National University of Computer and Emerging Sciences



Lab Manual 03

**Section BCS 2A**

**2nd April, 2021**

Object Oriented Programming

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| Course Instructor | Miss Abeeda Akram |
| Lab Instructor (s) National University of Computer and Emerging Sciences    Lab Manual 02  Object Oriented Programming  Department of Computer Science  FAST-NU, Lahore, Pakistan  1.1 Objectives  After performing this lab, students shall be able to:   Have an improved understanding of pointers.   Create and manipulate 1D dynamic array.   Allocation and de-allocation of 1D array.   Passing dynamic arrays into functions. | Miss. Siddiqua Nayyer  Mr. Dilawar Shabbir |
| Section | BCS – 2A |
| Semester | Spring 2021 |

Department of Computer Science

FAST-NU, Lahore, Pakistan

## Objectives

After performing this lab, students shall be able to:

* Have an improved understanding of 2D array pointers.
* Create and manipulate 2D dynamic array.
* Allocation and de-allocation of 2D array.
* Passing dynamic 2D arrays into functions.

**TASK 1:**

Write a menu driven C++ program to do following operation on two-dimensional array A of size m x n. You should use user-defined functions which accept 2-D array A, and its size m and n as arguments. The options are:

• To input elements into matrix of size m x n

• To display elements of matrix of size m x n

• Sum of all elements of matrix of size m x n

• To display row-wise sum of matrix of size m x n

• To display column-wise sum of matrix of size m x n

• To create transpose of matrix B of size n x m

**TASK 2:**

Write a function int\*\* AddMatrix(int\*\* A, int\*\* B, const int& rows, const int& cols) that creates a new matrix result of size rowsxcols, adds matrix A and B and saves the result in matrix result and returns the result pointer. Test your function in main().

**TASK 3:**

Write a program which takes input of number of rows in 2D array from the user and then asks user to enter numbers from 0 to n where n is equal to number of rows and find out factors of each number. Numbers entered should be greater than 6 and less than 100. If the number does not fall in this range, program should alert user to re-enter the number. Create factors array for each number in above allocated 2D array and store that number on 1st index of factors array. Your program should also de-allocate acquired dynamic memory at the end of the life cycle.

**Sample Output:**

Enter Number between 6 and 100: 12

Enter Number between 6 and 100: 5

Wrong input. Please re-enter the number

Enter Number between 6 and 100: 7

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**Following are the factors of numbers entered:**

Factors of 12 are 1,2,3,4,6,12

Factors of 10 are 1, 2,5,10

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