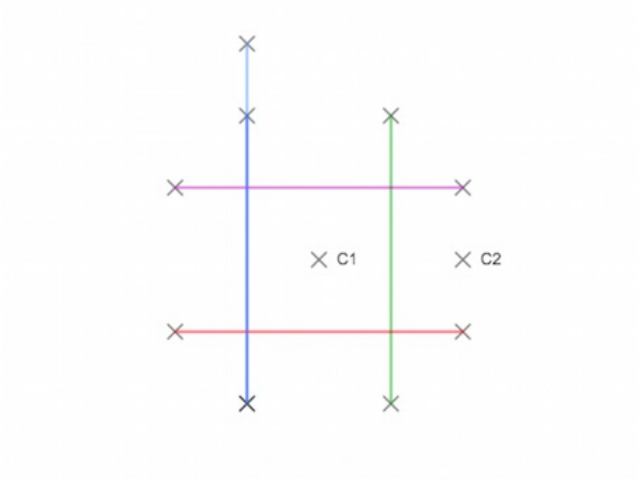
Split Plane

Consider n line segments on a plane with vertices at integer coordinates. Each line segment is either vertical or horizontal, meaning it has endpoints at (x_1, y_1) and (x_2, y_2) that satisfy either $x_1 = x_2$ or $y_1 = y_2$ (but not both).

Consider a set, S, of all points that don't belong to the union of the segments (i.e., all points that are not part of a line segment). Two points $a, b \in S$ are in the same *connected component* if we can form a continuous curved line using points from S that has endpoints at a and b.

For example, the diagram below has two connected components. Because no continuous line can join points $C1$ and $C2$ without passing through a line segment, we know that $C1$ is in one component and $C2$ is in the other component:



Solve q queries, where each query consists of n line segments. For each query, print the number of connected components on a new line.

Input Format

The first line contains an integer denoting q (the number of queries). The subsequent lines describe each query in the following format:

1. The first line contains an integer denoting n.
2. Each of the n subsequent lines describes the respective values of x_1, y_1, x_2, and y_2 for the endpoints of a line segment.

Constraints

- $1 \leq q \leq 15$
- $1 \leq n \leq 10^5$
- $-10^9 \leq x_1, x_2, y_1, y_2 \leq 10^9$
- The total number of line segments in all queries doesn't exceed 10^5.

Output Format

For each query, print the number of connected components formed by the line segments on a new line.

Sample Input 0

```
2
5
```

```
1 3 1 4
2 0 2 3
4 2 4 3
0 1 3 1
0 2 3 2
5
-1 -2 -1 2
1 -2 1 2
2 -1 -2 -1
2 1 -2 1
-1 -2 -1 3
```

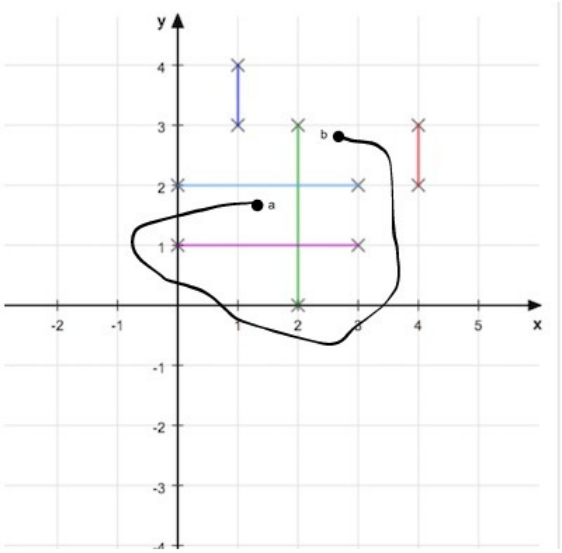
Sample Output 0

```
1
2
```

Explanation 0

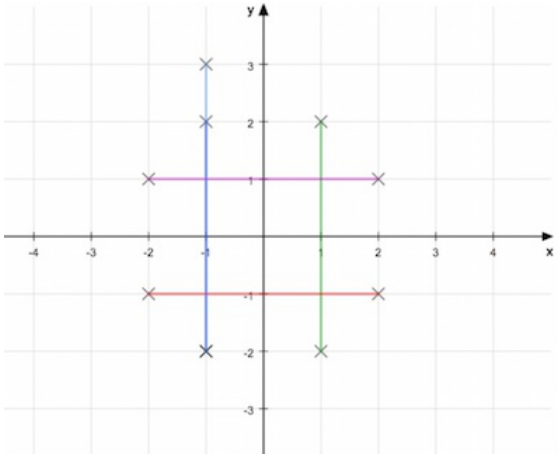
We perform the following $q = 2$ queries:

1. The diagram below depicts the set of line segments for the first query:



   We can draw a continuous line that joins any two points without passing through a line segment (axis lines are not line segments), so this graph only has one connected component and we print 1 on a new line.

2. The diagram below depicts the set of line segments for the second query:



   This graph has two connected components as depicted by $C1$ and $C2$ in the image given in problem statement; one component includes everything inside the square bounded by $x = \pm 1$ and $y = \pm 1$, and the other component consists of all the remaining points in S. Thus, we print 2 on a new line.