Software Requirements for Connect Four

Connect Four

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Overview

This document describes requirements for the software implementation of the classic game of Connect Four. This software will allow two players to play against each other or for one player to play against the computer. A description of the game plus the requirements of this implementation are provided below.

The game

Two players are presented with a 7x6 grid of empty spots. the players choose a color and then take turns dropping colored tokens into the grid. The pieces fall straight down, occupying the lowest available space within the column. The objective of the game is to be the first to form a horizontal, vertical, or diagonal line of four of one's own tokens. If all spots are filled and neither player has a winning set, then the game results in a tie.

Software implementation

UI elements

The software will present the Connect Four game with the UI elements listed below.

- 7x6 Grid of Labels
- One Button on top of each column of the grid to drop a token in that column
- Row of buttons on top of the screen (like a toolbar) that has:
  O Option buttons to choose between 2 Player or Play Against the Computer
  O Start button
  O Label to display Game Status message

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Player modes

There are two modes of play – (1) Two player and (2) Play against the computer – as described below.

Two Player

In this mode, as you would expect, each user clicks on the button that represents the column they would like to drop their token and their color token is displayed on the lowest available space from that column.

Play against the computer

In this mode, the computer is the color yellow. After red's turn the computer will make its move with an algorithm that follows the steps below sequentially:

1. Offense: If there is a winning spot, then take it.

2. Defense: If the other player can win, then take spot to block the win.

3. Offense: Take the spot with the largest number of yellow tokens in a row.

4. Random: take any random available space.

Game Process and Rules

- The game starts when the player clicks Start. Until then all clicks on the column buttons are ignored, and the game status message is "Click Start to begin Game."

- The player chooses the mode of the game either 2 player or play against the computer.

- After Start is clicked: The mode with the message "Current Turn: Red" is displayed. Red takes turn by clicking on the button that represents the column the player wants to enter his token, and the first available space on that column displays a red token. Then, the current turn changes to "Yellow," which is reflected in the game status message and when the player clicks. If a player clicks on a button in which the column is full, the click is ignored, with no effect to the grid or current turn.

- When there is a winner: a W displays on all winning tokens to indicate a win. Game status displays "Winner is: " followed by the winning letter

- If   the grid is full but there is no winner (tie): The back color of all Tokens changes   to a color that indicates no winner. Game status displays   "Tie.

- In the game state of Win or Tie all button clicks should be ignored. Do not disable the buttons because that will cause them to look faded out.

- If the user clicks Start in middle of a game, then the game should interrupt and begin a new game.