

CS 150 Lab 11 More Functions

The main objective of today's lab is to continue writing functions understanding passed by value versus passed by reference.

- Be sure your output looks exactly like the specified output.
- Submit the completed project to CS150-02 Lab by Friday at 5pm.
- Follow the coding standards and add comments to your code!
- Your projects are to be created in **PUNetIDLabsSecond**

Write a complete C++ program in a project **11_1_Grader** that will process a class of student grades. The data file "grades.txt" is:

```
5 10.0 10.0 15.0 50.0 100.0
smith 9.0 10.0 12.0 46.0 88.0
jones 8.0 7.0 15.0 48.0 75.0
done 0.0 0.0 0.0 0.0 0.0
```

The first line is the number of scores for each student and the maximum number of points on each assignment. Each subsequent line of data is a student's last name followed by the scores they achieved on each assignment.

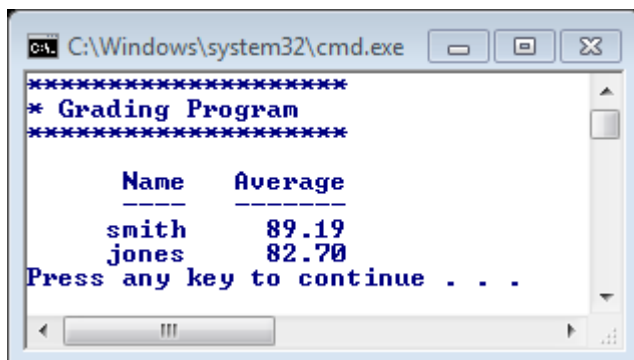
I have written most of the program that will process each student's grades. You must write each function definition and add a small amount of code in the main that will loop until the student "done" is read from the file. In the main loop, you will need to call the function `readScores` and `printIndividualResults` with the correct arguments.

I have placed the undocumented program **grader.cpp** in the CS150-02 Public folder on grace. Create a new project and then copy this code into your main.cpp.

- 1) Your program is to compile without any errors or warnings.
- 2) The entire program is to be documented and each function is to be documented including main.

Once your project is complete, place your solution **PUNetIDLabsSecond** into the CS150-01 Drop folder on grace. Your solution is to have ALL previous projects completely working and correct.

The output results must look exactly like the following:



```
C:\Windows\system32\cmd.exe
*****
* Grading Program
*****

  Name   Average
  ----   -
smith    89.19
jones    82.70
Press any key to continue . . .
```

```

void printTitle (string heading);
void printColumnHeadings ();
void readScores (ifstream &inputFile, int numScores, double &totalPoints);
void printIndividualResults (string name, double totalAchieved,
                             double totalPossible);

int main ()
{
    const string GRADING_TITLE = "Grading Program";
    const string FILE_OPEN_ERROR = "Error opening file";
    const string GRADES_TXT = "grades.txt";
    const string NO_STUDENT = "done";

    double totalPointsPossible, totalPointsAchieved;
    int numScores;
    ifstream inputFile;
    string name;

    cout << fixed << setprecision (2);

    inputFile.open (GRADES_TXT);
    if (inputFile.fail ())
    {
        cout << FILE_OPEN_ERROR << endl;
        exit (EXIT_FAILURE);
    }

    printTitle (GRADING_TITLE);
    printColumnHeadings ();

    inputFile >> numScores;
    readScores (inputFile, numScores, totalPointsPossible);

    // Write loop logic here to process each student in the class.
    // The pseudo-code is
    // read a name
    // while (name is not the last student)
    // {
    //   call readScores to get the points the student has achieved
    //   call printIndividualResults to print the student's results
    //   get the next name
    // }

    inputFile.close ();
    return EXIT_SUCCESS;
}

```

Optional Challenge:

Show a histogram of grades

Histogram

```

A's: ***
B's: *
C's: ****
D's: *
E's: *

```