DSA Roadmap for Placements

1. Arrays & Strings

- Concepts: Traversal, Sliding Window, Two Pointers, Sorting, Hashing, Kadane's Algo
- Algorithms: Merge Sort, Quick Sort, Binary Search, Matrix problems
- Goal: Solve problems like Two Sum, Subarray Sum, Longest Unique Substring

2. Linked List

- Concepts: Singly/Doubly, Reversal, Detect Cycle, Merge Lists
- Algorithms: LL Reversal, Add Two Numbers, Clone LL with Random Pointers
- Goal: Implement LL from scratch, solve medium problems

3. Stack & Queue

- Concepts: LIFO/FIFO, Balanced Parens, Next Greater Element
- Algorithms: Monotonic Stack, LRU Cache, Circular Queue
- Goal: Use stack/queue in expression and window problems

4. Trees

- Concepts: Traversals, Height, Balanced Tree, BST ops, LCA
- Algorithms: DFS, BFS, Morris, Insert/Delete in BST
- Goal: Solve 20+ tree problems with all traversals

5. Recursion & Backtracking

- Concepts: Base & Recursive Case, Choice Trees
- Algorithms: Subsets, Permutations, N-Queens, Sudoku Solver

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- Goal: Trace recursion and apply backtracking strategy

6. Hashing

- Concepts: Frequency, Prefix, Key-Value storage
- Algorithms: Top K Elements, Group Anagrams, Longest Sequence
- Goal: Solve 20+ hash-based problems

7. Searching & Sorting

- Concepts: Binary Search, Custom Sorting
- Algorithms: Merge, Quick, Binary Search Variants
- Goal: Understand and apply search/sort to optimize logic

8. Greedy

- Concepts: Interval Scheduling, Job Sequencing, Fractional Knapsack
- Algorithms: Huffman Coding, Activity Selection
- Goal: Solve problems by making local optimal choices

9. Dynamic Programming

- Concepts: Memoization, Tabulation, Patterns
- Algorithms: 0/1 Knapsack, LCS, LIS, Edit Distance
- Goal: Solve 30+ classic DP problems

10. Graphs

DSA Roadmap for Placements

- Concepts: Representation, DFS, BFS, Topo Sort, MST
- Algorithms: Dijkstra, Kruskal, Prim, Union-Find
- Goal: Master traversal and graph search algorithms

Bonus Topics

- Trie, Segment Tree, Fenwick Tree, Bit Manipulation, Sliding Window, Heap

Timeline (2-3 Months)

Week 1-2: Arrays, Strings, Sorting

Week 3-4: Linked Lists, Stacks, Queues

Week 5: Trees & BST

Week 6: Recursion, Hashing

Week 7: Greedy, Heap

Week 8-9: DP

Week 10: Graphs

Week 11-12: Mixed Practice + Mock Interviews