Fences

The Myzeqe plain lies between the Shkumbin and Vjosa rivers in Albania. In 1991, its large state farms were divided among the families who worked the land. Because the plain is flat, every boundary was drawn either east–west or north–south, with a fence placed along it.

The fences were built over time, and each extends only as far as its corresponding boundary. Some fences cross, while others do not meet. The cadastral office in Lushnjë has a complete list of the fences and wants to determine how many **fields** they enclose.

Model the plain as the entire coordinate plane, with x increasing to the east and y increasing to the north. There are N fences. Each fence is a horizontal or vertical line segment of positive length.

A point is *open* if it does not lie on any fence. Two open points belong to the same **field** if there is a path between them that consists entirely of open points. Exactly one field is unbounded. All other fields are enclosed and must be counted.

The fences satisfy the following general-position conditions:

- No two fences lie on the same line.
- No endpoint of a fence lies on another fence.

Therefore, whenever two fences meet, one is horizontal and the other is vertical. They cross at a single point in the interior of both fences.

Input format

The first line contains an integer N.

Each of the next N lines contains four integers x_1, y_1, x_2, and y_2, describing a fence from (x_1, y_1) to (x_2, y_2). Either $x_1 = x_2$ for a north–south fence or $y_1 = y_2$ for an east–west fence, but not both.

Output format

Print one integer: the number of enclosed fields.

Constraints

- $2 \leq N \leq 200\,000$
- $0 \leq x_1, y_1, x_2, y_2 \leq 10^9$
- Every fence is horizontal or vertical and has positive length.
- No two fences lie on the same line.
- No endpoint of a fence lies on another fence.

Subtasks

Subtask	Points	Additional constraints
1	20	$N \leq 2000$
2	25	At most 10^6 pairs of fences cross.
3	25	The fences form a single connected piece: it is possible to travel from any fence to any other along the fences, switching fences only at a crossing.
4	30	No additional constraints.

Examples

Example 1

Input:

```
4
2 0 2 8
6 0 6 8
0 2 8 2
0 6 8 6
```

Output:

```
1
```

The four fences enclose the square $2 < x < 6$, $2 < y < 6$. No other field is enclosed, so the answer is 1.

Example 2

Input:

```
6
2 0 2 12
6 0 6 12
10 0 10 12
0 2 12 2
0 6 12 6
0 10 12 10
```

Output:

```
4
```

The three north–south fences and three east–west fences enclose four fields.

Example 3

Input:

```
8
2 0 2 8
6 0 6 8
0 2 8 2
0 6 8 6
22 20 22 28
26 20 26 28
20 22 28 22
20 26 28 26
```

Output:

```
2
```

The arrangement contains two separate copies of Example 1. Each copy encloses one field, so the answer is 2.