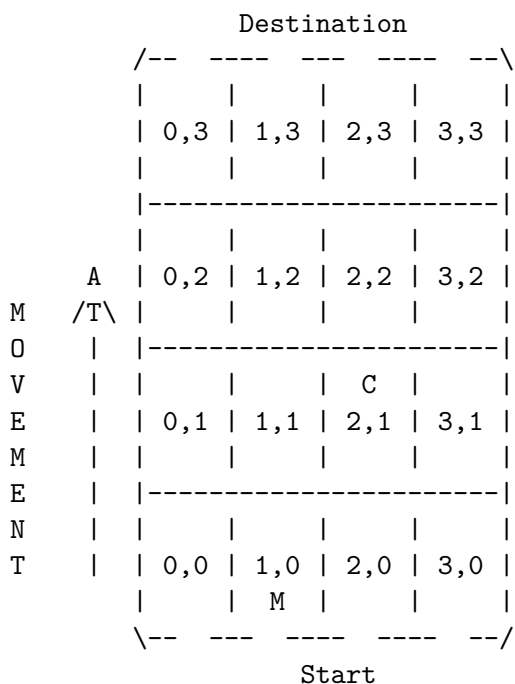


3086 Cat And Mouse

There is a rectangular grid of cells with m rows and n columns. The rows are numbered 0 to $m - 1$ and the columns are numbered 0 to $n - 1$. A cell is identified by an ordered pair (column number, row number). The cells in row 0 (bottom) are the entry points and the cells in row $n - 1$ (top) are the exit points.

The figure below shows a grid with 4 rows and columns.



A mouse wants to reach the “Destination” from “Start”. The mouse can move **horizontally** in either direction if possible (i.e. from cell (i, j) to either cell $(i - 1, j)$ or $(i + 1, j)$, if these are valid cells) or **vertically** upwards (i.e. move from cell (i, j) to $(i, j + 1)$).

Note that you can never move downwards. Also, the moves must alternate between horizontal and vertical. The mouse can enter the grid from any of the entry points (4 in the above example) and the first move can be either horizontal or vertical. A vertical move (when possible) from any of the exit points takes the mouse to the destination.

Cats may be present in some of the cells in the grid including entry and exit points. For any entry point, if p is the total number of paths to the destination from this entry point, and q is the number of such paths that do not pass through any cell containing a cat, then the ratio q/p is the success probability for that entry point. You have to write a program that finds the entry point with maximum success probability. If there is more than one such point, identify the one with minimum column number.

Input

The input will contain several test cases, and the first line contains the number N of test cases.

For each test case, the first line will contain the number of columns n , the number rows m , and the number of cats k , in this order, separated by a space. Here, $n \leq 1000$, $m \leq 30$, and $k \leq 1000$. The

next k lines will contain two integers each, giving the cells containing the cats. The first number is the column number and the second the row number. The numbers are separated by a space.

Output

The output for each test case is a single integer giving the column number of the required entry point. The outputs for all test cases should be printed successively, one per line.

Sample Input

```
2
4 4 1
2 1
5 3 1
1 2
```

Sample Output

```
0
4
```