ACM 2014: Not Sew Difficult

A quilt will be made by laying a number of rectangular pieces of fabric onto a square cloth backing. The rectangular pieces will all be laid with one edge parallel to an edge of the cloth backing.

We plan to sew the overlapping pieces together, and need to know the maximum thickness of fabric (not counting the backing) that we will need to push a needle through at any point.

The rectangles will be positioned at non-negative integer coordinates on a 100,000 by 100,000 grid with axes defined by the cloth backing and one corner of the backing treated as the origin. All rectangular pieces will lie entirely within the bounds of the backing cloth.

Pieces overlap only if they do so along a non-zero area. Pieces that are simply adjacent along an edge or at a corner point are not considered overlapping.

Input Format

The input will consist of one or more test cases. Each test case begins with a line containing an integer N, $1 \le N \le 1000$, denoting the number of rectangles. (End of input is signalled by a non-positive value for N.)

This is followed by N lines, each containing four non-negative integers $x_1\ y_1\ x_2\ y_2$, defining the coordinates of two opposite corners of a rectangle.

Note: The values on each line will be separated by one **or more** spaces.

Output Format

For each dataset, print a single line containing an integer D, denoting the maximum depth of overlapping pieces of fabric.

Sample Input 0

```
4
0 0 10 10
1 1 9 9
4 4 10 10
3 3 5 6
3
100 100 200 200
50 60 200 350
150 250 160 260
-1
```

Sample Output 0

```
4
2
```