Maximum perimeter
P57181_en

Novè Concurs de Programació de la UPC - Final (2011-09-21)

Given n different points on the plane, pick any three of them so that the perimeter of the resulting triangle is maximum.

Input

Input consists of several cases, each with n followed by n pairs of integer coordinates (x, y). Assume $3 \leq n \leq 10^4$, $-10^8 \leq x, y \leq 10^8$, and that no three given points are colinear.

Output

For every case, print the maximum perimeter of all the possible triangles with four digits after the decimal point. The input cases have no precision issues.

Observation

All "big" private test cases were built by choosing a "typical" geometric figure (such as a rectangle, a triangle, a circle, an ellipse, or alike), and placing n points at random inside it, always avoiding repeated points and points that would be collinear with two other points.

Sample input

```
3   0 0   0 1   1 0
5   -1 1   3 2   1 1   -2 -1   1 -3
```

Sample output

```
3.4142
14.8217
```

Problem information

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