

Program Title SIC BO (DICE GAME)

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Program Description, Equations, Variables

"SIC BO" is an ancient Chinese game of chance that uses 3 dice in a sealed shaker. Once all of the bets are placed, the dice are shaken and displayed in the center of the table. You may bet any amount of money which will be used for each of up-to-nine bets on each round.

There are six different types of bets possible:

- 1) BIG (11-17) and SMALL (4-10); pays 1 to 1.
(loses if three-of-a-kind appear)
- 2) SPECIFIC THREE-OF-A-KIND; pays 150 to 1.
- 3) ANY THREE-OF-A-KIND; pays 24 to 1.
- 4) SPECIFIC TWO-OF-A-KIND (select any pair); pays 8 to 1.
- 5) SPECIFIC TWO-OUT-OF-THREE (select any 2 numbers); pays 5 to 1.
- 6) SUM TOTAL OF DICE;

4 and 17 win	50 to 1.
5 and 16 win	18 to 1.
6 and 15 win	14 to 1.
7 and 14 win	12 to 1.
8 and 13 win	8 to 1.
9 to 12 win	6 to 1.

Operating Limits and Warnings

YOU MAY BET ONLY WHOLE NUMBER DOLLAR AMOUNTS and ANY NUMBER OF TIMES UP TO NINE.

To bet \$3.00 on 5 bets (for one round), bet "3.5 E"

DATA CARD must be loaded before INITIALIZING.

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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S-C-B-O

666	555	444	333	222	111	ANY (B) TRIPLE 24:1		22	33	55	44	11	66		
wins 150 : 1				(F)(A)		24:1			wins 8 : 1			(F)(C)			
17	16	15	14	13	12	11	10	9	8	7	6	5	4 (C)		
50:1	18:1	14:1	12:1	8:1	6:1	6:1	6:1	6:1	8:1	12:1	14:1	18:1	50:1		
→ wins 5 : 1	1-2	2-4	1-4	2-3	3-4	2-5	3-5	2-6	4-5	3-6	1-5	1-6	4-6	5-6	1-3 (D)
SPECIFIC TWO-OUT-OF-THREE DICE															
BIG (A) 11-17 1:1							(B)	SMALL (A) 4-10 1:1							

Play a game of SIC B0.

Start with a seed of .123456789*

.123456789 [f][E] → 0.00

Place 5 bets of \$2 each.

2.5 [E] → 2.00

Bet on BIG. 1 [A] → 4.**

Bet on a "6". 6 [B] → 3.

Bet on TOTAL 12. 12 [C] → 2.

Bet on TOTAL 13. 13 [C] → 1.

Bet on TOTAL 14. 14 [C] → 651.12***

(one 6, one 5, one 1; total 12)

(you've won \$12.00) 12.00

Place 4 bets of \$3 each.

3.4 [E] → 3.00

Bet on TOTAL 8. 8 [C] → 3.

Bet on TOTAL 9. 9 [C] → 2.

Bet on DOUBLE 3. 3 [f][C] → 1.

Bet on 2-3. 2.3 [D] → 432.09***

(total winnings:) 39.00

Place 5 bets of \$5 each.

5.5 [E] → 5.00

Bet on any TRIPLE. [f][B] → 4.

Bet on a "2". 2 [B] → 3.

Bet on TOTAL 15. 15 [C] → 2.

Bet on SMALL. 0 [A] → 1.

Bet on a "4". 4 [B] → 421.07***

(total winnings:) 44.00

Place 9 bets (maximum #) of \$10 each.

10.9 [E] → 10.00

Bet on any TRIPLE. [f][B] → 8.

Bet on DOUBLE 4. 4 [f][C] → 7.

Bet on TOTAL 8. 8 [C] → 6.

Bet on TOTAL 9. 9 [C] → 5.

Bet on TOTAL 10. 10 [C] → 4.

Bet on TOTAL 11. 11 [C] → 3.

Bet on 1-2. 1.2 [D] → 2.

Bet on 1-3. 1.3 [D] → 1.

Bet on 1-4. 1.4 [D] → 316.10***

(total winnings:) 84.00

and so on. . .

* In order for this sample game to be displayed as shown here, you must enter the DATA CARD before INITIALIZING.

** Number of bets remaining.

1	SPECIFIC 3 OF A KIND	ANY 3 OF A KIND	SPECIFIC 2 OF A KIND	SIC 30	INITIALIZE (SEED)	2
	SMALL 0	SPECIFIC 1 OF A KIND	TOTAL OF 3 DICE = N	2 DICE (X.Y)	BET	
	BIG 1					

STEP	INSTRUCTIONS	INPUT DATA/UNITS	KEYS	OUTPUT DATA/UNITS
1	LOAD PROGRAM CARD -- sides 1 and 2			
2	LOAD DATA CARD -- sides 1 and 2			
3	INITIALIZE (Input a seed: $0 \leq s \leq 1$)	seed	f E	0.00
4	PLACE YOUR BET -or- GTO STEP 4A	\$\$*	E	BET.00
4A	OPTIONAL: PLACE YOUR BET and NUMBER of TYPES OF BETTING to be done (maximum 9)	\$\$.#	E	BET.00
5	SELECT THE TYPE OF BET TO BE MADE: TYPE OF BET WINNING RANGE ODDS			
	A) SMALL 4-10 (no triple) 1:1	0	A	see below
	B) BIG 11-17 (no triple) 1:1	1	A	"
	C) 1 of a KIND match any die 1:1	1-6	B	"
	D) 2 of a KIND match two dice 8:1	1-6	f C	"
	E) 3 of a KIND match all three 150:1	1-6	f A	"
	F) any 3 of a KIND any triple 24:1		f B	"
	G) SPECIFIC TWO-OUT-OF-THREE (match two dice 5:1	1-6.1-6	D	"
	H) SUM TOTAL 4 or 17 50:1	4 or 17	C	"
	5 or 16 18:1	5 or 16	C	"
	6 or 15 14:1	6 or 15	C	"
	7 or 14 12:1	7 or 14	C	"
	8 or 13 8:1	8 or 13	C	"
	9, 10, 11, 12 6:1	9-12	C	NUMBER.
				-or-
	(X=Die #1/Y=Die #2/Z=Die #3)			XYZ.total***
				BANK.00
6	If ONLY the "NUMBER." is output at the end of STEP 5, that NUMBER tells you how many TYPES of BETS remain. Then GTO STEP 5			
7	TO CONTINUE, GTO STEP 4 or 4A -or- simply use the same bet and GTO STEP 5			
	* whole dollar amounts only!			

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Program Listing I

Page 4 of 6

STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	e	g LBL C	32 25 15	INITIALIZE		STO S	33 05
		h F?3	35 71 03			STO E	33 15
		h F?3	35 71 03			RCL 2	34 02
		GTO fd	22 31 14		060	DSP 2	23 02
		STO +0	33 61 00			h RTN	35 22
		0	00		A	f LBL A	31 25 11
		STO 4	33 04			h SF1	35 51 01
0		f LBL O	31 25 00	SHAKE 3 DICE		g GSB fa	32 25 11
		DSP 2	23 02			h CF1	35 61 01
010		0	00			RCL A	34 11
		STO 6	33 06			g X < Y	32 71
		RCL B	34 12			GTO 8	22 08
		f GSB I	31 22 01	DIE #1		RCL D	34 14
		STO 7	33 07		070	f X = 0	31 61
		X	71			h SF2	35 51 02
		RCL A	34 11			RCL A	34 11
		f GSB I	31 22 01	DIE #2		RCL 6	34 06
		STO 8	33 08			g X > Y	32 81
		X	71			h F?2	35 71 02
020		+	61			h F?2	35 71 02
		1	01			GTO 8	22 08
		f GSB I	31 22 01	DIE #3		GTO 5	22 05
		STO 9	33 09		B	f LBL B	31 25 12
		X	71		080	STO D	33 14
		+	61			RCL 7	34 07
		RCL 6	34 06			g X = Y	32 81
		RCL B	34 12			GTO 5	22 05
		÷	81			RCL 8	34 08
		+	61			RCL D	34 14
030		STO 1	33 01	HIDDEN NUMBER =		g X > Y	32 51
		RCL 4	34 04	XYZ.TT (where		GTO 5	22 05
		h RTN	35 22	X = DIE #1, Y = DIE #2,		RCL 9	34 09
		f LBL I	31 25 01	Z = DIE #3, TT = TOTAL)		g X ≠ Y	32 81
		RCL O	34 00	RANDOM NUMBER GEN.	090	GTO 8	22 08
		9	09		5	f LBL S	31 25 05
		9	09			1	01
		7	07			GTO 7	22 07
		X	71		C	f LBL C	31 25 13
		g FRAC	32 83	EACH ROLL of a DIE =		STO D	33 14
040		STO 0	33 00	$\text{INT} [6(\text{SEED}) + 1]$		RCL 6	34 06
		6	06			g X ≠ Y	32 61
		X	71			GTO 8	22 08
		1	01			RCL A	34 11
		+	61		100	h STO E	35 33
		f INT	31 83		4	f LBL 4	31 25 04
		STO +6	33 61 06			RCL D	34 14
		h RTN	35 22			RCL (i)	34 24
E		f LBL E	31 25 15	PLACE YOUR BET		f INT	31 83
		f INT	31 83			g X = Y	32 51
050		STO 2	33 02	STORE WHOLE DOLLAR		h SF2	35 51 02
		h LSTX	35 82	AMOUNT IN R2		RCL D	34 14
		g FRAC	32 83			h LSTX	35 82
		RCL A	34 11			g FRAC	32 83
		X	71	CHECK FOR MULTIPLE BETS	110	RCL B	34 12
		f X = 0	31 51	1, if default.		X	71
		1	01			f INT	31 83

REGISTERS

0 SEED	1 XYZ.TOTAL	2 BET	3 ISO.	4 BANK	5 # of BETS	6 TOTAL of 3 DICE	7 DIE #1	8 DIE #2	9 DIE #3
S0 17.0450	S1 16.0518	S2 15.0614	S3 14.0712	S4 13.0808	S5 12.0906	S6 11.1006	S7	S8	S9
A 10	B 100	C	D USED	E USED	I USED				

STEP KEY ENTRY KEY CODE			COMMENTS	STEP KEY ENTRY KEY CODE			COMMENTS	
	9X=Y	32 51	RETURN TO LBL 4 UNTIL YOU FIND WINNING # WIN for LBL C		RCL 5	34 05	RE-SET R5 for CONTINUED PLAY USING the SAME BET. STOP if more BETS remain	
	WSFZ	35 51 02		170	FX=0	31 61		
	HF?2	35 71 02			WSFZ	35 51 02		
	GTO 1	22 01			FX=0	31 51		
	FISZ	31 34			RCL 5	34 15		
	GTO 4	22 04		STO 5	33 05			
1	FLBL 1	31 25 01		DSP 0	23 00			
120	HLSTX	35 82	WIN 6, 8, 12, 14, 18, OR 50 TIMES BET.		HF?2	35 71 02		
	QFRAC	32 83			R/S	84		
	RCL B	34 12			DEP 2	23 62		
	X	71			RCL 1	34 01	← HIDDEN NUMBER	
	GTO 7	22 07			F-X-	31 84	THROW DICE AGAIN.	
D	FLBL D	31 25 14	2 DICE (X.Y)	180	GTO 0	22 00		
	STO D	33 14	CHECK "X" LOSE BET IF F2 NOT SET	b	Q LBL b	32 25 12	ANY 3 of a KIND	
	FINT	31 83			WSFZ	35 51 02		
	FGSB 2	31 22 02			a	Q LBL a	32 25 11	SPECIFIC 3 of a KIND
	HF?2	35 71 02			STO D	33 14		
	HF?2	35 71 02			RCL 7	34 07		
130	GTO 8	22 08	CHECK "Y" LOSE BET IF F2 NOT SET		RCL 8	34 08	GTO 8 if X≠Y≠Z	
	RCL D	34 14			9X≠Y	32 61		
	QFRAC	32 83			GTO 8	22 08		
	RCL A	34 11			RCL 9	34 09		
	X	71			9X≠Y	32 61		
	FGSB 2	31 22 02	LBL D SUBROUTINE		GTO 8	22 08	otherwise, check for SPECIFIC or ANY TRIPLE	
	HF?2	35 71 02			HF?2	35 71 02		
	HF?2	35 71 02			GTO 1	22 01		
	GTO 8	22 08			RCL D	34 14		
140	5	05			9X≠Y	32 61		
	GTO 7	22 07	CHECK EACH DIE		GTO 8	22 08	(150)	
2	FLBL 2	31 25 02			RCL 3	34 03		
	RCL 7	34 07			GTO 7	22 07		
	FGSB 3	31 22 03			FLBL 1	31 25 01	ANY TRIPLE	
	RCL 8	34 08			2	02		
	FGSB 3	31 22 03	SP2 if any die matches your guess.		4	04		
	RCL 9	34 09			GTO 7	22 07		
3	FLBL 3	31 25 03			c	Q LBL c	32 25 13	2 OF A KIND
	9X=Y	32 51			STO D	33 14		
150	WSFZ	35 51 02			RCL 7	34 07		
	HR↓	35 53	WIN (LBL A RETURN) AMOUNT of BET X ODDS		FGSB 1	31 22 01		
	HR↑N	35 22			RCL 9	34 09		
7	FLBL 7	31 25 07			FGSB 1	31 22 01		
	HF?1	35 71 01			HF?2	35 71 02		
	HR↑N	35 22			HF?2	35 71 02	LOSE BET IF F2 NOT SET	
	RCL 2	34 02	LOSE (LBL A RETURN) LOSE AMOUNT OF BET		GTO 8	22 08		
	X	71			8	08		
	STO +4	33 61 04			GTO 7	22 07		
	GTO 9	22 09			1	FLBL 1	31 25 01	CHECK for PAIR
160	8	08			RCL D	34 14		
	FLBL 8	31 25 08	COMPLETE ROUND DECREMENT COUNTER		9X≠Y	32 61		
	HF?1	35 71 01			HR↑N	35 22		
	HR↑N	35 22			RCL 8	34 08		
	RCL 2	34 02			220	9X=Y	32 51	
	CHS	42				WSFZ	35 51 02	
	STO +4	33 61 04			HR↑N	35 22		
9	FLBL 9	31 25 09						
	1	01						
	STO -5	33 51 05						
LABELS				FLAGS		SET STATUS		
A BIG, SMALL	B 1 of a kind	C TOTAL	D 2 DICE (X.Y)	E BET	0	FLAGS	TRIG	DISP
a SPECIFIC TRIPLE	b ANY TRIPLE	c ANY PAIR	d	e INITIALIZE	1 USED FOR LBL A	ON OFF	DEG ☒	FIX ☒
0 SHAKE DICE	1 USED	2 USED	3 USED	4 LBL C LOOP	2 USED	0 ☐ ☒	GRAD ☐	SCI ☐
5 USED	6	7 WIN	8 LOSE	9 COMPLETE ROUND	3 KEYBOARD ENTRY	1 ☐ ☒	RAD ☐	ENG ☐
						2 ☐ ☒		n <u>3</u>
						3 ☐ ☒		

RE-SET RS for
CONTINUED PLAY USING
the SAME BET.

STOP if MORE BETS remain

← HIDDEN NUMBER

THROW DICE AGAIN.

ANY 3 of a KIND

SPECIFIC 3 of a KIND

GTO 8 if $X \neq Y \neq Z$

otherwise, check for
SPECIFIC or ANY TRIPLE

(150)

ANY TRIPLE

2 OF A KIND

LOSE BET IF F2 NOT SET

CHECK for PAIR

Data Card Contents

DATA CARD 1		DATA CARD 2		DATA CARD 3	
Register Contents	Reg. #	Register Contents	Reg. #	Register Contents	Reg. #
0.5284163	0				
0. (Hidden #)	1				
0. (Bet)	2				
- 150.	3				
0. (Bank)	4				
0. (# of Bets)	5				
0. Total of 3 Dice	6				
0. (Die #1)	7				
0. (Die #2)	8				
0. (Die #3)	9				
17.0450	S0				
16.0518	S1				
15.0614	S2				
14.0712	S3				
13.0808	S4				
12.0906	S5				
11.1006	S6				
0.	S7				
0.	S8				
0.	S9				
10.	A				
100.	B				
0.	C				
0. (Used)	D				
0. (Used)	E				
0. (Used)	I				