SE101 - Lab Project Proposal

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Our project is to develop an AI that plays “connect 5” against a human. The game is projected onto an LED screen with button controls that the player uses to place their pieces. It will also feature a player vs player mode that will be included in the prototype.

The game will be played on an eight by eight tic-tac-toe style game board. Where the players are trying to connect five of their pieces in either a horizontal, vertical, or diagonal line. The two players, (either human player vs human player, or human player vs computer), take turns until either one player wins, or all spaces on the game board are filled with no winner which results in a tie game.

The computer player has two options as to how it will play the game, either placing pieces randomly, or using basic rules to intelligently place pieces. The human player can place pieces using button controls.

The creation of the project can be split up into three major stages.

- Stage 1: Creating a program that will allow to players to play connect 5.
- Stage 2: Further developing the software to have a computer player which randomly places its game pieces.
- Stage 3: Modifying the computer player so that intelligently places game pieces using basic rules built into the program.

Major software components

This project contains several major software components including creating an intelligent computer player that is capable of playing the game, but also has the ability to win against the human player. We must also develop the game logic to output the game board to the LED screen as well as track the game progress and determine if a player has won.

Prototype Plan

Our prototype plan is to create a program that allows two players to play connect 5, no computer player will be implemented in this evolutionary prototype. We can then expand the capabilities of our prototype to eventually become our final project which will have an intelligent computer player.

Hardware

Arduino and LCD screen have been **ordered and are being shipped**, and a laptop to create the software has been acquired. Buttons will also be acquired which will allow the human player to place their game pieces. We will also create a game board which will be used in combination with the LED screen to make the playing surface.

Challenges

Building an AI that is capable of playing (and winning) against a human player will be our main challenge for this project. Additionally creating the game logic to track the game progress will be a challenge.