A booking system for eSports coaching

DISSERTATION BY JAMES CLEW

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This thesis is submitted in part of the fulfilment of the requirements for Bsc computer science at Middlesex University

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Abstract

Problem statement

The aim of the project is to help players improve at a specific game and to allow specialist coaches to use their knowledge to teach someone at a game that they are well-versed in.

How the problem was addressed

The problem was addressed by creating a booking website that allows players to set up paid sessions with coaches.

This was implemented using html, php, JavaScript and SQL.

The SQL database was used to store all the data needed for the website, such as user info, timetables, and game data.

Php was used to connect to the database by XAMPP severs and convert the data from the database into html code that could be read by the browser.

JavaScript was used to handle the dynamic elements of the website, such as hiding and displaying forms, calculating the stars needed for a rating and allowing for visual change in pages.

HTML was used to create the website and display the content needed for the user.

How the project was evaluated and what conclusions could be drawn from the work

The project was evaluated by using a set of requirements, then using testing, we checked if those requirements were met. Then each page was analysed and checked to see if it matches these requirements and what could have been done to either complete the requirement or to improve the functions of these pages.

The conclusion of this project was that it was a partial success. There was a successful booking system that allowed players to book time with coaches and it considers the problems of time zones and how they can affect booking systems. However, the project was not a complete success as it failed to properly integrate the booking system into social features such as email or messaging, thus it was not a completed project. The conclusions from this project was that sometimes, researching methods to solve problems and integrating those solutions into an actual project are two different things, and as found out by my own experiences. Sometimes solutions may not be able to exactly fit into the specific problems that you have described, most of the time solutions are made up of various different methods that need to work together to solve a problem.

Problem statement

The problem is there are limited ways for players to be able to find instructors to help improve at games and limited ways for coaches to be able to find willing players in need of coaching.

The aim of the project is to help players improve at a specific game and to allow specialist coaches to use their knowledge to teach someone at a game that they are well-versed in. The goal of the project is to create some software to enable players and coaches to find each other. A booking system would help this process as you can assign coaching sessions to times and dates. A website would be best to display this data as it would be an easily accessible format.

This website will allow the client to search for coaches for various videogames and organise sessions with the coach to play. The client will be able to search for specific coaches for a game through a search bar, coaches will have a viewable profile with prices (most likely will be done on a per hour basis) and a schedule with the time zone they are from (helpful to clients as a majority of them will be from different countries).

Requirements

These requirements are the things that the system needs to do to function correctly.

1) A working profile system for both the players and the coaches. Each player and each coach would have a profile.
2) A searching system that finds the best matching coaches for the player. This would include, the game coached, time zone availability, coach skill level/coach experience, review rating.
3) A payment system that allows the coach to set a variable (for example games played, hours used, per session) so that it is easier to tell how much the player should owe the coach.
4) A review system that allows the player to provide feedback to the coach. Coaches should be able to easily view the feedback and see what they have done well and what needs improving.
5) A timetabling system that allows players and coaches to set when they are available. The time should be universal meaning that the player and the coach would see the timetable from their own time zone.
6) The website needs to be a safe way for the client to pay the coach, for example, there needs to be certain checks to ensure that the coach is coaching the player. There also needs to be a way for the coach to be able to ensure that they are not wasting their time and resources.

The problems that needs to be addressed

There are a few problems that need to be overcome. One of the first problems is the monetary security of the coaches and clients; The goal of this problem is to ensure that both parties feel satisfied that they are having their time and money rewarded.

Another problem is the time aspect. As eSports are less restrained by location, there is more of a focus on time. However, as many players are from different countries and time zones, it can be challenging for players and coaches to communicate and organise effectively.

Without careful planning, it can be difficult for the two parties to interact with each other as their schedules could be wildly different. This problem is heightened when taking into consideration time zones, and daylight-saving times are another problem. There is a need for the two parties to see when they are available before they interact and this needs to be shown clearly.

The goal of this problem is to ensure that, when a search is conducted, the player's results will prioritize coaches that match the player's schedules.

Another issue is community feedback. The website needs to be able to keep track of how the players and the coaches are performing, both parties need a system where they can compare themselves to others. A rating system is also needed to help players to avoid less beneficial coaches, and a rating system will allow both players and coaches to identify how to improve their coaching style. The goal of this problem is to reward good coaches and assist struggling coaches, allowing for the players to have an overall better experience.

Guide to the report

The rest of this report will go over how these deliverables were met and the challenges that arose while working on the project.

Requirements specification

User feedback

User feedback will be done on various aspects of the website such as profile ratings, scheduling by both parties and the searching system. The players and coaches have different needs from each other, therefore there needs to be two separate user feedback tables. This feedback will determine how effective each feature of the website is and it would give a clearer insight into how it could have been improved

Testing

Testing will be done similarly to the user feedback, as there needs to be two different testers, one for the players, the other for the coaches. There will also be areas that both parties need to test, for example, the scheduling table, the rating system and login/sign up testing. There will also be another group of tests on the internal code to ensure that the features work correctly.

Literature review

Since this project is a booking website there are many different sources that are booking websites, however there is extremely limited information on solutions that combine esports coaching and booking websites together. The best course of action to take is to review booking systems and try to apply it with the projects scope to get an accurate representation of the strengths and limitations that will be related to my project.

One of the first challenges with the project is the time zones involved with the scheduler, if the different parties are from different time zones, then the data needs to be displayed in a way that both parties can intercept clearly to avoid confusion.

In Addison Philips' work [1] they describe an overview about the many different methods and practices that you can use to help applications work with the effect of time zones. *"Computer systems tell time differently than people do. So it is helpful to understand how time works within computers as well as in the real world in order to get a handle on the things that can go wrong."*[1] they start by explaining how computer systems tell time such as observed time and incremental time. They also go into depth about what is a time zone and how it is defined, including countries that use time zones that are out of the norm, such as Japan and Korea.

Addison's [3] work also goes into depth about use cases that show how time zones affect applications, such as timestamps and Recurring events. Interestingly they also cover past and future events which is very relevant to this project as the scheduler needs to keep track of the bookings that have happened and the bookings that have not happened yet. This means that if a time zone changes, for example DST, then every single booking must be updated with the correct time zones.

However, although this case study is in depth and has good methods to solving the problem with time zones, it is not tied to a project, so it is more challenging to tell what the best method for time zones is for this project. Especially since there is not a case study to be able to see these methods in action.

In David turner's[3] work he talked about the visualising time zones and the problems that occur with graphs, this was very informative on how to visualise the changes that happen across time zones as like he said himself *"it's hard to actually get stuff done with this information alone"*[3].

Changing offsets

The fun and games *really* begin when you start to look at timezones that sometimes change their offsets from UTC. This happens in two different ways. Either they set their clocks forwards …
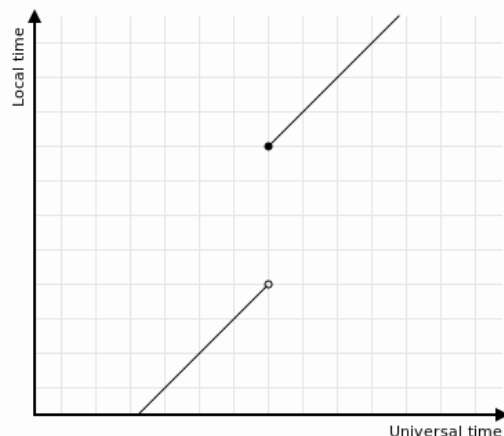
… or they set them back …
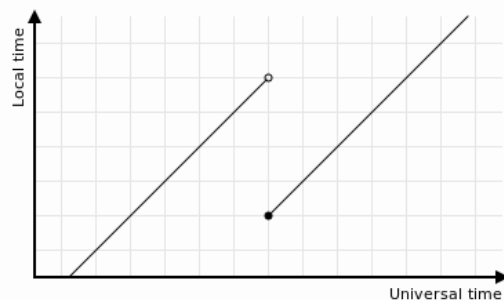
[3]

For example, the picture above explains the problem that comes with time zones, especially once you consider daylight saving hours and how that changes the data. For example when the clocks move forward, technically one hour is skipped and is never displayed on the data, this can cause some problems, what if a booking happens to be in between daylight savings, in theory up to an hour of time could be lost, but the booking would still take the same amount of time, this is the interesting challenge of time zones and how they would affect booking processes.

With these examples, it is clear that the best way to counter this problem is to use a common time zone for the scheduler and then convert the time zone based on where the user is located or based on the information that the user sets on their profile.

Another objective for this project is Generation algorithms, this is needed to be able to make sure that bookings do not overlap with each other.

In tanujas' work[2] they talk about timetable generation algorithms, although it is not the same as the problem that we face as a dynamic booking system, many of the ideas and some of the problems can be applied to this project. For example, there are a list of hard constraints and soft constraints.

Hard constraints are limitations that should not happen in any circumstance as they are impossible to do, for example *"no student can attend more than one lecture at a time"[2]*, is a hard constraint as it is impossible to attend two lectures at the same time.

These constraints can be modified to fit this project, by saying that no coach can have two or more overlapping coaching sessions, or no player can be having two or more overlapping coaching sessions.

There are also soft constraints that although it is technically possible, it should not really happen to improve user experience. For example, *"Same teacher must not have consecutive periods unless specified"* [2]. This constraint is in place to stop fatigue in teachers and the same thing can apply to coaches to.

Looking at these constraints we can try to take them and come up with our own constraints that would help the user experience of the booking. For example, we could have a setting for coaches and players that gives them a buffer time for coaching sessions, this way they can choose how long they want the break to be or not even have a break at all.

In Anisha's work [4] they also talk about hard and soft constraints, but they also touch upon validity violation constraints, which are *"constraints which need to be incorporated necessarily otherwise there is no guarantee of valid timetables generated."* [4].

Both papers conclude that heuristic algorithms are a good way to manage a timetabling system and I agree with that statement. I believe that for this project heuristic algorithm might be the best solution to the problem. However, there are other solutions such as Naïve Bayes and Genetic algorithms that could be suitable candidates for this problem.
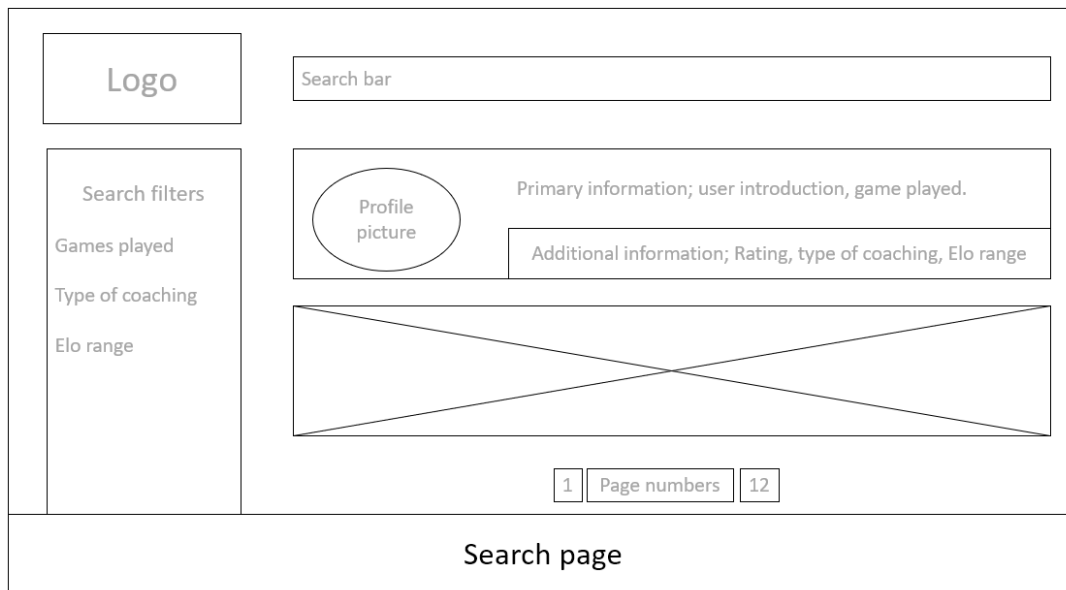
Design

The initial design is a website, but how would be presented, firstly we need to establish what pages we need in the system and how that will be displayed.

- Searching page with clickable profiles.
- Profile page with contact info, prices, games played and other statistics.
- Interactions page that contains all the profiles that the user has interacted with.
- A feedback page that allows the users to provide feedback to the coach or player.

Here are some wireframes that show an outline of the design of the website that could be used.

Here is a design for the search page

Search page

There are a few design choices with this page, firstly you can see the logo and search page at the top of the page, these elements as well as the search filters will be common across all pages, the reason for this is to allow the user to search for profiles from any page. meaning that the user will have an easier time to search for profiles.

The search filters on the left-hand side of the page allow the user to narrow and customise the search so that the user can find the best coach for their needs.

The profile selection on the right hand side shows the profile picture to identify the profile, and information about the coach, like what prices he offers, there is also a section in the lower right hand side that shows additional information such as the rating and the type of coaching.

Below the profiles there is a page number selector that allows the user to look at more search results, it also allows the website to be more efficient at displaying its data.

Here is a design for the profile page
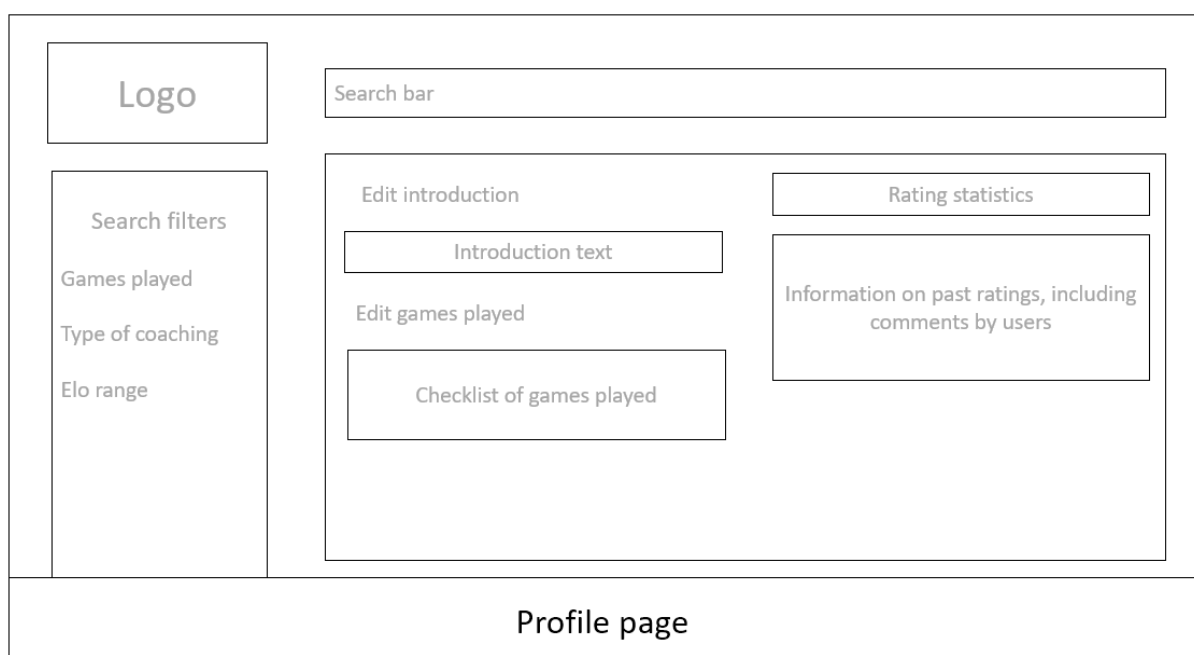
Profile page

As you can see the page has kept the logo, search bar and search filters on this page as well.

On the right hand side, you can see a profile editor that allows the user to change some of the information on their profile, such as their introduction and the games that they want to be coached on. To the right of the editor there are rating statistics that allow the user to track how well they are doing and the feedback that users have sent them, this allows the user to improve their coaching so that other players will have a more fulfilling experience.

Here is a design for the interactions page

The interactions page shares a lot with search page, however there are a few differences, firstly above the profile there is a time stamp that shows when the user last interacted with the profile. Secondly below the usual profile that the user will see on the search page, there is additional information about how the user interacted with the profile and what both parties rated each other, this in combination with profile page allows the user to analyse the ratings that the users have sent them and this would help the users improve.

Here is a design for the feedback page

┌───┐
│ ┌──────────┐   ┌───┐ │
│ │   │   │ Search bar   │ │
│ │ Logo   │   └───┘ │
│ │   │   │
│ └──────────┘   │
│   │
│ ┌──────────┐   ┌───┐ │
│ │Search   │   │ Feedback for user X   │ │
│ │filters   │   │   │ │
│ │   │   │ Quality of coaching; system of 1-10   │ │
│ │Games   │   │   │ │
│ │played   │   │ Comments   │ │
│ │   │   │ ┌─────────────────────────────────────┐ │ │
│ │Type of   │   │ │ Comments from user Y about what   │ │ │
│ │coaching │   │ │ User X could improve   │ │ │
│ │   │   │ │ on and what they did well   │ │ │
│ │Elo range │   │ └─────────────────────────────────────┘ │ │
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│ └──────────┘   └───┘ │
│   │
├─── │
│   Feedback page   │
└───┘

The feedback page is the most differing from the other pages as this is primarily a form. It allows the user to rate the coaching out of a system of 1-10 and allows the user to submit feedback in the form of comments. There is a submit button that sends the data to the coach.

Analysis and design

There were a lot of design elements that needed to be considered for this project to be effective. I started creating UML diagrams to outline the processes of the four main functions that the website must do: Profile creation, Search Results, Payment System, and time zone system.

These UML diagrams helped visualize the steps I needed to take to be able to complete this project. On reflexion, there were a few things that I did not do in the end such as not having multiple games per coach, this was due to complications with the database. As a result, the profile page was slightly changed so that the players do not choose the game and that the game was locked to the coach. This means that players are not restricted to the games they would have set on their profile and this also means that coaches are more specialised to that one game, meaning the coaching experience would be better.

UML diagrams
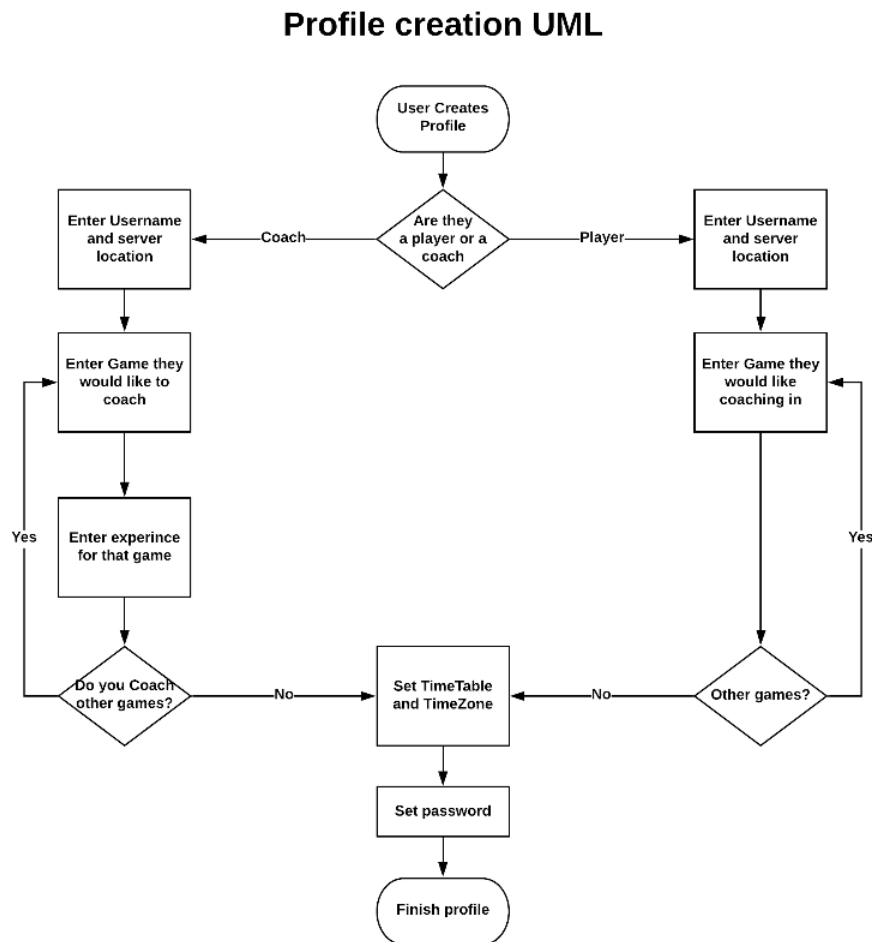Profile creation system UML (Figure 1)

Profile creation UML

Figure 1 is a flow diagram of how a user profile is created in the system. There is a decision tree that checks if the user is a player or a coach. There is then a decision loop that checks if the player/coach wants to add more games to their profile. In hindsight, this was not needed as there is now only one game per profile. It then waits for a timetable and a password to be created. In comparison to the project. The password and other information relating to the user is set before the timetable is created. Therefore, it should ideally set the password first, runs a check to see if it is valid, then it creates a new timetable.

Searching system UML (Figure 2)
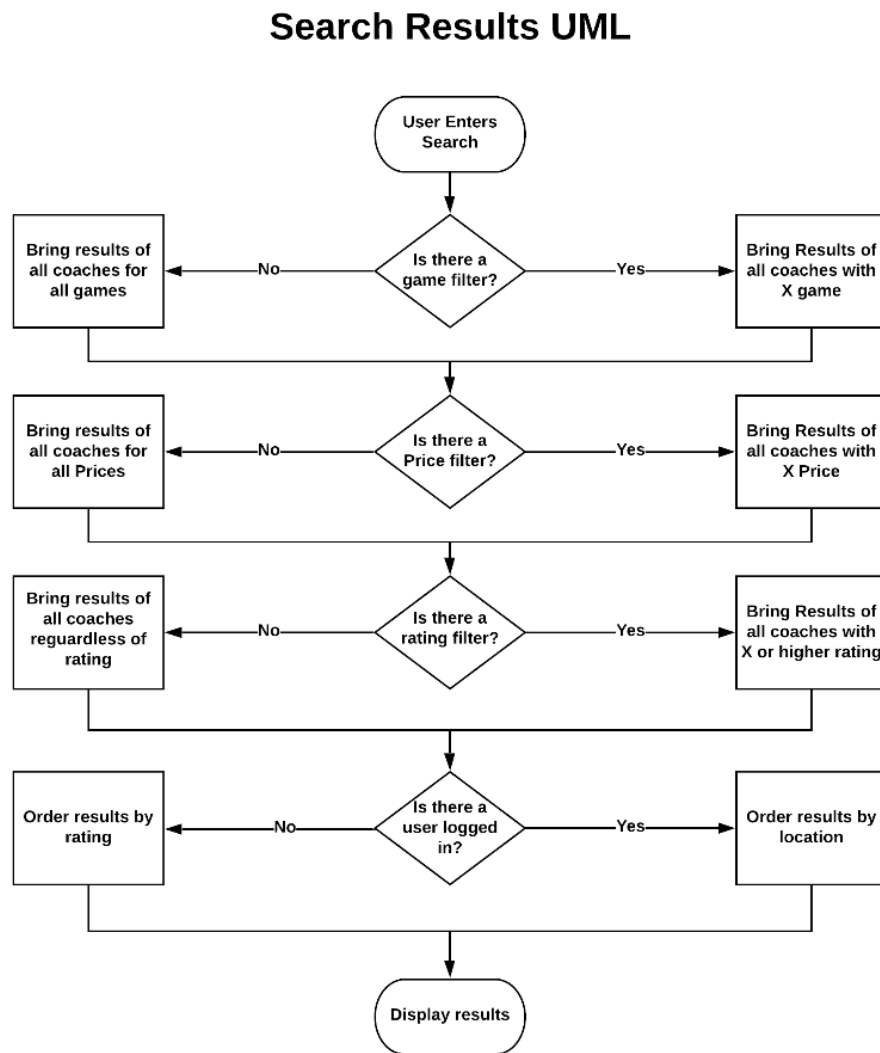
Search Results UML

Figure 2 is a UML diagram for the search engine. It checks each requirement one by one and if it is met then it limits the amount of results shown, for example, if there is a game filter, then the engine will show all of the coaches that play that specific game. The project's search is done slightly differently as when a user is logged in. It filters the results by the players region first and then it orders by rating.

Payment System UML
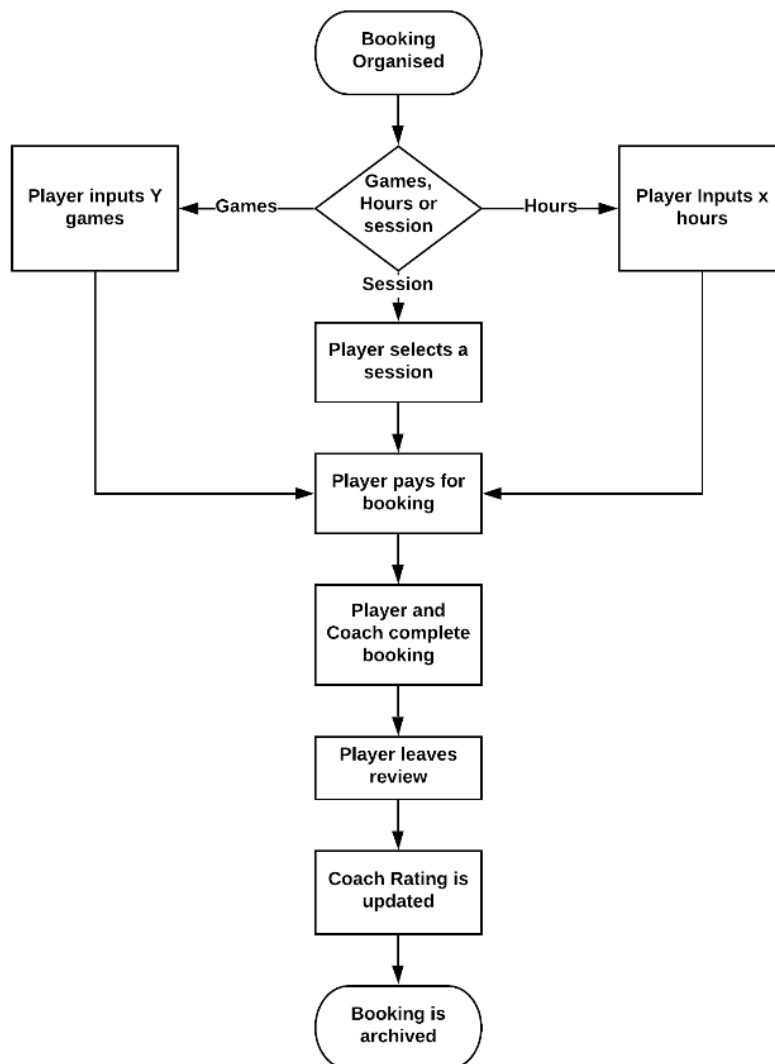
Figure 3 is a UML diagram on how payment is handled. First it checks what type the booking is, if the booking is hours based, then the player enters the number of hours they would like to play with the coach. If it is games based, then the player selects the amount of games they would like to play with the coach. Then the player pays for the booking and then the booking session is started. Then after the booking session is complete. The player leaves a review and the coaches rating is updated. This is fairly accurate to how it works in the project now, expect that the player does not select what type of session it is. The coach sets a session and then the player chooses how long it goes on for.

Timetable system UML (Figure 4)

Timezone System UML
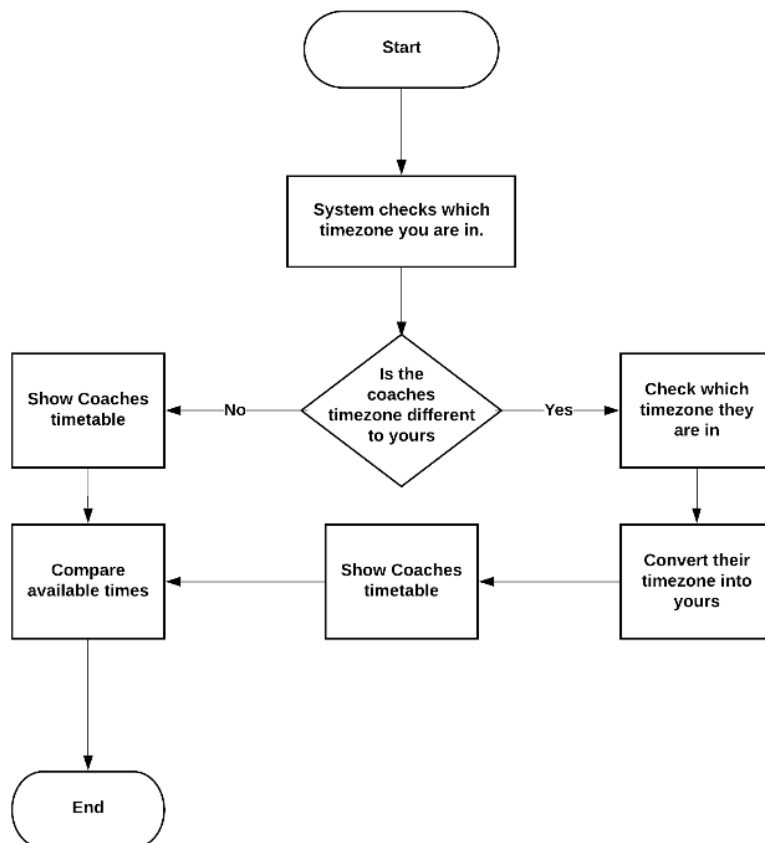
Figure 4 is a UML diagram showing how the time zones work in relation to a player booking a session with a coach. The system checks which time zone you are in and then compares it to the coaches' time zone. If the time zones are different, the coaches' timetable is changed to match the time zone of the player. Then the available times form the players perspective are shown. This is accurate to how the time zone system works in the project.

After I made the activity diagrams, I started making the website and the database. There were a few challenges with the database. Firstly, it was difficult to set multiple games for a coach or player. And how bookings must have a game that matches both the coaches and the players list. Instead I decided to only have one game per coach as it gives the player more flexibility. And it also means that the coaches are more specialised meaning the coaching experience would be higher.

Another problem was assigning timetables to a newly created player or coach. When a new player or coach is created a timetable record also needs to be created for that specific player/coach, however at first it was difficult to get the newly created player or coach id and place it into a query to create a new timetable. The solution to this was to start a separate process that takes places after the new player/coach is created. This way I was able to get the id required to create a new timetable.

Another problem was dealing with adding new data such as games, regions to the database without editing the input forms to match the updated database. The solution was to use a php query to go through all the records one by one and put them into a selection box. This way if a new game is added, the designer does not have to edit the html code. This allows the website to be scalable and be able to expand if need be.

Below are some screenshots of the pages as they were being developed.

Screenshots of developing pages

Home page

All pages are based on this page. Logo at the top left-hand corner followed by links to other webpages. Search bar is included.

The home page at this point was quite bland, knowing that this could be developed later on, It was more like a template for the website at this point, which allows me to easily test how I can improve the look of the website. There was a bit of trouble trying to use CSS to make the header more professional, but other than that there were no real problems with the home page.
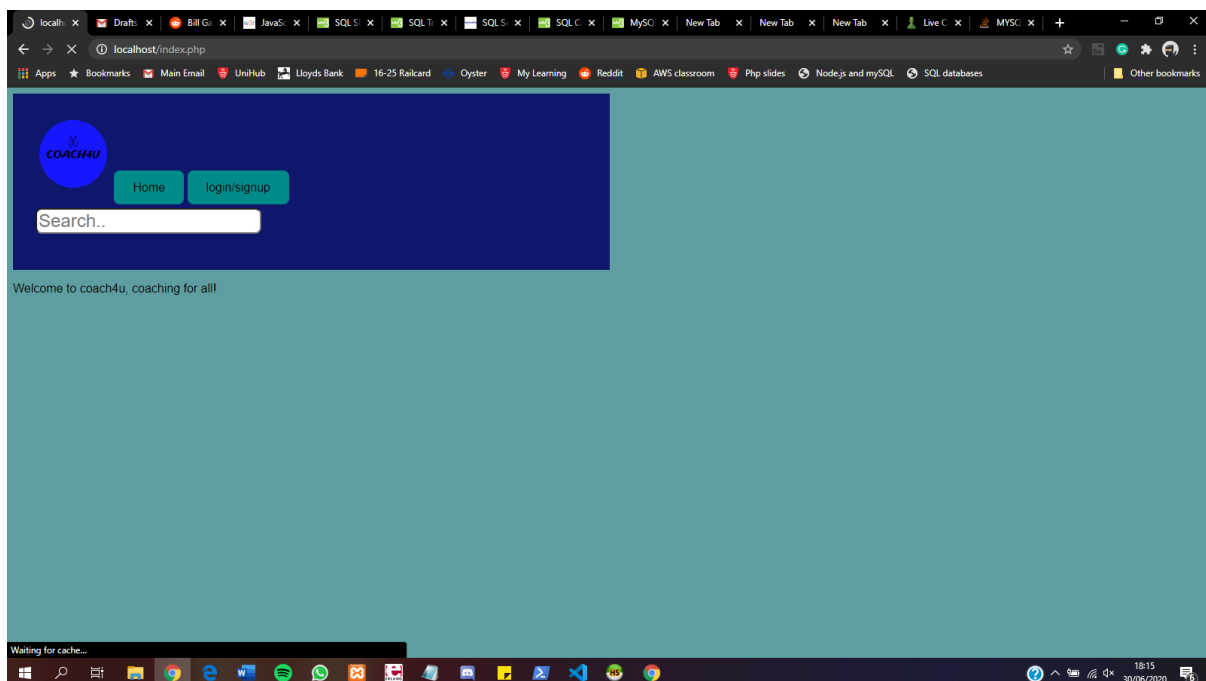
Login Page

Two buttons to select between coach and player. Checkbox to hide/show password. Link to create new account.

The home page was a challenge at first, mainly the issue of how I would separate the player login from the coach login and how to make it intuitive with the user. My solution was to add a toggle to switch between a player login and a coach login. This way the page is less cluttered, and it is simple enough for the user to understand.
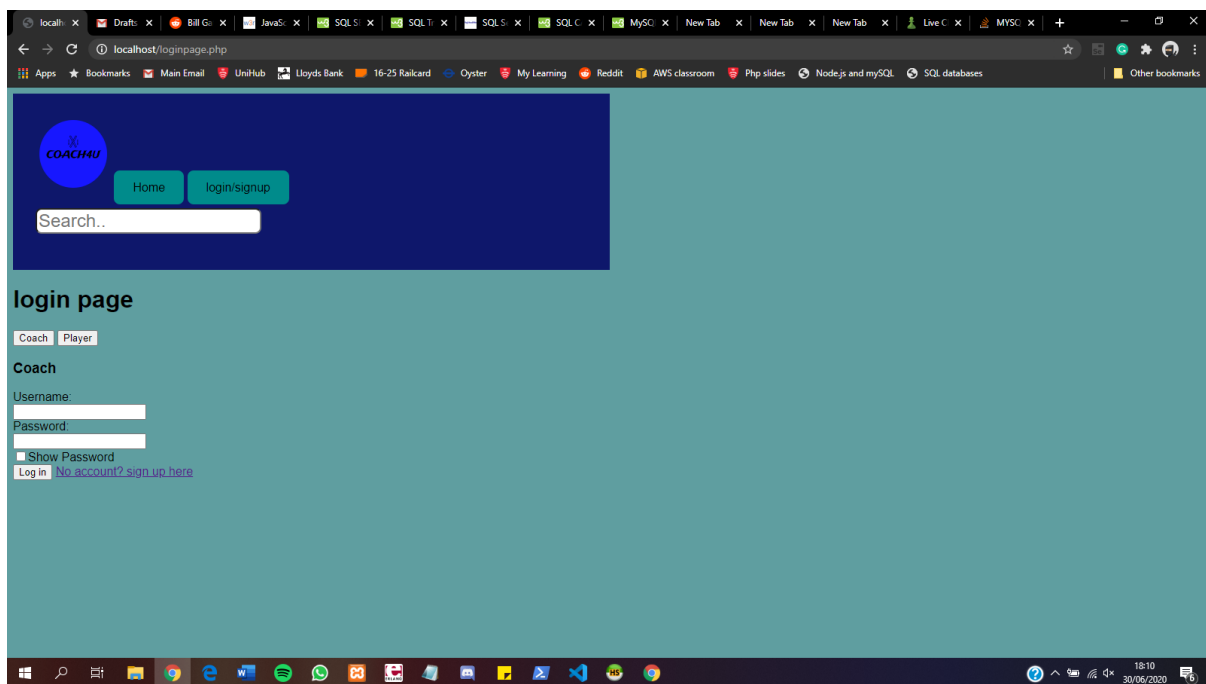

Sign up page

The sign-up game contains a form that creates a new coach or player depending on the button selected.

The sign-up page is where a lot of issues were discovered, and where a lot of solutions were found. There were several issues that were a problem with the sign-up pages. The first was getting the validation correct, there were some issues with checking to see if the game or region dropdowns were selected. As a solution I added a default selection option that has a value of null. This way when the login button is selected, if the value of the selection box is null, then the form knows that the value has not been selected.

Another issue was hiding the passwords and showing them using a checkbox. The issue was how would the form know what state it was currently in. the solution was using JavaScript to check the type of input box the field was and if it was a password field, it would change it to a text field and if it was a text field it would change it to a password field.
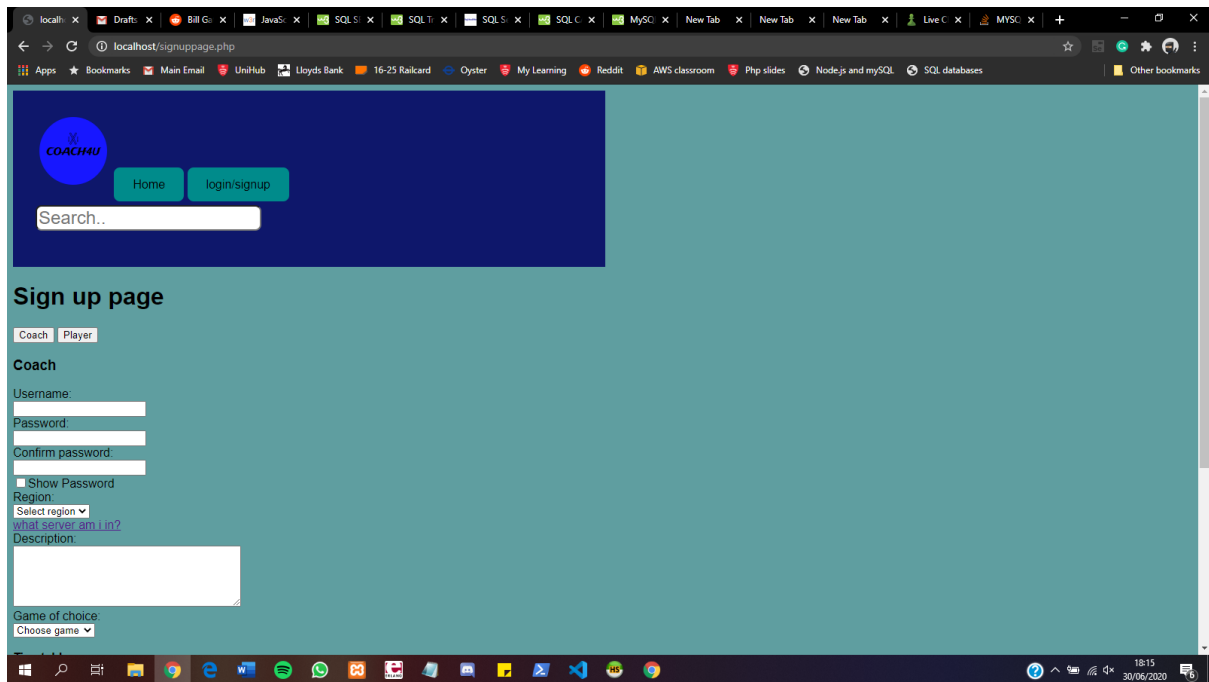
Timetable form, time zones from a dropdown.

The timetable part came with its own set of challenges. One of the first was setting a newly created timetable to be associated with a newly created user. There was a problem that I couldn't get the last created user id after the user is created, meaning when a timetable was created it was not being assigned to anything. the solution was to direct the user creation process to another process that creates the timetable. This way I was able to find the newly created user id and place it within the new timetable.
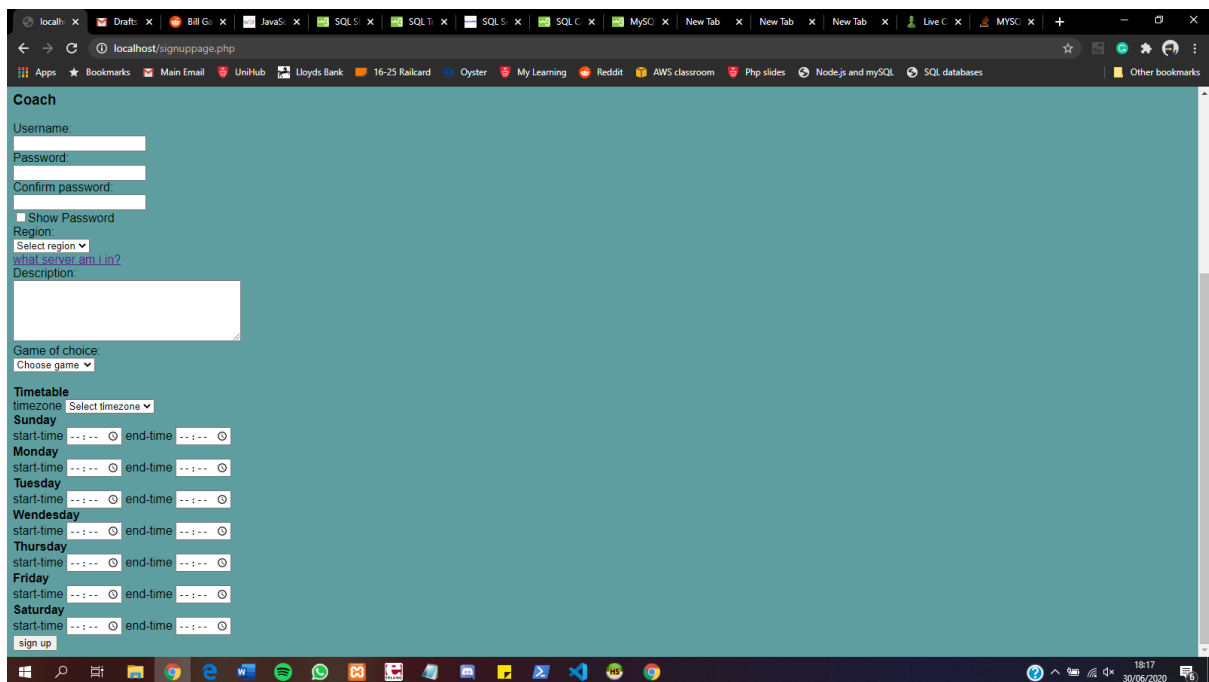
Logged in user

Removes login/sign link when user is logged in. link to profile page, changes text based on username. link to logout user.

This was relatively straight forward; I had no real issues with this although I feel I could have expanded upon this by changing the home page if there is a user logged in.
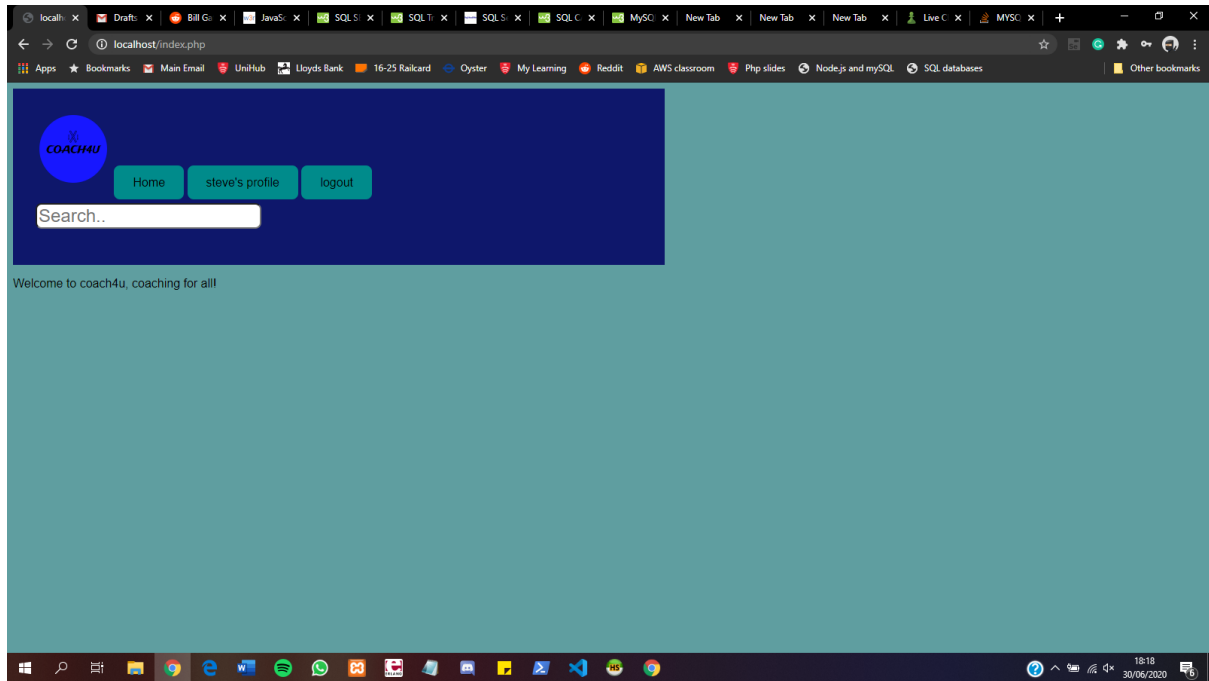
Profile page

Shows information for the player/coach, button to change information. Sections to show ongoing and completed bookings.

Again, this was quite straight forward. the session id is being used to filter which user shows up.
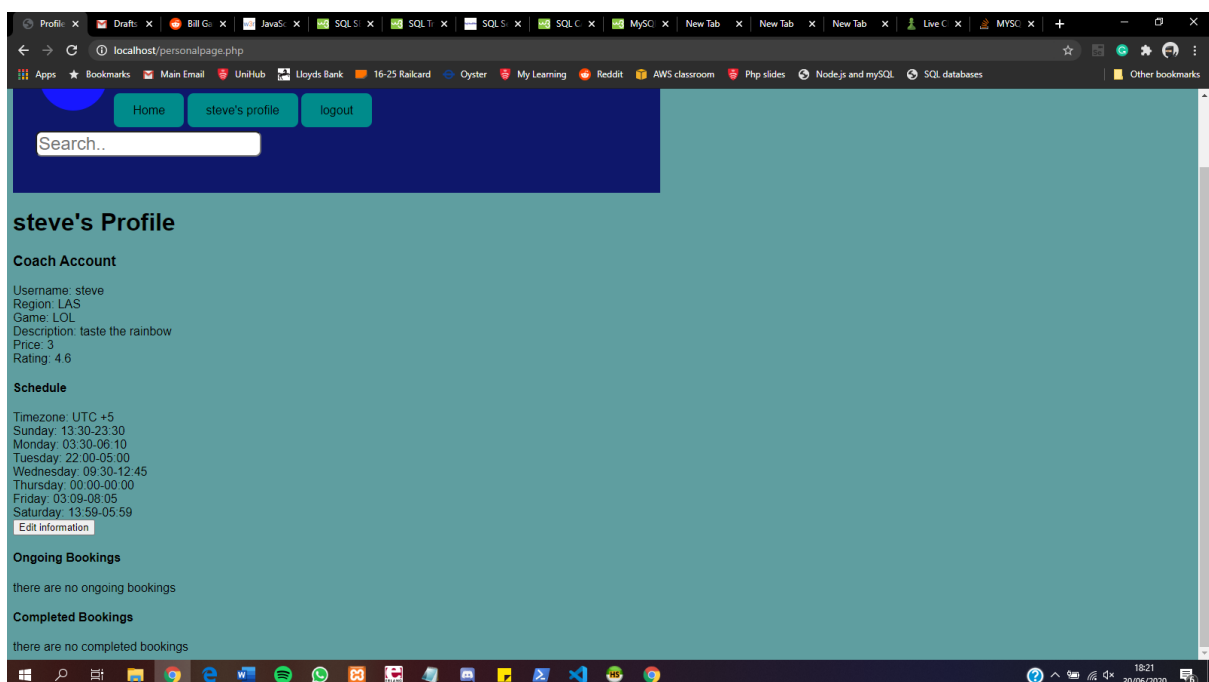
Edit information page

Allows user to edit information/timetable.

This was relatively easy due to working on the sign-up forms.
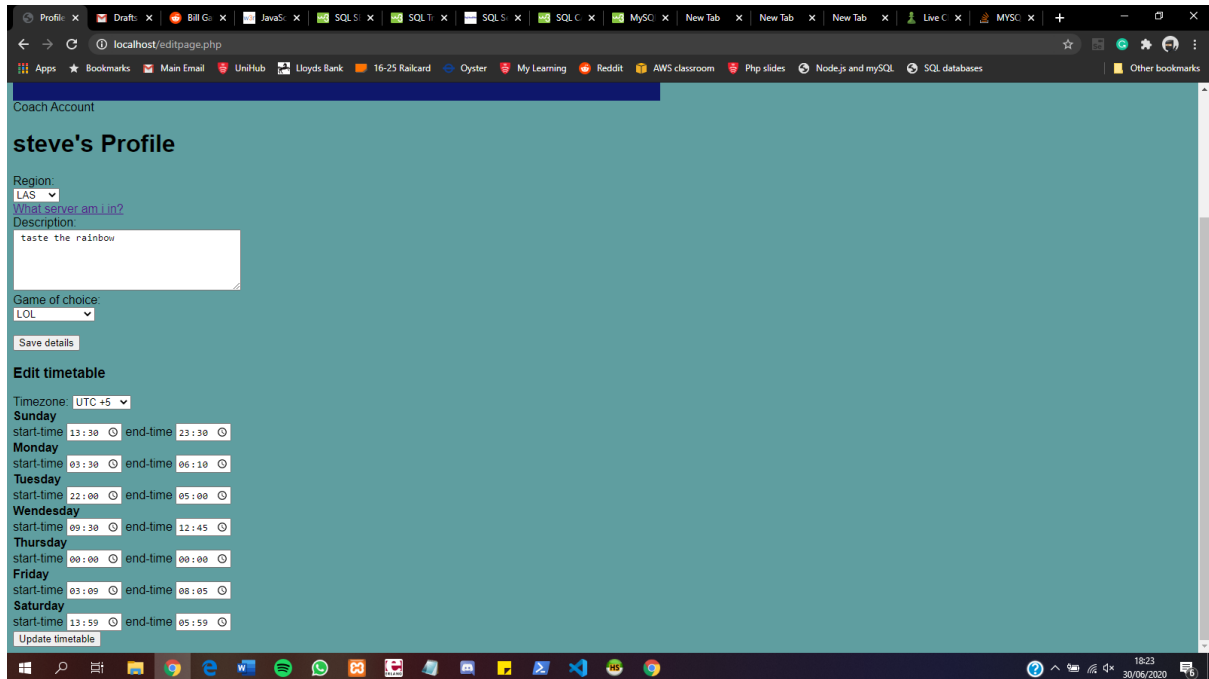
Star rating for each individual booking.

Players can select the rating for completed bookings.

This was a challenge. One of the first problems was how to have an interactive star system where you click on the star to give a rating. One of the problems was how to get a value from those stars. This was solved using a radio set of buttons and replacing those buttons with clickable labels. When a label is clicked, there is a hidden input box that contains a number, such as two or three, when that input box changes, the colour of the stars changes to match that value. So, if the value is three it would colour three stars yellow for example.

Another problem was differentiating the sets of stars from one another. Previously only the first set of stars would be coloured, and the coloured stars would be based on the last rating in the list. The solution to was to use php to make different names for the stars based on the booking id. So, star names with a booking id of 1 would be different from star names with a booking id of 2. This meant that the radio buttons were in separate groups which means that the star systems are independent from each other.

Search page

Shows coaches orders them by star rating by default. When a player is logged in, it shows the coaches in their region first then it shows all other coaches in different regions.

The search page had a multitude of issues. The first issue was how the coaches were being displayed and how to make it so that each button would take the user to the coaches' profile page.

The solution was to display the coaches in a table and using php, fill out each cell with the data of that coach, then inside that cell a hidden form is created which contains the information needed for the profile page to identify which user it is.

Another issue was the star rating, this was slightly different from the previous example where we were looking at individual bookings, the ratings this time were the overall ratings and this means we need round the number of stars to the coaches rating. The solution was the same as the individual booking except that the requirements for a star are slightly different. the stars would be rounded up or down.

You can search for specific games, regions and even coaches.
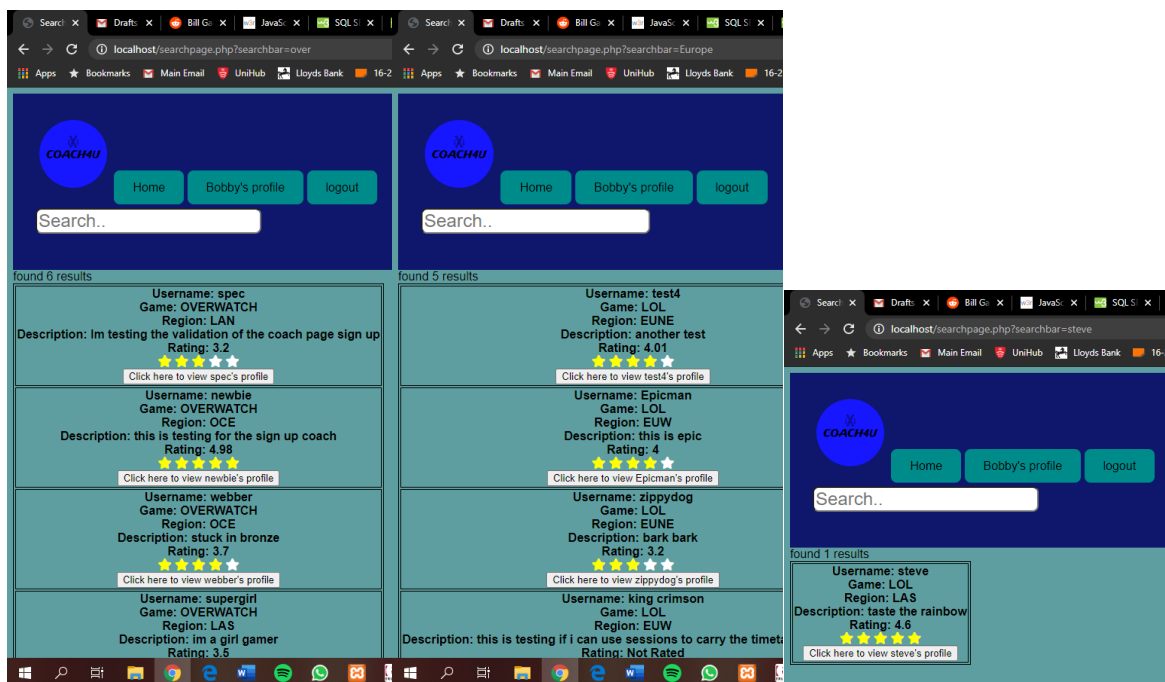
Another issue was the search system itself. There was a lot of trouble trying to find a way for the query to check what the inputted text in the search bar was and how that input would affect the search query. The solution was to convert the search bar input to a string that SQL could recognise then the cleaned text would be compared to the contents of the database.

Another issue was changing the search results based on which user is logged in. the difficulty was how to change the query without it reducing the number of records displayed.

You can click on a profile to book a session
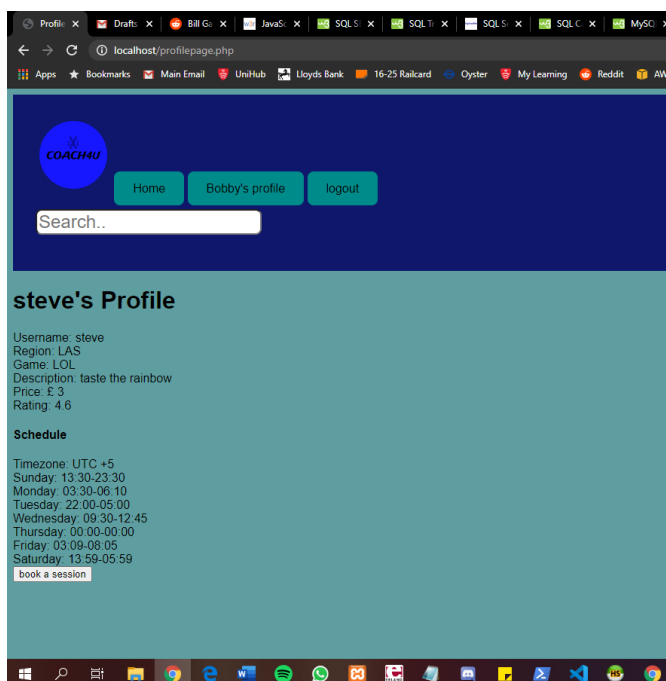
Evaluation

Testing

With testing the goal is to go through various quality tests to ensure that the product is at the correct standard.

I first looked at the requirements that were set and broke them down into groups to analyse, then I spilt those groups into smaller tests. This method gives me a through breakdown of what is needed to be tested with each requirement.

TEST Groups
GROUP 1: PROFILE
A) Does username validation work?
This covers all the checks for the username when the player or coach logs in
B) Does Password validation work?
This covers all the checks for the password when the player or coach logs in
C) Does password privacy work?
This checks the password filter feature
D) Does the website remember if you are logged in?
This checks if the website is storing session correctly
E) Does the website allow you to open your profile if you are logged out?
This checks if the website removes sessions correctly
GROUP 2: SEARCH
A) Does *specific column/name* affect search?
These checks make sure that each aspect of the search system is working correctly
B) Does logged in user affect search results order?
These checks check if the user can affect the search system
GROUP 3: PAYMENT
A) Does payment meet the GGPR standards?
This checks if the payment is in line with GGPR standards
B) Does payment automatically calculate based on the number of sessions?
This checks if the payment shows the correct amount of money based on the number of hours paid.
GROUP 4: RATING/REVIEW
A) Does the star system work?
This checks if the star system is updating the ratings of the coaches
B) Does the rating of the coach update after a booking rating is given?
This checks if the overall ratings are updated once a review is finished
C) Can feedback be given to the coach?
This checks what kind of feedback can be given to the coach

GROUP 5: TIMETABLING
A) Is the booking time set within the coach's schedule?
This checks if the booking time is shown to be possible inside of the coach's schedule
B) Does the time zone update depend on the players time zone?
This checks if the players time zone affects the coach's timetable and how that would affect the booking time
C) Can you view the coach original time zone within the booking form?
This checks if the player can see the time zone of the coach
D) Does the booking time change when the players or coaches time zone is changed?
This checks if the booking time updates when the time zone for a player or coach has changed

Then I spilt up the criteria into manageable groups to test each individual feature

TEST	Expected result	Result
1.a.1) does username reject blank entry	Yes	Yes, login and signup do not allow blank entry to occur
1.a.2) does username reject incorrect username	Yes	Yes, login and signup checks if the username is correct
1.a.3) does username check case sensitivity	Yes	Yes, username is case sensitive
1.b.1) does password reject blank entry	Yes	Yes, login and signup do not allow blank entry to occur
1.b.2) does password reject incorrect password	Yes	Yes, login and signup checks if the password is correct for the username
1.b.3) does password check case sensitivity	Yes	Yes, password is case sensitive
1.c) does password filter work?	Yes	Yes, the password filter correctly hides and shows the password
1.d) does the website remember if the user is logged in	Yes	Yes, the website remembers if the user is logged in if the user exits the website
1.e.1) does logout return you to the home page	Yes	Yes, logging out returns the user to the home page
1.e.2) can logged out users access their profile	No	No, they cannot access their settings when they are logged out.
2.a.1) does game name affect search results	Yes	Yes, typing the game name restricts the search results to the game name
2.a.2) does partial game name affect search results	Yes	Yes, partial entry affects the search results
2.a.3) does region name affect search results	Yes	Yes, typing the region name affects the search results
2.a.4) does partial region name affect search results	Yes	Yes, partial entry affects the search results
2.a.5) does username affect search results	Yes	Yes, coach usernames affect the search results

2.a.6) does partial username affect search results	Yes	Yes, partial entry affects the search results
2.b) do logged in users affect the search order	Yes	Yes, logged in users see coaches from their region first.
3.a) Does payment meet the GGPR standards?	Yes	Yes
3.b.1) does payment amount change based on number of hours	Yes	Yes, the payment amount changes with the number of hours ordered
3.b.2) does payment amount change based on number of games	Yes	Yes, the payment amount changes with the number of games ordered
4.a.1) can you click the stars	Yes	Yes, you can click the stars
4.a.2) does the stars give the correct rating	Yes	Yes, the stars give the correct rating
4.a.3) do the stars show the correct rating	Yes	Yes, the stars show the correct rating
4.b) does the rating of the coach update after giving a rating	Yes	Yes, the overall rating of the coach updates when a player gives a rating
4.c) can feedback be given to the coach	Yes	No, apart from the star rating there is no option to give detailed feedback to the coach
5.a.1) does the booking time match up with the coach's schedule	Yes	Yes, the booking time is set within the schedule
5.a.2) can you enter outside of the booking times?	No	No, there is validation to check if times are correct
5.b) does the players' time zone affect the coaches' timetable	Yes	Yes, player time zones can change the coach's timetables
5.c) is the coaches time zone viewable	Yes	Yes, the player can change the timetable to the coach's time zone
5.d) does the booking time change if either the player's or the coach's time zone changes	Yes	No, the booking time stays the same if the coaches or players time zone changes, however when the booking is updated, it would match the new time zone difference.

Evaluation

In this part I will be reviewing all the parts of the website and what could have been done to improve it. There will also be screenshots of each of the pages in question.

Design of the website

This will be analysing each page and explaining what it has done well and how they could have been improved on.

Home Page

The home page is the first page that the user would see upon entering the website. It shows off the layout and sets the presentation for the rest of the site. As far as presentation goes, it does a good job, information is clear and easy to read and the colours and tones complement each other well.

The layout of the buttons is good, it's in an eye catching spot being in a darker zone of the page to highlight where it is, and the search bar is shown on the right hand side, making it easy for the user to spot.

However, another reason for a home page is to sell the idea of the product to the user, due to the lack of content, this page does not really help sell the idea of the website to the customer. Being the first page that the user sees upon entering the website, it needs to promote the features of the website and who it is targeting to get more people to sign up and use the website. This home page only consists of a tag line welcoming the user to the site. This is not enough to engage the user into signing up.

To improve on this home page could have included some images of models playing games and small screenshots of the menus to sell the idea of this website to new users. Also, the home page could have been personalised based on who is logged in, for example, the home page could have been used to show new bookings for the coach or provide feedback for the user. Overall, this home page is not up to standard I would have liked.
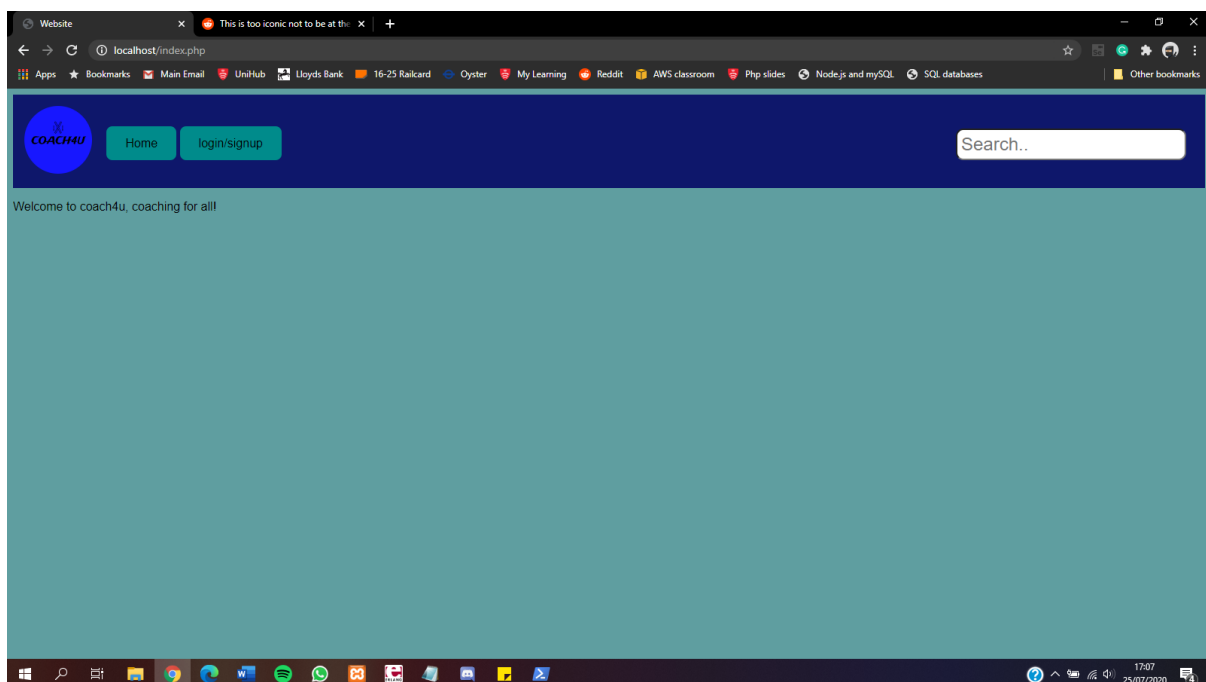
Login page

This login page does its job well, it allows users to login into the site. The design of the buttons show if the user is using the coach login or the player login, being in the centre of the page, it is easy for the user to see where the fields for entering their username and password are. It also has a show password feature which is handy if the user thinks that they have mistyped their password. An alert also appears if there is an error, such as not entering the correct password.

However, there are still some areas that could be improved. Firstly, there is no system to remember your password and username. Although this can be done via third party such as google, it is a feature that would be useful to have. Another issue is how signing up is presented, this is shown is a hyperlink, but it could have been done as a button with a similar style to the coach and player buttons at the top.

Another issue is that if there is an incorrect password, it does not remember what the user entered as their username, it is a minor problem, but it may be frustrating for the user's experience.

Overall, this page was done quite well.
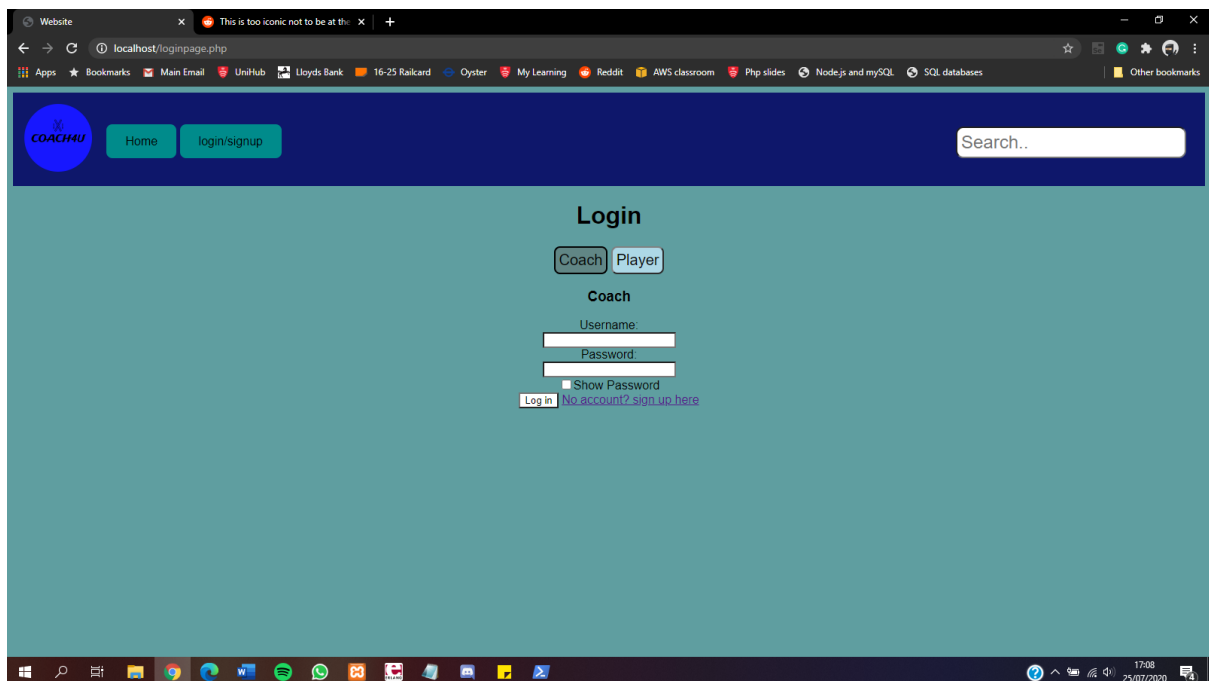
Signup page

This signup page does its job, it clearly shows which form the user is on with the buttons at the top. The information is also clearly shown in sections to break up information for the user, for example the timetable section is separate from the username and password section.

However, there are some issues with the design of this page.

Firstly, there is no option on the timetable section to select the dates to blank, this means that the entire timetable must be filled, which is not realistic to the user. As it is unlikely that they would be available every day.

Secondly, the sign-up button is not very visible to the user. It needs to be bigger to attract the user's attention. Also, the buttons do not match the style of the buttons in the login page, there must be a consistent layout across pages.

Profile page

This profile page is suitable, it allows the user to see their timetable, and what bookings have been completed and bookings that are in progress. The bookings are separated into sections so the user can easily see what bookings have been completed and what bookings are ongoing.

The user can clearly see which button belongs to which booking. The user can also see what rating each booking is using either the star system or using the rating number.

There are a few issues that need to be addressed, firstly, outside of the profile page, there is no way to know when the bookings are happening and if they have been completed. Secondly there is no way to cancel bookings from the users perspective, you could change a booking's date but once a user has made a booking, it must be completed, which is not realistic for the user, there is also no way to prevent multiple bookings from the same user and coach, meaning there could be overlap in the bookings.

There is also a slight design flaw that means that all the completed bookings/uncompleted bookings are shown at the same time. This might become a problem if coaches need to find a specific booking that was completed a while back. This also impacts how fast the page loads as the website would need to generate a large amount of data.
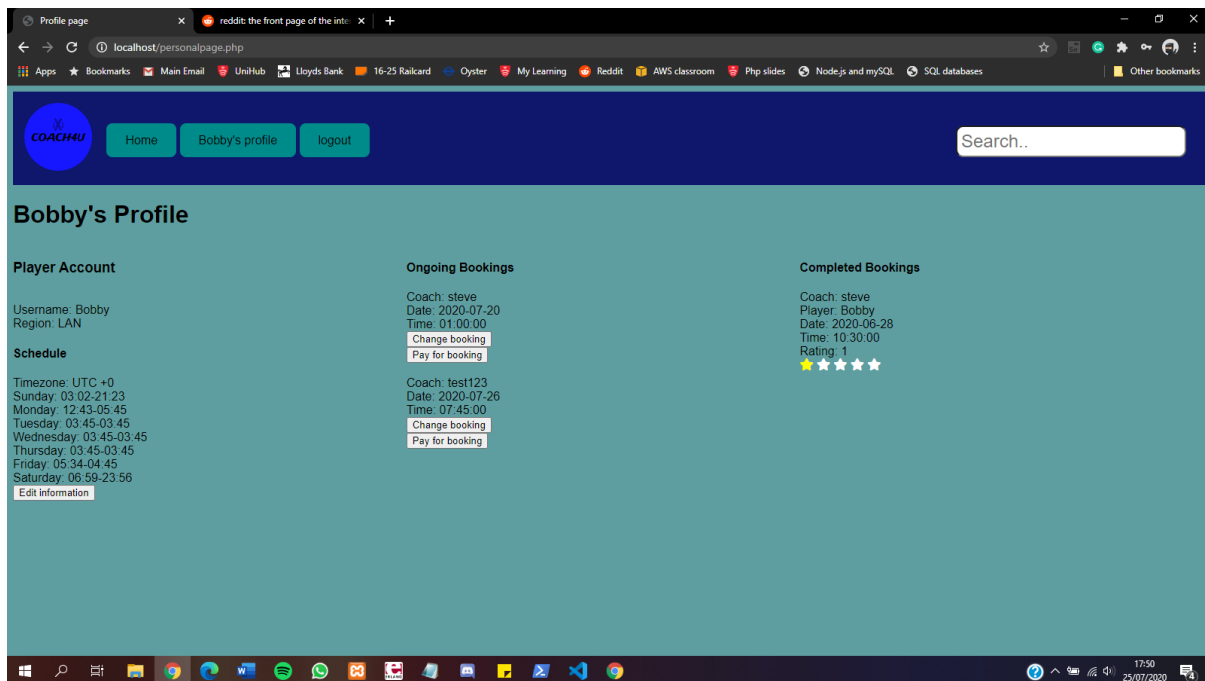
Search page

Overall, this was done well. It allows the user to search for coaches in specific regions and specific games, and the search result order would change based on which user is logged on. However, there are still some issues, firstly, there is no pagination to limit the amount of data being shown on the website, this would be a problem when there are thousands of coaches available. Another problem is that there is no indication of if a coach is an active account or an inactive account. This means that the search results could be cluttered with coaches that are no longer active on the site. Another improvement could have been to allow players to favourite coaches so they appear near the top of their search results, this would allow players to find the coaches that they like more easily.
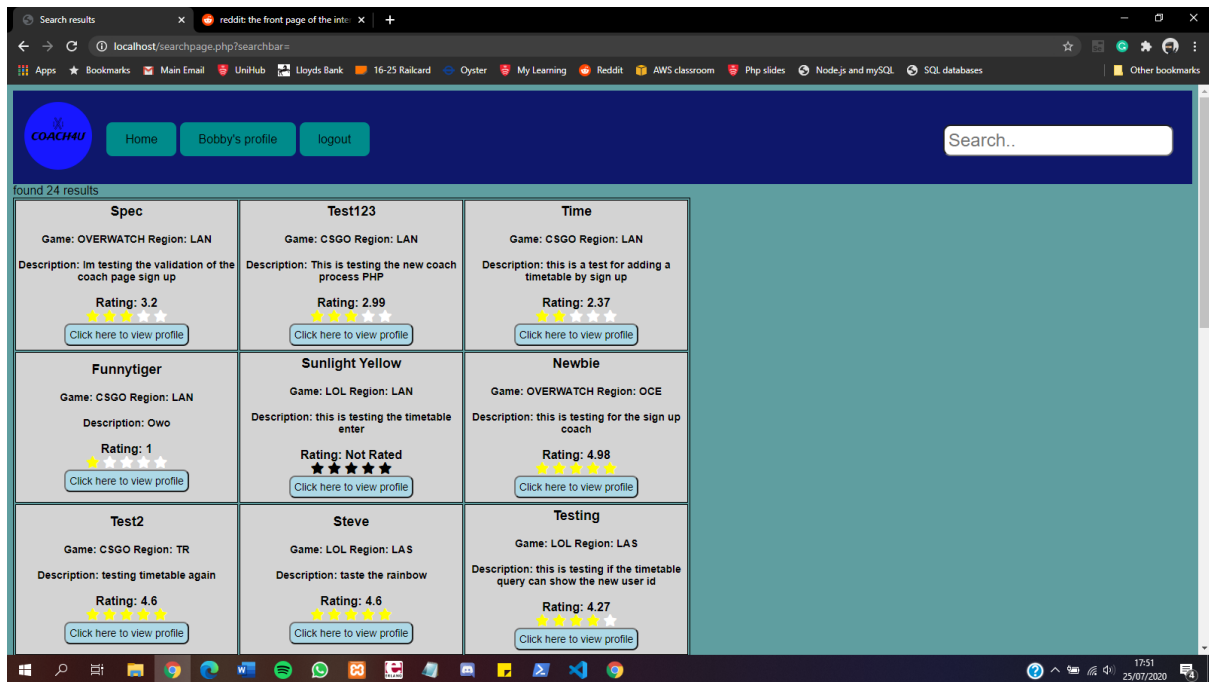
Coach profile page

This page is fine, it allows the user to see the timetable of the coach, and it shows the price of the booking session. with the overall rating of the coach.

However, there are a few nit-picks, firstly there is no way to compare coaches with other coaches directly without opening a separate tab, this makes it a bit tedious for players to compare different coaches.

Secondly there is no way to favourite coaches so that they can appear near the top of the users search page. This could mean that it might be hard for players to find specific coaches.
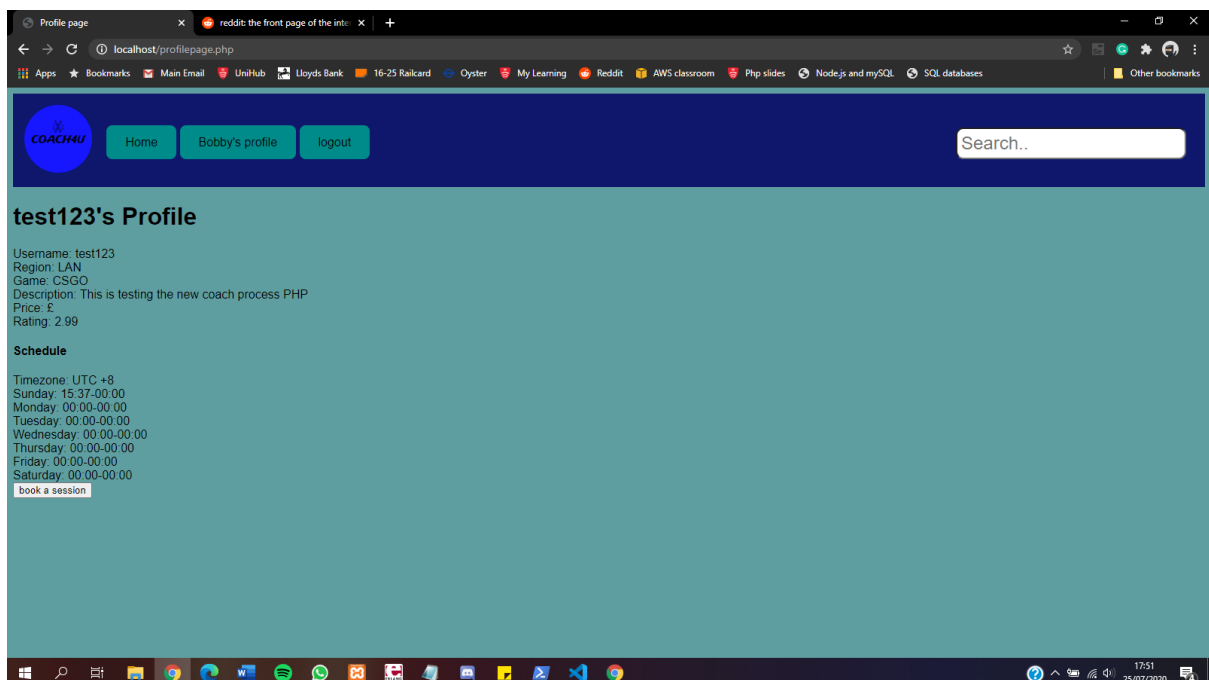
New booking page

This page is okay, it allows the user to book a time for the coach in the restrictions of the timetable for the coach, the user can also switch the time to their own time zone, or the coaches time zone.

However, there are a few problems, one of the biggest is that other bookings do not interfere with new bookings, meaning the coach could potentially have two bookings at the same time.

Another problem is that there is no way to cancel a created booking directly. This could lead to the problem of the coach not knowing how if the booking is still going ahead. This is especially a problem when the user has already paid for the booking, there is no way to reschedule the booking or allow for a refund on the website, potentially the coach would have to that manually, but that may not be guaranteed.
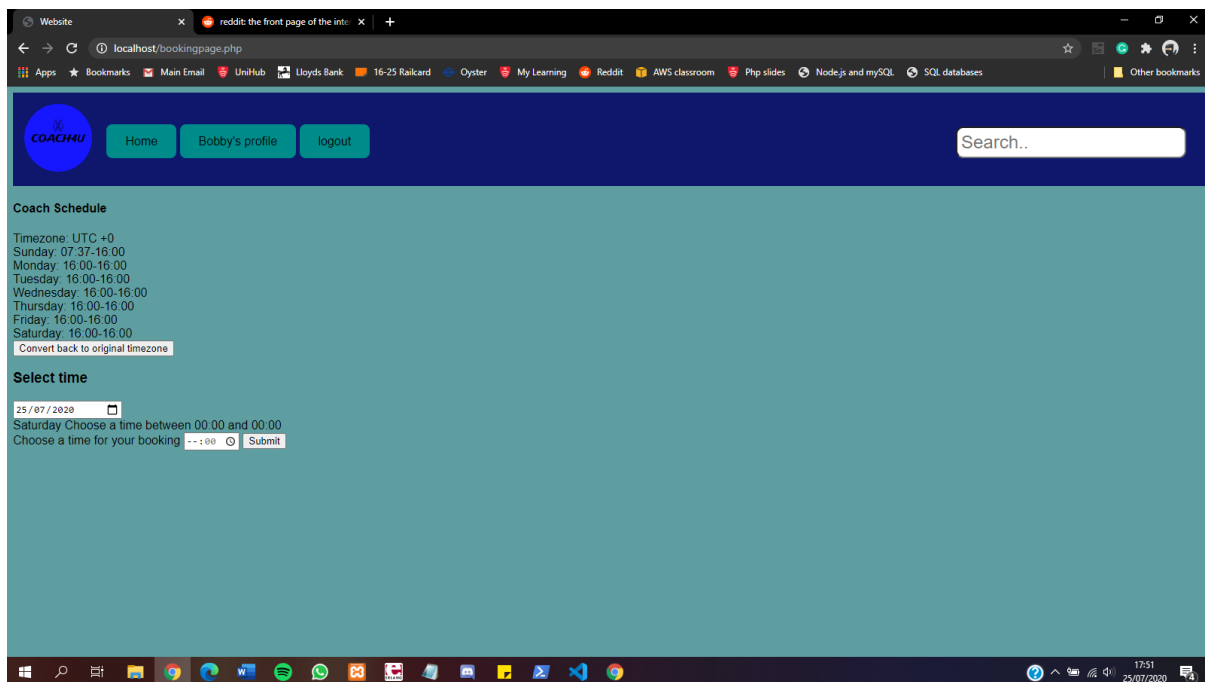
Edit booking page

This page is okay, it allows the player edit the time and date for the booking in the restrictions of the timetable for the coach, the user can also switch the time to their own time zone, or the coaches time zone.

However, the problems here are similar to the ones from the new booking page, however there are other problems, firstly, if the date has been passed on the booking, the user has to change it to be in the future. Secondly there is no check on the current day, if the time was been passed for example, if you book a time for 2:00 on a Wednesday and its already 4:00, it does not stop you from entering that data.
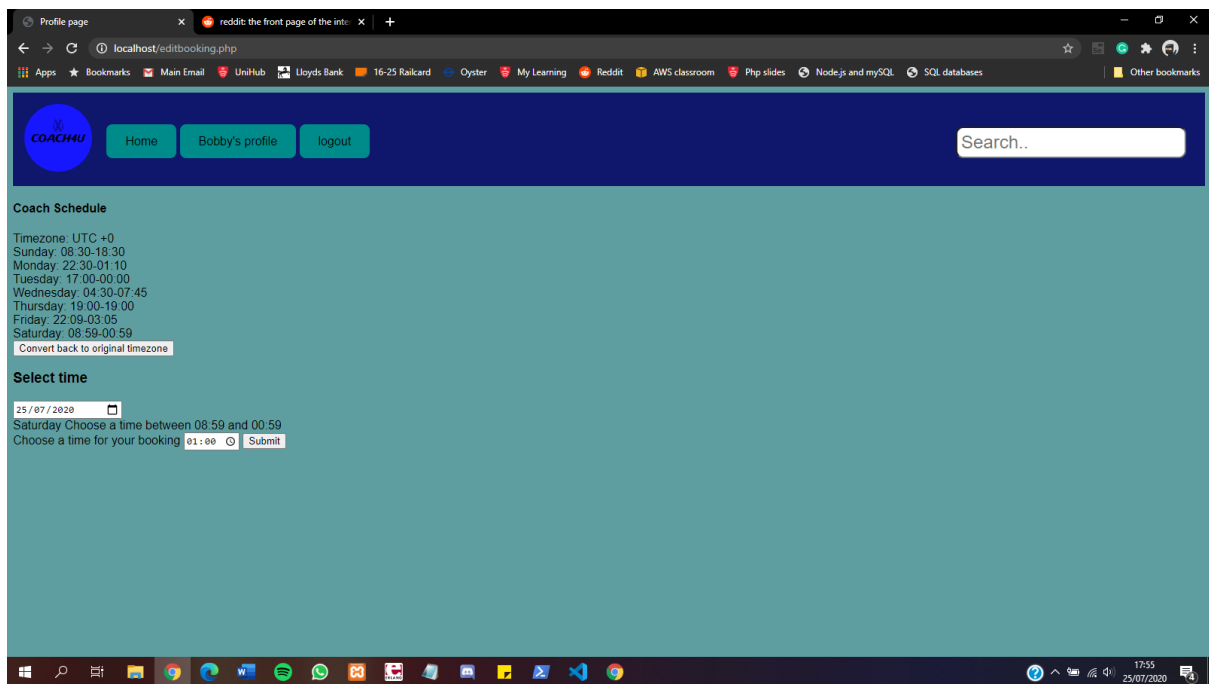
Region page

This page is fine, it shows an explanation of where the regions are located and helps players and coaches who are unfamiliar with the website's regions find where they would fit. However, there is a slight problem that the table does not update when the regions are updated. This is mainly because it takes a lot longer for regions to be added to games, especially in areas such as Central Africa and places with lower economic development.
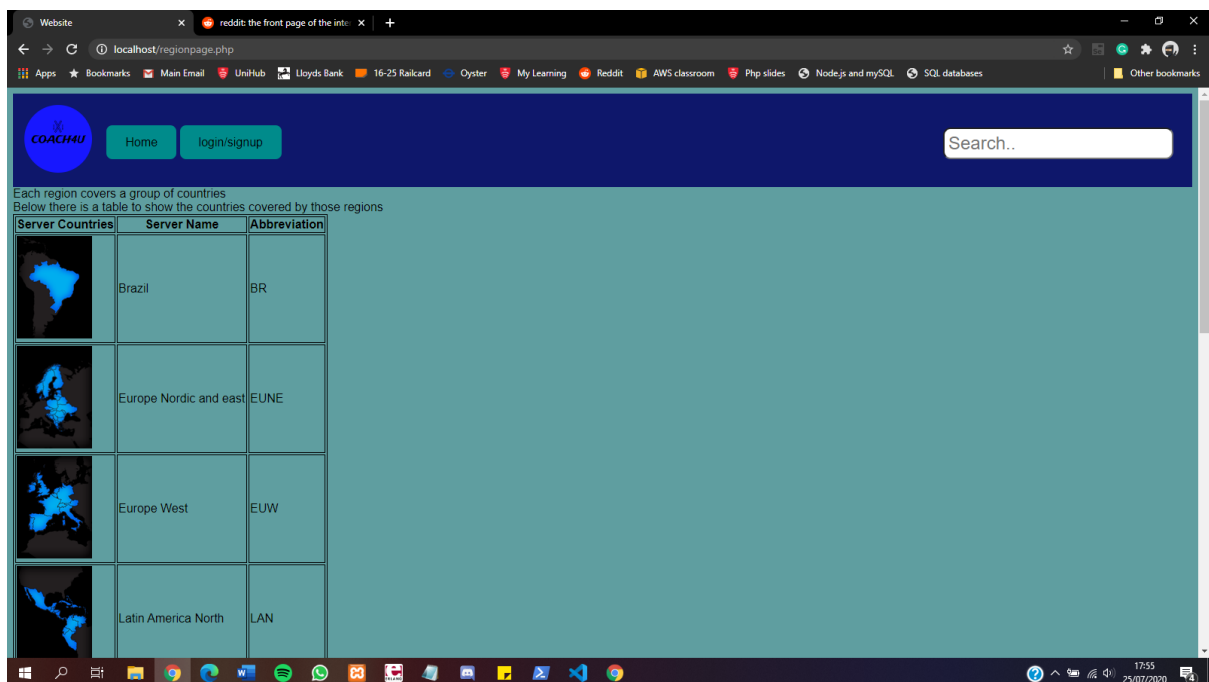
Edit profile page

This page is good, it allows the user to edit information such as the timetable, description, game played, region. However, there are a few things that could have been improved, firstly there is no way to delete a profile. This could become a problem later in the websites life when there are inactive accounts. This could become a problem when a player finds an inactive coach and tries to pay for a booking. Also edited timetables do not affect bookings that have already been booked, this is not a problem for completed bookings, however this is a problem for bookings that are in progress as the bookings could fall out of the time that the coach sets the schedule.
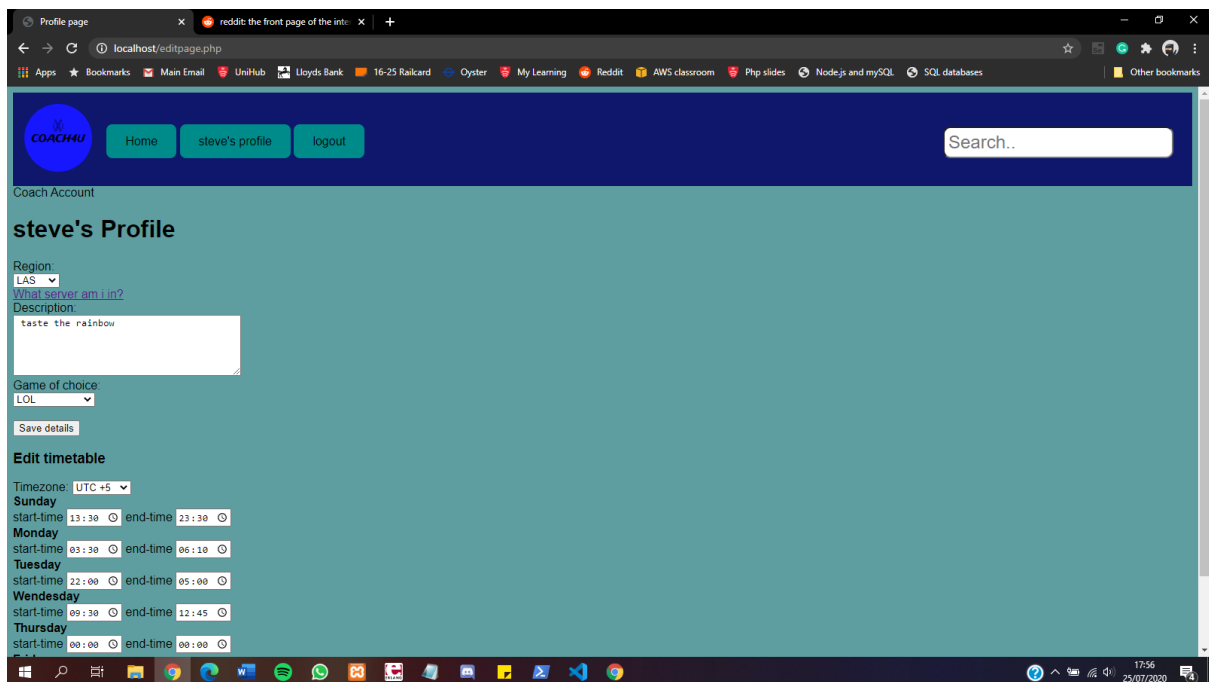
Architecture of the website

This section will go over the design of the parts that made up the website and how they could have been designed better.

The Database

The database is fine. It contains the data for the players and coaches. The timetables and time zones for each player and coach and the data for the games and regions. However, there are a few things that could have been improved with the database. Firstly, I would have ideally liked the coaches and players to be able to select multiple games on their profiles. However, I had trouble implementing that, so I switched to with having a single game for the coaches. Secondly, I have timetables for the players and the coaches, but on reflexion I did not really need a timetable for the players, when thinking about how other booking systems are managed, for example a hairdressers, there is a booking system for each hairdresser and customers are put into slots in the timetable. Another example is a school where teachers and students both have schedules, this is because they follow a weekly plan, which is the basis for the schedule for the coaches, it is a weekly schedule that shows a consistent plan for the week. However, in practice, this is not the case for the players, they are not restricted for a weekly basis, unlike students in a school. Therefore, it would have been easier to have the timetable for only the coaches.

The website

The website design is fine. It shows the information for the players and the coaches clearly. However, there are some things that could have been improved upon, firstly the CSS is not the greatest. The colour scheme is fine, using a light blue for the background and a darker blue for the navigation bar. However, it is nothing advanced and it looks somewhat older compared to other websites. There is nothing that is dynamic about the website, so although the colour scheme is fine, and the information is clear to see. It is not very eye catching to the user. Another design element is the way that the search results are presented. They are shown as boxes in a three-column table, and although they show the information of each coach clearly. Again, the design does not look very eye catching to the user.

Comparing the project to the requirements

This section will go over each of the deliverables and see if the project meets them.

A working profile system for both the players and the coaches. Each player and each coach would have a profile.

This has been met by the website. There are profiles for both the coaches and the players that can be viewed and edited. All the tests for the profiles were successful. However, there are a few things that could have been improved, firstly there is no social interaction on the website for the coaches and players. The players and coaches could communicate on third party applications such as email, text or apps like discord or line. However, some players/coaches may not be comfortable with this, so sometimes there may be little communication with the players and the coaches.

A searching system that finds the best matching coaches for the player. This would include, the game coached, time-zone availability, coach skill level/coach experience, review rating.

This has been mostly met by the website. The search system allows players to search by the game, the region, and reviews. All the tests were met; However, coach skill level is a bit more nuanced then that. Mainly because different games have different standards to how they define skill. For example, the highest level for overwatch competitive play would be grandmaster/top 500. However, for league of legends the highest rank is challenger. The coach could explain their qualifications on their description. However, there is no filter for it as it is a lot harder to quantify skill for multiple games in a standardised fashion.

A payment system that allows the coach to set a variable (for example games played, hours used, per session) so that it is easier to tell how much the player should owe the coach.

This has been met. The coach can select how they structure their sessions with a player, for example a more active coach might want to set a price on a per game basis as they could coach their player by playing alongside them. A different coach might want to have hourly based payment as they could be focused on more training aspects such as mechanics or explaining Marco-decisions. Or a coach could have a set session set that follows a set principle such as explaining aiming techniques. With this system, coaches can embrace their own coaching style. A minor problem is that this cannot really be explained in the description. Ideally you would have a messaging system that allows the coach to explain how the sessions work.

A review system that allows the player to provide feedback to the coach. Coaches should be able to easily view the feedback and see what they have done well and what needs improving.

This has been met. There is a star rating system that allows players to set stars based on how well the coaching session went. However, test 4.c was not met. This means that coaches do not get detailed analysis on their session, it is to the point where it is difficult to tell what the coach needs to improve on. Ideally there would be a comment section below the star system that would tell the coach what could have been improved or what they did well. Of course, not all players would give a detailed comment on how well the coach did but, it still would be satisfactory for the coach.

A timetabling system that allows players and coaches to set when they are available. The time should be universal meaning that the player and the coach would see the timetable from their own time zone.

This has been met. There are timetables for both the player and the coach, and they can change the time zone to theirs to see where it in their local time is. However, not all the tests were met in this, for example test 5.d) shows that when a player or coach changes their time zone. It does not affect the set booking times automatically.

In retrospect, the player timetable is not needed. As explained earlier on, the players and coaches' timetable are more like a hairdresser's appointment rather than a school-based scheduling system. Meaning having a player timetable is redundant.

User guide

Welcome to the Coach4U user guide, this guide will explain how to use this website to its fullest potential.

Jargon

This section will summarize the jargon used to describe certain features within the website.

Coach – a user that uses their knowledge to train *players*.

Players – a user that wants to improve their skill level with the help of *coaches*.

Booking – a time that the coaching session would take place

Stars – the rating system used to evaluate coaches.

Region – an area in the world that corresponds to a server area.

Signing up

To create a new account, you need to go to the sign-up page. On the top left-hand side of the site, there is a button called login/signup. Click on this button.
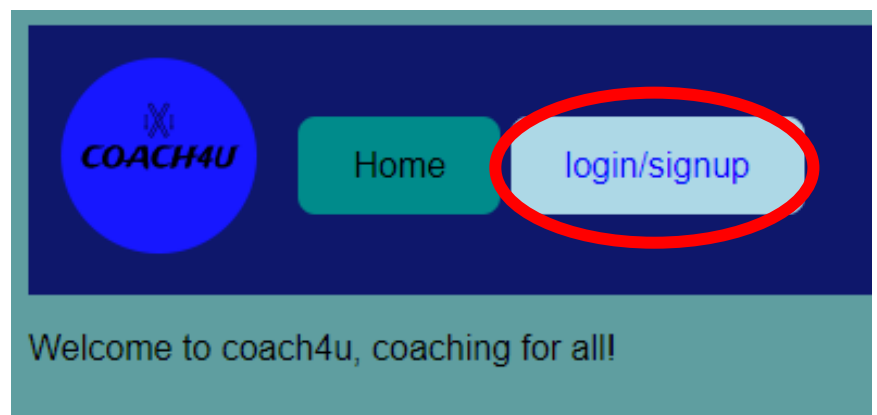
Once on the login page. click on the hyperlink next to the login button. This will take you to the sign-up page.

Once on the signup page, you need to decide if you are a coach or a player. If you want to improve at a game, then select player, if you want to teach others about a game, then select coach. You can select this at the top left-hand side of the page.

Once on the signup page, fill out all the information in the form. Once you are done, click the "sign up" button at the bottom right hand side of the page.

Logging in

To log in as a user, go to the login page.

Next, select one of the buttons at the top of the login page depending on where you are a coach, or if you are a player. If you are a coach, then select the coach button, if you are a player then select the player button.
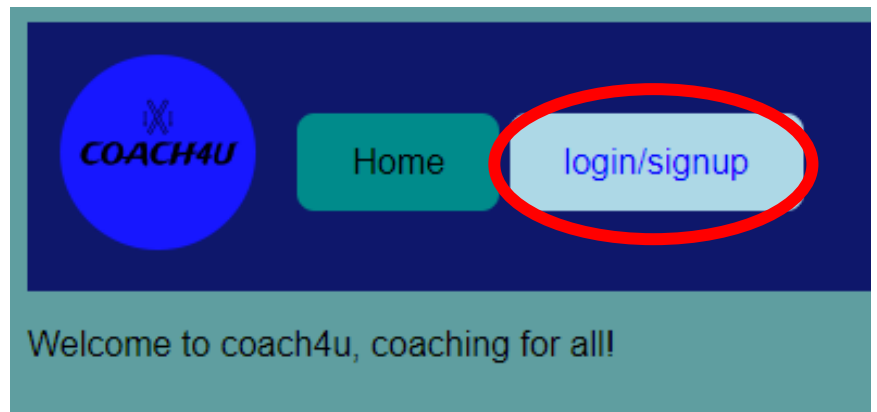
Then after entering in your username and password. Press the login button.

Searching for a coach

If you are a player, you can use the search bar to see the coaches that are currently available. To search for a coach, go to the search bar at the top of the page.

then type in the item you would like to search for, for example a specific game. Then after you have typed an item, press enter.
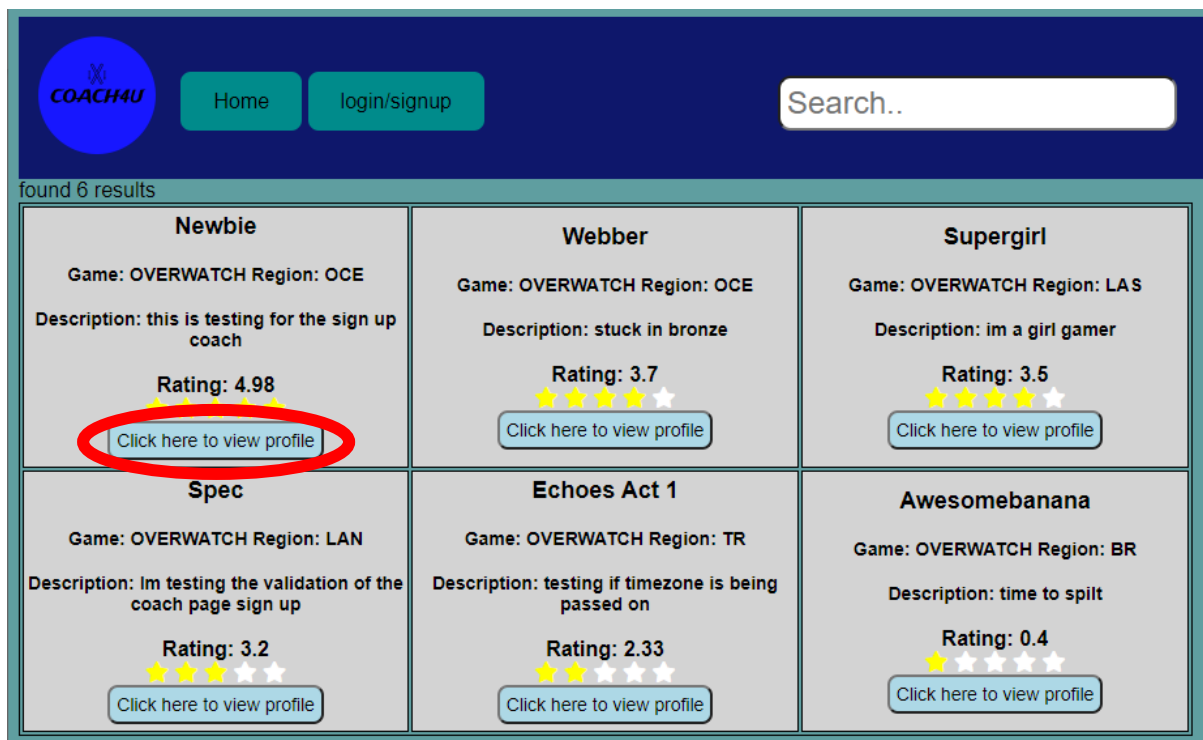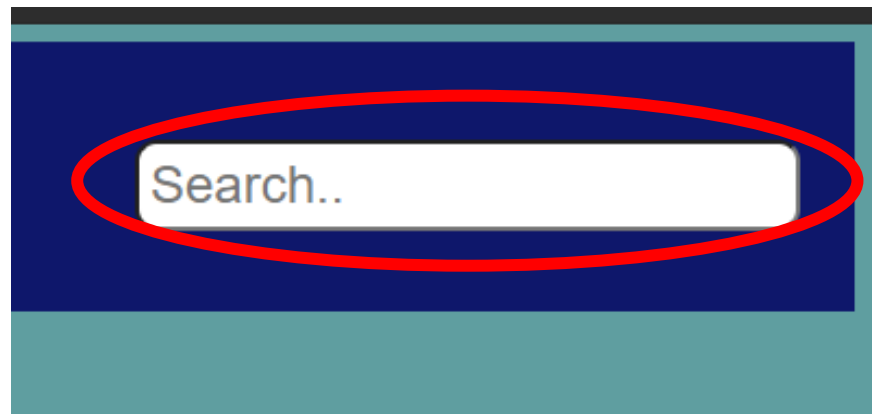
Then you can select one of the coaches to view their profile using the button "click here to view profile".

Booking a session with a coach

Once you have clicked on a coach. You can arrange a booking with them. To do this you need to be signed in. if you have not already signed in, you can click this button to take you to the login page.

If you have signed in. select the book a session button to go to the booking page.

Once you are in the booking page. you can select a time and a date of when you would like your booking. After you are done selecting the time and the date, you can press the submit button to save your booking.
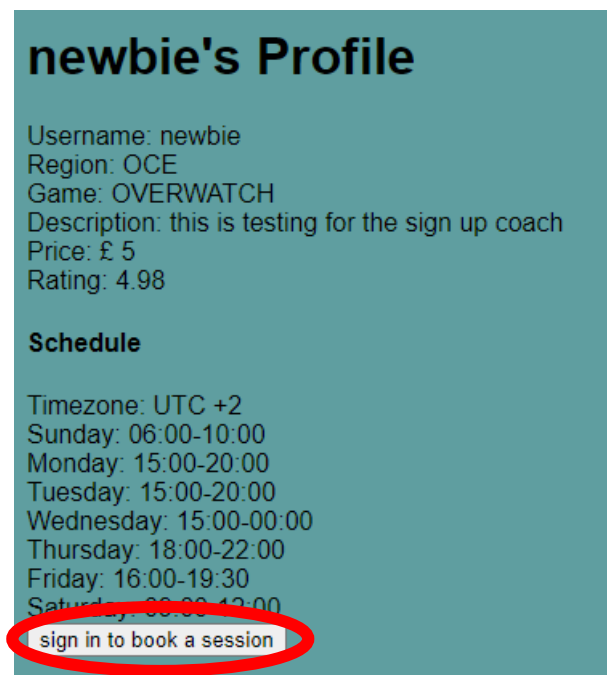
newbie's Profile

Username: newbie
Region: OCE
Game: OVERWATCH
Description: this is testing for the sign up coach
Price: £ 5
Rating: 4.98

Schedule

Timezone: UTC +2
Sunday: 06:00-10:00
Monday: 15:00-20:00
Tuesday: 15:00-20:00
Wednesday: 15:00-00:00
Thursday: 18:00-22:00
Friday: 16:00-19:30
Saturday: 09:00-12:00

book a session
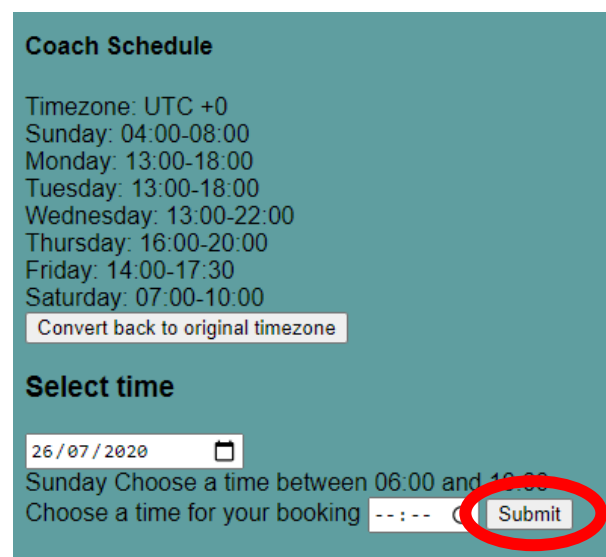
newbie's Profile

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Timezone: UTC +2
Sunday: 06:00-10:00
Monday: 15:00-20:00
Tuesday: 15:00-20:00
Wednesday: 15:00-00:00
Thursday: 18:00-22:00
Friday: 16:00-19:30
Saturday: 09:00-12:00

sign in to book a session

Coach Schedule

Timezone: UTC +0
Sunday: 04:00-08:00
Monday: 13:00-18:00
Tuesday: 13:00-18:00
Wednesday: 13:00-22:00
Thursday: 16:00-20:00
Friday: 14:00-17:30
Saturday: 07:00-10:00

Convert back to original timezone

Select time

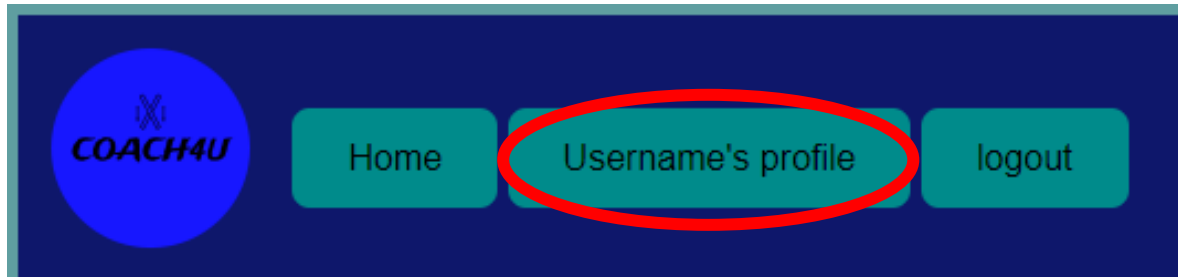26/07/2020
Sunday Choose a time between 06:00 and 10:00
Choose a time for your booking -- : -- Submit

Viewing and editing bookings

If you are logged in you can go to your user profile by clicking the button named, your profile at the top left-hand side of the page.

On your profile page, you can see three sections of your profile, your user information, your ongoing bookings, and your completed bookings. To change an ongoing booking, click the change booking button. Then you can edit the time and the date of your booking.
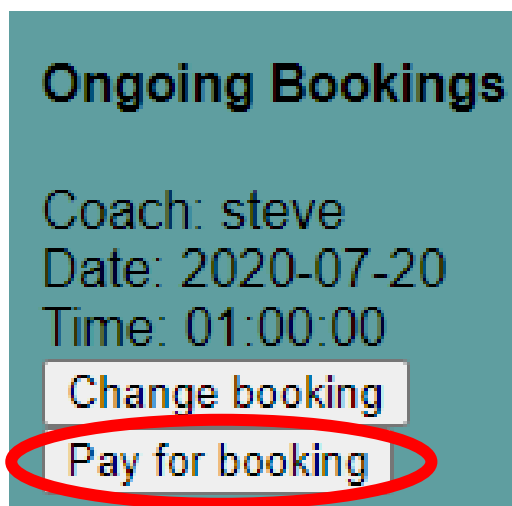
Paying for a booking

To pay for a booking, click the pay for booking button just below the change booking button.

Then select how long you like your coaching session to be. The options will vary depending on what your coach has set as their payment type. If your payment type is games. Then select the amount of games you would like to play. If your payment type is hours, then select the number of hours you would like to play. If your payment type is session, then you do not need to change anything. After selecting your hours/games/sessions, Press the submit button.

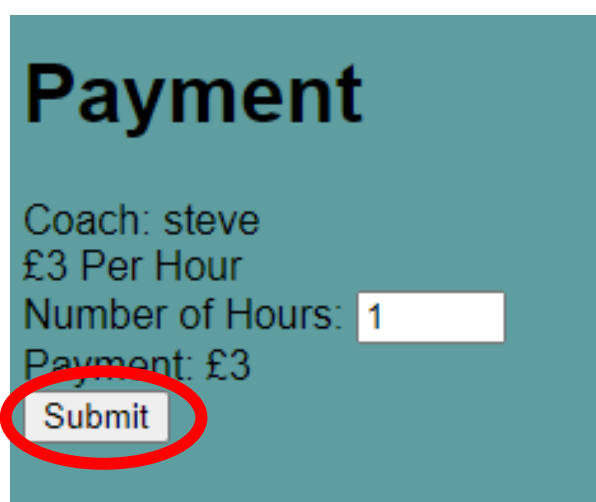Fill out all the necessary information for payment. Then click the submit button.

After you have paid, the coach will press the complete booking button to finish the booking.

After the coach has completed the booking, you can rate the experience of the coaching session using the star system. Click the star to select a rating and click the give rating button to submit the rating. The ranking goes from 1 to 5 with 5 stars being the highest mark.

Troubleshooting

I cannot log in to my account.

You cannot login to your account, make sure you are entering the correct username and password. You can click the show password option to see you are entering your password correctly.

Conclusion

In conclusion this project was an enlightening experience of the challenges that are faced when creating and designing a project. Not everything would go as expected and sometimes designing a project is different than implementing one. The project I believe was a partial success. I have successfully created an esports booking website. However as stated in the evaluation there were various things that I could have done to improve the quality of the project.

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[2] Tanujia padale , A literature review on timetable generation algorithms , Vol-3 issue-1 2017 [online] available at: https://pdfs.semanticscholar.org/74b5/88e2bc4672619e8c82e54d33319c39dc71f7.pdf?_ga=2.159418749.1147090899.1579281472-1871547306.1579281472

[3] David turner, working with time zones, 12th August 2018, [Online] available at: https://davecturner.github.io/2018/08/12/working-with-timezones.html

[4] Anisha Jain, A literature Review on timetable generation algorithms based on genetic algorithm and heuristic approach, vol.4 issue 4 April 2015, [Online] available at: https://www.ijarcce.com/upload/2015/april-15/IJARCCE%2037.pdf