

Problem G

Path Flipping

Time Limit: 2 seconds

For a grid with each cell colored either white or black, let us define the **beauty** of the grid as follows:

- Consider performing the following operation any number of times:
 - Choose a path from the upper-left corner to the lower-right corner, consisting only of downward and rightward moves. Invert the colors of all cells on the chosen path.
- The **beauty** of the grid is defined as the maximum possible number of cells colored black.

You have a grid with H rows and W columns. Initially, all cells are colored white.

You need to process Q queries in order. The i -th query is given in the following format:

- You are given two integers t_i and x_i .
 - If $t_i = 1$, invert the colors of all cells in the x_i -th row from the top.
 - If $t_i = 2$, invert the colors of all cells in the x_i -th column from the left.
- Then, find the **beauty** of the current grid.

Input

The input is given in the following format:

```
H W Q
t1 x1
⋮
tQ xQ
```

- $1 \leq H, W \leq 200\,000$
- $1 \leq Q \leq 200\,000$
- $t_i \in \{1, 2\}$ ($1 \leq i \leq Q$)
- $t_i = 1 \implies 1 \leq x_i \leq H$ ($1 \leq i \leq Q$)
- $t_i = 2 \implies 1 \leq x_i \leq W$ ($1 \leq i \leq Q$)
- All input values are integers.

Output

Output Q lines. On the i -th line ($1 \leq i \leq Q$), output the answer for the i -th query.

Sample Input	Sample Output
3 4 5	9
2 2	12
2 3	10
1 1	10
1 2	9
2 3	