Problem B. Airports

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Snuke is the owner of N airports. The coordinates of the i-th airport are (x_i, y_i). Snuke chooses a constant D, and for each pair of two airports p and q, adds a flight between these two airports if the Manhattan distance between p and q is at least D. Compute the maximum D that makes the airports connected (that is, any airport is reachable from any other airport by using one or more flights).

Note that the Manhattan distance between two points with coordinates (x_1, y_1) and (x_2, y_2) is defined as $|x_1 - x_2| + |y_1 - y_2|$.

Input

First line of the input contains one integer N ($2 \le N \le 10^5$). Then N lines follow, i-th of them contains two integers x_i and y_i — coordinates of the i-th airport ($0 \le x_i, y_i \le 10^9$). No two airports share the same position.

Output

Print the answer to the problem in a single line.

Example

standard input	standard output
6 1 7 8 5 6 3 10 3 5 2 6 10	9