Queries in Social Networks II

Task Description

In this problem you are given the names of m persons, $1 \leq m \leq 500$. The goal is to maintain a social network, so that the following types of queries can be answered:

- **MakeFriend NameA NameB**
  This means that the person named **NameA** and the person named **NameB** become friends to each other after this query.
  It is guaranteed that **NameA** != **NameB**.
  Note that, **there may be duplicate pairs**.

- **UnFriend NameA NameB**
  This means that NameA and NameB unfriend each other. If they were not friends, this operation has no effect.

- **ListFriend NameA**
  This is a query for the friend list of **NameA** up to the present time. You need to output the friend list of **NameA** for this query.

Input

The first line contains one integer m, $1 \leq m \leq 500$, the number of persons.
Each of the next m lines contains one string s, $1 \leq |s| \leq 20$, which is the name of each person.

The next line contains one integer n, $1 \leq n \leq 1000$, the number of queries to be processed.
Then there are n lines, each contains one query as described in the above format.

It is guaranteed that the name of each person consists of only alphabetical characters.

Output

For each ListFriend query, output the friend list of that person, separated by a space, in a line.

Example

Input1:

```
3
Amy
John
Xman
5
MakeFriend Amy John
MakeFriend Amy Xman
UnFriend Amy John
ListFriend Amy
ListFriend John
```

Output2:

```
Xman
```

Input2:

```
4
Alice
Bob
Charlie
David
7
MakeFriend Alice Bob
MakeFriend Alice Bob
MakeFriend Bob Charlie
ListFriend Bob
UnFriend Alice Bob
ListFriend Alice
ListFriend Bob
```

Output2:

Alice Charlie

Charlie