
Never trust Ivan (2)

P46204_en

Tretzè Concurs de Programació de la UPC - Semifinal (2015-07-01)

Given n points on the plane $p_1 \dots p_n$ no three of which are collinear, find a permutation of the points $p_{i_1} \dots p_{i_n}$ such that the n segments $(p_{i_1}, p_{i_2}), (p_{i_2}, p_{i_3}), \dots, (p_{i_{n-1}}, p_{i_n}), (p_{i_n}, p_{i_1})$ form a non-degenerate polygon, that is, one that does not cross itself.

Input

Input consists of several cases, each one with n followed by n points with integer coordinates not larger than 10^7 in absolute value. Assume $3 \leq n \leq 10^4$, and that no three given points are collinear.

Output

For every case, print a correct polygon constructed from the n points. If there is more than one solution, print any of them. If there is no solution, print "Ivan is a troll".

Sample input

```
4 0 0 1 1 0 1 1 0
3 0 0 10 10 15 20
5 -1 -1 -3 -3 -1 1 1 -2 -2 0
4 0 0 -1 1 0 -1 1 -2
7 -9 -4 0 -5 2 3 1 7 0 0 5 -5 1 4
```

Sample output

```
1 4 2 3
1 2 3
2 4 1 3 5
3 4 1 2
1 2 6 5 3 7 4
```

Problem information

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