## Arrays

- Prefix Sum / Difference Array
- Sliding Window (fixed, variable)
- Two Pointers (opposite, same direction)
- Kadane’s Algorithm
- Binary Search on Answer
- Partitioning / Quickselect
- Sorting + Greedy
- Frequency Counting
- Prefix XOR
- Meet in the Middle

## Strings

- Two Pointers
- KMP Algorithm
- Z-Algorithm
- Rabin-Karp
- Manacher’s Algorithm
- Sliding Window + Frequency Map
- Trie / Prefix Tree
- Rolling Hash
- Suffix Array / Suffix Automaton
- Dynamic Programming on Strings
- Aho-Corasick Algorithm

## Linked Lists

- Fast & Slow Pointers
- Pointer Reversal
- Merge Techniques
- Dummy Node Technique
- In-place Rearrangement
- Hashing for Node Tracking
- Linked List to Tree

## Stacks & Queues

- Monotonic Stack
- Min Stack / Max Stack
- Two Stacks $\rightarrow$ Queue
- Deque for Sliding Window
- Expression Evaluation
- Stack State Simulation

## Trees

- DFS (Preorder, Inorder, Postorder)
- BFS (Level Order Traversal)
- Recursive Divide & Conquer
- Binary Search Tree Operations
- Lowest Common Ancestor (LCA)

- Diameter / Height Calculation
- Morris Traversal
- Segment Tree
- Fenwick Tree (BIT)
- Trie as Tree Structure
- Tree DP

## Graphs

- DFS / BFS
- Topological Sort
- Cycle Detection
- Dijkstra’s Algorithm
- Bellman-Ford
- Floyd-Warshall
- Minimum Spanning Tree
- Union-Find with Path Compression
- Tarjan’s Algorithm
- Kosaraju’s Algorithm
- Bipartite Check
- A* Search
- 0-1 BFS

## Heaps & Priority Queues

- Heapify / Build Heap
- Two Heaps
- Heap + Lazy Deletion
- Top-K Problems
- Priority Queue for Scheduling
- D-ary Heap

## Dynamic Programming

- 1D DP
- 2D DP
- Knapsack Variants
- State Compression DP
- DP on Subsequences
- Interval DP
- Tree DP
- Digit DP
- DP with Prefix Optimization
- DP with Binary Search
- Divide & Conquer Optimization

## Bit Manipulation

- Masking & Shifting
- XOR Properties
- Brian Kernighan’s Algorithm
- Subset Enumeration
- Bit DP

- Fast Walsh-Hadamard Transform (FWHT)

## Math & Geometry

- Modular Arithmetic
- Number Theory
- Chinese Remainder Theorem
- Geometry Basics
- Convex Hull Algorithms
- Line Sweep
- Vector Cross & Dot Products

## Problem-Solving Patterns

- Greedy Choice
- Meet in the Middle
- Backtracking
- Binary Search on Answer
- Search Space Pruning
- Simulation
- Randomization