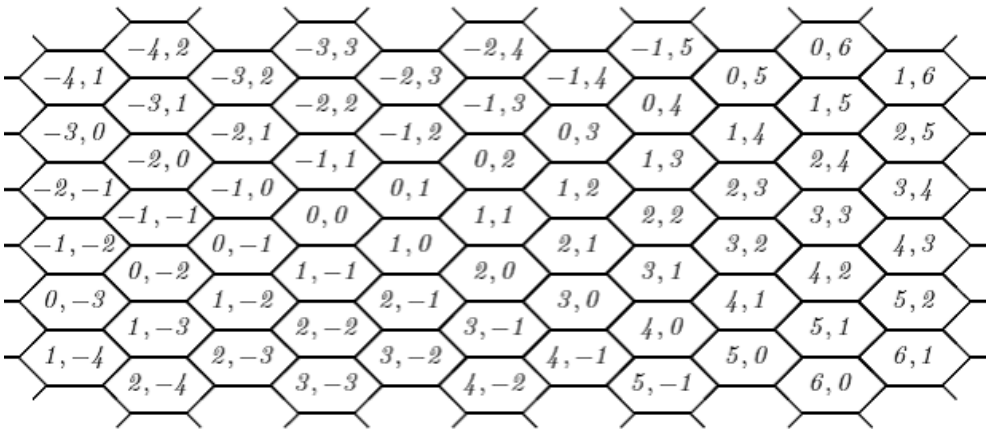
Problem I. Interfering the Cat

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds (*3 seconds for Java*)
Memory limit:	256 mebibytes

Rabbit loves to play with Cat. They live in a town, where the floor is filled with regular hexagon tiles. The town is infinitely large. Each cell is represented by two integers (x, y) as in the picture below.

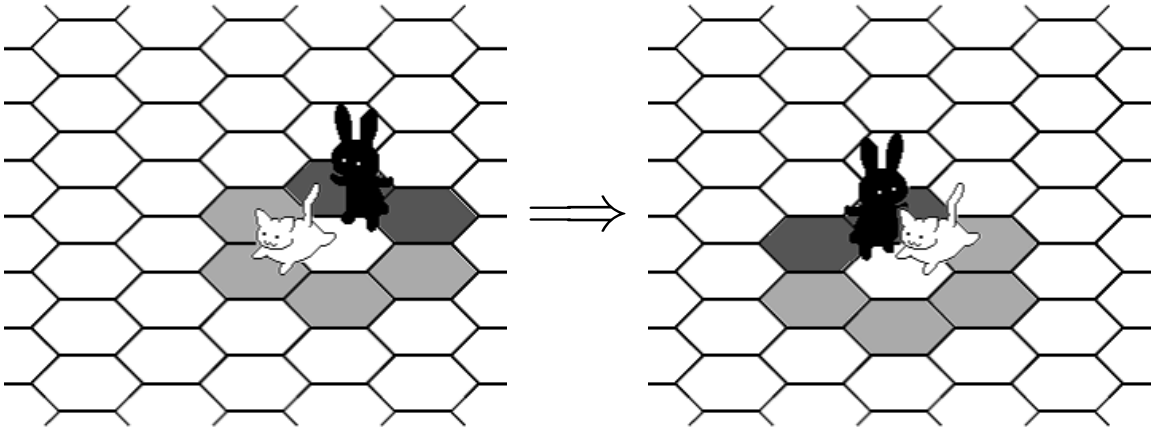


There are N *territories* of Cat in this town. Each territory is represented by six cells which forms a regular hexagon whose edge is perpendicular to some edge of a tile, and it contains all cells on the boundary of the hexagon. For example, six cells $(1, -1)$, $(3, -1)$, $(3, 1)$, $(1, 3)$, $(-1, 3)$ and $(-1, 1)$ defines a territory containing twelve cells.

Cat wants to go to cell $(0, 0)$. There are K candidates for the starting point of Cat.

Rabbit decided to play a trick and interfere Cat. Rabbit and Cat will make following actions alternatively (Rabbit moves first):

- Rabbit *blocks* at most two of the the six cells neighboring to the cell on which Cat is standing. Rabbit cannot block a cell which belongs at least one territory of Cat. **If Rabbit chooses to block two cells, they must be neighboring to each other**.
- Cat chooses one of the six cells neighboring to the cell on which Cat is standing. Cat cannot choose a cell which is blocked in the Rabbit's action **just before this action** (Note that there are at most two such cells). Then Cat moves to the chosen cell.



Write a program that judges whether or not Cat can reach cell $(0, 0)$ against any interfering by Rabbit, for each candidate.

Input

The input is given in the following format:

N
$P_{1,1}\ Q_{1,1}\ P_{1,2}\ Q_{1,2}\ \cdots\ P_{1,6}\ Q_{1,6}$
$\vdots$
$P_{N,1}\ Q_{N,1}\ P_{N,2}\ Q_{N,2}\ \cdots\ P_{N,6}\ Q_{N,6}$
K
$X_1\ Y_1$
$\vdots$
$X_K\ Y_K$

The first line contains an integers N ($1 \leq N \leq 40\,000$). The i-th line of the following N lines ($1 \leq i \leq N$) contains twelve integers $P_{i,j}$ and $Q_{i,j}$ ($1 \leq j \leq 6$, $-10^9 \leq P_{i,j} \leq 10^9$, $-10^9 \leq Q_{i,j} \leq 10^9$), which means the i-th territory is defined by six cells $(P_{i,j}, Q_{i,j})$. These six cells are distinct, form an appropriate regular hexagon and they are in counterclockwise order. The next line contains an integers K ($1 \leq K \leq 40\,000$). The k-th line of the following K lines ($1 \leq k \leq K$) contains two integers X_k and Y_k ($-10^9 \leq X_k \leq 10^9$, $-10^9 \leq Y_k \leq 10^9$), which means the k-th candidate for the starting point of Cat is cell (X_k, Y_k).

Output

Your program should output K lines. The k-th line should contain a word `YES` if Cat can reach cell $(0, 0)$ starting from cell (X_k, Y_k), or `NO` otherwise.

Examples

standard input	standard output
2 1 -1 3 -1 3 1 1 3 -1 3 -1 1 3 0 4 0 4 1 3 2 2 2 2 1 3 1 1 -1 -1 2 4	YES NO YES