

**Lakehead University**  
**Department of Computer Science**  
**COMP-1411 – Computer Programming I - Fall 2021**

**Assignment 5 [20 Points]**

Due: Nov 8<sup>th</sup>, 2021, at 11:55 PM

Write a C program to calculate the minimum, maximum, and average GPA for a class of students. First, your program will prompt the user for the number of students. Next, your program will obtain all students' IDs and GPAs from the standard input terminal. Next, your program will sort the students' IDs and GPAs in ascending order of GPA. Finally, your program will display (1) all student IDs and GPAs in two columns (2) determine and display the minimum and maximum GPAs with corresponding student IDs, and (3) determine and display the average GPA. Display the GPA with 2 decimal digits (see the test run).

Your program **must** contain the following user defined functions:

- **getIDandGPA** – this function prompts the user to get IDs and GPAs; and places the data in two separate arrays (one for IDs and another for GPAs).
- **arrangeInAscendingOrder** – this function arranges both arrays in ascending order of GPAs
- **displayMinMaxGPA** – this function finds and shows the lowest and the highest GPAs with their corresponding student IDs from the array that contains GPAs. Note: several students may obtain the lowest and/or the highest GPAs.
- **displayAveGPA** – this function calculates and displays the average GPA obtained in the class of students.

Your program must not contain any global variables. You may declare additional user-defined functions if required. Your program must work for any number of students (up to 100 students). You can assume that the student IDs are 5 digits number e.g., 52345, 53443; and the GPAs are in the range of 0.0 to 4.0.

Submit a file named – **a5idGPA.c** - that contains your C program code to implement the problem statement.

## Test Run:

Enter the Class Size: 5

Enter Student #1's ID: 51123

Enter Student #1's GPA: 3.78

Enter Student #2's ID: 51122

Enter Student #2's GPA: 4.00

Enter Student #3's ID: 51156

Enter Student #3's GPA: 2.45

Enter Student #4's ID: 51178

Enter Student #4's GPA: 3.23

Enter Student #5's ID: 51159

Enter Student #5's GPA: 3.92

STUDENT ID	GPA
51156	2.45
51178	3.23
51123	3.78
51159	3.92
51122	4.00

Lowest GPA: 2.45

List of students with lowest GPA:

51156

Highest GPA: 4.00

List of students with Highest GPA:

51122

The average GPA of the 5 students is: 3.48

**Test Run 2:**

Enter the Class Size: 3

Enter Student #1's ID: 51234

Enter Student #1's GPA: 3.94

Enter Student #2's ID: 56723

Enter Student #2's GPA: 3.66

Enter Student #3's ID: 59876

Enter Student #3's GPA: 3.66

STUDENT ID	GPA
56723	3.66
59876	3.66
51234	3.94

Lowest GPA: 3.66

List of students with lowest GPA:

56723

59876

Highest GPA: 3.94

List of students with highest GPA:

51234

The average GPA of the 3 students is: 3.75