# LAB SESSION 03

**Date of the Session: / / Time of the Session: to**

**Pre-Lab:**

1. Write a Divide and Conquer algorithm to find the minimum distance between the pair of the points given in an array. Find the time complexity of the algorithm.

P[] = {{2, 3}, {12, 30}, {40, 50}, {5, 1}, {12, 10}, {3, 4}}

1. Write a divide and conquer algorithm for finding the maximum and minimum in the sequence of numbers. Find the time complexity**.**
2. Trace out the output of the following using Merge sort.10, 49, 32, 67, 45, 4, 7, 2, 1, 51, 78, 34, 89, 87, 36, 29, 3, 9, 11.

**In-Lab:**

1. Harry’s Aunt and family treat him badly and make him work all the time. Dudley, his cousin got homework from school and he as usual handed it over to Harry but Harry has a lot of work and his own homework to do.

The homework is to solve the problems which are numbered in numerical he tries to solve random question after solving random questions he did not put those questions in order Dudley will return in a time of n\*logn Harry has to arrange them as soon as possible. Help Harry to solve this problem so that he can go on and do his own homework.

**Example**

**Input**

9

15,5,24,8,1,3,16,10,20

**Output**

1, 3, 5, 8, 10, 15, 16, 20, 24

1. A group of 9 friends are playing a game, rules of the game are as follows: Each member will be assigned with a number and the sequence goes like e.g.: 7,6,10,5,9,2,1,15,7.

Now they will be sorted in ascending order in such a way that tallest one will be sorted first. Now your task is to find the order of indices based on initial position of the given sequence and print the order of indices at the end of the iteration.

## Post-Lab:

1. Suppose a merge sort algorithm, for input size 64, takes 30 secs in the worst case. What is the maximum input size that can be calculated in 6 minutes (approximately)?
2. Chris and Scarlett were playing a block sorting game where Scarlett challenged Chris that he has to sort the blocks which arranged in random order. And Scarlett puts a restriction that he should not use reference of first, median and last blocks to sort, and after sorting one block with reference to other block, for next iteration he must choose another block as the reference not the same block (random pivot).

Now, Chris wants help from you to sort the blocks. He wanted to sort them in a least time. Help him with the least time complexity sorting algorithm.

**Input format**

First line of input contains the number of test cases.

Next t lines of input contain

The number of blocks provided by Scarlett.

The array of blocks.