Parallel Bounding Lines

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Given a set of points S, we want to find the minimum distance between two parallel bounding lines. Two parallel bounding lines are parallel lines such that all the points of S lie between the two lines.

Input

The first line of input contains a single integer n ($1 \leq n \leq 10^5$) representing the number of points.

Each of the next n lines contains two space-separate integers x and y ($-10^9 \leq x, y \leq 10^9$), representing the coordinates of the points. It is guaranteed that no two points have the same coordinates.

Output

Output one number representing the shortest possible distance between two parallel bounding lines. The answer will be considered correct if the absolute or relative error is less than 10^{-6}.

Examples

standard input	standard output
5 0 0 -1 1 -1 -1 1 -1 2 2	2.52982212813
2 2417 215415 -6464247 5749221	0.00000000000
10 -2 2 7 -3 1 3 3 -1 6 5 -2 0 7 4 0 -5 -1 3 4 5	8.51635496482