Problem ID: journeywitnesses

It is June 23rd, 2073. Your friend Riley just returned from a journey through time. Normally, time travelling is very time consuming (that's only fair). However, Riley has modified her time machine slightly, hard-wiring certain locations and directional paths between them. Now, whenever there is a so-called *time wire* going from her current location to another, she can time travel to that location in just one minute (measured in *accurate absolute time* – AAT). The downside to mods using time wires is that they prevent all other location changes – Riley always has to travel along the wires now.

This last trip of hers was a *flash visit trip*: Each location she visited she jumped out of the machine, took a picture and went back in to continue to the next location. She now proudly presents you with all her photographs, showing various famous cities, boasting about how amazing her time wire mod is and that she changed location every minute. Knowing her, you have a hunch that she may be making some stuff up, and decide to investigate.

Figure 1: All photos that you consider in Sample 1. From left to right (year, AAT): Paris (2073, 0), Rome (34 BC, 2), Tokyo (2015, 5), Toyko (2142, 7), Lima (1993, 8).

A small trick and now you are in possession of all the photos. For some of them, it is impossible to determine where they were taken. You discard those. The remaining ones are useful not just because of the cities shown, but also because each one contains a unique timestamp placed there by the camera. These timestamps indicate when the photos were actually taken in AAT, because the time chip in the camera is not affected by time travelling. This might suffice to prove Riley a liar!

Compare the photos' timestamps with the time machine's time wires to detect how many photos she went without lying (it's nice to phrase things positively, after all).

Input

The input consists of:

- One line with two integers l and w ($2 \leq l \leq 250$, $1 \leq w \leq 10^5$), giving the number of hard-wired locations and the number of time wires, respectively.
- w lines, each with two strings a and b ($1 \leq |a|, |b| \leq 20$, $a \neq b$), indicating that a time wire exists to rapidly travel from a to b. All wires are unique.
- One line with a single integer p ($1 \leq p \leq 10^3$), giving the number of usable photos. They are numbered from 1 to p in increasing AAT order.
- One line with p strings $s_1, \ldots, s_p$, indicating that the ith photo was taken in city s_i (for each i). It is guaranteed that all s_i appear in the list of time wires.
- One line with p integers $t_1, \ldots, t_p$ ($0 \leq t_1 < t_2 < \ldots < t_p \leq 10^{12}$), indicating that photo i has an AAT timestamp of minute t_i (for each i).

All location names consist of lowercase letters `a-z`.

Output

Assuming Riley started her flash visit trip in the city shown in the first photo (at the given time), print the maximum i such that all photos between the first and ith are consistent with the given information.

Explanation Sample 1

AAT 0: Riley started her flash visit trip in Paris.
AAT 1: She must have been in Tokyo, but the photo just shows a beautiful tree. This could be everywhere on earth, so you discarded this photo.
AAT 2: She visited Rome, which can be proved by the second photo in the list.
After jumping between Rome and Tokyo, she managed to be in Tokyo at AAT 5 and again at 7. But the next photo clearly shows Lima at AAT 8, and there is no way to get there from Tokyo that fast.
Perhaps there is another time wire that goes from Tokyo to Lima – you confront her with the fact that only the first 4 photos are consistent with her story.

Sample Input 1

```
4 4
paris tokyo
tokyo rome
rome tokyo
rome lima
5
paris rome tokyo tokyo lima
0 2 5 7 8
```

Sample Output 1

```
4
```