

Problem E: Spreading The News

In a large organization, everyone knows a lot of colleagues. However, friendship relations are kept with only a few of them, to whom news are told.

Suppose that whenever an employee knows of a piece of news, he tells it to all his friends on the following day. So, on the first day, the source of the information tells it to his friends; on the second day, the source's friends tell it to their friends; on the third day, the friends of the source's friends' tell it to their friends; and so on.

The goal is to determine:

- *the maximum daily boom size*, which is the largest number of employees that, on a single day, hear the piece of news for the first time; and
- *the first boom day*, which is the first day on which the maximum daily boom size occurs.

Problem

Write a program that, given the friendship relations between the employees and the source of a piece of news, computes the maximum daily boom size and the first boom day of that information spreading process.

Input

The first line of the input contains the number E of employees ($1 \leq E \leq 2500$). Employees are numbered from 0 to $E - 1$.

Each of the following E lines specifies the set of friends of an employee's (from employee 0 to employee $E - 1$). A set of friends contains the number of friends N ($0 \leq N \leq 15$), followed by N distinct integers representing the employee's friends. All integers are separated by a single space.

The next line contains an integer T ($1 \leq T < 60$), which is the number of test cases.

Each of the following T lines contains an employee, which represents the (unique) source of the piece of news in the test case.

Output

The output consists of T lines, one for each test case.

If no employee (but the source) hears the piece of news, 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 maximum daily boom size and D is the first boom day.

Sample Input

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

Sample Output

```
3 2
0
2 1
```

Notas adicionais

1. Os limites presentes no enunciado mostram bem que, em 2004, as máquinas era bem mais lentas e a memória mais escassa do que as actuais.
2. Algumas dúvidas que podem surgir, durante a leitura do enunciado, podem ser esclarecidas estudando o exemplo apresentado.