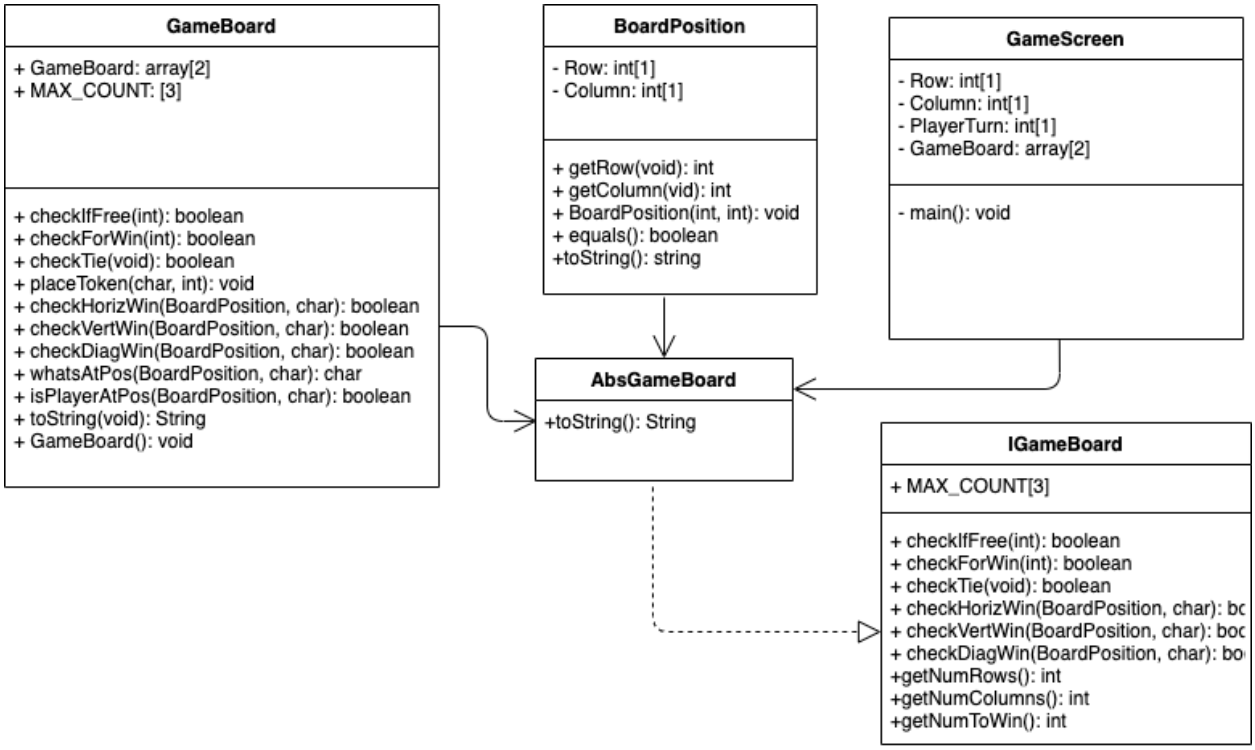
Annie Hayes ahayes5@g.clemson.edu

functional requirements:

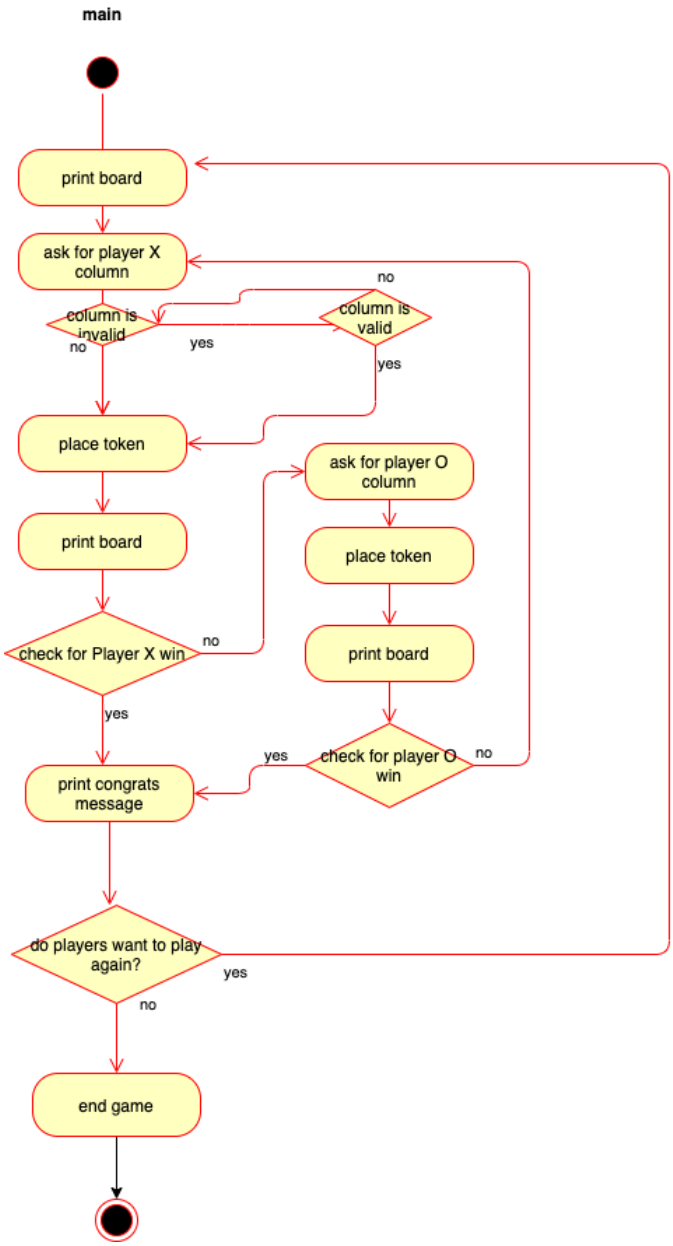
1. As a player, I can only place a marker vertically in a column to simulate the connect 4 game.
2. As a user, I can only place a marker in 9 columns so I don't lose my turn
3. As a player, I cannot place a marker in a column that is already full so the board stays the same.
4. As a user, I can win if I have 5 of my markers in a row horizontally.
5. As a player, I can win if I have 5 of my markers in a row vertically.
6. As a player, I can win if I have 5 of my markers in a row diagonally.
7. As a strategist, I can have a tie in the game because all of the columns are full.
8. As the user, I can alternate between players so each player can have a turn.
9. As a player, I can see whose turn it is so I know who is supposed to pick a column
10. As a connect-4 pro, I can pick which column to place my marker so I know which spot I played.
11. As a player, I cannot pick a spot outside of the bounds of the board or I will get an error message.
12. As a player, I can see if I have won by looking if I have 4 in a row.
13. As a player, I can play again once the game has ended.
14. As a player, I can enter an integer value to say which column I have selected.
15. As a player, I cannot enter a value over 9 since there are only 9 columns.
16. As a player, X will start the game so it is consistent every game.
17. As a player, the board will keep track of all of the markers so I can see which positions are filled.

non-functional requirements

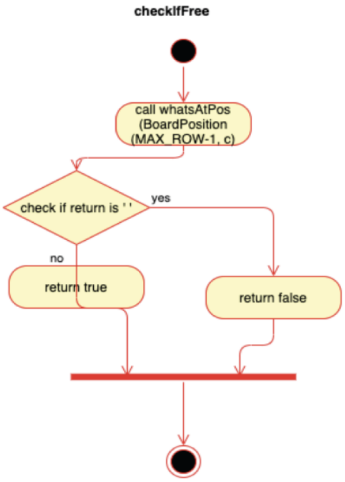
1. The system must be coded in Java
2. 0,0 is the bottom left corner of the board
3. 6x9 game board size
4. player X goes first
5. The system must run on Unix
6. Do not use magic numbers
7. use good comments
8. write contracts
9. make a program report
10. make UML class diagrams
11. make UML activity diagrams
12. write code for functions

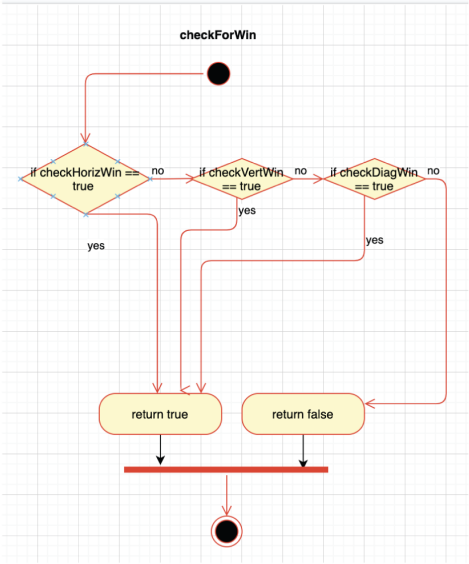

GameBoard
+ GameBoard: array[2]
+ MAX_COUNT: [3]
+ checkIfFree(int): boolean
+ checkForWin(int): boolean
+ checkTie(void): boolean
+ placeToken(char, int): void
+ checkHorizWin(BoardPosition, char): boolean
+ checkVertWin(BoardPosition, char): boolean
+ checkDiagWin(BoardPosition, char): boolean
+ whatsAtPos(BoardPosition, char): char
+ isPlayerAtPos(BoardPosition, char): boolean
+ toString(void): String
+ GameBoard(): void
BoardPosition
- Row: int[1]
- Column: int[1]
+ getRow(void): int
+ getColumn(vid): int
+ BoardPosition(int, int): void
+ equals(): boolean
+toString(): string
GameScreen
- Row: int[1]
- Column: int[1]
- PlayerTurn: int[1]
- GameBoard: array[2]
- main(): void
AbsGameBoard
+toString(): String
IGameBoard
+ MAX_COUNT[3]
+ checkIfFree(int): boolean
+ checkForWin(int): boolean
+ checkTie(void): boolean
+ checkHorizWin(BoardPosition, char): bc
+ checkVertWin(BoardPosition, char): boc
+ checkDiagWin(BoardPosition, char): bo
+getNumRows(): int
+getNumColumns(): int
+getNumToWin(): int

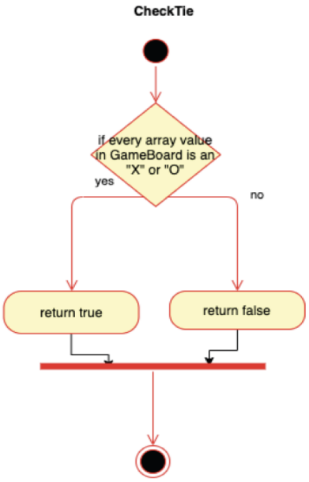
GameScreen.java

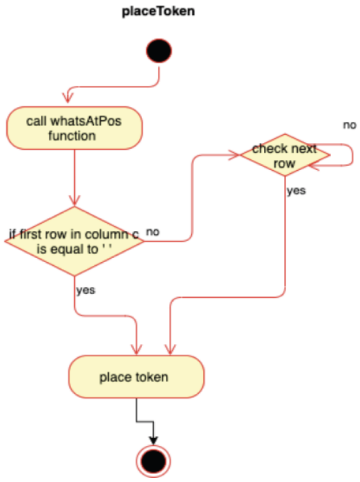


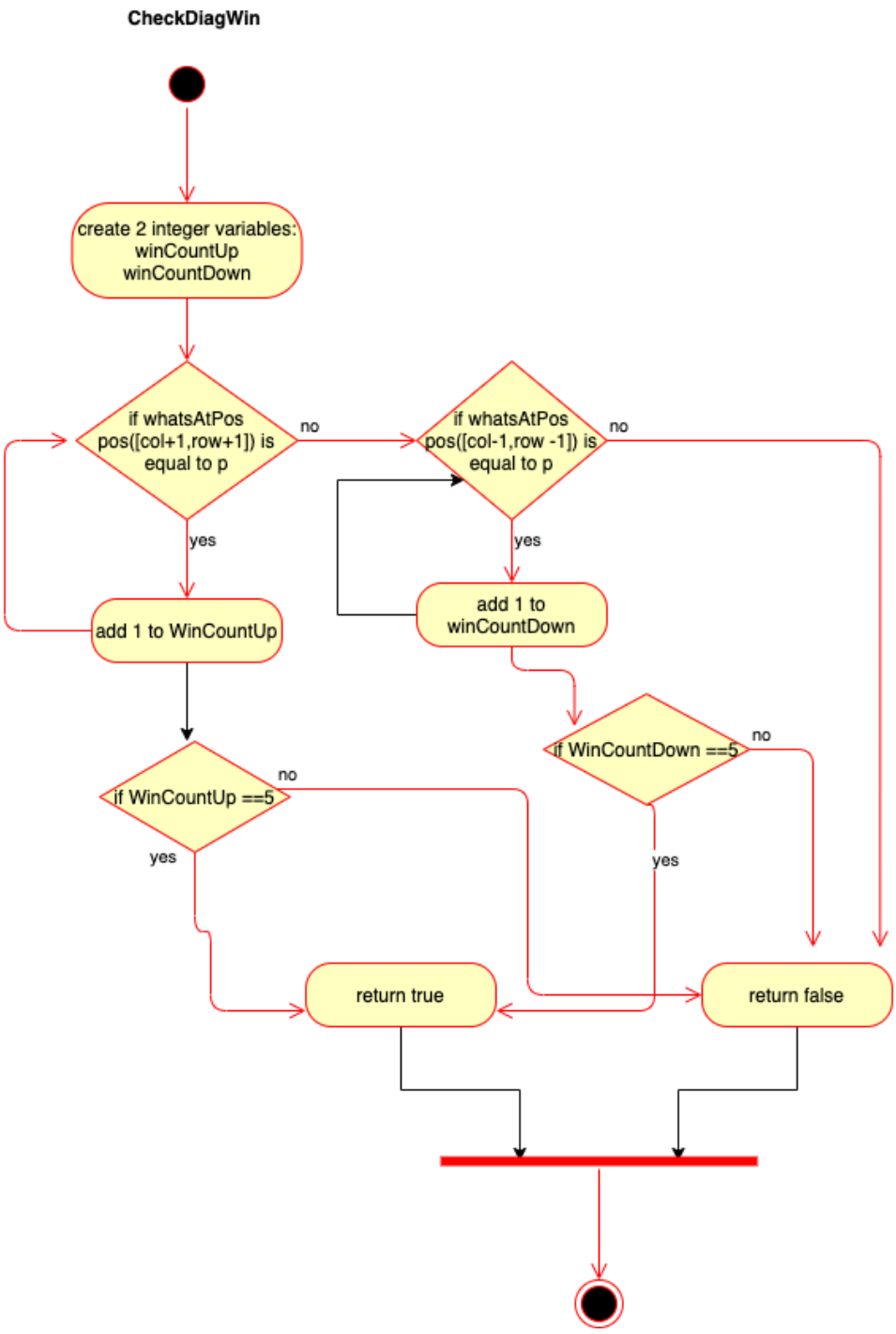
GameBoard.java

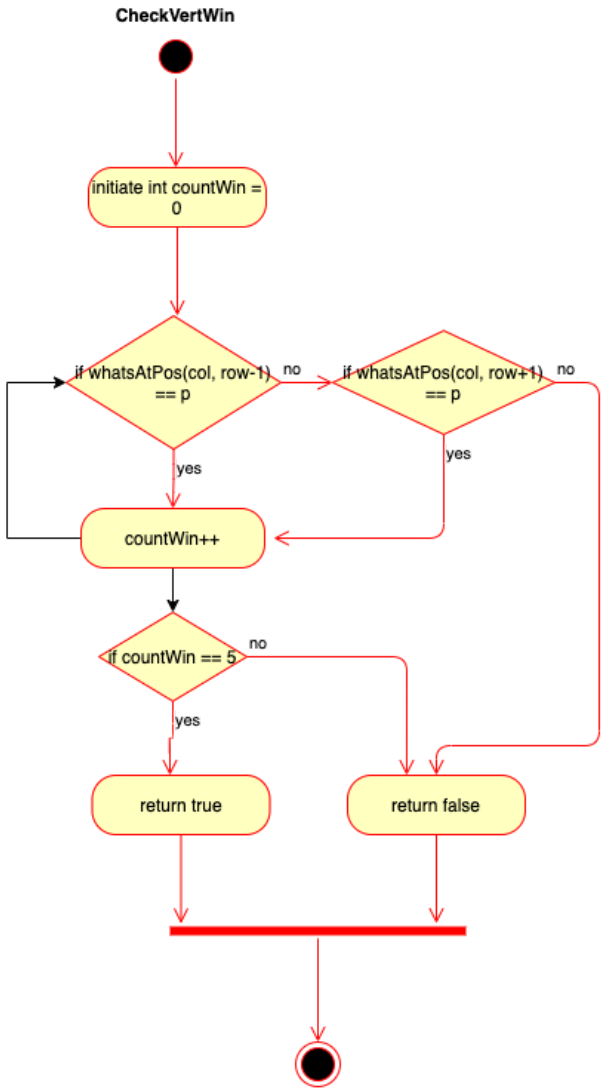


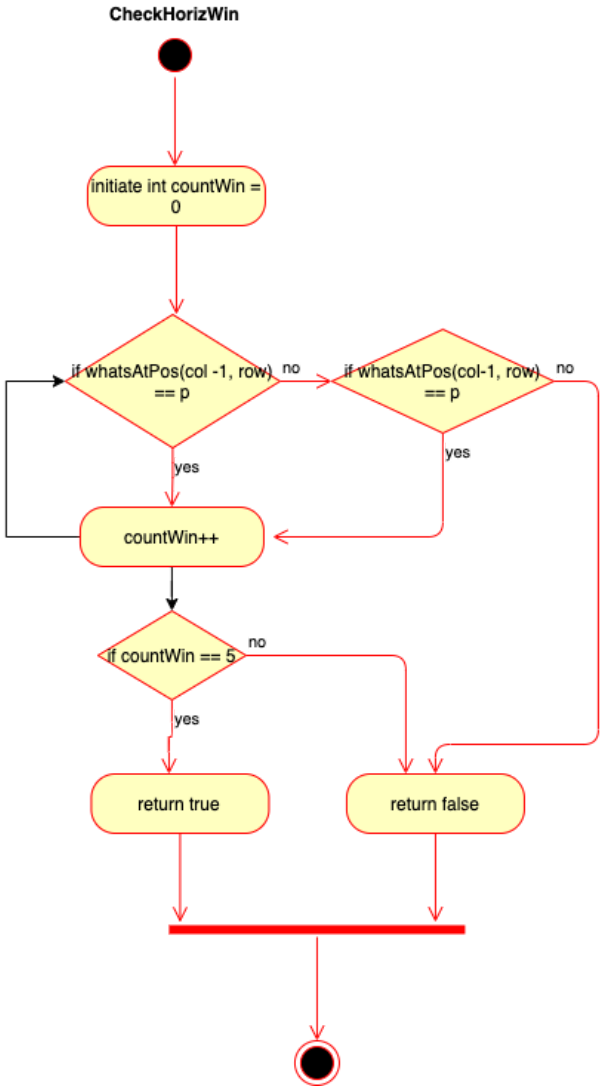


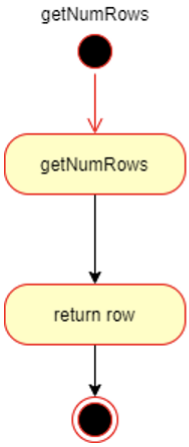


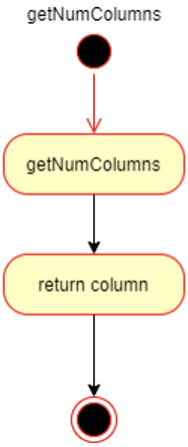


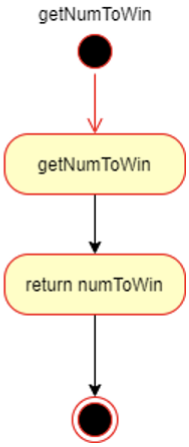

CheckDiagWin
create 2 integer variables:
winCountUp
winCountDown
if whatsAtPos
pos([col+1,row+1]) is
equal to p
no
yes
add 1 to WinCountUp
if whatsAtPos
pos([col-1,row -1]) is
equal to p
no
yes
add 1 to
winCountDown
if WinCountDown ==5
no
yes
if WinCountUp ==5
no
yes
return true
return false

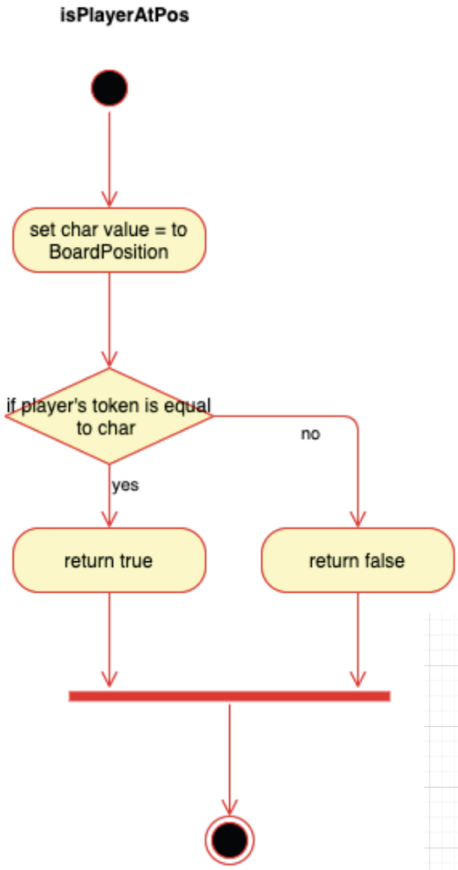

CheckVertWin
initiate int countWin = 0
if whatsAtPos(col, row-1) == p
no
if whatsAtPos(col, row+1) == p
no
yes
yes
countWin++
if countWin == 5
no
yes
return true
return false

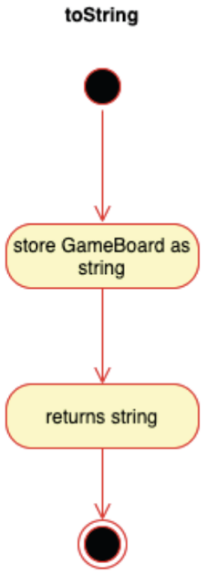

CheckHorizWin
initiate int countWin = 0
if whatsAtPos(col -1, row) == p
no
if whatsAtPos(col-1, row) == p
no
yes
yes
countWin++
if countWin == 5
no
yes
return true
return false

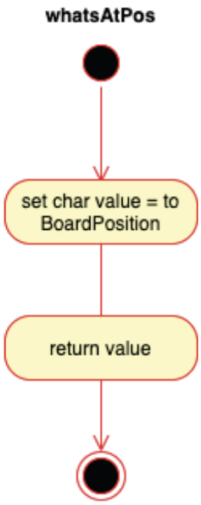

getNumRows
getNumRows
return row

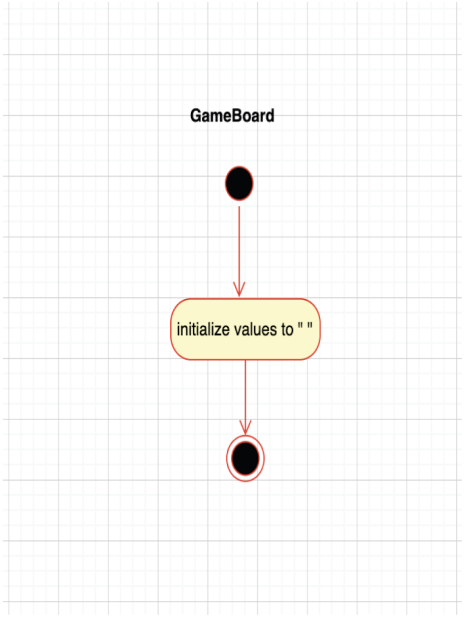

getNumColumns
getNumColumns
return column


getNumToWin
getNumToWin
return numToWin


isPlayerAtPos
set char value = to BoardPosition
if player's token is equal to char
no
yes
return true
return false


toString
store GameBoard as string
returns string


whatsAtPos
set char value = to BoardPosition
return value


GameBoard
initialize values to " "