

# Most Distant



Keko has  $N$  dots in a 2-D coordinate plane. He wants to measure the gap between the most distant two dots. To make the problem easier, Keko decided to change each dot's  $x$  or  $y$  coordinate to zero.

Help Keko calculate the distance!

## Input Format

The first line contains an integer,  $N$ , the number of dots.

The next  $N$  lines each contain the integer coordinates of the dots in  $(x, y)$  fashion.

## Constraints

$$2 \leq N \leq 10^6$$

$$-10^9 \leq x_i, y_i \leq 10^9$$

It is guaranteed that all dots are distinct, and either their  $x$  or  $y$  coordinate is equal to 0.

## Output Format

Print the distance between the most distant dots with an absolute error of, at most,  $10^{-6}$ .

## Sample Input

```
4
-1 0
1 0
0 1
0 -1
```

## Sample Output

```
2.000000
```

## Explanation

In the sample, the most distant dots are located at  $(-1, 0)$  and  $(1, 0)$ .

The distance between them is 2.