Final Program with Comments

SDP_Project.m:

```
clc
clear
%create the sprites and pieces of the game
my_scene = simpleGameEngine('ConnectFour.png', 86,101);
empty_sprite = 1;
red_sprite = 2;
black_sprite = 3;
player = 2;
turn = 1;
gameOver = 0;
endMessage = "Game is tied. Try again.";
%create the actual game board out of the empty sprites
board_display = empty_sprite * ones(6,7);
r = 1;
c = 1;
b = 6;
%the game should run until someone wins, or a tie
while gameOver == 0
    b = 6;
    %in the beginnning it should draw the board and prompt either player to
    %make a move
    drawScene(my_scene, board_display);
    if player == 2
        title('Player 1 please pick a column to drop your marker.')
    end
    if player == 3
        title('Player 2 please pick a column to drop your marker.')
    end
    %it should take the mouse input of which column the player clicks
    [r,c] = getMouseInput(my_scene);
    %it should only work if the player clicks inside of the game board
    while board_display(r,c) ~= 1
        [r,c] = getMouseInput(my_scene);
    end
    %this is meant to change the row of where the marker goes in order for
    %it to drop into the lowest possible spot inside the column
    r = rowCheck(player, board_display, empty_sprite, r, c);
    board_display(r, c) = player;
    %should constantly check if any player has connected 4, or if there is
    %a tie
    gameOver = isWin(player, board_display, red_sprite, black_sprite, r, c);
    %if there is a win, the game should congratulate the player who won
    if gameOver == 1
        endMessage = "Congrats player " + (player - 1) + "!";
        %if there is a tie, the game should still display a tie game
        %message
    else if turn == 42
            gameOver = 1;
            %the game should switch players every time their turn ends
    else
        player = 5 - player;
```

```
        turn = turn + 1;
    end
    end

end
%the final game board should be displayed, with a message congratulating
%the winner, or urging to try again after a tie.
    drawScene(my_scene, board_display);
    title(endMessage);
    hold on
```

rowCheck.m:

```
%this function is meant to find the lowest possible row for the marker to
%drop into
function row = rowCheck(player, board, e, r, c)
b = 6;
%if the column is emppty, it should drop into the first row of the column
if board(b,c) == e
    row = b;
    %otherwise if should go up until it finds a spot that is not empty
else
    while board(b,c) ~= e
    b=b-1;
    end
    row = b;
end
end
```

isWin.m:

```
function done = isWin(player, board, R, B, r, c)
done = 0;
%this should find all the list of possible horizontal connect 4's
for i=1:6
    for j=1:4
        if board(i,j) == R && board(i, j+1) == R && board(i, j+2) == R &&
board(i, j+3) == R
            done = 1;
        elseif board(i,j) == B && board(i, j+1) == B && board(i, j+2) == B &&
board(i, j+3) == B
            done = 1;
        end
    end
end
%this should find all the list of possible vertical connect 4's
for j=1:7
    for i=1:3
        if board(i,j) == R && board(i+1, j) == R && board(i+2, j) == R &&
board(i+3, j) == R
            done = 1;
        elseif board(i,j) == B && board(i+1, j) == B && board(i+2, j) == B &&
board(i+3, j) == B
            done = 1;
```

```
        end
    end
end
%this should find the list of all the possible diagonal connect 4's from
%the left
for j = 1:4
    if board(6, j) == R && board(5, j+1) == R && board(4, j+2) == R &&
board(3, j+3) == R
        done = 1;
    elseif board(6, j) == B && board(5, j+1) == B && board(4, j+2) == B &&
board(3, j+3) == B
        done = 1;
    elseif board(1, j) == R && board(2, j+1) == R && board(3, j+2) == R &&
board(4, j+3) == R
        done = 1;
    elseif board(1, j) == B && board(2, j+1) == B && board(3, j+2) == B &&
board(4, j+3) == B
        done = 1;
    end
end
%this should find the list of all the possible diagonal connect 4's from
%the right
for j=7:-1:4
    if board(6, j) == R && board(5, j-1) == R && board(4, j-2) == R &&
board(3, j-3) == R
        done = 1;
    elseif board(6, j) == B && board(5, j-1) == B && board(4, j-2) == B &&
board(3, j-3) == B
        done = 1;
    elseif board(1, j) == R && board(2, j-1) == R && board(3, j-2) == R &&
board(4, j-3) == R
        done = 1;
    elseif board(1, j) == B && board(2, j-1) == B && board(3, j-2) == B &&
board(4, j-3) == B
        done = 1;
    end
end
```

ConnectFour.png