towertowntrains

In TowerTown, there are 2 special towers on the east and west side of town and T towers labelled from 1 to T in between. For convenience, the two special towers are labelled 0 and *T+1* respectively. This results in a total of T+2 towers labelled from 0 to T+1. Imagine you are the Train Manager of TowerTown, where you are tasked to manage R railways between towers of course. With the advent of smartphones, the mayor of TowerTown decided that you should build an application that can calculate the shortest distance between any two towers in TowerTown, in order to increase tourism to TowerTown. The program should support Q queries.

However, he decides that since this is a programming question, the above problem would be too easy to work out. Thus, he also wants the program to allow him to add a theoretical extra two-directional railway between two towers, and answer another P different queries for the shortest path between two towers, with the option of using the theoretical railway. Do note that the theoretical railway might be constructed between two towers that were originally already connected via railways. Also, all railways (theoretical or not) have positive lengths and will not exceed 1 kilometer.

Input

On the first line you are given three integers, T, R and Q. (T ≤ 200 and Q, P ≤ 100000)

The followng R lines will also contain three integers, T1, T2 and L, representing a two-directional railway of length L meters between towers T1 and T2.

The following Q lines will contain two integers, T1 and T2, representing a query for the shortest distance between towers T1 and T2.

On the next line, there will be four integers, T1, T2, L2 and P, representing a theoretical railway between T1 and T2 of length L2 meters and P more queries.

The following P lines will contain two integers, T1 and T2, representing a query for the shortest distance between towers T1 and T2.

Output

Give output for Q queries each on a new line, as well as for another P queries where there is an option of using the theoretical railway, also each on a new line.

For all queries in the input, it is guaranteed that it is possible to get from T1 to T2 directly or indirectly. However, it is not guaranteed that it is possible to get from any tower to any other tower directly or indirectly.

Sample Input

```
5 5 1
0 1 1
1 2 1
2 3 2
3 4 1
2 4 6
2 4
1 4 1 1
2 4
```

Sample Output

```
3
2
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