DSA Learning Path & Resources

Week 1-2: Foundations

- Understand Time & Space Complexity

- Master Recursion Basics

- Learn Stack Operations and Applications

- Practice Queue Implementations

- Understand HashMap and HashSet Usage

Practice Problems:

- Two Sum

- Valid Parentheses

- Group Anagrams

Week 3: Two Pointers & Sliding Window

- Understand Fixed & Variable Sliding Window

- Practice Fast and Slow Pointer Problems

Practice Problems:

- Longest Substring Without Repeating Characters

- Minimum Window Substring

- Container With Most Water

Week 4: Binary Search & Sorting

- Master Classic Binary Search

- Learn Binary Search on Answer Technique

- Understand Merge and Quick Sort

Practice Problems:

- Search in Rotated Sorted Array

- Median of Two Sorted Arrays

- Kth Smallest Element in a Matrix

DSA Learning Path & Resources

Week 5: Recursion & Backtracking

- Solve Problems using Recursion

- Apply Backtracking for Combinations & Permutations

Practice Problems:

- Word Search

- N-Queens

- Combination Sum

Week 6-7: Dynamic Programming (DP)

- Learn Top-down (Memoization)

- Practice Bottom-up (Tabulation)

- Understand State Transitions

Practice Problems:

- House Robber I & II

- Longest Increasing Subsequence

- Edit Distance

Week 8: Greedy Algorithms

- Understand Greedy Strategy

- Solve Interval Problems

Practice Problems:

- Jump Game

- Merge Intervals

- Activity Selection / Minimum Arrows

Week 9: Graph Algorithms

- Implement BFS and DFS

- Learn Topological Sort

- Understand Union-Find (DSU)

Practice Problems:

- Number of Islands

- Course Schedule

- Clone Graph

Week 10: Trees & Tries

- Practice Tree Traversals

- Implement Trie Structure

Practice Problems:

- Binary Tree Level Order Traversal

- Serialize and Deserialize Binary Tree

- Implement Trie

Week 11: Bit Manipulation & Math

- Understand Bitmasking

- Learn XOR Tricks

- Practice Sieve of Eratosthenes

Practice Problems:

- Single Number

- Subsets with Bitmasks

- Count Primes

Week 12: Mixed Practice & Mock Contests

- Participate in Weekly Contests (LeetCode/Codeforces)

- Revisit Failed/Hard Problems

DSA Learning Path & Resources

- Focus on Speed and Accuracy

Recommended Resources

- CP Algorithms: https://cp-algorithms.com

- GeeksforGeeks DSA: https://www.geeksforgeeks.org/data-structures/

- LeetCode Top Interview Questions: https://leetcode.com/problemset/top-interview-questions/

- HackerRank Interview Prep Kit: https://www.hackerrank.com/interview/interview-preparation-kit