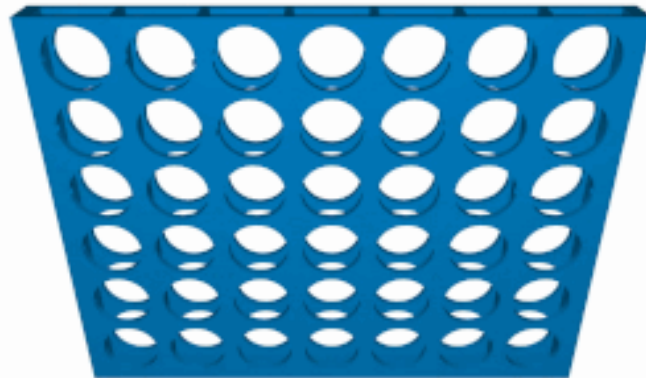# Web Technologies II

ASSIGNMENT - CONNECT 4

Introduction

- Connect 4 is a two player game where two players each play turn by turn until one of them connects 4 coins in any direction to win.

Features

▶ Single player option – Played on the same computer. It works by provisioning a local server to play.

▶ Multiplayer option - Multiplayer is played over Websocket connection. This is playable across multiple computers.

▶ Front-end is done on plain HTML,CSS, JavaScript,jQuery and jQuery-UI with simple bootstrap.

▶ Back-end is over Nodejs using Express. Sockets.io is implemented to make use of powerful websockets.

Technologies Used

▶ Caching - This prevents users from reloading the game and overwriting saved data. Once the game is complete, the local storage will be closed.

▶ Websockets – The multiplayer facet of the game runs over websocket connections.

▶ AJAX – Most of the data and updates are sent over AJAX requests. These include setting IP addresses, marking player numbers and colors, as well as tracking game states.

▶ Periodic refresh – During multiplayer, the server is constantly polled while waiting for the second player to connect. Once connected, the server will switch to websockets for the remaining duration.

Technologies Used - continued

▶ Promises – As per ECMA6, arrow functions and Promises have been included. Tracking socket data and connections is done over Promises to ensure race conditions do not occur.

▶ CORS – Allows multiplayer games to take place

Working

- The game works in a very simple way. First, the user picks an option to play. If it's single player, the game goes on as it is and completes once the winning condition of connecting four are matched.

- In Multiplayer however, a slight difference is present. The player opens up their server to the public and is shown their IP address. Should they want to play, they pass their IP address to the person the want to play against.

- The opponent will enter the IP address and connect.

- Upon connection, the two players will exchange data and set the session for a game. The player who sent the IP address will be hosting the server.

Working contd.

- ▶ Once the data exchange is completed, each of the games load and the colors and names are set.

- ▶ From there, each player plays turn by turn until the winning condition is met. Once met, the game is completed.

- ▶ Small extra features include custom animations and loaders, along with being able to highlight player moves.

- ▶ The games can be accessed via a BAT script file to run the server.