Task 3 Lab: Tic-Tac-Toe

Summary

Create a console based (command line interface or CLI) version of the simple game Tic-Tac-Toe in python that supports the development and comparison of computer-controlled AI players (bots).

Your software design can be simple functions (strongly suggested if you are not sure where to start) or a more OO design. The two most important aspects that you must have in your implementation are:

- A clear game loop architecture that contains:
  - input() processing,
  - update()'ing of the game model (including game rules), and
  - render() of the game state to the user.
- A modular block of AI code that can be easily changed.

Stage 1: Create Software Design (Seriously)

Create a design/outline on paper first for the overall game (not the AI). Show your design to the tutor and make sure you are on the right track. Keep your design for use in later work. (It's okay if you use Word or pen/paper for your design.) **Submit this design document to Canvas and commit to your repo.**

If you are unsure of how to approach this, there is a sample implementation provided. You can have a look at this and modify it, use it for inspiration (i.e. cut-n-paste bits if that helps), or ignore it - it's up to you.

Stage 2: Implement Game Loop Model and External AI Call

The input()/update() (or equivalent) blocks of code of your main game loop should support an external call to an AI function/object method that is able to observe the current game state and then make its next move.

Important: Your code must demonstrate the game loop and input/update concepts to be accepted.

Stage 3: Create Two Different AI Bots

Design two different AI's to play the game. Suggested procedure is to write a list of steps (pseudo code) for each AI, and only then implement them. (Strongly suggest that you start by writing code comments for each of the steps in your list, and then "flesh them out".).For the purpose of quick feedback, **Commit your code and your bots to your repo - don't wait until it's perfect.**

By the end of this lab you should have created (or modified the supplied code) the game of Tic-Tac-Toe in python, you should understand the structure and function of a standard game loop, and you should have created at least two different AI bots that can play the game.

Extensions: Tic-Tac-Toe AI battles!

Get your own two AI bots to battle it out. Note: you don't need to "render" to screen if your bots are battling - just print the results (and repeat multiple times?!).

Keep your extension code in a separate file from your code lab code. (You may also wish to use a separate extension(s) branch if you're familiar with git branches)

Note: Extensions are suggestions for work you may wish to undertake as a part of earning a Credit or higher grades. Most Labs and Spikes will have some suggested extensions. Tackling some of these extension tasks or coming up with some of your own is essential to earning a Credit or higher! See Task 17 for details.