Garden Gathering

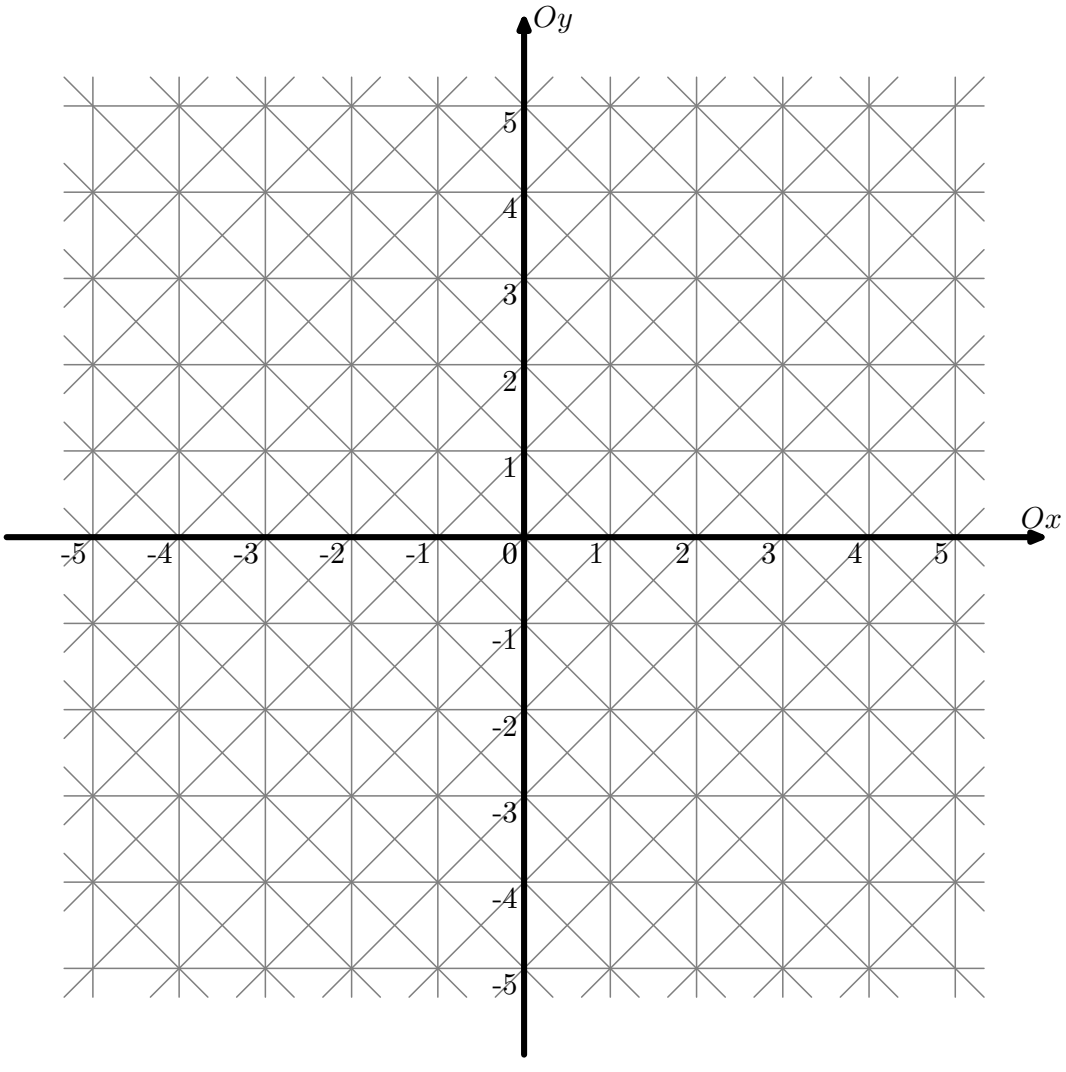
Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	512 megabytes

Many of you may have been to St. Petersburg, but have you visited Peterhof Palace? It is a collection of splendid palaces and gardens with spectacular fountains!

Besides the beauty, it is huge, and you can easily get lost in one of the park labyrinths. Imagine that you are not a regular visitor, but one of the guides, and your group of tourists is scattered across one of the gardens — a complete disaster! To continue the tour, you need to collect them all in one place, and technologies of the XXI century could be very useful in this task.

Each tourist has a smartphone with a GPS tracker which transmits data directly to your phone. Unfortunately, the application for Peterhof's guides lacks in functionality. Actually, it has the only button which, when pressed, automatically selects one person at random and tells his or her coordinates to everyone in the group. After that, all tourists immediately start to move to this position using the shortest path, while the selected person stands still and waits for others.

The only thing to worry about is that you can be late for the last train home, so you want to know the maximum possible time this gathering process could take. You have a map of this garden with you:



Picture 1: Plan of garden trails

All tourists from your group travel through the park with constant speed using only the trails shown on the picture 1.

If in the end you will be late, then you can ask your boss to reimburse the money spent on Yandex.Taxi. To do so, you need to present a proof in the form of two numbers: ID of the person selected by the app and ID of the person who will be the last to arrive. As you have a lot of time while the tourists are gathering, calculate any possible pair for the worst case.

Input

The first line of the input contains a single integer n ($2 \le n \le 200\,000$) — the size of your group.

The i-th of the next n lines contains two integers x_i and y_i ($|x_i|, |y_i| \le 10^7$) — coordinates of the tourist with ID i (numbered from 1 to n).

Initial positions of all tourists are guaranteed to be distinct.

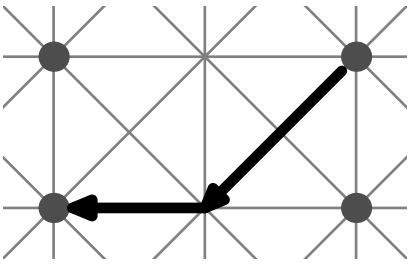
Output

Output ID of the selected person and ID of the last person. If there are several possible answers, output any of them.

Examples

standard input	standard output
4 0 0 2 0 0 1 2 1	1 4

Note



Picture 2: Answer for the first sample

In the sample the distance between the first and the fourth tourists is $\sqrt{2} + 1$. Answers $(4, 1)$, $(2, 3)$, and $(3, 2)$ are also considered correct.