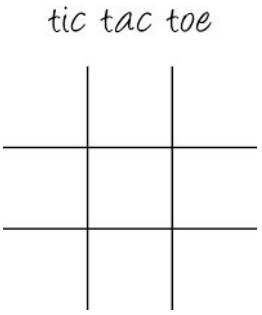
Final Project

TIC TAC TOE AI

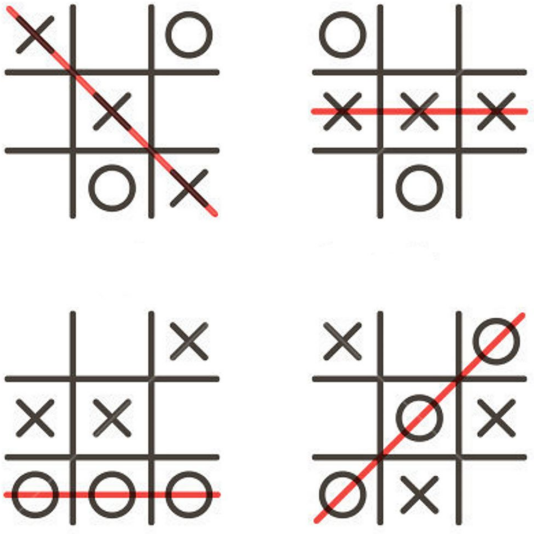
How to play Tic Tac Toe

First, you have to draw the board, which is made up of a 3 x 3 grid of squares. This means it has three rows of three squares. During the game, players will place “their” symbols in the squares marking them as their own.



Second, the first player places a symbol on the board. Traditionally, the first player goes with "X" and for this assignment, X is first. After this, the players alternate turns.

The **goal** of the game is to be the **first** to get three symbols in a row.



The game does not necessarily end in a win and a loss - there can be a tie.

The Necessary Functions

genBoard()

This function will generate an empty board and then return it. This should be called when starting a game. Hopefully you remember how we worked to create this function on Wednesday.

printBoard()

This function will print out the board in an easy to see manner, so humans can understand what is happening. This function will be provided to you.

boardIsFull(board)

This function takes in the board, and returns true if the board is full, and empty if it is not. It is needed to stop the game when it finishes, should a tie occur.

replace(board, old, replaceWith)

This function replaces a character on the board with one of the players symbols (an “X” or an “O”), allowing them to make their move

checkWin(board)

Check win determines if anyone has won the game

winner(board)

Prints the winner of the game

playOne()

Starts a multiplayer game of Tic Tac Toe (no AI’s, two humans are needed). This called upon all the functions mentioned up to this point. It will continue to loop until board is full and there is no winner, or someone has one. If someone wins, it will print the winner after the loop. It switches players each loop, allowing turns to alternate. Each turn it asks a player to type in their move, but if the move is not valid it asks the player to type in their move again. The board should be printed after each move, so the players know what is going on.

randomPlay(board, character)

Random takes in the board and the character (“X” or “O”), and places it into a random *empty* position on the board

playTwo()

playTwo is similar to playOne, except one of the players will be a computer. The computer can be set to X, and the human to O, or you can assign a random character to the computer at the start of each game.

playThree()

Same as playTwo, but now both players are AI’s.

<u>Programming an AI</u>

AImove(board, character)

This function should take in the board, and return the position on the board it would like to move to. This function can be programmed however you want - it is your AI. You create other functions for it to call on, such as “firstMove”, if you want your AI to have a designed first move. Or “nonLoser” which blocks your opponent if they have two characters lined up in a row.