

Point Travel

time limit per test: 5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

points: 1 · problem code: pondopointtravel · author: jszqlew

Problem Statement

You are given n integer coordinates in a two dimensional plane.

Determine a path (going from point to point) which has a total Manhattan distance travelled of less than $3 \cdot 10^9$.

NOTE: The Manhattan distance of (x, y) to (p, q) is $|x - p| + |y - q|$.

Input Statement

Your first line will contain n . Your next n lines will contain two space-separated integers each x and y representing the point (x, y) on the two dimensional plane.

Output Statement

You should output n points, containing each of the points you have been given, in the order of the path that you will take.

Constraints

- $1 \leq n \leq 10^6$
- $0 \leq x, y \leq 10^6$

Sample Cases

Input 1

```
6
0 0
0 1000000
1 1000000
1000000 0
1000000 1000000
1000000 1000000
```

Output 1

```
1 1000000
0 0
1000000 1000000
0 1000000
1000000 1000000
1000000 0
```

Explanation 1

To be honest, the sample cases won't really help, but they are here anyway. Notice any path you take in this case will have total distance travelled less than $3 \cdot 10^9$. Notice there are repeated coordinates and