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CPSC 2150

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Project Report

Requirements Analysis

Functional Requirements

1) As a user, I can view the current board, so that I know how the game is going.
2) As a user, I can enter a column position, so that I can place my piece in a specific position.
3) As a user, I can view the results of the game, so that I know who has won.
4) As a user, I can be notified when I try to place my piece in an already filled column, so that I know an illegal move has been made.
5) As a user, I can have the option to play again after finishing a game, so that I can start a new game if I want to.
6) As a user, I can have the option to end the program after the game has finished, so that I can stop playing if I want to.
7) As a user, I can see when the game has ended in a tie, so that I know that no one has won.

8) As a user, I can see when a player has won due to placing five tokens in a row horizontally
9) As a user, I can see when a player has won due to placing five tokens in a row vertically
10) As a user, I can see when a player has won due to placing five tokens in a row diagonally
11) As a user, I can be given the option to place my token after my opponent's turn
12) As a user, I can be notified whenever a column I've chosen is already full.
13) As a user, I can be notified whenever I make a selection that is out of the bounds of the game board.

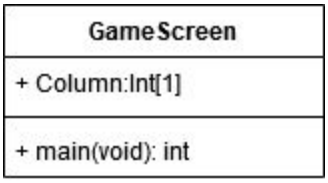
Non Functional Requirements

1) Must run on the Clemson School of Computing server.
2) Must be in Java.
3) Need to create UML class diagrams.
4) Need to create UML activity diagrams.
5) Need to create contracts for each method in my classes.
6) Create javadoc comments, specifying parameters, invariants, etc.
7) Game Board must be 6 x 9 in size
8) The bottom left of the board has coordinates [0, 0] and the top right of the board has coordinates [5, 8]
9) Player X goes first

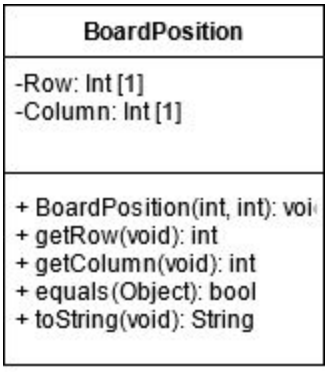
Design

UML Class Diagrams

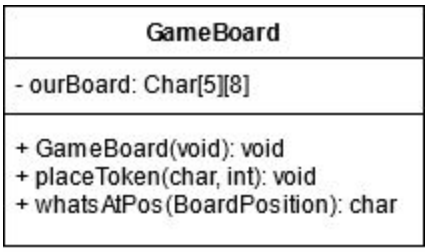
`GameScreen.java`



`BoardPosition.java`

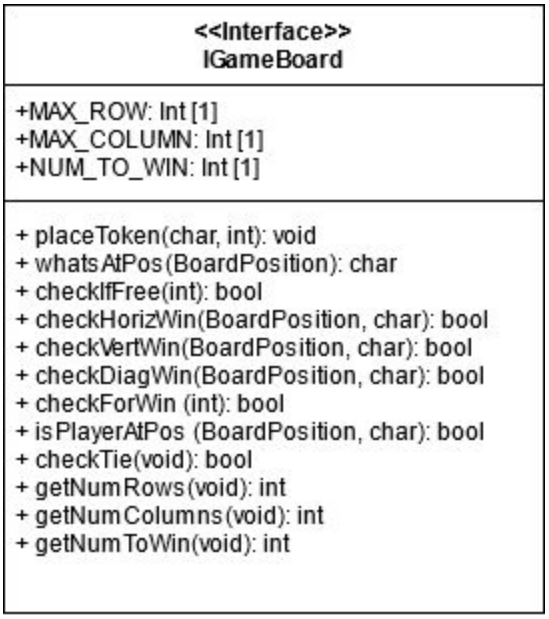


`GameBoard.java`



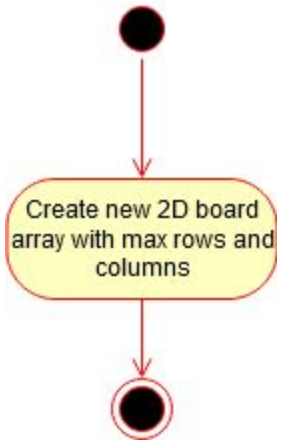
AbsGameBoard.java

IGameBoard.java

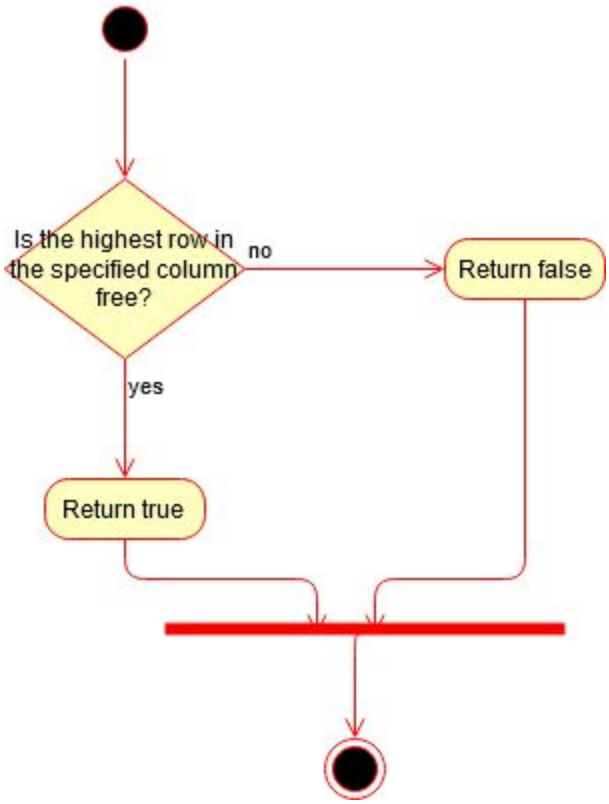


UML Activity Diagrams

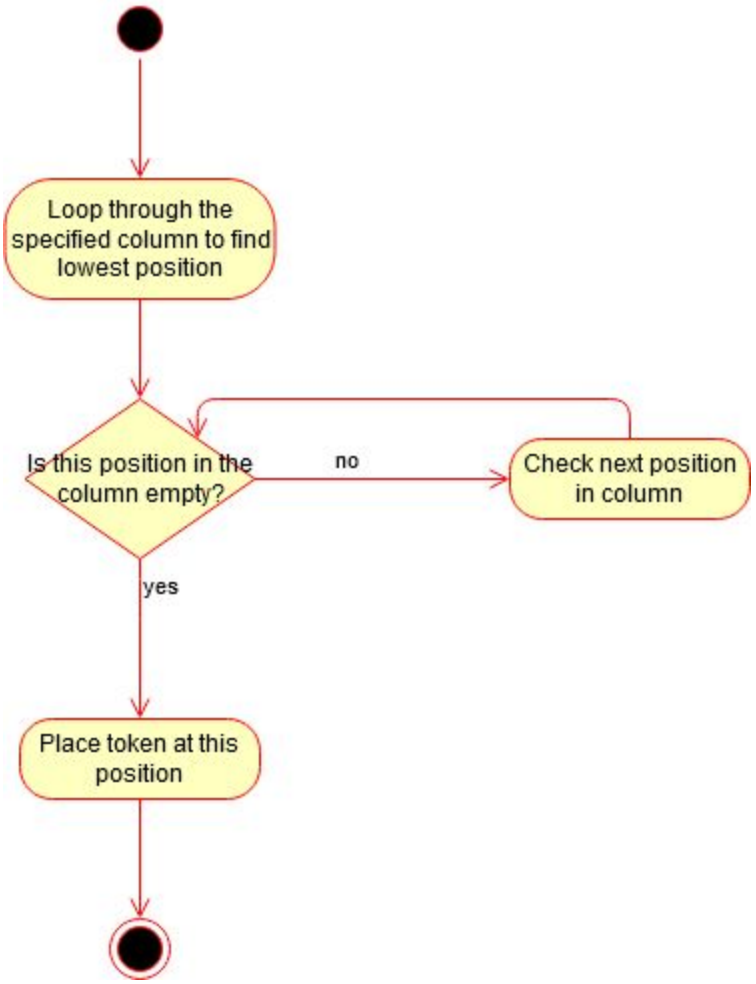
`GameBoard.java - GameBoard()`



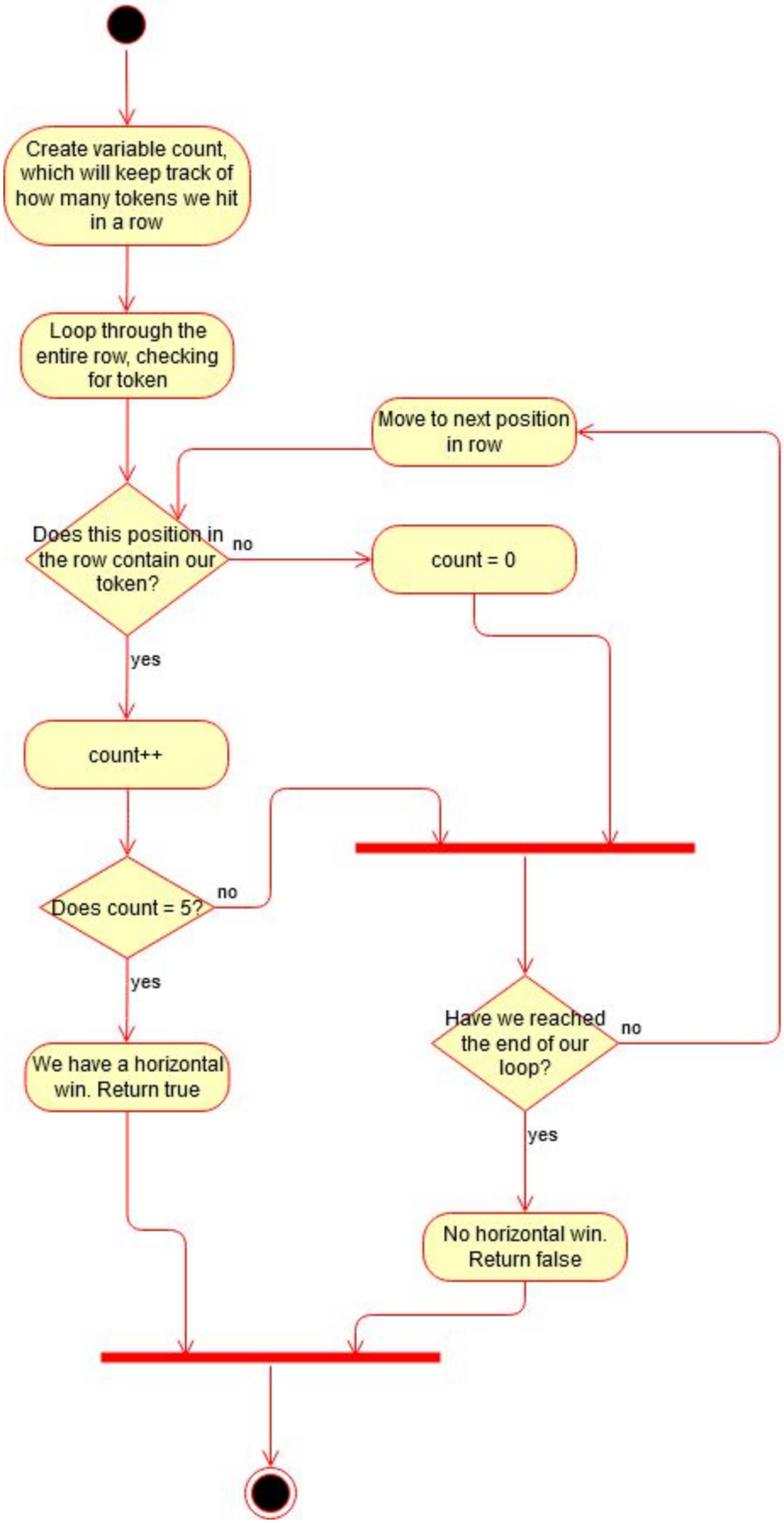
`IGameBoard - checkIfFree()`



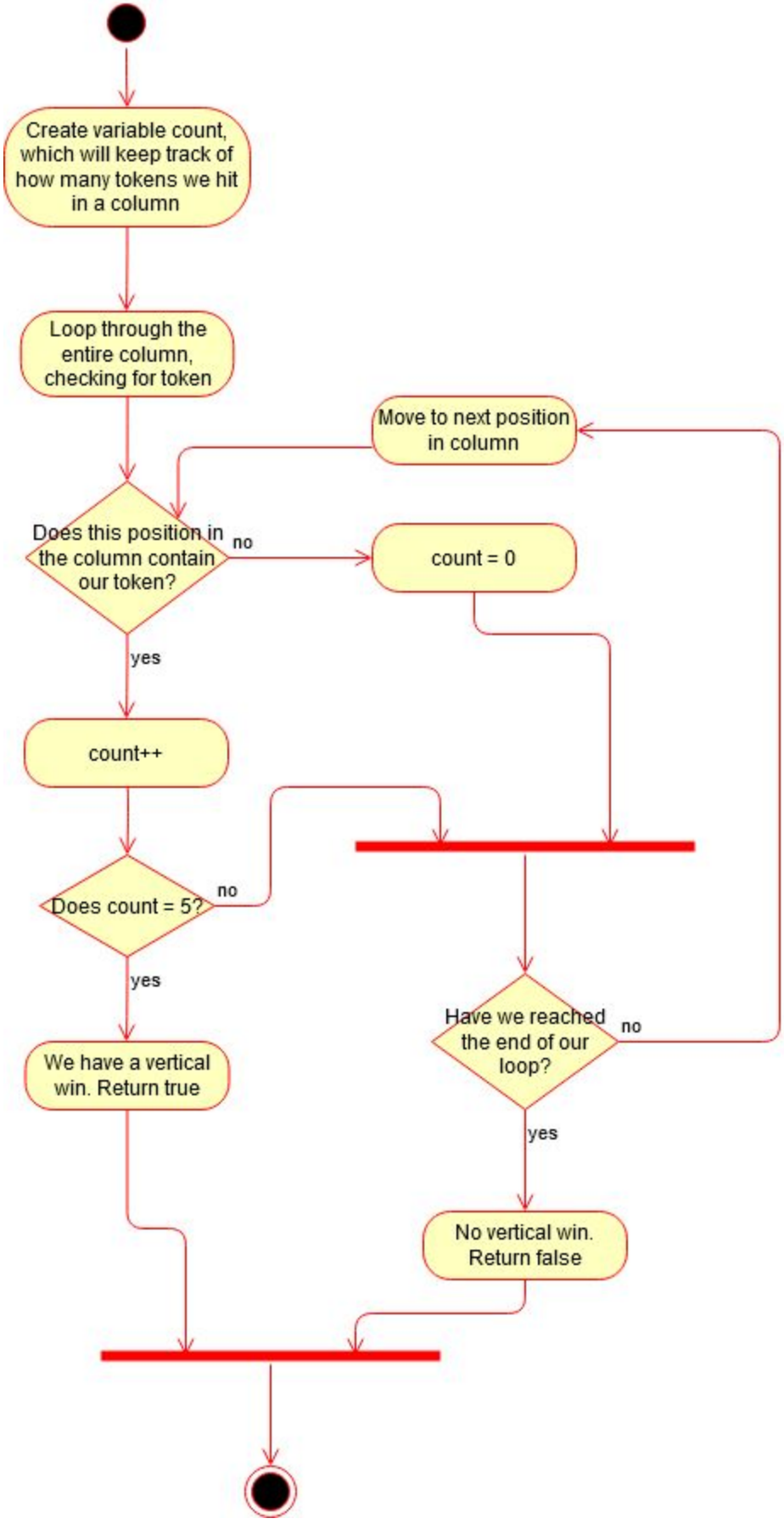
`GameBoard - placeToken()`



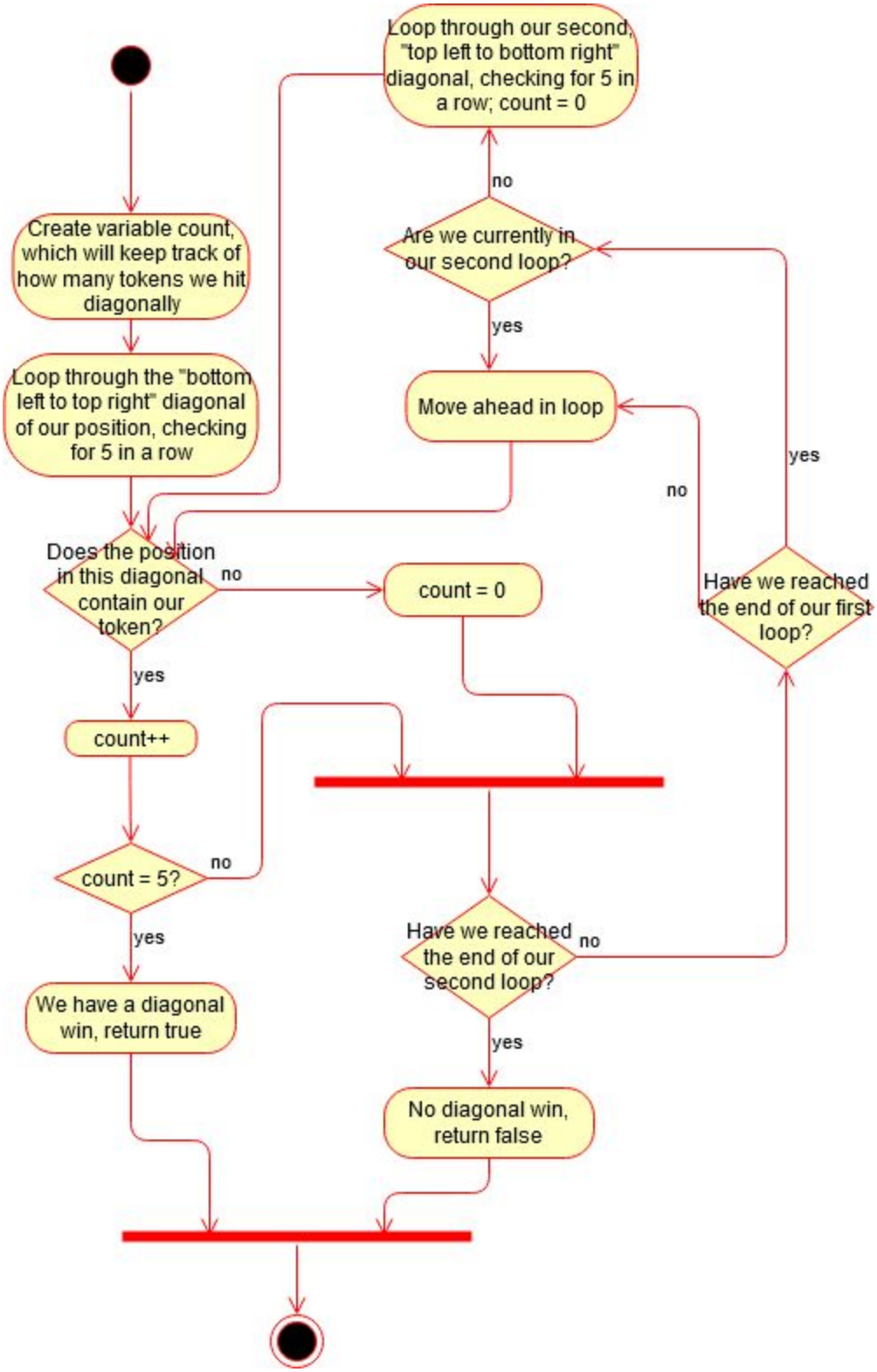
IGameBoard - checkHorizWin()



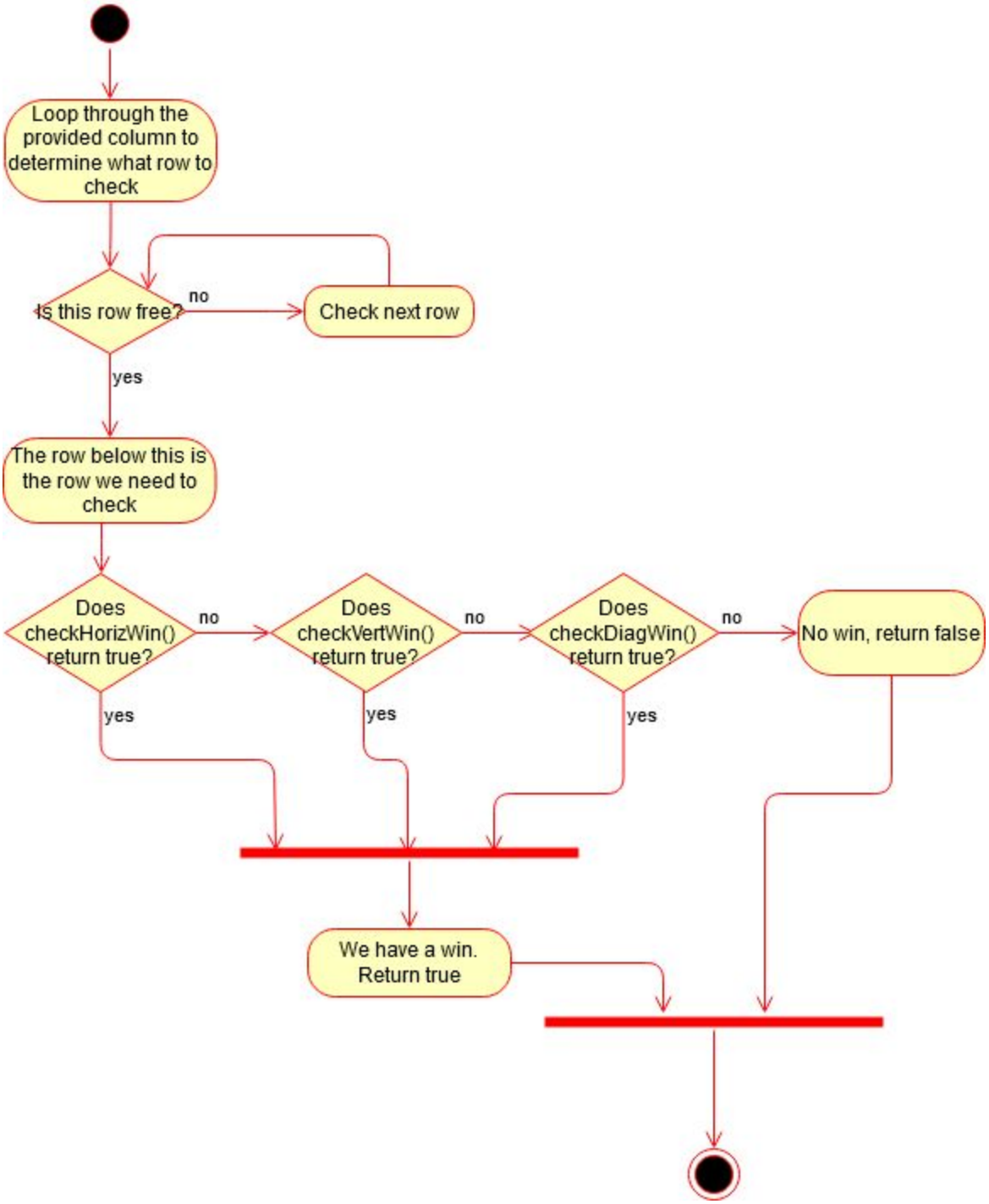
IGameBoard - checkVertWin()



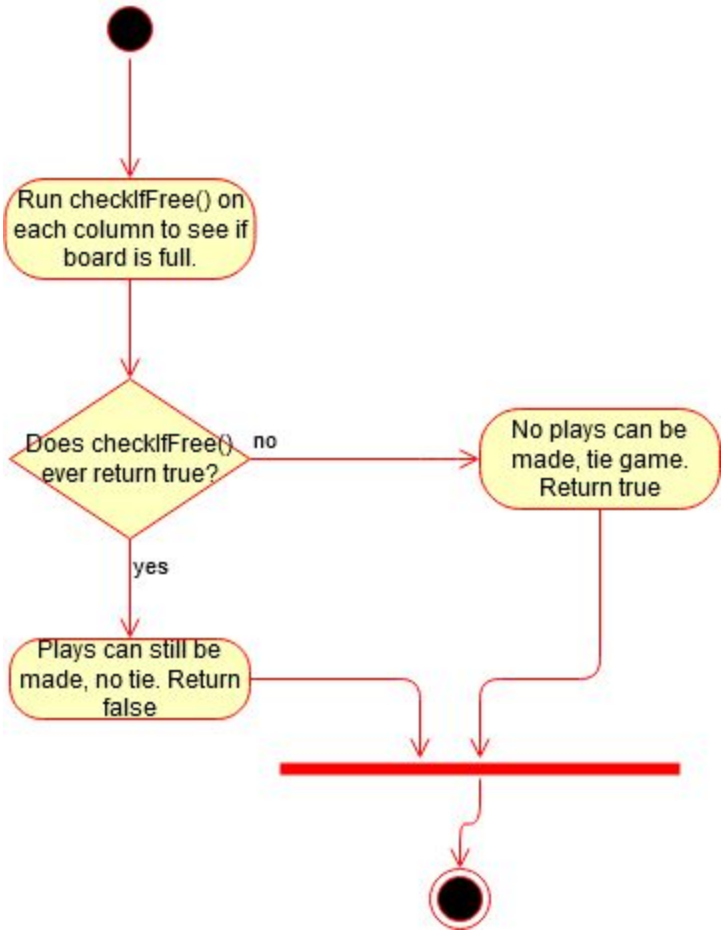
IGameBoard - checkDiagWin()



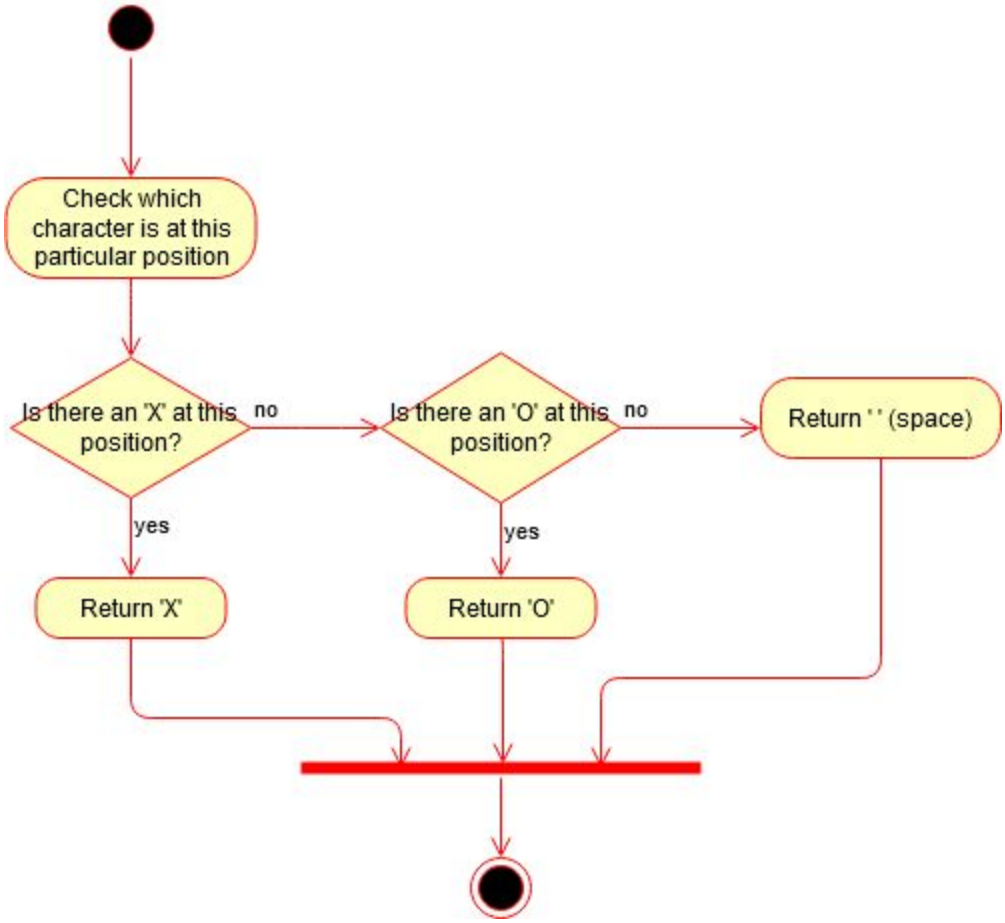
IGameBoard - checkForWin()



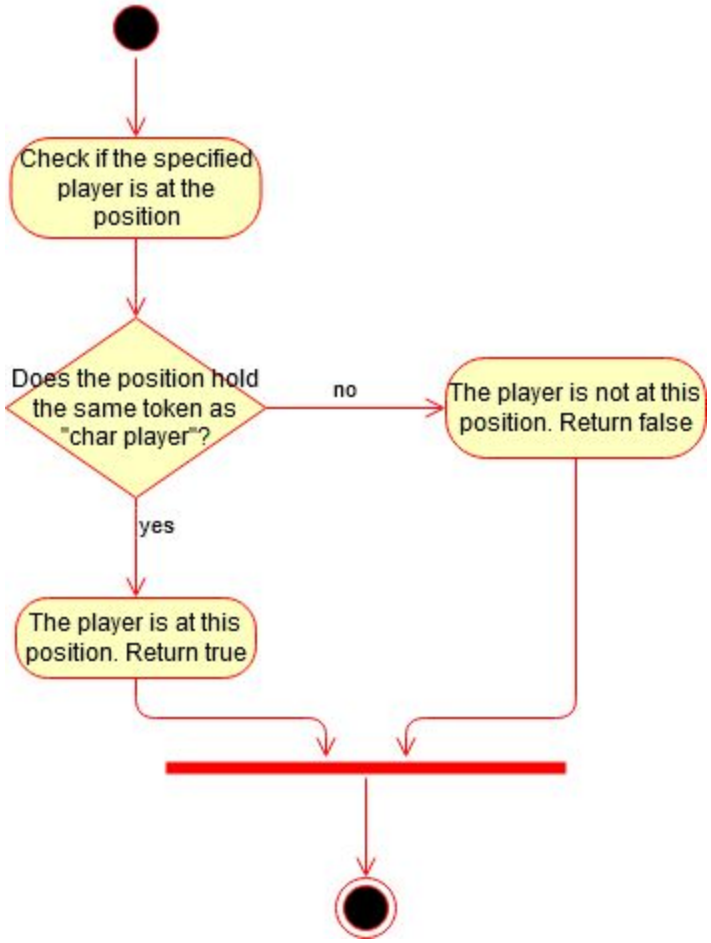
IGameboard - checkTie()



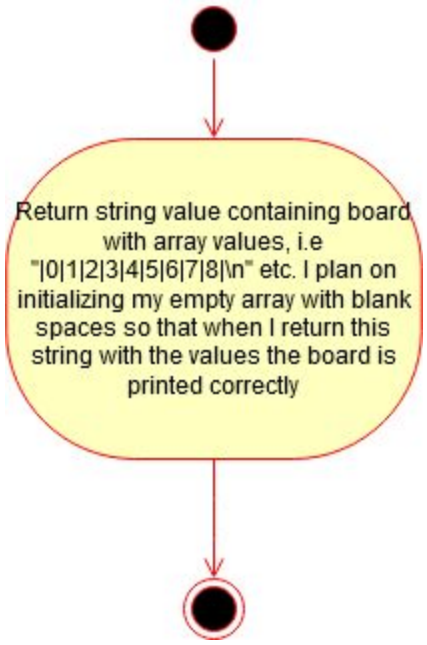
`Gameboard - whatsAtPos()`



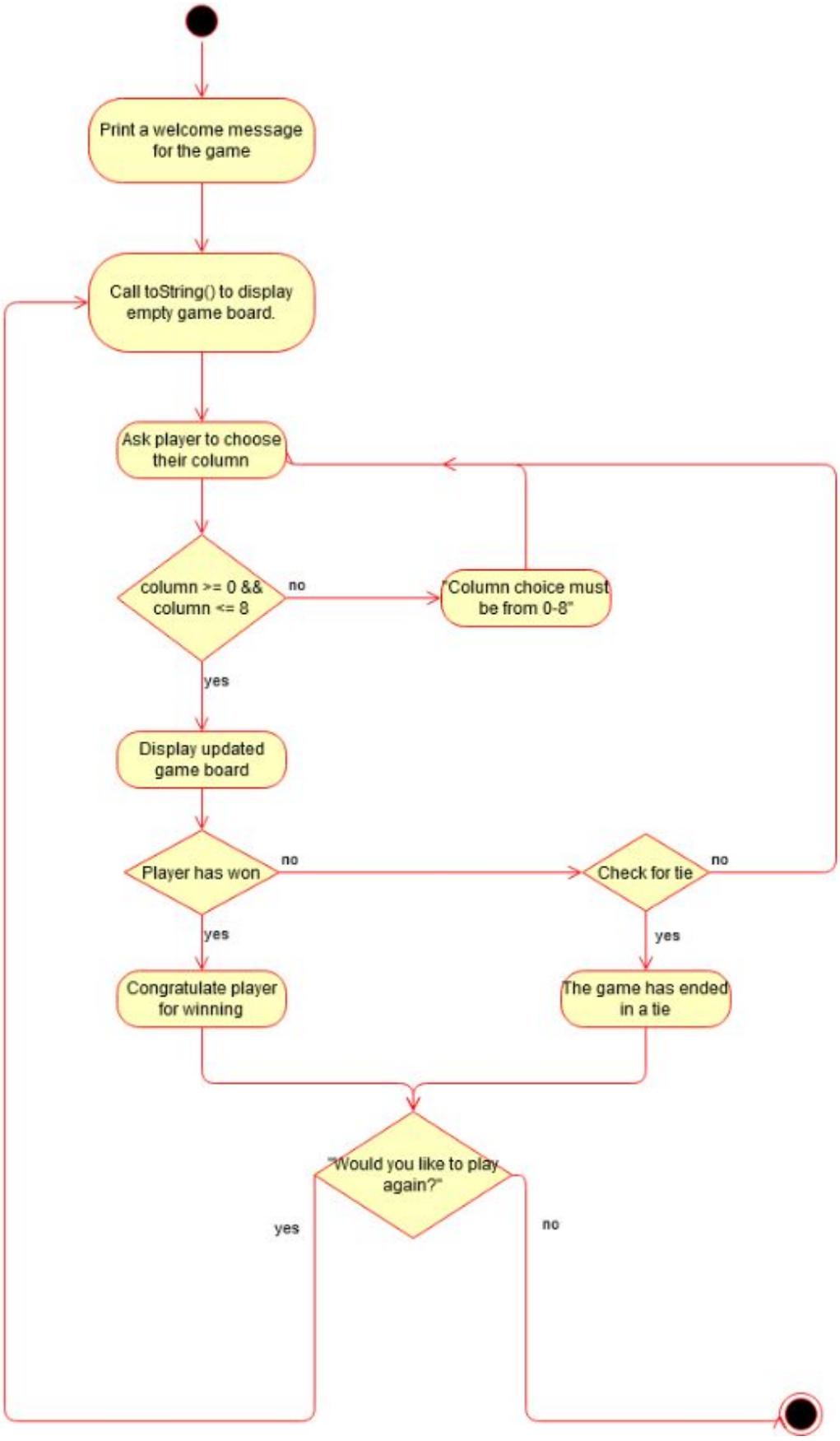
IGameBoard - isPlayerAtPos()



AbsGameBoard - toString()



GameScreen.java - main()

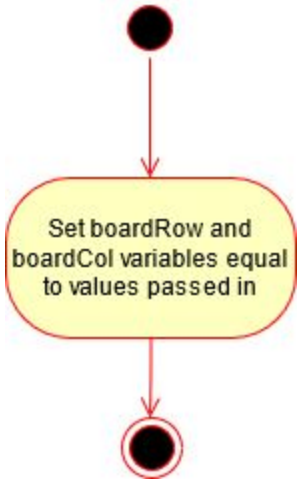


IGameBoard.java - getNumRows()

IGameBoard.java - getNumColumns()

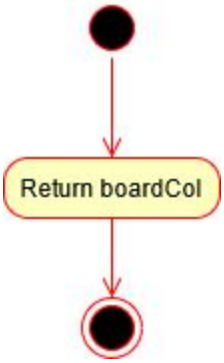
IGameBoard.java - getNumToWin()

BoardPosition.java - BoardPosition()

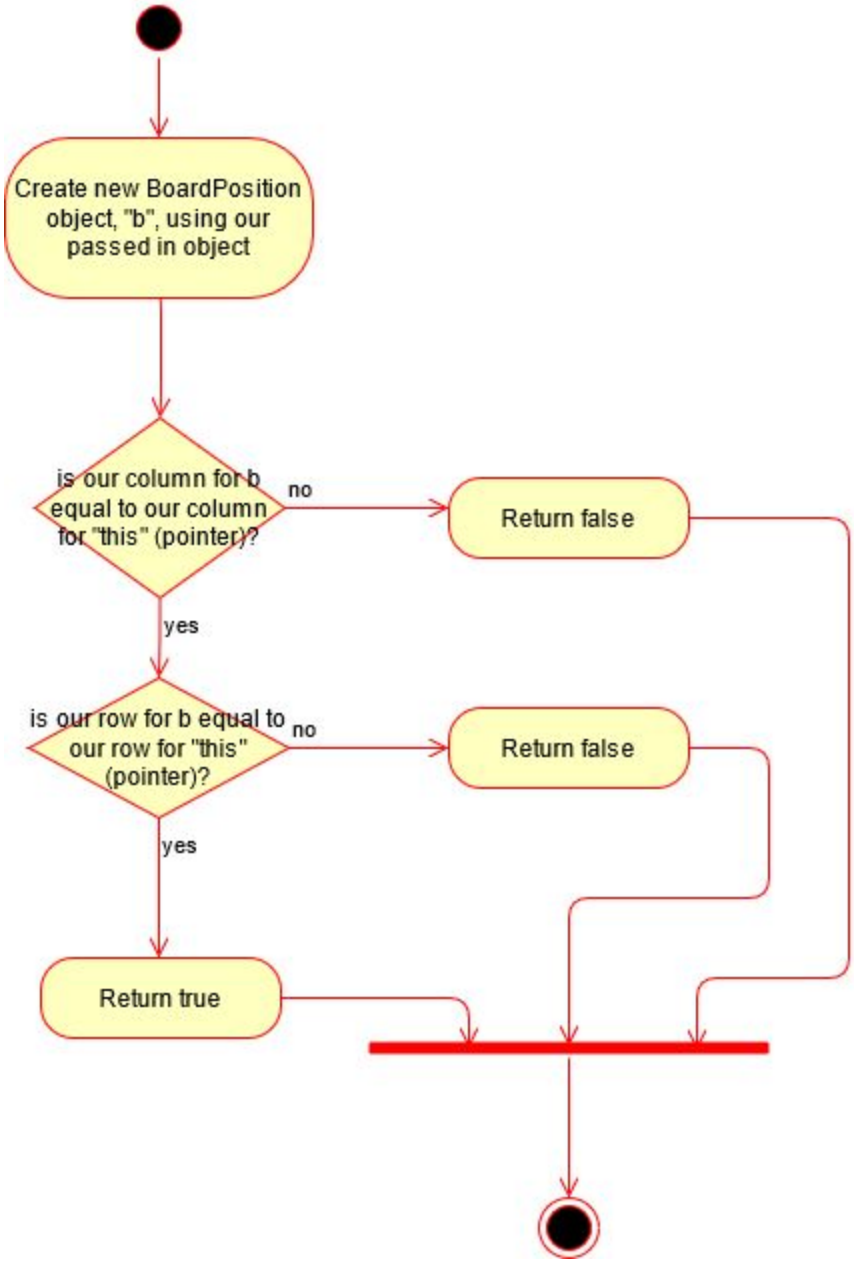


BoardPosition.java - getRow()

`BoardPosition.java - getColumn()`



BoardPosition.java - equals()



BoardPosition.java - toString