

Problem K. Stains

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 512 mebibytes

There are N stains on Snuke's desk. The coordinates of the i -th stain are (x_i, y_i) .

Snuke wants to add zero or more stains and create an interesting pattern. A set of stains is interesting if the number of stains is K^2 for some integer K and they form a square grid of size $K \times K$. Note that this square grid is not necessarily parallel to coordinate axes.

Formally, a square grid of size $K \times K$ is the set of K^2 different points $(a + ci + dj, b + di - cj)$ for all values i and j such that $0 \leq i, j \leq K - 1$ and some constants a, b, c , and d .

Compute the minimum number of stains Snuke must add to create a square grid. Assume that the desk is sufficiently large and he can add new stains at any coordinates. All input coordinates are integers, but the coordinates of new stains don't necessarily have to be integers.

Input

First line of the input contains one integer N ($1 \leq N \leq 10^5$). Each of the next N lines contains coordinates x_i and y_i of some stain ($0 \leq x_i, y_i \leq 10^9$). No two stains share the same position.

Output

Print the answer in a single line.

Example

standard input	standard output
3 1 5 3 6 4 9	6

Note

For example, you can add stains at the following six points: $(5, 7)$, $(0, 7)$, $(2, 8)$, $(-1, 9)$, $(1, 10)$, and $(3, 11)$.