



Painting patterns

Task: patterns	Day: Friday
Time limit: 3 s	Memory limit: 47 MB

Lukas has a large grid. Initially, all squares of the grid are of white colour. Lukas has three patterns (numbered from one to three, starting with the left one):

XXXX	X.X.	X.X.
....	X.X.	.X.X
XXXX	X.X.	X.X.
....	X.X.	.X.X

He applies patterns on the grid. He chooses a rectangle, chooses a pattern and paints some squares with black colour according to the pattern. He repeats this N times. When painted areas overlap, he obeys the OR rule. For example, if he chooses pattern 1 and then pattern 3 on a square 4×4 , he gets

```
XXXX
.X.X
XXXX
.X.X
```

Task

Your task is to compute number of black squares after Lukas has painted all rectangles. The pattern begins in the top left corner of a rectangle (the lowest x and the highest y coordinate).

Input

In the first line of input, there is number $N(0 \leq N \leq 100,000)$. N lines follow. In each of these lines, there are five integers x_1, y_1, x_2, y_2, p , where x_1, y_1 and x_2, y_2 are the coordinates of grid points in two opposite corners of the rectangle, in which a pattern is applied, and $p(1 \leq p \leq 3)$ is the number of the used pattern. Coordinates of rectangles do not exceed 10^9 in their absolute value and each rectangle is at least one unit high and wide.

In 40% of test cases, $0 \leq N \leq 2000$.

Output

The first and only line of output should contain number of black squares.

Example

input

3
0 0 3 2 3
1 4 4 1 1
2 3 6 0 2

output

13

