Task: POS
Messenger

Olimpiada Informatyczna

XXIII OI, Stage III, Day 1. Source file `pos.*` Available memory: 256 MB. *13.04.2016*

After a long rein over the kingdom of Byteotia, Byteasar abdicated, too exhausted to keep on ruling the country. Soon he realized that he missed being up to date on court news, policy, and intrigue. So to stay in touch, he decided to become a royal messenger.

On the very first day at his new job, he was entrusted to deliver an urgent message from one town to another. Rather than make his very first trip as timely as possible, Byteasaur decided to turn it into a tour of the country in order to recover after his years of service as the king. Naturally, he is going to take some precautions so that the new king never finds out the true nature of the messenger's itinerary.

All the roads in Byteotia are one-way only, leading directly from one town to another. Byteasar has declared the exact number of road segments he wants to follow on his trip, regardless of how many are actually required. In order not to arouse the suspicion of the royal officials, he insists on visiting each of the source and destination towns exactly once, but he is willing to visit any other town multiple times, as well as take the same road segment more than once.

Help our hero by writing a program that will determine the number of routes that satisfy his requirements. In other words, the program is to determine the number of different routes of a given length between a given pair of towns that visits each of those exactly once. As this number may be quite large, it is sufficient to return its remainder after division by a number of Byteasar's choice.

Input

In the first line of the standard input, there are three integers n, m, and z ($n \geq 2$, $0 \leq m \leq n(n-1)$, $2 \leq z \leq 1\,000\,000\,000$), separated by single spaces, that specify, respectively: the number of towns in Byteotia, the number of one-way roads between them, and the divisor chosen by Byteasar. The towns are numbered from 1 to n.

Next, m lines follow, each containing a pair of integers a, b ($1 \leq a, b \leq n$, $a \neq b$), separated by a single space, which indicate that there is a direct one-way road from the town no. a to the town no. b. No road segment appears on the input more than once.

In the next line, there is a positive integer q, specifying the number of Byteasar's queries. Each of the q lines that follow contains a query. The query consists of three integers u_i, v_i, and d_i ($1 \leq u_i, v_i \leq n$, $u_i \neq v_i$, $1 \leq d_i \leq 50$), separated by single spaces, which specify that Byteasar wants to travel from the town no. u_i to the town no. v_i by taking exactly d_i road segments.

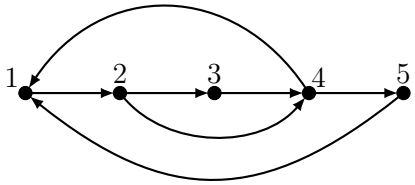
Output

Exactly q lines should be printed to the standard output. The i-th of those should contain the remainder after division by z of the number of routes asked for by the i-th query.

Example

For the input data:

```
5 7 10
1 2
2 3
3 4
4 5
5 1
2 4
4 1
2
2 1 3
5 3 6
```



the correct result is:

```
2
1
```

Explanation of the example: Two routes satisfy the first query: $2 \to 3 \to 4 \to 1$ oraz $2 \to 4 \to 5 \to 1$; and only one route satisfies the second query: $5 \to 1 \to 2 \to 4 \to 1 \to 2 \to 3$.

Sample Grading Tests:

- `1ocen:` $n = 6$, $q = 10$, five towns, each pair of which is directly linked in both directions; a sixth town has no adjacent roads whatsoever;
- `2ocen:` $n = 20$, $q = 100$, the towns are arranged on a circle; every pair of towns adjacent on the circle is directly linked in both directions;
- `3ocen:` $n = 100$, $q = 500\,000$, the map of Byteotia has the shape of a trident.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several test groups.

Subset	Property	Score
1	$n \leq 20$, $q \leq 100$	12
2	$n \leq 100$, $m \leq 500$, $q \leq 100$	20
3	$n \leq 100$, $q \leq 10\,000$	38
4	$n \leq 100$, $q \leq 500\,000$	30