

## G. Armistice Area Apportionment

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

After a drawn-out nuclear 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  $(x_1, y_1), (x_2, y_2), \dots, (x_n, y_n)$ .

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,  $|PX - QX| \leq d$ . (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  $a$  ( $2 \leq n \leq 100\,000$ ,  $1 \leq a \leq 10\,000$ ) — 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  $(x_i, y_i)$  ( $|x_i|, |y_i| \leq 10\,000$ ). 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.