ICS4U1

Score Four! Game Assignment

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Introduction

Score Four is game that is based on the popular game *Connect Four* but adds an extra dimension to the gameplay. It's time for you to use your coding skills to take on the challenge of building your own digital version of the game and a computer player that is better than most humans!

Gameplay

The game works by players taking turns placing a chip onto a 4x4 grid (row,column,height). There are four levels of this grid and their chip will fall to the lowest point available in the slot it was placed. A player wins when four of their chips are in a row. This can be horizontally, vertically, or diagonally. (Video)

Details

Programmer #1 – All UI and win checking

You will be designing code (game board and score detection) that:

- Switches between players [main program]
  - Keeps track of number of moves
- Draws maintains the game board [method 1]
  - 3D array
  - Graphics
- Updates/Maintains the game board [method 2]
  - Given coordinates from methods below
- Determines when four-in-a-row has been made [method 3]
  - Accepts array as parameter, returns boolean

Programmer #2 - Algorithms

You will be designing code (human & computer player) that:

- Accepts player1 input [method 4]
  - Accepts the board as a parameter
  - Asks the user for move to make
  - returns a coordinate at which to play
- Determines computer players move [method 5]
  - Accepts the board as a parameter
  - Determines that optimum move to make
  - Returns a coordinate at which to play

Tips

- Your program should start by asking if the player of computer is playing first (Y/N)
- Your program should store all game content via 3D arrays
- You can divide up your work differently than the suggestions above
- Your program will compete against others in a class wide tournament to measure effectiveness

Evaluation

Level 1 – The game is playable. The player and computer select valid moves until the game ends for a 4x4x4 board. The game accepts input and outputs the game state.

Level 2 – The game asks for the game dimensions at the beginning and can play for any size game. Note: the game is always a cube (n x n x n)

Level 3 – The User interface is graphical. The Computer move selection is no longer random (algorithmic)

Level 4 – The game is able to compete and perform well is the class tournament.