

Area of Rectangles

Time: 5 sec / Memory: 256 MB

Problem Statement

Given n rectangles in the 2-D plane, your task is to compute the area of their union.

Input

The first input line has an integer n : the number of rectangles. After that, there are n lines describing the rectangles. Each line has four integers x_1, y_1, x_2 and y_2 : a rectangle with lower-left corner (x_1, y_1) and upper-right corner (x_2, y_2) .

Output

Print the area of the union of the rectangles.

Constraints

- $1 \leq n \leq 10^5$
- $-10^6 \leq x_1 < x_2 \leq 10^6$
- $-10^6 \leq y_1 < y_2 \leq 10^6$

Example

Input1:

```
3
1 3 4 5
3 1 7 4
5 3 8 6
```

Output1:

