

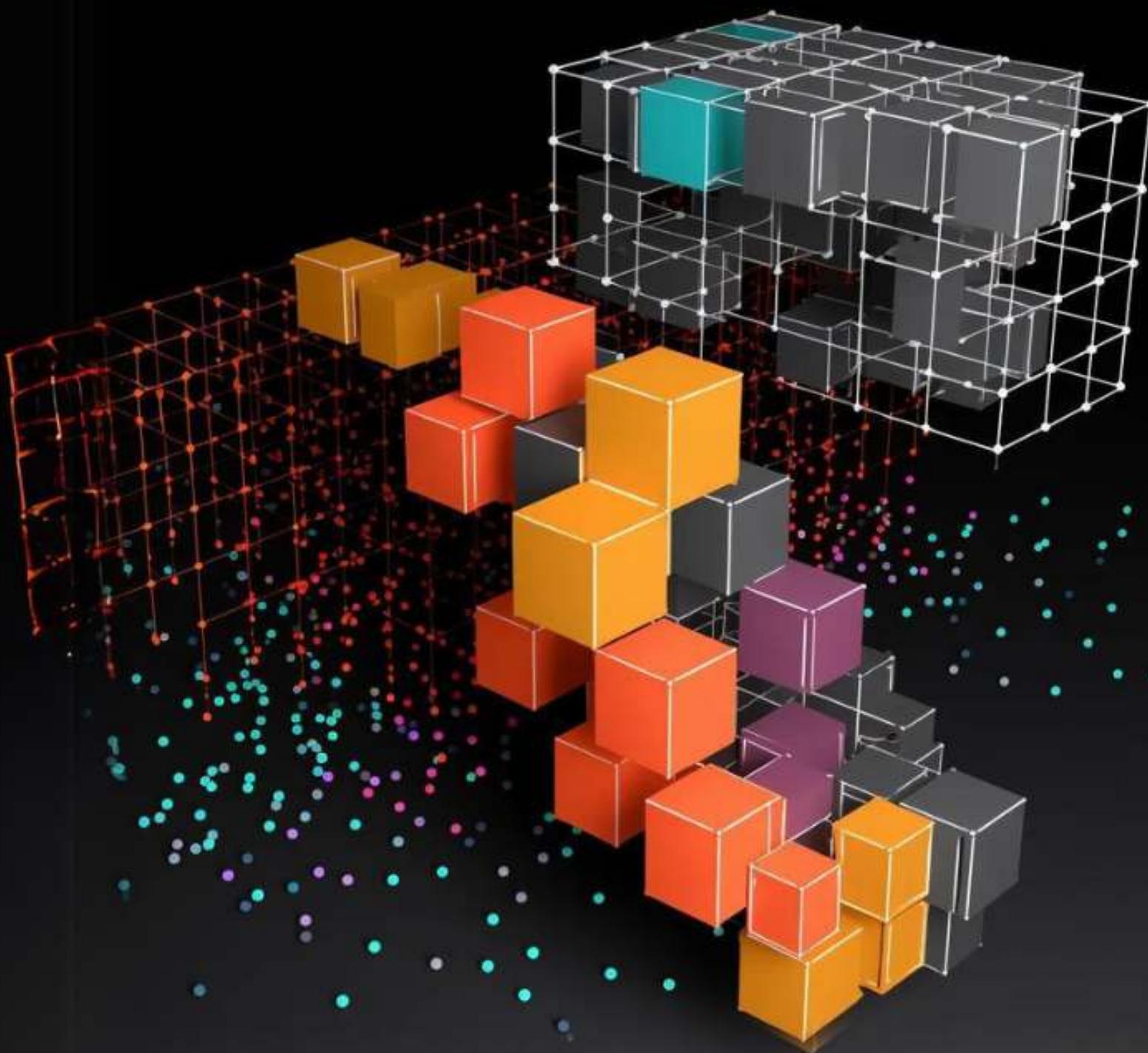


BOSSCODER  
ACADEMY

Zero to Advance in

# Data Structure

# & Algorithm



30 Days Challenge



## \*Disclaimer\*

**Everyone learns uniquely.**

What matters is developing the problem solving ability to solve new problems.

This Doc will help you with the same.



## DAY 1

Given an array of integers **num** and an **integer** target, return indices of the two numbers such that they add up to **target**.

Practice

Asked in:



Given an integer array **nums**, find the subarray with the largest sum, and return its sum.

Practice

Asked in:



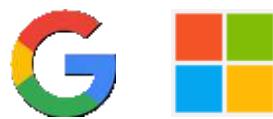


## DAY 2

Given an array `nums` with `n` objects colored red, white, or blue, sort them in-place so that objects of the same color are adjacent, with the colors in the order red, white, and blue.

Practice

Asked in:



You are given an integer array `height` of length `n`. There are `n` vertical lines drawn such that the two endpoints of the `ith` line are `(i, 0)` and `(i, height[i])`. Find two lines that together with the x-axis form a container, such that the container contains the most water. Return the maximum amount of water a container can store.

Practice

Asked in:



intuit



## DAY 3

You are given an array of **prices** where **prices[i]** is the price of a given stock on an *i*th day. You want to maximise your profit by choosing a single day to buy one stock and choosing a different day in the future to sell that stock. Return the maximum profit you can achieve from this transaction. If you cannot achieve any profit, return **0**.

Practice

Asked in:



Given an array **nums** of **n** integers, return an array of all the unique quadruplets **[nums[a], nums[b], nums[c], nums[d]]** such that:

$0 \leq a, b, c, d < n$

**a**, **b**, **c**, and **d** are distinct.

**nums[a] + nums[b] + nums[c] + nums[d] == target**

Practice

Asked in:





## DAY 4

Write a function that reverses a string. The input string is given as an array of characters **s**. You must do this by modifying the input array **in-place** with **O(1)** extra memory.

Practice

Asked in:



Given a string **s**, sort it in decreasing order based on the frequency of the characters. The frequency of a character is the number of times it appears in the string.

Return the sorted string. If there are multiple answers, return any of them.

Practice

Asked in:





## DAY 5

Given two strings **s1** and **s2**, return **true** if **s2** contains a permutation of **s1**, or **false** otherwise.

In other words, return **true** if one of **s1**'s permutations is the substring of **s2**.

Practice

Asked in:



Given a string **s**, partition **s** such that every Substring of the partition is a Palindrome. Return all possible palindrome partitioning of **s**.

Practice

Asked in:





## DAY 6

You are given a string **s** and an integer **k**. You can choose any character of the string and change it to any other uppercase English character. You can perform this operation at most **k** times.

**Practice**

Asked in:



A phrase is a palindrome if, after converting all uppercase letters into lowercase letters and removing all non-alphanumeric characters, it reads the same forward and backward. Alphanumeric characters include letters and numbers.

Given a string **s**, return **true** if it is a palindrome, or **false** otherwise.

**Practice**

Asked in:





## DAY 7

Given the **head** of a linked list and an integer **val**, remove all the nodes of the linked list that has **Node.val == val**, and return the new head.

Practice

Asked in: Intuit

Given the **head** of a singly linked list, reverse the list, and return the reversed list.

Practice

Asked in: G a Microsoft



## DAY 8

Given an integer array **nums** of unique elements, return all possible Subsets (the power set).

The solution set must not contain duplicate subsets. Return the solution in any order.

**Practice**

Asked in:



Given **n** pairs of parentheses, write a function to generate all combinations of well-formed parentheses.

**Practice**

Asked in:



intuit





## DAY 9

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

Practice

Asked in:



intuit

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 constant extra space.

Practice

Asked in:





## DAY 10

Given an  $m \times n$  matrix, return all elements of the matrix in spiral order.

Practice

Asked in:



Determine if a  $9 \times 9$  Sudoku board is valid. Only the filled cells need to be validated according to the following rules:

Each row must contain the digits **1-9** without repetition.

Each column must contain the digits **1-9** without repetition.

Each of the nine  $3 \times 3$  sub-boxes of the grid must contain the digits **1-9** without repetition.

Practice

Asked in:





## DAY 11

Given an  $m \times n$  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 or vertically neighboring. The same letter cell may not be used more than once.

**Practice**

Asked in:



Given an  $m \times n$  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.

**Practice**

Asked in:





## DAY 12

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.

Practice

Asked in:



intuit

Given elements as nodes of the two linked lists. The task is to multiply these two linked lists, say **L1** and **L2**.

Practice

Asked in:





## DAY 13

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.

**Practice**

Asked in:



You are given the heads of two sorted linked lists **list1** and **list2**.

Merge the two lists in a one sorted list. The list should be made by splicing together the nodes of the first two lists.

Return the head of the merged linked list.

**Practice**

Asked in:





## DAY 14

You are given the head of a singly linked-list. The list can be represented as:  $L_0 \rightarrow L_1 \rightarrow \dots \rightarrow L_{n-1} \rightarrow L_n$

Reorder the list to be on the following form:

$L_0 \rightarrow L_n \rightarrow L_1 \rightarrow L_{n-1} \rightarrow L_2 \rightarrow L_{n-2} \rightarrow \dots$

You may not modify the values in the list's nodes. Only nodes themselves may be changed.

**Practice**

Asked in:

Given a linked list, swap every two adjacent nodes and return its head. You must solve the problem without modifying the values in the list's nodes (i.e., only nodes themselves may be changed.)

**Practice**

Asked in:



## DAY 15

Given an array **nums** containing **n** distinct numbers in the range **[0, n]**, return the only number in the range that is missing from the array.

Practice

Asked in:



Given an integer **n**, return an array **ans** of length **n + 1** such that for each **i** ( $0 \leq i \leq n$ ), **ans[i]** is the number of **1**'s in the binary representation of **i**.

Practice

Asked in:





## DAY 16

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.

Practice

Asked in:

Given a linked list, swap every two adjacent nodes and return its head. You must solve the problem without modifying the values in the list's nodes (i.e., only nodes themselves may be changed.)

Practice

Asked in:



## DAY 17

Implement a last-in-first-out (LIFO) stack using only two queues. The implemented stack should support all the functions of a normal stack (push, top, pop, and empty).

**Practice**

Asked in:



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

**Practice**

Asked in:





## DAY 18

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.

Practice

Asked in:



Given an array of integers `temperatures` represents the daily temperatures, return an array `answer` such that `answer[i]` is the number of days you have to wait after the `ith` day to get a warmer temperature. If there is no future day for which this is possible, keep `answer[i] == 0` instead.

Practice

Asked in:





## DAY 19

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.

**Practice**

Asked in: Uber  

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

**Practice**

Asked in:  



## DAY 20

Given a binary tree, determine if it is height-balanced

Practice

Asked in:



Given a binary tree, find the lowest common ancestor (LCA) of two given nodes in the tree.

Practice

Asked in:





## DAY 21

Given the **root** of a binary search tree, and an integer **k**, return the **kth** smallest value (1-indexed) of all the values of the nodes in the tree.

Practice

Asked in:



Given the **root** of a binary tree, return the level order traversal of its nodes' values. (i.e., from left to right, level by level).

Practice

Asked in:





## DAY 22

You are given the **root** of a binary tree containing digits from **0 to 9** only.

Each root-to-leaf path in the tree represents a number.

For example, the root-to-leaf path **1 -> 2 -> 3** represents the number **123**. Return the total sum of all root-to-leaf numbers. Test cases are generated so that the answer will fit in a **32-bit integer**.

**Practice**

Asked in:



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.

The path sum of a path is the sum of the node's values in the path...

**Practice**

Asked in:





## DAY 23

A **trie** (pronounced as "try") or **prefix tree** is a tree data structure used to efficiently store and retrieve keys in a dataset of strings. There are various applications of this data structure, such as autocomplete and spellchecker.

Implement the Trie.

**Practice**

Asked in: **Uber**  

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Given an array of strings **strs**, group the anagrams together. You can return the answer in any order.

**Practice**

Asked in:    



## DAY 24

You are given an array of  $k$  linked-lists lists, each linked-list is sorted in ascending order.

Merge all the **linked-lists** into one sorted linked-list and return it.

**Practice**

Asked in:



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. Implement the MedianFinder class:

**Practice**

Asked in:





## DAY 25

Given an  $m \times n$  binary matrix `mat`, return the distance of the nearest `0` for each cell.

The distance between two adjacent cells is `1`.

**Practice**

Asked in: **Uber**

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An image is represented by an  $m \times n$  integer grid `image` where `image[i][j]` represents the pixel value of the image.

You are also given three integers `sr`, `sc`, and `color`. You should perform a flood fill on the image starting from the pixel `image[sr][sc]`.

**Practice**

Asked in:



## DAY 26

Given an  $m \times n$  2D binary **grid** which represents a map of '**1**'s (land) and '**0**'s (water), return the number of islands.

An **island** is surrounded by water and is formed by connecting adjacent lands horizontally or vertically. You may assume all four edges of the grid are all surrounded by water.

**Practice**

Asked in:



Given a reference of a node in a **connected undirected graph**.

Return a **deep copy (clone)** of the graph.

**Practice**

Asked in:





## DAY 27

Given an  $m \times n$  integers **matrix**, return the length of the longest increasing path in **matrix**.

From each cell, you can either move in four directions: left, right, up, or down. You **may not** move diagonally or move outside the boundary (i.e., wrap-around is not allowed).

**Practice**

Asked in: **Uber**  

You are given a network of  $n$  nodes, labeled from **1** to **n**. You are also given times, a list of travel times as directed edges **times[i] = (ui, vi, wi)**, where **ui** is the source node, **vi** is the target node, and **wi** is the time it takes for a signal to travel from source to target.

We will send a signal from a given node **k**. Return the minimum time it takes for all the  $n$  nodes to receive the signal. If it is impossible for all the  $n$  nodes to receive the signal, return **-1**.

**Practice**



## DAY 28

Given an integer array **nums**, find a subarray that has the largest product, and return the product.

Practice

Asked in:



Given an integer array **nums**, return **true** if you can partition the array into two subsets such that the sum of the elements in both subsets is equal or **false** otherwise.

Practice

Asked in:





## DAY 29

There is a robot on an  $m \times n$  grid. The robot is initially located at the top-left corner (i.e., `grid[0][0]`). The robot tries to move to the bottom-right corner (i.e., `grid[m - 1][n - 1]`). The robot can only move either down or right at any point in time.

Given the two integers  $m$  and  $n$ , return the number of possible unique paths that the robot can take to reach the bottom-right corner.

**Practice**

Asked in: Uber   

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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:

Insert a character

Delete a character

Replace a character

**Practice**

Asked in: Uber  



## DAY 30

You are given an integer array **coins** representing coins of different denominations and an integer **amount** representing a total amount of money.

Return the fewest number of coins that you need to make up that amount. If that amount of money cannot be made up by any combination of the coins, return **-1**.

You may assume that you have an infinite number of each kind of coin.

**Practice**

Asked in:

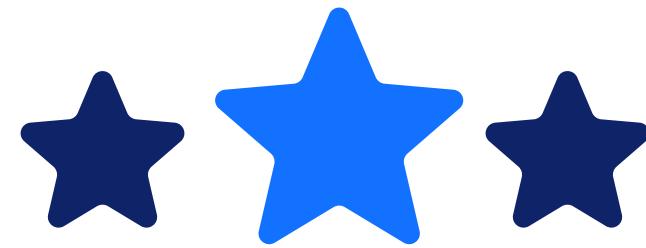


Given an integer array **nums**, return **true** if you can partition the array into two subsets such that the sum of the elements in both subsets is equal or **false** otherwise.

**Practice**

Asked in:





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