6CS402CC22 Data Structures and Algorithms

L. Laboratory Manuals

1. Write a program for the following sorting algorithms.

a) Bubble sort

b) Selection Sort

c) Insertion Sort

d) Quick Sort

Evaluate the time complexity of each algorithm on already sorted, reversed and random inputs. Visualize the same using graph representation.

2. Implement merge sort and external merge sort with different input types (random, ascending order, descending order) and large input sizes.

3. Implement a quick sort algorithm with the following ways to select pivot element and give your observations for the same with different input type and size as given in Practical 1.

a. Always pick the first element as pivot
b. Always pick the last element as pivot
c. Pick a random element as pivot
d. Pick median as pivot

4. Solve Make-Change problem using Greedy approach.

5. Implement Kruskal's algorithm to find MST using greedy approach.

6. Implement fractional knapsack problem using greedy approach.

7. Implement Assembly Line Scheduling problem using dynamic programming concepts.

8. Implement matrix chain multiplication using dynamic programming concepts.

9. Given two sequences X and Y, find the longest common subsequence (LCS) of X and Y using dynamic programming.

10. Implement 0-1 knapsack problem using dynamic programming.