E. Points on Plane

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

On a plane are n points (x_i, y_i) with integer coordinates between 0 and 10^6. The distance between the two points with numbers a and b is said to be the following value: (the distance calculated by such formula is called *Manhattan distance*).

We call a hamiltonian path to be some permutation p_i of numbers from 1 to n. We say that the length of this path is value .

Find some hamiltonian path with a length of no more than 25×10^8. Note that you do not have to minimize the path length.

Input

The first line contains integer n ($1 \le n \le 10^6$).

The $i + 1$-th line contains the coordinates of the i-th point: x_i and y_i ($0 \le x_i, y_i \le 10^6$).

It is guaranteed that no two points coincide.

Output

Print the permutation of numbers p_i from 1 to n — the sought Hamiltonian path. The permutation must meet the inequality .

If there are multiple possible answers, print any of them.

It is guaranteed that the answer exists.

Examples

input
5 0 7 8 10 3 4 5 0 9 12
output
4 3 1 2 5

Note

In the sample test the total distance is:

$$(|5 - 3| + |0 - 4|) + (|3 - 0| + |4 - 7|) + (|0 - 8| + |7 - 10|) + (|8 - 9| + |10 - 12|) = 2 + 4 + 3 + 3 + 8 + 3 + 1 + 2 = 26$$