
Two parties**P82271_en**

You want to throw a party with all your friends, but unfortunately some of them hate each other. So you decide to make two parties instead of one, inviting each friend to exactly one party, and avoiding two people who hate each other going to the same party. Can you do it?

Input

Input consists of several cases, each with the number of friends a , followed by their a names, all different and in any order. Follow the number of hate relationships m , and the m pairs of friends x and y that hate each other.

Suppose $2 \leq a \leq 10^4$, that the names are words with between one and six lowercase letters, $1 \leq m \leq 5a$, $x \neq y$, that both x and y appear in a 's friends list, and that no hate relationship appears more than once.

Output

Print one line for each case. If there is no solution, print "NO". Otherwise, print "SI" followed by the names of the participants in either party, in any order. If there is more than one solution, choose anyone. Follow the format of the examples exactly.

Sample input

```
5 edgar tomas omer anna ivet
4
anna tomas
omer anna
edgar ivet
edgar anna

3 x y z
3
x y
y z
x z

3 a b c
1
c a
```

Sample output

```
SI anna ivet
NO
SI a b
```

Problem information

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