In the previous described design problem we proposed a scenario where we want to check if a student has any available buses to get in.

Alice is a student at Dhaka university . He is a very lazy student just like the author . Tonight he was dreaming about becoming the richest person in the world and because of this he was late to get up . Now he is rushing to get to the university and he uses the University Bus for transportation.

As mentioned in the design problem description, Alice's University has a lot of buses and they follow different routes to go to the campus.

Alice's university has "n" buses and each bus has m_i ($1 <= m_i <= 100$, for each i from 1 to n) stoppages. Each bus stops at campus which is at stoppage "0" . Bus follows

$a_1, a_2, a_3, \ldots\ldots\ldots\ldots a_{mi-1}, a_{mi}$ $[a_{mi} = 0]$

While going to the campus a bus needs to pick up students from different places so the route of stoppages will not always be decreasing .

Like : the Bus Route can follow : (Starting) 5 -> 2 -> 3 -> 1 -> 0 (Campus)

Different buses will have different routes and for each route Every stoppage is unique , no stoppage is visited twice in a single route.

Alice is in a rush , he can't wait much longer . All the buses have started to move from their starting position and He is already x minutes late .He wants to reach campus as fast as possible . For each bus the time takes to reach next stoppage is the that stoppage minus the next stoppage $|a_i - a_{i+1}|$ (for, i = 1 to n - 1) .

Alice is in position p ($p > 0$). Now , What is the minimum time Alice will take to reach campus if he takes the most efficient choice of bus.

Input :

Each test contains multiple test cases. The first line contains the number of test cases t ($1 <= t <= 10^4$)

The description of the test cases follows. The first line of each test case contains one integer n. ($1 <= n <= 100$)

Next n lines contain an integer m the number of stoppages (2 <= m <= 100) of that bus. Then there is m integers, positions of the stoppages, , , $a_1, a_2, a_3, \ldots\ldots\ldots\ldots a_{mi-1}, a_{mi}$. Last stop is 0, campus . (0<= a_i <= 1000)

Then two integers p and x representing Alice's current stoppage and how much time he is late. (0 < p) , (1 <= x <= 1000)

Output :

Output the minimum time for Alice to reach campus or state that Alice will not be able to catch any bus by printing -1.

See the sample input and output to get a better understanding.

Sample Input 01 :

1

3

5

5 2 3 1 0

4

6 7 5 0

4

6 7 8 0

3 1

Output 01 : 6

Explanation :

Among the three routes only 1st bus route has a stoppage at 3, Alice's stoppage . Now , the bus is at stoppage 4 after time x. So , Alice will wait (2 + 1) then it will take him (2 + 1) more time to reach campus .