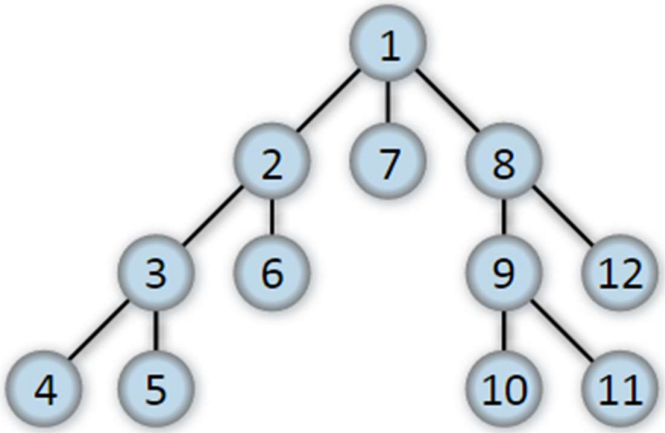
Advanced Data Structures and Algorithms

E2UC503C

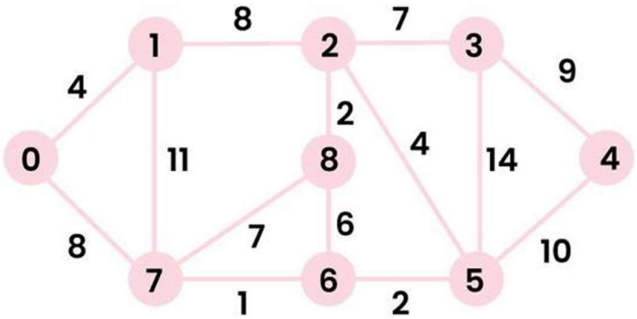
ASSIGNMENT 4

Note: In case of programming problem, write your code in Java or Python Only.

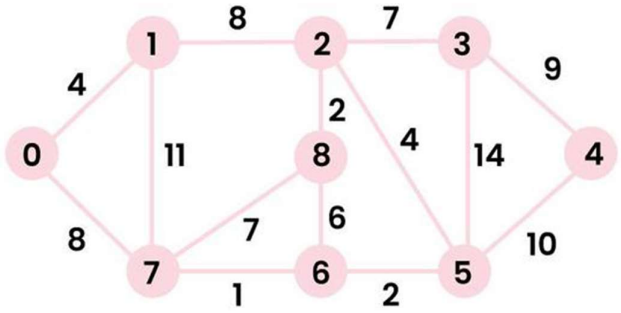
1 Write programs for Depth first search (DFS) and Breadth first search (BFS). Find the complexity of algorithms. Apply DFS and BFS on



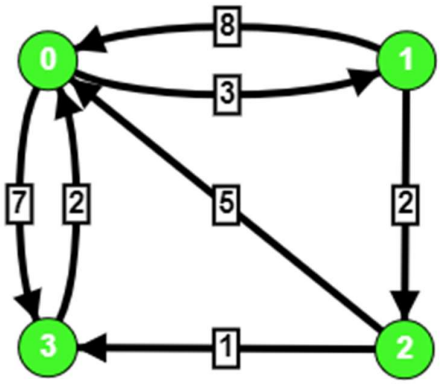
2 What is a minimum spanning tree. Write a program for Prim's and Kruskal's algorithms. Find the complexity of algorithms. Apply Prim's and Kruskal algorithms on (source is node 0)



3 What is single source shortest path problem. Write algorithms for Dijkstra algorithm. Find its complexity, and apply on (source is node 0)



4 What is all pairs shortest path problem. Write a algorithm for all pairs shortest path. Find its complexity. Apply algorithm on



5 What are elements of Dynamic programming. How it is different from Divide and conquer and greedy approach.

6 What are elements of greedy programming.

7 What is Longest Common Subsequence (LCS) problem. Write a program to find a LCS. Find the complexity. Find LCS of str1 = ABCDGH and str2 = AEDFHR.

8 What is 0/1 Knapsack problem. Write a program for 0/1 Knapsack problem and find is complexity. Apply 0/1 Knapsack algorithm on Weights = {1, 2, 3} and Profit ={6, 10, 12} and we have knapsack of capacity 5.

9 What is fractional Knapsack problem. Write a program for fractional Knapsack problem and find is complexity. Apply

fractional Knapsack problem on arr[] = {{100, 20}, {60, 10}, {120, 30}}, W = 50. Given the weights and profits of N items, in the form of {profit, weight}, Knapsack capacity W.

10 What is N-Queens problem in algorithm. Write a program for N Queens problem. Find the complexity.

11 Write a program for Counting Sort and Radix sort and find their complexities.