

Lipschitz Constant

Limits: 2 sec., 64 MiB

Today you are doing your calculus homework, and you are tasked with finding a Lipschitz Constant for a function f that is defined for \mathbf{N} integer numbers and takes on real values. Formally, the Lipschitz Constant for such function f is the smallest number L that for any x and y such that $f(x)$ and $f(y)$ are defined we have

$$|f(x) - f(y)| \leq L \times |x - y|$$

Input

The first line contains \mathbf{N} – the number of points for which f is defined. The next \mathbf{N} lines each contain two numbers x and y , which mean that $f(x) = y$; x is integer, y is real.

Output

Print one number – the Lipschitz Constant. The result will be considered correct if it's within 10^{-4} from the jury's answer.

Constraints

$$2 \leq \mathbf{N} \leq 200000$$

For each x, y such that $f(x) = y$ we have $-10^9 \leq x \leq 10^9$ and $-10^9 \leq y \leq 10^9$. All x -s in the input are different.

Samples

Input (<i>stdin</i>)	Output (<i>stdout</i>)
3 1 1 2 2 3 4	2
2 1 1.5 3 2.2	0.35