

# ZERO TO HERO IN DSA

**75 DAYS CODING CHALLENGE**



**AlgoTutor**





## Day 1 Concatenation of Array

Given an integer array `nums` of length  $n$ , you want to create an array `ans` of length  $2n$  where `ans[i] == nums[i]` and `ans[i + n] == nums[i]` for  $0 \leq i < n$  (0-indexed).

Specifically, `ans` is the concatenation of two `nums` arrays.

Return the array `ans`.

**Practice**

## Day 2 Shuffle the Array

Given the array `nums` consisting of  $2n$  elements in the form `[x1,x2,...,xn,y1,y2,...,yn]`.

Return the array in the form `[x1,y1,x2,y2,...,xn,yn]`.

**Practice**

## Day 3 Number of Good Pairs

Given an array of integers `nums`, return the number of good pairs.

A pair  $(i, j)$  is called good if `nums[i] == nums[j]` and  $i < j$ .

**Practice**



## Day 4 Pascal's Triangle

Given an integer numRows, return the first numRows of Pascal's triangle.

In Pascal's triangle, each number is the sum of the two numbers directly above it

**Practice**

## Day 5 Maximum Subarray

Given an integer array nums, find the subarray

with the largest sum, and return its sum.

**Practice**

## Day 6 Best Time to Buy and Sell Stock

You are given an array prices where prices[i] is the price of a given stock on the ith day.

You want to maximize your profit by choosing a single day to buy one stock and choosing a different day in the future to sell that stock.

**Practice**



## Day 7 Reverse Words in a String

Given an input string *s*, reverse the order of the words.

A word is defined as a sequence of non-space characters. The words in *s* will be separated by at least one space.

**Practice**

## Day 8 Longest Palindromic Substring

Given a string *s*, return the longest palindromic substring in *s*.

**Practice**

## Day 9 Longest Common Prefix

Write a function to find the longest common prefix string amongst an array of strings.

If there is no common prefix, return an empty string "".

**Practice**



## Day 10 Valid Anagram

Given two strings *s* and *t*, return true if *t* is an anagram of *s*, and false otherwise.

An Anagram is a word or phrase formed by rearranging the letters of a different word or phrase, typically using all the original letters exactly once.

### Practice

## Day 11 Repeated String Match

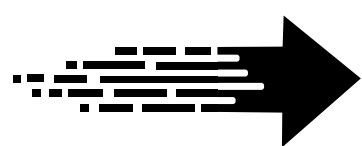
Given two strings *a* and *b*, return the minimum number of times you should repeat string *a* so that string *b* is a substring of it. If it is impossible for *b* to be a substring of *a* after repeating it, return -1.

### Practice

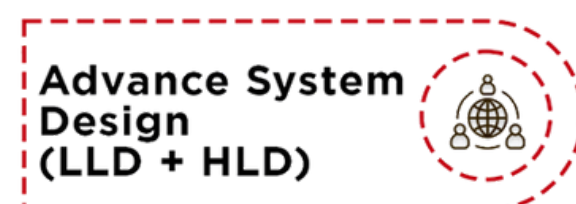
## Day 12 Roman to Integer

Roman numerals are represented by seven different symbols: I, V, X, L, C, D and M.

### Practice



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## Day 13 Subsets II

Given an integer array `nums` that may contain duplicates, return all possible subsets (the power set).

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

### Practice

## Day 14 Palindrome Partitioning

Given a string `s`, partition `s` such that every substring of the partition is a palindrome.

Return all possible palindrome partitioning of `s`.

### Practice

## Day 15 Combination Sum II

Given a collection of candidate numbers (`candidates`) and a target number (`target`), find all unique combinations in `candidates` where the candidate numbers sum to `target`.

Each number in `candidates` may only be used once in the combination.

### Practice



## Day 16 Power of Two

Given an integer  $n$ , return true if it is a power of two. Otherwise, return false.

An integer  $n$  is a power of two, if there exists an integer  $x$  such that  $n == 2^x$ .

### Practice

## Day 17 Different Ways to Add Parentheses

Given a string expression of numbers and operators, return all possible results from computing all the different possible ways to group numbers and operators. You may return the answer in any order.

### Practice

## Day 18 Sudoku Solver

Write a program to solve a Sudoku puzzle by filling the empty cells.

A sudoku solution must satisfy all of the following rules:

### Practice





## Day 19 Reverse Linked List

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

### Practice

## Day 20 Middle of the Linked List

Given the head of a singly linked list, return the middle node of the linked list.

If there are two middle nodes, return the second middle node.

### Practice

## Day 21 Merge Two Sorted Lists

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





## Day 22 Add Two Numbers

You are given two non-empty linked lists representing two non-negative integers. The digits are stored in reverse order, and each of their nodes contains a single digit. Add the two numbers and return the sum as a linked list.

You may assume the two numbers do not contain any leading zero, except the number 0 itself.

**Practice**

## Day 23 Linked List Cycle

Given head, the head of a linked list, determine if the linked list has a cycle in it.

**Practice**

## Day 24 Palindrome Linked List

Given the head of a singly linked list, return true if it is a palindrome or false otherwise.

**Practice**



## Day 25 Single Element in a Sorted Array

You are given a sorted array consisting of only integers where every element appears exactly twice, except for one element which appears exactly once.

Return the single element that appears only once.

### Practice

## Day 26 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  $O(\log(m+n))$ .

### Practice

## Day 27 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` ( $1 \leq k < \text{nums.length}$ ).

### Practice





## Day 28 Kth Largest Element in an Array

Given an integer array `nums` and an integer `k`, return the `k`th largest element in the array.

Note that it is the `k`th largest element in the sorted order, not the `k`th distinct element.

**Practice**

## Day 29 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.

**Practice**

## Day 30 Top K Frequent Elements

Given an integer array `nums` and an integer `k`, return the `k` most frequent elements. You may return the answer in any order.

**Practice**



## Day 31 Implement Stack using Queues

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

## Day 32 Implement Queue using Stacks

Implement a first in first out (FIFO) queue using only two stacks. The implemented queue should support all the functions of a normal queue (push, peek, pop, and empty).

### Practice

## Day 33 Valid Parentheses

Given a string *s* containing just the characters '(', ')', '{', '}', '[' and ']', determine if the input string is valid.

An input string is valid if:

- Open brackets must be closed by the same type of brackets.
- Open brackets must be closed in the correct order.

Every close bracket has a corresponding open bracket of the same type.

### Practice





## Day 34 LRU Cache

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

**Practice**

## Day 35 LFU Cache

Design and implement a data structure for a Least Frequently Used (LFU) cache.

**Practice**

## Day 36 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.

**Practice**

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## Day 37 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.

**Practice**

## Day 38 Min Stack

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

**Practice**

## Day 39 Rotting Oranges

You are given an  $m \times n$  grid where each cell can have one of three values:

- 0 representing an empty cell,
- 1 representing a fresh orange
- 2 representing a rotten orange.

**Practice**





## **Day 40** Binary Tree Inorder Traversal

Given the root of a binary tree, return the inorder traversal of its nodes' values.

**Practice**

## **Day 41** Binary Tree Preorder Traversal

Given the root of a binary tree, return the preorder traversal of its nodes' values.

**Practice**

## **Day 42** Binary Tree Postorder Traversal

Given the root of a binary tree, return the postorder traversal of its nodes' values.

**Practice**

## **Day 42** Maximum Width of Binary Tree

Given the root of a binary tree, return the maximum width of the given tree.

**Practice**



## Day 43 Binary Tree Level Order Traversal

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**

## Day 44 Maximum Depth of Binary Tree

Given the root of a binary tree, return its maximum depth.

A binary tree's maximum depth is the number of nodes along the longest path from the root node down to the farthest leaf node.

**Practice**

## Day 45 Balanced Binary Tree

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

**Practice**

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## Day 46 Vertical Order Traversal of a Binary Tree

Given the root of a binary tree, calculate the vertical order traversal of the binary tree.

**Practice**

## Day 47 Maximum Width of Binary Tree

Given the root of a binary tree, return the maximum width of the given tree.

The maximum width of a tree is the maximum width among all levels.

**Practice**

## Day 48 Binary Tree Level Order Traversal

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**



## Day 49 Binary Tree Zigzag Level Order Traversal

Given the root of a binary tree, return the zigzag level order traversal of its nodes' values. (i.e., from left to right, then right to left for the next level and alternate between).

**Practice**

## Day 50 Same Tree

Given the roots of two binary trees p and q, write a function to check if they are the same or not.

Two binary trees are considered the same if they are structurally identical, and the nodes have the same value.

**Practice**

## Day 51 Lowest Common Ancestor of a Binary Tree

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

**Practice**



## Day 52 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`.

### Practice

## Day 53 Topological Sort BFS

Given a Directed Acyclic Graph (DAG) with `V` vertices and `E` edges, Find any Topological Sorting of that Graph.

### Practice

## Day 54 Topological Sort DFS

Given a Directed Acyclic Graph (DAG) with `V` vertices and `E` edges, Find any Topological Sorting of that Graph.

### Practice





## Day 55 Kosaraju algorithm $O(N)$

Model this question as graph problem.

If there is a character 'b' between the first and last occurrence of character 'a', then it means we must include 'b' in the substring if we want to include 'a', so we can create an edge from 'a' to 'b'.

### Practice

## Day 56 Implementing Dijkstra Algorithm

Given a weighted, undirected and connected graph of  $V$  vertices and an adjacency list  $adj$ .

where  $adj[i]$  is a list of lists containing two integers where the first integer of each list  $j$  denotes there is edge between  $i$  and  $j$ , second integers corresponds to the weight of that edge.

You are given the source vertex  $S$  and You to Find the shortest distance of all the vertex's from the source vertex  $S$ . You have to return a list of integers denoting shortest distance between each node and Source vertex  $S$ .

### Practice



## Day 57 Bellman-Ford Algorithm

Given a weighted, directed and connected graph of  $V$  vertices and  $E$  edges, Find the shortest distance of all the vertex's from the source vertex  $S$ .

**Practice**

## Day 58 Floyd Warshall

The problem is to find the shortest distances between every pair of vertices in a given edge-weighted directed graph.

The graph is represented as an adjacency matrix of size  $n \times n$ .

$\text{Matrix}[i][j]$  denotes the weight of the edge from  $i$  to  $j$ .  
If  $\text{Matrix}[i][j] = -1$ , it means there is no edge from  $i$  to  $j$ .

**Practice**

## Day 59 Minimum Spanning Tree

Given a weighted, undirected and connected graph of  $V$  vertices and  $E$  edges. The task is to find the sum of weights of the edges of the Minimum Spanning Tree.

**Practice**



## Day 60 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.

**Practice**

## Day 61 Longest Common Subsequence

Given two strings `text1` and `text2`, return the length of their longest common subsequence. If there is no common subsequence, return 0.

**Practice**

## Day 62 0 - 1 Knapsack Problem

You are given weights and values of  $N$  items, put these items in a knapsack of capacity  $W$  to get the maximum total value in the knapsack.

**Practice**





## Day 63 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:

- Insert a character
- Delete a character
- Replace a character

### Practice

## Day 64 Matrix Chain Multiplication

Given a sequence of matrices, find the most efficient way to multiply these matrices together. The efficient way is the one that involves the least number of multiplications.

The dimensions of the matrices are given in an array arr[] of size N (such that  $N = \text{number of matrices} + 1$ ) where the  $i$ th matrix has the dimensions (arr[i-1] x arr[i]).

### Practice



## Day 65 Minimum Path Sum

Given a  $m \times n$  grid filled with non-negative numbers, find a path from top left to bottom right, which minimizes the sum of all numbers along its path.

**Practice**

## Day 66 Coin Change

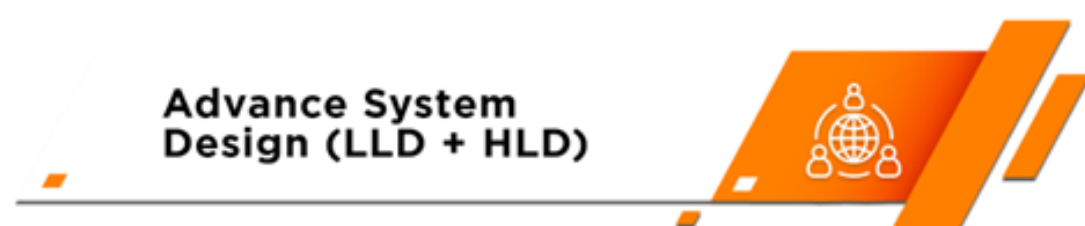
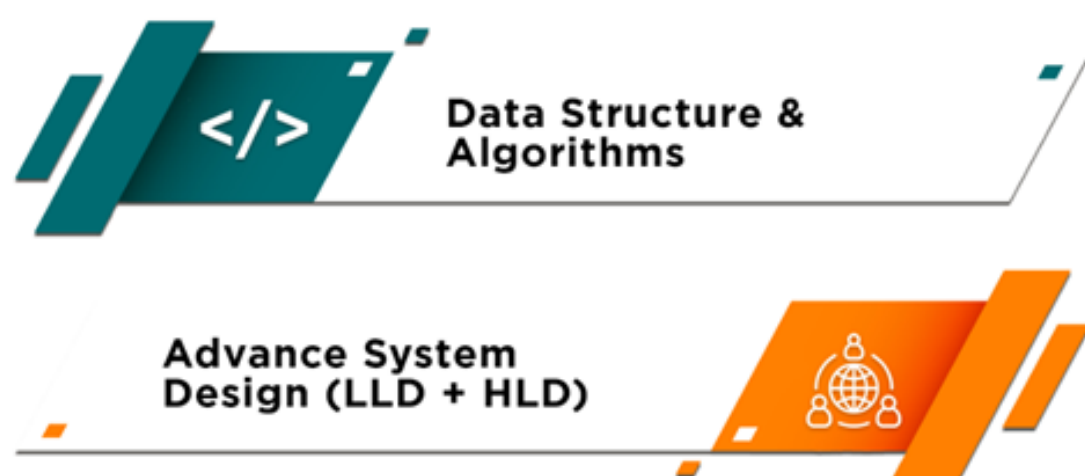
You are given an integer array `coins` representing coins of different denominations and an integer `amount` representing a total amount of money.

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**

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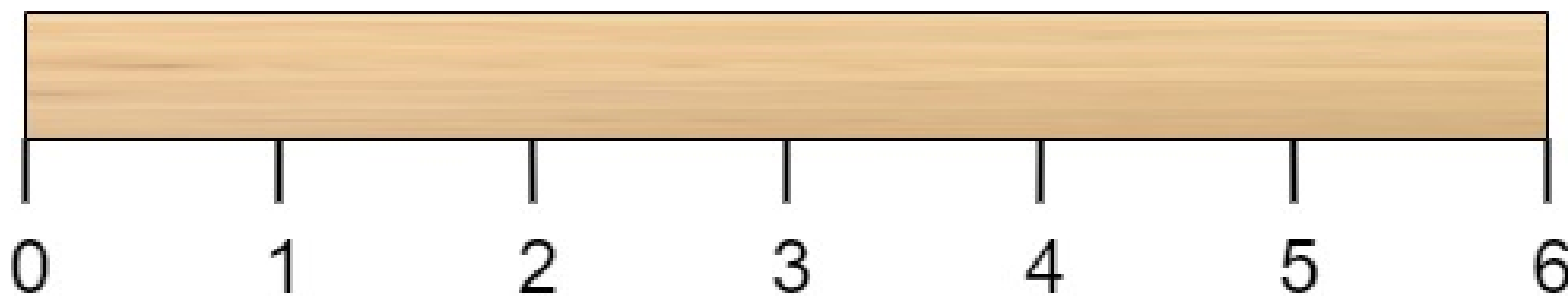
## Day 67 Partition Equal Subset Sum

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

## Day 68 Minimum Cost to Cut a Stick

Given a wooden stick of length  $n$  units. The stick is labelled from 0 to  $n$ . For example, a stick of length 6 is labelled as follows:



### Practice

## Day 69 Egg Dropping Puzzle

You are given  $N$  identical eggs and you have access to a  $K$ -floored building from 1 to  $K$ .

### Practice





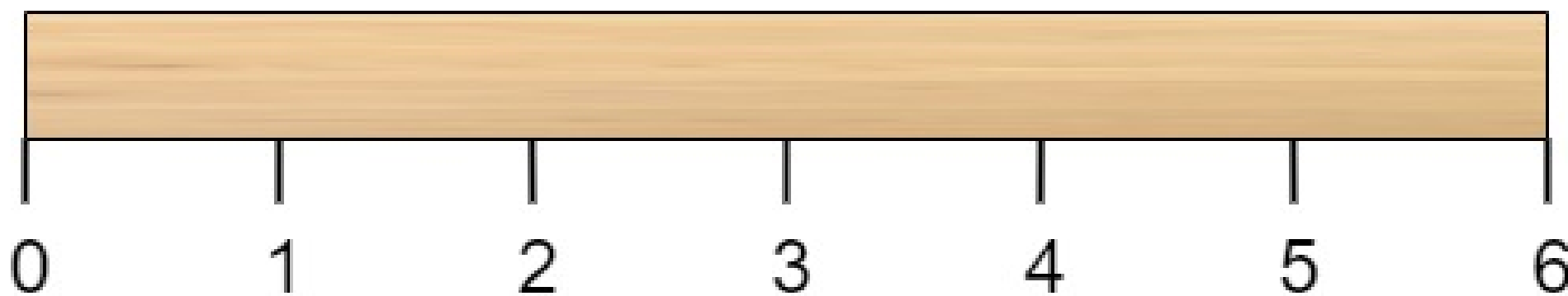
## Day 70 Word Break

Given a string  $s$  and a dictionary of strings  $\text{wordDict}$ , return true if  $s$  can be segmented into a space-separated sequence of one or more dictionary words.

### Practice

## Day 68 Minimum Cost to Cut a Stick

Given a wooden stick of length  $n$  units. The stick is labelled from 0 to  $n$ . For example, a stick of length 6 is labelled as follows:



### Practice

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## Day 70 Word Break

Given a string  $s$  and a dictionary of strings  $\text{wordDict}$ , return true if  $s$  can be segmented into a space-separated sequence of one or more dictionary words.

**Practice**

## Day 71 Palindromic Partitioning

Given a string  $\text{str}$ , a partitioning of the string is a palindrome partitioning if every sub-string of the partition is a palindrome.

Determine the fewest cuts needed for palindrome partitioning of the given string.

**Practice**

## Day 72 Job Sequencing Problem

Given a set of  $N$  jobs where each job  $i$  has a deadline and profit associated with it.

**Practice**



## Day 73 Power Set

Given a string S, Find all the possible subsequences of the String in lexicographically-sorted order.

**Practice**

## Day 74 Maximum XOR of Two Numbers in an Array

Given an integer array nums, return the maximum result of  $\text{nums}[i] \text{ XOR } \text{nums}[j]$ , where  $0 \leq i \leq j < n$ .

**Practice**

## Day 75 Implement Trie (Prefix Tree)

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.

**Practice**



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