
Problem A. The Sprawl

Input file: **standard input**
Output file: **standard output**
Time limit: 5 seconds
Memory limit: 1024 megabytes

Kim is playing a city-building simulation game in an infinite chessboard. Every cell is denoted with two integer (x, y) . Two cells are adjacent if they share an edge - formally, cell (x, y) is adjacent with four cells, $\{(x + 1, y), (x, y + 1), (x - 1, y), (x, y - 1)\}$.

In the beginning (day 0), city i occupies the single cell (x_i, y_i) . If a cell is occupied by any city, then it's called **developed cells**. Thus, in day 0, there is exactly N developed cells.

After each day, the city will grow and expand itself by occupying any undeveloped adjacent cells. Formally, for each city i , let S_i be the set that is adjacent to at least one cell in city i . Starting from city 1 to city n , any undeveloped cell in S_i becomes the part of city i , and become developed.

We call two city u, v "connected when you can move between (x_u, y_u) to (x_v, y_v) by only passing between adjacent developed cells. For two city u, v , let $f(u, v)$ the first day where two city u, v become connected. Kim is interested in each values of $f(u, v)$, but there are too much values to consider. Thus, Kim only want to calculate $\sum_{1 \leq i < j \leq N} f(u, v)$ for a given first developed cells.

Input

The first line contains the number of city N . ($1 \leq N \leq 250000$)

In next N lines, the position of i -th city's starting cell is given as two integer x_i, y_i . ($-10^7 \leq x_i, y_i \leq 10^7$). All given cells are distinct.

Output

Print $\sum_{1 \leq i < j \leq N} f(u, v)$, when $f(u, v)$ is the first day where two city u, v become connected.

Examples

standard input	standard output
5 -3 2 0 0 0 5 1 2 4 3	19
3 0 2 4 0 0 0	5

Note

In Day 0 : 100000 000000 300020

In Day 1 : 110000 100020 330222

In Day 2 : 111020 110222 332222

$f(1, 2) = 2, f(1, 3) = 1, f(2, 3) = 2$. Thus the answer is 5.