Problem A. Lahsen le jardinier

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

Lahsen is one of the best gardeners in the world.

Lahsen want to cut the grass of a land containing K trees.
He has a special way to cut grass :
- He form M triangles shapes each of them having one vertex in the origin and the two vertices with non-negative coordinates.
- If there is at least one tree on the triangle : Lahsen will cut the grass .
otherwise: he will not.

We believe that you are a great programmer, can you help Lahsen to determine for each triangle whether it has at least one tree of the given K trees inside ? (None of the K trees are on any edge of any triangle.)

Input

The first line contains two integers $1 \leq K \leq 10^5$ and $1 \leq M \leq 10^5$.

Each of the following K lines contain two positive integers x y separated by one space representing the coordinates of each tree.

The next M lines contain four non-negative integers separated by one space, $(x1, y1)$ and $(x2, y2)$, that represent the other two vertices of each triangle, except the origin.

$1 \leq x, y \leq 10^9$
$0 \leq x_1, x_2, y_1, y_2 \leq 10^9$

Output

The output should contain exactly M lines. The k-th line should contain `"Y SI LAHSEN"` if the k-th triangle (in the order of the input file) contains at least one tree inside it, or `"N SI LAHSEN"` otherwise.

Examples

standard input	standard output
3 3 1 5 2 4 3 1 3 0 0 4 5 0 0 8 3 0 0 8	N SI LAHSEN Y SI LAHSEN Y SI LAHSEN
5 4 2 5 1 3 4 4 3 2 5 3 4 1 3 3 1 2 3 4 0 5 3 6 6 3 6 5	Y SI LAHSEN N SI LAHSEN Y SI LAHSEN Y SI LAHSEN