

B. Valuable Resources

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Many computer strategy games require building cities, recruiting army, conquering tribes, collecting resources. Sometimes it leads to interesting problems.

Let's suppose that your task is to build a square city. The world map uses the Cartesian coordinates. The sides of the city should be parallel to coordinate axes. The map contains mines with valuable resources, located at some points with integer coordinates. The sizes of mines are relatively small, i.e. they can be treated as points. The city should be built in such a way that all the mines are inside or on the border of the city square.

Building a city takes large amount of money depending on the size of the city, so you have to build the city with the minimum area. Given the positions of the mines find the minimum possible area of the city.

Input

The first line of the input contains number n — the number of mines on the map ($2 \leq n \leq 1000$). Each of the next n lines contains a pair of integers x_i and y_i — the coordinates of the corresponding mine ($-10^9 \leq x_i, y_i \leq 10^9$). All points are pairwise distinct.

Output

Print the minimum area of the city that can cover all the mines with valuable resources.

Examples

input
2 0 0 2 2
output
4
input
2 0 0 0 3
output
9