Problem F
Interesting Couple

You are hosting a party with N guests (numbered from 1 to N) in a large room. The party room can be represented as a 2-dimensional Cartesian space where guest i stands at (X_i, Y_i). Since you have a unique personality, you require each guest to only move horizontally or vertically within this room.

The **distance** between two guests i and j, denoted as $d(i, j)$, is the total distance they need to travel in both horizontal and vertical directions to reach each other, i.e., $d(i, j) = |X_i - X_j| + |Y_i - Y_j|$.

The **privacy value** of two guests i and j, denoted as $p(i, j)$, is determined by their distances to the closest other guest. Formally, $p(i, j)$ is the smallest $\min(d(i, k), d(j, k))$ over all k where $k \neq i$ and $k \neq j$.

A pair of guest i and j is an **interesting couple** if and only if their privacy value is greater or equal to the distance between them. In other words, it is a pair $\langle i, j \rangle$ such that $p(i, j) \geq d(i, j)$.

Your task in this problem is to find the minimum value of $p(i, j)$ among all such interesting couples.

Input

The first line consists of an integer N ($3 \leq N \leq 100\,000$).

Each of the next N lines consists of two integers X_i Y_i ($0 \leq X_i, Y_i \leq 10^9$). There are no two guests stand at the same location. Formally, $(X_i, Y_i) \neq (X_j, Y_j)$ for $1 \leq i < j \leq N$.

Under the given constraints, it can be shown that an interesting couple always exists.

Output

Output an integer representing the minimum value of $p(i, j)$ among all interesting couples.

Sample Input #1

```
4
3 2
6 4
3 4
4 7
```

Sample Output #1

```
3
```

Explanation for the sample input/output #1

The only interesting couple is $\langle 1, 3 \rangle$, with guest 2 being the closest guest to this couple. Their privacy value is $\min(d(1, 2), d(3, 2)) = \min(5, 3) = 3$.

Sample Input #2

```
3
4 6
8 6
6 4
```

Sample Output #2

```
4
```

Explanation for the sample input/output #2

There are 3 possible guest pairs, and all of them are interesting couples, each with a privacy value of 4.

Sample Input #3

```
5
1 5
2 5
11 5
12 5
20 5
```

Sample Output #3

```
8
```

Explanation for the sample input/output #3

There are two interesting couples, $\langle 1, 2 \rangle$ and $\langle 3, 4 \rangle$, with privacy values of 9 and 8, respectively.

Sample Input #4

```
5
4 4
4 3
4 5
3 4
5 4
```

Sample Output #4

```
1
```