

# Convex Checker

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         256 megabytes

Given a polygon, determine if it is a convex polyon.

A convex polygon is a simple polygon (i.e., no two vertices **coincide** and no two edges intersect unless two continuous edges intersect at a vertex) with all interior angles strictly less than  $\pi$ .

## Input

The first line of input contains a single integer  $n$  ( $3 \leq n \leq 2 \times 10^5$ ), denoting the number of vertices of the polygon.

The next  $n$  lines each contains two integers  $(x_i, y_i)$ , denoting the vertices of the polygon. It is guaranteed that  $|x_i|, |y_i| \leq 10^9$ .

The polygon is formed by connecting  $(x_i, y_i)$  and  $(x_{i \bmod n+1}, y_{i \bmod n+1})$ , where  $1 \leq i \leq n$ .

## Output

Print one string, “Yes” or “No”, denoting if it is a convex polyon.

## Examples

standard input	standard output
3 0 0 1 0 0 1	Yes
4 0 0 0 1 1 1 1 0	Yes
4 0 0 0 3 1 2 1 1	Yes
3 0 0 0 0 0 0	No