There are k attackers in an $n * m$ chessboard.

The i-th attacker is located in (X_i, Y_i), with a attacking range of R_i.

A square (X, Y) is attacked by the i-th attacker if and only if $|X - X_i| + |Y - Y_i| \leq R_i$.

Count the number of squares on the chessboard attacked by at least one attacker.

Input

There are several input cases. The first line contains three integers n, m, k ($1 \leq n, m \leq 100000000, 1 \leq k \leq 20000$). In the following k lines, each line contains three integers X_i, Y_i, R_i ($1 \leq X_i \leq n$, $1 \leq Y_i \leq m$, $1 \leq R_i \leq 1000000$), the position and attack range of each attacker.

The last case is followed by a single zero, which should not be processed.

Output

For each case, print the case number and the answer.

Sample Input

```
4 4 3
1 1 1
3 1 1
3 3 1
1 10 1
1 1 1
0
```

Sample Output

```
Case 1: 10
Case 2: 2
```