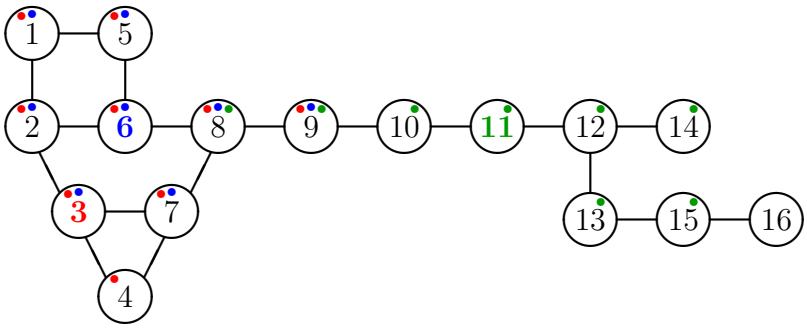
Legionellosis

When there is a legionellosis outbreak, Health Authorities interview the people who get sick to find out the source of infection. After these interviews, the Authorities estimate how far each person has been from home on the days it is most likely to have caught the disease. All locations reachable from home by some route of length less than or equal to the corresponding estimated distance define the region where legionella has been inhaled. So, locations that lie in all these regions, called *perilous locations*, need urgent inspection, as the source of infection is probably located in one of them. Can you help Health Authorities determine the perilous locations?



Suppose three people got legionellosis in the area depicted in the figure above, where there are 16 locations, connected by paths of 1 km of length:

- Anne lives at location **3** and was always at a distance less than or equal to **3** km from home. So, she inhaled the bacteria at location 1, 2, 3, 4, 5, 6, 7, 8, or 9.
- Bob lives at location **6** and was never farther than **2** km from home. The locations where he can have caught the disease are 1, 2, 3, 5, 6, 7, 8, and 9.
- Curt lives at location **11** and was only at locations whose (shortest) distance from home does not exceed **3** km. These locations are 8, 9, 10, 11, 12, 13, 14, and 15.

Locations 8 and 9 are the perilous locations: the source of infection should be located in one of them, where all patients could have been infected.

Task

Write a program that, given the map of the area and the data collected in the interviews (home location and maximum distance from home the patient has been on the days before the first symptoms), computes the perilous locations.

Input

The input first line has two integers, L and C, which represent, respectively, the number of locations and the number of connections on the map. Locations are identified by integers,

ranging from 1 to L. Each of the following C lines has two distinct integers, l_1 and l_2, specifying that there is a (two-way) connection (of length 1) linking locations l_1 and l_2.

The next line contains an integer, S, which denotes the number of sick people. Each of the following S lines contains the information extracted from the interview of a different patient. The line has a pair of integers, h and d, specifying the patient's home location and the maximum distance from home the patient has been on the days before the first symptoms, respectively.

Constraints

$1 \leq S \leq 20$	(Number of sick people)
$S \leq L \leq 10\,000$	(Number of locations)
$L - 1 \leq C \leq 17\,500$	(Number of connections)
$1 \leq d < L$	(Maximum distance from home)

Output

The output consists of a line with the perilous locations, in strictly increasing order and separated by a single space. If there is no perilous location, the line has "0" (zero).

Sample Input 1

```
16 18
6 8
7 3
16 15
12 14
13 12
2 1
13 15
11 12
6 2
10 11
4 7
5 6
1 5
3 4
3 2
9 10
9 8
8 7
3
3 3
6 2
11 3
```

Sample Input 2

```
16 18
15 16
2 6
5 1
3 7
12 13
3 2
4 3
10 9
12 11
8 6
7 8
13 15
9 8
14 12
4 7
6 5
2 1
10 11
3
6 2
11 1
3 3
```

Sample Output 1

```
8 9
```

Sample Output 2

```
0
```