Lab Manual for CS-108P (Data Structure and Algorithms)

List-2

The aim of this practical is to reinforce some of the ideas about types you have met in the lectures, and to reinforce ideas about the, algorithms, programming concept on data structures along with difference between compile-time and run-time checking on Sorting, Searching, Tree and Graph algorithms. In addition, you will practice your skills in coding with Linear Search, Binary Search, Insertion Sort, Selection Sort, Bubble Sort, Quick Sort, Merge Sort, Tree (different types of trees), Binary Tree, Binary Search Tree, Shortest Path Algorithms (Dijkstra Algorithm), MST etc.

You are going to experiment with the contents of all of the above List of problems and illustrate some points about the types of the problems, algorithms, complexity etc.

You will see how troublesome it can be.

- You may use any programming language of your interest (C, C++, Java, Python etc) to execute your program.
- The code is very simple and it's also discussed during the time of theory lectures as well.
- Run the application to see what it does.
- Use the debugger to inspect objects and step through the code.
- You may get a warning from the compiler about unsafe operations; that's what this example is about.

Problem-5-6: Write a program for linear search and binary search of an element from the Array.

Problem-7-11: Write a program to sort with Insertion Sort, Selection Sort Bubble Sort, Quick Sort, and Merge Sort from the List.

Problem-12-13: Write a program for shortest path (Dijkstra Algorithms etc), and MST.