



TOP 100 DSA INTERVIEW QUESTIONS

```
        curr.b) {  
            hd=h;  
        }  
    }  
  
private void topView(Node root) { // vertical traversal using level order  
    TreeMap<Integer,ArrayList<Integer>> map = new TreeMap<>(); //self balancing  
    Queue<Pair> q = new LinkedList<>();  
    q.add(new Pair(root,0)); //root hd always will be 0  
    while(!q.isEmpty())  
    {  
        Pair p=q.poll();  
        Node curr = p.node;  
        int hd = p.hd;  
        if(map.containsKey(hd)){} //skipping the next bottom elements  
        else {  
            ArrayList<Integer> al=new ArrayList<Integer>();  
            al.add(curr.data);  
            map.put(hd,al);  
        } //left will always be decremented by 1  
        if(curr.left!=null) q.add(new Pair(curr.left,hd-1));  
        //right will always be incremented by 1  
        if(curr.right!=null) q.add(new Pair(curr.right,hd+1));  
    }  
    display(map);  
}
```

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ARRAYS

Question 1

Given an array $A[]$ of n numbers and another number x , the task is to check whether or not there exist two elements in $A[]$ whose sum is exactly x .

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Question 2

Given an array $\text{prices}[]$ of length N , representing the prices of the stocks on different days, the task is to find the maximum profit possible for buying and selling the stocks on different days using transactions where at most one transaction is allowed.

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Question 3

Given an array of n elements that contains elements from 0 to $n-1$, with any of these numbers appearing any number of times. Find these repeating numbers in $O(n)$ and using only constant memory space.

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Question 1

Given an array $\text{arr}[]$ of n integers, construct a Product Array $\text{prod}[]$ (of the same size) such that $\text{prod}[i]$ is equal to the product of all the elements of $\text{arr}[]$ except $\text{arr}[i]$.

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Question 2

Given an array $\text{arr}[]$ of size N . The task is to find the sum of the contiguous subarray within a $\text{arr}[]$ with the largest sum.

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Question 3

Given an array that contains both positive and negative integers, find the product of the maximum product subarray.

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Question 4

Given a sorted array $\text{arr}[]$ (may be distinct or may contain duplicates) of size N that is rotated at some unknown point, the task is to find the minimum element in it.

PRACTICE NOW



Question 5

Given a sorted and rotated array arr[] of size N and a key, the task is to find the key in the array.

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Question 6

Given an array of distinct elements. The task is to find triplets in the array whose sum is zero.

PRACTICE NOW

Question 7

Given n non-negative integers where each represents a point at coordinate . ‘ n ’ vertical lines are drawn such that the two endpoints of line i is at and .

Find two lines, which together with x-axis forms a container, such that the container contains the most water.

The program should return an integer which corresponds to the maximum area of water that can be contained (maximum area instead of maximum volume sounds weird but this is the 2D plane we are working with for simplicity).

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Question 8

Find the factorial of a large number.

PRACTICE NOW

Question 9

Given an array of N non-negative integers arr[] representing an elevation map where the width of each bar is 1, compute how much water it is able to trap after raining.

PRACTICE NOW

Question 10

Given an array of N integers where each value represents the number of chocolates in a packet. Each packet can have a variable number of chocolates. There are m students, the task is to distribute chocolate packets such that:

- Each student gets one packet.
- The difference between the number of chocolates in the packet with maximum chocolates and the packet with minimum chocolates given to the students is minimum.

PRACTICE NOW



Question 11

Given a set of non-overlapping intervals and a new interval, insert the interval at correct position. If the insertion results in overlapping intervals, then merge the overlapping intervals. Assume that the set of non-overlapping intervals is sorted on the basis of start time, to find correct position of insertion.

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Question 12

Given a set of time intervals in any order, merge all overlapping intervals into one and output the result which should have only mutually exclusive intervals.

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Question 13

Given N set of time intervals, the task is to find the intervals which don't overlap with the given set of intervals.

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MATRIX

Question 1

Given a boolean matrix $\text{mat}[M][N]$ of size $M \times N$, modify it such that if a matrix cell $\text{mat}[i][j]$ is 1 (or true) then make all the cells of ith row and jth column as 1.

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Question 2

Given a 2D array, print it in spiral form.

PRACTICE NOW

Question 3

Transpose of a matrix is obtained by changing rows to columns and columns to rows. In other words, transpose of $A[N][M]$ is obtained by changing $A[i][j]$ to $A[j][i]$.

PRACTICE NOW



Question 4

Given a 2D grid of characters and a single word/an array of words, find all occurrences of the given word/words in the grid. A word can be matched in all 8 directions at any point. Word is said to be found in a direction if all characters match in this direction (not in zig-zag form). The 8 directions are, Horizontally Left, Horizontally Right, Vertically Up, Vertically Down and 4 Diagonal directions.

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STRING

Question 1

Given a string str, find the length of the longest substring without repeating characters.

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Question 2

Given a string, the task is to find the maximum consecutive repeating character in a string.

Note: We do not need to consider the overall count, but the count of repeating that appears in one place.

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Question 3

Given two strings, string and pattern, the task is to find the smallest substring in string containing all characters of pattern.

PRACTICE NOW



Question 4

Given two strings. The task is to check whether the given strings are anagrams of each other or not.

PRACTICE NOW

Question 5

Given an array of words, print all anagrams together. For example, if the given array is {"cat", "dog", "tac", "god", "act"}, then output may be "cat tac act dog god".

PRACTICE NOW

Question 7

Given a string str of length N, consisting of '(' and ')' only, the task is to check whether it is balanced or not.

PRACTICE NOW

Question 8

Write a program to check if a sentence is a palindrome or not. You can ignore white spaces and other characters to consider sentences as a palindrome.

PRACTICE NOW



Question 9

Given a string str, the task is to find the longest substring which is a palindrome.

PRACTICE NOW

Question 10

Given a string, the task is to count all palindrome sub string in a given string. Length of palindrome sub string is greater than or equal to 2.

PRACTICE NOW

Question 11

Given a set of strings, find the longest common prefix.

PRACTICE NOW



LINKED LIST

Question 1

Given a pointer to the head node of a linked list, the task is to reverse the linked list. We need to reverse the list by changing the links between nodes.

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Question 2

Given a linked list, check if the linked list has a loop (cycle) or not. The below diagram shows a linked list with a loop.

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Question 3

Auxiliary Given two sorted linked lists consisting of N and M nodes respectively. The task is to merge both of the lists (in place) and return the head of the merged list.

PRACTICE NOW



Question 4

Given K sorted linked lists of size N each, the task is to merge them all maintaining their sorted order.

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Question 5

Given a linked list. The task is to remove the Nth node from the end of the linked list.

PRACTICE NOW

Question 7

Given a singly linked list: $A_0 \rightarrow A_1 \rightarrow \dots \rightarrow A_{n-2} \rightarrow A_{n-1}$, reorder it to: $A_0 \rightarrow A_{n-1} \rightarrow A_1 \rightarrow A_{n-2} \rightarrow A_2 \rightarrow A_{n-3} \rightarrow \dots$

PRACTICE NOW

Question 8

Using pointers, loop through the whole list and keep track of the node prior to the node containing the last occurrence key using a special pointer. After this just store the next of next of the special pointer, into to next of special pointer to remove the required node from the linked list.

PRACTICE NOW



Question 9

Number is represented in linked list such that each digit corresponds to a node in linked list. Add 1 to it. For example 1999 is represented as (1-> 9-> 9 -> 9) and adding 1 to it should change it to (2->0->0->0)

PRACTICE NOW

Question 10

Auxiliary Given a singly linked list, find the middle of the linked list. For example, if the given linked list is 1->2->3->4->5 then the output should be 3.

If there are even nodes, then there would be two middle nodes, we need to print the second middle element.

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STACK & QUEUE

Question 1

Write a program to convert an Infix expression to Postfix form.

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Question 2

Given an array, print the Next Greater Element (NGE) for every element.

PRACTICE NOW

Question 3

Given a stack with push(), pop(), and empty() operations, The task is to delete the middle element of it without using any additional data structure.

PRACTICE NOW



Question 4

Given two n-ary trees, the task is to check if they are the mirror of each other or not. Print “Yes” if they are the mirror of each other else “No”.

PRACTICE NOW

Question 5

Given a string consisting of opening and closing parenthesis, find the length of the longest valid parenthesis substring.

PRACTICE NOW

Question 7

Given a Binary Tree, print the Right view of it.
The right view of a Binary Tree is a set of nodes visible when the tree is visited from the Right side.

PRACTICE NOW



Question 8

In a party of N people, only one person is known to everyone. Such a person may be present at the party, if yes, (s)he doesn't know anyone at the party. We can only ask questions like “does A know B?”. Find the stranger (celebrity) in the minimum number of questions.

We can describe the problem input as an array of numbers/characters representing persons in the party. We also have a hypothetical function `HaveAcquaintance(A, B)` which returns true if A knows B, and false otherwise. How can we solve the problem?

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Question 9

Given information about N petrol pumps (say `arr[]`) that are present in a circular path. The information consists of the distance of the next petrol pump from the current one (in `arr[i][1]`) and the amount of petrol stored in that petrol pump (in `arr[i][0]`). Consider a truck with infinite capacity that consumes 1 unit of petrol to travel 1 unit distance. The task is to find the index of the first starting point such that the truck can visit all the petrol pumps and come back to that starting point.

PRACTICE NOW



TREE

Question 1

Given a binary tree, the task is to find the height of the tree. The height of the tree is the number of edges in the tree from the root to the deepest node.

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Question 2

Given two binary trees. The task is to write a program to check if the two trees are identical in structure.

PRACTICE NOW

Question 3

A Given a binary tree, the task is to flip the binary tree towards the right direction that is clockwise.

PRACTICE NOW



Question 4

Given a binary tree, find the maximum path sum. The path may start and end at any node in the tree.

PRACTICE NOW

Question 5

Given the root of the Binary Tree. The task is to print the Level order traversal of a tree is breadth first traversal for the tree.

PRACTICE NOW

Question 7

Given two binary trees, check if the first tree is a subtree of the second one. A subtree of a tree T is a tree S consisting of a node in T and all of its descendants in T. The subtree corresponding to the root node is the entire tree; the subtree corresponding to any other node is called a proper subtree.

PRACTICE NOW



Question 8

Construct Tree from given Inorder and Preorder traversals

PRACTICE NOW

Question 9

check if a Binary Tree is BST or not

PRACTICE NOW

Question 10

Given the root of a binary search tree and K as input, find Kth smallest element in BST.

PRACTICE NOW

Question 11

Given two values n1 and n2 in a Binary Search Tree, find the Lowest Common Ancestor (LCA). You may assume that both values exist in the tree.

PRACTICE NOW



HEAP

Question 1

Given a non-empty array of integers, find the top k elements which have the highest frequency in the array. If two numbers have the same frequency then the larger number should be given preference.

PRACTICE NOW

Question 2

Given that integers are read from a data stream. Find the median of elements read so far in an efficient way. For simplicity assume, there are no duplicates.

PRACTICE NOW

Question 3

Given a stream of integers represented as arr[]. For each index i from 0 to n-1, print the multiplication of largest, second largest, third largest element of the subarray arr[0...i]. If i < 2 print -1.

PRACTICE NOW

Question 4

Given are N ropes of different lengths, the task is to connect these ropes into one rope with minimum cost, such that the cost to connect two ropes is equal to the sum of their lengths.

PRACTICE NOW



GRAPHS

Question 1

Clone an Undirected Graph

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Question 2

There are a total of n tasks you have to pick, labeled from 0 to $n-1$. Some tasks may have prerequisites tasks, for example to pick task 0 you have to first finish tasks 1, which is expressed as a pair: $[0, 1]$

Given the total number of n tasks and a list of prerequisite pairs of size m . Find a ordering of tasks you should pick to finish all tasks.

PRACTICE NOW

Question 3

Given a binary 2D matrix, find the number of islands. A group of connected 1s forms an island. For example, the below matrix contains 5 islands.

PRACTICE NOW



Question 4

Given an array of integers, find the length of the longest sub-sequence such that elements in the subsequence are consecutive integers, the consecutive numbers can be in any order.

PRACTICE NOW

Question 5

Given the root of a Directed graph, The task is to check whether the graph contains a cycle or not.

PRACTICE NOW

Question 6

Given an undirected Graph, The task is to find the Bridges in this Graph.

PRACTICE NOW

Question 7

Check whether a given graph is Bipartite or not

PRACTICE NOW



Question 8

There is an $N \times M$ rectangular island that borders both the Pacific Ocean and the Atlantic Ocean. The Pacific Ocean touches the island's left and top edges, and the Atlantic Ocean touches the island's right and bottom edges. The island is partitioned into a grid of square cells. The island receives a lot of rain, and the rainwater can flow to neighboring cells directly north, south, east, and west if the neighboring cell's height is less than or equal to the current cell's height. Water can flow from any cell adjacent to an ocean into the ocean.

Given a matrix $\text{mat}[][]$ having N rows and M columns where $\text{mat}[x][y]$ represents the height above sea level of the cell at coordinate (x, y) , the task is to find the number of coordinates (x, y) such that the rainwater can flow from the cell (x, y) to both the Pacific and Atlantic oceans.

PRACTICE NOW

Question 9

Consider a matrix, where each cell contains either a '0' or a '1', and any cell containing a 1 is called a filled cell. Two cells are said to be connected if they are adjacent to each other horizontally, vertically, or diagonally. If one or more filled cells are also connected, they form a region. find the size of the largest region.

PRACTICE NOW



Question 10

Given a snake and ladder board, find the minimum number of dice throws required to reach the destination or last cell from the source or 1st cell. Basically, the player has total control over the outcome of the dice throw and wants to find out the minimum number of throws required to reach the last cell.

If the player reaches a cell which is the base of a ladder, the player has to climb up that ladder and if reaches a cell is the mouth of the snake, and has to go down to the tail of the snake without a dice throw.

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Question 11

Given a 2D screen arr[][] where each arr[i][j] is an integer representing the color of that pixel, also given the location of a pixel (X, Y) and a color C, the task is to replace the color of the given pixel and all the adjacent same-colored pixels with the given color.

PRACTICE NOW



DYNAMIC PROGRAMMING

Question 1

There are n stairs, a person standing at the bottom wants to reach the top. The person can climb either 1 stair or 2 stairs at a time. Count the number of ways, the person can reach the top.

PRACTICE NOW

Question 2

Given an integer array of coins[] of size N representing different types of currency and an integer sum, The task is to find the number of ways to make sum by using different combinations from coins[].

PRACTICE NOW

Question 3

We are given N items where each item has some weight and profit associated with it. We are also given a bag with capacity W , [i.e., the bag can hold at most W weight in it]. The target is to put the items into the bag such that the sum of profits associated with them is the maximum possible.

PRACTICE NOW



Question 4

Given an array arr[] of size N, the task is to find the length of the Longest Increasing Subsequence (LIS) i.e., the longest possible subsequence in which the elements of the subsequence are sorted in increasing order.

PRACTICE NOW

Question 5

Given two strings, S1 and S2, the task is to find the length of the longest subsequence present in both of the strings.

PRACTICE NOW

Question 6

Given an input string and a dictionary of words, find out if the input string can be segmented into a space-separated sequence of dictionary words.

PRACTICE NOW

Question 7

Given n dice each with m faces, numbered from 1 to m, find the number of ways to get sum X. X is the summation of values on each face when all the dice are thrown.

PRACTICE NOW



Question 8

The following is a description of the instance of this famous puzzle involving $N = 2$ eggs and a building with $K = 36$ floors.

Suppose that we wish to know which stories in a 36-story building are safe to drop eggs from, and which will cause the eggs to break on landing. We make a few assumptions:

- An egg that survives a fall can be used again.
- A broken egg must be discarded.
- The effect of a fall is the same for all eggs.
- If an egg breaks when dropped, then it would break if dropped from a higher floor.
- If an egg survives a fall then it would survive a shorter fall.
- It is not ruled out that the first-floor windows break eggs, nor is it ruled out that the 36th-floor does not cause an egg to break.

If only one egg is available and we wish to be sure of obtaining the right result, the experiment can be carried out in only one way. Drop the egg from the first-floor window; if it survives, drop it from the second-floor window. Continue upward until it breaks. In the worst case, this method may require 36 droppings. Suppose 2 eggs are available. What is the least number of egg droppings that are guaranteed to work in all cases?

The problem is not actually to find the critical floor, but merely to decide floors from which eggs should be dropped so that the total number of trials is minimized.

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Question 9

Given an array of positive integers arr[] and an integer x, The task is to find all unique combinations in arr[] where the sum is equal to x.

The same repeated number may be chosen from arr[] an unlimited number of times. Elements in a combination (a₁, a₂, ..., a_k) must be printed in non-descending order. (ie, a₁ <= a₂ <= ... <= a_k). If there is no combination possible print "Empty".

PRACTICE NOW

Question 10

Given a set of non-negative integers and a value sum, the task is to check if there is a subset of the given set whose sum is equal to the given sum.

PRACTICE NOW

Question 11

Let 1 represent 'A', 2 represents 'B', etc. Given a digit sequence, count the number of possible decodings of the given digit sequence.

PRACTICE NOW



Question 12

Given a grid of size $m * n$, let us assume you are starting at $(1, 1)$ and your goal is to reach (m, n) . At any instance, if you are on (x, y) , you can either go to $(x, y + 1)$ or $(x + 1, y)$. Now consider if some obstacles are added to the grids. How many unique paths would there be?

PRACTICE NOW

Question 13

Given an positive integer N and a list of N integers $A[]$. Each element in the array denotes the maximum length of jump you can cover. Find out if you can make it to the last index if you start at the first index of the list.

PRACTICE NOW

Question 14

Given a rod of length n inches and an array of prices that includes prices of all pieces of size smaller than n . Determine the maximum value obtainable by cutting up the rod and selling the pieces.

PRACTICE NOW



Question 15

Given a rope of length n meters, cut the rope in different parts of integer lengths in a way that maximizes product of lengths of all parts. You must make at least one cut. Assume that the length of rope is more than 2 meters.

PRACTICE NOW

Question 16

Given the dimension of a sequence of matrices in an array $\text{arr}[]$, where the dimension of the i th matrix is $(\text{arr}[i-1] * \text{arr}[i])$, the task is to find the most efficient way to multiply these matrices together such that the total number of element multiplications is minimum.

PRACTICE NOW

Question 17

Given a distance 'dist', count total number of ways to cover the distance with 1, 2 and 3 steps.

PRACTICE NOW



BIT MANIPULATION

Question 1

Write an efficient program to count the number of 1s in the binary representation of an integer.

PRACTICE NOW

Question 2

Write an efficient program to count the number of 1s in the binary representation of an integer.

PRACTICE NOW

Question 3

Given an array arr[] of size N-1 with integers in the range of [1, N], the task is to find the missing number from the first N integers.

PRACTICE NOW

Question 4

Given a non-negative integer n. The problem is to reverse the bits of n and print the number obtained after reversing the bits.

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