

## Spreading the Virus

In every society, everyone knows a lot of other people. However, friendship relationships are kept between only a few of them. Unfortunately, these relationships impose the greatest risk for a virus transmission from person to person. For the sake of this problem, let's assume that the infection rate of our fabricated virus is perfect. Furthermore, suppose that whenever someone is infected, he/she spreads the virus to all his/her friends on the following day. So, on the first day, the initial source of the virus (some specific person) infects his/her friends; on the second day, the source's friends infect their friends; and so on and so forth. We are interested in just one quantitative measure regarding this epidemic. The goal of this task is to determine:

- **The size of the infection peak day:** the largest number of people that, on a single day, caught the virus for the first time.
- **The first infection peak day:** the first day on which the the infection peak day occurred.

Given the friendship relations between people in some artificial population and the initial source of the virus (just a single person), compute the number of infected people on the infection peak day as well as at what day that situation occurs.

### Input

The first line contains the number  $P$  of people ( $1 \leq P \leq 2\,500$ ) and the number  $F$  of friendships ( $0 \leq F \leq 10\,000$ ). People are numbered from 0 to  $P - 1$ . Each of the following  $F$  lines specifies the mutual friendship between two people formatted as "a b", where  $0 \leq a < b \leq P - 1$ . No person can be a friend with himself/herself. The next line contains an integer  $T$  ( $1 \leq T \leq 200$ ), the number of test cases. Each of the following  $T$  lines contains a person, which represents the unique source of the viral infection for the particular test case.

### Output

The output consists of  $T$  lines, one for each test case. If no other person (but the source) is infected by the virus, the output line contains the integer 0. Otherwise, the output line contains two integers,  $M$  and  $D$ , separated by a single space, where  $M$  is the number of newly infected people on the peak day and  $D$  is the first day at which  $M$  occurred.

### Input sample

```
6 3
0 1
0 2
3 4
4
0
3
5
4
```

### Output sample

```
2 1
1 1
0
1 1
```