TCS Coding Questions

1. Given a string S(input consisting) of '*' and '#'. The length of the string is variable. The task is to find the minimum number of '*' or '#' to make it a valid string. The string is considered valid if the number of '*' and '#' are equal. The '*' and '#' can be at any position in the string.
   Note : The output will be a positive or negative integer based on number of '*' and '#' in the input string.

   - (*>#): positive integer
   - (#>*): negative integer
   - (#=*): 0

   Example 1:
   Input 1:

   - ###*** -> Value of S

   Output :

   - 0 → number of * and # are equal

2. Given an integer array Arr of size N the task is to find the count of elements whose value is greater than all of its prior elements.

   Note : 1st element of the array should be considered in the count of the result.

   For example,
   Arr[]={7,4,8,2,9}
   As 7 is the first element, it will consider in the result.
   8 and 9 are also the elements that are greater than all of its previous elements.
   Since total of 3 elements is present in the array that meets the condition.
   Hence the output = 3.
   Example 1:

   Input
   5 -> Value of N, represents size of Arr
   7-> Value of Arr[0]
   4 -> Value of Arr[1]
   8-> Value of Arr[2]
   2-> Value of Arr[3]
   9-> Value of Arr[4]

   Output :
   3

3. A parking lot in a mall has RxC number of parking spaces. Each parking space will either be empty (0) or full (1). The status (0/1) of a parking space is represented as the

element of the matrix. The task is to find index of the prpeinzta row(R) in the parking lot that has the most of the parking spaces full(1).

Note :
RxC- Size of the matrix
Elements of the matrix M should be only 0 or 1.

Example 1:
Input :
3 -> Value of R(row)
3 -> value of C(column)
[0 1 0 1 1 0 1 1 1] -> Elements of the array M[R][C] where each element is separated by new line.
Output :
3 -> Row 3 has maximum number of 1's

Example 2:
input :
4 -> Value of R(row)
3 -> Value of C(column)
[0 1 0 1 1 0 1 0 1 1 1 1] -> Elements of the array M[R][C]
Output :
4 -> Row 4 has maximum number of 1's

4. A party has been organised on cruise. The party is organised for a limited time(T). The number of guests entering (E[i]) and leaving (L[i]) the party at every hour is represented as elements of the array. The task is to find the maximum number of guests present on the cruise at any given instance within T hours.

   Example 1:
   Input :

   - 5 -> Value of T
   - [7,0,5,1,3] -> E[], Element of E[0] to E[N-1], where input each element is separated by new line
   - [1,2,1,3,4] -> L[], Element of L[0] to L[N-1], while input each element is separate by new line.

   Output :
   8 -> Maximum number of guests on cruise at an instance.

   Explanation:

   1st hour:
   Entry : 7 Exit: 1
   No. of guests on ship : 6

   2nd hour :

Entry : 0 Exit : 2
No. of guests on ship : 6-2=4

Hour 3:
Entry: 5 Exit: 1
No. of guests on ship : 4+5-1=8

Hour 4:
Entry : 1 Exit : 3
No. of guests on ship : 8+1-3=6

Hour 5:
Entry : 3 Exit: 4
No. of guests on ship: 6+3-4=5
Hence, the maximum number of guests within 5 hours is 8.

5. At a fun fair, a street vendor is selling different colours of balloons. He sells N number of different colours of balloons (B[]). The task is to find the colour (odd) of the balloon which is present odd number of times in the bunch of balloons.

   Note: If there is more than one colour which is odd in number, then the first colour in the array which is present odd number of times is displayed. The colours of the balloons can all be either upper case or lower case in the array. If all the inputs are even in number, display the message "All are even".

   Example 1:

   - 7 -> Value of N
   - [r,g,b,b,g,y,y] -> B[] Elements B[0] to B[N-1], where each input element is sepārated by new line.

   Output :

   - r -> [r,g,b,b,g,y,y] -> "r" colour balloon is present odd number of times in the bunch.

   Explanation:
   From the input array above:

   - r: 1 balloon
   - g: 2 balloons
   - b: 2 balloons
   - y : 2 balloons
     Hence , r is only the balloon which is odd in number.

6. There is a JAR full of candies for sale at a mall counter. JAR has the capacity N, that is JAR can contain maximum N candies when JAR is full. At any point of time. JAR

can have M number of Candies where M<=N. Candies are served to the customers. JAR is never remain empty as when last k candies are left. JAR if refilled with new candies in such a way that JAR get full.
Write a code to implement above scenario. Display JAR at counter with available number of candies. Input should be the number of candies one customer can order at point of time. Update the JAR after each purchase and display JAR at Counter.

Output should give number of Candies sold and updated number of Candies in JAR.

If Input is more than candies in JAR, return: "INVALID INPUT"
Given,
N=10, where N is NUMBER OF CANDIES AVAILABLE
K =< 5, where k is number of minimum candies that must be inside JAR ever.
Example 1:(N = 10, k =< 5)

Input Value
3
Output Value
NUMBER OF CANDIES SOLD : 3
NUMBER OF CANDIES LEFT : 7

7. Selection of MPCS exams include a fitness test which is conducted on ground. There will be a batch of 3 trainees, appearing for running test in track for 3 rounds. You need to record their oxygen level after every round. After trainee are finished with all rounds, calculate for each trainee his average oxygen level over the 3 rounds and select one with highest oxygen level as the most fit trainee. If more than one trainee attains the same highest average level, they all need to be selected.

   Display the most fit trainee (or trainees) and the highest average oxygen level.

   Note:

   - **The oxygen value entered should not be accepted if it is not in the range between 1 and 100.**
   - If the calculated maximum average oxygen value of trainees is below 70 then declare the trainees as unfit with meaningful message as "All trainees are unfit.
   - Average Oxygen Values should be rounded.

   Example 1:
   INPUT VALUES
   95
   92
   95
   92
   90
   92
   90
   92

90

OUTPUT VALUES
Trainee Number : 1
Trainee Number : 3

8. A washing machine works on the principle of Fuzzy System, the weight of clothes put inside it for washing is uncertain But based on weight measured by sensors, it decides time and water level which can be changed by menus given on the machine control area.

   For low level water, the time estimate is 25 minutes, where approximately weight is between 2000 grams or any nonzero positive number below that.

   For medium level water, the time estimate is 35 minutes, where approximately weight is between 2001 grams and 4000 grams.

   For high level water, the time estimate is 45 minutes, where approximately weight is above 4000 grams.

   Assume the capacity of machine is maximum 7000 grams

   Where approximately weight is zero, time estimate is 0 minutes.

   Write a function which takes a numeric weight in the range [0,7000] as input and produces estimated time as output is: “OVERLOADED”, and for all other inputs, the output statement is

   “INVALID INPUT”.

   Input should be in the form of integer value –

   Output must have the following format –

   Time Estimated: Minutes

   Example:
   Input value
   2000
   Output value
   Time Estimated: 25 minutes

9. The Caesar cipher is a type of substitution cipher in which each alphabet in the plaintext or messages is shifted by a number of places down the alphabet.
   For example,with a shift of 1, P would be replaced by Q, Q would become R, and so on.
   To pass an encrypted message from one person to another, it is first necessary that both parties have the ‘Key’ for the cipher, so that the sender may encrypt and the receiver may decrypt it.

Key is the number of OFFSET to shift the cipher alphabet. Key can have basic shifts from 1 to 25 positions as there are 26 total alphabets.
As we are designing custom Caesar Cipher, in addition to alphabets, we are considering numeric digits from 0 to 9. Digits can also be shifted by key places.
For Example, if a given plain text contains any digit with values 5 and keyy =2, then 5 will be replaced by 7, "-"(minus sign) will remain as it is. Key value less than 0 should result into "INVALID INPUT"

Example 1:
Enter your PlainText: All the best
Enter the Key: 1

The encrypted Text is: Bmm uif Cftu

10. We want to estimate the cost of painting a property. Interior wall painting cost is Rs.18 per sq.ft. and exterior wall painting cost is Rs.12 per sq.ft.

    Take input as
    1. Number of Interior walls
    2. Number of Exterior walls
    3. Surface Area of each Interior 4. Wall in units of square feet
    Surface Area of each Exterior Wall in units of square feet
    If a user enters zero as the number of walls then skip Surface area values as User may don't want to paint that wall.

    Calculate and display the total cost of painting the property
    Example 1:
    6
    3
    12.3
    15.2
    12.3
    15.2
    12.3
    15.2
    10.10
    10.10
    10.00
    Total estimated Cost : 1847.4 INR