2005 Canadian Computing Competition
Day 2, Question 3

Input file: `windows.in`
Output file: `windows.out`
Source file: `n:\windows\windows.___`

Move that Mouse AGAIN

You probably remember from Stage 1 that computers have a *mouse* and sometimes, if you really have to, you have a bunch of *windows* that you can click on.

In particular, you will have a screen which has R ($1 \leq R \leq 10000$) rows and C ($1 \leq C \leq 10000$) columns. You have n ($1 \leq n \leq 50000$) rectangular windows, defined by the "top-left" coordinates (x_l, y_t) and "bottom-right" coordinates (x_r, y_b). Note that you can assume that $1 \leq x_l < x_r \leq C$ and $1 \leq y_b < y_t \leq R$ (thus, you don't have empty windows). It is worth noting that a window includes all points on its borders: that is, the window defined by (x_l, y_t) and (x_r, y_b) includes exactly the points (x, y) such that $x_l \leq x \leq x_r$ and $y_b \leq y \leq y_t$.

If two windows overlap, the one which is on top of the other window will be listed *later* in the sequence (not necessarily immediately after, however).

Here comes the mouse part.

You also have a mouse that can click on windows. Initially, the mouse is at position $(1, 1)$ (the bottom-left corner of the screen). The mouse will then to be told to move to a particular position (say (x, y), where $1 \leq x \leq C$ and $1 \leq y \leq R$) and click. When the mouse clicks, the window which is visible at that position moves to the top (that is, the entire window becomes visible, possibly hiding some other windows). There will be m ($1 \leq m \leq 10000$) such mouse clicks.

Your job is to indicate which of the n windows is "in focus" (i.e., most recently clicked on) after each mouse move.

Input

The first line of input consists of an integer C, the number of columns. The second line of input consists of an integer R, the number of rows. The third line of input consists of the number n, the number of windows. On each of the next n lines, there are four integers x_l followed by y_t followed by x_r followed by y_b, indicating the "top-left" and "bottom-right" coordinates of this window. (These windows are numbered from 1 to n). On the next line is the integer m. On each of the next m lines will be two integers, x followed by y, indicating the new position of the mouse.

Output

The output is m lines long, each line containing an integer v_i such that $0 \leq v_i \leq n$. If line i contains the integer v_i ($v_i > 0$), that indicates that after the ith mouse move, the window

v_i was just clicked on (and has moved to the top). If, instead, $v_i = 0$, then there was no window at that position.

Sample Input

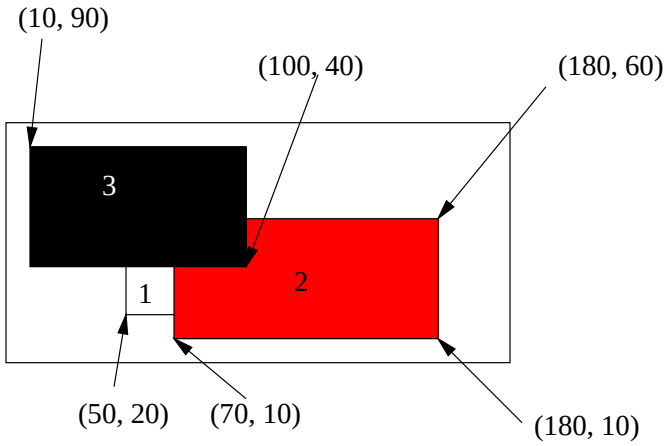
```
200
100
3
50 50 80 20
70 60 180 10
10 90 100 40
3
60 20
150 90
150 30
```

Sample Output

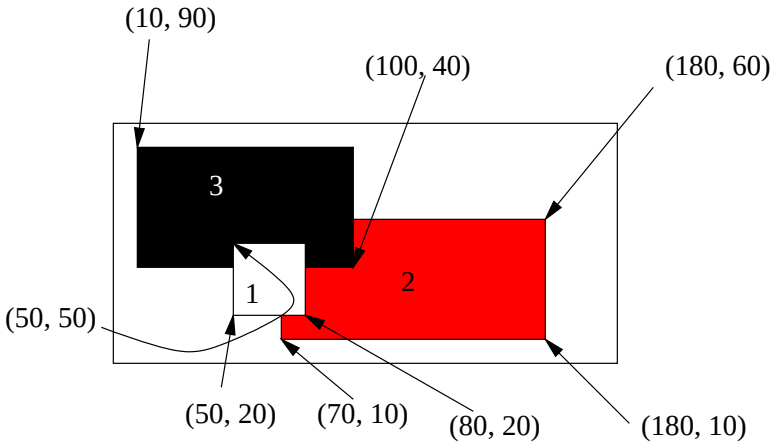
```
1
0
2
```

Explanation of Sample Input/Output

The screen has width 200 and height 100. There are three windows on the screen, and initially, we have the following configuration:

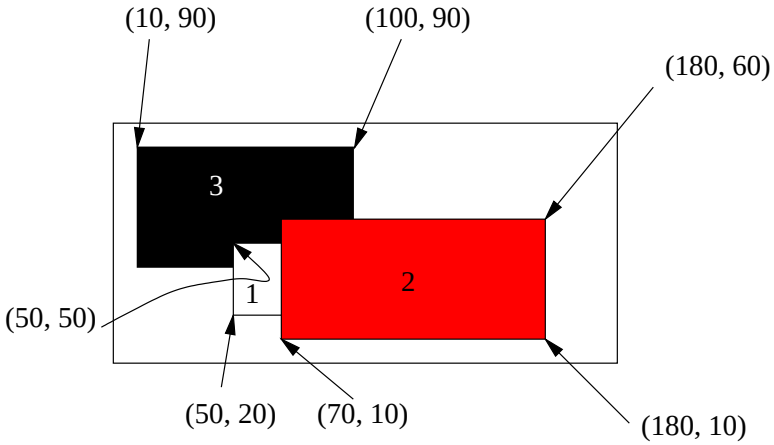


After the mouse clicks at $(60, 20)$, we have



Since there is no window at position $(150, 90)$, 0 is outputted.

Once we click at position $(150, 30)$, that moves window 2 into focus, to get the following picture.



QOJ adaptation notes

CCO 2005: Move that Mouse AGAIN

Input and output
Read from standard input and write to standard output. Do not open the input/output filenames in the original statement. All other input and output requirements are unchanged.

Scoring
The maximum score is 25. The original official test2/scheme.txt assigns the five tests 2, 5, 5, 5, and 8 points, respectively. These weights are preserved exactly.

Data selection
The later official test2 data release is used, matching the recovered official score scheme. Three superseded cases in the earlier archive contain 50,000 mouse clicks, exceeding the statement limit of 10,000; they are not used in this edition.

Provenance
The preceding original official PDF pages are unchanged. The unmodified statement is attached as original-statement.pdf. Test inputs and answers are from official CEMC archives. No synthetic hidden tests or answer corrections are used.