Trucks

We are observing the movement of N trucks on the road. The road can be represented as a number line. The points on the line denoting cities are integers. The cities are denoted with the number of the corresponding point on the line.

All trucks are moving with the same speed and no single truck is standing still at any given moment. Each truck takes 1 minute to pass the distance between two adjacent cities.

You are given the route of each truck. All of the trucks start their route at the same initial moment.

The route is given as an array of k_k cities: $A_1, A_2, \ldots, A_k$. The truck starts from city A_1 and drives to city A_2, then turns and drives to city A3 and so on. Given the fact that the truck turns, it will hold:

$$A_1 < A_2 > A_3 < A_4 > \ldots$$

or

$$A_1 > A_2 < A_3 > A_4 < \ldots$$

The time it takes for the truck to turn is negligible.
One possible route is 2, 5, 1, 7. The truck is at city number 2 initially, 3 minutes after departure it arrives to city number 5. It turns and continues towards the city number 1 in which it arrives 7 minutes after departure. It turns again and drives towards city number 7 in which it arrives at moment 13.

After the truck completes his route, aliens appear and take it away in their space rocket.

For some pairs of trucks, we want to know the number of times they met each other on the road. In other words, how many times they appeared to be on the same position (the position they met does not need to be an integer; i.e. they could have met at position 2.5).
Write a program that will, for a given number of trucks N and their routes and for M pairs of trucks, determine the number of encounters for each pair.

Please note: each pair of trucks we want to know the number of encounters for, it will hold:

- they won't be at the same place in the moment when one of them (or both) are being taken away by aliens

- they won't be at the same place in the initial moment or in the moment when one of them (or both) are turning

The upper statement won't hold for all pairs of trucks, but only the pairs we want to know the number of encounters for.

Input

The first line of input contains the integers N and M ($1 \le N \le 10^5$, $1 \le M \le 10^5$), the number of trucks and the number of pairs of trucks we want to know the number of encounters for.

The i-th of the following N lines contains the description of the route of the i-th truck. The first integer in the line, K_i ($2 \le K_i \le 3 \cdot 10^5$) represents the number of cities on the truck's route. Afterwards K_i integers follow, A_j ($1 \le A_j \le 10^9$), the ordinal numbers of the cities on the truck's route given in the order which the truck visits them.
The sum of routes of all the trucks won't exceed $3 \cdot 10^5$.

Each of the following M lines contains two integers (a_i, b_j), the ordinal numbers of the trucks we want to know the number of encounters for.

Output

Output M lines. The i-th line must contain the number of encounters of the i-th pair of trucks from the input.

Sample input	Sample output
3 3 3 1 3 1 2 2 1 3 3 1 3 1 2 2 3 3 1	1 0 2
2 1 4 1 6 3 6 7 3 4 2 6 5 6 1 1 2	3
3 4 3 1 4 2 4 3 4 2 4 3 4 1 3 1 2 2 3 3 1 1 3	2 1 2 2