



Problem F

Frog on a Line

Time limit: 1 second

Memory limit: 2048 megabytes

Problem Description

Roy is a very lazy little frog. He has no plans or dreams for his life, except jumping on a line of lotus leaves everyday.

At the beginning (the 0th day), Roy is standing on the lotus at position 0 facing right. Although the little frog has no purpose in life, what he does everyday is the same. He takes exactly one of the following actions once a day:

- Turn around (change from facing left to facing right and vice versa).
- Jump to the next lotus leaf in front of him. If he is facing right, then his position increases by 1, otherwise it decreases by 1.

His friend Hong can't stand Roy's undisturbed life, and plans to visit him one day. Hong will randomly visit a certain lotus leaf on different days, and since he doesn't want Roy to see him from afar, Hong wants to approach Roy from behind to give him a big surprise.

Hong wonders which direction Roy might be facing when he's on a the lotus leaf at position x at a certain moment t . He can be facing right, facing left, facing either way, or must not be there at the moment.

Although Hong is smart, he is still a frog after all. Can you help Hong find these answers so that Hong can visit Roy?

Input Format

The first line contains the number of test cases T . Each test case contains a line with two integers t and x .

Output Format

- If it is impossible for Roy be at position x on the t^{th} day, output “impossible” (without quotes).
- If it is possible for Roy to be facing either direction at position x on the t^{th} day, output “both”.
- If it is only possible for Roy to be facing right at position x on the t^{th} day, output “right”.
- If it is only possible for Roy to be facing left at position x on the t^{th} day, output “left”.

Technical Specification

- $1 \leq T \leq 2 \times 10^5$



- $0 \leq t \leq 10^{18}$
- $-10^{18} \leq x \leq 10^{18}$

Sample Input 1

```
4
0 0
1 0
10 4
4 10
```

Sample Output 1

```
right
left
right
impossible
```