ECOO '18 R2 P4 - Three Squares

Time limit: 13.0s **Memory limit:** 128M

Given N distinct points on a 2D plane, you would like to place three identical, axis-aligned squares on the plane such that every point is either inside or on the border on one of the squares.

Let L be the side length of the squares. What is the minimum possible value of L such that all the points can be covered?

Input Specification

The standard input will contain 10 datasets. Each dataset begins with an integer N $(4 \leq N \leq 100\,000)$. The next N lines each contain two integers X, Y $(-10^9 \leq X, Y \leq 10^9)$, the points in the plane.

For the first 4 cases, $N \leq 30$.

Output Specification

For each dataset, output the value of L.

Sample Input (Two Datasets Shown)

```
4
1 1
2 2
3 3
4 4
5
1 1
2 1
-2 -1
4 4
-4 -2
```

Sample Output

```
1
2
```