

Rice Bugs!

A group of rice bugs are ready to attack a paddy field. The field is a two dimensional matrix with each element representing a plant. The field is bounded by an electric fence. So any rice bug crossing the boundary of the field gets killed. The rice bugs can move only in a particular direction to infect the crops. The movement of the rice bugs is defined as:

A	B	C
D		E
F	G	H

A: North West

B: North

C: North East

D: West

E: East

F: South West

G: South

H: South East

At a given unit of time the rice bug can infect only a single plant. With each non-infected plant the rice bug infects, its strength increases by one unit. At a given time the number of rice bugs jumping on a plant can be more than one, in this case the strongest of the rice bugs survives and the others are killed. If more than one rice bug turns out to be strongest then all those rice bugs survive and rest get killed. All surviving rice bugs each increase their strength by one unit if the plant was previously uninfected. You are required to find out the number of plants that have NOT been infected and the number of surviving rice bug(s) at the end of the simulation.

Each rice bug starts off with a strength of zero units.

Input specification:

The first line of input gives the size (M x N) of the paddy field. Both M and N are integers and their value will not exceed 6. The next line of input will be the period of simulation. The next line of input will be the number of rice bugs, L (< 15), which are going to attack the field. Next L lines will have the starting

position of the rice bugs in the field, their starting time and their directional movement.

The starting position will be given as zero-based row, column values.

Output specification:

The output will be count of number of uninfected plants and the number of surviving rice bug(s) separated by a blank space. The output will be terminated by a newline.

Sample Input and Output:

Input:

```
6 6
25
5
2 3 10 H
1 1 5 E
1 2 6 D
3 3 18 A
4 5 2 E
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Output:

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25 0
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