G. Armistice Area Apportionment

After a drawn-out mooclear arms race, Farmer John and the Mischievous Mess Makers have finally agreed to establish peace. They plan to divide the territory of Bovinia with a line passing through at least two of the n outposts scattered throughout the land. These outposts, remnants of the conflict, are located at the points $(x_1, y_1), (x_2, y_2), ..., (x_n, y_n)$.

In order to find the optimal dividing line, Farmer John and Elsie have plotted a map of Bovinia on the coordinate plane. Farmer John's farm and the Mischievous Mess Makers' base are located at the points $P = (a, 0)$ and $Q = (-a, 0)$, respectively. Because they seek a lasting peace, Farmer John and Elsie would like to minimize the maximum difference between the distances from any point on the line to P and Q.

Formally, define the **difference** of a line relative to two points P and Q as the smallest real number d so that for all points X on line , $|PX - QX| \le d$. (It is guaranteed that d exists and is unique.) They wish to find the line passing through two distinct outposts (x_i, y_i) and (x_j, y_j) such that the difference of relative to P and Q is minimized.

Input

The first line of the input contains two integers n and a ($2 \le n \le 100\,000$, $1 \le a \le 10\,000$) — the number of outposts and the coordinates of the farm and the base, respectively.

The following n lines describe the locations of the outposts as pairs of integers (x_i, y_i) ($|x_i|, |y_i| \le 10\,000$). These points are distinct from each other as well as from P and Q.

Output

Print a single real number—the difference of the optimal dividing line. Your answer will be considered correct if its absolute or relative error does not exceed 10^{-6}.

Namely: let's assume that your answer is a, and the answer of the jury is b. The checker program will consider your answer correct, if .

Examples

input

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

output

```
7.2111025509
```

input

```
3 6
0 1
2 5
0 -3
```

output

```
0.0000000000
```

Note

In the first sample case, the only possible line is $y = x - 1$. It can be shown that the point X which maximizes $|PX - QX|$ is $(13, 12)$, with , which is .

In the second sample case, if we pick the points $(0, 1)$ and $(0, -3)$, we get as $x = 0$. Because $PX = QX$ on this line, the minimum possible difference is 0.