# National University of Computer and Emerging Sciences

**Laboratory Manual**

*for*

**Data Structures Lab**

Semester Fall 2023

**Department of Computer Science**

FAST-NU, Lahore, Pakistan

**Objectives:**

In this lab, students will practice:
1. Arrays and Vectors

**Question 1**

1. Given an **array of positive** and **negative numbers**, arrange them in an **alternate** fashion such that every positive number is followed by a negative and vice-versa maintaining the **order of appearance**. The number of positive and negative numbers need not be equal. If there are more positive numbers they appear at the end of the array. If there are more negative numbers, they too appear at the end of the array.

Example:

```
Input: arr[] = {1, 2, 3, -4, -1, 4}
Output: arr[] = {-4, 1, -1, 2, 3, 4}

Input: arr[] = {-5, -2, 5, 2, 4, 7, 1, 8, 0, -8}
Output: arr[] = {-5, 5, -2, 2, -8, 4, 7, 1, 8, 0}
```

**Question 2**

Write a program to reverse an array of numbers.
Example:

```
Input   : arr[] = {1, 2, 3}
Output  : arr[] = {3, 2, 1}

Input  :  arr[] = {4, 5, 1, 2}
Output  : arr[] = {2, 1, 5, 4}
```

**Question 3**

Given an array arr[] and an integer K where K is smaller than the size of the array, the task is to find the Kth smallest element in the given array. It is given that all array elements are distinct. Example:

```
Input: arr[] = {7, 10, 4, 3, 20, 15}, K = 3
Output: 7

Input: arr[] = {7, 10, 4, 3, 20, 15}, K = 4
Output: 10
```