

• D.S.A. RoadMap.

[Shayan]

Solve Questions Attached Below.

(Covering All famous Questions LeetCode Focused)

Prepare Notes By Yourself.

(Below, I have given Topics in Order)

NOTE:- Don't Fill Your Notes With Unnecessary Thing !!

Mtlb Aap apne notes Placement & Internships ke
Uge Bana Raha ho, Copy Bhaune ke Liye Nahi

Link :- <https://drive.google.com/file/d/1tSA3BJwVVYCeC6epvxPf6CyLM3TW3w1p/view>

1) Basics of D.S.A.

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in Chrome].

- Time & Space Complexity Analysis.
- Big-O, Big- Θ , Big- Ω Notations.

2) Arrays.

- Basics of Array (1D & 2D)
- Insertion & Deletion in an Array
- Reverse an Array.
- Maxm Subarray Sum (Kadane's Algo).
- Find Max & Min in an Array.
- Two Sum Problem.
- Majority Element (Moore's Voting Algorithm)
- Rearrange (+)ve & (-)ve Numbers.
- Next Permutation
- Merge Two Sorted Array (Without Extra Space)
- Find Duplicate Number (Floyd's Cycle Detection)
- Longest Consecutive Subsequence
- Trapping Rain Water
- Maxm Product Subarray.
- Subarray Sum Equals K.

3) Searching & Sorting Algorithms.

- Linear Search

- .

- Binary Search (Iterative & Recursive)
- Bubble Sort, Merge Sort, Quick Sort.
- Insertion Sort, Selection Sort.
- Heap Sort, Radix Sort.

4) Recursion & Backtracking

- Basics Of Recursion
- Tail Recursion
- Subset Generation
- Permutation & Combinations
- N-Queens Problem
- Sudoku Solver
- Rat in a Maze.

5) Bit Manipulation

- Bitwise AND, OR, XOR.
- Left & Right Shifts
- Checking If a Number is Power of 2.
- Counting Set Bits
- XOR Trick for finding Unique Elements.

6) Linked Lists.

- Singly Linked List (Insertion, Deletion, Traversal)
- Doubly Linked List.
- Circular Linked List.
- Detect & Remove Loop in Linked List (Floyd's Cycle Detection)
- Reverse a Linked List.
- Merge Two Sorted Linked Lists
- Clone a Linked List.

7) Stack

(Insertion & Deletion from front, end, & Specific Position)

- Stack Implementation Using Arrays & Linked Lists.
- Next Greater Element.
- Balanced Parentheses Problem.

- Infix to Postfix Conversion & All 3 Notations.
- Stock Span Problem
- Largest Rectangle in Histogram

8) Queue

(Insertion & Deletion from front, End & Specific Position)

- Queue Implementation Using Arrays & Linked Lists.
- Circular Queue
- Priority Queue
- Deque (Double Ended Queue)
- Sliding Window Maxm

9) Hashing.

- Hash Table (Chain & Open Addressing)
- Counting Frequency of Elements.
- Two Sum Problem
- Longest Consecutive Sequence
- Subarray Sum Equals K

10) Trees

- Binary Tree Traversal (Pre, In, Postorder)
- Level Order Traversal
- BST Insertion & Deletion
- Lowest Common Ancestor
- Diameter of a Tree.
- AVL Tree & Balancing Trees.

11) Graphs

- Graph Representation (Adjacency Matrix & List)
- BFS & DFS
- Cycle Detection in Graphs
- Dijkstra's Algorithm
- Floyd-Warshall's Algorithm
- Kruskal's & Prim's Algorithm

12) Dynamic Programming

- 0/1 Knapsack
- Fibonacci with memoization
- Longest Common Subsequence
- Longest Increasing Subsequence
- Coin Change Problem
- Edit Distance

13) Greedy Algorithms

- Activity Selection Problem
- Huffman Coding
- Kruskal's Algorithm (MST)
- Prim's Algorithm (MSP)
- Dijkstra Algorithm

14) Sliding Window & Two Pointers

- Maxm Sum Subarray.
- Longest String without Repeating Characters
- Minm Window substring
- Container with Most Water
- Trapping Rain Water

15) Heaps

- Min heap & Max Heap
- Heap Sort
- n^{th} Largest Element in an Array.
- Find Median from Data Stream

Now, if You Got time left:-

- i) Trie
- ii) Disjoint set
- iii) Segment tree
- iv) Fenwick tree

Apart from this focus On:-

- i) System Design
- ii) OOPs
- iii) DBMS
- iv) OS

v3 Networking

Attachments Below :

Behavioral Questions : STAR Method
(Situation, Task, Action, Result).

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google.com

If Links Don't Work, Then Do Below Stuff

i) Select & Copy Link

ii) Paste it in Chrome & Go!! 😊

LinkedIn : <https://www.linkedin.com/in/shayan-akhtar-abedeen-7aa888264>

linkedin.com

GitHub: <https://github.com/shayan-ing>

github.com

Date: _____

- Array

⇒ Easy.

1) Majority Element.

2) Repeating & Missing Number

3) Merged two sorted Array with Extra space

4) Stock - Buy & sell

5) Minimize the maxm diff with height.

⇒ Medium.

1) Kadane's Algorithm

2) Sort Arrays of 0's, 1's, 2's.

3) Three sum

4) Four sum

5) Two sum

6) Container with most water

7) Next permutation

8) Merge Overlapping Intervals

9) Longest Substring without Repeating.

10) Set Matrix Zeros

11) Word search

12) Product of Array ~~of~~ Except itself.

Date: _____

13) Find Duplicate

14) Find Largest Sum Contiguous Sub-Array.

16) Power (x, n)

⇒ Hand.

1) Trapping Rain Water

2) Best time to Buy and Sell Stock (3)

3) Sliding Window Maxm

4) Count Inversions.

• Binary Search.

↳ Search in Rotated Sorted Array.

2) Allocate Minimum Pages (Book Allocation)

3) Median of Two Sorted Arrays.

4) Aggressive Cows.

5) Peak Index in Mountain Array.

Date: _____

- Strings:

⇒ Easy.

1) Valid Palindrome

2) Longest Common Prefix

3) Valid Anagram

⇒ Medium

1) Reverse Words in String

2) Group Anagram

3) Permutation in Strings

⇒ Hard

1) KMP (Knuth - Morris - Pratt) Algorithm

2) Rabin - Karp Algorithm

3) Minimum Window Substring

* Recursion & Backtracking

1) Fibonacci No

2) Combination Sum 1

3) Combination Sum 2

4) Palindrome Partitioning

Date: _____

5) Rat in a Maze

6) Knight's Tour Problem

7) N-Queens Problem

8) Sudoku Solver

9) Subset II

10) M Colouring

* Linked List.

⇒ Easy

1, Reverse Linked List.

2, Middle of Linked List.

3, Reverse of Linked List in a Group of given size.

4, Merge two sorted Linked List.

5) Check if Linked List is Palindrome or not.

⇒ Medium

1, Remove Duplicates in Sorted Linked List

2, Remove Cycle in Linked List.

3, Rotate a Doubly Linked List in group of given size.

4, Sort a 'K' Sealed Doubly Linked List

5) Add two Numbers represented by linked list.

6) LRU Cache

Date: _____

7) Reverse Nodes in K-Groups

8) Flatten a Linked List

* Stack & Queue

=> Easy.

1) Implement Stack Using Queue / Queue Using Stack

2) Next Greater Element - I

3) Valid Parenthesis

4) Reverse first K-elements for Queue

=> Medium

1) Next Greater Element - II

2) Celebrity Problem

3) Get Min Element from Stack

4) Gas Station / Find 1st Circular Tour Visits all Pumps.

5) Rotten Oranges

6) Stock span

=> Hard

1) Maxm Area in Histogram

2) Length of Longest Valid string

3) Sum of Min & Max Elements of all subarray of
Size K.

Date: _____

* Greedy Technique

=> Easy

1, Task Scheduling

2, Find Min No of Coins.

3, Huffman Coding

=> Medium

1, Job Sequencing Problem

2, Gas Station

3, Minimum Deletion to make character freq unique

4, Min Number of Arrows to Burst Balloons

5) Non-Overlapping Intervals.

=> Hard

1, Candy Problem

2, Min No of Taps to Open to Water a Garden

* Dynamic Programming.

1) Climbing Stairs

2, Min^{Cost} Climbing Stairs

3, Nth Tribonacci Number

4, Knapsack with Duplicate

Date: _____

- 5) Coin Change
- 6) Longest Increasing Subsequence
- 7) Min Cost Jet Tickets
- 8) Knapsack Problem
- 9) Longest Common Subsequence
- 10) Word Break
- 11) Combination Sum IV
- 12) House Robber
- 13) Decode Ways
- 14) Unique paths
- 15) Jumps Game
- 16) Edit Distance
- 17) Burst Balloons
- 18) Super Egg Drop
- 19) Catalan Number

* Trees & BST.

- 1) Maxm Depth Of Binary Tree
- 2) Reverse Level Order Traversal
- 3) Binary Tree Pre/in/Post-Order Traversal
- 4) Invert Binary Tree

Date: _____

- 5) ZigZag Tree Traversal.
- 6) Diameter of Binary Tree
- 7) Same Tree
- 8) Validate Binary Search Tree
- 9) Lowest Common Ancestor of a Binary Tree
- 10) Kth Smallest Element on a BST.
- 11) Serialize & Deserialize Binary Tree.
- 12) Binary Tree Maxm Path Sum
- 13) Convert Sorted Array to BST.

* Graphs

- 1, BFS
- 2, DFS.
- 3, No of As
- 4, Flood Fill Algorithm
- 5) Clone Graph
- 6) Djikstra's Shortestpath algorithm.
- 7, Topological Sort
- 8) No of Islands
- 9, Prim's Algo
- 10, Floyd Warshall

Date:

11) Graph Colouring

12) Snakes & Ladders.

13) Kosaraju's Theorem

14) Cheapest Flights within K-stops

15) Bellman Ford

16) Alien Dictionary

17) Word Ladder

18) Kruskal's MST.

19) Total No of Spanning trees graph

20) Travelling Salesman

* Searching & Sorting

1) Binary Search

2) First Bad Version

3) Find First & Last Position of Element in Sorted Array

4) Merge Sorted Array

5) Sort Colors (Dutch National Flag Problem)

6) Find Peak Element

7) Kth Largest Element in an Array

8) Find Min in Rotated Sorted Array