

Problem D

Isomers

Input file: *testdata.in*
Time limit: 10 seconds

Problem Description

In chemistry, to determine whether two molecules are identical could be a difficult problem when they are composed by a large number of atoms. Now you are given a list of molecule pairs and you need to determine whether they are *isomer* or not. If they are isomers, please determine whether they are *structural* isomers or *spatial* isomers. More specifically, you must determine for every given pair of molecules, which of the following is true.

1. *Structural isomers* – the molecule pairs contain the same number of atoms for each kind, but have different structure.
2. *Spatial isomers or identical* – the molecule pairs not only have the same number of atoms for each kind, but also the same structure.
3. *Not isomers* – the pairs of molecules are not structural isomers nor spatial isomers.

For more information please refer to the following wiki article:
<http://en.wikipedia.org/wiki/Isomer>

Technical Specification

- $1 \leq N \leq 20000$
- $B = N - 1$

- All molecules in the given input contains no cycle structure.
- All atom types are represented as an uppercase for simplicity.
- The number of pairs of molecules to be categorized will be no more than 60.

Input Format

There will be a series of pairs molecules to be categorized. For each pair there will be two molecules. A molecule will be expressed by a list of atoms and a set of chemical bounds.

At the beginning there will be two integers, N and B , denoting the number of atoms and the number of chemical bounds. For each atom, a distinctive number ranged from 1 to N is assigned.

In the next line there will be N uppercase characters separated by one or several spaces, of which the i^{th} character represents the type of the atom numbered i . For simplicity, all the atom types are represented as an uppercase character.

Then in the following there will be the list of the B bounds, each of the bound denoted by two numbers, i and j , meaning that the atom numbered i is connected with the atom numbered j .

Output Format

For each test case, output one of the following in its own line:

- ‘STRUCTURAL’, if the pair of molecules are structural isomers.
- ‘SPATIAL/IDENTICAL’, if the pair of molecules are either spatial isomers or identical.
- ‘NONISOMER’, if the pair of molecules are not isomers.

Sample Input

```
11 10
H F H H C C C H H H H
1 5
2 6
```

```

3 7
4 5
5 6
6 7
7 8
5 9
6 10
7 11
11 10
H H H H C C C F H H H
1 5
2 6
3 7
4 5
5 6
6 7
7 8
5 9
6 10
7 11
5 4
H C B X F
1 2
2 3
2 4
2 5
5 4
H C F X B
1 2
2 3
2 4
2 5

```

Sample Output

```

STRUCTURAL
SPATIAL/IDENTICAL

```