



Central European Olympiad in Informatics  
Tîrgu Mureş, România  
July 8 – 14, 2009  
Contest Day 2

## tri

100 points

Source code: `tri.c`, `tri.cpp`, `tri.pas`  
Input files: `tri.in`  
Output files: `tri.out`  
Time limit: `2 s`  
Memory limit: `64 MB`

## Task

You are given  $K$  points with positive integer coordinates. You are also given  $M$  triangles, each of them having one vertex in the origin and the other 2 vertices with non-negative integer coordinates.

You are asked to determine for each triangle whether it has at least one of the  $K$  given points inside. (None of the  $K$  points are on any edge of any triangle.)

## Input

The first line of the input file `tri.in` will contain  $K$  and  $M$ . The following  $K$  lines will contain 2 positive integers  $x$   $y$  separated by one space that represent the coordinates of each point. The next  $M$  lines have 4 non-negative integers separated by one space,  $(x_1, y_1)$  and  $(x_2, y_2)$ , that represent the other 2 vertices of each triangle, except the origin.

## Output

The output file `tri.out` should contain exactly  $M$  lines. The  $k$ -th line should contain the character  $Y$  if the  $k$ -th triangle (in the order of the input file) contains at least one point inside it, or  $N$  otherwise.

## Constraints

- $1 \leq K, M \leq 100\ 000$
- $1 \leq$  each coordinate of the  $K$  points  $\leq 10^9$
- $0 \leq$  each coordinate of the triangle vertices  $\leq 10^9$
- Triangles are not degenerate (they all have nonzero area).
- In 50% of the test cases, all triangles have vertices with coordinates  $x_1=0$  and  $y_2=0$ . That is, one edge of the triangle is on the  $x$ -axis, and another is on the  $y$ -axis.



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### Example

tri.in	tri.out	Explanation
<pre> 4 3 1 2 1 3 5 1 5 3 1 4 3 3 2 2 4 1 4 4 6 3 </pre>	<pre> Y N Y </pre>	

tri.in	tri.out	Explanation
<pre> 4 2 1 2 1 3 5 1 4 3 0 2 1 0 0 3 5 0 </pre>	<pre> N Y </pre>	