

Surround

Pieces and Board: Surround is played on a rectangular board of n rows and m columns. (see Figure 1) Your implementation must handle an arbitrary number of rows and columns.

To Move: Each player is a worm that is rapidly growing from its head. When it is your turn you must choose the next square for the head to grow onto. You may choose up, down, left, or right, but may not grow diagonally. You must also choose a square not currently occupied by either yourself or your opponent. On your turn, you may not pass or grow off the board.

To Win: You must cut off your opponent and leave her with no room to grow. You win when your opponent has no room to grow on her turn.

Compulsory Rule Changes:

- **Misère Rules:** You win when *you* have no room to grow on your turn.
- **Worm Holes:** The edges of the board are no longer bounds. Worms may grow into 'worm holes' at the edges allowing the worm to loop around to the opposite side of the board. (see Worm Hole Example)

Position Representation:

• (T row row row row ...)
 T stores whose turn it is. Each *row* is a word of the form $www\dots$ where w is a *slot* on the board. The number of w 's is the number of columns and the number of *row*'s is the number of rows. Each w is either the body or head of the worm consuming the space, or "-" if the space is empty. The head and body of the white worm are represented by 'w' and 'o' respectively, while the head and body of the black worm are 'b' and 'x' respectively.

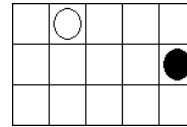
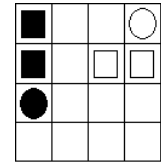


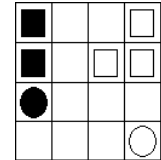
Figure 1
(default board)

Worm Hole Example (on different board):

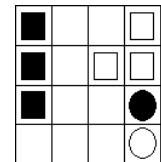
It is white's turn to grow. Its choices are left or worm hole up (it cannot worm hole right because it would grow onto the opponent, nor can it move down because it would grow onto itself). White decides to take the worm hole by moving up.



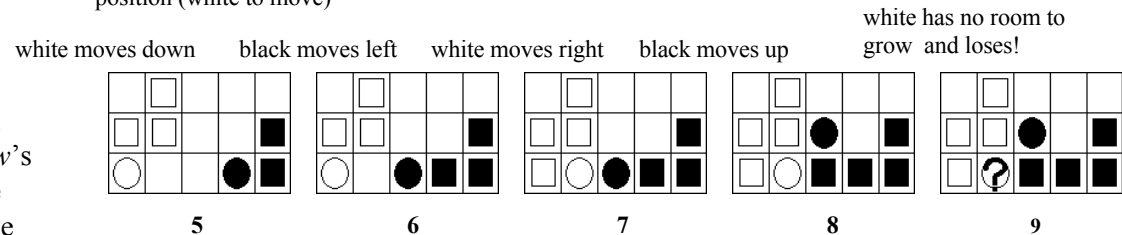
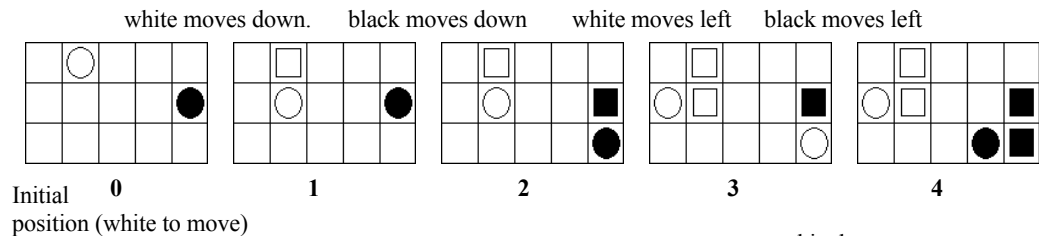
It is black's turn to grow. Its choices are down, right or worm hole left. Black decides to take the worm hole by moving left. It cannot move up because it would grow onto itself.



It is white's turn again and it can choose to grow left or take the worm hole right. It cannot worm hole down because it would grow onto itself, which is an illegal move.



Example game on default board:



E.g., representation for position 0: (w -w--- ----b -----)
 position 5: (b -o--- oo--x w--bx); position 8: (w -o--- oob-x owxxxx)