TCSS 435 - Artificial Intelligence
Assignment 2 - Tic Tac Toe

Guidelines

This assignment consists of programming work. Solutions should be a complete working JavaScript program including your original work or **cited contributions** from other sources. These files should be compressed in a .zip file for submission through the Canvas link.

This assignment is to be completed on your own or in a group of two or three. If you choose to work in a group this must be clear in your submission. Please see the course syllabus or the course instructor for clarification on what is acceptable and unacceptable academic behavior regarding collaboration outside of a group of two or three.
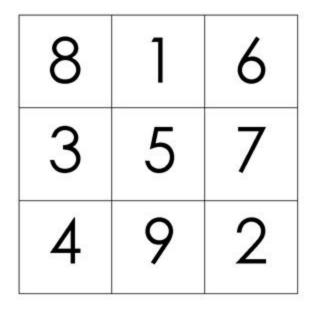
Assignment

The game of Tic Tac Toe is simple enough that even children can become experts. However, the task of encoding a strategy in an artificial intelligence program can be challenging. As a first attempt at artificial intelligence programming you will create a Tic Tac Toe agent that will win whenever it can and never lose.

You are provided with a simple Tic Tac Toe simulator. The provided agent selects its move randomly. You must replace its selectMove method with your own strategy. It may be convenient to also create a test agent to play against your agent. Otherwise your agent will play against itself.

Your agent will be evaluated by testing it against secret agents of the instructors design. Your agent should defeat all agents that do not play perfectly and achieve a draw with all other agents. Your agent will have to play both first player and second player roles.

Specifications

The Tic Tac Toe simulator numbers the squares according to this magic square (all winning combinations sum to 15):

By numbering the squares in this way it is simple to calculate if a combination of three plays is a winning combination (it is if it sums to 15).

You can check the game board by inspecting one of these variables:
  ● board.X - a list of cells with X's by number
  ● board.O - a list of cells with O's by number
  ● board.cells[i].className - will be "X" or "O" if cell i has an "X" or "O" respectively

You can use this method to check if a cell is free:
  ● board.cellFree(i)

Your selectMove method should return the cell you wish to play in by number.

Submission
The following files are provided for you:
  ● index.html
  ● style.css
  ● tictactoe.js - simulator code
  ● tictactoeAgent.js - agent template

You will submit only:
  ● tictactoeAgent.js - your agent code