

Problem 8D - The Shire

All hobbits in the Shire are asked to document their height. But as hobbits are very sensitive about their height, they don't like to be measured. Therefore, everyone agreed to only give a relative height. This means, they only tell if they are larger or smaller than another hobbit.

Unfortunately, it seems like not everyone is telling the truth. So your help is needed to find out, if there is a liar or not.

Input

The input consists of:

- one line with integers n ($1 \leq n \leq 10^5$), where n is the number of statements;
- n lines describing the relations between the hobbits. Each relation is described by one line with " $s_1 < s_2$ " or " $s_1 > s_2$ " telling whether hobbit s_1 is smaller or taller than hobbit s_2 . s_1 and s_2 are two different hobbit names. A hobbit name consists of at most 20 letters from A to Z and a to z. A hobbit name does not contain spaces or additional characters. The number of hobbits does not exceed 10^4 .

Output

Output **impossible** if the statements are not consistent, otherwise output **possible**.

Sample Input 1

```
3
Frodo > Sam
Sam > Pippin
Frodo < Pippin
```

Sample Output 1

```
impossible
```

Sample Input 2

```
3
Frodo > Sam
Sam > Pippin
Frodo > Pippin
```

Sample Output 2

```
possible
```