CL-210
Data Structures
Lab # 1

Objectives:

- Arrays
  - Insertion
  - Searching
  - Sorting
- Pointers
- Pointer to Function
- DMA

Note: Carefully read the following instructions (*Each instruction contains a weightage*)

1. There must be a block of comments at start of every question's code by students; the block should contain brief description about functionality of code.
2. Comment on every function and about its functionality.
3. Mention comments where necessary such as comments with variables, loop, classes etc to increase code understandability.
4. Use understandable name of variables.
5. Proper indentation of code is essential.
6. Write a code in C++ language.
7. Make a Microsoft Word file and paste all of your C++ code with all possible screenshots of every task **outputs in Microsoft Word and submit word file.**
8. First think about statement problems and then write/draw your logic on copy.
9. After copy pencil work, code the problem statement on MS Studio C++ compiler.
10. At the end when you done your tasks, attached C++ created files in MS word file and make your submission on Google Classroom. (Make sure your submission is completed).
11. Please submit your file in this format **19F1234_L1**.
12. Do not submit your assignment after deadline. Late and email submission is not accepted.
13. Do not copy code from any source otherwise you will be penalized with negative marks.

Problem: 1 |

Populate an array of your size choice and write a program to find the largest and smallest element in that array.

Problem: 2 |

Perform problem 1 using pass by reference using pointer variables

Problem: 3 |

Implement a function that finds common elements in two arrays. You can assume that the sets are stored using arrays. So, if array1 = {1,2,3,4,5,6,3,2} and array2 is {1,3,5,7}, then array3 should be {1,3,5}. Note array3 should not have any duplicate elements. You have to:
think of all the functions that are required for this problem. Each function should perform its dedicated task. So, plan them out before implementing them.
Main should only have a set of function calls.

Problem: 4 |

Develop a program to create three 3x3 matrices using DMA and populate those two matrices using pointers now perform addition and multiplication using pointers and store the result into third matrix and print them also using pointers.

Problem: 5 |

Write a code to take input in 2 dynamic arrays as long as the user doesn't enter sentinel value. After you have finished taking input for one dynamic array start for the second. Their size depends on after entering how many elements the user enters the sentinel value and their size may be different. Now completely swap the contents of the two dynamic arrays.

Problem: 6 |

Implement another function; pass the array (again using a pointer) to it. The function should then sort the array using the Bubble, Selection, and Insertion Sort algorithm. The function should use pointers for all computations (counter variables, traversal, swap).

Best of luck ☺