Stack or Queue ?

Problem Description

Professor X gives you a mysterious data structure containing integers. The data structure supports the following operations:

- `push`: Insert an element into the data structure.
- `pop`: Take out an element from the data structure.
- `reverse`: Reverse the elements inside.

Given the list of operations and their return values, Professor X asks you to guess the data structure. He also gives you a hint: it could be a stack or a queue only.

Input

There will be several test cases in this problem. Each test case contains **N** (1 <= **N** <= 20), the number of operations. The next **N** lines are the list of operations and their return values.

- `push M`
  Push the integer M into the data structure.
- `pop M`
  Pop an element from the data structure and you get the integer M.
- `reverse`
  Reverse the elements inside the data structure.

The input will be terminated by EOF.

Output

For each test case, output one of the followings in a single line:

- `stack`: It is definitely a stack.
- `queue`: It is definitely a queue.
- `stack or queue`: It can be both stack or queue.
- `impossible`: Professor X wants to trick you, it cannot be both!

Sample Input

```
4
push 1
push 2
pop 2
pop 1
5
push 1
push 2
reverse
pop 2
pop 1
```

```
2
push 1
pop 1
2
push 1
pop 2
```

Sample Output

```
stack
queue
stack or queue
impossible
```

Explanation

For Test Case #1, every time you pop an element the last element inserted will be returned (Last-In First-Out), hence it is a stack.

For Test Case #2, every time you pop an element you get the oldest element (First-In First-Out), so it is a queue. Also notice that the order of the elements in the data structure is reversed in this case.

In Test Case #3, only 1 element is inserted into the data structure. Hence it is ambiguous; stack and queue are possible in this case.

For the last test case, the integer 1 is inserted, but when you try to remove an element it returns the integer 2. Clearly this is not possible.