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, (**x1,y1**) and (**x2, y2**), that represent the other **2** vertices of each triangle, except the origin.

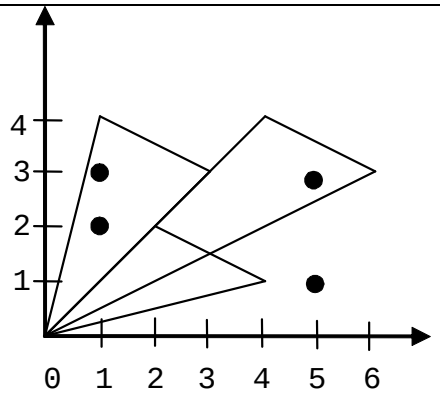
Output

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

- $1 \le K, M \le 100\,000$
- $1 \le$ each coordinate of the K points $\le 10^9$
- $0 \le$ each coordinate of the triangle vertices $\le 10^9$
- Triangles are not degenerate (they all have nonzero area).
- In **50%** of the test cases, all triangles have vertices with coordinates **x1=0** and **y2=0**. That is, one edge of the triangle is on the *x*-axis, and another is on the *y*-axis.

Example

tri.in	tri.out	Explanation
4 3 1 2 1 3 5 1 5 3 1 4 3 3 2 2 4 1 4 4 6 3	Y N Y	

tri.in	tri.out	Explanation
4 2 1 2 1 3 5 1 4 3 0 2 1 0 0 3 5 0	N Y