COCI '20 Contest 2 #2 Odašiljači

Time limit: 1.0s **Memory limit:** 512M

Sadly, this is the last time Sean will play James Bond.

His mission is to network n antennas that are scattered across a vast desert, which can be represented as a 2D plane. He will set the transmission radius of each antenna to be the **same** non-negative real number r. The range of an antenna is defined as the set of all points whose distance to the antenna is at most r. If ranges of two antennas have a common point, those antennas can directly communicate. Also, if antennas A and B can communicate, as well as antennas B and C, then antennas A and C are also able to communicate, through antenna B.

Sean wants to network the antennas, i.e. make it possible for every two antennas to communicate. Since M has limited his spending for this mission, and larger radii require more money, Sean will choose the **smallest possible radius** r. Help him solve this problem!

Input

The first line contains an integer n $(1 \leq n \leq 1\,000)$, the number of antennas.

Each of the following n lines contains integers x_i and y_i $(0 \leq x_i, y_i \leq 10^9)$, coordinates of the i-th antenna.

Output

Output the minimal radius.

Your answer will be considered correct if its absolute or relative error doesn't exceed 10^{-6}.

Scoring

In test cases worth 50% points it holds that $1 \leq n \leq 100$.

Sample Input 1

```
2
1 1
2 2
```

Sample Output 1

```
0.7071068
```

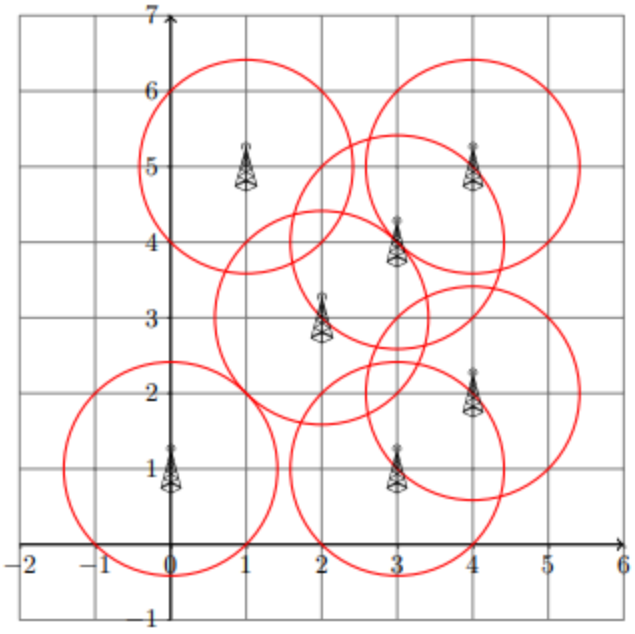
Sample Input 2

```
7
2 3
3 4
4 5
0 1
3 1
4 2
1 5
```

Sample Output 2

```
1.4142135
```

Explanation for Sample Output 2



Sample Input 3

```
4
2020 20
20 2020
2020 2020
20 20
```

Sample Output 3

```
1000.0000000
```