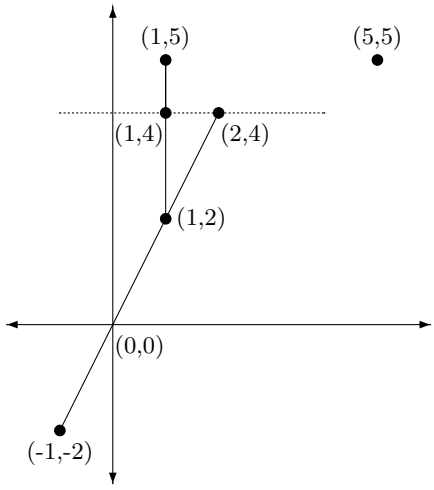
Problem 3 An Airport for Siruseri - II[1]

A grander plan for the Siruseri Airport has emerged from the Airport Authority of Siruseri. The new plan departs from the earlier one and allows for runways that are not parallel to the axes. Runways are simply line segments joining a pair of points on the plane. These endpoints have integer coordinates. There are no other restrictions—runways could be of length 0 (for helicopters?), one runway may be contained in another, runways may intersect, ...

The chief architect, with a penchant for gambling, has already bet a vast sum on an early collision at this airport. To ensure that he wins his bet, he plans to surreptitiously add another runway that intersects the maximum number of existing runways. Out of desperation, he is even willing to relax the restriction on the endpoints of the new runway and allow any pair of real numbers as an endpoint.

Suppose there are four runways to start with and their endpoints are as given below, corresponding to the picture on the right:

(5,5)	(5,5)
(1,4)	(1,5)
(1,2)	(1,5)
(2,4)	(−1,−2)



By building a runway from $(-1, 4)$ to $(4, 4)$ you can intersect three existing runways, as shown by the dotted line. Your task is to help the chief architect determine the maximum number of existing runways that a new runway can intersect.

Input format

The first line of the input contains an integer N, the number of runways in the airport. The next N lines of input describe the runways. For $1 \leq i \leq N$, runway i is described by line $i+1$ consisting of four integers, x_1, y_1, x_2 and y_2, where (x_1, y_1) and (x_2, y_2) describe the endpoints of runway i.

Output format

A single integer giving the maximum number of runways that any new runway can intersect.

Test Data

In all test cases, $2 \leq N \leq 600$ and the coordinates are integers in the range $-10^9 \ldots 10^9$. In test cases worth 40% of the total marks, $2 \leq N \leq 150$.

Limits

Time: 1.5 sec

Memory: 64MB

Sample input

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4
5 5 5 5
1 4 1 5
1 2 1 5
2 4 -1 -2
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Sample output

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3
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[1]Problem formulated by Prateek Karandikar.