Analysis

My project will involve creating a web API using the web framework Flask, and programming the game connect four. The game will run on a server which will store the players’ user-names and their number of wins and losses. Players will be able to play against each other online.

I have tested online games of connect 4, but I feel like there are still many ways to improve on the ideas. For starters, most of the sites I could find only supported local multi-player1, 2, so you would have to be in the same room to play with a friend. I found only a single website that allowed you to play over the internet3. However the way this was implemented was to provide a URL which you would need to send to a friend. Furthermore you had to repeat this process each time you wished to play against the same person. This made it very slow and tedious if you wanted a rematch. None of the games I found supported playing against a randomly matched opponent.

I will focus on the network multi-player for my project as I find that this is what is lacking in many other online versions of connect 4. My implementation will support user accounts that you can log into, and will give the player the choice to play with a friend or a stranger. I will also provide the option for users to see statistics of their previous matches, and a leader-board amongst friends. I will give the site a simple interface that is easy to use, and you will just need to press a button to select your move.

I have researched into the web framework Flask. I have chosen this framework as it can be versatile but is easy to get started on. It also has a simple and easy to understand format, and the use of function decorators in it is very effective.

I am aiming my project at end-users who will be in general a few years younger than me, approximately 10 years old, but have a good degree of familiarity with computers and spend a fair bit of time online. I believe this age-range particularly enjoy classic problem-solving games such as Four in a Row, that they may be already familiar with outside of the online world. Alternatively, it is also aimed at people who spend a large portion of their time online and frequently get bored. Furthermore they also increasingly want to play them with their friends when they are not in the same physical space. I will be consulting both with friends and potential users during the project to ensure that the features are effective.

Objectives:

Create a web API

Create a working connect 4 backend

Make the game playable on a local network.

Use web socketing to check to see if a move has been made, and update the board.

Make a frontend website people can play the game on, using the web API.

Make a server with accounts so that players can record how many wins and losses they’ve had in total and can play online with others.

Have a ranking system based on the chess Elo system, and provide a global leader-board as well as one amongst friends.

Because the end-user is around the age of 10, I interviewed a ten year old boy named Kieran Rowe on the 21st of September about what he would like to see in the game. Kieran is at present in Year 6, is one of the oldest in his year, and is at ease with computers and enjoys gaming in a variety of formats.

The questions and answers were as follows:

***Sam:*** *Do you play games with your friends online?*

**Kieran:** I Occasionally play games online.

***Sam:*** *Are you familiar with the game four in a row?*

**Kieran:** Yes.

***Sam:*** *Do you play four in a row often?*

**Kieran:** I sometimes play it.

***Sam:*** *Would you be interested in playing four in a row online?*

**Kieran:** Yes.

***Sam:*** *What would you look for in an online version of four in a row?*

**Kieran:** When playing with friends, being able to start up a game easily. You can have an in-box in which people can send you requests to join a game, and have an option to request a rematch. This would make games more enjoyable as it wouldn’t be so difficult to start a game.

When playing with a random person, it would be good if it put you against someone of similar skill level, and have some sort of ranking system, with a database of wins and losses.

I also hope that there will be a chat for games with friends, but have the chat limited to certain phrases when playing with strangers, if having it at all.

***Sam:*** *In what ways could an online version be more enjoyable than the physical version?*

**Kieran:** I look forward to being able to play with my friends, even if they live far away. I also think it would be cool if you got to choose your colour, and maybe even have unlock-able colours that you could get by playing the game a lot.

Further research:

Since many of the techniques I will use in my project I haven’t used before, I had to spend a lot of time researching how to use them. First of all I used the website tutorialspoint (<https://www.tutorialspoint.com/flask/index.htm>) to quickly learn how to use basic flask functions. It has been incredibly helpful in teaching me the ins and outs of flask. However, the flask tutorial I looked at expected some knowledge of using html, which I did not have. Because of this I used w3schools (<https://www.w3schools.com/>) to explain the many specifics of html and css that I needed. This site was indispensable for helping me display anything on the webpage, and tidying up the nuisances. As for the websocketing (\*not fully implemented), a software engineer named Miguel Grinberg has a blog, along with links to examples, concisely explaining web socketing and the library socketio. (<https://blog.miguelgrinberg.com/post/easy-websockets-with-flask-and-gevent>).

Stuff to add:

links to existing connect 4 games using footnotes, more detailed critique of each site and separate paragraph into critiques and what I’m going to do.