

Prime Cut 3

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 100 · problem code: primecut3 · author: caneToadCoad

Wahoo!

It's a me, Mario! I need you to help me win a round of Mario Party Jamboree (TM).

I have to play a minigame with my bro, Luigi, called Prime cut. In this game I get a steak and cut it in 2 equal portions, can you find a cut for me?

The steak is a 2d convex polygon (no internal angle is greater than 180 degrees). You have to find the value of a such that the line $x=a$ cuts the steak into 2 pieces of equal size. In other words, you have to find the vertical line that splits the steak into 2 halves.

Input

The first line has one integer, n , the number of points in the steak The next n lines each have 2 integers, $x_i y_i$, the x and y value of the i th point.

- $-1e4 \leq x_i, y_i \leq 1e4$
- $1000 \leq n \leq 1e5$

It is guaranteed that no 3 successive points in the the steak are collinear, or form an internal angle greater than 180 degrees. All points are distinct.

Output:

Give me the x -value of the line that divides the steak in 2. Answers within $1e-3$ will be accepted.

Sample Input:

```
3
0 0
1 1
0 1
```

Sample Output:

```
0.2928931713
```

Sample Input:

```
4
1 1
3 1
3 4
1 4
```

Sample Output:

```
2
```

Sample Input:

```
5
0 0
1 0
1 1
0 2
-1 1
```

Sample Output:

```
0.1291712523
```