

# **Problem Trampoline**

Input file: standard input
Output file: standard output

Little Square has started jumping on trampolines from his school's gym. In the gym there are  $R \times C$  trampolines arranged in a rectangular grid with R rows and C columns. Each trampoline is either green or blue. There are exactly N green trampolines. Let (i,j) denote the trampoline in the  $i^{th}$  row and  $j^{th}$  column. We index the rows from 1 to R and the columns from 1 to C.

Little Square's teacher has asked him to practice T gymnastics routines. The  $i^{th}$  routine has the following rules:

- The routine starts at trampoline  $(x_i^{start}, y_i^{start})$ .
- The routine ends at trampoline  $(x_i^{stop}, y_i^{stop})$ .
- If Little Square jumps on a green trampoline at position (i, j) then he may go to trampolines (i + 1, j) or (i, j + 1), as long as these are not outside the grid.
- If Little Square jumps on a blue trampoline at position (i, j) then he may go to trampoline (i, j+1), as long as it is not outside the grid.

Little Square wants to know, for each routine, if it is possible to accomplish his teacher's request.

#### Input

On the first line of the input you will find R, C and N. On the next N lines you will find the positions of the green trampolines. If a line contains integers **a b** then there is a green trampoline at position (a, b). On the next line you will find T. On the next T lines you will find the descriptions of the gymnastics routines. On the  $i^{th}$  of these lines you will find  $x_i^{start}$ ,  $y_i^{start}$ ,  $x_i^{storp}$ ,  $y_i^{storp}$ .

#### Output

Output T lines. The  $i^{th}$  line should contain Yes if it possible to accomplish the  $i^{th}$  routine, and No if it is not.

#### **Constraints**

- $1 \le R, C \le 1.000.000.000$
- $1 \le N, T \le 200.000$
- $1 \le x_i^{start}, x_i^{stop} \le R,$
- $1 \le y_i^{start}, y_i^{stop} \le C$ ,
- The coordinates of green trampolines are pairwise distinct.

## Subtask 1 (points: 23)

• 1 < R, C, T < 200

## Subtask 2 (points: 20)

•  $1 \le R, C \le 2.500$ 

 $\bullet \ 1 \le T \le 4.000$ 

## Subtask 3 (points: 11)

$$\bullet \ x_{stop}^i - x_{start}^i = 1$$

## Subtask 4 (points: 19)

•  $1 \le T, N \le 5.000$ 

#### Subtask 5 (points: 27)

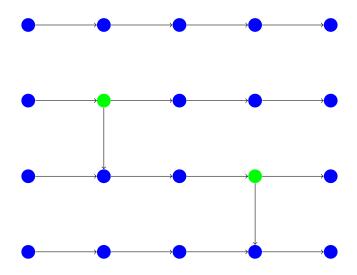
• No additional constraints.

#### **Examples**

standard input	standard output
4 5 2	Yes
2 2	Yes
3 4	No
3	
2 1 4 5	
1 2 1 4	
2 3 4 4	

#### **Explanation**

The trampolines are placed like so:



In the first routine Little Square can go on the following route:  $(2,1) \rightarrow (2,2) \rightarrow (3,2) \rightarrow (3,3) \rightarrow (3,4) \rightarrow (4,4) \rightarrow (4,5)$ .

In the second routine Little Square can go on the following route:  $(1,2) \to (1,3) \to (1,4)$ .

The third routine cannot be accomplished. No route exists from (2,3) to (4,4) that respects Little Square's teacher's rules.