



Problem K

Antarctic Crowning Match

Time limit: 3 seconds

McMurdo Station, Antarctica

In the frigid expanse of Antarctica, the annual Antarctic Crowning Match (ACM) determines which penguin will be crowned emperor. The match follows ancient penguin tradition, where contestants engage in a strategic snowball elimination contest.

There are n penguins positioned at distinct points on a 2D plane. When the match begins, each penguin simultaneously throws a snowball at their closest competitor(s). If multiple penguins are at the same minimum distance from a thrower, that penguin throws snowballs at all of those equally close competitors. Any penguin hit by at least one snowball is eliminated from the match.

The process continues with the remaining penguins until either one penguin remains (the winner) or all penguins are eliminated (resulting in no winner). As the official tournament judge, your task is to determine if there will be a winner, and if so, which penguin will be crowned emperor.

Input

The first line contains a single integer n ($2 \leq n \leq 1000$)—the number of penguins in the match.

The next n lines each contain two integers x_i and y_i ($-10^7 \leq x_i, y_i \leq 10^7$)—the coordinates of the i^{th} penguin on the 2D ice sheet.

All coordinates are guaranteed to be distinct.

Output

Output one line with the index i ($1 \leq i \leq N$) of the last remaining penguin, in the case of a winner. If there is no winner, output `No Emperor` instead.

Sample Input 1

```
3
0 0
2 0
0 2
```

Sample Output 1

```
No Emperor
```

Sample Input 2

```
4
4 4
4 5
0 0
5 4
```

Sample Output 2

```
3
```