A. Square and Rectangles

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given n rectangles. The corners of rectangles have integer coordinates and their edges are parallel to the Ox and Oy axes. The rectangles may touch each other, but they do not overlap (that is, there are no points that belong to the interior of more than one rectangle).

Your task is to determine if the rectangles form a square. In other words, determine if the set of points inside or on the border of at least one rectangle is precisely equal to the set of points inside or on the border of some square.

Input

The first line contains a single integer n ($1 \le n \le 5$). Next n lines contain four integers each, describing a single rectangle: x_1, y_1, x_2, y_2 ($0 \le x_1 < x_2 \le 31400, 0 \le y_1 < y_2 \le 31400$) — x_1 and x_2 are x-coordinates of the left and right edges of the rectangle, and y_1 and y_2 are y-coordinates of the bottom and top edges of the rectangle.

No two rectangles overlap (that is, there are no points that belong to the interior of more than one rectangle).

Output

In a single line print "YES", if the given rectangles form a square, or "NO" otherwise.

Examples

input
5 0 0 2 3 0 3 3 5 2 0 5 2 3 2 5 5 2 2 3 3

output
YES

input
4 0 0 2 3 0 3 3 5 2 0 5 2 3 2 5 5

output
NO