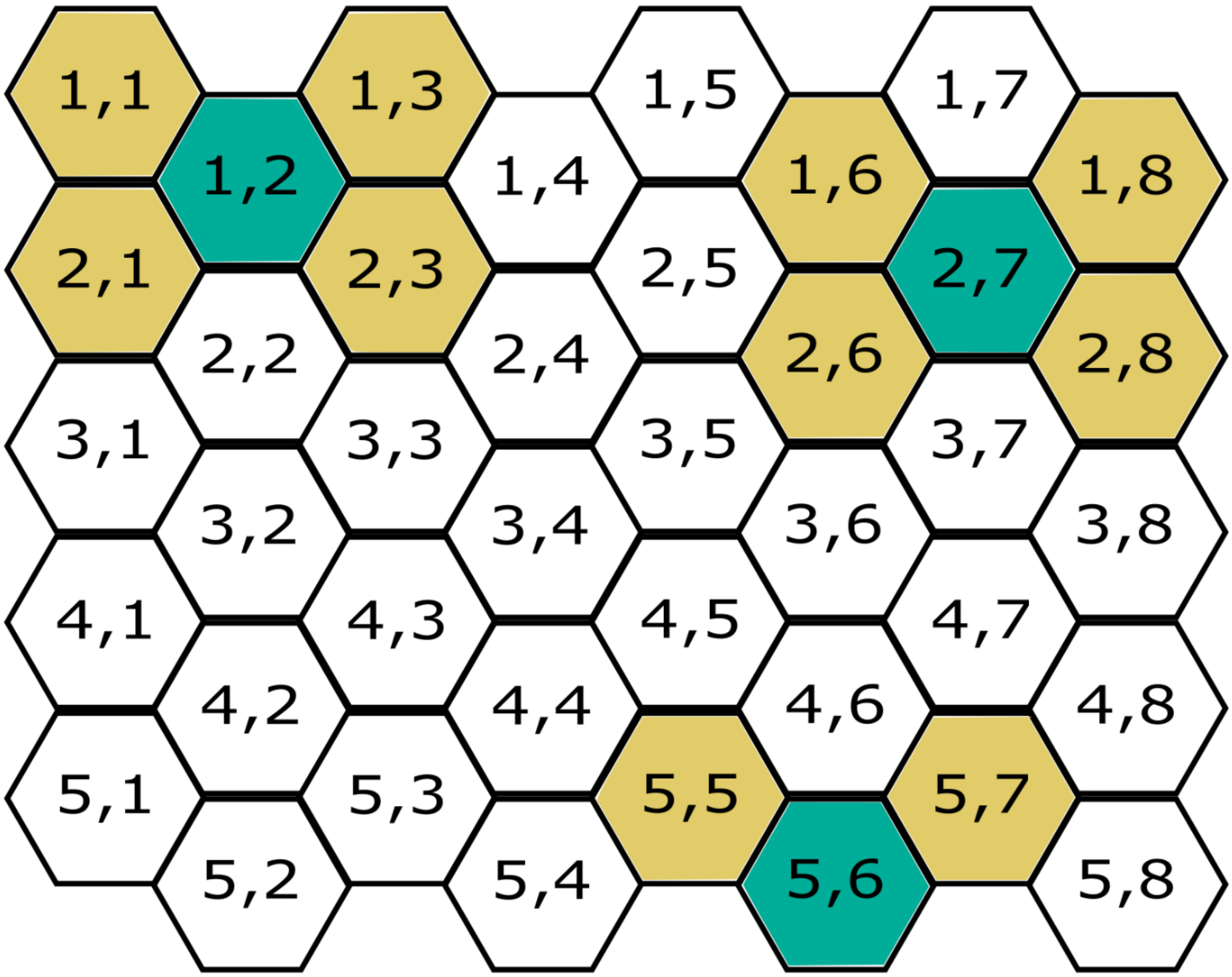
Honeycomb Research

Albert studies honey bees and honeycombs as hobby. As we all know, honeycombs consist of hexagonal cells -- for simplicity, let's assume that the honeycomb being studied by Albert is a hex grid of **R** rows and **C** columns. The figure below shows an example hex grid with **R**=5 and **C**=8



Albert wants to install micro-devices in some empty cells in the honeycomb in order to monitor honey bees' behavior. A single micro-device requires one empty cell to be installed, and one cell can contain at most one micro-device. Yet, if devices are too close to each other, they may interfere with each other. Specifically, if a micro-device is installed in a particular cell, then among (up to) six adjacent cells to it, (up to) two adjacent cells in the same column will be free from interference but the rest (up to) four adjacent cells will be subjected to interference.

For instance, suppose that Albert has installed three micro-devices at (1, 2), (2, 7), and (5, 6) as shown above.

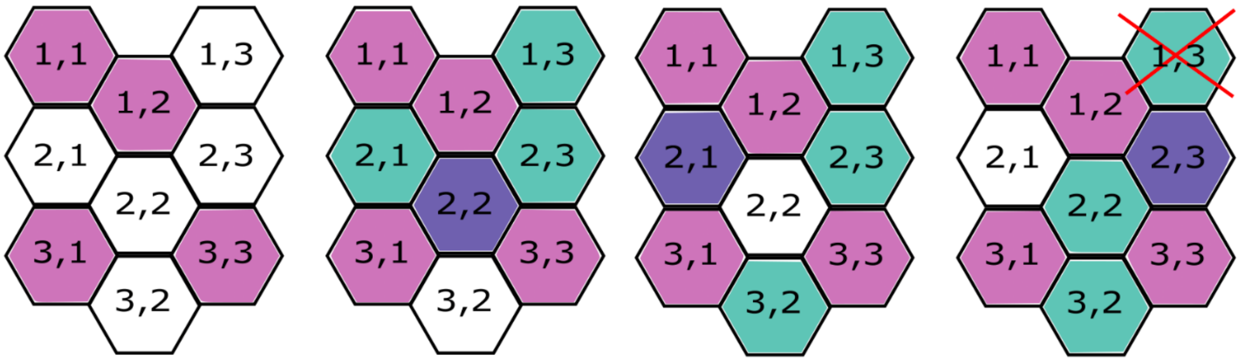
- Cell (1, 2) has five adjacent cells, among which four cells (1, 2), (2, 1), (1, 3) and (2, 3) cannot have another device installed due to interference. However, cell (2, 2) will be free from interference even though it is adjacent to (1, 2).
- Cell (2, 7) has six adjacent cells, among which four cells (1, 6), (1, 8), (2, 6), and (2, 8) will have interference with it. On the other hand, cells (1, 7) and (3, 7) can have devices installed.
- Cell (5, 6) has three adjacent cells, among which two cells (5, 5) and (5, 7) will have interference with it. Yet a device can be installed at cell (4, 6).

If there are no other constraints than the interference stated above, then Albert can maximize the number of devices installed by installing them in odd-indexed columns only -- of course, Albert has already proved this. Yet there are two other constraints to be taken into account, which is bothering Albert.

- First, not all cells may be empty, so **K** cells may contain pupae so that micro-devices cannot be installed in such cells. Let (**Xi**,**Yi**) be the i-th cell (out of **K**) with a pupa in it.
- Second, there is a newly developed prototype sensor that must be tested. Similar to micro-devices, the sensor requires one empty cell

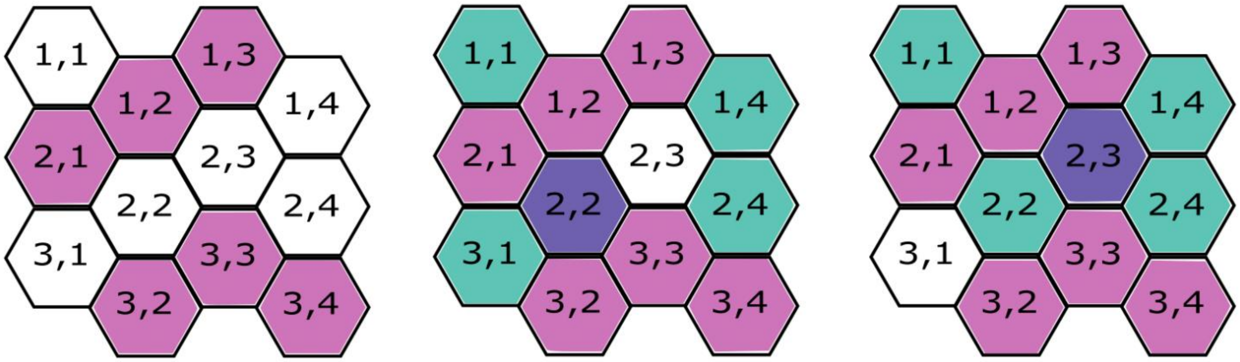
to be installed and it cannot be installed along with a micro-device in the same cell. However, the new sensor only interferes with all other cells in the same column but no other cells (even if they are adjacent) in a different column. Albert only has one prototype sensor and it must be installed.

For instance, the image on the left below shows an example grid with R=3, C=3, K=4 and X=[1,3,1,3] & Y=[1,1,2,3]



- Image 2nd from left: Albert can install the prototype sensor at (2, 2) and 3 micro-devices at (2, 1), (1, 3), and (2, 3).
- Image 3nd from left: Albert can install the prototype sensor at (2, 1) and 3 micro-devices at (3, 2), (1, 3), and (2, 3).
- Image on the right: In this case, the prototype sensor is installed at (2, 3) and micro-devices at (2, 2), (3, 2), and (1, 3). However, the prototype sensor interferes with all cells in the same column, and therefore it will interfere with the micro-device at (1, 3). On the other hand, the sensor will not interfere with the micro-device at (2, 2).
- In this example, installing 3 micro-devices (in addition to the sensor) is optimal.

Consider a different example below left where R=3, C=4, K=6 and X=[2,1,3,1,3,3] & Y=[1,2,2,3,3,4].



- Center: The prototype sensor can be installed at (2, 2) and four micro-devices at (1, 1), (3, 1), (1, 4), and (2, 4).
- Right: The prototype sensor can be installed at (2, 3) and four micro-devices at (1, 1), (2, 2), (1, 4), and (2, 4).
- In this example, installing 4 micro-devices (in addition to the sensor) is optimal. There exist other ways to install 4 micro-devices.

Given R,C,K, and the coordinates of pupae (X and Y), compute the maximum number of micro-devices Albert can install while meeting the requirements mentioned above.

Input

The first line will contain T, the number of test cases.

The first line of each test case will contain R, C and K, separated by whitespace.
If K=0, then the input for the test case ends with the first line.
If K>0, then the second line will contain K integers describing X (separated by whitespace) and the third line will contain K integers describing Y (separated by whitespace).

Output

Output the answer for each test case in each line.

Limit

- $1 \le T \le 5$
- $1 \le R,C \le 70$
- $0 \le K \le \min(500, R.C - 1)$
- For test cases with K>0, for each i with $1 \le i \le K$:
    - $1 \le Xi \le R$
    - $1 \le Yi \le C$
    - (Xi, Yi)s are distinct (no duplicate cells will be given as input)

Sample Input 1 Copy

```
4
3 3 4
1 3 1 3
1 1 2 3
3 4 6
2 1 3 1 3 3
1 2 2 3 3 4
1 5 2
1 1
1 4
5 1 0
```

Sample Output 1 Copy

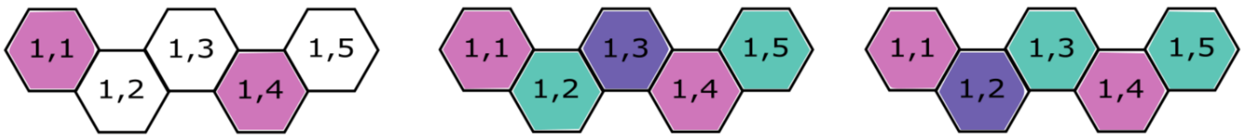
```
3
4
```

```
2
0
```

Case 1: Described in the problem statement.

Case 2: Described in the problem statement.

Case 3: There are many ways to install two micro-devices (there still exist other methods).



Case 4: As the prototype sensor must be installed, it must be installed somewhere in column 1. Hence, micro-devices cannot be installed in column 1, and the answer is 0.

Time Limit

- Java 8: 3 seconds
- PyPy3: 5 seconds