

DSA Theory Interview Questions (Basic to Medium)

Array & String

- What is an array?
- Difference between array and linked list?
- How is memory allocated for arrays?
- What is a string in programming?
- How are strings stored in memory in C/C++ vs Java?
- What are the advantages and disadvantages of arrays?
- What is a dynamic array?
- What is character array vs string object?

Linked List

- What is a linked list?
- Types of linked lists?
- Advantages of linked lists over arrays?
- How does insertion/deletion work in a linked list?
- What is a circular linked list?
- What is a doubly linked list?
- Real-life use cases of linked list?

Stack & Queue

- What is a stack? Applications of stack?
- What is a queue? Types of queues?
- Difference between stack and queue?
- What is a circular queue?
- What is a priority queue?
- What is a dequeue (double-ended queue)?
- Use cases of stack and queue in real life?

Trees

- What is a binary tree?
- What is a binary search tree (BST)?
- Difference between BST and Binary Tree?
- What is tree traversal? Types of traversals?
- What is a balanced binary tree?
- What is a heap? Difference between min-heap and max-heap?
- What is an AVL tree?
- What is a complete binary tree?

Graph

- What is a graph? Types of graphs?
- Difference between tree and graph?
- What are DFS and BFS?
- What is a weighted graph?
- What is a cycle in a graph?
- What is an adjacency matrix and list?
- What is a directed acyclic graph (DAG)?

Hashing

- What is hashing?
- What is a hash table?
- What are hash collisions? How to handle them?
- Applications of hashing?
- What is a good hash function?
- Difference between HashMap and HashSet?

Sorting & Searching

- Common sorting algorithms and their complexities?
- Difference between comparison and non-comparison sorts?

- What is bubble sort and how it works?
- What is binary search and its conditions?
- Difference between linear and binary search?
- What is merge sort and quicksort?

Recursion & Complexity

- What is recursion?
- Difference between recursion and iteration?
- What is tail recursion?
- What is time complexity?
- What is space complexity?
- What is Big O, Big Omega, and Big Theta notation?
- How to calculate time complexity of a code?

General Concepts

- Difference between linear and non-linear data structures?
- What is dynamic programming?
- What is greedy algorithm?
- When to use greedy vs dynamic programming?
- What is divide and conquer approach?
- What is backtracking?