Cognizant Technical Assessment Coding Questions

1.Fuel Consumption Calculation:
Write a program to calculate the fuel consumption of a truck. The program should ask the user to enter the quantity of diesel to fill up the tank and the distance covered till the tank goes dry. Calculate the fuel consumption and display it in the format (liters per 100 kilometers). Convert the same result to the U.S. style of miles per gallon and display the result. If the quantity or distance is zero or negative, display "is an Invalid Input.

Approach: First, take diesel quantity and distance as input and validate them. If invalid, display
an error message. If valid, calculate liters per 100 km using (quantity/distance) * 100. Then, convert distance to miles and diesel to gallons to find miles per gallon and display both results.

2.Factor Finder:
Write a program to find the factors of a given number. If the input provided is negative, ignore the sign and provide the output. If the input is zero, the output should be "No Factors."

Approach: Take an integer input from the user. If the number is zero, display "No Factors." If negative, ignore the sign by taking the absolute value. Then, find and print all numbers that divide the given number exactly without a remainder.

3.Ticket Booking Discount:
Develop a program to find the total cost of tickets based on a discount scheme. There is a 10% discount on the total cost of tickets when there is a bulk booking of more than 20 tickets, and a discount of 2% on the total cost of tickets if a special coupon card is submitted. The cost of the k class ticket is Rs.75 and q class is Rs.150. Refreshments can also
be opted by paying an additional of Rs. 50 per member. If the number of tickets is less than 5 or more than 40, display "Minimum of 5 and Maximum of 40 Tickets". If the ticket type is given a value other than 'k' or 'q'

, the output should be "Invalid Input". The ticket cost should

be printed exactly to two decimal places.

Approach: Take inputs: number of tickets, ticket type (k or q), whether refreshments are needed, and if a coupon is submitted. Validate ticket number and ticket type. Calculate base cost, add refreshment charges if needed, apply a 10% discount if tickets >20, then apply a 2% discount if a coupon is available. Finally, print the total cost to two decimal places.

4.Solar System Moons Calculation:
Determine the maximum number of moons in any solar system. There are N suns in a galaxy, each sun has M planets, each of the M planets have some number of moons, denoted by galaxy(i)(j), where galaxy(i)(j) denotes the number of moons of the jth planet having the ith sun.

Approach: Take inputs for the number of suns (N) and planets per sun (M). Create a 2D structure to store the number of moons for each planet under each sun. Traverse through all entries, and keep track of the maximum number of moons found while iterating. Finally, output the maximum value.

5.Array Transformation: Given an array, replace each element with the greatest element among the elements to its right. The last element should be replaced with -1 since there are no elements to its right. The function should return the modified array after these transformations

Apprpoach: Start from the end of the array and keep track of the maximum element seen so far. Replace each element with this maximum and update the maximum if the current element is greater. Set the last element to -1 after the traversal. Return the transformed array.

6.Sequence Greatness: Given a sequence A and a number X, determine the minimum number of positive integers that should be added to the sequence A so that it becomes "great" for the number X. A sequence is "great" for X if it can be divided into pairs such that multiplying the first number by X equals the second number for each pair.

Approach: Sort the sequence A. Use a counter to match each number with its corresponding X multiple. If a number cannot form a valid pair, consider it for addition. Count how many new numbers are needed to complete all valid pairs and return that count.

7.Empty Subarrays:
Given an array arr, find the number of empty subarrays present in the array. An empty subarray is defined as a non-empty array whose sum is zero.

Approach: Use a prefix sum approach where you keep track of cumulative sums while traversing the array. Use a hashmap to count how many times each prefix sum appears. If the same prefix sum appears multiple times, it indicates zero-sum subarrays. Calculate the total number of such subarrays using combinations.

8.Spare Balls:
You have N boxes numbered from 1 to N, each containing a certain number of balls. Additionally, you have M spare balls that you can add to any one of the boxes. For each box, determine if adding all the spare balls to that box will make it the box with the largest number of balls.

Approach: Find the box with the current largest number of balls. For each box, check if adding all spare balls will make it the box with the largest number. Compare the new count (current balls + spare balls) with the current maximum, and if it's greater, mark the box as having the potential to be the largest.

9.Attacking Forts:
There are n forts with different power levels in an enemy kingdom. The army must attack forts in increasing order of power where the power difference between the last attacked fort and the next to be attacked is exactly 1. Your task is to maximize the number of attacked forts and determine the absolute difference between (last attacked fort power + 1) and the fort with the maximum power.

Approach: Sort the fort powers. Start from the lowest power and attack forts in increasing order where each consecutive fort has a power difference of exactly 1. Track the longest subsequence of forts that follow this rule. After identifying the maximum length subsequence, compute the absolute difference between the last attacked fort's power + 1 and the fort with the maximum power in that subsequence.

10.Class Representative:
Given an array arr representing the marks of N students and an integer K, find the eligible students based on their marks. Only K number of students having greater marks will be chosen, and students whose marks are multiples of 5 are not eligible. Print the marks of the eligible students in ascending order.

Approach: Sort the array in descending order and filter out students whose marks are multiples of 5. Select the top K students from the remaining list. Finally, sort the marks of these selected students in ascending order and print them.

11.Deciphering Encrypted Code:
You are an agent tasked with deciphering an encrypted code. The encrypted code contains two lines, each containing a sequence of characters. To decipher the code, you have to merge the two lines by adding characters in alternating sequences. Finally, if one sequence is longer than the other, append it to the end.

Approach: Traverse both strings simultaneously, adding one character from each sequence alternately. If one sequence is longer, append the remaining characters of the longer sequence to the result. The final merged string will be the deciphered code.

What is the SQL command to create a table named "Employees" with columns for "EmployeeID"
,
"Name"

, and "Salary"?

How would you write an SQL query to select all employees with a salary greater than $50,000?

Write an SQL query to find the average salary of all employees in the "Employees" table.

What SQL command is used to add a new column named "Department" to the "Employees" table?

How would you write an SQL query to delete an employee with EmployeeID 100 from the "Employees" table?

Cognizant Technical Assessment SQL Questions

Write an SQL query to find the maximum salary in the "Employees" table.

What is the SQL command to update the salary of an employee with EmployeeID 101 to $60,000?

How would you write an SQL query to select all employees from the "Employees" table who are in the "Sales" department?

Write an SQL query to find the number of employees in the "Employees" table.

What SQL command is used to drop the "Department" column from the "Employees" table?

Cognizant Technical Assessment SQL Questions

How would you write an SQL query to select all employees whose names start with the letter "J"?

Write an SQL query to find the minimum salary in the "Employees" table.

What is the SQL command to add a primary key constraint to the "EmployeeID" column in the "Employees" table?

How would you write an SQL query to select all employees who have a salary between $40,000 and $70,000?

Write an SQL query to find the total salary of all employees in the "Employees" table.

Cognizant Technical Assessment SQL Questions

HTML Structure: Given a set of HTML elements, write the code to structure a simple webpage with a header, main content area, and footer.

CSS Styling: Apply CSS to style a webpage such that the header has a background color, the main content area has padding, and the footer is at the bottom of the page.

JavaScript Functionality: Write a JavaScript function that toggles the visibility of a webpage element when a button is clicked.

Responsive Design: Use media queries to ensure a webpage layout is responsive and adjusts properly for different screen sizes.

CSS Flexbox: Implement a layout using CSS Flexbox to arrange items in a row with equal spacing.
Cognizant Technical Assessment Web Technology Based Questions

CSS Grid: Create a grid layout using CSS Grid to display items in a 2x2 grid.

JavaScript DOM Manipulation: Write JavaScript code to dynamically add a new element to a webpage and change its text content.

JavaScript Events: Implement an event listener in JavaScript to handle a click event on a webpage element.

JavaScript AJAX: Use JavaScript to make an AJAX request to fetch data from a server and display it on the webpage.

JavaScript Local Storage: Write JavaScript code to store and retrieve data using the browser's local storage.
Cognizant Technical Assessment Web Technology Based Questions

HTML Forms: Create an HTML form with input fields for name, email, and a submit button. Use JavaScript to validate the form before submission.

CSS Animations: Apply CSS animations to an element to make it fade in and out when hovered over.

JavaScript Promises: Use JavaScript Promises to handle asynchronous operations and display the result on the webpage.

JavaScript Fetch API: Write JavaScript code to fetch JSON data from a URL and display it on the webpage.

CSS Transitions: Implement CSS transitions to smoothly change the color of an element when hovered over.