CS150 Assignment 5

Rainfall Study

Date assigned: Friday, October 31, 2008
Design Documents Due: Tuesday, November 4, 2008, 5 pm (5 points)
Date due: Friday, November 7, 2008, 9:15 am (35 points)

Total points: 40

Problem

For this assignment, you need to produce a computer program that will allow biologists to record and analyze the rainfall over a 10 day period. You will need to ask the user to input the amount of rainfall, in centimeters, received each day. You may assume that the user will enter rainfall amounts as decimal numbers < 10.0 cm and >= 0.0 cm.

You need to display a table containing the amount of rainfall received each day. Display each number with exactly 1 numeral after the decimal point. For your analysis, you need to print the average rainfall, the total rainfall, and which day received the most rainfall as well as the amount of rain on that day.

Submit an electronic copy of your design document

Before you start you need to think about the data in your program and the calculations you will need to perform. Answer the following questions in a GoogleDoc (named **05ProgramDesignPUNetID**) and share it with the instructor (profchadd@gmail.com). Be sure to answer the questions in complete sentences where appropriate. This design document is due on **Tuesday at 5pm**.

Design Questions:

1. What data will you need to store for this program, and what are their data types?
2. What data will you need to store in an array?
3. What operations will need to be protected by if statements?
4. How many loops will you need for your program?
5. What will your program need to do in each loop?
6. What data and conditions will your program use to stop the loop(s)?

Notes

1. You must use an array.
2. You must follow the coding standards.
3. You must use constants when possible.
4. Your program will be graded on efficiency. In other words, you will be marked down for repeating code statements unnecessarily.
5. You may only use the C++ programming concepts covered thus far in class. Do not use any more advanced concepts that we have not covered or any other programming concepts that you have had experience with.
6. Your output must look **exactly** like the sample given.
7. You must comment your code appropriately.
8. Refer to the syllabus for what constitutes plagiarism, and the consequences for plagiarizing.

Output

The output for this program should look exactly like this:

```
++++++++++++++++++
|Rainfall Analysis|
++++++++++++++++++

Please enter the rainfall for ten days:
1.0 0.0 1.0 0.1 0.5 2.3 3.1 1.0 1.0 1.1

Analysis:
-------------------------------------------------------------
Day  |   1 |   2 |   3 |   4 |   5 |   6 |   7 |   8 |   9 |  10 |
Rain | 1.0 | 0.0 | 1.0 | 0.1 | 0.5 | 2.3 | 3.1 | 1.0 | 1.0 | 1.1 |
-------------------------------------------------------------

Average:  1.1
Total  : 11.1
Maximum:  3.1 on day 7
```

To complete this assignment you must

1. Create a new C++ project in Visual Studio. Name your project "05Rainxxxxxxxx", where xxxxxxxx should be replaced by your PU Net Id. As an example, my project would be called "05Rainwill4614". It is vital that you name your project correctly!
2. Type the solution (fully documented/commented) to the problem into your project.
3. Make sure that your program compiles and runs correctly. If you get any errors, double check that you typed everything correctly. Be aware that C++ is case sensitive.
4. Once you are sure that the program works correctly it is time to submit your program. You do this by logging on to Turing and placing your complete project folder in the CS150-02 drop folder. Make sure that you copy your program folder and don't move it. If you move it, then you will not have your own copy!

Remember:

To receive full credit for this assignment, your project must be in the drop box by 9:15am on the day that it is due. Anything later will be considered late. Further, you must bring a color hard copy of your program to class and place it on the instructor's desk by 9:15am.

Good luck! And remember, if you have any problems, come and see me straight away.