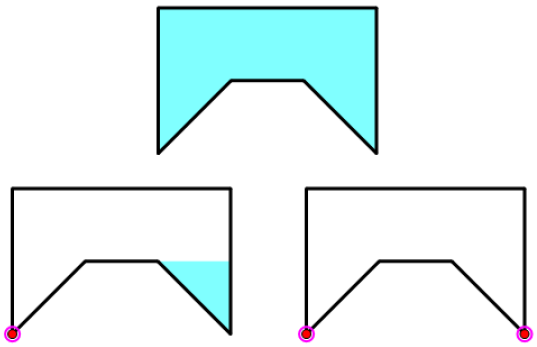
Problem M. Drain the Water Tank

The water plant has made a new water tank with a polygon shape and negligible thickness recently.

To bring the water tank into service, the engineers are going to install some drain valves on the tank. A drain valve is considered a point on the water tank, and the water will flow out of the tank through the drain valve when it is on.



As illustrated above, valves are represented by purple dots and the light blue areas are the water remaining in the tank after all valves are turned on.

You, as the chief engineer, are willing to know the minimum number of drain valves needed so that all the water in the tank can be drained off when turning on all the drain valves simultaneously.

You may assume that the water is an ideal fluid and no atmospheric pressure here, so the water always tends to flow to somewhere strictly lower, even when the water is on a horizontal stage.

Input

There is only one test case in each test file.

The first line of the input contains an integer n ($3 \le n \le 2 \times 10^3$) indicating the number of vertices of the polygon (that is, the shape of the water tank).

For the following n lines, the i-th line contains two integers x_i and y_i ($|x_i|, |y_i| \le 10^4$) indicating the coordinate of the i-th vertex of the polygon. Vertices are given in counter-clockwise order.

The polygon is simple. That is, its vertices are distinct and no two edges of the polygon intersect or touch, except that consecutive edges touch at their common vertex. It is **NOT** guaranteed that no two consecutive edges are collinear.

Output

Output one line containing one integer indicating the minimum number of drain valves that suffices to drain the water tank.

Examples

standard input	standard output
6 0 0 1 1 2 1 3 0 3 2 0 2	2
8 4 4 0 4 0 2 1 2 2 2 2 0 3 0 4 0	1
7 1 0 3 4 0 3 1 2 2 3 1 1 0 2	2

Note

In the first sample test case, two drain valves installed at $(0, 0)$ and $(3, 0)$ are sufficient to drain the water tank.

In the second sample test case, a single drain valve installed at $(3, 0)$ is sufficient to drain the water tank. Actually, it is sufficient to install the valve at $(x, 0)$ where $2 \leq x \leq 4$.

In the third sample test case, two drain valves installed at $(1, 0)$ and $(1, 2)$ are sufficient to drain the water tank.

