

## Lab -2: Design and Analysis of Algorithms Lab Questions:

27.01.2023

Using the Divide and Conquer method solve the following questions.

### Question 1: Maximum Difference in an Array

Given an array  $A[]$  of integers, write a program to find the maximum difference between any two elements such that the larger element appears after the smaller element. In other words, we need to find  $\max(A[j] - A[i])$ , where  $A[j] > A[i]$  and  $j > i$ .

#### Example 1

Input:  $A[] = [1, 4, 9, 5, 3, 7]$ , Output: 8

Explanation: Maximum difference is between 9 and 1.

#### Example 2

Input:  $A[] = [9, 8, 1, 6, 3, 2]$ , Output: 5

Explanation: Maximum difference is between 6 and 1.

#### Example 3

Input:  $A[] = [9, 8, 6, 3, 2]$ , Output: -1

Explanation: Input elements are in decreasing order i.e. no larger element appears after the smaller element.

### Question 2: Implement Quick Sort for a given set of integers.