

Data Structures and Algorithms: Important Questions

Problems Based on Trees

1. Construct Binary Search Tree, insert/delete operations.
2. AVL Tree: Constructing and balancing operations.
3. B+ Tree: Insertion and traversal.
4. Tree Traversals: In-order, Pre-order, Post-order, Level-order.
5. Tree Algorithms: Counting nodes, height calculation, and parent nodes with two children.
6. Differences among BST, AVL, and other types of trees.
7. Tree Copy and Equality Check.

Problems Based on Graphs

1. Depth First Search (DFS) and Breadth First Search (BFS).
2. Kruskal's and Prim's Algorithms for Minimum Spanning Tree.
3. Shortest Path Algorithms like Dijkstra's Method.
4. Graph Representation: Adjacency matrix and adjacency list.
5. Topological Sorting.

Problems Based on Linked Lists

1. Operations on Singly, Doubly, and Circular Linked Lists:
 - Adding/Removing nodes.
 - Reversing a list without creating a new one.
2. Detecting and removing cycles in linked lists.
3. Deque implementation using a linked structure.

Problems Based on Queue

1. Queue Operations:
 - Array-based and linked list-based implementations.

- Circular queue and priority queue operations.

2. Conversion of infix to postfix expressions and evaluation using stack-based queues.

Most Repeated and Important Questions

1. Tree Construction and Traversals: Constructing binary trees, AVL trees, and performing various tree traversals.

2. Graph Algorithms: Implementing BFS and DFS, finding minimum spanning trees using Prim's and Kruskal's algorithms.

3. Linked List Operations: Adding, removing, and reversing nodes in various types of linked lists.

4. Queue Implementations: Circular queue operations and priority queue discussion.

5. Algorithm Efficiency: Analyzing and implementing efficient data structures like AVL trees and efficient graph algorithms.