Northcott's Game

Pieces and Board: Northcott's Game is played on an rectangular *n* rows by *m* columns board. The default game has 3 rows of 6 columns with the configuration of Figure 1. In a given row, L may not be placed to the right of R. Your implementation must handle an arbitrary number of rows and columns.

To Move: The players, Left and Right, alternate turns moving as many spaces horizontally forward (towards opponent) without jumping over the opponent. Pieces never leave the row (I.e., they never move vertically).

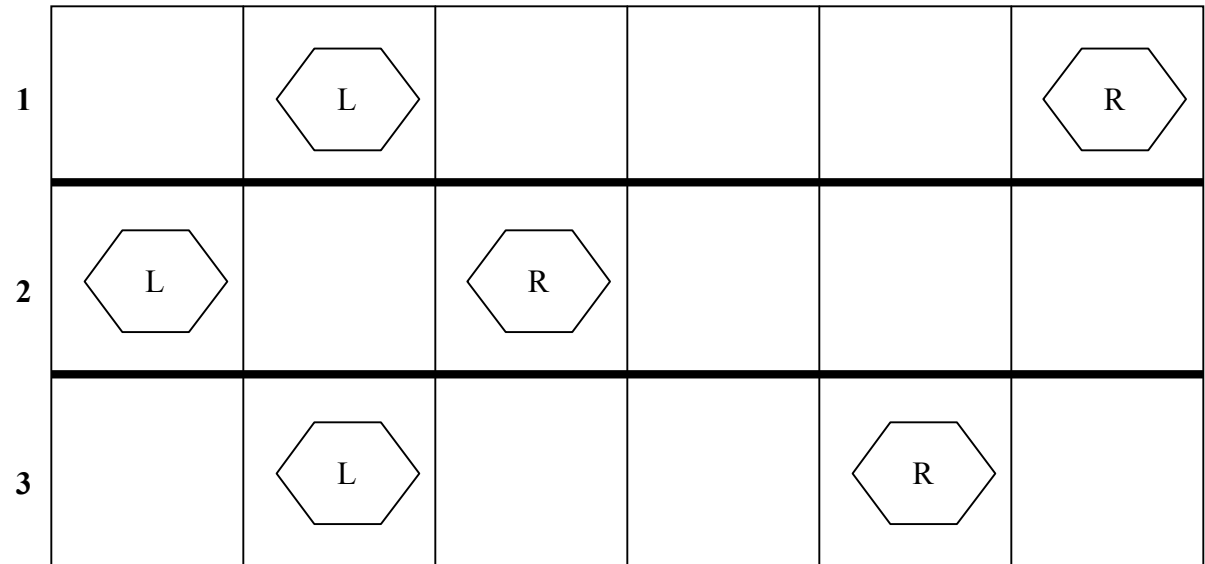**To Win:** The player who has no moves remaining *loses*. (I.e., the last to move wins)

Compulsory Rule Changes:
• Misére Rules: The player who has no moves remaining *wins*. (I.e., the last to move loses)
• A player may move both forward (towards the opponent) and back (away from the opponent).
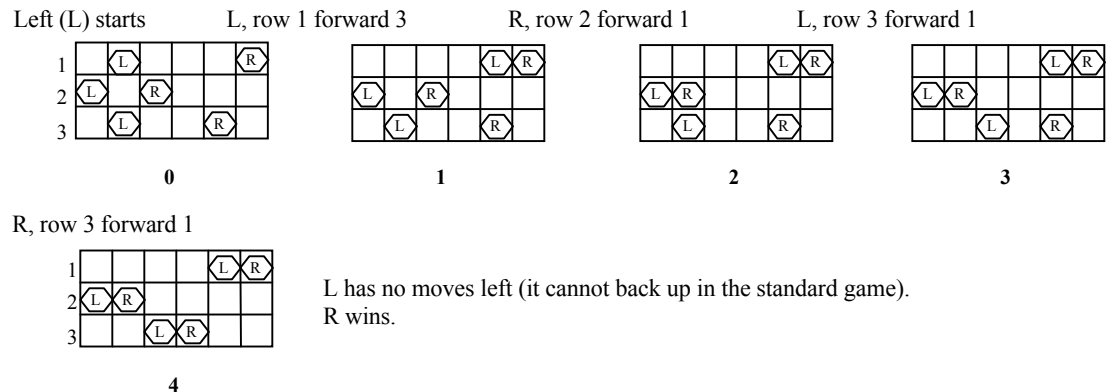
Position Representation:
• (*T row row row row* …)
T stores whose turn it is (`L` or `R`). Each *row* is a word in the form $\#_1 L \#_2 R \#_3$ where $\#_1$ represents the number of spaces to the left of player L, $\#_2$ the number of spaces between the two players, and $\#_3$ the number of spaces to the right of R. E.g. The row "- - L - R- - -" is the word "2L1R3". The number of *row*'s in the position indicates the number of rows. In each *row*, the sum of $\#_1$, $\#_2$, $\#_3$, plus 2 (for the pieces) indicates the number of columns.

Figure 1

Example game:

Left (L) starts   L, row 1 forward 3   R, row 2 forward 1   L, row 3 forward 1

R, row 3 forward 1

L has no moves left (it cannot back up in the standard game).
R wins.

Representations for initial position (see Figure 1): (L 1L3R0 0L1R3 1L2R1)
Representations for position mid-game (see board 1 above): (R 4L0R0 0L1R3 1L2R1)

If you choose to implement this game, you cannot get above a "B" in CS3.