ReTravel

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

On the xy-plane, there are N points labeled $1, 2, \ldots, N$. The coordinates of point i ($1 \leq i \leq N$) are (X_i, Y_i).

There is a robot at the origin of this plane. Your task is to control the robot to visit all the points $1, 2, \ldots, N$ **in this order**.

The robot has a string variable S, which is initially an empty string. You can move the robot using the following four types of operations:

- **Operation 1:** Increase the robot's x coordinate by 1 and append `X` to the end of S. This operation costs 1.
- **Operation 2:** Increase the robot's y coordinate by 1 and append `Y` to the end of S. This operation costs 1.
- **Operation 3:** Decrease the robot's x coordinate by 1 and remove the last character of S. This operation can only be performed if the last character of S is `X`. This operation costs 0.
- **Operation 4:** Decrease the robot's y coordinate by 1 and remove the last character of S. This operation can only be performed if the last character of S is `Y`. This operation costs 0.

Find the minimum cost required for the robot to visit all points $1, 2, \ldots, N$ in this order.

Input

The input is given in the following format:

N
X_1 Y_1
X_2 Y_2
$\vdots$
X_N Y_N

- All input values are integers.
- $1 \leq N \leq 500$
- $0 \leq X_i, Y_i \leq 10^9$

Output

Output the minimum cost required for the robot to visit all points in order.

Examples

standard input	standard output
2 3 3 1 2	6
3 2 2 3 3 1 3	7

Note

In the first example, by performing **Operation 1** once, **Operation 2** three times, and **Operation 1** twice, you can reach point 1. Then, by performing **Operation 3** twice and **Operation 4** once, you can reach point 2.

The total cost of this sequence of operations is the sum of the number of times **Operations 1** and **2** are performed, which is 6.