A grid game
Novè Concurs de Programació de la UPC - Semifinal (2011-06-29)

Consider a two-player game, played on an \( r \times c \) grid, where every cell is initially permitted. Alternating moves, each player chooses any permitted cell \( x \), and marks as forbidden all the cells of the same row to the left and to the right of \( x \), and all the cells of the same column above and below \( x \), until an already forbidden cell or the border of the grid is found in every direction. The player that eventually cannot make any move loses the game.

Assume \((1, 1)\) to be the upper-left cell. This is the result of the moves \((3, 4)\), \((5, 2)\) and \((1, 1)\) in this order on a grid \(5 \times 6\) (forbidden cells are painted grey):

The game after the moves \((3, 4)\) and \((5, 2)\) is winning, that is, with perfect play the opponent is doomed to lose. But it is easy to see that the game after \((1, 1)\) is also winning, which implies that \((1, 1)\) was a bad move for this position.

Write a program that, for every given partial game, tells if it is winning or losing.

Input
Input consists of several cases. Each case begins with \( r \) and \( c \), followed by a number \( m \), followed by \( m \) moves. Assume \( 1 \leq r, c \leq 80 \), and that each sequence of moves is correct.

Output
For every case, print “winning” or “losing”.

Sample input

```
5 6 0
5 6 1 3 4
5 6 2 3 4 5 2
5 6 3 3 4 5 2 1 1
6 6 1 6 5
6 6 0
12 8 0
80 80 0
```

Sample output

```
winning
losing
winning
winning
losing
winning
losing
winning
```

Problem information

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