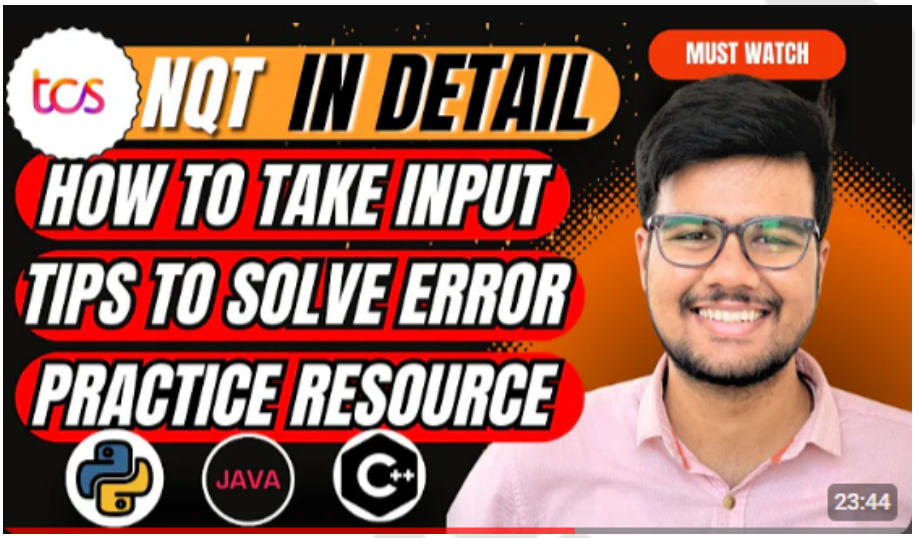
NATIONAL QUALIFIER TEST

TCS NQT 2025

HOW TO TAKE INPUT?



@DarshJain-ew3jc 3 hours ago

For Everyone going to write the test on 4,6 may or any future batch:

1. If there is any indentation error, make sure that you insert two blank spaces manually and do not use TAB (if any indentations to be given)

For example:

If a==0:<press_enter>
<space><space>b=9 <press_enter>
<space><space>c=5 <press_enter>
else: <press_enter>
<space><space>d=10 <press_enter>

2. Do not print anything while taking input i.e x= input("enter your value")
and do not use print statement anywhere else other than to print your final answer since the very first statement that gets printed will be considered as your answer :(

Workaround for this problem to print values for debugging, is to use try except block for example, if i want to check what format is input or whether even input has been taken or not

x=input()
try:<Enter>
<space> <space>x=9/0
except Exception as e:
<sp><sp>raise ZeroDivisionError (str(type(x)) + " "+ x)

Always at start check whether you are able to get input in processable format or not using above method since the input format displayed is not always the same as the one considered at backend for evaluation.

NATIONAL QUALIFIER TEST

TCS NQT 2025

PREVIOUS YEARS UNIQUE SET OF PROBLEMS [2018-2024]

Question 1: Find the Subarray with a Given Sum
Imagine you are analyzing a sequence of financial transactions where each entry is the gain or loss for the day. You want to find continuous periods where the sum of the transactions is a specific target amount, which could signify something important, such as a balance being achieved or a certain profit target.

Problem Statement:
You are given an array of integers, where both positive and negative values represent daily gains and losses. Your task is to find all the subarrays within the array that sum up to a given target. These subarrays can start and end at any position, but they must be contiguous. You need to list each such subarray.

Example:
Input:
arr = [3, 4, -7, 1, 3, 3, 1, -4]
Target Sum: 0
Output:
[3, 4, -7]
[3, 4, -7, 1, 3, 3]
[1, 3, 3]
[3, 3, 1, -4]
Explanation:
Each subarray represents a series of days where the sum of the gains and losses adds up to the target sum, which in this case is zero.

Question 2: Cyclically Rotate the Array Clockwise by K
Imagine you have a group of people standing in a circle, and you want to rotate their positions in such a way that everyone shifts by a few places to the right. Similarly, given an array of integers, your task is to cyclically rotate the array clockwise by a given number K, meaning every element moves K places to the right, and the ones at the end wrap around to the start.

Problem Statement:
Given an array of size N and a number K, cyclically rotate the array K times in the clockwise direction. The order of elements should remain the same but shifted by K.

Example 1:
Input:
Arr = [10, 20, 30, 40, 50]
K = 2
Output:
[40, 50, 10, 20, 30]

Example 2:
Input:
Arr = [10, 20, 30, 40]
K = 1
Output:
[40, 10, 20, 30]
Explanation:
In the first example, after rotating the array by 2 positions, elements [40, 50] from the end shift to the front, and the others follow in sequence. The same process applies to the second example with K = 1.

Question 3: Find Numbers with No Repeated Digits
You are tasked with finding unique product codes that do not have repeated digits within a certain range. Let's say you are given two numbers n1 and n2, representing a range of product codes. Your goal is to find how many numbers in that range have no repeated digits (e.g., the number 112 has repeated digits, but 123 does not).

Problem Statement:
Given two integers n1 and n2, where n1 < n2, find how many numbers within this range have no repeated digits.

Example 1:
Input:
n1 = 11
n2 = 15
Output:
4
Explanation:
The numbers 12, 13, 14, and 15 have no repeated digits, while 11 does.

Example 2:
Input:
n1 = 101
n2 = 200
Output:
72
Explanation:
Out of all numbers between 101 and 200, there are 72 numbers with no repeated digits.

Question 4: Rearrange Multiples of 10 to the End of the Array
Consider you are managing an inventory of products, and the products that are stored in multiples of 10 need to be sent to a different warehouse. The goal is to rearrange the inventory list such that all products which are multiples of 10 are moved to the end of the list while keeping the relative order of all other products unchanged.

Problem Statement:
Given an array of integers, rearrange the elements so that all multiples of 10 appear at the end of the array. The order of the non-multiples of 10 should remain the same.

Example:
Input:
Arr = [10, 12, 5, 40, 30, 7, 5, 9, 10]
Output:
[12, 5, 7, 5, 9, 10, 40, 30, 10]
Explanation:
All numbers which are not multiples of 10 stay in their original positions, and the multiples of 10 (10, 40, 30, 10) are moved to the end.

Question 5: Format Camel Case String
Imagine you are working with a string written in camel case, where multiple words are joined together without spaces, and each new word begins with an uppercase letter. Your task is to reformat this string by placing spaces between words and converting all uppercase letters to lowercase.

Problem Statement:
Given a string in camel case format, insert spaces between the words and convert all characters to lowercase.

Example 1:
Input:
"ThisIsAnAutomationEra"
Output:
"this is an automation era"
Example 2:
Input:
"HeyYou"
Output:
"hey you"
Explanation:
For both examples, spaces are inserted between each word, and all uppercase letters are converted to lowercase.

Question 6: Pairing Employees for a Game
You are tasked with organizing a game for employees in a company. Each employee can either compete individually or pair up with another employee. If the total number of employees is odd, no pairs can be formed. If it is even, they can either stay single or form pairs. Your goal is to calculate how many different ways employees can either stay single or pair up.

Problem Statement:
Given a number N, which represents the total number of employees, find the number of possible ways they can compete either as individuals or in pairs. If N is odd, employees must all remain single.

Example 1:
Input:
N = 3
Output:
1
Explanation:
Since the number of employees is odd, there is only one way: all employees compete as individuals.

Example 2:
Input:
N = 4
Output:
10
Explanation:
When N = 4, there are 10 different combinations of employees competing individually or in pairs.

Question 7: Find the Longest Subarray with Equal Number of 0s and 1s
Imagine you are observing a sequence of binary responses (0s and 1s) from a group of people answering a survey. You want to find the longest continuous sequence where the number of yes (1s) equals the number of no (0s).

Problem Statement:
Given an array of 0s and 1s, find the longest subarray that contains an equal number of 0s and 1s.

Example:
Input:
Arr = [1, 0, 0, 1, 0, 1, 1]
Output:
6
Explanation:
The subarray [0, 0, 1, 0, 1, 1] has equal 0s and 1s, and its length is 6.

Question 8: Maximum Profit from Stock Prices
You are a trader looking to make the most profit from buying and selling stocks. You can only complete one transaction, meaning you need to pick the best day to buy and the best day to sell.
Problem Statement:
Given an array where each element represents the stock price on a given day, find the maximum profit you can achieve by buying on one day and selling on another day later.
Example:
Input:
Prices = [7, 1, 5, 3, 6, 4]
Output:
5
Explanation:
You can buy at a price of 1 and sell at a price of 6, making a profit of 6-1=5.

Question 9: Merge Two Sorted Lists
Imagine you are helping to merge two teams of employees, and their names are sorted alphabetically. Your job is to combine these lists while keeping the final list in sorted order.

Problem Statement:
Given two sorted arrays, merge them into one sorted array without using any extra sorting functions.
Example:
Input:
Arr1 = [1, 3, 5]
Arr2 = [2, 4, 6]
Output:
[1, 2, 3, 4, 5, 6]

Question 10: Count Valid Parentheses
You are tasked with checking if a string of parentheses is balanced. For example, when someone enters data inside a form, you need to validate that every opening parenthesis (has a corresponding closing parenthesis).

Problem Statement:
Given a string containing just the characters (and), determine if the input string is valid. A valid string is one where every open parenthesis has a corresponding closing parenthesis.
Example:
Input:
Str = "((()))"
Output:
True
Explanation:
The parentheses are balanced, so the output is True.

Question 10: Count Valid Parentheses
You are tasked with checking if a string of parentheses is balanced. For example, when someone enters data inside a form, you need to validate that every opening parenthesis (has a corresponding closing parenthesis).

Problem Statement:
Given a string containing just the characters (and), determine if the input string is valid. A valid string is one where every open parenthesis has a corresponding closing parenthesis.

Example:
Input:
Str = "((()))"
Output:
True
Explanation:
The parentheses are balanced, so the output is True.

Question 11: Find the Missing Number in a Sequence
Imagine you are organizing a relay race, and each runner is assigned a number in a continuous sequence. However, one runner's number is missing from the sequence, and you need to find out which one.

Problem Statement:
Given an array of n-1 numbers, where the numbers are between 1 and n, find the missing number.
Example:
Input:
Arr = [1, 2, 4, 5, 6]
Output:
3
Explanation:
The missing number in the sequence is 3.

Question 12: Find the First Unique Character in a String
You’re analyzing a stream of text messages, and your task is to find the first unique character that doesn't repeat in the message.

Problem Statement:
Given a string s, find the first non-repeating character in it and return its index. If it doesn't exist, return -1.
Example:
Input:
Str = "loveleetcode"
Output:
2
Explanation:
The first non-repeating character is 'v', and its index is 2.

Question 13: Reverse Only Vowels in a String
Imagine you’re working on a text-based game where you need to perform special effects on vowels in words. Your job is to reverse the order of vowels in the string, while keeping the consonants in place.

Problem Statement:
Given a string, reverse only the vowels of the string.
Example:
Input:
Str = "hello"
Output:
"holle"
Explanation:
The vowels e and o are swapped, while the other letters remain the same.

Question 14: Find All Anagrams of a String
You're tasked with searching for hidden patterns in text. In this problem, you need to find all the start indices of substrings in a given string that are anagrams of a target word.

Problem Statement:
Given a string s and a non-empty string p, find all the start indices of p's anagrams in s.
Example:
Input:
S = "cbaebabacd"
P = "abc"
Output:
[0, 6]
Explanation:
The substring starting at index 0 ("cba") and the one starting at index 6 ("bac") are anagrams of "abc".

Question 15: Find the Median of Two Sorted Arrays
Imagine you are comparing the incomes of two departments in your company. Each department has a sorted list of salaries, and you want to find the median income across both departments combined.

Problem Statement:
Given two sorted arrays arr1 and arr2, find the median of the two sorted arrays.
Example:
Input:
Arr1 = [1, 3]
Arr2 = [2]
Output:
2
Explanation:
When the arrays are merged, the median of [1, 2, 3] is 2.

Question 16: Find the Longest Palindromic Substring
Imagine you are analyzing a sequence of characters, and you want to find the longest subsequence that reads the same forward and backward.

Problem Statement:
Given a string s, find the longest palindromic substring.
Example:
Input:
Str = "babad"
Output:
"bab"
Explanation:
The longest palindromic substring is "bab" or "aba".

Question 17: Rotate Image (Matrix)
Imagine you are working on an image editor that allows users to rotate an image by 90 degrees. The image is represented as an N x N matrix where each pixel is an element of the matrix.
Problem Statement:
Given an N x N matrix, rotate the matrix by 90 degrees clockwise.
Example:
Input:
Matrix = [[1,2,3],[4,5,6],[7,8,9]]
Output:
[[7,4,1],[8,5,2],[9,6,3]]

Question 18: Find the Longest Consecutive Sequence
Imagine you are analyzing a set of data points over consecutive days. You want to find the longest period where the data points are consecutive.
Problem Statement:
Given an unsorted array of integers, find the length of the longest consecutive sequence.
Example:
Input:
Arr = [100, 4, 200, 1, 3, 2]
Output:
4
Explanation:
The longest consecutive sequence is [1, 2, 3, 4].

Question 19: Convert Roman Numerals to Integer
Imagine you're working with an ancient system where Roman numerals are used. Your job is to convert these Roman numerals to integers.
Problem Statement:
Given a string representing a Roman numeral, convert it to an integer.
Example:
Input:
Str = "IX"
Output:
9
Explanation:
IX represents 9.

Question 20: Find the Majority Element
Imagine you are counting votes in an election, and you need to find the candidate who received more than half of the total votes.
Problem Statement:
Given an array of integers, where each integer represents a vote for a candidate, find the majority element (the element that appears more than n/2 times).
Example:
Input:
Arr = [2, 2, 1, 1, 2, 2]
Output:
2
Explanation:
2 is the majority element as it appears 4 times, more than half the array length.

Question 21: Find the Kth Largest Element
You are given a list of prizes won by participants in a competition. You want to determine the prize that ranks at a specific position from the top.
Problem Statement:
Given an array of integers and an integer K, find the Kth largest element in the array.
Example:
Input:
Arr = [3, 2, 1, 5, 6, 4]
K = 2
Output:
5
Explanation:
The second-largest element is 5.

Question 22: Find the Sum of Subarray Closest to Zero

Imagine you're analyzing temperature changes over a series of days, and you want to find the stretch of days where the change in temperature was closest to zero.

Problem Statement:

Given an array of integers representing temperature changes, find the subarray with a sum closest to zero.

Example:

Input:

Arr = [1, -2, 3, 4, -5, 6]

Output:

1

Explanation:

The subarray [-2, 3] has a sum of 1, which is closest to zero.

Question 23: Find the Subarray with Maximum Sum

Imagine you are evaluating the financial performance of a company over several quarters, and you want to find the period where the company achieved the highest profits.

Problem Statement:

Given an array of integers representing profits and losses over a period of time, find the contiguous subarray with the largest sum.

Example:

Input:

Arr = [-2,1,-3,4,-1,2,1,-5,4]

Output:

6

Explanation:

The subarray [4,-1,2,1] has the largest sum, which is 6.

Question 24: Merge Intervals

Imagine you are managing the schedules of multiple employees, and you want to merge overlapping time slots into a single time block.

Problem Statement:

Given an array of intervals where each interval is represented as a pair [start, end], merge all overlapping intervals.

Example:

Input:

Intervals = [[1,3],[2,6],[8,10],[15,18]]

Output:

[[1,6],[8,10],[15,18]]

Explanation:

The intervals [1,3] and [2,6] overlap, so they are merged into [1,6].

Question 25: Find the GCD of Two Numbers

Imagine you are tasked with creating a system to calculate the greatest common divisor (GCD) of two product codes to ensure compatibility between components.

Problem Statement:

Given two integers a and b, return their greatest common divisor (GCD).

Example:

Input:

a = 54

b = 24

Output:

6

Explanation:

The GCD of 54 and 24 is 6.

Question 26: Find the Subarray with a Given Sum

You are analyzing customer transaction data and want to find a continuous sequence of transactions that adds up to a specific target amount.

Problem Statement:

Given an array of integers and a target sum, find the subarray that adds up to the target sum.

Example:

Input:

Arr = [1,2,3,7,5]

Target = 12

Output:

[2,3,7]

Explanation:

The subarray [2,3,7] adds up to 12.

Question 27: Find the Product of Array Except Self

Imagine you are developing a system to distribute bonuses to employees, where the bonus is determined by multiplying the performance scores of all other employees except the one under consideration.

Problem Statement:

Given an array of integers, return an array such that each element at index i is the product of all elements in the array except the one at index i.

Example:

Input:

Arr = [1,2,3,4]

Output:

[24,12,8,6]

Explanation:

For example, the product of all elements except the element at index 1 is 3*4*1=12.

Question 28: Count the Number of Set Bits

Imagine you are working with a binary communication protocol, and you need to count the number of bits set to 1 in a transmitted message.

Problem Statement:

Given an integer n, return the number of 1 bits it has (also known as the Hamming weight).

Example:

Input:

n = 11

Output:

3

Explanation:

The binary representation of 11 is 1011, which has three 1 bits.

Question 29: Generate Pascal's Triangle

Imagine you are arranging items in a triangular pattern. Your task is to generate the structure of Pascal's triangle, a triangular arrangement where each element is the sum of the two directly above it.

Problem Statement:

Given an integer n, generate the first n rows of Pascal's triangle.

Example:

Input:

n = 5

Output:

[[1], [1,1], [1,2,1], [1,3,3,1], [1,4,6,4,1]]

Question 30: Check if a String is a Valid Palindrome

Imagine you are analyzing text for grammatical correctness, and one of the checks involves verifying if the text reads the same backward as forward, ignoring punctuation and spaces.

Problem Statement:

Given a string, determine if it is a palindrome, considering only alphanumeric characters and ignoring cases.

Example:

Input:

Str = "A man, a plan, a canal: Panama"

Output:

True

Explanation:

The string is a palindrome when ignoring punctuation and case.

MASSIVE SUCCESS RATE

"Transform Your Interview Opportunity into an Offer Letter and Make Your Parents Proud!"

- **In-depth Technical Mock**
  - **Crack coding challenges with real TCS Prime experts.**
- **HR & Managerial Prep**
  - **Master behavioral questions and impress TCS.**
- **Full Interview Simulation**
  - **Ace both technical and HR in one session.**
- **Resume Review**
  - **Identify and fix weaknesses for a standout CV.**
- **Personalized Feedback & Expert Guidance**
  - **Tailored improvement tips to boost success.**

www.primecoding.in