TOP 50 SDE

Interview Questions

Most asked in

Easy | Medium | Hard

Question 1

Longest Substring Without Repeating Characters

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

Example:

Input: s = "abcabcbb"
Output: 3
Explanation: The answer is "abc", with the length of 3.

Problem link

Question 2

Zigzag Conversion

The string "PAYPALISHIRING" is written in a zigzag pattern on a given number of rows like this: (you may want to display this pattern in a fixed font for better legibility)

Example:

Input: s = "PAYPALISHIRING", numRows = 3
Output: "PAHNAPLSIIGYIR"

P A H N
A P L S I I G
Y I R

And then read line by line: "PAHNAPLSIIGYIR"
Write the code that will take a string and make this conversion given a number of rows.

Problem link

Question 3

String to Integer

Implement the myAtoi (string s) function which converts a string to a 32-bit signed integer (similar to C/C++'s atoi function).

```
Example 1:
Input: s = "42"
Output: 42

Example 2:
Input: s = "   -42"
Output: -42
```

Do not ignore any characters other than the leading whitespace or the rest of the string after the digits.

Problem link

Question 4

Divide Two Integers

Given two integers dividend and divisor, divide two integers without using multiplication, division, and mod operator. The integer division should truncate toward zero, which means losing its fractional part.

Example:
Input: dividend = 10, divisor = 3
Output: 3
Explanation: 10/3 = 3.33333.. which is truncated to 3.

Problem link

Question 5

5) Next Permutation

Given an array of integers nums, find the next permutation of nums.
The next permutation of an array of integers is the next lexicographically greater permutation of its integer.

```
Example 1:
Input: nums = [1,2,3]
Output: [1,3,2]

Example 2:
Input: nums = [3,2,1]
Output: [1,2,3]
```

Problem link

Question 6

Search in Rotated Sorted Array

There is an integer array nums sorted in ascending order (with distinct values). Prior to being passed to your function, nums is possibly rotated at an unknown pivot index k (1 <= k < nums.length).
Given the array nums after the possible rotation and an integer target, return the index of target if it is in nums, or -1 if it is not in nums.

Example 1:
Input: nums = [4,5,6,7,0,1,2], target = 0
Output: 4

Example 2:
nums [4,5,6,7,0,1,2]

Problem link

Question 7

Group Anagrams

Given an array of strings strs, group the anagrams together. You can return the answer in any order.
An Anagram is a word or phrase formed by rearranging the letters of a different word or phrase,

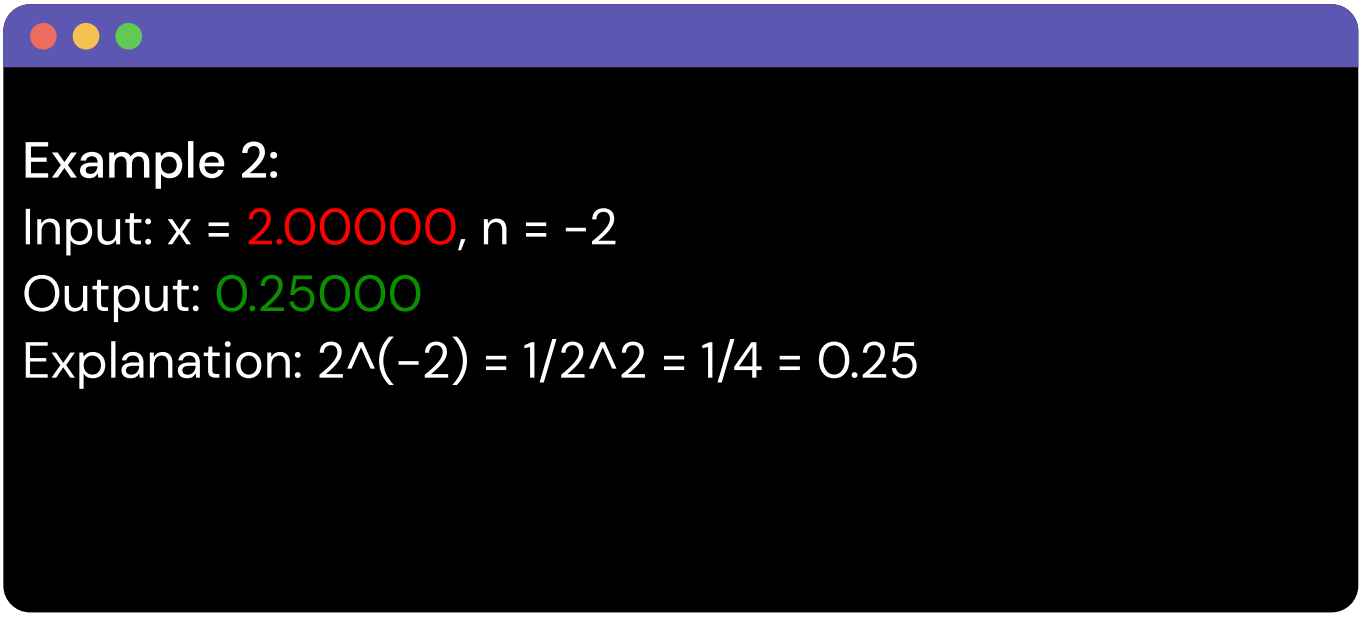
Example:
Input: strs = ["eat","tea","tan","ate","nat","bat"]
Output: [["bat"],["nat","tan"],["ate","eat","tea"]]

Problem link

Question 8

Pow(x,n)

Implement pow(x, n), which calculates x raised to the power n (i.e., x^n).



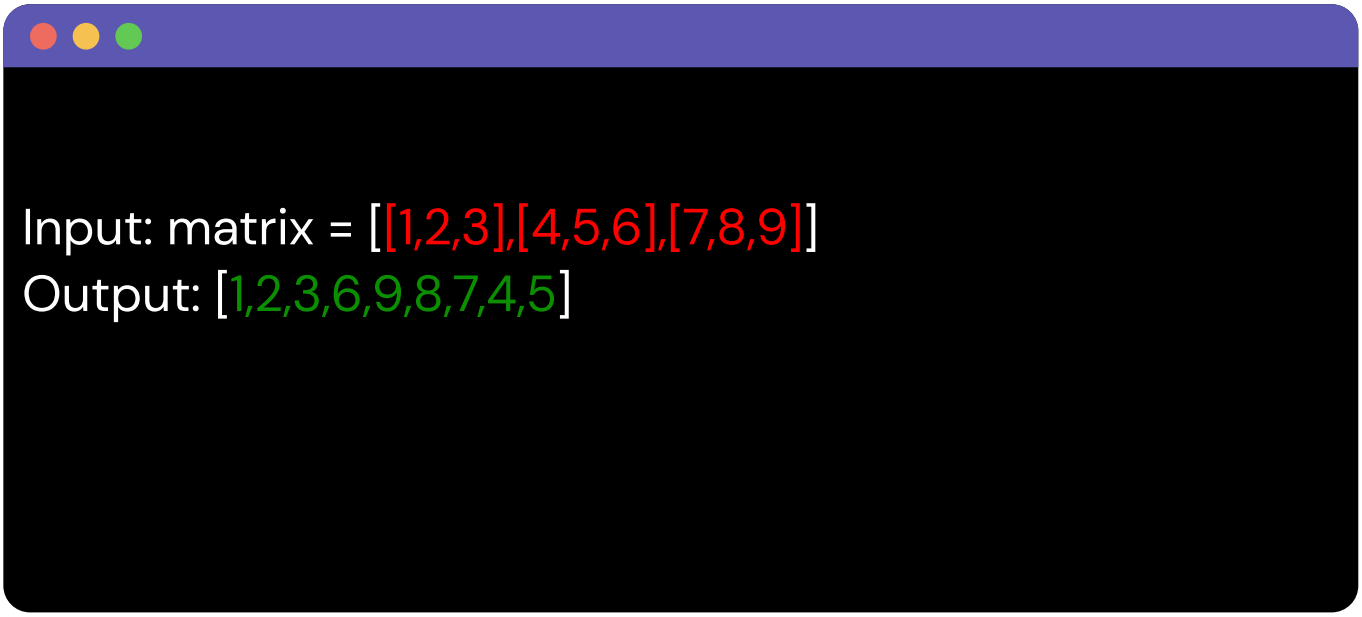
Problem link

Question 9

Spiral Matrix

Given an m x n matrix, return all elements of the matrix in spiral order.

Example 1:

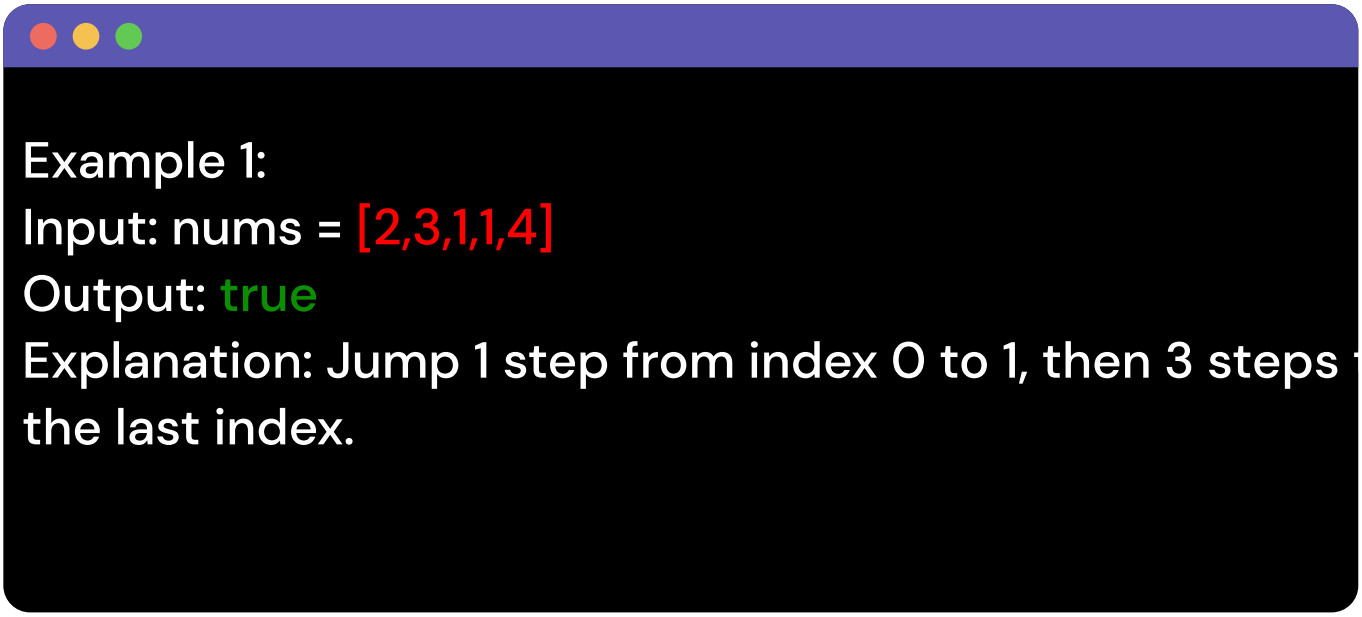


Problem link

Question 10

Jump Game

You are given an integer array nums. You are initially positioned at the array's first index, and each element in the array represents your maximum jump length at that position.



Problem link

Question 11

Merge Intervals

Given an array of intervals where intervals[i] = [starti, endi], merge all overlapping intervals, and return an array of the non-overlapping intervals that cover all the intervals in the input.

Example:
Input: intervals = [[1,3],[2,6],[8,10],[15,18]]
Output: [[1,6],[8,10],[15,18]]
Explanation: Since intervals [1,3] and [2,6] overlap, merge them into [1,6].

Problem link

Question 12

Edit Distance

Given two strings word1 and word2, return the minimum number of operations required to convert word1 to word2.

You have the following three operations permitted on a word:

Example:
Input: word1 = "horse", word2 = "ros"
Output: 3
Explanation:
horse -> rorse (replace 'h' with 'r')
rorse -> rose (remove 'r')
rose -> ros remove 'e'

Problem link

Question 13

Search a 2D Matrix

You are given an m x n integer matrix matrix with the following two properties:

a) Each row is sorted in non-decreasing order.

b) The first integer of each row is greater than the last integer of the previous row.

Example:

Input: matrix = [[1,3,5,7],[10,11,16,20],[23,30,34,60]], target = 3

Output: trueGiven an integer target, return true if target is in matrix or false otherwise. You must write a solution in O(log(m * n)) time complexity.

Problem link

Question 14

Word Search

Given an m x n grid of characters board and a string word, return true if word exists in the grid.
The word can be constructed from letters of sequentially adjacent cells, where adjacent cells are horizontally.

```
Example:
Input: board = [["A","B","C","E"],["S","F","C","S"],["A","D","E","E"]], w
= "ABCCED"
Output: true
```

Problem link

Question 15

Decode Ways

A message containing letters from A-Z can be encoded into numbers using the following mapping:
'A' -> "1", 'B' -> "2" , ..., 'Z' -> "26"
Given a string s containing only digits, return the number of ways to decode it.

Explanation: "226" could be decoded as "BZ" (2 26), "VF" (22 6), or "BBF" (2 2 6).

Problem link

Question 16

Unique Binary Search Trees

Given an integer n, return the number of structurally unique BST's (binary search trees) which has exactly n nodes of unique values from 1 to n.

Problem link

Question 17

Interleaving String

Given strings s1, s2, and s3, find whether s3 is formed by an interleaving of s1 and s2.
An interleaving of two strings s and t is a configuration where s and t are divided into n and m
substrings respectively, such that:
s = s1 + s2 + ... + sn
t = t1 + t2 + ... + tm
|n - m| <= 1
The interleaving is s1 + t1 + s2 + t2 + s3 + t3 + ... or t1 + s1 + t2 + s2 + t3 + s3 + ...
Note: a + b is the concatenation of strings a and b.

Example:

Input: s1 = "aabcc", s2 = "dbbca", s3 = "aadbbcbcac"
Output: true

Problem link

Question 18

Recover Binary Search Tree

You are given the root of a binary search tree (BST), where the values of exactly two nodes of the tree were swapped by mistake. Recover the tree without changing its structure.

Example:

Input: root = [3,1,4,null,null,2]
Output: [2,1,4,null,null,3]

Explanation: 2 cannot be in the right subtree of 3 because 2 < 3. Swapping 2 and 3 makes the BST valid.

Question 19

Construct Binary Tree from Preorder and Inorder Traversal

Given two integer arrays preorder and inorder where preorder is the preorder traversal of a binary tree and inorder is the inorder traversal of the same tree, construct and return the binary tree.

Example:

Input: preorder = [3,9,20,15,7], inorder = [9,3,15,20,7]
Output: [3,9,20,null,null,15,7]

Problem link

Question 20

Flatten Binary Tree to Linked List

Given the root of a binary tree, flatten the tree into a "linked list":

The "linked list" should use the same TreeNode class where the right child pointer points to the next node in the list and the left child pointer is always null.
The "linked list" should be in the same order as a pre-order traversal of the binary tree.

Example:

Input: root = [1,2,5,3,4,null,6]
Output: [1,null,2,null,3,null,4,null,5,null,6]

Problem link

Question 21

Populating Next Right Pointers in Each Node II

Given a binary tree, populate each next pointer to point to its next right node. If there is no next right node, the next pointer should be set to NULL.
Initially, all next pointers are set to NULL.

Example:

Input: root = [1,2,3,4,5,null,7]
Output: [1,#,2,3,#,4,5,7,#]

Explanation: Given the above binary tree (Figure A), your function should populate each next pointer to point to its next right node, just like in Figure B. The serialized output is in level order as connected by the next pointers, with '#' signifying the end of each level.

Problem link

Question 22

Surrounded Regions

Given an m x n matrix board containing 'X' and 'O', capture all regions that are 4-directionally surrounded by 'X'.

A region is captured by flipping all 'O's into 'X's in that surrounded region.

Example:

Input: board = [["X","X","X","X"],["X","O","O","X"],["X","X","O","X"],["X","O","X","X"]]
Output: [["X","X","X","X"],["X","X","X","X"],["X","X","X","X"],["X","O","X","X"]]

Explanation: Notice that an 'O' should not be flipped if:
- It is on the border, or
- It is adjacent to an 'O' that should not be flipped.
The bottom 'O' is on the border, so it is not flipped.
The other three 'O' form a surrounded region, so they are flipped.

Problem link

Question 23

Gas Station

There are n gas stations along a circular route, where the amount of gas at the ith station is gas[i].

You have a car with an unlimited gas tank and it costs cost[i] of gas to travel from the ith station to its next (i + 1)th station. You begin the journey with an empty tank at one of the gas stations.

Given two integer arrays gas and cost, return the starting gas station's index if you can travel around the circuit once in the clockwise direction, otherwise return -1. If there exists a solution, it is guaranteed to be unique.

```
Example 1:
Input: gas = [1,2,3,4,5], cost = [3,4,5,1,2]
Output: 3
```

Question 24

Copy List with Random Pointer

A linked list of length n is given such that each node
Construct a deep copy of the list. The deep copy should consist of exactly n brand new nodes, where each new node has its value set to the value of its corresponding original node. Both the next and random pointer of the new nodes should point to new nodes in the copied list
Return the head of the copied linked list.

Example:

Input: head = [[7,null],[13,0],[11,4],[10,2],[1,0]]
Output: [[7,null],[13,0],[11,4],[10,2],[1,0]]

Problem link

Question 25

Word Break

Given a string s and a dictionary of strings wordDict, return true if s can be segmented into a space-separated sequence of one or more dictionary words.
Note that the same word in the dictionary may be reused multiple times in the segmentation.

Example:
Input: s = "leetcode", wordDict = ["leet","code"]
Output: true
Explanation: Return true because "leetcode" can be segmented as "leet code".

Problem link

Question 26

LRU Cache

Design a data structure that follows the constraints of a Least Recently Used (LRU) cache.

Implement the LRUCache class:

a) LRUCache(int capacity) Initialize the LRU cache with positive size capacity.
b) int get(int key) Return the value of the key if the key exists, otherwise return -1.

The functions get and put must each run in O(1) average time complexity.

Example:
Input:
["LRUCache", "put", "put", "get", "put", "get", "put", "get", "get", "get"]
[[2], [1, 1], [2, 2], [1], [3, 3], [2], [4, 4], [1], [3], [4]]
Output:
[null, null, null, 1, null, -1, null, -1, 3, 4]

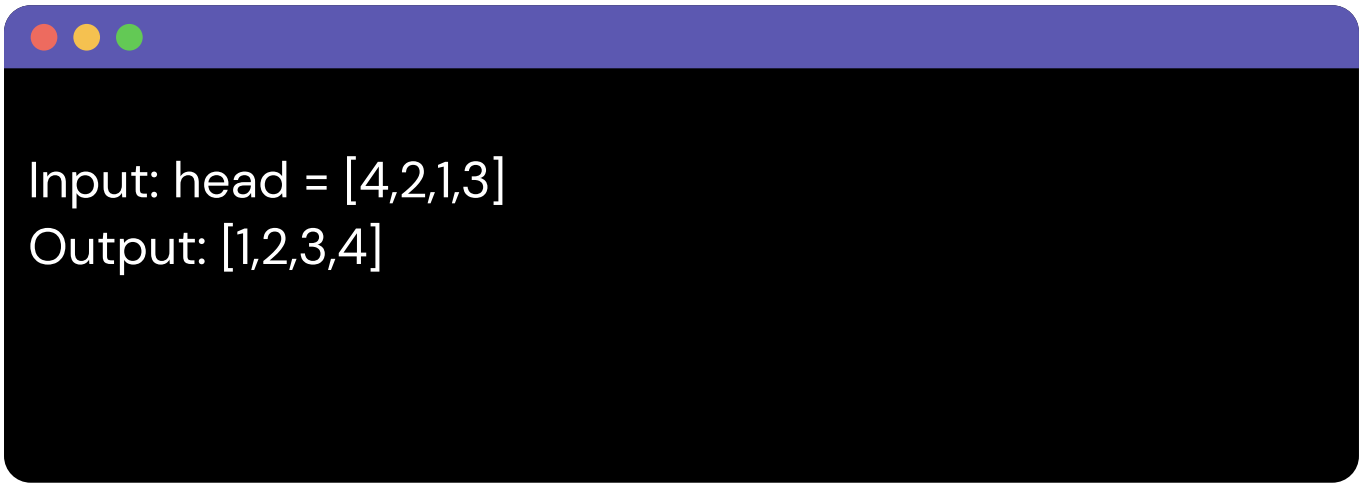
Problem link

Question 27

Sort List

Given the head of a linked list, return the list after sorting it in ascending order.

Example:



Problem link

Question 28

Min Stack

Design a stack that supports push, pop, top, and retrieving the minimum element in constant time.
Implement the MinStack class:

a) MinStack() initializes the stack object.
b) void push(int val) pushes the element val onto the stack.
c) void pop() removes the element on the top of the stack.
d) int top() gets the top element of the stack.
e) int getMin() retrieves the minimum element in the stack.

Example:
Input:
["MinStack","push","push","push","getMin","pop","top","getMin"]
[[],[-2],[0],[-3],[],[],[],[]]
Output:
[null,null,null,null,-3,null,0,-2]

Problem link

Question 29

Binary Search Tree Iterator

Implement the BSTIterator class that represents an iterator over the in-order traversal of a binary search tree (BST):

a) BSTIterator(TreeNode root) Initializes an object of the BSTIterator class. The root of the BST is given as part of the constructor. The pointer should be initialized to a non-existent number smaller than any element in the BST.
b) boolean hasNext() Returns true if there exists a number in the traversal to the right of the pointer, otherwise returns false.

```
Example:
Input:
["BSTIterator", "next", "next", "hasNext", "next", "hasNext", "next"
"hasNext", "next", "hasNext"]
[[[7, 3, 15, null, null, 9, 20]], [], [], [], [], [], [], [], [], []]
Output:
[null, 3, 7, true, 9, true, 15, true, 20, false]
```

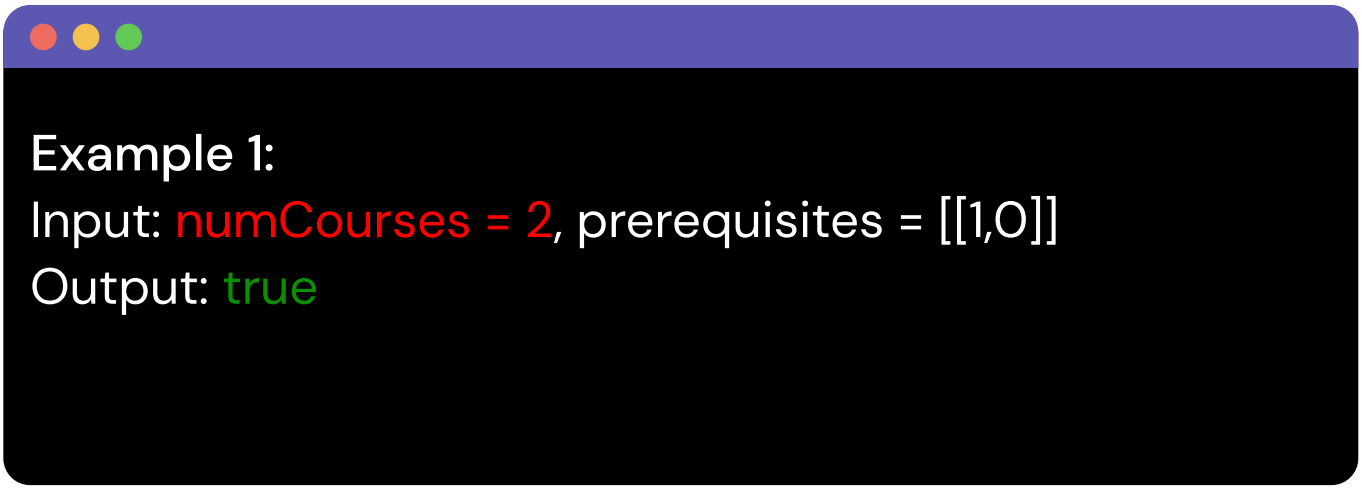
Problem link

Question 30

Course Schedule

There are a total of numCourses courses you have to take, labeled from 0 to numCourses - 1. You are given an array prerequisites where prerequisites[i] = [ai, bi] indicates that you must take course bi first if you want to take course ai.

For example, the pair [0, 1], indicates that to take course 0 you have to first take course 1. Return true if you can finish all courses. Otherwise, return false.



Explanation: There are a total of 2 courses to take.
To take course 1 you should have finished course 0. So it is possible.

Problem link

Question 31

Longest Increasing Subsequence

Given an integer array nums, return the length of the longest strictly increasing subsequence.

```
Example:
Input: nums = [10,9,2,5,3,7,101,18]
Output: 4
```

Explanation: The longest increasing subsequence is [2,3,7,101], therefore the length is 4.

Problem link

Question 32

Insert Delete GetRandom O(1)

Implement the RandomizedSet class:

a) RandomizedSet() Initializes the RandomizedSet object.
b) bool insert(int val) Inserts an item val into the set if not present. Returns true if the item was not present, false otherwise.
c) bool remove(int val) Removes an item val from the set if present. Returns true if the item was present, false otherwise.

Example:
Input:
["RandomizedSet", "insert", "remove", "insert", "getRandom", "remove", "insert", "getRandom"]
[[], [1], [2], [2], [], [1], [2], []]
Output:
[null, true, false, true, 2, true, false, 2]

Problem link

Question 33

Linked List Cycle II

Given the head of a linked list, return the node where the cycle begins. If there is no cycle, return null. Do not modify the linked list.

Example:

Input: head = [3,2,0,-4], pos = 1
Output: tail connects to node index 1

Explanation: There is a cycle in the linked list, where tail connects to the second n

Problem link

Question 34

Maximum Product Subarray

Given an integer array nums, find a subarray that has the largest product, and return the product. The test cases are generated so that the answer will fit in a 32-bit integer.

```
Example 1:
Input: nums = [2,3,-2,4]
Output: 6
Explanation: [2,3] has the largest product 6.

Example 2:
Input: nums = [-2,0,-1]
Output: 0
```

Explanation: The result cannot be 2, because [-2,-1] is not a subarray.

Problem link

Question 35

Median of Two Sorted Arrays

Given two sorted arrays nums1 and nums2 of size m and n respectively, return the median of the two sorted arrays. The overall run time complexity should be O(log (m+n)).

Example 1:
Input: nums1 = [1,3], nums2 = [2]
Output: 2.00000
Explanation: merged array = [1,2,3] and median is 2.

Example 2:
Input: nums1 = [1,2], nums2 = [3,4]
Output: 2.50000
Explanation: merged array = [1,2,3,4] and median is (2 + 3) = 2.5.

Problem link

Question 36

Reverse Nodes in k-Group

Given the head of a linked list, reverse the nodes of the list k at a time, and return the modified list.

k is a positive integer and is less than or equal to the length of the linked list. If the number of nodes is not a multiple of k then left-out nodes, in the end, should remain as it is.

You may not alter the values in the list's nodes, only nodes themselves may be changed.

Example:

Input: head = [1,2,3,4,5], k = 2
Output: [2,1,4,3,5]

Problem link

Question 37

First Missing Positive

Given an unsorted integer array nums, return the smallest missing positive integer.

You must implement an algorithm that runs in O(n) time and uses O(1) auxiliary space.

```
Example 1:
Input: nums = [1,2,0]
Output: 3
Explanation: The numbers in the range [1,2] are all in the array.
```

Problem link

Question 38

Trapping Rain Water

Given n non-negative integers representing an elevation map where the width of each bar is 1, compute how much water it can trap after raining.

```
Example:
Input: height = [0,1,0,2,1,0,1,3,2,1,2,1]
Output: 6
```

Explanation: The above elevation map (black section) is represented by array [0,1,0,2,1,0,1,3,2,1,2,1]. In this case, 6 units of rain water (blue section) are being trapped.

Problem link

Question 39

Wildcard Matching

Given an input string (s) and a pattern (p), implement wildcard pattern matching with support for '?' and '*' where:
'?' Matches any single character.
'*' Matches any sequence of characters (including the empty sequence).
The matching should cover the entire input string (not partial).

```
Example 2:

Input: s = "cb", p = "?a"
Output: false
```

Explanation: '?' matches 'c', but the second letter is 'a', which does not match 'b'.

Problem link

Question 40

N-Queens

The n-queens puzzle is the problem of placing n queens on an n x n chessboard such that no two queens attack each other.

Given an integer n, return all distinct solutions to the n-queens puzzle. You may return the answer in any order.

Each solution contains a distinct board configuration of the n-queens' placement, where 'Q' and '.' both indicate a queen and an empty space, respectively.

Example:

Input: n = 4
Output: [[".Q..","...Q","Q...","..Q."],["..Q.","Q...","...Q",".Q.."]]

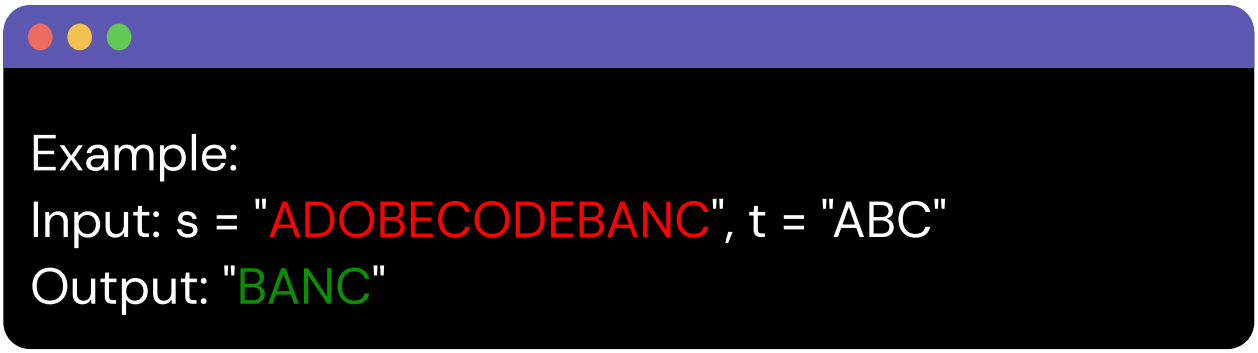
Explanation: There exist two distinct solutions to the 4-queens puzzle as shown above.

Problem link

Question 41

Minimum Window Substring

Given two strings s and t of lengths m and n respectively, return the minimum window substring of s such that every character in t (including duplicates) is included in the window. If there is no such substring, return the empty string "". The testcases will be generated such that the answer is unique.



Explanation: The minimum window substring "BANC" includes 'A', B', and 'C' from string t.

Problem link

Question 42

Largest Rectangle in Histogram

Given an array of integers heights representing the histogram's bar height where the width of each bar is 1, return the area of the largest rectangle in the histogram.

Example:

Input: heights = [2,1,5,6,2,3]
Output: 10

Explanation: The above is a histogram where width of each bar is 1.

The largest rectangle is shown in the red area, which has an area = 10 units.

Problem link

Question 43

Distinct Subsequences

Given two strings s and t, return the number of distinct subsequences of s which equals t.
The test cases are generated so that the answer fits on a 32-bit signed integer.

```
Example:
Input: s = "rabbbit", t = "rabbit"
Output: 3
```

Explanation:
As shown below, there are 3 ways you can generate "rabbit" from s.

Problem link

Question 44

Best Time to Buy and Sell Stock III

You are given an array prices where prices[i] is the price of a given stock on the ith day. Find the maximum profit you can achieve. You may complete at most two transactions.

Note: You may not engage in multiple transactions simultaneously (i.e., you must sell the stock before you buy again).

```
Example:
Input: prices = [3,3,5,0,0,3,1,4]
Output: 6
```

Explanation: Buy on day 4 (price = 0) and sell on day 6 (price = 3), profit = 3-0 = 3.
Then buy on day 7 (price = 1) and sell on day 8 (price = 4), profit = 4-1 = 3.

Problem link

Question 45

Binary Tree Maximum Path Sum

A path in a binary tree is a sequence of nodes where each pair of adjacent nodes in the sequence has an edge connecting them. A node can only appear in the sequence at most once. Note that the path does not need to pass through the root.

Given the root of a binary tree, return the maximum path sum of any non-empty path.

```
Example:
Input: root = [-10,9,20,null,null,15,7]
Output: 42
```

Explanation: The optimal path is 15 -> 20 -> 7 with a path sum of 15 + 20 + 7 = 42.

Problem link

Question 46

Word Ladder

A transformation sequence from word beginWord to word endWord using a dictionary wordList is a sequence of words beginWord -> s1 -> s2 -> ... -> sk such that:

```
Example:
Input: beginWord = "hit", endWord = "cog", wordList =
["hot","dot","dog","lot","log","cog"]
Output: 5
```

Explanation: One shortest transformation sequence is "hit" -> "hot" -> "dot" -> "dog" -> cog", which is 5 words long.

Problem link

Question 47

Palindrome Partitioning II

Given a string s, partition s such that every substring of the partition is a palindrome. Return the minimum cuts needed for a palindrome partitioning of s.

```
Example:
Input: s = "aab"
Output: 1
```

Explanation: The palindrome partitioning ["aa","b"] could be produced using 1 cut.

Problem link

Question 48

Candy

There are n children standing in a line. Each child is assigned a rating value given in the integer array ratings. You are giving candies to these children subjected to the following requirements:

a) Each child must have at least one candy.
b) Children with a higher rating get more candies than their neighbors.

Return the minimum number of candies you need to have to distribute the candies to the children.

```
Example:
Input: ratings = [1,0,2]
Output: 5
```

Explanation: You can allocate to the first, second and third child with 2, 1, 2 candies respectively.

Problem link

Question 49

Sliding Window Maximum

You are given an array of integers nums, there is a sliding window of size k which is moving from the very left of the array to the very right. You can only see the k numbers in the window. Each time the sliding window moves right by one position.
Return the max sliding window.

Example:
Input: nums = [1,3,-1,-3,5,3,6,7], k = 3
Output: [3,3,5,5,6,7]

Explanation:

Window position	Max
[1 3 -1] -3 5 3 6 7	3
1 [3 -1 -3] 5 3 6 7	3
1 3 [-1 -3 5] 3 6 7	5
1 3 -1 [-3 5 3] 6 7	5
1 3 -1 -3 [5 3 6] 7	6
1 3 -1 -3 5 [3 6 7]	7

Problem link

Question 50

Find Median from Data Stream

The median is the middle value in an ordered integer list. If the size of the list is even, there is no middle value, and the median is the mean of the two middle values.

For example, for arr = [2,3,4], the median is 3.
For example, for arr = [2,3], the median is (2 + 3) / 2 = 2.5.
Implement the MedianFinder class:

```
Example:
Input:
["MedianFinder", "addNum", "addNum", "findMedian",
"addNum", "findMedian"]
[[], [1], [2], [], [3], []]
Output:
[null, null, null, 1.5, null, 2.0]
```

Problem link