A - Abnormal 96'ers

According to a study conducted by Stanford University, a good contest is a contest that each team solves more than 40% of the problems on average. Now we want to use the result of that study and check goodness of Amirkabir University of Technology Contests during the past few years.

Given the data of the the number of problems, the number of accepts and the number of teams for the contests, find out goodness of each contest.

Input Format

First line of input contains an integer N, denoting the number of contests to be analyzed.
Each of the next N lines contains three space separated integers, P, A and T, the number of problems, the number of accepts and the number of teams, respectively.

Constraints

$1 \leq N \leq 1000$

$1 \leq P, T \leq 1000$

$0 \leq A \leq 1000000$

Output Format

Print one line of output for each contest, containing the word "Good" or "Bad", depending on the goodness of that contest. For more info look at sample input and output.

Sample Input	Sample Output
3 10 100 10 10 100 20 10 100 30	Good Good Bad

B - Final Ceremony

In each programming contest one of the organizers' concerns is to have all teams at the final ceremony even the teams with no chance to win a prize, so they have announced a special kind of prize! At the final ceremony they are going to give a prize to a person with the most valueable name! Value of each name is calculated as follow: $\sum_{i=1}^{n} value[\ name[i]\ ] * i$. Value of the alphabet is a permutation of 1 2 ... 26. For example (1, 2, 3, 4, 5, ... , 26) means letter a has value 1, letter b has value 2 and ... letter z has value 26.
Actually something is missing, the value of the alphabet characters! No one knows it, except judge committee. One person have managed to lobby with one of the judges :(to replace the value of the alphabet characters with his desired value.

Your task is to help that person calculate his name's value in the best possible way.

Input Format

First line of input contains name of that person. Each name consists of lowercase English letters.

Constraints

$1 \leq |name| \leq 100$

Output Format

Print one line of output containing the value of input name in the best possible way.

Sample Input	Sample Output
reza	250
ali	152
mohsen	511

C - Lovers in Matrix Land

If you haven't read about matrix land yet, it means you are reading problems from A to K not K to A! For each lover in matrix land there is exactly one other lover in the land who loves him / her too. As you may know stars are numbered with integers! For each star there is a girl and a boy who loves it. A lover can fly to its beloved star if he / she can find his / her love in matrix land, then they will both leave the matrix and fly to their beloved star. Since we are such a gracious person we want to send all of the lovers to their beloved star, but there is a problem, at any time only lovers of the same star can occupy a cell of the matrix, if two lover of different stars enter the same cell they will fight with each other. Lovers can only move in the four direction (i.e. up, down, left, right). Can you schedule movement of the lovers so they get together and fly to their love star without causing any fights?

Input Format

First line of input contains two space separated integers, M and N, number of rows and number of columns.
Each of the next M lines contains N numbers, the star the person in that cell loves. Zero means that cell is empty. Stars are numbered with positive integers.
It's guaranteed that each star is loved by exactly two persons in the matrix.

Constraints

$1 \leq M, N \leq 1000$

Output Format

Print one line of output consisting of "yes" if you can schedule movement of the lovers so the matrix becomes empty, or "no" otherwise.

Sample Input	Sample Output
4 5 5 5 9 9 10 10 8 8 7 7 3 3 16 16 17 17 19 19 20 20	yes

D - One Two Tree

We are still talking about Matrix Land, if you have no idea about Matrix Land then you haven't read problems C, E and H! In Matrix Land poeple earn their livings through buying and selling matrices and lattices. Reza has a great business in Matrix Land. Reza sells 2xN lattices (look at the picture for a 2xN lattice) to people who grow tree (not in the farm but in graph theory!) in this Land. Reza has built a few 2xN lattices and wants to sell them. The price of each one is equal to the number of different trees we can put on them so each intersection of the lattice is covered by a node in **the** tree. Reza is busy building the lattices and can't calculate the price of them. Can you help him calculate the price of them?

A 2x4 lattice and a sample Tree on it

Input Format

The only line of input contains one positive integer N, as stated in the problem statement. (For more info look at sample input and sample output)

Constraints

$1 \leq N \leq 10^5$

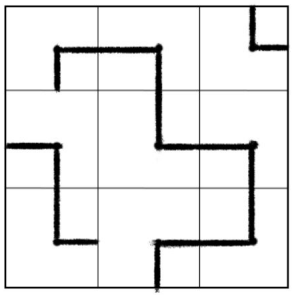
Output Format

Print one line of output containing the price of the lattice, since price may get large print the answer modulo $10^9 + 7$.

Sample Input	Sample Output
1	1
2	4

E - Rotation

MeHdi lives in matrix land. There are a special kind of matrices that each cell of it is wired with L shaped things! MeHdi lives in one cell and wants to go shopping in another cell. Each cell rotates 90' each morning clockwise. MeHdi wants to do his shopping at night after coming back from work. Given MeHdi's cell, shop cell, each cell situation at the end of the first night, find the first night MeHdi can start from his cell, follow the wires in each cell and do his shopping.



Input Format

First line of input contains 6 space separated integers, M, N, R1, C1, R2, C2, number of rows, number of columns, row and column of MeHdi's cell and row and column of shop cell.
Each of the next M lines contains N characters, which is the initial state of that cell (look at the above picture for more details)

Constraints

$1 \leq M, N \leq 50$
$0 \leq R1, R2 < M$
$0 \leq C1, C2 < N$

Output Format

Print one line of output containing the first night MeHdi can do his shopping, or print "never" (without quotations) if he can never do his shopping.

Sample Input	Sample Output
3 3 0 0 2 2 120 202 013	1

F - Guards and United Nations

To decrease cost of the guards of their buildings in New York City, United Nations have to hold guard levels as low as possible while maintaining sufficient number of guards to provide satisfactory levels of security for the buildings. UN has K buildings and buildings has T different work shifts each with different levels of necessary guards. The UN authorities would like to identify the minimum number of guards required to meet the following three constraints:
(1) The UN must allocate at least B1 ... BN guards to the N buildings (over all shifts)
(2) The UN must assign at least S1 ... ST guards to the T shifts (over all buildings)
(3) the minimum and maximum number of guards allocated to each building in a specific shift must satisfy the limits given for them.

		Shift		
		1	2	3
Building	1	(7 , 9)	(12 , 13)	(8 , 13)
	2	(5 , 7)	(12 , 13)	(8 , 13)
	3	(3 , 5)	(11 , 13)	(5 , 7)

Input Format
First line of input contains the number of test cases.
First line of each test contains two space separated integers N and T, the number of buildings and the number of shifts.
Second line of input contains N space separated integers B1 ... BN.
Third line of input contains T space separated integers S1 ... ST.
Then follows two N x T matrices.
Cell (*i*, *j*) of the first matrix contains the minimum number of guards for the j'th Building at i'th Shift.
Cell (*i*, *j*) of the second matrix contains the maximum number of guards for the j'th Building at i'th Shift.

Constraints
$1 \leq N, T \leq 50$
$1 \leq min_{i,j} \leq max_{i,j} \leq 50$

Output Format

Print one line of output containing the minimum number of guards required to meet the constraints, or print "IMPOSSIBLE" if it is not possible to satisfy all of the constraints.

Sample input	Sample output
1 3 3 13 32 22 26 24 19 7 12 8 5 12 8 3 11 5 9 13 13 7 13 13 5 13 7	72

G - Color it

Ali and Reza live in the same neighborhood. The intersections and streets in their neighborhood forms a tree (not in the farm but in graph theory). Ali loves Perspolis Club and wants to color all of the streets with red and Reza loves Esteghlal Club and wants to color all of the streets blue. Instead of getting into a fight and killing eachother they want to play a game. Ali lives at intersection i and Reza lives at intersection j. Ali starts the game. The game is like this, on each turn, the person whose turn it is walks to one of adjacent intersections and colors the connecting street between them or doesn't move at all. Each person can only walk and color a street that has not been colored by the other person yet. Goal of each person is to maximize the number of streets colored with their favorite color.
Given the format of their neighborhood, calculate the number of streets each one of them will paint if both of them play optimally.

Input Format

First line of input contains three space separated integers N, A, R, the number of intersections, Ali's initial intersection and Reza's initial intersection, respectively. Each of the next N-1 lines contains two integers x and y, which means there is a street connecting intersection x and intersection y.

Constraints

$1 \leq N \leq 100{,}000$

$0 \leq A, R < N$

$0 \leq x, y < N,\ x \neq y$

Output Format

Print one line of output containing two space separated integers, the first denotes the number of streets colored in Red (Ali's favorite) and the second denotes the number of streets colored in Blue (Reza's favorite).

Sample Input	Sample Output
2 0 1 0 1	1 0
3 0 2 0 1 1 2	1 1

H - Matrix Land

MeHdi went bankrupt in his lastest business, he started a new business! with hope of being able to recover from that bankruptcy and guess what? he has gotten into the business of matrices! He started selling beautiful sorted matrices to mad mathematicians who loved to work with them. But in the beginning he has no matrices at all. Like any other countries government gets tax to burry used matrices or recover them properly. Unfortunately when people mix matrices and graphs together, government cannot recycle them and they have to burry them under the dust. MeHdi has gone to the place where people throw their used matrices and graphs at night in order not to pay the trailer to move them to the proper place to be burried or recycled. He wants to take some of the matrices with him back to his guarage to start his new business with them. Matrices has N rows and N columns. The structure of the matrices in matrix land is such that one can reverse each row or each column any number of times he likes, but as mentioned above MeHdi only can use matrices which are sorted (i.e. if you put rows one after the other from top to bottom it is like a sorted array).
He has no idea whether he can sort the matrices or not?
It is cold outside and MeHdi has no idea what to do. Can you help him figure out whether to take that matrix with him home or not?

Input Format

First line of input contains the number of test cases.
First line of input contains an integer N, the dimension of the matrix MeHdi has found.
Each of the next N lines contains N space separated integers. It's guaranteed that the numbers in the matrix are unique.

Constraints

$1 \leq N \leq 500$

Output Format

Print one line of output for each test containing "Yes" if the matrix is sortable or "No", otherwise.

Sample Input	Sample Output
1 4 11 12 13 14 24 23 22 21 31 32 33 34 41 42 43 44	Yes

I - Permute it

Do you remember Lucky Luke? What about the Dalton brothers?

One of the Dalton brothers loved math and numbers. If they stand by increasing height they will make a sequence of length 4 with each person in the line taller than the previous one. Then he asked brothers to stand in a way so that they can point at three of them in the same order and their height is increasing. Let's assume their heights were 1 2 3 and 4 meters each :)), so one way they could have standed in line would have been 1 2 4 3 which we can point at 1 2 4 or 1 2 3. Now he wonders about the generic problem, given N people with heights 1, 2, 3 ... n can you put them in one line so the largest number of them you can point at them to have increasing height would be k? Among all possible permutations print the one which is lexicographically the largest permutation. For example 1 2 4 3 is larger than 1 2 3 4.

Input Format
First line of input contains two space separated integers N and K.

Constraints
$1 \leq K \leq N \leq 1000$

Output Format
Print N space separated integers, which is the answer to the problem described above.

Sample Input	Sample Output
1 1	1
2 1	2 1

J - Poly Moly

Amirkabir University of Technology, formerly called Tehran Polytechnic, referred to as "The Mother of Engineering Universities" in Iran, has more than 15 departments. The main campus of Amirkabir University of Technology is in Tehran, Iran. It is located close to Vali-Asr crossroads, the intersection of Enghelab Street and Vali-Asr Street, in the very center of Tehran City. Many students commute to AUT via the subway by Theatre Shahr station. The university was founded by Habib Nafisi in 1956 and developed by Dr. Mohammad Ali Mojtahedi, during the reign of the Pahlavi dynasty. Named the Tehran Polytechnic, it began with five engineering departments. Six months before the victory of 1979 Iranian Revolution, Tehran Polytechnic was renamed after the Iranian Prime minister Amirkabir (1807–1852).

Now that you have a good understanding of the host of this contest, let's get straight to the problem statement. You are given N convex polygons. It is guaranteed that no two polygons intersect each other (i.e. Each two of them are either completely sepraate from each other, or one of them is inside the other one)
You have to answer these kind of queries: In how many ways can you select k polygons so that the number of edges of the polygons satisfies this sequence e1 e2 ... ek. (i.e. the outest polygon has e1 sides, next one has e2 sides and so on. The second one is inside the first one, the third one is inside the second one and so on)

Input Format
First line of input contains an integer N, the number of convex polygons. Each of the next N lines contains points of a polygon.
Each polygon is presented by the number of edges it has followed by the points in clockwise or counterclockwise order.
Then comes the number of queries you have to answer.
First line of queries contains an integer Q, the number of queries.
Each of the next Q lines contains a query.
A query is like this : K e1 e2 ... eK (For more details look at samble input)

Constraints

$1 \leq N \leq 100000$

3 ≤ number of edges of each polygon ≤ 100

3 ≤ total number of edges in all polygons ≤ 1000000

$1 \leq Q \leq 10$

1 ≤ length of each query ≤ 10

Output Format

For each query print one line of output which contains the answer to that query, since the answer may get large print it modulo $10^9 + 7$.

Sample Input	Sample Output
5 4 50 50 50 51 51 51 51 50 4 -100 -100 -100 100 100 100 100 -100 4 0 0 0 3 4 3 4 0 3 1 1 2 2 1 2 3 2 1 3 1 3 2 4 3 4 4 3 2 4 3 1 3 1 4	2 4 2 3

K - In The Farm

In a farm there are **A** grasshoppers who are ruining the farm (the farm is like an infinite lattice). The farmer has bought **B** snakes and wants to put them in the farm so that all of the grasshoppers are eaten by the snakes. Each snake has no limit on the number of grasshoppers it can eat. In order to spend less money on the snakes the farmer has bought a special kind of snakes that only go *right* or go *up* at each step. The farmer has randomly put snakes on the farm. Can you calculate for him if all of the grasshoppers can be eaten by the snakes or not?

Input Format

First line of input contains an integer T, the number of testcases. This is followed by T blocks of input. First line of each testcase contains two positive integers A and B, the number of grasshoppers and the number of snakes. Each of the next A lines contains two space separated integers, coordinates of grasshoppers. No two grasshoppers have the same coordinates. Each of the next B lines contains two space separated integers, coordinates of snakes. No two snakes have the same coordinates.

Constraints

$1 \le T \le 40$
$1 \le A \le 150$
$1 \le B \le 150$

Output Format

For each testcase print YES if all of the grasshoppers can be eaten and print NO otherwise.

Sample Input	Sample Output
2 2 1 3 1 1 3 0 0 2 2 3 1 1 3 0 0 1 0	NO YES