South African Computer Olympiad
Online Camp 2008
Day 1

Introduction

Jack desperately wants to marry his school sweetheart, Jill. But before Jill will consent to marriage, she sets a hard puzzle for Jack so that he can show how serious he is about marriage.

Jill takes all the rectangular love letters that Jack has ever sent her, and scatters them on the floor, with some letters overlapping others. For Jack to pass the test, he needs to work out what area of the floor is covered by letters.

Task

Given the positions of all the rectangular letters on the floor, find the total area of floor covered. Note that letters may overlap, meaning that some areas of the floor might be covered by more than one letter.

Example

Given four letters with the following sets of top-left and bottom-right co-ordinates in (x; y) format:

- $(1; 2)$ to $(3; 4)$
- $(1; 1)$ to $(2; 2)$
- $(0; 6)$ to $(7; 8)$
- $(2; 3)$ to $(5; 7)$

The total area of the floor covered by letters is 27 because the sum of the areas of the letters is 31, but 4 of these units are comprised of overlapping letters.

Input (area.in)

The first line of area.in will contain a single integer, N, which specifies the number of rectangles that Jill has thrown onto the plane. The next N lines will each contain 4 integers, x_1, y_1, x_2 and y_2, which specify the bottom left and top right corners of each rectangle. So $(x_1; y_1)$ specifies the bottom left corner and $(x_2; y_2)$ specifies the top right corner.

Sample input

```
4
1 2 3 4
1 1 2 2
0 6 7 8
2 3 5 7
```

Output (area.out)

area.out should contain a single integer which specifies the area occupied by the N rectangles in the input.

Sample output

```
27
```

Constraints

- $0 \leq xi, yi \leq 10000$
- $2 \leq N \leq 10000$

50% constraints

- $0 \leq xi, yi \leq 500$
- $2 \leq N \leq 500$

Time limit

10 seconds.

Scoring

A correct solution will score 100% while an incorrect solution will score 0%.