Grid Creatures

Grid creatures are a remarkable colony of organisms that live in a square grid. The creatures can keep their mouths open and eat unsuspecting bugs that crawl in. They can also protect themselves by closing into their shells.

Open creatures can be eaten by birds. When a bird eats an open creature, the neighboring creatures (including diagonal neighbors) soon close themselves in case the bird tries to feed again. This causes a ripple effect, because neighbors also close soon after they sense one of their neighbors close. After closing, a creature waits a little bit and then opens back up.

Model this behavior using a simulation. At time step t_0, all creatures are alive and open. At each subsequent time step t_i, the following events occur in this order:

1. A bird might attempt to eat a target creature. If the target creature is open the creature is eaten; if the target creature is closed it is safe and remains closed.
2. If an open creature has a neighbor that was eaten or became closed during the previous step t_{i-1}, the creature closes.
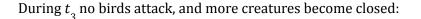3. If a closed creature became closed during step t_{i-2}, the creature opens.

For example, here is a 5x5 grid at time t_0 (all creatures are open):

```
OOOOO
OOOOO
OOOOO
OOOOO
OOOOO
```

At t_1, a bird eats the creature in the center:

```
OOOOO
OOOOO
OOEOO
OOOOO
OOOOO
```

During t_2 another bird attacks, and then the neighbors of the creature that was eaten during t_1 close. Note that the bird was able to eat a neighbor of the creature eaten last step, because eating happens before closing:

```
OOOOO
OcccO
OcEcO
OccEO
OOOOO
```

During t_3 no birds attack, and more creatures become closed:

```
ccccc
ccccc
ccEcc
cccEc
ccccc
```

During t_4 if a bird tried to attack any creature it would fail, because they are all closed at the beginning of the step. The creatures that were closed for 2 steps then open:

```
ccccc
cOOOc
cOEOc
cOOEc
ccccc
```

Input

The first line of the input will contain 3 integers N, T, and A separated by spaces. The size of simulation grid is N rows by N columns, the last time step of the simulation is t_T, and there are A bird attacks.

$5 \leq N \leq 50, 5 \leq T \leq 100,$ and $1 \leq A \leq 100.$

The next A lines define attacks, and have the form `i  x  y`. Each attack occurs at time step t_i at column x row y in the grid. Rows and columns are 0-indexed. Not every time step will have an attack, and there will not be more than 1 attack per time step. No cell in the grid will be attacked more than once.

Output

Your output should be a single line with 3 integers that specify the number of open creatures o, closed creatures c, and eaten creatures e at the end of the simulation, with the form `o  c  e`.

Example

Input:

```
10 10 6
1 2 4
2 2 3
5 4 4
6 4 3
7 7 6
8 6 5
```

Output:

```
49 47 4
```