Recursive Equations on the TI-82/83 II

MA 114
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The following instructions are primarily for the TI-82 and -83, with modifications for the -85 and -86. The program developed here will allow you to generate values for general recursive systems.

Program Inputs
First off, here’s what the four program inputs are used for:

1. D: The initial amount ($D_0$).
2. I: The decay/growth rate. This may be zero, positive, or negative.
3. S: The period increase. This, also, may be any value.
4. N: The number of periods over which to iterate. This number should be a positive integer. For example, if you wanted to know your salary five years from now you would want to calculate $D_5$. Thus, 5 should be entered for N.

The recursive system solved by this program is:

$$D_0 = D$$
$$D_n = (1+I)D_{n-1} + S$$

The program will calculate and display the value of $D_N$.

Starting a New Program
1. Press the PRGM key. Use the arrow key to go over to NEW. Choose Create New. (For the -85 or -86, choose the EDIT menu.)
2. Enter a name for your program (note that the keyboard is in alpha-lock mode). Press ENTER after entering the program name. For example: REC
3. You are now in program editing mode.
4. Once you have finished editing a program, exit editing mode by pressing 2nd then QUIT.

Running a Program
1. Press PRGM to display the list of programs.
2. Select the program you want to run.
Entering I/O Statements

While you are editing a program on the TI-82 and -83, pressing the PRGM key will bring up a menu. Use the arrow keys to select the I/O menu and then choose the appropriate I/O statement from the menu. On the -85 and -86, this menu is always accessible from the menu selection key just below the display panel.

1. Prompt: prompt the user for an input value for a variable. Example:

   Prompt D

   will prompt the user for a value which is stored in the variable D.

2. Disp: output a value. Example:

   Disp D

   will print the value of D.

Entering Control Statements

While you are editing a program on the TI-82 and -83, pressing the PRGM key will bring up a menu. Use the arrow keys to select the CTL menu and then choose the appropriate statement from the menu. On the -85 and -86, this menu is always accessible from the menu selection key just below the display panel.

1. For(: Used to repeat a set of statements a certain number of times. This is called a loop. Example:

   For(A,1,5)
   Disp D
   End

   Will print the value of D 5 times. A is the For( loop control variable and can be safely ignored. End indicates the last statement to be repeated by the For( loop.

2. End: See For(.

3. Stop: The last statement of a program. The program stops running.

The Program

Enter the program exactly as you see it here, commas, spaces, parentheses, and everything.

Prompt D
Prompt I
Prompt S
Prompt N
For(J,1,N)
(1+I)D+S STO D
End
Disp D
Stop