

## Problem 3. Movie

In one of his interviews, the actor Kevin Bacon commented that he had worked with everybody in Hollywood or someone who's worked with them. Although this is not true, it leads to the following definition

- 1) Let Kevin Bacon have Bacon number equal to 0.
- 2) If the lowest Bacon number of any actor with whom X has appeared in any movie is N, X's Bacon number is N + 1.

For example, everyone who has worked with Kevin Bacon has Bacon number equal to 1 and everyone else has a higher Bacon number (except Bacon himself).

We can expand this definition by defining the **Y**-number of an actor **X** using actor **Y**. This means that we can substitute Kevin Bacon with Y and calculate the **Y**-number using the aforementioned definition.

We are given **N** actors, **M** movies and the actors which play in each of the movies. Answer **Q** times the query: "What is the **Y**-number of the actor **X**". If the number is not defined (there is no sequence of movies which connects the two actors), you should print -1.

### Input

On the first line of the input file **movie.in** we have **N** and **M**.

Movies are numbered from 1 to **M** and the actors are numbered from 1 to **N**.

Then the description of each movie follows in the order 1,2,3...**M**.

Each description contains the number **Si** and then **Si** different numbers between 1 and **N** - the numbers of the actors acting in this movie.

After this follows the number **Q** followed by **Q** lines containing **X** and **Y** - two numbers of actors.

### Output

The output file **movie.out** should contain **M** numbers on different lines. Answers of the queries should be printed in the order they were given in the input.

### Constraints:

$$1 \leq N \leq 1,000$$

$$1 \leq M \leq 150$$

$$1 \leq Q \leq 500$$

**Time Limit: 0.5s**

**Example:**

<b>movie.in</b>	<b>movie.out</b>
10 5	1
3 1 2 3	0
3 2 3 4	4
3 5 6 7	-1
3 1 5 10	2
2 9 8	
5	
1 2	
8 8	
4 7	
1 9	
2 10	