

Criss-Cross

by Godmar Back

Kai is bored during his operating systems class, so he draws doodles on a sheet of paper. He feels like drawing abstract art using his ruler: he draws line segments by choosing two points in the plane and connecting them. Lots of them.

Can you write a program that counts the number of distinct points at which the line segments he drew intersect or touch?

Input

The first line in the input contains an integer n ($1 \leq n \leq 1000$) which is the number of segments. The following n lines contain four integers x_1, y_1, x_2, y_2 ($-1000000 \leq x_1, y_1, x_2, y_2 \leq 1000000$). Segments have non-zero length, that is, the two points will be distinct: $x_1 \neq x_2$ or $y_1 \neq y_2$ or both.

Output

Output the number of distinct points for which there is at least one pair of line segments that intersects or touches at this point. If there are infinitely many such points, output -1.

Examples

Sample input 1

```
3
1 3 9 5
2 2 6 8
4 8 9 3
```

Sample output 1

```
3
```

Sample input 2

```
3
5 2 7 10
7 4 4 10
2 4 10 8
```

Sample output 2

```
1
```

Sample input 3

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

Sample output 3

```
1
```

Sample input 4

```
2
-1 -2 -1 -1
-1 2 -1 -1
```

Sample output 4

```
1
```

Sample input 5

```
2
0 0 2 2
1 1 -5 -5
```

Sample output 5

```
-1
```

Limits

Time limit is 3 seconds.

Memory limit is 1024 megabytes.