

**CS2413: Data Structure**  
**Fall 2021**

Lab Assignment #3

- Release date: Sep 14, 2021 (Tuesday)
- Due date: Sep 16, 2021 (Thursday) 11:59PM
- Please turn in your codes through Blackboard in the **same file in .cpp format**. You can have different functions for different questions. Do not compress/zip your submission. This is to ensure faster grading.
- Please name your submission file starting with “LastName\_FirstName\_Lab01”
- Total: 35 points

1. Write a C++ program to do the following: [5 pts]
  - a. Declare an `std::array` and name it `arr1` and initialize it with 10 integer values.
  - b. Declare an `std::array` and name it `arr2` and populate it with the value 5 for all 10 elements.
  - c. Print the first and last element of `arr1`.
  - d. Swap the values of `arr1` and `arr2`.
  - e. Print the size of the arrays.
2. Write C++ programs to do the following: [5+10+5+5+5=30 pts]
  - a. Ask the user for the number of elements in the vector, and import them from the keyboard. After you save them in the memory, copy them in similar vector which will be sorted. Finally, display all the elements of the vectors, the sorted one and not sorted one.
  - b. Create a container for at least 100 integer values. Then you will be provided with second vector of 10 elements. You need to calculate how many of elements of the second vector are contained in the first one. Also need to calculate percent of how many elements are in vector, and how many are not.
  - c. There are two vectors for which you don't know the size in advance. But, the sizes are same all the time. You need to show the message, are those two vectors equal.
  - d. In the vector of unknown size, and `int` type, you should count how many times one element is repeated.
  - e. Merge two sorted vectors into one.