COMSC 165

Spring 2020

Programming Assignment 3

Worth 20 points (2% of your grade)

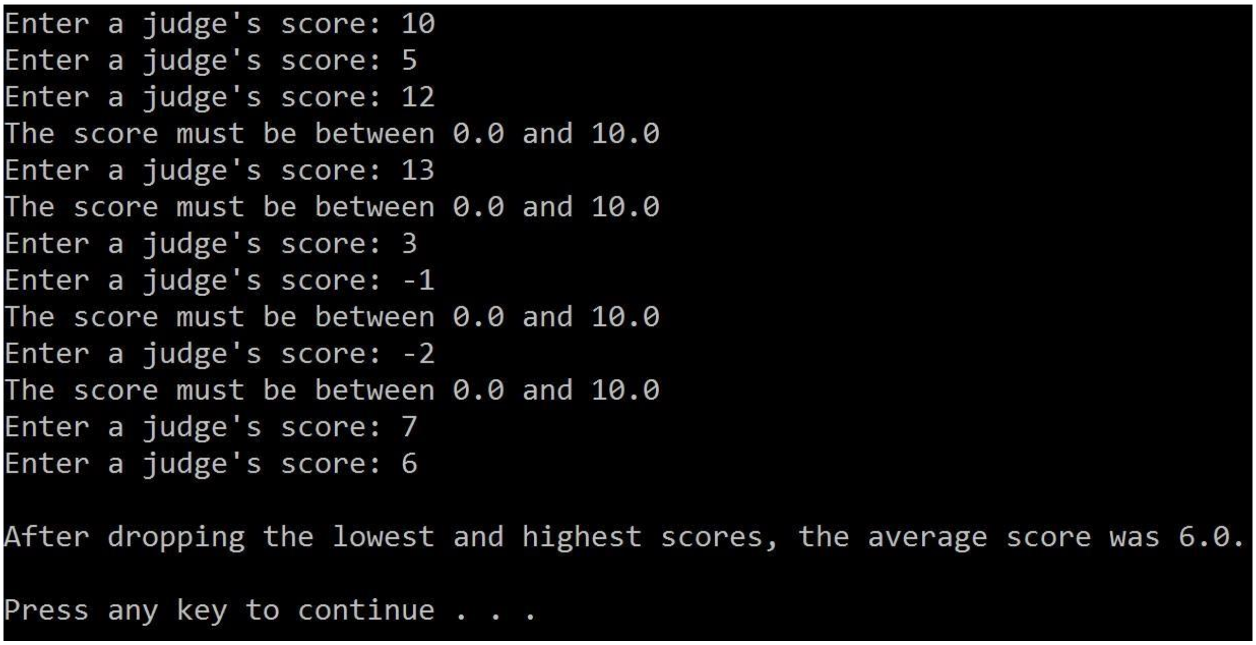
DUE: Friday, 6/26/20 by 11:59 P.M. on Canvas

Start by downloading the **165_assign3.cpp** file from the Programming Assignment 3 folder on Canvas

NOTE: Your submission for this assignment should be a single **.cpp** file and a single **.pdf** file. The following naming convention should be used for naming your files: **firstname_lastname_165_assign3.cpp and firstname_lastname_165_assign3.pdf**. The pdf file that you submit should contain the screenshots of your sample runs of the program (see below). For example, if your first name is "James" and your last name is "Smith", then your files should be named James_Smith_165_assign3.cpp and James_Smith_165_assign3.pdf.

COMMENTS (7.5% of programming assignment grade): Your program should have at least **ten (10)** different detailed comments explaining the different parts of your program. Each individual comment should be, at a minimum, a sentence explaining a particular part of your code. You should make each comment as detailed as necessary to fully explain your code. You should also number each of your comments (i.e., comment 1, comment 2, etc.). **NOTE: My comments in the code that you download do NOT count towards your ten (10) comments!**

SAMPLE RUNS (7.5% of programming assignment grade): You should submit screenshots of at least **five (5)** different sample runs of your program. Each sample run needs to use different inputs, and your sample runs should **NOT** be the same as the sample runs that are used in this write-up for the assignment. **Each sample run needs to purposefully include several invalid inputs (the invalid inputs should be different for each sample run) so I can see your input validation loop running**. You should also number each of your sample runs (i.e., sample run 1, sample run 2, etc.). Each of your sample runs should be similar to this format:



```
Enter a judge's score: 10
Enter a judge's score: 5
Enter a judge's score: 12
The score must be between 0.0 and 10.0
Enter a judge's score: 13
The score must be between 0.0 and 10.0
Enter a judge's score: 3
Enter a judge's score: -1
The score must be between 0.0 and 10.0
Enter a judge's score: -2
The score must be between 0.0 and 10.0
Enter a judge's score: 7
Enter a judge's score: 6

After dropping the lowest and highest scores, the average score was 6.0.

Press any key to continue . . .
```

Where multiple invalid inputs are included.

For your third programming assignment you will be writing the following C++ program:

There are five judges, each of whom awards a score between 0.0 and 10.0 to a computer science student that is competing in a coding competition. Fractional scores, such as 8.3, are allowed. A student’s final score is determined by dropping the highest and lowest scores received, then averaging the three remaining scores. Write a program that uses this method to calculate a student’s score. It should include the following functions:

- **void getJudgeData()** should ask the user for a judge's score, store it in a **reference parameter variable** and validate it. This function should be called by **main** once for each of the five judges. An **input validation loop** is also needed here to make sure that a judge's score is between 0.0 and 10.0. Any score that is **NOT** between 0.0 and 10.0 should be rejected (see the screenshots of the sample runs below).

- **void calcScore()** should calculate and display the average of the three scores that remain after dropping the highest and lowest scores the student received. This function should be called just once by **main** and should be passed the five scores.

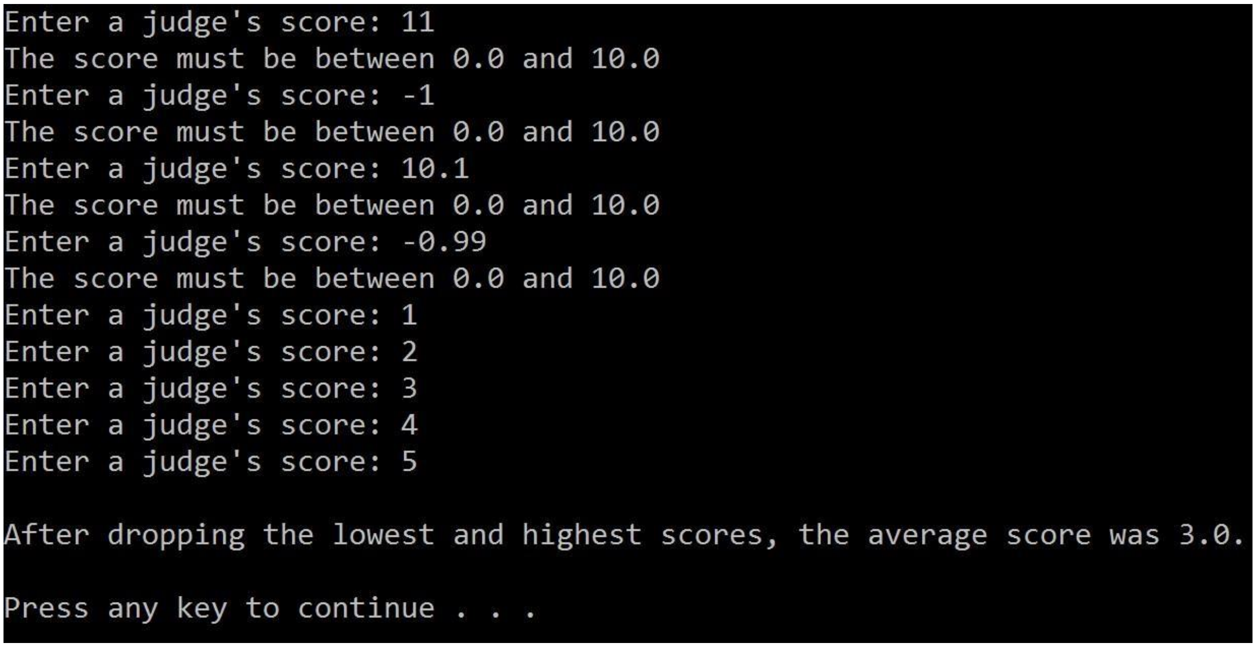
The last two functions, described below, should be called by **calcScore**, which uses the returned information to determine which of the scores to drop.

- **double findLowest()** should find and return the lowest of the five scores passed to it.

- **double findHighest()** should find and return the highest of the five scores passed to it.

The **165_assign3.cpp** file you have been given already has the function prototypes, and part of the main function. Your task is to **finish** the main function and **implement** the four functions listed in the function prototypes section of the program.

Sample Run 1:

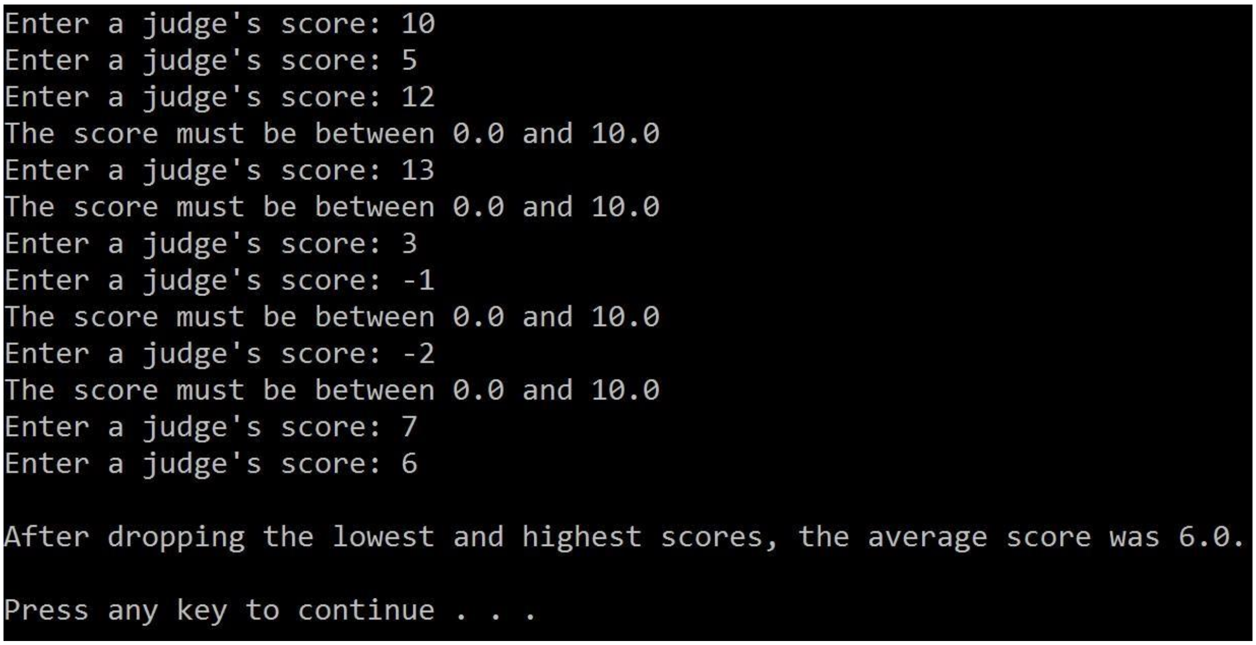


```
Enter a judge's score: 11
The score must be between 0.0 and 10.0
Enter a judge's score: -1
The score must be between 0.0 and 10.0
Enter a judge's score: 10.1
The score must be between 0.0 and 10.0
Enter a judge's score: -0.99
The score must be between 0.0 and 10.0
Enter a judge's score: 1
Enter a judge's score: 2
Enter a judge's score: 3
Enter a judge's score: 4
Enter a judge's score: 5

After dropping the lowest and highest scores, the average score was 3.0.

Press any key to continue . . .
```

Sample Run 2:



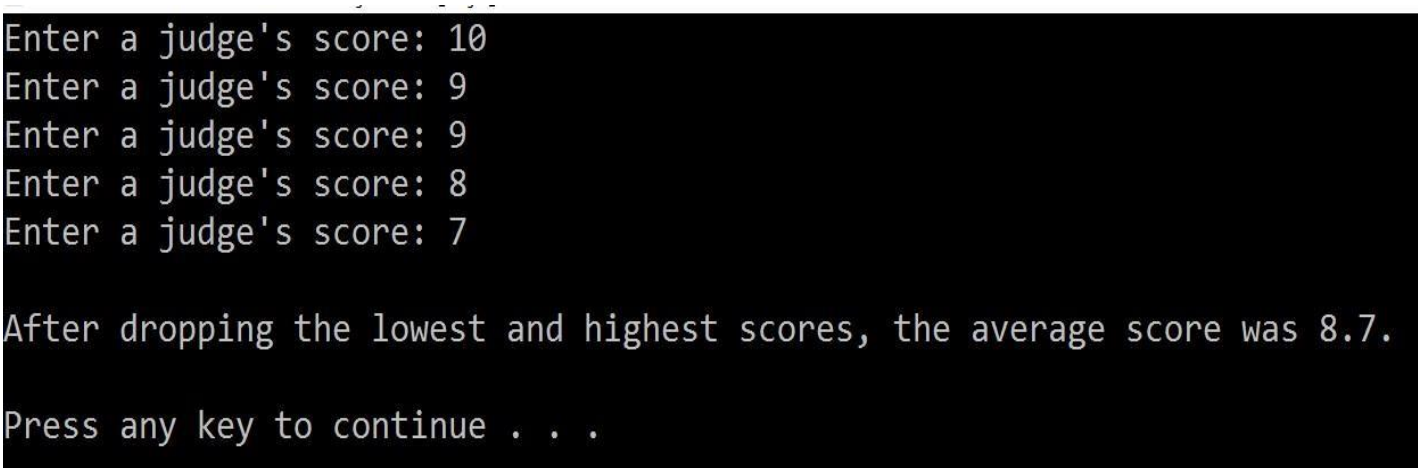
```
Enter a judge's score: 10
Enter a judge's score: 5
Enter a judge's score: 12
The score must be between 0.0 and 10.0
Enter a judge's score: 13
The score must be between 0.0 and 10.0
Enter a judge's score: 3
Enter a judge's score: -1
The score must be between 0.0 and 10.0
Enter a judge's score: -2
The score must be between 0.0 and 10.0
Enter a judge's score: 7
Enter a judge's score: 6

After dropping the lowest and highest scores, the average score was 6.0.

Press any key to continue . . .
```

NOTE: The valid judge scores here are 10, 5, 3, 7, and 6

Sample Run 3:

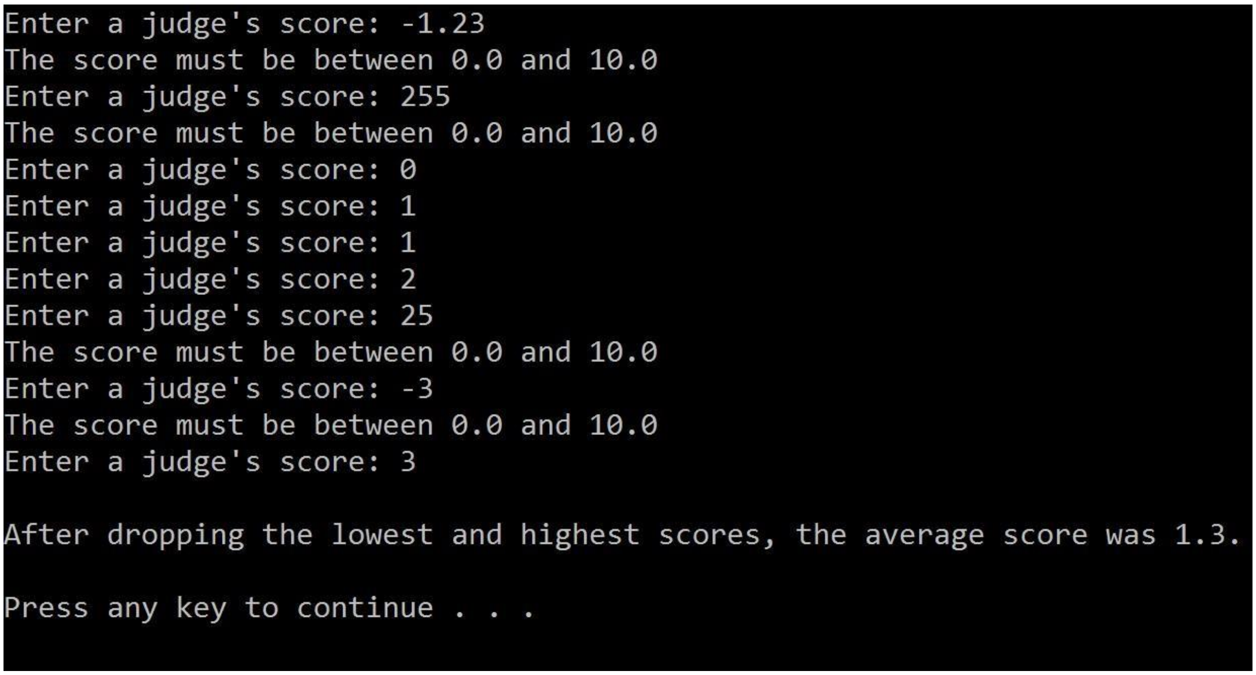


```
Enter a judge's score: 10
Enter a judge's score: 9
Enter a judge's score: 9
Enter a judge's score: 8
Enter a judge's score: 7

After dropping the lowest and highest scores, the average score was 8.7.

Press any key to continue . . .
```

Sample Run 4:



```
Enter a judge's score: -1.23
The score must be between 0.0 and 10.0
Enter a judge's score: 255
The score must be between 0.0 and 10.0
Enter a judge's score: 0
Enter a judge's score: 1
Enter a judge's score: 1
Enter a judge's score: 2
Enter a judge's score: 25
The score must be between 0.0 and 10.0
Enter a judge's score: -3
The score must be between 0.0 and 10.0
Enter a judge's score: 3

After dropping the lowest and highest scores, the average score was 1.3.

Press any key to continue . . .
```

NOTE: The valid judge scores here are 0, 1, 1, 2, and 3