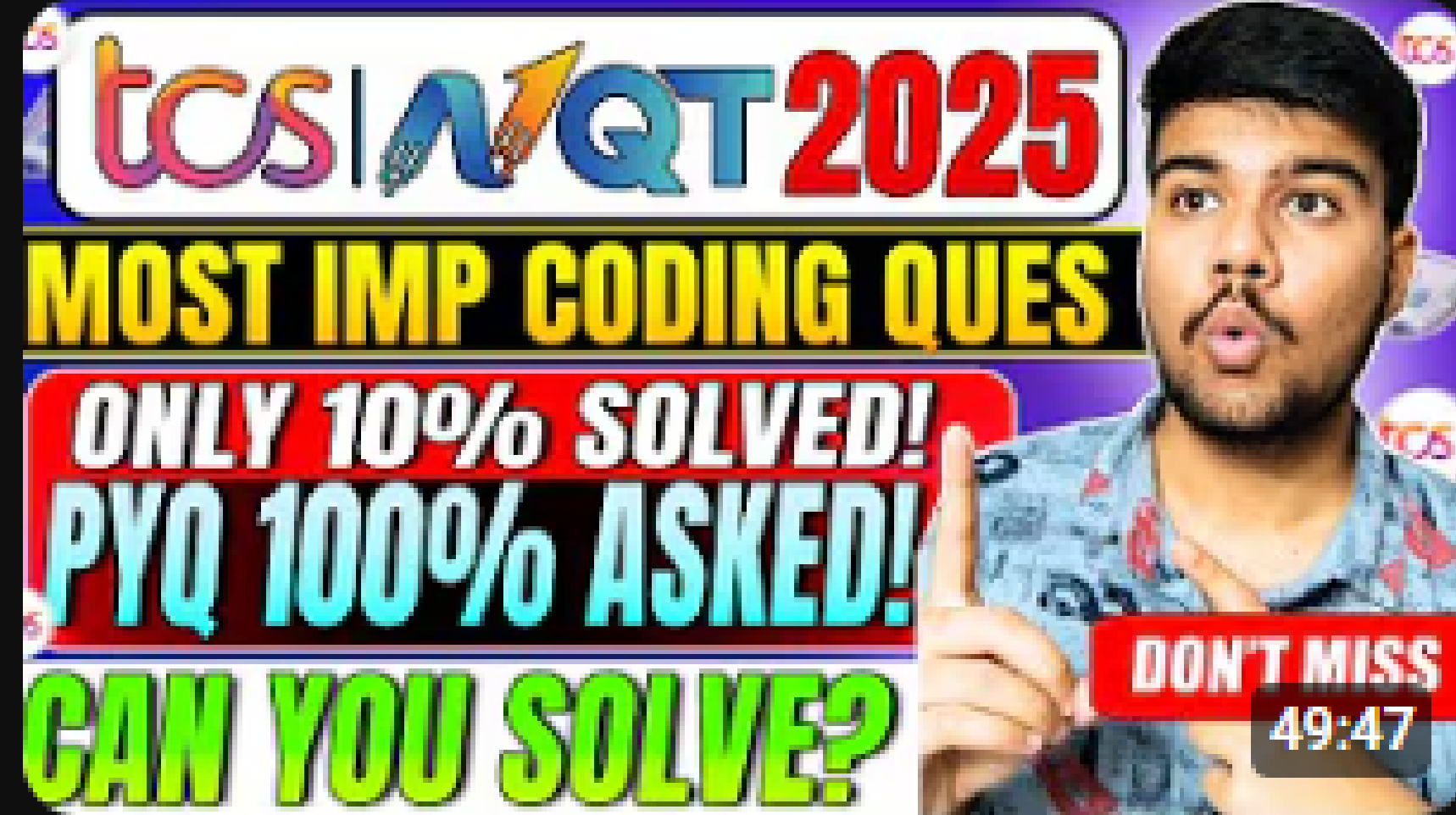# TCS NQT 2025

TOP 20 MUST DO QUES

🔥 TCS NQT 2025 Actual Coding Questions | Only 10% Cracked This!

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TCS NQT 2025

NUMBER THEORY

Ques 1:

Write a program that takes two integers, N and M (N ≤ M), as input and calculates the sum of cubes of all numbers in the range [N, M].

Example:
📌 Input: N = 2, M = 4
📌 Calculations:
2^3 + 3^3 + 4^3 = 8 + 27 + 64 = 99

📌 Output:
Sum of cubes from 2 to 4 is: 99

Ques 2:

Question:

Write a program that takes two integers, N and M (N ≤ M), as input and finds the sum of all prime numbers in the range [N, M].

Example:

📌 Input: N = 10, M = 20

📌 Prime numbers in range: 11, 13, 17, 19

📌 Sum: 11 + 13 + 17 + 19 = 60

📌 Output:

Sum of prime numbers from 10 to 20 is: 60

HW

- **Perfect Numbers**
- **Harshad Numbers**
- **Armstrong Numbers**

Ques 3:

Question:

Write a program that takes an integer N as input and calculates the sum of the first N multiples of 10.

Example 1:

📌 Input: N = 5

📌 Multiples of 10: 10, 20, 30, 40, 50

📌 Sum: 10 + 20 + 30 + 40 + 50 = 150

📌 Output:

Sum of first 5 multiples of 10 is: 150

Example 2:

📌 Input: N = 10

📌 Multiples of 10: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

📌 Sum: 550

📌 Output:

Sum of first 10 multiples of 10 is: 550

Ques 4:

Question:

John has discovered a magical tree, where each new branch grows following a unique pattern. Unlike the traditional Fibonacci sequence, the number of branches at each stage follows this rule:

- Stage 1: 1 branch
- Stage 2: 2 branches
- From Stage 3 onwards: The branches at each stage are the product of the previous two stages multiplied by 2.

John wants to know the total number of branches that will exist after N stages. Can you help him calculate it?

Formula:

$$F(N) = F(N-1) \times F(N-2) \times 2$$

$$F(1) = 1, \quad F(2) = 2$$

Example 1:

📌 Input:

N = 5

📌 Stages of growth:

1, 2, 4, 16, 128

📌 Total branches:

1 + 2 + 4 + 16 + 128 = 151

📌 Output:

Total branches after stage 5: 151

Ques 5:

Question: The Secret Code

A great kingdom hides its treasure behind a three-digit secret code. The gate will open only if the code is divisible by 9.

Your task is to check whether the given three-digit number N can unlock the treasure.

Input:

N (A three-digit number)

Output:

- **Print "Yes" if N is divisible by 9.**
- **Otherwise, print "No".**

Example 1:

📌 **Input:**

162

📌 **Output:**

Yes

(The treasure gate opens!)

Example 2:

📌 **Input:**

245

📌 **Output:**

No

(The gate remains locked!)

TCS NQT 2025

ARRAY AND STRINGS QUESTIONS

Ques 1:

Question: Sorting Colored Marbles (DNF Algorithm)

A craftsman has N marbles, each colored Red (0), White (1), or Blue (2). The marbles are arranged in a line, but they are unordered.

Your task is to sort the marbles in-place such that all Red (0) marbles come first, followed by White (1), and then Blue (2), using the Dutch National Flag (DNF) Algorithm.

Input Format (String):

"N C1 C2 C3 ... CN"

Where:

- N is the number of marbles.
- Ci represents the color of the i-th marble (0, 1, or 2).

Output Format:

[Sorted marbles]

Example 1:

📌 Input (String):

"6 2 0 2 1 1 0"

📌 Output:

"0 0 1 1 2 2"

Example 2:

📌 Input (String):

"5 1 2 0 1 0"

📌 Output:

"0 0 1 1 2"

Ques 2:

Question: The Treasure Hunt

A group of explorers found a list of N treasure values hidden in an ancient scroll. The value of the treasure is determined by the difference between the largest and smallest number in the list.

Your task is to find this maximum difference.

Input:

N

A1 A2 A3 … AN (List of N numbers)

Output:

- Print the difference between the largest and smallest number in the list.

Example 1:

📌 Input:

5

3 8 1 9 2

📌 Output:

8

(9 - 1 = 8)

Example 2:

📌 Input:

4

10 20 30 40

📌 Output:

30

(40 - 10 = 30)

Can you unlock the true value of the treasure? 💰☠️

Ques 3:

Question: Choosing the Ruler

In a kingdom of N people, each person supports a family represented by a number. A family can rule only if it has more than half the support.

Input:

N

F1 F2 F3 ... FN (Family numbers)

Output:

- The winning family's number if it has a majority.
- -1 if no majority exists.

Example 1:

📌 Input:

5

2 2 1 2 2

📌 Output:

2

Example 2:

📌 Input:

4

1 2 3 4

📌 Output:

-1

Who will rule the kingdom?

Ques 4:

Question:

Given N students with their name, age, grade, and gender, perform the following tasks:

1. **Print the names of students older than 20.**
2. **Print the average ASCII value of grades for female students.**

Input Format:

N

Name Age Grade Gender

(repeated N times)

Output Format:

[Filtered Names]

[Average ASCII of Female Grades]

Example:

📌 **Input:**

3

AAA 21 A Female

BBB 14 B Male

CCC 24 C Female

📌 **Output:**

AAA CCC

66

Ques 5:

Question:

A person has N shoes labeled with size and foot (L for left, R for right). A pair is formed when both L and R of the same size exist. Given a space-separated string of N shoes, find the number of complete pairs.

Input Format (String):

"N S1 S2 S3 ... SN"

Where:

- **N is the number of shoes.**
- **Si represents a shoe, formatted as size + foot (L/R).**

Output Format:

[Number of pairs]

Example 1:

📌 **Input (String):**

"8 7L 7R 7L 8L 6R 7R 8R 6R"

📌 **Output:**

3

Example 2:

📌 **Input (String):**

"5 7R 7L 8R 10R 10L"

📌 **Output:**

2

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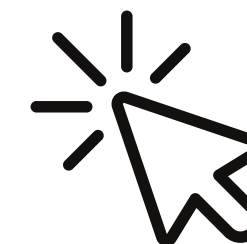
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SUBARRAY AND BITWISE

Ques 1:

Question:
Given an integer array nums and an integer k, find a contiguous subarray whose sum is equal to k. If such a subarray exists, print it; otherwise, print -1.

Example 1:

Input:

nums = [1, 4, 20, 3, 10, 5]

k = 33

Output:

Subarray found: [20, 3, 10]

Explanation:

 The subarray [20, 3, 10] has a sum of 33.

Example 2:

Input:

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

k = 20

Output:

-1

Explanation:

 No contiguous subarray sums to 20.

Ques 2:

Longest Substring Without Repeating Characters (LeetCode #3)

Question:

 Given a string S, find the length of the longest substring that contains no repeating characters.

📌 **Input (String):**

"S"

📌 **Output:**

[Length of the longest unique substring]

Example 1:

📌 **Input:**

"abcabcbb"

📌 **Output:**

3

(Explanation: The longest substring without repeating characters is "abc", length = 3.)

Example 2:

📌 **Input:**

"bbbbb"

📌 **Output:**

1

(Explanation: The longest substring is "b", length = 1.)

Ques 3:

Sum of XOR of All Subarrays of Length K

Question:

 Given an array A of size N and an integer K, find the sum of XOR values of all contiguous subarrays of length K.

📌 **Input (String):**

"N K A1 A2 ... AN"

Where:

- **N → Number of elements in the array.**
- **K → Size of the subarrays.**
- **A1, A2, ..., AN → The array elements.**

📌 **Output:**

[Sum of XOR of all subarrays of length K]

Example 1:

📌 **Input:**

"5 3 1 2 3 4 5"

📌 **Output:**

12

(Explanation:

- XOR of [1, 2, 3] → 1 ⊕ 2 ⊕ 3 = 0
- XOR of [2, 3, 4] → 2 ⊕ 3 ⊕ 4 = 5
- XOR of [3, 4, 5] → 3 ⊕ 4 ⊕ 5 = 6
- Total Sum: 0 + 5 + 6 = 12.)

Example 2:

📌 **Input:**

"4 2 4 5 7 8"

📌 **Output:**

19

Ques 4:

Question:

Given an array of integers nums, find the bitwise AND of all elements whose index is divisible by 3. If no such elements exist, return -1.

Example 1:

Input:

nums = [3, 5, 9, 10, 11, 17, 15]

Output:

3

Explanation:

- **Indices divisible by 3: 0, 3, 6**
- **Elements at these indices: [3, 10, 15]**
- **3 & 10 & 15 = 3**

Example 2:

Input:

nums = [4, 7, 8, 13, 21, 25]

Output:

4

Explanation:

- **Indices divisible by 3: 0, 3**
- **Elements at these indices: [4, 13]**
- **4 & 13 = 4**

Ques 5:

Maximum Bitwise OR of Any Subset

📌 **Question:**

Given an array of N integers, find the maximum possible Bitwise OR of any subset of the array.

📌 **Input (String):**

"N A1 A2 ... AN"

📌 **Output:**

[Maximum OR value]

Example 1:

📌 **Input:**

"4 1 2 4 8"

📌 **Output:**

15

(Explanation: The maximum OR is achieved by considering all elements: 1 | 2 | 4 | 8 = 15.)

Example 2:

📌 **Input:**

"3 3 5 6"

📌 **Output:**

7

(Explanation: The subset {3, 5, 6} gives 3 | 5 | 6 = 7.)

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Recursion and DP

Ques 1:

1. Longest Increasing Subsequence (LIS)

Question:

Given an array of N numbers, find the length of the longest increasing subsequence.

📌 Input (String):

"N A1 A2 … AN"

Where:

- N is the number of elements in the array.
- Ai represents the elements of the array.

📌 Output:

[Length of LIS]

Example 1:

📌 Input:

"6 10 22 9 33 21 50"

📌 Output:

4

(Explanation: LIS = {10, 22, 33, 50})

Example 2:

📌 Input:

"5 3 4 2 8 10"

📌 Output:

4

(Explanation: LIS = {3, 4, 8, 10})

2. Longest Common Subsequence (LCS)

Question:

Given two strings S1 and S2, find the length of the longest common subsequence (LCS) between them.

📌 Input (String):

"S1 S2"

Where:

- S1 and S2 are the two given strings.

📌 Output:

[Length of LCS]

Example 1:

📌 Input:

"abcde ace"

📌 Output:

3

(Explanation: LCS = "ace", length = 3)

Example 2:

📌 Input:

"AGGTAB GXTXAYB"

📌 Output:

4

(Explanation: LCS = "GTAB", length = 4)

Ques 3:

3. Grid Unique Paths

Question:

You are given a M × N grid. You start at the top-left corner and want to reach the bottom-right corner. You can only move right or down. Find the number of unique paths to reach the destination.

📌 **Input (String):**

"M N"

Where:

- M is the number of rows.
- N is the number of columns.

📌 **Output:**

[Number of unique paths]

Example 1:

📌 **Input:**

"3 3"

📌 **Output:**

6

(Explanation: Possible paths → RRDD, RDRD, RDDR, DRRD, DRDR, DDRR)

Example 2:

📌 **Input:**

"2 2"

📌 **Output:**

2

(Explanation: Possible paths → RD, DR)

Can you find how many ways we can navigate the grid? 🚀🔥

Ques 4:

Minimum Coins Needed

Question:

You are given an array coins representing different denominations and an integer amount representing a total sum. Return the minimum number of coins required to make up the amount. If it's not possible, return -1.

📌 **Input (String):**

"N S C1 C2 ... CN"

Where:

- N → Number of coin denominations.
- S → Target amount.
- C1, C2, ..., CN → The available coin denominations.

📌 **Output:**

[Minimum number of coins or -1 if not possible]

Example 1:

📌 **Input:**

"3 11 1 2 5"

📌 **Output:**

3

(Explanation: The minimum number of coins to make 11 is 3 → {5 + 5 + 1})

Example 2:

📌 **Input:**

"2 3 2 4"

📌 **Output:**

-1

(Explanation: There is no way to form 3 using {2,4}.)

Ques 5:

5. Partition Equal Subset Sum

Question:

Given an array of N positive integers, determine if it can be partitioned into two subsets with an equal sum.

📌 **Input (String):**

"N A1 A2 ... AN"

Where:

- **N → Number of elements in the array.**
- **A1, A2, ..., AN → The array elements.**

📌 **Output:**

"Yes" or "No"

Example 1:

📌 **Input:**

"4 1 5 11 5"

📌 **Output:**

Yes

(Explanation: We can partition into {1, 5, 5} and {11}, both having sum 11.)

Example 2:

📌 **Input:**

"3 1 2 3"

📌 **Output:**

No

(Explanation: It is impossible to divide the array into two subsets with equal sum.)