

Some Random Games

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With the increasing number of inexpensive programmable calculators, game and entertainment programs are becoming popular.

Here are two simple entertainment programs written for the Texas Instruments model 58 or 59 programmable calculators with the master library. After entering any of the programs, always single step through the program, checking the entries against the program listing to help prevent wrong entries.

Listing 1 is the ESP program. The object of this game is to guess the number (0 or 1) that the program will come up with. The operator enters either a 0 or a 1 into the calculator, then presses D. The calculator displays its number, independent of the input. The number of correct guesses is stored in register 01 while the total number of guesses is stored in register 00.

The random number generator program of the master library is used to calculate a random number between 0 and 1. The program then rounds the number to either a 0 or 1. The steps required to generate this random number using the library program are as follows:

1. Call up program 15.
2. Enter a seed number.
3. Press A.
4. Press E to initialize the program.
5. Press SBR and D.MS to obtain answer.

To obtain another random number, repeat step 5. These steps are accomplished by program steps 00, 01, 03 through 05, and 12 through 15.

The guess is entered by steps 08 through 11 and is stored in register T. Steps 21 and 22 keep track of the number of guesses. Steps 23 through 25 determine if the guess is correct, and steps 26 and 27 keep track of the number of correct guesses.

To use the program:

1. Enter the program from the program listing.

2. Press RST.
3. Enter a seed number (between 0 and 19907).
4. Press A.
5. Enter guess (either 0 or 1).
6. Press D (the number calculated will then be displayed).
7. Repeat steps 5 and 6 for the next guess.
8. Read registers 00 and 01 to determine the number of guesses and the number of correct guesses.
9. Start at step 2 to reinitialize the program.

Listing 2 is a dice game. This program allows the user to "roll two dice" and end up with two random numbers (representing the dice) between 1 and 6. The two num-

bers are separated by a decimal point. In this program, as with the previous program, a seed number is entered to initialize the random number generator. Entering the same seed number will result in the same sequence of numbers for the rolls of the dice. But there are over 19,000 possible combinations for the seed, so it is virtually impossible to memorize the sequence for more than a few seed numbers. Also, by letting a player other than the operator enter the seed number, the possibility of cheating is eliminated.

Program steps 1 through 14 set the limits for the random number program to 0.5 and 6.5. Steps 16 and 17 set up the loop for the roll of the dice. Steps 21 through 23 determine the value of the first die. Steps 24 through 30 round this to a whole number

Listing 1: ESP program for guessing which number will be played next.

| Location | Keys | | | | | | Commentary |
|----------|------|-----|-----|-----|-----|------|---|
| 00 | 2nd | LBL | A | | | | Define A as seed. |
| 02 | 2nd | CM | | | | | Clear memory. |
| 03 | 2nd | PGM | 15 | E | | | Initialize random number program. |
| 06 | 2nd | LBL | + | | | | Define loop. |
| 08 | R/S | 2nd | LBL | D | | | Enter guess. |
| 11 | X↔T | | | | | | Move to T. |
| 12 | 2nd | PGM | 15 | SBR | 2nd | D.MS | Calculate random number between 0 and 1. |
| 16 | 2nd | FIX | 0 | EE | INV | EE | Round answer to either 0 or 1. |
| 21 | 2nd | OP | 20 | | | | Increment number of guesses. |
| 23 | INV | 2nd | X=T | + | | | If guess does not equal number, go to loop. |
| 26 | 2nd | OP | 21 | | | | Increment number of correct guesses. |
| 28 | GTO | + | | | | | Go to loop for next try. |

and store the results. Steps 31 through 38 determine the value of the second die and round it to a whole number. Steps 39 through 46 combine the two numbers by multiplying the value of the second die by 0.1 and adding to the first value. Steps 47 and 48 loop back to display the results and wait for the next roll.

To use the program:

1. Load program from program listing.

2. Press RST.
3. Enter seed number (between 0 and 19907).
4. Press R/S (display will go out and then display 0).
5. Press D to roll the dice. The display will show the value of the two dice, separated by a period.
6. Press D to roll the dice again.
7. To reinitialize the program, return to step 2. ■

Listing 2: Dice program for rolling two dice. The two dice are displayed on either side of the decimal point.

| Location | Keys | Commentary |
|----------|---|---------------------------------------|
| 00 | 2nd CM | Enter seed number. |
| 01 | 2nd PGM 15 | Initialize random number program. |
| 03 | E . 5 | Set lower limit at 0.5. |
| 06 | 2nd PGM 15 | |
| 08 | A 6 . 5 | Set upper limit at 6.5. |
| 12 | 2nd PGM 15 B 0 | Zero display. |
| 16 | 2nd LBL + | Set up loop. |
| 18 | R/S | Stop program and display results. |
| 19 | 2nd LBL D | |
| 21 | 2nd PGM 15 C | Calculate value of first die. |
| 24 | 2nd FIX 0 EE INV EE | Round value to a whole number. |
| 29 | STO 0 | Store value of first die. |
| 31 | 2nd PGM 15 C | Calculate value of second die. |
| 34 | 2nd FIX 0 EE INV EE | Round value to a whole number. |
| 39 | INV 2nd FIX X . 1 | Multiply value of second die by 0.1. |
| 44 | + RCL 0 = | Combine first and second dice values. |
| 47 | GTO + | Loop back for next roll. |