

Data Structures and Algorithms Preparation Guide

This PDF categorizes a list of 100 essential problems by topic to aid focused preparation for the upcoming Data Structures and Algorithms (DSA) competition.

By structuring your practice by topic, you can build a well-rounded understanding of each core concept.

Array

- Two Sum
- Best Time to Buy and Sell Stock
- Valid Anagram
- Maximum Subarray
- Product of Array Except Self
- Best Time to Buy and Sell Stock II
- Contains Duplicate
- 3Sum
- Spiral Matrix
- Set Matrix Zeroes
- Maximum Product Subarray
- Find Peak Element
- Minimum Path Sum
- Rotate Image
- Trapping Rain Water
- Remove Element
- Rotate Array
- Unique Paths
- Find Minimum in Rotated Sorted Array

- Remove Duplicates from Sorted Array

String

- Valid Parentheses
- Valid Palindrome
- Reverse String
- Longest Palindromic Substring
- Longest Substring Without Repeating Characters
- Minimum Window Substring
- Word Break
- Letter Combinations of a Phone Number
- Longest Consecutive Sequence
- Generate Parentheses
- Word Search

Linked List

- Merge Two Sorted Lists
- Linked List Cycle
- Reverse Linked List
- Middle of the Linked List
- Remove Nth Node From End of List
- Reverse Nodes in k-Group
- Copy List with Random Pointer
- Add Two Numbers
- Merge k Sorted Lists

Binary Tree / Binary Search Tree (BST)

- Invert Binary Tree

- Maximum Depth of Binary Tree
- Diameter of Binary Tree
- Symmetric Tree
- Validate Binary Search Tree
- Kth Smallest Element in a BST
- Convert Sorted Array to Binary Search Tree
- Binary Tree Zigzag Level Order Traversal
- Construct Binary Tree from Preorder and Inorder Traversal
- Flatten Binary Tree to Linked List
- Construct Binary Tree from Inorder and Postorder Traversal
- Binary Tree Right Side View
- Binary Tree Level Order Traversal
- Minimum Absolute Difference in BST
- Path Sum

Dynamic Programming

- Climbing Stairs
- House Robber
- Maximum Sum Circular Subarray
- Jump Game
- Coin Change
- Unique Paths
- Maximal Square
- Word Break
- Longest Increasing Subsequence

Graph

- Number of Islands

- Surrounded Regions
- Clone Graph
- Course Schedule
- Course Schedule II
- Evaluate Division

Heap / Priority Queue

- Kth Largest Element in an Array
- Top K Frequent Elements
- Merge k Sorted Lists

Searching and Sorting

- Binary Search
- Search in Rotated Sorted Array
- Search a 2D Matrix
- Kth Largest Element in an Array
- Sort List
- Merge Sorted Array
- Find Median from Data Stream
- Median of Two Sorted Arrays

Backtracking / Recursion

- Permutations
- Subsets
- Generate Parentheses
- Combination Sum
- Word Search II
- Letter Combinations of a Phone Number

Math / Bit Manipulation

- Single Number
- Power ($\text{Pow}(x, n)$)
- $\text{Sqrt}(x)$
- Number of 1 Bits
- Bitwise AND of Numbers Range
- Palindrome Number
- Plus One

Stack / Queue

- Min Stack
- Basic Calculator
- Implement Trie (Prefix Tree)
- Design Add and Search Words Data Structure
- Valid Parentheses

Matrix

- Spiral Matrix
- Set Matrix Zeroes
- Rotate Image
- Game of Life
- Search a 2D Matrix

Greedy

- Container With Most Water
- Jump Game
- Best Time to Buy and Sell Stock
- Best Time to Buy and Sell Stock II