Task: HER
The Hero

UFAM Workshop, contest #3. Source file `her.*` Available memory: 256 MB.

Byteotheus, most famous Byteotian hero, once again emerged victorious from the battle. While his crew are loading the ship up with the acquired valuables, in his cabin, Byteotheus plans his way back to his homeland island – The Bitaca. It is not an easy task. Many gods envy Byteotheus popularity among the people and gladly would take him down a peg or two. Fortunately, some of them look favourably on him, especially goddess Bythena. It was none other but her that sent Byteotheus a dream last night, warning him of the dangers that he could encounter.

There are n islands on the Byteonian Sea. It will be convenient to number those from 1 to n. Presently Byteotheus's ship is at island 1, and its destination is The Bitaca – island n. In some cases two islands are joined by *one-way* sea routes, additionally each of those islands is a start point for maximum of 10 sea routes. We are numbering the sea routes from 1 to m; i-th route leads from island a_i, to island b_i, and it takes exactly d_i days to cover it. In case the ship set sail on i-th route, starting from island a_i at dawn on j day, it will reach its destination island b_i at dawn, at day $j + d_i$. The ship can stop at any island for an indefinite period before moving on again. However, before reaching a successive island, it cannot deviate off the set path, and sail no longer that is required to cover the particular route. Byteotheus can start his voyage from island 1 at dawn on the first day, at the earliest.

The goddess Bythena warning has been very precise. She provided Byteotheus an exact list of p traps, prepared by the gods. Every trap is situated on a certain island and is active for a certain time period. To be more precise, the i-th trap is located on the w_i island and is active from the day s_i until and including the day k_i. The traps are really dangerous – in case Byteotheus's ship finds itself on an island with an active trap, no one will survive. Luckily his homeland Bitaca is free from traps, and no traps on the island 1 are active on the first day.

Obviously Byteotheus wants to plan his way home, to avoid all traps. He wonders, however, how much longer he would need for his voyage because of them. Help him and indicate the minimum number of days necessary to safely return to Bitaca.

Input

The first line of input contains two integers n and m ($2 \leq n \leq 100\,000$, $1 \leq m \leq 1\,000\,000$): the number of islands and the number of sea routes. Subsequent m lines describe the sea routes: included in the i-th there are three integers a_i, b_i, d_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$, $1 \leq d_i \leq 10^9$), indicating that the i-th route leads from island a_i to island b_i and it takes d_i days. All routes are one way. Every island is a start point for maximum of 10 sea routes.

The next line contains integer p ($0 \leq p \leq 100\,000$), describing the number of the traps. Next p lines hold the description of the traps: in the i-th line there are three integers w_i, s_i, k_i ($1 \leq w_i < n$, $1 \leq s_i \leq k_i \leq 10^9$), indicating that the i-th trap is located on the island w_i and is active from the day s_i until and including the day k_i. If $w_i = 1$, then $s_i > 1$.

Output

In case it is not possible to plan the route avoiding all the traps, the one and only line should output word `NIE` (Polish for *no*). In the opposite case, an integer d should be output describing the minimum number of days required to finalise the voyage (the ship reaches Bitaca on the day $d + 1$ at sunrise).

Example

For the input data:

```
5 6
1 2 3
1 4 13
2 3 1
2 4 2
3 2 2
4 5 1
5
1 2 4
1 8 8
2 6 7
2 10 11
4 6 7
```

the correct result is:

```
10
```

Explanation to the example: Byteotheus set sail from island 1 on the first day, at sunrise. He arrives on island 2 on the fourth day. There he waits one day and starts off for island 3. After getting there on the sixth day, he immediately turns back to island 2, where from he travels in the direction of island 4 on the eighth day. He arrives there on the tenth day and finally reaches Bitaca on the eleventh day.