COMSC 165

Summer 2020

Programming Assignment 6

Worth 20 points (2% of your grade)

DUE: Wednesday, 7/1/20 by 11:59 P.M. on Canvas

Start by downloading the **165_assign6.cpp** file from the Programming Assignment 6 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_assign6.cpp** and **firstname_lastname_165_assign6.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_assign6.cpp and James_Smith_165_assign6.pdf.

COMMENTS (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.).

SAMPLE RUNS (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 a different 2D array, and your sample runs should **NOT** be the same as the sample runs that are used in this write-up for the assignment. 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:

```
// Array with test data
int testArray[ROWS][COLS] =
                    { { 1,    2,  3,  4,  5 },
                      {  6,    7,  8,  9, 10 },
                      { 11,   12, 13, 14, 15 },
                      { 16,   17, 18, 19, 20 } };
```

```
The total of the array elements is 210
The average value of an element is 10.5
The total of row 0 is 15
The total of col 2 is 42
The highest value in row 2 is 15
The lowest value in row 2 is 11

Press any key to continue . . .
```

Each of your 10 sample runs should contain two screenshots: 1) one screenshot of your code, showing the 2D array that was used to run the program and 2) one screenshot of the output on the console screen. Therefore, you should have a total 20 screenshots between your 10 sample runs.

Write a program that creates a **two-dimensional array (2D array)** initialized with test data. The program should have the following functions:

+ **getTotal** . This function should accept a two-dimensional array as its argument and return the total of all the values in the array.
+ **getAverage** . This function should accept a two-dimensional array as its argument and return the average of all the values in the array.

- **getRowTotal** . This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the total of the values in the specified row.
- **getColumnTotal** . This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a column in the array. The function should return the total of the values in the specified column.
- **getHighestInRow** . This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the highest value in the specified row of the array.
- **getLowestInRow** . This function should accept a two-dimensional array as its first argument and an integer as its second argument. The second argument should be the subscript of a row in the array. The function should return the lowest value in the specified row of the array.

Demonstrate each of the functions in this program.

Sample run:

```cpp
// Array with test data
int testArray[ROWS][COLS] =
                { { 1,    2,   3,   4,   5 },
                  {    6,    7,   8,   9,  10 },
                  {   11,   12,  13,  14,  15 },
                  {   16,   17,  18,  19,  20 } };
```

```
The total of the array elements is 210
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Press any key to continue . . .
```