

Problem D

Trees on My Island

Input: standard input

Output: standard output

I have bought an island where I want to plant trees in rows and columns. So, the trees will form a rectangular grid and each of them can be thought of having integer coordinates by taking a suitable grid point as the origin.

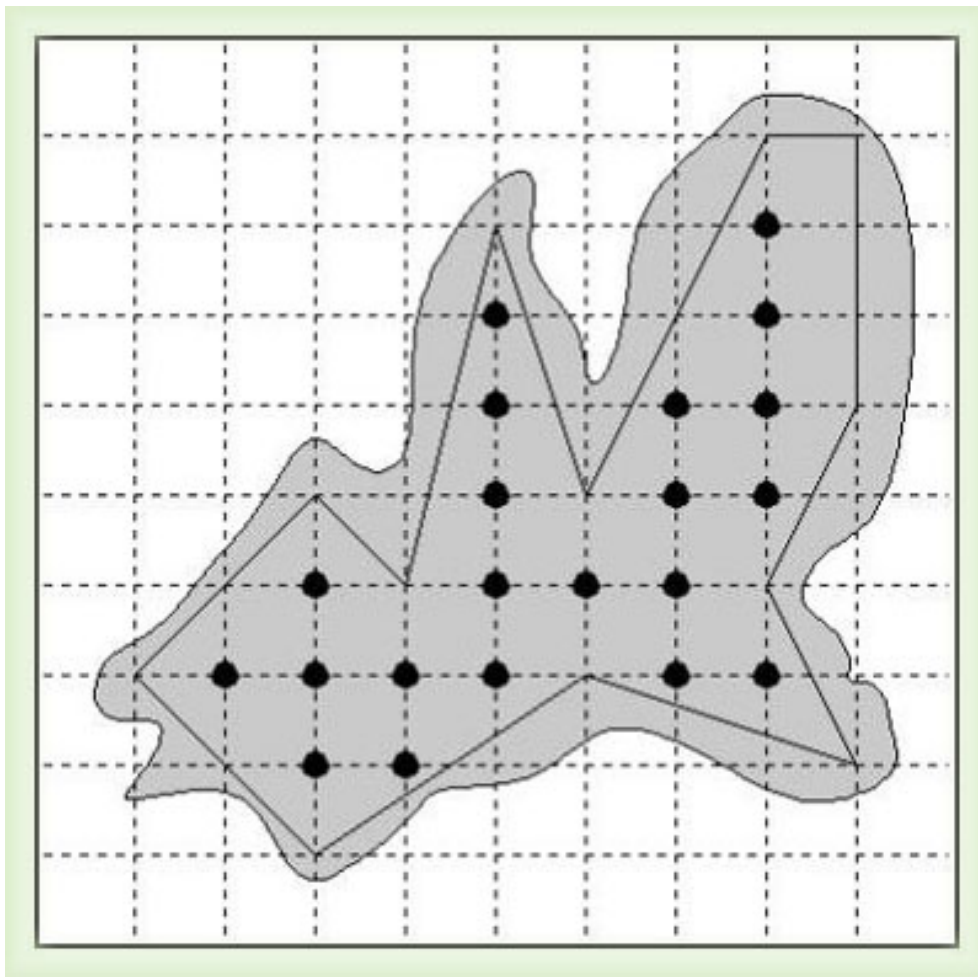


Figure: A sample of my island

But, the problem is that the island itself is not rectangular. So, I have identified a simple polygonal area inside the island with vertices on the grid points and have decided to plant trees on grid points lying strictly inside the polygon.

Now, I seek your help for calculating the number of trees that can be planted on my island.

Input

The input file may contain multiple test cases. Each test case begins with a line containing an integer N ($3 \leq N \leq 1,000$) identifying the number of vertices of the polygon. The next N lines contain the vertices of the polygon either in clockwise or in anti-clockwise direction. Each of these N lines contains two integers identifying the x and y -coordinates of a vertex. You may assume that none of the coordinates will be larger than 1,000,000 in absolute values.

A test case containing a zero for N in the first line terminates the input.

Output

For each test case in the input print a line containing the number of trees that can be planted inside the polygon.

Sample Input

```

12
3 1
6 3
9 2
8 4
9 6
9 9
8 9
6 5
5 8
4 4
3 5
1 3
12
1000 1000
2000 1000
4000 2000
6000 1000
8000 3000
8000 8000
7000 8000
5000 4000
4000 5000
3000 4000
3000 5000
1000 3000
0

```

Sample Output

21
25990001

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What we see is often what we look for.