1. Basics of programming

1.1 Time and Space Complexity

Learn about Time and Space Complexity

1.2 Basic Maths Logic Buildup

Count Digits

Reverse a number

Check palindrome

GCD or HCF

Armstrong Number

Print all Divisors of a number

Check Prime

1.3 Recursion Basics

Print 1 to N without Loop

Print N times with Recursion

Print N to 1 without Loop

Sum of first N natural numbers without Loop

Factorial of N numbers

Reverse an Array without Loop

Check if String is palindrome

Fibonacci Series

1.4 Hashing

Learn basics of hashing

Count Frequency in a range

Highest / Lowest Frequency Elements

2. Different types of Sorting

Selection Sort
Bubble Sort
Insertion Sort
Merge Sort
Recursive Bubble Sort
Recursive Insertion Sort
Quick Sort

3. Problems on Arrays

3.1 EASY

Largest Element in an Array
Second Largest Element in an Array without sorting
Check if the array is sorted
Remove duplicates from Sorted array
Left Rotate an array by one place
Left rotate an array by D places
Move Zeros to end
Linear Search
Merge 2 sorted Arrays
Find missing number in an array
Maximum Consecutive Ones
Find the number that appears once, and other numbers twice.
Longest subarray with given sum K(positives)
Longest subarray with sum K (Positives + Negatives)

3.2 MEDIUM

2Sum Problem
Sort an array of 0's 1's and 2's
Majority Element (>n/2 times)
Kadane's Algorithm, maximum subarray sum
Print subarray with maximum subarray sum
Stock Buy and Sell
Rearrange the array in alternating positive and negative items
Next Permutation
Leaders in an Array problem
Longest Consecutive Sequence in an Array
Set Matrix Zeros

Rotate Matrix by 90 degrees
Print the matrix in spiral manner
Count subarrays with given sum

3.3 HARD

Find the repeating and missing number
Majority Element (n/3 times)
3-Sum Problem
4-Sum Problem
Largest Subarray with 0 Sum
Count number of subarrays with given xor K
Merge Overlapping Subintervals
Merge two sorted arrays without extra space
Find the repeating and missing number
Count Inversions
Reverse Pairs
Maximum Product Subarray

4. Binary Search

4.1 Binary Search on simple 1D Arrays

Binary Search to find X in sorted array
Implement Lower Bound
Implement Upper Bound
Search Insert Position
Floor/Ceil in Sorted Array
Find the first or last occurrence of a given number in a sorted array
Count occurrences of a number in a sorted array with duplicates
Search in Rotated Sorted Array I
Search in Rotated Sorted Array II
Find minimum in Rotated Sorted Array
Find out how many times has an array been rotated
Single element in a Sorted Array
Find peak element

4.2 Binary Search on Answers

Find square root of a number in log n
Find the Nth root of a number using binary search

Koko Eating Bananas
Minimum days to make M bouquets
Find the smallest Divisor
Capacity to Ship Packages within D Days
Kth Missing Positive Number
Aggressive Cows
Book Allocation Problem
Split array - Largest Sum
Painter's partition
Minimize Max Distance to Gas Station
Median of 2 sorted arrays
Kth element of 2 sorted arrays

4.3 Binary Search on 2D Arrays

Find the row with maximum number of 1's
Search in a 2 D matrix
Search in a row and column wise sorted matrix
Find Peak Element (2D Matrix)
Matrix Median

5. Strings

5.1 EASY

Remove outermost Paranthesis
Reverse words in a given string / Palindrome Check
Largest odd number in a string
Longest Common Prefix
Isomorphic String
Check whether one string is a rotation of another
Check if two strings are anagram of each other

5.2 MEDIUM

Sort Characters by frequency
Maximum Nesting Depth of Paranthesis
Roman Number to Integer and vice versa
Implement Atoi
Count Number of Substrings
Longest Palindromic Substring [Do it without DP]

Sum of Beauty of all substring
Reverse Every Word in A String

5.3 HARD

Minimum number of bracket reversals needed to make an expression balanced
Count and say
Hashing In Strings
Rabin Karp
Z-Function
KMP algo / LPS(pi) array
Shortest Palindrome
Longest happy prefix
Count palindromic subsequence in given string

6. Linked List (Single LL, Double LL)

6.1 Learn Singly Linked List

Introduction to LinkedList
Inserting a node in LinkedList
Deleting a node in LinkedList
Find the length of the linkedlist
Search an element in the LL
Design Linked List

6.2 Learn Doubly Linked List

Introduction to DLL
Insert a node in DLL
Delete a node in DLL
Reverse a DLL

6.3 Medium problems of SLL

Middle of a LinkedList [TortoiseHare Method]
Reverse a LinkedList [Iterative]
Reverse a LL [Recursive]
Detect a loop in LL
Find the starting point in LL

Length of Loop in LL
Check if LL is palindrome or not
Segrregate odd and even nodes in LL
Remove Nth node from the back of the LL
Delete the middle node of LL
Sort LL
Sort a LL of 0's 1's and 2's by changing links
Find the intersection point of 2 LL
Add 1 to a number represented by LL
Add 2 numbers in LL

6.4 Medium problems of DLL

Delete all occurrences of a key in DLL
Find pairs with given sum in DLL
Remove duplicates from sorted DLL

6.5 Hard problems of LL

Reverse LL in group of given size K
Rotate a LL
Flattening of LL
Clone a Linked List with random and next pointer

7. Bit Manipulation

7.1 Learning Bit Manipulation

Introduction to Bit Manipulation
Check if the i-th bit is set or not
Check if a number is odd or not
Check if a number is power of 2 or not
Count the number of set bits
Set/Unset the rightmost unset bit
Swap two numbers
Divide two integers without using multiplication, division and mod operator

7.2 Problems on Bit Manipulation

Count number of bits to be flipped to convert A to B

Find the number that appears odd number of times
Power Set
Find xor of numbers from L to R
Find the two numbers appearing odd number of times

7.3 Advance Problems

Print Prime Factors of a Number
All Divisors of a Number
Sieve of Eratosthenes
Find Prime Factorisation of a Number using Sieve
Power(n, x)

8. Recursion

8.1 Learn Basic Recursion

Recursive Implementation of atoi()
Pow(x, n)
Count Good numbers
Sort a stack using recursion
Reverse a stack using recursion

8.2 Generate Subsequences

Generate all binary strings
Generate Paranthesis
Print all subsequences/Power Set
Learn All Patterns of Subsequences
Count all subsequences with sum K
Check if there exists a subsequence with sum K
Combination Sum
Combination Sum-II
Subset Sum-I
Subset Sum-II
Combination Sum - III
Letter Combinations of a Phone number

8.3 Hard problems on recursion

Palindrome Partitioning
Word Search
N Queen
Rat in a Maze
Word Break
M Coloring Problem
Sudoko Solver
Expression Add Operators

9. Stacks and Queues

9.1 Learn the basics

Implement Stack using Arrays
Implement Queue using Arrays
Implement Stack using Queue
Implement Queue using Stack
Implement stack using Linkedlist
Implement queue using Linkedlist
Check for balanced paranthesis
Implement Min Stack

9.2 Prefix, Infix, Postfix conversions

Infix to Postfix Conversion using Stack
Prefix to Infix Conversion
Prefix to Postfix Conversion
Postfix to Prefix Conversion
Postfix to Infix
Convert Infix To Prefix Notation

9.3 Monotonic Stack/Queue Problems

Next Greater Element
Next Greater Element 2
Next Smaller Element
Number of NGEs to the right
Trapping Rainwater
Sum of subarray minimum
Asteroid Collision
Sum of subarray ranges

Remove k Digits
Largest rectangle in a histogram
Maximal Rectangles

9.4 Implemention Problems

Sliding Window maximum
Stock span problem
The Celebrity Problem
LRU cache
LFU cache

10. Sliding Window and Two Pointers

10.1 Medium level Problems

Longest Substring Without Repeating Characters
Max Consecutive Ones III
Fruit Into Baskets
Longest repeating character replacement
Binary subarray with sum
Count number of nice subarrays
Number of substring containing all three characters
Maximum point you can obtain from cards

10.2 Hard level Problems

Longest Substring with At Most K Distinct Characters
Subarray with k different integers
Minimum Window Substring
Minimum Window Subsequence

11. Heaps

11.1 Introduction to Heaps

Introduction to Priority Queues using Binary Heaps
Min Heap and Max Heap Implementation
Convert min Heap to max Heap

11.2 Medium level problems

Kth largest element in an array [use priority queue]
Kth smallest element in an array [use priority queue]
Merge M sorted Lists
Replace each array element by its corresponding rank
Task Scheduler
Hands of Straights

11.3 Hard level problems

Design twitter
Connect `n` ropes with minimal cost
Kth largest element in a stream of running integers
Maximum Sum Combination
Find Median from Data Stream
K most frequent elements

12. Greedy Algorithms

12.1 Easy Level Problems

Assign Cookies
Fractional Knapsack Problem
Greedy algorithm to find minimum number of coins
Lemonade Change
Valid Paranthesis Checker

12.2 Medium/Hard Level Problems

N meetings in one room
Jump Game
Jump Game 2
Minimum number of platforms required for a railway
Job sequencing Problem
Candy
Program for Shortest Job First (or SJF) CPU Scheduling
Program for Least Recently Used (LRU) Page Replacement Algorithm
Insert Interval
Merge Intervals

Non-overlapping Intervals

13. Binary Trees

13.1 Learn Traversal

Introduction to Trees
Create Binary Tree
Binary Tree Traversals in Binary Tree
Preorder Traversal of Binary Tree
Inorder Traversal of Binary Tree
Post-order Traversal of Binary Tree
Level order Traversal / Level order traversal in spiral form
Iterative Preorder Traversal of Binary Tree
Iterative Inorder Traversal of Binary Tree
Post-order Traversal of Binary Tree using 2 stack
Post-order Traversal of Binary Tree using 1 stack
Preorder, Inorder, and Postorder Traversal in one Traversal

13.2 Medium Level Problems

Height of a Binary Tree
Check if the Binary tree is height-balanced or not
Diameter of Binary Tree
Maximum path sum
Check if two trees are identical or not
Zig Zag Traversal of Binary Tree
Boundary Traversal of Binary Tree
Vertical Order Traversal of Binary Tree
Top View of Binary Tree
Bottom View of Binary Tree
Right/Left View of Binary Tree
Symmetric Binary Tree

13.3 Hard Level Problems

Root to Node Path in Binary Tree
LCA in Binary Tree
Maximum width of a Binary Tree
Check for Children Sum Property
Print all the Nodes at a distance of K in a Binary Tree

Minimum time taken to BURN the Binary Tree from a Node
Count total Nodes in a COMPLETE Binary Tree
Requirements needed to construct a Unique Binary Tree
Construct Binary Tree from inorder and preorder
Construct the Binary Tree from Postorder and Inorder Traversal
Serialize and deserialize Binary Tree
Morris Preorder Traversal of a Binary Tree
Morris Inorder Traversal of a Binary Tree
Flatten Binary Tree to LinkedList

14. Binary Search Trees

14.1 Introduction

Introduction to Binary Search Tree
Search in a Binary Search Tree
Find Min/Max in BST

14.2 Practice Problems

Ceil in a Binary Search Tree
Floor in a Binary Search Tree
Insert a given Node in Binary Search Tree
Delete a Node in Binary Search Tree
Find K-th smallest/largest element in BST
Check if a tree is a BST or BT
LCA in Binary Search Tree
Construct a BST from a preorder traversal
Inorder Successor/Predecessor in BST
Merge 2 BST's
Two Sum In BST | Check if there exists a pair with Sum K
Recover BST | Correct BST with two nodes swapped
Largest BST in Binary Tree

15. Graphs

15.1 Introduction to Graphs

Graph and Types
Graph Representation

Connected Components
BFS
DFS

15.2 Problems based on BFS & DFS

Number of provinces
Connected Components Problem in Matrix
Rotten Oranges
Flood fill
Cycle Detection in undirected Graph (bfs)
Cycle Detection in undirected Graph (dfs)
0/1 Matrix (Bfs Problem)
Surrounded Regions (dfs)
Number of Enclaves [flood fill implementation - multisource]
Word ladder - 1
Word ladder - 2
Number of Distinct Islands [dfs multisource]
Bipartite Graph (DFS)
Cycle Detection in Directed Graph (DFS)

15.3 Topo Sort based problems

Topo Sort
Kahn's Algorithm
Cycle Detection in Directed Graph (BFS)
Course Schedule - I
Course Schedule - II
Find eventual safe states
Alien dictionary

15.4 Shortest Path related Problems

Shortest Path in UG with unit weights
Shortest Path in DAG
Djisktra's Algorithm
Why priority Queue is used in Djisktra's Algorithm
Shortest path in a binary maze
Path with minimum effort
Cheapest flights within k stops
Network Delay time

Number of ways to arrive at destination
Minimum steps to reach end from start by performing multiplication and mod operations
Bellman Ford Algorithm
Floyd Warshal Algorithm
Find the city with the smallest number of neighbors in a threshold distance

15.5 Minimum Spanning Tree and Disjoint Set

Minimum Spanning Tree
Prim's Algorithm
Disjoint Set [Union by Rank]
Disjoint Set [Union by Size]
Kruskal's Algorithm
Number of operations to make network connected
Most stones removed with same rows or columns
Accounts merge
Number of island II
Making a Large Island
Swim in rising water

15.6 Other Graph Algorithms

Bridges in Graph
Articulation Point
Kosaraju's Algorithm

16. Dynamic Programming

16.1 Introduction to Dynamic Programming

Dynamic Programming Introduction

16.2 DP on 1D

Climbing Stars
Frog Jump
Frog Jump with k distances
Maximum sum of non-adjacent elements
House Robber

16.3 DP on 2D/3D or Grids

Ninja's Training
Grid Unique Paths : DP on Grids
Grid Unique Paths 2
Minimum path sum in Grid
Minimum path sum in Triangular Grid
Minimum/Maximum Falling Path Sum
3-d DP : Ninja and his friends

16.4 DP on subsequences

Subset sum equal to target
Partition Equal Subset Sum
Partition Set Into 2 Subsets With Min Absolute Sum Diff
Count Subsets with Sum K
Count Partitions with Given Difference
0/1 Knapsack
Minimum Coins
Target Sum
Coin Change 2
Unbounded Knapsack
Rod Cutting Problem

16.5 DP on Strings

Longest Common Subsequence
Print Longest Common Subsequence
Longest Common Substring
Longest Palindromic Subsequence
Minimum insertions to make string palindrome
Minimum Insertions/Deletions to Convert String
Shortest Common Supersequence
Distinct Subsequences
Edit Distance
Wildcard Matching

16.6 DP on Stocks

Best Time to Buy and Sell Stock
Buy and Sell Stock - II

Buy and Sell Stocks III
Buy and Stock Sell IV
Buy and Sell Stocks With Cooldown
Buy and Sell Stocks With Transaction Fee

16.7 DP on LIS

Longest Increasing Subsequence
Printing Longest Increasing Subsequence
Longest Increasing Subsequence
Largest Divisible Subset
Longest String Chain
Longest Bitonic Subsequence
Number of Longest Increasing Subsequences

16.8 MCM DP | Partition DP

Matrix Chain Multiplication
Matrix Chain Multiplication | Bottom-Up
Minimum Cost to Cut the Stick
Burst Balloons
Evaluate Boolean Expression to True
Palindrome Partitioning - II
Partition Array for Maximum Sum

16.9 DP on Squares

Maximum Rectangle Area with all 1's
Count Square Submatrices with All Ones

17. Tries

17.1 Introduction and Problems

Implement TRIE | INSERT | SEARCH | STARTSWITH
Implement Trie - 2 (Prefix Tree)
Longest String with All Prefixes
Number of Distinct Substrings in a String
Bit PreRequisites for TRIE Problems
Maximum XOR of two numbers in an array

Maximum XOR With an Element From Array