CS150-01 Lab 9

Compound Interest

Date Assigned: Tuesday, October 26, 2004

Date Due: Tuesday, November 2, 2004

Points: 15

Objectives

Program using functions.

Problem statement

The compound interest formula is as follows:

$A = P(1 + \frac{i}{m})^{mn}$

where:

A = the amount earned at the end of years n

P = the principal

i = the interest rate

m = compounding times per year

n = number of years

Write a complete C++ program that asks the user to input the initial principal (principal), the interest rate (rate), the compounding time (compound) and the number of years (years). You are to produce a table that shows the yearly values for the interest rate inputted and the following three interest rates. Your table should look like:

```
Years   Amount(6%)   Amount(7%)   Amount(8%)   Amount(9%)

    1   ######.##    ######.##    ######.##    ######.##

    2   and so on
```

Your main C++ function must call two other functions:

1. headings: this function accepts the rate and produces the headings shown above. The only purpose of this function is to produce the headings under which the results will be printed.
2. compute: this function will accept the principal, interest rate, compouding, and the number of years and return the amount that the investment is worth.

Steps for software development

1. First, we need to understand the program requirements. What needs to be calculated? Is there any additional information that we need?

2. Next, we need a program analysis. Answering the following questions will help guide you through the process.

   (a) What is the input to your program? What units will it be in?

   (b) What is the output to your program? What units will it be in?

   (c) Is there any data that will be internal to your program?

   (d) What are the calculations needed for your program?

3. What is the algorithm to solve this problem? Here you should describe in English the steps for solving the program. This is the place where you decide the specifics of your program. For example, if you need to use any selection or repetition structures.

4. Create a new project in Visual Studio .NET. You should name your project "09CompoundPUNetId", where PUNetId is your own id. I would name my project "09Compoundkhoj0332". While working on a project, it should be located on the current computer you are working on (i.e. the desktop). Once you have completed developing, you should copy the project folder onto Turing.

5. Write the code that will solve the problem. Make sure that you add comments to the code as you type and that your code follows the coding standards
6. How can you verify that your program works correctly? What numbers would you use to test the program.

What to turn in

When you have completed writing the program and you have verified that it works correctly, you will need to show it to the instructor or the TA.

Once you have done this you will submit the project for grading. You submit your program by placing a copy of the project folder in the "CS150-01 Lab" folder on Turing. Make sure that you also place a copy of the project folder in your own folder on Turing.

To receive full credit for this lab project, your program must be in the "CS150-01 Lab" folder by 8am on Tuesday, November 2. DON'T FORGET TO VOTE!