The Closest-pair Problem

Description

This is a classic problem. You need to find the closest pairs of points on a two-dimensional plane.

Input Format

The first line includes one integer n, which is the number of points.

The next n rows, each containing two integers x_i, y_i, represent the coordinates of the i-th point.

Output Format

Output a line containing an integer D^2 that represents the **square** of the distance between the two closest points.

Sample

Sample Input

```
2
-10000000 -10000000
10000000 10000000
```

Sample Output

```
800000000000000
```

For 40% testcases: $1 \leq n \leq 1000$.

For 100% testcases: $1 \leq n \leq 10^5, |x_i|, |y_i| \leq 10^7$.

Notes

We highly recommend that you write the entire algorithm yourself. We will do a strict plagiarism check on the code for this problem.

The complexity of $O(nlog^2n)$ is sufficient to pass this problem. Btw, there exists $O(nlogn)$ solutions.