

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)					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)															SMALL (A)
	11-17															4-10
	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1

Play a game of SIC BO.

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

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Program Listing I

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STEP	KEY ENTRY	KEY CODE	COMMENTS	STEP	KEY ENTRY	KEY CODE	COMMENTS
001	e	g LBLc	32 25 15	INITIALIZE		STO 5	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	DSP2	23 02
		STO +0	33 61 00			h RTN	35 22
		0	00		A	f LBLA	31 25 11
		STO 4	33 04			h SF1	35 51 01
0		f LBL0	31 25 00			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 GSB1	31 22 01			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 GSB1	31 22 01			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 GSB1	31 22 01			GTO 5	22 05
		STO 9	33 09		B	f LBLB	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			g X < Y	32 51
		RCL 4	34 04			GTO 5	22 05
		h RTN	35 22			RCL 9	34 09
1		f LBL1	31 25 01			g X ≠ Y	32 81
		RCL 0	34 00		090	GTO 8	22 08
		9	09		5	f LBL 5	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			STO D	33 14
040		STO 0	33 00			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 LBLE	31 25 15			f INT	31 83
		f INT	31 83			g X = Y	32 51
050		STO 2	33 02			h SF2	35 51 02
		h LSTX	35 82			RCL D	34 14
		g FRAC	32 83			h LSTX	35 82
		RCL A	34 11			g FRAC	32 83
		X	71		110	RCL B	34 12
		f X = 0	31 51			X	71
		1	01			f INT	31 83

SHAKE 3 DICE

DIE #1

DIE #2

DIE #3

HIDDEN NUMBER =
XYZ.TT (where
X = DIE #1, Y = DIE #2,
Z = DIE #3, TT = TOTAL)

RANDOM NUMBER GEN.

EACH ROLL of a DIE =
 $\text{INT} [6(\text{SEED}) + 1]$

PLACE YOUR BET

STORE WHOLE DOLLAR
AMOUNT IN R2

CHECK FOR MULTIPLE BETS
1, if default.

BIG, SMALL

check for TRIPLE

IF X=Y=7, "WINNINGS"
for LBLA or LBLB would
be 150 or 24 (≥ 10).
Therefore, if $10 \leq Y$,
GTO 8.

SET FLAG 2 for BIG

1 OF A KIND

check each of the
3 dice.

WIN for LBLA, LBLB

3-DICE TOTAL

IF X ≠ Y, LOSE BET
OTHERWISE, CHECK R50-
R5C FOR SPECIFIC WIN

LBL C LOOP

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	
	qx=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	WIN 6, 8, 12, 14, 18, OR 50 TIMES BET.		STO 5	33 05	← HIDDEN NUMBER	
1	FLBL 1	31 25 01			DSP 0	23 00		
120	HLSTX	35 82			HF?2	35 71 02		
	qFRAC	32 83			R/S	84		
	RCL B	34 12			DEP 2	23 62		
	X	71	2 DICE (X.Y)		RCL 1	34 01	THROW DICE AGAIN.	
	GTO 7	22 07		180	f-x-	31 84		
D	FLBL D	31 25 14			GTO 0	22 00		
	STO D	33 14		b	qCBL b	32 25 12		ANY 3 of a KIND
	FINT	31 83			WSFZ	35 51 02		SPECIFIC 3 of a KIND
	FGSB 2	31 22 02	CHECK "X"	a	qLBL a	32 25 11	GTO 8 if X≠Y≠Z otherwise, check for SPECIFIC or ANY TRIPLE (150) ANY TRIPLE 2 OF A KIND LOSE BET IF F2 NOT SET CHECK for PAIR	
	HF?2	35 71 02	LOSE BET IF F2 NOT SET		STO D	33 14		
130	HF?2	35 71 02	CHECK "Y"		RCL 7	34 07		
	GTO 8	22 08			RCL 8	34 08		
	RCL D	34 14			qx≠y	32 61		
	qFRAC	32 83		190	GTO 8	22 08		
	RCL A	34 11			RCL 9	34 09		
	X	71			qx≠y	32 61		
	FGSB 2	31 22 02			GTO 8	22 08		
	HF?2	35 71 02			HF?2	35 71 02		
	HF?2	35 71 02		LOSE BET IF F2 NOT SET		GTO 1	22 01	
	GTO 8	22 08			RCL D	34 14		
140	5	05	LBL D SUBROUTINE		qx≠y	32 61		
	GTO 7	22 07			GTO 8	22 08		
2	FLBL 2	31 25 02			RCL 3	34 03		
	RCL 7	34 07		200	GTO 7	22 07		
	FGSB 3	31 22 03		1	FLBL 1	31 25 01		
	RCL 8	34 08		2	02	2 OF A KIND LOSE BET IF F2 NOT SET CHECK for PAIR		
	FGSB 3	31 22 03		4	04			
	RCL 9	34 09		GTO 7	22 07			
3	FLBL 3	31 25 03	CHECK EACH DIE	c	qLBL c		32 25 13	
	qx=y	32 51	SF 2 if any die matches your guess.		STO D		33 14	
150	WSFZ	35 51 02			RCL 7		34 07	
	HR↓	35 53			FGSB 1		31 22 01	
	HR↑N	35 22			RCL 9		34 09	
7	FLBL 7	31 25 07		WIN			FGSB 1	31 22 01
	HF?1	35 71 01	(LBL A RETURN)	210	HF?2		35 71 02	
	HR↑N	35 22			HF?2	35 71 02		
	RCL 2	34 02			GTO 8	22 08		
	X	71			8	08		
	STO +4	33 61 04		AMOUNT OF BET X ODDS		GTO 7	22 07	
	GTO 9	22 09	LOSE	1	FLBL 1	31 25 01		
160	FLBL 8	31 25 08		(LBL A RETURN)		RCL D	34 14	
	HF?1	35 71 01				qx≠y	32 61	
	HR↑N	35 22				HR↑N	35 22	
	RCL 2	34 02		LOSE AMOUNT OF BET		RCL 8	34 08	
	CHS	42	COMPLETE ROUND	220	qx=y	32 51		
	STO +4	33 61 04				WSFZ	35 51 02	
9	FLBL 9	31 25 09		DECREMENT COUNTER		HR↑N	35 22	
	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 <input checked="" type="checkbox"/>	FIX <input checked="" type="checkbox"/>
0 SHAKE DICE	1 USED	2 USED	3 USED	4 LBL C LOOP	2 USED	0 <input type="checkbox"/> <input checked="" type="checkbox"/>	GRAD <input type="checkbox"/>	SCI <input type="checkbox"/>
5 USED	6	7 WIN	8 LOSE	9 COMPLETE ROUND	3 KEYBOARD ENTRY	1 <input type="checkbox"/> <input checked="" type="checkbox"/>	RAD <input type="checkbox"/>	ENG <input type="checkbox"/>
						2 <input type="checkbox"/> <input checked="" type="checkbox"/>		n 3
						3 <input type="checkbox"/> <input checked="" type="checkbox"/>		

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				