RR

SRH

CSK

KKR

DC

PBKS

Output

WIN:DC|LOSE:RR||WIN:SRH|LOSE:KKR

WIN:RR|LOSE:DC||WIN:SRH|LOSE:KKR

Explanation-

From the given 54 matches and the rankings as input, four teams have one match remaining. Specifically, the match DC vs RR and SRH vs KKR.

Case1- DC wins against RR and SRH wins against KKR. In that case the rankings will look as follows MI, RCB, RR, SRH, CSK, KKR, DC, PBKS.

Case2- RR wins against DC and SRH wins against KKR. In that case the rankings will look as follows MI, RCB, RR, SRH, CSK, KKR, DC, PBKS.

Then print the cases lexicographically in provided format

4.Problem Description

Ramu just learned about binary numbers. One day his tutor gave him T similar tasks and asked him to find the answer for them. As the number of tasks is more and also the size of input in each task is large, he concluded that manual calculation will be tough, so he decided to write a program for that.

Given T binary strings of varying lengths which consists of only 0s and 1s. He will be given two values A and B which indicates cost of one occurrence of sub strings "01" and "10". The total cost of the given string will be the sum of the costs of all "01" and "10". His task is to minimize the cost of given strings in each case, by rearranging it in any order. After he rearrange the string, he has to find the distance between the original string and the rearranged string and print it in each case. In case of invalid input, print "INVALID". If there are more than one rearrangement which gives least cost, then consider the string which gives distance.

As Ramu is new to binary strings, he is a bit confused. Can you help Ramu to implement!

Note: The sub strings are considered in an overlapping manner i.e., in the string 010, there is one "01" and one "10".

Constraints

$1 <= len(str) <= 10^5$

$0 <= A,B <= 10^4$

Input

First line consists of T the number of test cases.

For each test case there will be two lines, first line consists of the binary string and the second line consists of A and B separated by space.

Output

For each string, print the distance in a new line.

Refer examples section for more clarity.

Time Limit (secs)

1

Example 1

Input

2

0100

3 2

000

4 5

Output

2

0

Explanation

Here, cost of original string viz. 0100 is 3, because there is one occurrence of "01". Now this string can be transformed into a new string viz. 1000 which is having one occurrence of "10". The cost of transformed string= (number of occurrences of "01")*3 + (number of occurrences of "10")*2 = 0*3 + 1*2 = 2 which is the minimum possible and the distance of original and transformed string 2.

The string 000 has the cost of 0 which is minimum, and hence no need to do any transformation. So the distance will be 0.

Example 2:

Input

1

01001a10

1 2

Output

INVALID

Explanation

The given string is not binary string.

5. **Problem Description**

You must be aware of the concept of Stocks Portfolio. A stock portfolio is a collection of stock(s) that you invest into with an objective of making profit.

Stocks are bought and sold. Selling price minus buying price is realized profit or loss. In case a stock is not sold yet, if buying price is more than or less than the current stock market price, then it is termed as unrealized profit or loss, respectively.

Given information in form of <Quantity of Stock bought, time of purchase, time of sell, array of prices>, calculate the realized P/L and unrealized P/L at the given time.

Constraints

$1 <=$ No. Of Stocks $(N) <= 10^2$

$1 <=$ Price of Stock $<= 2*10^4$

$1 <= M <= 365$

$1 <=$ Time of Purchase $<=$ Time of Sell $<=$ Length of list

Input

First line contains an integer N which denotes the number of stocks in the portfolio.

Next N lines contain a space separate tuple of 3 integers which denote < Quantity Bought, Time of Purchase, Time of Sell > for each stock. If the stock has not been sold, the Time of Sell will be 0.

The N+1 line contains an integer M which denotes number of days for which price of stock is provided

Then the next N lines contain M integers which denote the stock price from time T1 to TM.

The last line will be the time instance at which the the P/L needs to be computed.

Output

Print realized P/L on first line

Print unrealized P/L on the second line

Time Limit (secs)

1

Example 1

Input

3

10 4 20

10 1 11