Lecture Notes: Programming Business Formulas

in R

by Professor F

I’m assuming you’ve done the “Lecture Notes: Variables, Operators, Expressions, and Operator Precedence” reading. If you haven’t done so, go back and do the reading and all the hands-on sections within the reading.

The bottom line is that after all the readings, you have the foundation for programming basic business formulas. Essentially, you can write an R program for any business formula that does not involve either loops or conditionals, and there are a lot of useful business formulas. Let’s go over converting one very popular business formula, Present Value.

Here’s the problem: Suppose someone promises to give you $10,057, 5 years from now. Assuming a 15% rate of return, how much is that money worth today? Write a program to solve the present value.

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| **Action** | **Reaction** |
| **OPEN DEVELOPMENT ENVIRONMENT, SETUP FILE, FIND EQUATION** | |
| 1. Run R and open your project (from the first reading)   Notes:   * The project name will have an .Rproj extension, e.g., Week2.RProj * From the first reading, I have a project folder named Week2 inside of the folder MGMT-330-R. * I recommend you create a main project folder named MGMT-330-R with a subfolder Week 2. |  |
| 1. File > New File > R Notebook |  |
| 1. File > Save As > *LastName*-*FirstName*-Homework2   Notes:   * Please replace *LastName* and *FirstName* with your actual names! E.g., Flor-Nick-Homework2 * Verify that your new notebook file shows up in the lower-right panel. * The .Rmd extension is added automatically. |  |
| 1. Delete all boilerplate text. 2. Add an appropriate title, e.g., “Homework 2”. 3. Add yourself as the author, e.g., “Nick V. Flor”.   Notes:   * I didn’t show step 6 in the previous readings, but you should always add yourself as the author. |  |
| 1. Add a label, e.g., *Sample Problem:* |  |
| 1. Add a code chunk *Code* (menu) > *Insert code Chunk* |  |
| 1. Locate the appropriate formula in the business formula reading. You may only use those formulas, not ones you find off of the internet. |  |
| **STEP 1: INPUT** | |
| 1. Determine the input and output variables. | The inputs variables are all the variables to the right of the equals sign, *Future Value*, *Rate of Return*, and *Time.*  The output variable is the variable to the left of the equals sign, *Present Value* |
| 1. Add the comment line: **# INPUT**   Notes:   * Technically, you don’t have to add a comment. * Comments aren’t executed by the computer. * However, you should add comments to denote key parts of the code, and to serve as mental signposts when you’re first learning to code. |  |
| 1. Add code to assign initial values to the input variables.   Notes:   * You have to enter values without $ signs and commas, e.g., $10,507 must be coded as **10507** * You have to enter percentages as decimals, e.g., 15% must be coded as **0.15** * You could also enter 15% as 15/100 vs .15 |  |
| **STEP 2: PROCESSING** | |
| 1. Add the comment **# PROCESSING** |  |
| 1. Code the equation   Notes:   * I added a comment marking the Processing section * I commented the present value formula to the right of the statement (line 9). |  |
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| **STEP 3: OUTPUT** | |
| 1. Display the result in the console window.   Notes:   * Again, note the Output section comment and the statement comment to the right |  |
| **STEP 4: TEST** | |
| 1. Debug > Start Debugging OR Bug Icon > Run Arrow OR   F5  Notes:   * Again, note the Output section comment and the statement comment to the right   WE’RE DONE!!! |  |
| **STEP 2A: PROCESSING (ALTERNATIVES)** | |
| Sometimes the equations are so complex that you have to assign variables to expressions before doing the final calculation. Here’s one example  Note:   * I declared top and bottom variables * Lines 10-12 is the new PV calculation using top & bottom * Line 13 is the original PV formula commented out so the computer doesn’t run it. * The answer is the same: $5000.11 |  |

***Don’t be afraid to put complex expressions in variables and to substitute those variables in the original equation.***

That’s it. I have given hints / solved 2 or the 20 homework questions, now practice programming with the other 18!

Good luck!