Greetings From Globussoft

- Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.

- These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP

- To solve these 3 questions you've max. 3 hours.

- While Solving these questions you are not allowed to use any Search Engine like Google,

  Yahoo, Bing ...

All the best for your test

Globussoft

QUESTION - 1

This man has grown so rich that, when he travels between any two locations he always takes atleast K flights. In a region of N cities, we need to find the minimal cost required for the man to travel between every pair of cities. There are provisions (especially for this type of rich men,) to fly from i-th city to the i-th city itself!

Input

T – The number of test cases.
In each test case :
K N
NxN matrix representing the costs of the tickets. The i-th line, j-th column's entry represents the cost of a ticket from city i to city j. The numbers are of course space separated.

Constraints :
T<=20
N<=50
K<=10^9
The cost of each ticket <= 100
Each element of the output matrix will fit into a 64-bit integer.

Output

For the i-th test case , 1st line is of the form "Region #i:".
In the following N lines, output an NxN matrix where the j-th element of the i-th line represents the minimal cost to travel from city i to city j with taking atleast K flights. The numbers on a line must be separated by atleast one space. Output a blank line after each testcase (including the last one).

Example

Sample Input:

```
2
3 4
1 2 3 4
5 6 7 8
```

```
9 10 11 12
13 14 15 16
10999 4
1 2 3 4
5 6 7 8
9 10 11 12
13 14 15 16
```

Sample Output:

```
Region #1:
3 4 5 6
7 8 9 10
11 12 13 14
15 16 17 18

Region #2:
10999 11000 11001 11002
11003 11004 11005 11006
11007 11008 11009 11010
11011 11012 11013 11014
```

QUESTION – 2

A company provides service for its partners that are located in different towns. The company has three mobile service staff employees. If a request occurs at some location, an employee of the service staff must move from his current location to the location of the request (if no employee is there) in order to satisfy the request. Only one employee can move at any moment. They can move only on request and are not allowed to be at the same location. Moving an employee from location p to location q incurs a given cost C(p,q). The cost function is not necessarily symmetric, but the cost of not moving is 0, i.e. C(p,p)=0. The company must satisfy the received requests in a strict first-come, first-serve basis. The goal is to minimize the total cost of serving a given sequence of requests.

Task

You are to write a program that decides which employee of the service staff is to move for each request such that the total cost of serving the given sequence of requests is as small as possible.

Input

The first line of input contains the number of test cases - nTest. Each test case contains:

The first line of each test cases contains two integers, L and N. L (3 <= L <= 200) is the number of locations and N (1 <= N <= 1000) is the number of requests. Locations are identified by the integers from 1 to L. Each of the next L lines contains L non-negative integers. The jth number in the line i+1 is the cost C(i,j), and it is less than 2000.

The last of each test cases contains N integers, the list of the requests. A request is identified by the identifier of the location where the request occurs. Initially, the three service staff employees are located at location 1, 2 and 3, respectively.

Output

For each test case write the minimal total cost in a separate line.

Example

```
Input:
1
5 9
0 1 1 1 1
1 0 2 3 2
1 1 0 4 1
2 1 5 0 1
4 2 3 4 0
4 2 4 1 5 4 3 2 1
Output:
5
```

QUESTION – 3

The International Olympiad in Informatics is coming and the leaders of the Vietnamese Team have to choose the best contestants all over the country. Fortunately, the leaders could choose the members of the team among N very good contestants, numbered from 1 to N ($3 \leq N \leq 100000$). In order to select the best contestants the leaders organized three competitions. Each of the N contestants took part in all three competitions and there were no two contestants with equal results on any of the competitions. We say that contestant A is better than another contestant B when A is ranked before B in all of the competitions. A contestant A is said to be excellent if no other contestant is better than A. The leaders of the Vietnamese Team would like to know the number of excellent contestants.

Input

First line of the input contains an integer t ($1 \leq t \leq 10$), equal to the number of testcases. Then descriptions of t testcases follow. First line of description contains the number of competitors N . Each of the next N lines describes one competitor and contains integer numbers ai, bi, ci ($1 \leq ai, bi , ci \leq N$) separated by spaces, the order of i-th competitor's ranking in the first competition , the second competition and the third competition.

Output

For each test case in the input your program should output the number of excellent contestants in one line.

Note : Because the input is too large so we have 4 input files and the total time limit is 4s (not 1s).

Example

```
Input:
1
3
1 2 3
2 3 1
3 1 2

Output:
3
```

QUESTION – 4

A large Bytelandian supermarket chain has asked you to write a program for the simulating costs of a promotion being prepared.

The promotion has to follow the following rules:

- A customer who wants to participate in the promotion, writes on the receipt, paid by himself, his personal details and throws it into a special ballot box.
- At the end of every day of the promotion, two bills are taken out from the ballot box:
  - first, the receipt amounting to the largest sum is chosen,
  - then the receipt amounting to the smallest sum is chosen;

  The customer who has paid the largest sum gets a money prize equal to the difference between the sum on his bill and the sum on the bill amounting to the smallest sum.

- To avoid multiple prizes for one purchase, both bills selected according to the above rules are not returned to the ballot box, but all remaining bills still participate in the promotion.

The turnover of the supermarket is very big, thus an assumption can be made, that at the end of every day, before taking out receipts amounting to the largest and the smallest sum, there are at least 2 receipts in the ballot box.

Your task is to compute (on the basis of information about prices on receipts thrown into the ballot box on each day of promotion) what the total cost of prizes during the whole promotion will be.

Write a program, which: reads from the standard input a list of prices on receipts thrown into the ballot box on each day of the promotion, computes the total cost of prizes paid in consecutive days of promotion, then writes the result to the standard output.

Input

The first line of the input contains one positive integer n (1 <= n <= 5000), which is the duration of promotion in days. Each of the next n lines consists of a sequence of non-negative integers separated by single spaces. Numbers in the (i+1)-th line of the file represent prices on receipts thrown into the ballot box on the i-th day of promotion. The first integer in the line is k, 0 <= k <= 10^5, the number of receipts on the day, and the next k numbers are positive integers standing for the sums on receipts; none of these numbers is larger than 10^6.

The total number of bills thrown into the ballot box during the whole promotion does not exceed 10^6.

Output

The output should contain exactly one integer, equal to the total cost of prizes paid during the whole promotion.

Example

Input:
```
5
3 1 2 3
2 1 1
4 10 5 5 1
0
1 2
```

Output:
```
19
```

QUESTION – 5

Farmer John and Bessie the cow have embarked on one of those 'active' vacations. They spend entire days walking in the mountains and then, at the end of the day, they tire and return to their vacation cabin.

Since climbing requires a lot of energy and they are already tired, they wish to return to the cabin using a path that has the least difference between its highest and lowest elevations, no matter how long that path is. Help FJ find this easy-to-traverse path.

The map of the mountains is given by an N x N (2 <= N <= 100) matrix of integer elevations (0 <= any elevation <= 110) FJ and Bessie are currently at the upper left position (row 1, column 1) and the cabin is at the lower right (row N, column N). They can travel right, left, toward the top, or toward the bottom of the grid. They can not travel on a diagonal.

Input

- Line 1: The single integer, N
- Lines 2..N+1: Each line contains N integers, each of which specifies a square's height. Line 2 contains the first (top) row of the grid; line 3 contains the second row, and so on. The first number on the line corresponds to the first (left) column of the grid, and so on.

Output

An integer that is the minimal height difference on the optimal path.

Example

Input:
```
5
1 1 3 6 8
1 2 2 5 5
4 4 0 3 3
8 0 2 3 4
4 3 0 2 1
```

Output:
```
2
```