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## A grid game

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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  $x$ , 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 oponent 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 1

```
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 1

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

### Problem information

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