

Art Class II

Input File: artin.txt
Output File: artout.txt

Time and Memory Limits: 1 second, 1 GB

You and your classmates were being a little too rowdy during art class this morning and have made a bit of a mess.

There's a large, usually blank wall at the back of the classroom. Unfortunately, the class (mostly you, honestly) have made N holes in the wall. The i th hole is located x_i centimetres from the left edge of the wall, and y_i centimetres from the bottom edge of the wall.

You and your class have decided to create a single large poster to put on the wall to cover the holes.

To be as inconspicuous as possible, your poster should be:

- rectangular in shape
- hung so its sides are parallel to the edges of the wall
- large enough to cover all of the holes.

Note that a hole on the very edge of the poster will still be hidden (seems like your teacher forgot their glasses today).

You don't have a lot of time before the teacher returns, so you've decided to write a program that will tell you the area of the smallest poster that will cover all the holes.

Input

- The first line of input contains the single integer N .
- The next N lines describe the location of the holes. The i th line contains the two integers x_i and y_i .

Output

Your program should output a single integer, the area (in square centimetres) of the smallest poster that will cover all the holes.

Sample Input 1

```
5
2 3
3 1
4 2
4 4
6 1
```

Sample Input 2

```
4
4 4
3 3
5 5
1 1
```

Sample Input 3

```
2
2 1
3 1
```

Sample Output 1

```
12
```

Sample Output 2

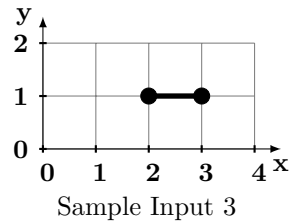
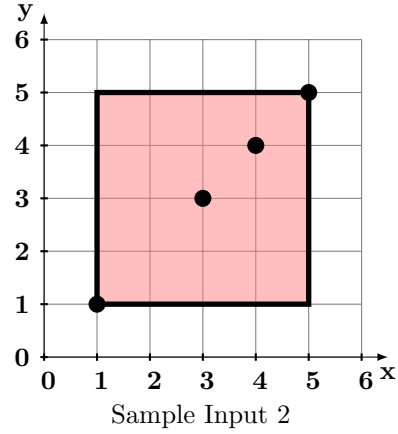
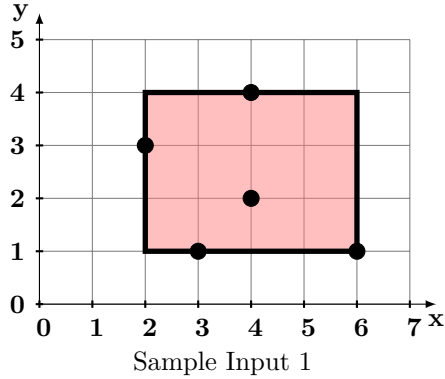
```
16
```

Sample Output 3

```
0
```

Explanation

Each of the sample cases are illustrated below. Note that in the third sample input, the holes can be covered by an infinitely thin poster with a height of zero. The area of this poster is zero.



Subtasks & Constraints

For all test cases:

- $2 \leq N \leq 100\,000$.
- $1 \leq x_i \leq 10\,000$, for all i .
- $1 \leq y_i \leq 10\,000$, for all i .

Additionally:

- For Subtask 1 (40 points), $N = 2$.
- For Subtask 2 (40 points), $x_i = y_i$, for all i . See Sample Input 2 for an example.
- For Subtask 3 (20 points), no special constraints apply.