8-Week DSA Study Plan

Week 1: Introduction & Arrays

- Understanding Time and Space Complexity
- Arrays and their operations
- Basic array problems (reverse array, find max/min)
- Video: Time & Space Complexity - https://www.youtube.com/watch?v=V6mKVRU1evU
- Video: Arrays in DSA - https://www.youtube.com/watch?v=ZJieZ3i9N2Q

Week 2: Strings and Hashing

- String manipulation techniques
- Hash Tables and Hash Maps
- Anagram checks, palindrome validations
- Video: Strings in DSA - https://www.youtube.com/watch?v=QBYTz4p6g3g
- Video: Hashing Techniques - https://www.youtube.com/watch?v=2zj6e0y8r9c

Week 3: Linked Lists

- Singly and Doubly Linked Lists
- Operations: insertion, deletion, traversal
- Detecting cycles, reversing linked lists
- Video: Linked Lists Explained - https://www.youtube.com/watch?v=njTh_OwMljA

Week 4: Stacks and Queues

- Stack operations and applications
- Queue types: simple, circular, priority
- Stacks & queues using arrays and linked lists
- Video: Stacks and Queues - https://www.youtube.com/watch?v=wjI1WNcIntg

Week 5: Trees

- Binary Trees and Binary Search Trees

- Tree traversals: in-order, pre-order, post-order

- Balanced trees (AVL, Red-Black Trees)

- Video: Binary Trees - https://www.youtube.com/watch?v=H5JubkIy_p8

Week 6: Graphs

- Graph representations: adjacency list/matrix

- BFS and DFS traversal

- Shortest path algorithms: Dijkstra's, Bellman-Ford

- Video: Graphs - https://www.youtube.com/watch?v=AfSk24UTFS8

Week 7: Sorting and Searching Algorithms

- Sorting: bubble, selection, insertion, merge, quick

- Searching: linear and binary

- Time and space complexity analysis

- Video: Sorting Algorithms - https://www.youtube.com/watch?v=kgBjXUE_Nwc

Week 8: Advanced Topics and Practice

- Dynamic Programming basics

- Greedy algorithms

- Backtracking and recursion

- Practice problems and mock interviews

- Video: Dynamic Programming - https://www.youtube.com/watch?v=tyB0ztf0DNY