Colouring in Kalponikdesh

Welcome to kalponikdesh. In kalponikdesh ,all people cover their walls with tiles. Then, to decorate the walls,they imply colour on them. Colouring each and every tiles might be a very hard task. But in Kalponikdesh ,it’s very easy ! Because each wall has some special tiles. If you colour them,they spread their colours to their adjacent four tiles and make them special. Then the process continues means these new special tiles colour their adjacent tiles in next one unit of time and make them as new special tiles. It’s a common sense that colour doesn’t spread outside the wall. You can assume that it takes no time to colour the first set of tiles and they can be colored at the same time. You’ve to tell the minimum time when the wall will be fully coloured .

Input specification:

There will be at most 50 taste cases per file . You will be given a wall description per case. Which is how many rows(<=1000) of tiles and the number of tiles(<=1000) in each row . After that there’ll be a number K(<= row number \* number of tiles in each row) , the number of special tiles in the first set . Then there’ll be K lines denoting the row number x (1<=x<=row) and the position y(1<=y<=number of tiles in each row) of the tile in this row.

Output specification:

You’ve to print the minimum time when the wall will be fully coloured.

| 3  2 5 1  1 2  3 2 1  3 2  5 5 2  5 5  3 3 | 4  3  4 |
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