Problem S1: Surmising a Sprinter's Speed

Problem Description

Trick E. Dingo is trying, as usual, to catch his nemesis the Street Sprinter. His past attempts using magnets, traps and explosives have failed miserably, so he's catching his breath to gather observational data and learn more about how fast Street Sprinter is.

Trick E. Dingo and Street Sprinter both inhabit a single straight west-east road with a particularly famous rock on it known affectionately as The Origin. Positions on this straight road are measured numerically according to the distance from The Origin, and using negative numbers for positions west of The Origin and positive numbers for positions east of The Origin.

The observations by Trick E. Dingo each contain two numbers: a time, and the value of Street Sprinter's position on the road at that time. Given this information, what speed must Street Sprinter must be capable of?

Input Specification

The first line contains a number $2 \leq N \leq 100\,000$, the number of observations that follow. The next N lines each contain an integer $0 \leq T \leq 1\,000\,000\,000$ indicating the time, in seconds, of when a measurement was made, and an integer $-1\,000\,000\,000 \leq X \leq 1\,000\,000\,000$ indicating the position, in metres, of the Street Sprinter at that time. No two lines will have the same value of T.

For 7 of the 15 available marks, $N \leq 1000$.

Output Specification

Output a single number X, such that we can conclude that Street Sprinter's speed was at least X metres/second at some point in time, and such that X is as large as possible. If the correct answer is C, the grader will view X as correct if $|X - C|/C < 10^{-5}$.

Sample Input 1
```
3
0 100
20 50
10 120
```

Output for Sample Input 1
```
7.0
```

Explanation of Output for Sample Input 1

Since the Street Sprinter ran from position 100 to position 120 between time 0 and time 10, we know its speed must have been at least 2 at some point in time: if it was always less than 2, then the distance of 20 could not be covered in 10 seconds. Likewise, the speed must have been at least 7 in order to travel between position 120 and 50 in 10 seconds.

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Sample Input 2
```
5
20 -5
0 -17
10 31
5 -3
30 11
```

Output for Sample Input 2
```
6.8
```

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