Data Structures Lab (CSC204) **Session: Monsoon 2021-22**
III BTech (CSE) **Date: 16.11.2021**

Assignment-10 (Sorting and Searching)

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1. Sorting is a process of organizing data in a particular order allowing for information to be found easier. You are given an array of integer, perform the following task:

a) Write a program to sort the elements of the given array in descending order using the logic of ***quick sort*** algorithm. Always select the median element of the array as pivot.

Sample Input:
Elements of array: 6 9 3 −5 2 8 5

Sample Output:
Array after sorting: 9 8 6 5 3 2 −5

b) Apply the ***binary search*** on the above output (output of part a) to display weather a given number '**X**' is present on that array or not. If present then print the array index in which it is present, and if not present then print -1.

Sample Input: 5

Sample Output: 3

2. ***Merge*** procedure of ***marge sort*** algorithm is used to merge two sorted arrays in to a single sorted array. Your task in this problem is to modify the ***merge*** procedure of ***marge sort*** algorithm so that it can merge three sorted arrays in to a single sorted array.

Sample Inputs:
Elements of 1st sorted array: 3 5 6 12 15
Elements of 2nd sorted array: 7 9 11 17
Elements of 3rd sorted array: 2 8 16 20 25

Sample Output:
Elements of the array after merging: 2 3 5 6 7 8 9 11 12 15 16 17 20 25

3. Write a function ***sort***(***int*** ∗ ***array***, ***int arraylength***) which sorts the numbers in array using the **heapsort** algorithm.

Sample Input: 23 10 25 2 3 1 61 12

Sample Output: 1 2 3 10 12 23 25 61