	÷	81			R+	35 53		
	★ LBLE	32 25 15			GSBB	32 22 12		
130	ST-0	33 51 00			RCL2	34 02		
	RCL4	34 04			X>0?	31 81	DOUBLED?	
	X<0?	31 71			RCL9	34 09	INSULT	
	SF2	35 51 02			GSBB	32 22 12		
	GTOD	22 00		190	RCL1	34 01	GAME	
	★ LBLD	31 25 14	WIN SCORE		RCL8	34 08	CHECK	
	I	01	SLAM		XSY?	32 71	"WE" > 100?	
	.	83	CHECK		GSB3	31 22 03		
	S	05			RCL1	34 01		
	RCL8	34 08			FRAC	32 83		
140	S	05			EEX	43		
	X	71			S	05		
	F0?	35 71 00	VULNERABLE?		X	71		
	X	71			RCL8	34 08		
	F1?	35 71 01		200	XSY?	32 71	"THEY" > 100?	
	X	71			GSB4	31 22 04		
	RCL3	34 03			RCL5	34 05	RUBBER	
	S	05			RCL6	34 06	CHECK	
	-	51			→P	32 72		
	X<0?	31 71	SMALL OR GRAND		4	04		
150	0	00	SLAM?		X>Y?	32 81		
	X	71			GTOD	22 00	NO RUBBER	
	GSBB	32 22 12			RCLC	34 13		
	ISZ	31 34	BELOW LINE POINTS		9	09		
	RCL3	34 03		210	X	71	DISPLAY	
	ST-7	33 51 07			R/S	84	99999.99999	
	RCLA	34 11			★ LBL3	31 25 03		
	X	71			2	02		
	RCLB	34 12			ST+5	33 61 05	"WE" VULNERABLE	
	+	61			GTOD	22 03		
160	RCL2	34 02			★ LBL4	31 25 04		
	ENT	41			2	02		
	+	61			ST+6	33 61 06	"THEY" VULNERABLE	
	X>0?	31 81	DOUBLED?		★ LBL3	31 25 03		
	X	71		220	RCL1	34 01	MOVE BELOW TO	
	X=0?	31 51			ST+0	33 61 00	ABOVE LINE	
	R+	35 53			0	00		
	GSBB	32 22 12			STO1	33 01	CLEAR BELOW LINE	
	0	00			RTN	35 22		
LABELS				FLAGS		SET STATUS		
A CLUBS OR DIAMONDS	B HEARTS OR SPADES	C NOTRUMP	D WIN	E	0 "WE" CONTRACT VULNERABLE	FLAGS	TRIG	DISP
a CONTRACT INFO	b SCORE "WE" OR "THEY"	c "THEY" FORMAT	d PENALTY "THEY" OR "WE"	e "WE" FORMAT	1 "THEY" CONTRACT VULNERABLE	ON OFF		
0 DISPLAY	1 DOUBLED PENALTY	2	3 "WE" VULN GAME CHECK	4 "THEY" VULN GAME CHECK	2 "THEY" CONTRACT	0 ☐ ON ☒ OFF	DEG ☒	FIX ☒
5	6	7 "WE" VULN DISPLAY	8 BOTH VULN DISPLAY	9 "THEY" VULN DISPLAY	3 INPUT	1 ☐ ON ☒ OFF	GRAD ☐	SCI ☐
						2 ☐ ON ☒ OFF	RAD ☐	ENG ☐
						3 ☐ ON ☒ OFF		n <u>5</u>

Program Description I

Program Title Duplicate Bridge Score with Running Totals
 Contributor's Name Robert L. Patton, Jr.
 Address 1713 Parkcrest Terrace
 City Arlington State Texas Zip Code 76012

Program Description, Equations, Variables Contract made:

$$\text{Score} = \left[\begin{array}{l} (R1 \cdot R2 + R6) \cdot R3 + R7 \cdot R8 + 5 \\ + R4 \text{ if game bid} \\ + (R1 - 5) \cdot R5 \text{ if slam bid} \\ + 5 \text{ if doubled} \end{array} \right] \cdot 10$$

where R1 = contract level (1 to 7)

R2 = points per trick (2 or 3)

R3 = doubling multiplier (2 doubled, 4 redoubled, else 1)

R4 = game bonus (45 vulnerable, else 25)

R5 = slam bonus (75 vulnerable, else 50)

R6 = 1 if notrump, else 0

R7 = overtricks

R8 = points per overtrick

Contract set:

$$\text{Score} = [R0 \cdot \text{ETV} \cdot R3 + (R0 - 1) \cdot 10 \cdot \text{INT}(R3/2)] \cdot 10$$

where R0 = number of tricks down

R3 = doubling multiplier (see above)

ETV = exceptional trick value = 5 not vul., = 10 vul.

Operating Limits and Warnings

Warning note: If you have entered a wrong contract,
press to clear it before entering the right contract.

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 II

Sketch(es)

Sample Problem(s) A round of Chicago (4 deal bridge).

Hand 1 (no one vulnerable)

Your side bids 2 hearts doubled and makes 3.

2 [B] [D] 3 [f] [b] giving 570, then [f] [a] for your score.

Hand 2 (They are vulnerable)

They bid 6 diamonds and make 6.

6 [C] [E] 6 [f] [b] giving 1370, then [f] [e] for their score.

Hand 3 (You are vulnerable)

You bid 3 notrump and go down 2.

3 [A] [E] 2 [f] [d] giving 200, then [f] [e] for their score.

Hand 4 (Both vulnerable)

They bid 5 clubs, doubled and redoubled and go down 2.

5 [C] [D] [D] [E] 2 [f] [d] giving 1000 then [f] [a]
giving a total of 1570 for you.

To read their total:

0 [f] [e] giving 1570, so this round was a tie.

Clear scores for next game: [f] [c]

Reference(s)

57

[illegible]

67 Program Listing I

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	F LBL A	31 25 11	NT		+	61	- Add for NT.
	1	01			RCL 3	34 03	} Handle doubles.
	STO 6	33 06	Set no trump adder.		X	71	
	h R↓	35 53		060	9X≤4	32 71	} Add game bonus if earned.
	F LBL B	31 25 12	MAJOR		GTO 4	22 04	
	1	01	Set extra 10 points per major suit trick.		RCL 4	34 04	
	STO 2	33 02			+	61	
	h R↓	35 53			F LBL 4	31 25 04	
	F LBL C	31 25 13	MINOR		RCL 1	34 01	(Contract level - 5)
010	STO 1	33 01			5	05	X
	2	02	} add 20 points/trick.		-	51	(slam bonus)
	STO + 2	33 61 02			RCL 5	34 05	
	RCL 2	34 02	Set points per overtrick.		X	71	
	STO 8	33 08		070	F X<0	31 71	} If negative, no slam bonus.
	2	02	Set game value adder.		CLX	44	
	5	05			+	61	
	STO 4	33 04			5	05	} Part score bonus.
	5	05			+	61	
	0	00	set slam bonus.		RCL 7	34 07	
020	STO 5	33 05			RCL 8	34 08	} overtricks bonus.
	1	01	set doubling multiplier.		X	71	
	STO 3	33 03			+	61	
	h RTN	35 22			0	00	} Doubled bonus.
	F LBL D	31 25 14	DBL	080	h X≤4	35 52	
	RCL 3	34 03	Double the doubling multiplier.		h F? 0	35 71 00	
	STO + 3	33 61 03			5	05	
	1	01	Set points per overtrick.		GTO 1	22 01	
	0	00			h RTN	35 22	
	STO 8	33 08			F LBL 0	31 25 00	} Set down-tricks positive
030	h F? 0	35 71 00	If redoubled, double points per overtrick.		CHS	42	
	STO + 8	33 61 08			9 LBL F d	32 25 14	Down?
	h SF 0	35 51 00	Set doubled flag.		STO 0	33 00	
	h RTN	35 22			5	05	
	F LBL E	31 25 15	VUL	090	X	71	} Compute basic set value.
	4	04	Set vulnerable game adder.		ENTER ↑	41	
	5	05			h F? 1	35 71 01	
	STO 4	33 04			+	61	
	7	07	Set vulnerable slam bonus.		RCL 3	34 03	
	5	05			X	71	
040	STO 5	33 05			RCL 0	34 00	
	RCL 8	34 08			1	01	} Compute adder for extra tricks down.
	h F? 0	35 71 00	If doubled, double points per overtrick.		-	51	
	STO + 8	33 61 08			1	01	
	h SF 1	35 51 01	Set vulnerable flag.	100	0	00	
	h RTN	35 22			X	71	
	9 LBL F b	32 25 12	Made?		RCL 3	34 03	
	RCL 1	34 01	Compute overtricks.		2	02	
	-	51			÷	81	
	F X<0	31 71			F INT	31 83	
050	GTO 0	22 00	Contract was set.		X	71	
	STO 7	33 07			F LBL 1	31 25 01	} Finish all calculations.
	9	09	Game test value.		+	61	
	RCL 1	34 01			1	01	
	RCL 2	34 02	Compute basic contract trick score.	110	0	00	
	X	71			X	71	
	RCL 6	34 06			h CF 0	35 61 00	

REGISTERS

0 TRICKS DOWN	1 CONTRACT LEVEL	2 POINTS PER TRICK	3 DOUBLING MULTIPLIER	4 GAME BONUS	5 SLAM BONUS	6 NO TRUMP ADDER	7 OVER-TRICKS	8 POINTS PER OVERTRICK	9
S0 WE TOTAL	S1 THEY TOTAL	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	I	TOTALS	CONTROL		

Program Description I

Program Title Battleship

Contributor's Name Richard Toptani

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City Dearborn Heights

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Program Description, Equations, Variables You are the commander of a naval attack team. Air scouts have informed you of an enemy battleship ahead. Upon placing a grid over the general area, you see it is in an area with both X and Y coordinates ≥ 0 and < 100 . For each shot you input X and Y coordinates. Your instruments then tell you how far away your shot was from the enemy and how many torpedoes you have left (you begin with 15). A shot ≤ 1 unit from the correct coordinates is a direct hit and displays 8888888888. A shot ≤ 5 units from the coordinates (and not a direct hit) is a minor hit. This does not destroy the enemy, but this starts him on evasive action, changing his coordinates. The more times he is hit, the less he can run each time. The enemy battleship only moves after a minor hit. On the fifth minor hit, the ship is destroyed and 777777777 is displayed. If the ship is not destroyed after 15 shots, 111111111 is displayed and you lose. A new game begins automatically after you win or lose.

The level of difficulty for the game can be changed as shown below. Simply change the values in the steps as show.

LEVEL	STEP 65	STEP 75	STEP 38	STEPS 35-36
Novice	5	4	7	16
Amateur	4	5	8	13
Advanced	3	7	10	10
Professional	2	9	12	8

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 II

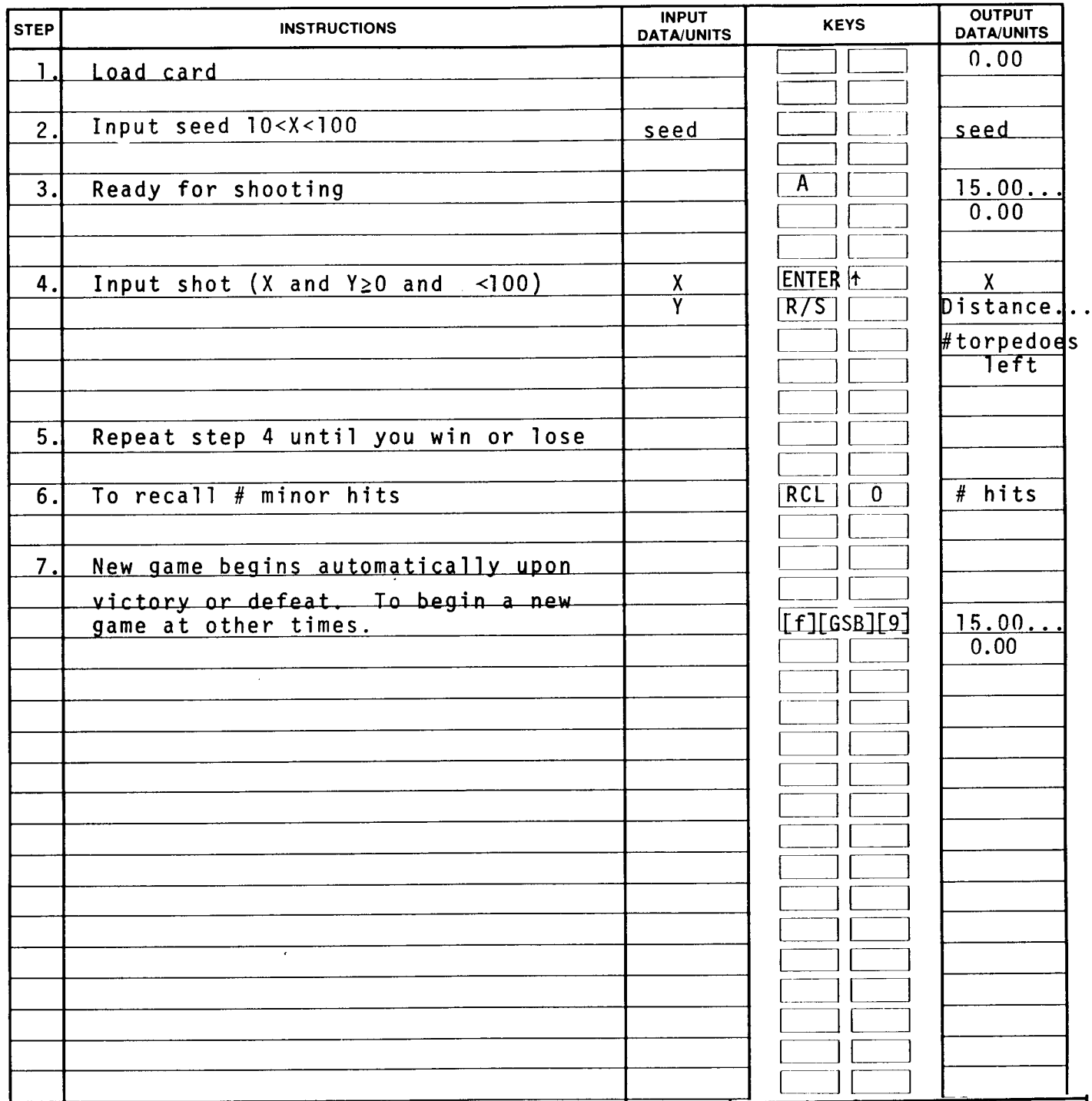
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Sketch(es)

Sample Problem(s) Keystrokes

25 [A]	15.00... # torpedoes
	0.00
50 [ENTER+] 50 [R/S]	31.02... distance
	14.00 # torpedoes left
40 [ENTER+] 50 [R/S]	29.02
	13.00
30 [ENTER+] 50 [R/S]	30.36...
	12.00
35 [ENTER+] 50 [R/S]	29.27...
	11.00
38 [ENTER+] 50 [R/S]	29.02
	10.00
39 [ENTER+] 50 [R/S]	29.00...
	9.00
39 [ENTER+] 21 [R/S]	58.00...
	8.00
39 [ENTER+] 79 [R/S]	0.00...
	888888888... YOU WIN
	15.00... NEW GAME
	0.00

Reference(s)



LABELS					FLAGS	SET STATUS			
A	B	C	D	E	0	FLAGS		TRIG	DISP
Start						ON OFF			
a	b	c	d	e	1	0	☐ ☒	DEG ☒	FIX ☒
0	1 You win	Next shot or you lose	3 Win	4	2	1	☐ ☒	GRAD ☐	SCI ☐
5 Used	6	7	8	9 New Game	3	2	☐ ☒	RAD ☐	ENG ☐
						3	☐ ☒		n <u>2</u>

97 Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	*LBLA	21 11		057	X²	53	
002	LOG	16 32		058	XZY	-41	
003	FRC	16 44	Random #	059	RCL1	36 01	
004	EEK	-23		060	-	-45	
005	2	02		061	X²	53	
006	*	-35		062	+	-55	
007	ST03	35 03		063	JX	54	
008	INT	16 34		064	PSE	16 51	
009	ST01	35 01	X ₂	065	5	05	
010	LSTX	16-63	(Seed for next game)	066	XZY	-41	
011	FRC	16 44		067	XZY?	16-34	Shoot within 5?
012	EEK	-23		068	GT02	22 02	No, shoot again
013	2	02		069	1	01	Yes, continue
014	*	-35		070	XZY	-41	
015	ABS	16 31		071	XZY?	16-35	Shot within 1?
016	INT	16 34		072	GT01	22 01	Yes, you win
017	ST02	35 02	Y ₂	073	1	01	
018	RCL1	36 01		074	ST+0	35-55 00	
019	INT	16 34		075	4	04	
020	ST01	35 01		076	RCL0	36 00	# minor hits
021	1	01		077	XZY?	16-34	5 minor hits?
022	1	01		078	GT03	22 03	Yes, you win
023	1	01		079	ST-7	35-45 07	No, enemy moves
024	1	01		080	RCL7	36 07	
025	1	01		081	ST-1	35-45 01	
026	1	01		082	ST-2	35-45 02	
027	1	01		083	RCL1	36 01	X<0?
028	1	01		084	X<0?	16-45	Yes
029	1	01		085	GT05	22 05	Make it positive
030	1	01		086	RCL2	36 02	
031	ST06	35 06		087	X<0?	16-45	Y<0?
032	6	06		088	GT05	22 05	Yes, make positive
033	*	-35		089	GT02	22 02	No, next shot
034	ST06	35 06		090	*LBL5	21 05	
035	1	01		091	RCL7	36 07	
036	6	06		092	2	02	
037	ST01	35 46		093	*	-35	
038	7	07		094	ST+1	35-55 01	
039	ST07	35 07		095	ST+2	35-55 02	Next shot
040	RCL8	36 08		096	GT02	22 02	
041	7	07		097	*LBL3	21 03	
042	*	-35		098	RCL5	36 05	You win
043	ST05	35 05		099	PRTX	-14	New game
044	*LBL2	21 02	Decrease #torpedoes	100	GT09	22 09	
045	DSZ1	16 25 46		101	*LBL1	21 01	You win
046	GT06	22 06	You lose	102	RCL6	36 06	
047	RCL8	36 08		103	PRTX	-14	Next game
048	PRTX	-14		104	*LBL9	21 09	
049	GT09	22 09	Begin new game	105	CLX	-51	
050	*LBL6	21 06		106	ST00	35 00	Prepares
051	RCL1	36 46		107	RCL3	36 03	New
052	PSE	16 51		108	Fi	16-24	Seed
053	CLX	-51		109	*	-35	
054	R/S	51	Accept shot	110	GT04	22 11	
055	RCL2	36 02		111	RTN	24	
056	-	-45		112	R/S	51	

REGIS									
0 #Minor hits	1 X ₂	2 Y ₂	3 Seed	4	5 77777777	6 88888888	7 Used	8 11111111	9
S0	S1	S2	S3	S4	S5	S6	S7	S8	S9
A	B	C	D	E	#torpedoes left				

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