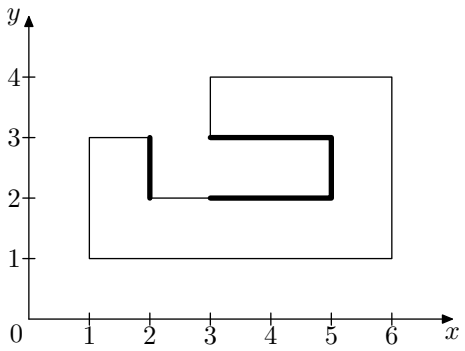
Problem I. Intelligence in Perpendicularia

Input file:	intel.in	Time limit:	3 seconds
Output file:	intel.out	Memory limit:	512 megabytes

There are only two directions in Perpendicularia: vertical and horizontal. Perpendicularia government are going to build a new secret service facility. They have some proposed facility plans and want to calculate total secured perimeter for each of them.

The total secured perimeter is calculated as the total length of the facility walls invisible for the perpendicularly-looking outside observer. The figure below shows one of the proposed plans and corresponding secured perimeter.



Write a program that calculates the total secured perimeter for the given plan of the secret service facility.

Input

The plan of the secret service facility is specified as a polygon.

The first line of the input contains one integer n — the number of vertices of the polygon ($4 \le n \le 1000$). Each of the following n lines contains two integers x_i and y_i – the coordinates of the i-th vertex ($-10^6 \le x_i, y_i \le 10^6$). Vertices are listed in the consecutive order.

All polygon vertices are distinct and none of them lie at the polygon's edge. All polygon edges are either vertical ($x_i = x_{i+1}$) or horizontal ($y_i = y_{i+1}$) and none of them intersect each other.

Output

Output a single integer — the total secured perimeter of the secret service facility.

Example

intel.in	intel.out
10 1 1 6 1 6 4 3 4 3 3 5 3 5 2 2 2 2 3 1 3	6