Game Show Guessing

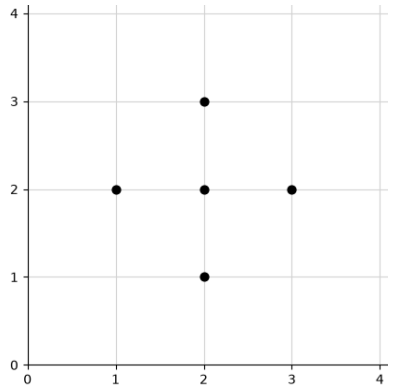


Figure 1: Illustration of Sample Input 1

You and your teammate have made it to the final stage of the ICPC Game Show. In the final round, both of you will be locked in separate rooms that are very far apart. Both of the rooms contain an identical map of N points on a 2-D coordinate plane.

The host has chosen one of the N points in secret, and tells you (but not your teammate) the x-coordinate of the point, and tells your teammate (but not you) the y-coordinate. Every morning, the host will visit you in your room and ask if you want to guess the secret point. The host then visits your teammate and asks them the same question. If you or your teammate choose to guess but answer incorrectly, both of you lose the game. If you both answer correctly, or one answers correctly and the other declines to guess, you and your teammate win the game. The result of winning or losing the game is announced in the evening, so you and your teammate are not given any immediate feedback after guessing. If both you and your teammate decline to guess the secret point, nothing happens in the evening and the host will visit again the next morning.

It is impossible for you and your teammate to communicate to each other in any way. You are both perfect logicians, and will make a guess if (and only if) you are certain of the answer. This and the rules of the game are common knowledge.

The host knows it will make for good TV if the game lasts as long as possible. Which of the N points should the host choose such that the game lasts as many days as possible?

Input

The first line of input contains a single integer N ($1 \leq N \leq 200\,000$), indicating the number of points.

Then N lines follow, the i-th such line containing two integers x_i, y_i ($-10^9 \leq x_i, y_i \leq 10^9$), indicating the position of the i-th point. All N points are distinct. The first point in the input has index 1.

Output

Output a single integer, the index of the point that the host should choose to make the game last as long as possible. If there are ties, output the point with the smallest index such that the game lasts as long as possible. Points that cause the game to go on forever are considered to be tied with each other.

Sample Input 1

```
5
1 2
2 3
3 2
2 2
2 1
```

Sample Output 1

```
4
```

Sample Input 2

```
5
3 1
2 2
1 3
3 3
1 1
```

Sample Output 2

```
1
```