National University of Computer and Emerging Sciences



**Lab Manual**

*for*

# Object Oriented Programming

|  |  |
| --- | --- |
| Course Instructor | Ms. Hafsa Tariq |
| Lab Instructor(s) | Ms. Sonia Anum Ms. Yusra Arshad |
| Section | OOP BSCS-2J |
| Semester | Spring 2022 |

Department of Computer Science FAST-NU, Lahore, Pakistan

## Lab Manual 2

**Objectives:**

After performing this lab, students shall be able to:

* Dynamically allocate and deallocate memory
* Create and manipulate dynamic 1D arrays
* Use pointers to pass arrays to functions
* Pass pointers to functions by value and by reference.

## Problem 1

Consider the following C++ code.

string seasons[4] = {"Winter", "Spring", "Summer", "Fall"};

string \*strPtr;

strPtr = new string[5];

for (int i = 0; i < 4; i++)

strPtr[i] = seasons[i];

**a**. Write a C11 code that outputs the contents of the array to which

strPtr points.

## Problem 2

## Write a C++ program that declares and initializes an integer array dynamically and input a segregation value from user. It then partitions the array such that all the elements smaller than the segregator value come to the left and all the bigger values come to the right. It would then display the contents of this array.

## Sample Input:

## Enter ten elements in the Array. 1 589 512 -4 -6 1 4 56 10 12 -1

## Enter the Segregation Value: 56

## Sample Output:

## Segregated Array: 1 -1 12 -4 -6 1 4 56 512 589

**Problem 3**

**Problem 3**

## Problem 3

Write a C++ program that declares and initializes a float array dynamically and finds the index of the first occurrence of the second largest element in the array.

**For Example:**

**Input:**

Please enter size: 5

Please enter elements:

1.5

7.8

3.2

9.0

7.1

**Output:**

Second Largest element is: 7.8

Index of second largest element is: 1

## Problem 4

## 

Fibonacci sequence is a sequence in which every number after the first two is the sum of the two preceding ones. Write a C++ program that takes a number n from user and populate a dynamic array with first n Fibonacci numbers.

|  |
| --- |
| **For example:**  For n=10  Fibonacci Numbers: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55 |

## Problem 5

Take size input from the user and create an array of that size. Now populate the array as well by taking input from the user.

* First Implement void copyArray(int\* arr, int \*&arr1, int size) that copies arr into arr1.
* Now implement another function reduceArray(int \*arr, int \*&arr1, int size) that sort array and remove the duplicates element from this array. Use copyArray function to copy.

**For Example:**

**Input:**

Please enter array size: 8

Please enter elements: 91 5 91 40 5 7 5 642

**Output:**

Array after reduction is:

5

7

40

91

642

## Problem 6

Write a C++ program that keeps taking character input from the user until user enters q and displays the data in reverse order. Your program should save the input in a dynamically allocated array. Initially create a dynamic array of five characters. Each time the array gets filled your program should double the size of array and continue taking the input. After receiving q (i.e., end of data input) your program should print the characters in the reverse order as entered by the user. You have to make use of the following functions for this task:

* void Input (char \* & arr, int & size); //why is size passed by reference for this?
* void reverse (char \* arr, int size);
* void Output (char \* arr, int size);