

DSA imp questions



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Array

Find max and min with minimum number of comparisons

- Sort 0, 1, 2
- Union and Intersection
- Find the largest sum contiguous subarray
- Find duplicates in an array
- Merge overlapping intervals
- Count inversions in an array
- Next permutation
- Minimize the maximum pair
- Best time to buy and sell stock
- Rearrange – move all negative elements to one side
- Rotate array
- Subarray with 0 sum
- Maximum product in a subarray
- Merge two sorted arrays
- Common in 3 sorted arrays
- Smallest sum subarray with sum greater than X
- Rotated sorted array
- Check if array is sorted and rotated
- Sum of two arrays

2D Array

- Wave print pattern
- Spiral matrix
- Rotate a matrix by 90 degrees
- Search in a 2D matrix
- Search in a 2D matrix (another variant)

Linked List

- Insertion and deletion
- Reverse a linked list
- Find middle of linked list
- Reverse K linked list groups
- Detect and remove loop
- Remove duplicates from linked list
- Merge 2 sorted linked lists
- Sort 0s, 1s, 2s
- Check palindrome in linked list
- Add two numbers
- Merge sort in linked list
- Reorder list
- Remove Nth node from the end
- Merge K sorted lists
- Doubly and circular linked list

Maths – DSA Questions

- Prime numbers
- Sieve of Eratosthenes
- GCD / LCM
- Fast power (Modular arithmetic)
- Pigeonhole principle
- Catalan numbers

Recursion & Backtracking

- Fibonacci series
- Climb stairs
- Binary search
- Reverse string
- Palindrome in a string
- Merge sort
- Quick sort

Stack

- Array implementation – struct contains size, array
- Linked list implementation – keywords → 2 classes for LL, 1st node, etc.
- Implement 2 stacks in one array
- Delete middle element from stack
- Valid parentheses – put open brackets, check in stack if `)`, etc.
- Insert at bottom in a stack
- Reverse a stack using recursion
- Redundant brackets – push in stack if open bracket or operator
- Next smaller element – if stack top is less, add in answer else check

- Largest rectangular area in histogram
- Min stack – use `min(st.top())` , `minStack.pop()`
- Evaluate reverse polish notation
- General parentheses – if open → add, else check after closing
- Daily temperatures – next greater element
- Prefix, postfix conversion – symbol, stack, postfix etc.

Binary Search

1. First and last occurrence in an array
2. Find peak element
3. Find pivot element
4. Search in sorted and rotated array
5. Square root of a number
6. Search 2D matrix
7. Koko eating bananas
8. Find minimum in rotated sorted array
9. Search in rotated sorted array
10. Book allocation
11. Search in 2D matrix II
12. Binary search
13. Median of two sorted arrays
14. Floor and ceil