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 CS150-01 Lab by Friday at 5pm.
- Follow the coding standards and add comments to your code!
- Your projects are to be created in PUNetIDLabs

Write a complete C++ program in a project 11_1_Grader that will process grades for a class. The user will be prompted with a menu that will allow them select one of the following four options:

M) Enter the number of assignments and the maximum score for each assignment
S) Enter a student’s name and their scores on each of the assignments
P) Print a summary for most recent student entered
Q) Quit

The user should NOT be able to choose option S) until they have completed option M), and the user should NOT be able to choose option P) until they have completed both options M and S. Also, after completing a particular task, the screen should be cleared using the commands:

```cpp
system("pause");
system("cls");
```

If the user selects an option other than one of the four given, the program should terminate.

Some complete sample runs of the program are below:

**Run 1: (Complete clean run)**

![Complete clean run](image)
Run 2: (Try to enter S before having entered M)
An undocumented program 11_1_GraderClean in the CS150 Public folder on grace. Create a new project and then copy this code into your main.cpp.

To complete this project, you will need to write each of the following four function definitions:

```cpp
void getScores (int numScores, double &totalPoints);
void printIndividualResults (string name, double totalEarned, double totalPossible);
void getSelection (char &userChoice);
void printTitle (string heading);
```

in addition to adding code in main that will implement the logic of the program. Within the loop structure inside main, you will need to call all four of these functions, possibly more than once.
Make certain that you completely write and test each function before moving onto the next function and BEFORE implementing any of the logic in main!

... 
void printTitle (string heading);
void getScores (int numScores, double &totalPoints);
void printIndividualResults (string name, double totalEarned, double totalPossible);
void getSelection (char &userChoice);

int main ()
{
  const string GRADING_TITLE = "Grading Program";
  const char QUIT = 'Q';
  const char GET_STUDENT_SCORES = 'S';
  const char GET_MAX_SCORES = 'M';
  const char PRINT_SUMMARY = 'P';
  double totalPointsPossible = 0;
  double totalPointsAchieved = 0;
  int numScores = 0;
  char menuChoice;
  string name;
  cout << fixed << setprecision (2);
  printTitle (GRADING_TITLE);
  getSelection (menuChoice);
  // Write the logic of the program here!
  return EXIT_SUCCESS;
} 

Show the instructor or TA your solution

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 into the CS150-01 Drop folder on grace. Your solution is to have ALL previous projects completely working and correct.

Optional Challenge:

Show a histogram of grades

Histogram
A's: ***
B's: *
C's: ****
D's: *
F's: *