Building Mistakes (polygon)

As building a house is a hard process, you should seriously consider asking an engineer pieces of advice and plans. Despite this, Luca ignored Marco's warnings and decided to try building his house himself. Following the well-known proverb *"you cannot build the roof without the floor"*, he started from building the floor. He was so happy with the newly purchased tiles that he placed all the 100×100 tiles, forming a square, even before raising the walls!

Rare picture of Luca placing his tiles before realizing the mistake. 2020, colorized.

What a terrible mistake! Now he has to break and throw away some of his tiles in order to raise the planned walls, keeping only those completely inside the house. The original plan of the house has the shape of a polygon and luckily all the vertexes of this polygon coincide with a corner of a tile.

How many tiles will survive the raising of the walls?

> ☞ Among the attachments of this task you may find a template file `polygon.*` with a sample incomplete implementation.

Input

The first line contains the only integer F, the number of walls to build. The next F lines contain two integers each: X_i and Y_i, the coordinates of the vertexes of the polygon.

Output

You need to write a single line with an integer: the number of tiles that are completely inside the polygon.

Constraints

- $3 \leq F \leq 1000$.
- $0 \leq X_i, Y_i \leq 100$ for $0 \ldots F-1$.
- The walls do not intersect, thus two walls share a point if and only if they are adjacent.
- The angle between two adjacent walls is not zero nor 360 degrees.
- All the coordinates are distinct.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (10 points) The polygon is a rectangle.

– **Subtask 3** (20 points) All the sides are vertical or horizontal.

– **Subtask 4** (20 points) $F = 3$ and $Y_0 = Y_1$.

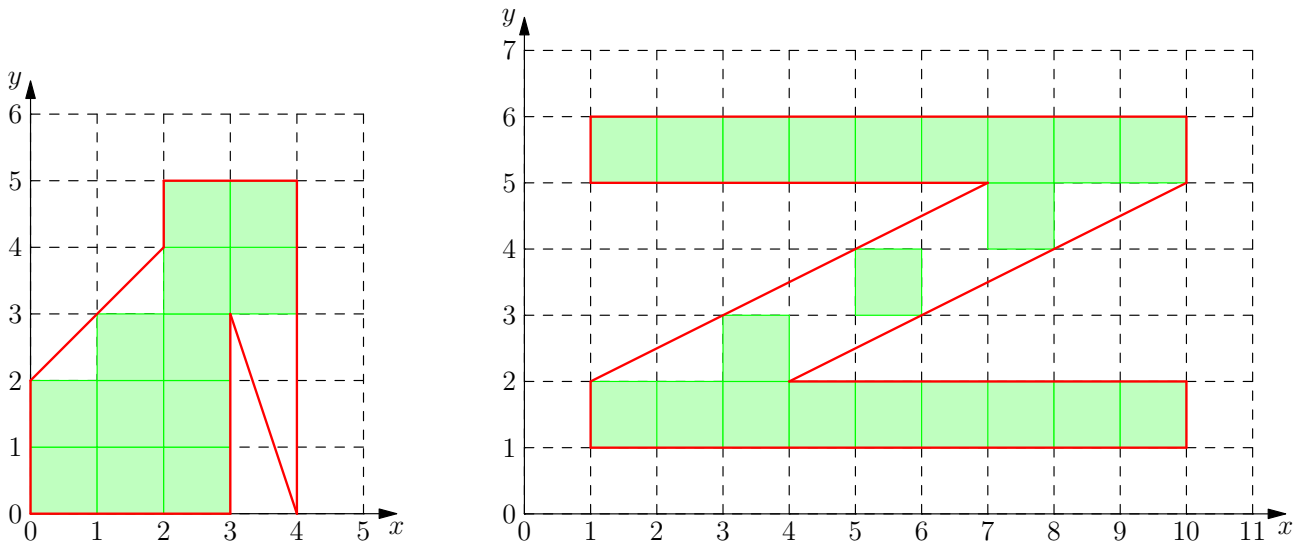
– **Subtask 5** (20 points) The polygon is convex.

– **Subtask 6** (30 points) No additional limitations.

Examples

input	output
8 0 0 3 0 3 3 4 0 4 5 2 5 2 4 0 2	12
10 1 1 10 1 10 2 4 2 10 5 10 6 1 6 1 5 7 5 1 2	21

Explanation



Visualization of the two sample cases (first on the left, second on the right).

The images show only the relevant portion of the floor tiled with 100×100 tiles. Red lines represent the walls that need to be raised; the surviving tiles are highlighted in green.