Homework for CS112 | Geometry
Input: Standard Input | Time limit per test: 2 seconds
Output: Standard Output | Memory limit per test: 128 megabytes

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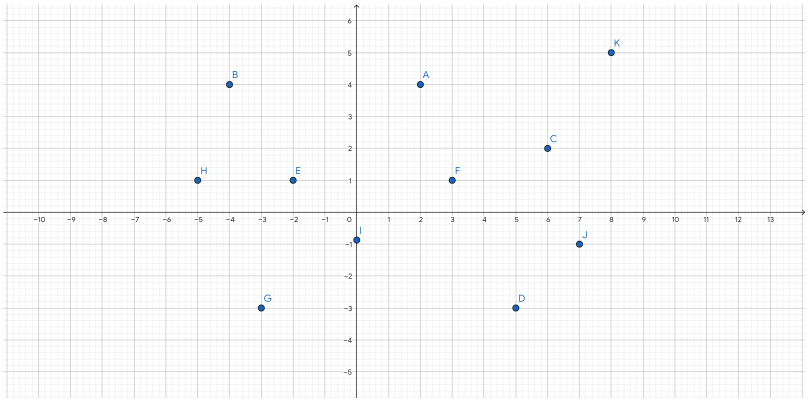
Problem. *Closest Pair of Points*

You are given n distinct points with integer coordinates on an Euclidean plane, the i-point has coordinate (x_i, y_i).

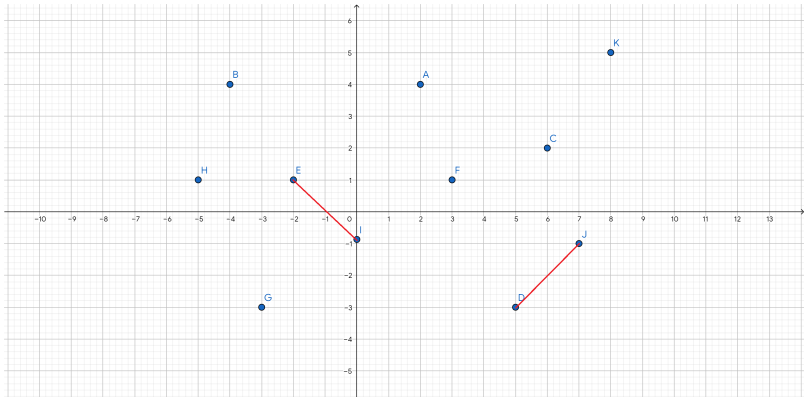
Your goal is find two points $A(x_a, y_a)$ and $B(x_b, y_b)$, s.t. the Euclidean distance from A to B is minimum. Note that $A - B \neq 0$.

Example.



There are 11 points - $P = \{ (2; 4), (-4; 4), (6; 2), (5; -3), (-2; 1), (3; 1), (-3; -3), (-5; -1), (0; -1), (7; -1), (8; 5)\}$.

The answer should be equal to 2.83. Hence, we have two pair satisfy with problem's require which are $\{(-2, 1), (0, -1)\}$ and $\{(5, -3), (7, -1)\}$.



Input.

- The first line contains an integer n.
- The next n lines contain two integers x_i and y_i - the coordinates of the i-th point. It is guaranteed that all given points are pairwise distinct.

Output.

- Your output should include one number − the smallest distance. Your answer is considered correct if its absolute or relative error does not exceed 10^{-6}.
- Formally, let your answer be a, and the jury's answer be b. Your answer is accepted iff $\frac{|a-b|}{max(1,|b|)} \leq 10^{-6}$.

Constrains.

- $2 \leq n \leq 2 * 10^5$.
- $-10^8 \leq x_i, y_i \leq 10^8$

Sample.

Input	Output
11 2 4 -4 4 6 2 5 -3 -2 1 3 1 -3 -3 -5 -1 0 -1 7 -1 8 5	2.8284271