

Ada and Field

Ada the Ladybug owns a beautiful field where she grows vegetables. She often visits local Farmers Market, where she buys new seeds. Since two types of vegetable can't share same field, she always divide the field, by either vertical or horizontal line (she is very precise, so the width of line is negligible). Since she visits Farmers Market almost every day, she has already made a lot of such lines, so she needs your help with finding out the area of biggest field.

Input

The first line will contain $0 < T \leq 200$, the number of test-cases.

Then T test-cases follow, each beginning with three integers $1 \leq N, M \leq 2 \cdot 10^9$, $1 \leq Q \leq 10^5$, top right corner of field (field goes from $[0,0]$ to $[N,M]$) and number of field divisions.

Afterward Q lines follows:

$0 \ x \ (0 \leq x \leq N)$, meaning that line was made vertically, on coordinate x

$1 \ y \ (0 \leq y \leq M)$, meaning that line was made horizontally, on coordinate y

Sum of Q over all test-cases won't exceed 10^6

Output

Print Q lines, the area of biggest field after each line was made.

Example Input

```
2
10 10 5
0 5
0 8
1 1
1 9
1 5
10 10 5
0 5
1 4
1 6
1 8
0 5
```

Example Output

```
50
50
45
40
20
50
30
```

20
20
20