

Program Selection — Iteration

Iteration is the foundation of many programs in C++. In this project, you will write a short program that will read Curator grading data from an input file, select a specific program grade to assign to a student, and then print nicely formatted results to an output file.

This program will produce a grade report for a single programming assignment. Each student is allowed five (5) submissions. For each student in the input file, select the program submission with the highest grade. In the case of ties, the first submission with the highest grade is used. A “-1” indicates an unused submission. A student entry with a first program grade of -99 signifies the end of the input that should be processed. No output should be produced for this “sentinel” line, or for any subsequent data. The input file format is described below.

The input file:

The input file for this program is named “ProgGrades.txt”. A sample input file is given below:

Boole, George	98	105	-1	-1	-1
Pascal, Blaise	63	48	92	92	92
Babbage, Charles	100	97	100	98	-1
Kepler, Johannes	75	102	100	-1	-1
Clown, Bozo	0	6	6	57	62
Fini, End	-99	-99	-99	-99	-99

Each line in the input file represents the grades for a student. The student’s name appears first, and then a grade for each program submission appears. There will be a student name and five integers on each line. For simplicity, we guarantee that every student will have made at least one submission. We also guarantee that the input file will contain a sentinel line.

This is a tab-delimited file; that is, there is one tab character separating the student name from the first score, and one tab character separating adjacent scores. No input line will contain more than 255 characters.

What must be calculated:

For each student, your program must determine the highest grade and which submission received the highest grade. In the case of a tie, the earliest submission with the highest grade should be selected.

The output file:

The output file is named “GradeReport.txt”. An output file, which corresponds to the given input file, is shown below:

Programmer: Rich Wheaton		
CS 1044 Project 4 Fall 2003		
Student	Submission	Grade
Boole, George	2	105
Pascal, Blaise	3	92
Babbage, Charles	1	100
Kepler, Johannes	2	102
Clown, Bozo	5	62

The first two lines specify the programmer and the assignment, and the third is blank. The fourth line identifies each column in the grade report. Each of the remaining lines contains the student name, submission number with the highest grade, and the highest grade. The columns in the grade report are separated by a single tab.

Note: When you view the input file or the output file in an editor like *Word* or *Notepad*, the columns may not line up exactly as shown. That is OK. Try opening the file in *Microsoft Excel*, to see how your output is converted to a spreadsheet.

If you have read the description of how the Curator scores your program in the *Student Guide*, you know that is important that you use the same spelling and capitalization for all the labels shown above. The horizontal spacing does not effect scoring unless you combine things that should be separate or separate things that should be combined. You must, however, use blank lines exactly as shown in the sample output.

Documentation and other requirements:

You must meet the following requirements (in addition to designing and implementing a program that merely produces correct output):

- Write a header comment with your identification information, the required pledge statement (below), and a brief description of what the program does.
- Write a comment explaining the purpose of every variable and named constant you use.
- Write comments describing what most of the statements in your program do.
- Use descriptive identifiers for variables and for constants.
- Use named constants instead of “magic numbers” whenever it is appropriate. Note: there are some candidates in this category.
- Use both a `while` loop and a `for` loop (appropriately) in your implementation.

Submitting your program:

You will submit this assignment to the Curator System (read the *Student Guide*), and it will be graded automatically. Instructions for submitting, and a description of how the grading is done, are contained in the *Student Guide*.

You will be allowed up to five submissions for this assignment. Use them wisely. Test your program thoroughly before submitting it. Make sure that your program produces correct results for every sample input file posted on the course website. If you do not get a perfect score, analyze the problem carefully and test your fix with the input file returned as part of the grade report, before submitting again. The highest score you achieve will be counted.

The *Student Guide* and submission link can be found at: <http://www.cs.vt.edu/curator/>

Evaluation:

Your submitted program will be assigned a score based upon the runtime testing performed by the Curator System. We may very well evaluate your submission of this program for documentation style, and to see whether you followed the requirements given in this specification. Therefore, you should compare your comments to those given in the programs for project1 and 2. The programs serve as useful a guide to acceptable documentation style at this point in the course.

If your program is evaluated for documentation and requirements, your instructor will specify how that score will be counted.

Pledge:

Each of your program submissions must be pledged to conform to the Honor Code requirements for this course. Specifically, you **must** include the following pledge statement in the header comment for your program:

```
// On my honor:  
//  
// - I have not discussed the C++ language code in my program with  
// anyone other than my instructor or the teaching assistants  
// assigned to this course.  
//  
// - I have not used C++ language code obtained from another student,  
// or any other unauthorized source, either modified or unmodified.  
//  
// - If any C++ language code or documentation used in my program  
// was obtained from another source, such as a text book or course  
// notes, that has been clearly noted with a proper citation in  
// the comments of my program.  
//  
// - I have not designed this program in such a way as to defeat or  
// interfere with the normal operation of the Curator System.  
//  
// <Student Name>
```

Failure to include this pledge in a submission is a violation of the Honor Code.