

## Problem J. Most distant point from the stations

- Time Limit: 2 sec

### Problem Statement

JAG-island is a rectangular island on the  $xy$ -plane. The 4 coastlines of JAG-island are parallel to the  $x$ -axis or the  $y$ -axis. The left-bottom and right-top corners of JAG-island are located at  $(0, 0)$  and  $(W, H)$ , respectively.

There are  $N$  stations in JAG-island. The  $i$ -th station is located in  $(x_i, y_i)$ . You are interested in the coordinates that maximize the (Euclidean) distance to the nearest station. Find the distance from such a coordinate to its nearest station. In other words, calculate the value of

$$\max_{0 \leq x \leq W} \min_{0 \leq y \leq H} \min_i \sqrt{(x - x_i)^2 + (y - y_i)^2}.$$

### Input

```
N W H
x1 y1
⋮
xN yN
```

The first line of the input consists of three integers, the number  $N$  ( $1 \leq N \leq 2,000$ ) of stations, the width  $W$  and the height  $H$  ( $1 \leq W, H \leq 1,000$ ) of JAG-island.

The  $i$ -th of the following  $N$  lines has two integers  $x_i$  and  $y_i$  ( $0 \leq x_i \leq W, 0 \leq y_i \leq H$ ), which represent the coordinate of the  $i$ -th station. The coordinates of stations are distinct, i.e.  $(x_i, y_i) \neq (x_j, y_j)$  for any  $i, j (i \neq j)$ .

### Output

Print the answer in a line. Absolute or relative errors less than  $10^{-6}$  are permissible.

Sample Input 1	Sample Output 1
1 1 1 0 0	1.41421356237
Sample Input 2	Sample Output 2
1 4 4 2 2	2.82842712475
Sample Input 3	Sample Output 3
2 6 6 3 1 3 5	3.60555127546
Sample Input 4	Sample Output 4
4 10 10 1 1 1 9 9 1 9 9	5.65685424949

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**Sample Input 5**

```
9 10 10
1 1
1 5
1 9
5 1
5 5
5 9
9 1
9 5
9 9
```

**Sample Output 5**

```
2.82842712475
```