Bloomberg
CODECON

Memory Limit: 1350 MB
Time Limit: 5 s

Chemistry 101 (250 points)

Introduction

The freshman class of DEADBEEF is taking *Introduction to Chemistry*. To prevent the danger of blowing up the class, each page contains the list of chemicals that *must* be in the test tube beforehand to prevent a dangerous chemical reaction. If ANY of the chemicals are added in the **wrong** order, you might blow up the class. As the smartest one in the class, you want to validate the order of chemicals that your classmates are adding to make sure that they will be safe.

You are given the name of a chemical, followed by the number of prerequisites for that chemical, and then the names of those prerequisites.

For example, assume the first page contains `Arraylium 2 Bronyx Chaotium`; the second page contains `Chaotium 2 Bronyx Dopralt`; and the third page contains `Bronyx 1 Dopralt`. If your classmate adds the ingredients in the order of `Dopralt Bronyx Chaotium Arraylium` he is `SAFE!`. If they add the chemicals in any other order, they will blow up the whole class - `BOOM!`.

Please verify your classmates are not going to blow up the class.

Input Specifications

Your program will take from **STDIN**

- The first line will be **n**, the number of pages in the book.
- The next **n** lines will give a chemical followed by the number of ingredients it requires beforehand, followed by that list of chemical ingredients. Note that chemical names will not contain whitespace, but may contain any other printable ASCII character. For example, `A 3 B C D` indicates that chemicals B, C, and D are prerequisites for chemical A *(that is, all 3 of B, C, & D will need to be added first before A can be added)*
- The last line will indicate the order of ingredients your classmate plans to enter. For example, `X Y Z` means they are adding chemicals in the order of X followed by Y followed by Z.

Output Specifications

The output should be `SAFE!` or `BOOM!`. `SAFE!` indicates that the order is valid. `BOOM!` indicates the the order caused a chemical reaction dangerous for the students!

Sample Input/Output

Input

```
2
X 2 Y Z
Y 1 Z
Z Y X
```

Output

```
SAFE!
```

Explanation

Since you need to add Y & Z before X and Z before Y, Z->Y->X is a safe chemical order

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Input

```
3
Arraylium 2 Bronyx Chaotium
Chaotium 2 Bronyx Dopralt
Bronyx 1 Dopralt
Dopralt Bronyx Arraylium
```

Output

```
BOOM!
```

Explanation

You blew up the class because Choatium needs to be added before Arraylium!