

Practice Assignment

Module 6	
Sr. No.	Questions
1	Huffman Coding is a popular algorithm for data compression. Describe how Huffman Coding works using Binary Trees. Provide a step-by-step example of encoding and decoding a message using Huffman Coding.
2	Graphs are powerful data structures for representing and analysing relationships between objects. Explain the key features of graphs and how they differ from other data structures. Provide real-world examples where graphs can be effectively used to model relationships.
3	Discuss the different ways of representing graphs in computer memory. Compare and contrast adjacency matrix and adjacency list representations. Illustrate with examples how these representations work for both directed and undirected graphs.
4	Connectivity in graphs is an important property that helps determine the connectedness of nodes. Explain the concepts of connected and disconnected graphs. Provide algorithms to check for connectivity and illustrate with examples.
5	Traversing a graph is a fundamental operation used to explore its nodes and edges. Describe the Breadth-First Search (BFS) algorithm. Provide a step-by-step walkthrough of BFS on a

	sample graph, highlighting the order of visited nodes.
6	Depth-First Search (DFS) is another graph traversal technique. Compare and contrast DFS with BFS in terms of implementation and behaviour. Provide an example of a graph traversal using DFS, showing the order of visited nodes.
7	Paths in graphs represent sequences of edges and nodes connecting two vertices. Explain the concepts of simple paths, cycles, and Eulerian paths. Provide an example of finding an Eulerian path in a graph and explain the conditions for its existence.
8	Dijkstra's algorithm is used to find the shortest path in weighted graphs. Describe the algorithm and its step-by-step process of finding the shortest path. Include a numerical example to demonstrate the application of Dijkstra's algorithm.
9	Bellman-Ford algorithm is another method for finding the shortest path in weighted graphs, even with negative edge weights. Explain how the Bellman-Ford algorithm works. Discuss its advantages and limitations compared to Dijkstra's algorithm.
10	Kruskal's algorithm is used to find the minimum spanning tree of a graph. Describe the algorithm and its steps for constructing the minimum spanning tree. Use a sample graph to show the application of Kruskal's algorithm.