Another Contest 3 Problem 2 - Camelot

In the game of chess, a king can move horizontally, vertically, or diagonally by one unit. More specifically, if a king is at (x, y), their x-coordinate can change by at most one and their y-coordinate can change by at most one in a single move.

There are N kings on an infinite chessboard where each square can fit an infinite number of kings, and they wish to meet up at a single location. In one second, exactly one king can move by one unit - all other kings must stay still. Compute the minimum amount of time needed for all the kings to meet up.

Constraints

$1 \le N \le 10^6$

$-10^9 \le x_i, y_i \le 10^9$

Kings may already be in the same square.

Input Specification

The first line contains a single positive integer, N.

Each of the next N lines contains two space-separated integers, x_i and y_i, indicating that a king is at (x_i, y_i).

Output Specification

Output the minimum time in seconds needed for all the kings to convene.

Sample Input

```
4
1 1
1 3
1 2
1 10
```

Sample Output

```
10
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