Exercise Logger Web Application

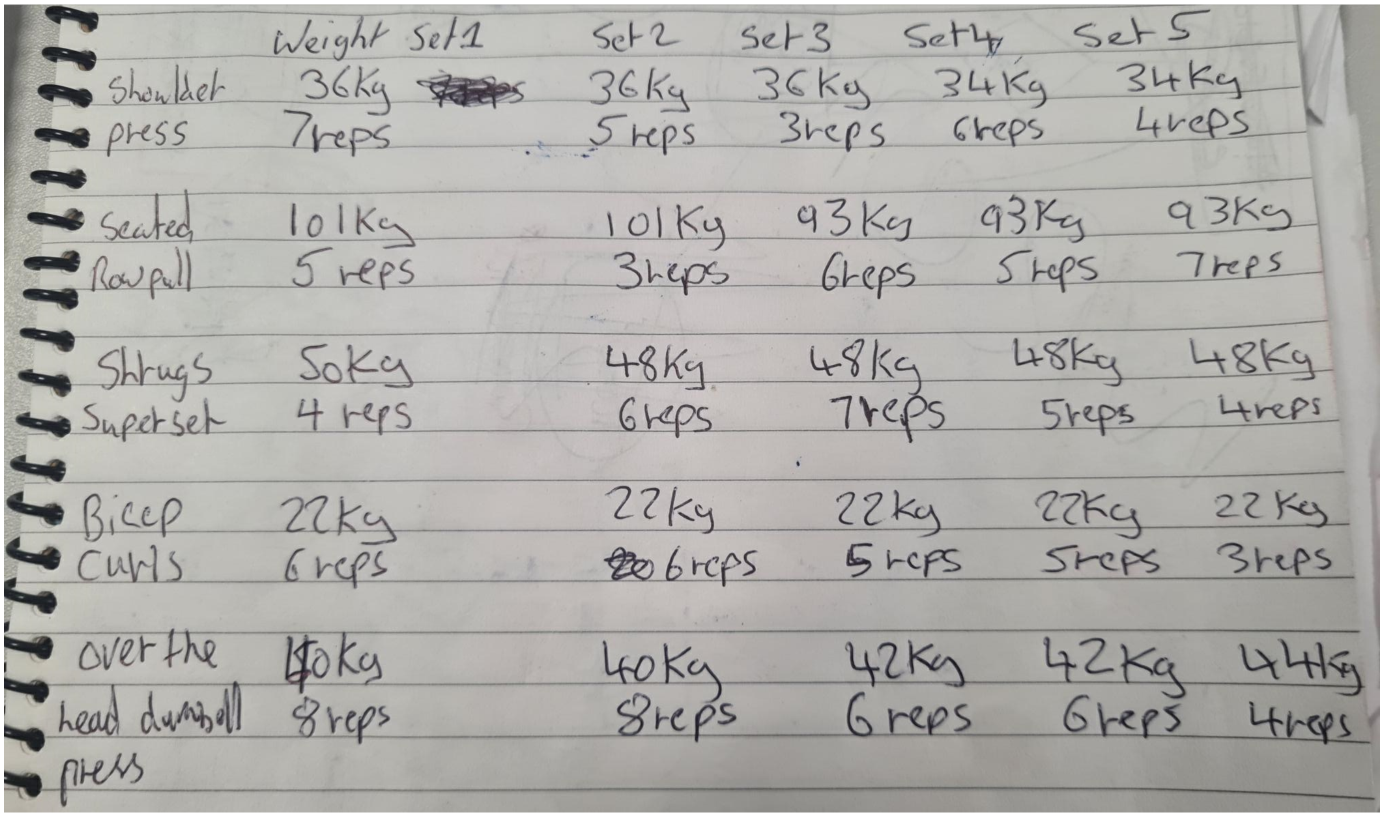
Hosted Application: https://fine-lime-veil.cyclic.app/

GitHub Repository: https://github.com/DAghaSolent/COM519Assessment

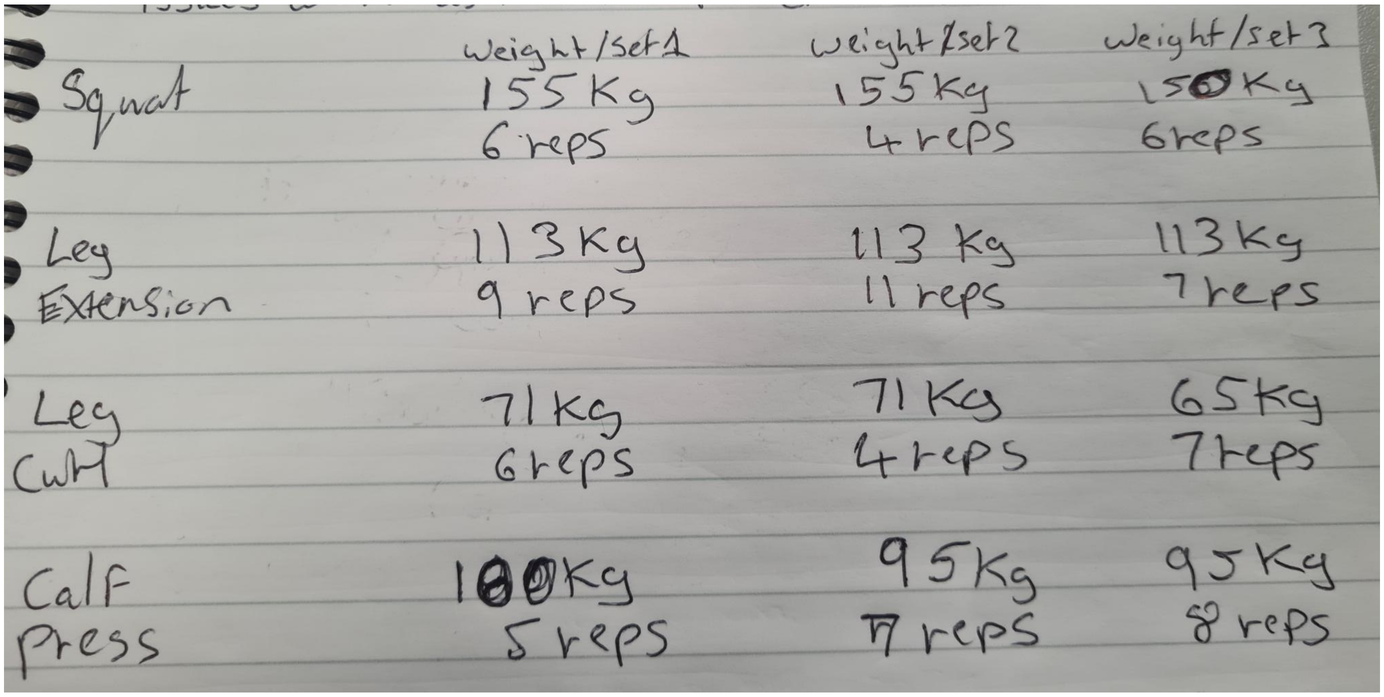
Introduction

The project idea for this assessment was to create a product to be able to effectively track all my lifts in the gym in an easier solution compared to my previous method which was using pen and paper to track my exercises.

In addition to this I wanted to provide an easier and fluent way of comparing data of individual exercise logs that were created by allowing the user to search for specific exercise logs. Thus allowing the user to see a better view of progression when comparing the same exercise on different dates. Also I included a summary option that shows the user the last 7 days of exercises logged so they are able to see their recent activity.



	Weight Set1	Set 2	Set 3	Set 4	Set 5
Shoulder press	36Kg 7reps	36Kg 5 reps	36Kg 3reps	34Kg 6reps	34Kg 4reps
Seated Rowpull	101Kg 5 reps	101Kg 3reps	93Kg 6reps	93Kg 5reps	93Kg 7reps
Shrugs Superset	50Kg 4 reps	48Kg 6reps	48Kg 7reps	48Kg 5reps	48Kg 4reps
Bicep Curls	22Kg 6reps	22kg 6reps	22kg 5reps	22Kg 5reps	22Kg 3reps
over the head dumbell press	40Kg 8reps	40Kg 8reps	42Kg 6reps	42Kg 6reps	44Kg 4reps



	Weight/set1	weight/set2	Weight/set3
Squat	155Kg 6 reps	155Kg 4 reps	150Kg 6reps
Leg Extension	113Kg 9 reps	113 Kg 11 reps	113Kg 7reps
Leg Curl	71Kg 6reps	71Kg 4reps	65Kg 7reps
Calf Press	100Kg 5 reps	95Kg 7 reps	95Kg 8 reps

As you can see in the images above when logging the exercises on pen and paper it is time consuming manually writing each exercise and it's details, alongside that it is missing relevant information such as date and the ability to write more information such as comments for each exercise as I try to keep it concise on the paper. The inability to search for a specific exercise with a certain date or the inability to view the same exercises on various dates lacks a view of progression to the user. These inabilities that I have mentioned are providing issues to me when trying to gauge the progress that I am making at the gym, the application that I have built works round these problems and allows me to see a better view of my progress in the gym.

System Overview

The application that I created was built with a MVC (Model, View, Controller) architecture in mind, I used Node.js for the back end to connect my application to MongoDB which I used as a cloud database solution that was holding the data for this application which was the individual exercises and the users that would sign-up and login onto the application. For the front end views I used EJS and Bootstrap to create my views for my application.

Within my application I have two database collections which are exercises and users.

My application has 4 key folders

- Controllers which has my exercise and user controllers which communicate with their respective models. Alongside that has an API folder which has a function inside of it which is useful for searching exercises
- Models folder which holds the schemas for my database collections User and Exercise
- Views folder which holds all my front end web pages
- Public folder which has some basic images for my application, also their is a scripts folder inside public which has an important script that is used to allow functionality for a user to search for an exercise.

Controllers

The role of the controller in an MVC architecture is responsible for communicating with the model and the view layers within a MVC architecture. In my application the controller is used to communicate with the model to retrieve specific data, which then passes that data to the view layer to render the specific action back to the user(Vikramsaha7,2022).

User Controller

My user controller that I have implemented is used to handle user authentication in two ways. One function allows a new user to sign up to my application and the other function handles authentication by allowing the user to login in to my application.

```
const User = require('../models/User');
const bcrypt = require('bcrypt');

exports.create = async (req, res) => {
    try {

        const user = new User({ email: req.body.email, password: req.body.password });
        await user.save();
        res.redirect('/home')
    } catch (e) {
        if (e.errors) {
            console.log(e.errors);
            res.render('sign-up', { errors: e.errors })
            return;
        }
        return res.status(400).send({
            message: JSON.parse(e),
        });
    }
```

Function from user controller which creates a new user and allows a user to sign up to my application.

```
exports.login = async (req, res) => {
    try {
        const user = await User.findOne({ email: req.body.email });
        if (!user) {
            res.render('login-user', { errors: { email: { message: 'email not found' } } })
            return;
        }

        const match = await bcrypt.compare(req.body.password, user.password);

        if (match) {
            req.session.userID = user._id;
            res.redirect('/home')
            console.log(req.session.userID);
            return
        }

        res.render('login-user', { errors: { password: { message: 'password does not match'
} } })


    } catch (e) {
        return res.status(400).send({
            message: JSON.parse(e),
        });
    }
}
```

Function that handles user authentication and allows the user to login. Within the function there is validation that is passed back to the user if there is no email found or if there is no match with the email and password. If the login is successful then the user is then redirected to the home page.

Exercise Controller

The exercise controller that I have implemented is used to communicate with the exercise model to retrieve specific data depending on the user's action.

```
const Exercise = require("../models/Exercise");
const { db } = require("../models/User");

exports.create = async (req, res) => {
    try{
        let exercise =  new Exercise(
            {date: req.body.date,
            exerciseName: req.body.exerciseName,
            weight: req.body.weight,
            setAndReps: req.body.setAndReps,
            comments: req.body.comments,
            user: req.session.userID,});
        await exercise.save();
        res.redirect(`view-exercise/?message=New Exercise: ${req.body.exerciseName} with
Date: ${req.body.date} has been created`)
    }catch(e){
        if(e.errors) {
            console.log(e.errors);
            res.render('create-exercise', { errors: e.errors});
            return;
        }
        return res.status(400).send({
            message: JSON.parse(e),
        });
    }
}
```

This function here communicates to the exercise model to create a new exercise record within the database. If successful redirects the user back to the view-exercise page and displays a success message.

```
exports.lists = async (req, res) => {
    try{
        const message = req.query.message;
        const exercises = await Exercise.find({user: req.session.userID});
        res.render("view-exercise", {exercises, message: req.query?.message});
    } catch(e){
        res.status(404).send({message: "could not find exercise"})
    }
}
```

This function communicates with the exercise model to get all the exercises that is associated with the logged in user. When the exercises are found it renders and passes the exercises found to the view layer page view-exercise. The view-exercise page then handles how it displays that information to the user.

```
exports.delete = async (req, res) => {
    const id = req.params.id;
    try{
        await Exercise.findByIdAndDelete(id);
        res.redirect(`/view-exercise/?message= Exercise has been sucessfully deleted`);
    } catch(e){
        res.status(404).send({message: "could not delete exercise"})
    }
}
```

This function communicates to the exercise model to find an exercise by it's unique id and then deletes it, if successful then a success message is presented to the user.

```
exports.edit = async (req, res) => {
    const id = req.params.id;
    try{
        const exercise = await Exercise.findById(id);
        res.render("update-exercise", {exercise: exercise, id: id, errors: {} });
    } catch(e){
        if(e.errors){
            console.log(e.errors);
            return res.render('update-exercise', {errors: e.errors });
        }
        res.status(404).send({
            message: `could not find exercise ${id}.`,
        });
    }
}

exports.update = async (req, res) => {
    const id = req.params.id;
    try{
        const exercise = await Exercise.updateOne({ _id: id }, req.body,
{runValidators:true});
        res.redirect(`/view-exercise/?message= Exercise: ${req.body.exerciseName} with Date:
${req.body.date} has been sucessfully updated`);
    }catch(e){
        if(e.errors){
            return res.render('update-exercise', {errors: e.errors, exercise:req.body});
        }
        res.status(404).send({
            message: `could not update exercise ${id}.`,
        });
    }
}
```

These 2 functions communicate to the exercise model to edit and update those edits to the specific exercise.

```
exports.last7DaysExercises = async (req, res) => {
    try {
        const sevenDaysAgo = new Date(Date.now() - 7 * 24 * 60 * 60 * 1000);
        const exercises = await Exercise.find({
            user: req.session.userID,
            date: { $gte: sevenDaysAgo }
        }).sort({ date: -1 }).limit(10);
        res.render("home", { exercises });
    } catch (e) {
        res.status(404).send({ message: "could not find exercise" });
    }
};
```

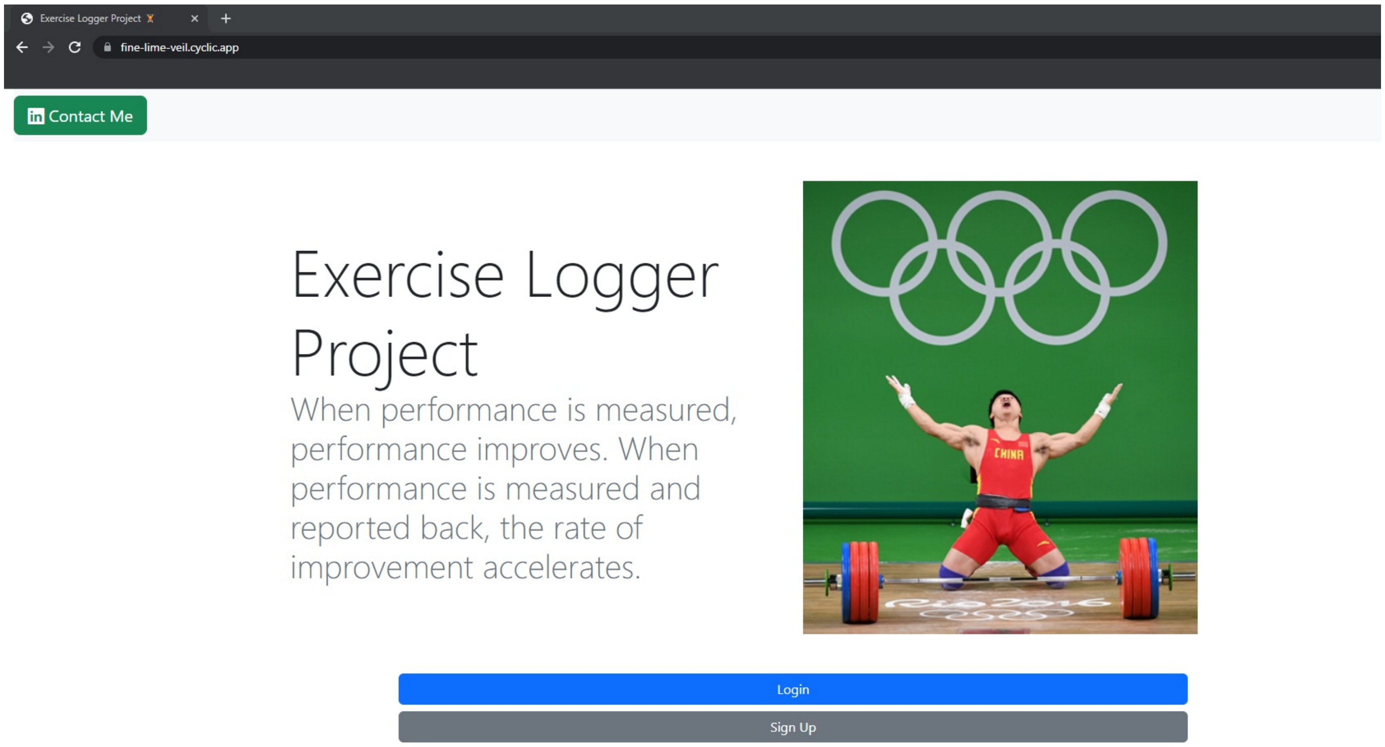
This function here works similar to the lists function that was previously mentioned, but this function communicates with the exercise model to retrieve exercises that have a date within the last 7 days. It retrieves and renders the information and passes it to the home page.

API Controllers

```
const Exercise = require('../../models/Exercise');

exports.list = async (req, res ) => {
    const searchQuery = req.query.search;

    if (!searchQuery) {
        res.json([]);
    }

    try{
        const Result = await Exercise.find({
            $text: {$search: searchQuery},
            user: req.session.userID,
        });
        if (!Result.length) {
            res.render('view-exercise', {
                message: 'No results found'
            });
            return;
        }
        res.json(Result);
    } catch(error){
        console.log(error);
        res.status(404).send({
            message: `could not perform search`
        });
    }
}
```

This API function that I created allows the user to search for specific exercises that are associated with the user.

Key View and interfaces



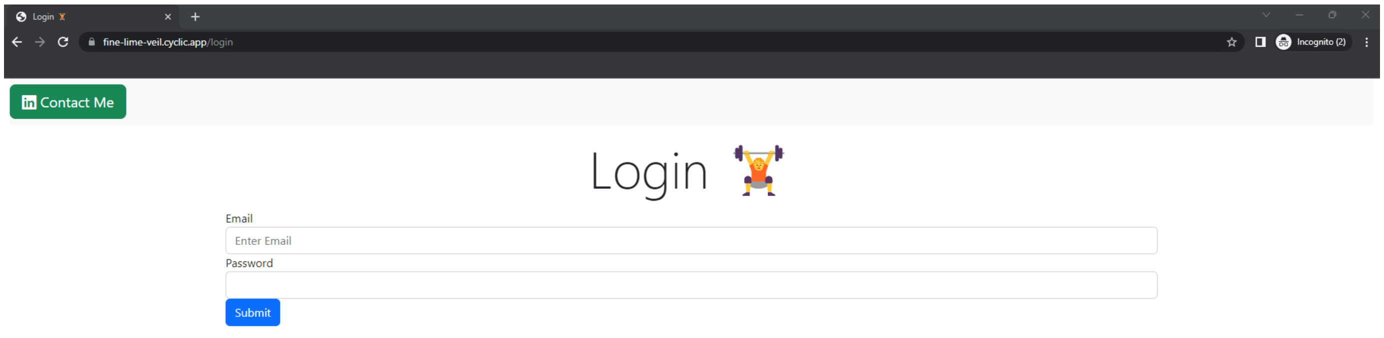
Exercise Logger Project

When performance is measured, performance improves. When performance is measured and reported back, the rate of improvement accelerates.

When the user goes to my hosted application they will be presented with this index page. From there the user has the option to sign up or login onto the application.

```
//________ Locking non logged in from users from  accessing the various
pages____________________


app.get("/create-exercise", authMiddleware, (req, res) => {
  res.render("create-exercise", { errors: {} });
});


app.get("/edit-exercise", authMiddleware, (req, res) => {
  res.render("edit-exercise", { errors: {} });
});

app.get("/edit-success", authMiddleware, (req, res) => {
  res.render("edit-success", { errors: {} });
});

app.get("/delete-success", authMiddleware, (req, res) => {
  res.render("delete-success", { errors: {} });
});

app.get("/search-exercises", authMiddleware, (req, res) => {
  res.render("search-exercises", { errors: {} });
});

//_______________________End of locking out of non logged in users
____________________________
```

The user must be logged in to be able to do CRUD operations on the application. This image shows all the routes that are protected and locked down, which forces the user to be logged in to be able to get to these pages. This is critical that a user must be logged in when creating an exercise as there is a relationship association between an exercise and a user.



Login

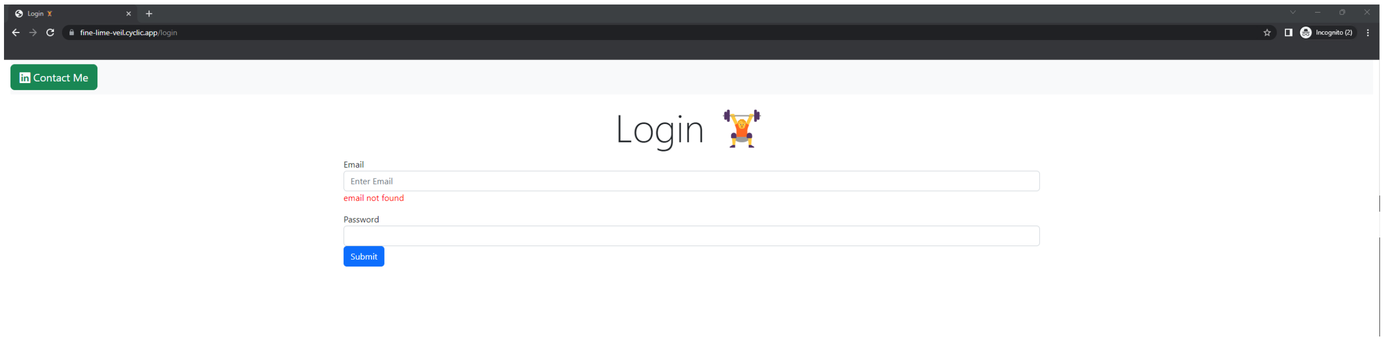
Email

Enter Email

Password

Submit

Login Page



Login

Email

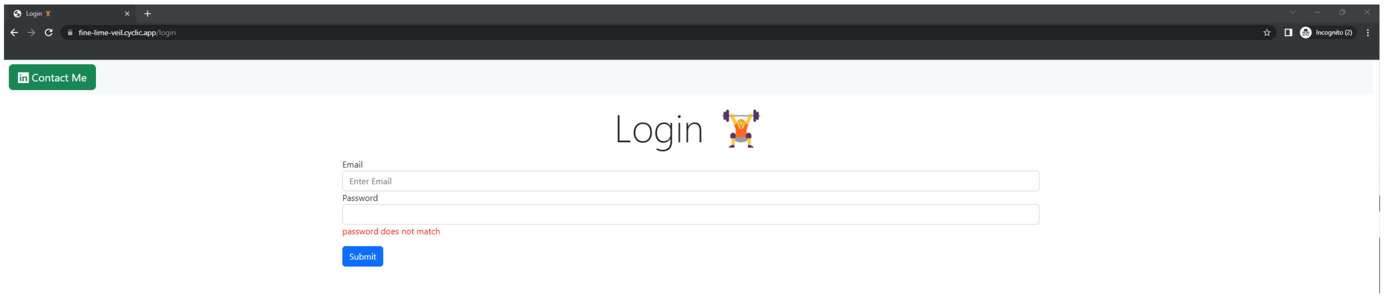
Enter Email

email not found

Password

Submit

Error validation in place if a user tries to login with an email that hasn't been registered onto the application



Login

Email

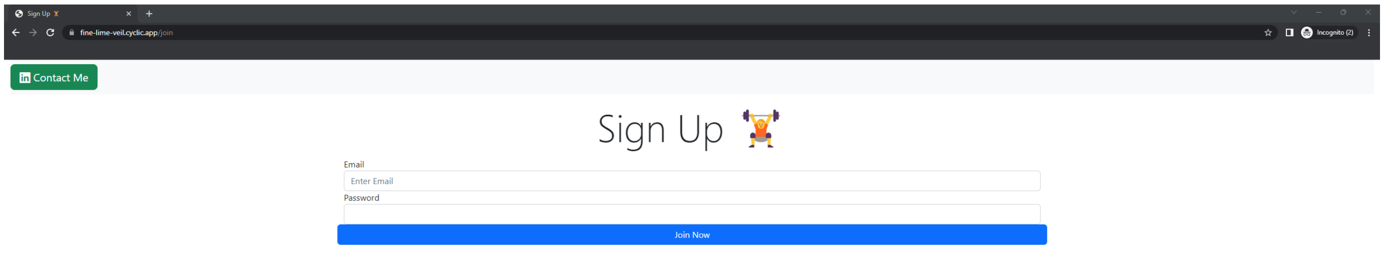
Enter Email

Password

password does not match

Submit

Error validation in place if a user inputs an incorrect password with a registered email.



Sign Up

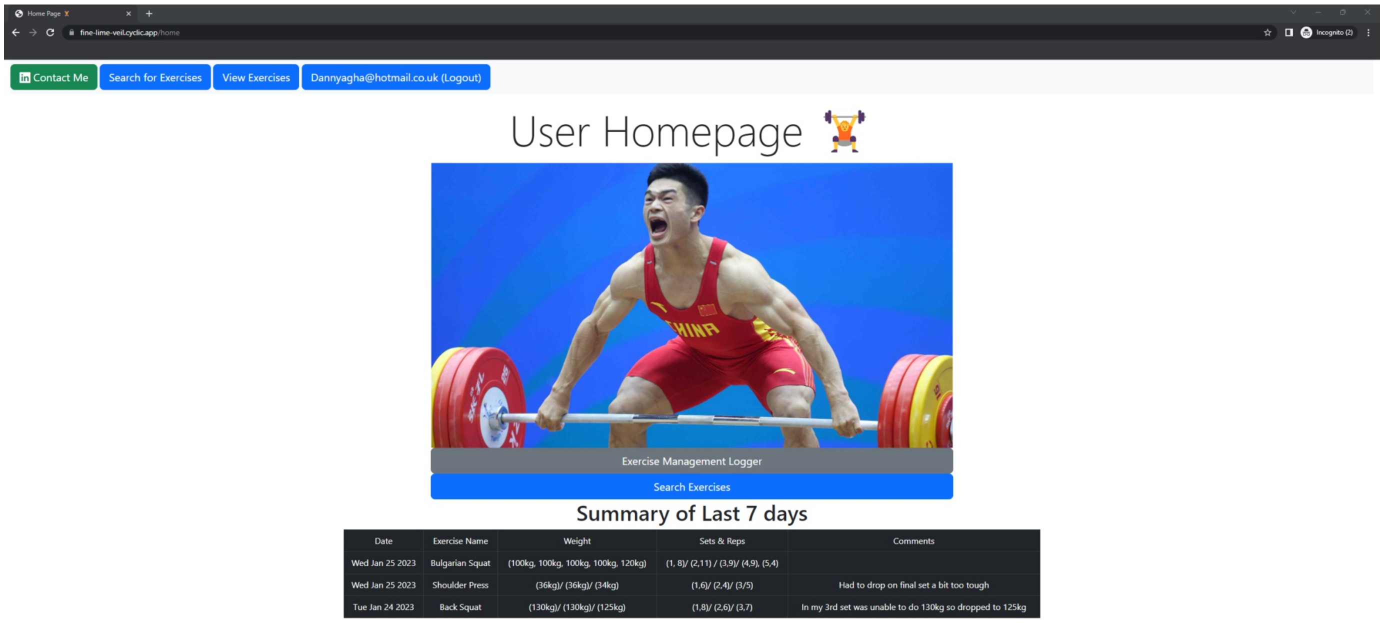
Email

Enter Email

Password

Join Now

Sign up page allowing a user to register an email and a password onto the application.



Home Page
fine-lime-veil.cyclic.app/home
Incognito (2)
Contact Me
Search for Exercises
View Exercises
Dannyagha@hotmail.co.uk (Logout)

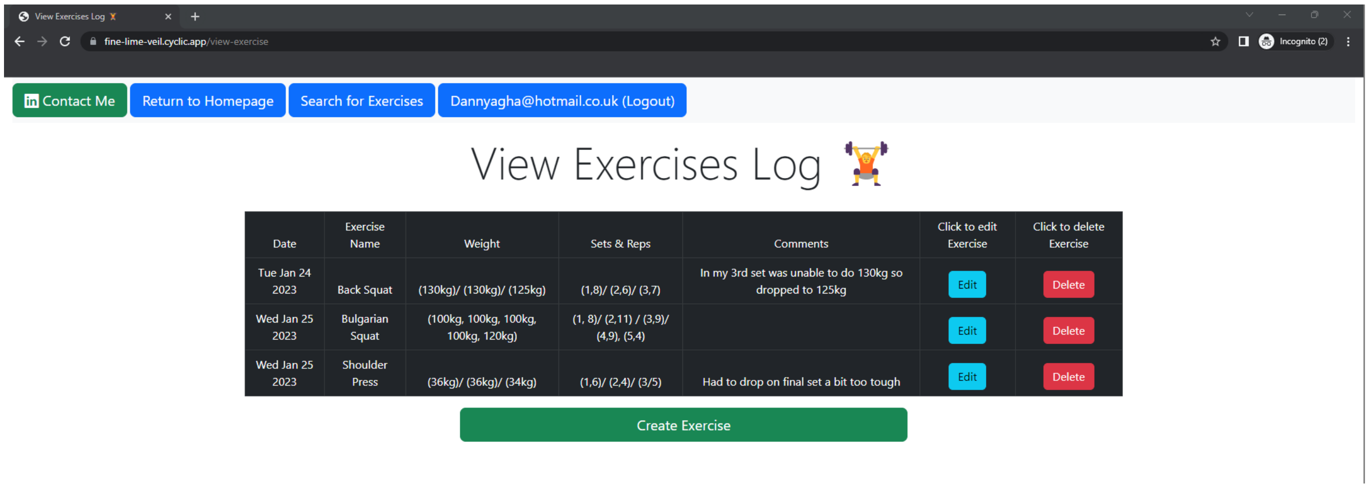
User Homepage 🏋️

Exercise Management Logger
Search Exercises

Summary of Last 7 days

Date	Exercise Name	Weight	Sets & Reps	Comments
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)	
Wed Jan 25 2023	Shoulder Press	(36kg)/ (36kg)/ (34kg)	(1,6)/ (2,4)/ (3/5)	Had to drop on final set a bit too tough
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg

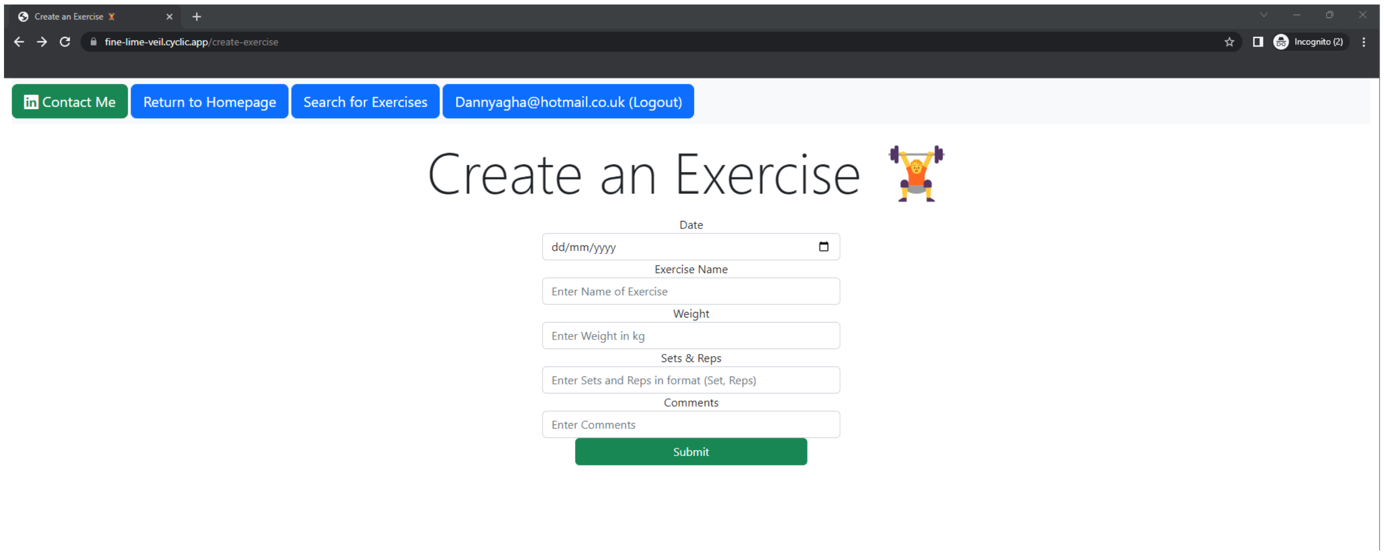
Once the user has logged in successfully they will be redirect to this homepage. From there they can search exercises, view exercises and logout. This page utilities the last7DayExercises function to showcase a recent summary of the last 7 days worth of exercises.



View Exercises Log 🏋️

Date	Exercise Name	Weight	Sets & Reps	Comments	Click to edit Exercise	Click to delete Exercise
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg	Edit	Delete
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)		Edit	Delete
Wed Jan 25 2023	Shoulder Press	(36kg)/ (36kg)/ (34kg)	(1,6)/ (2,4)/ (3/5)	Had to drop on final set a bit too tough	Edit	Delete

The view-exercise is a very important page in that from this page the user is able to do all the CRUD operations within this page. The user can see all exercises that they have created on the application, they also have the ability to create exercises, edit current exercises or delete exercises.


Create an Exercise

fine-lime-veil.cyclic.app/create-exercise

Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

Create an Exercise

Date: dd/mm/yyyy

Exercise Name: Enter Name of Exercise

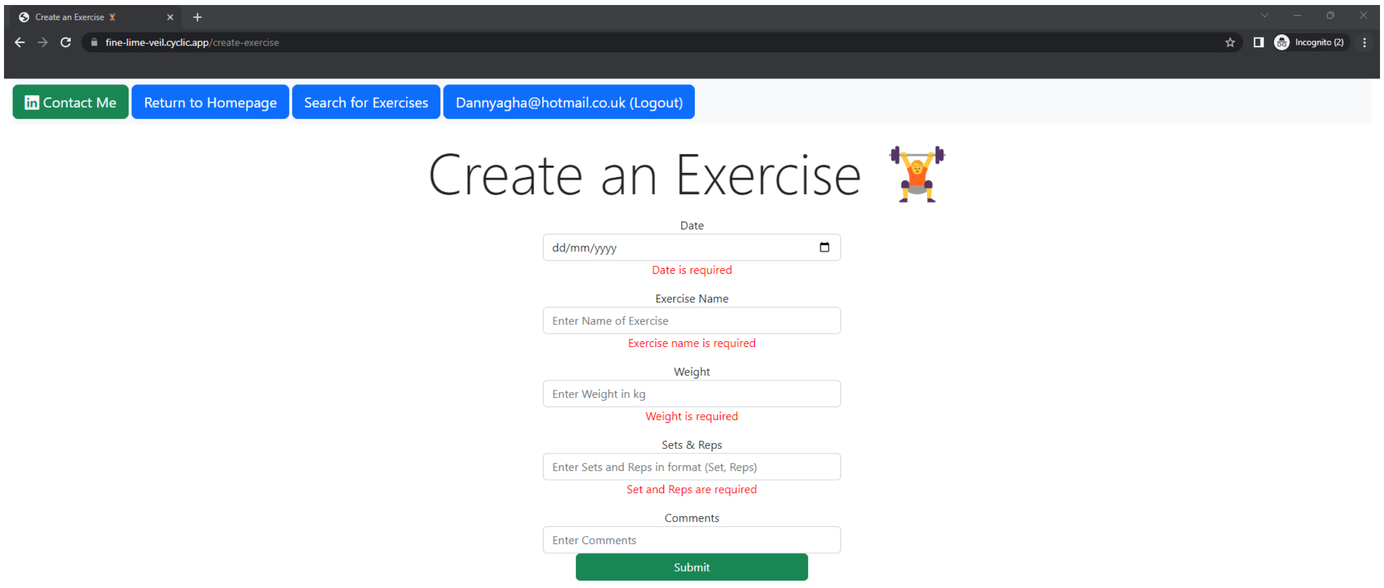
Weight: Enter Weight in kg

Sets & Reps: Enter Sets and Reps in format (Set, Reps)

Comments: Enter Comments

Submit

Create exercise page


Create an Exercise

fine-lime-veil.cyclic.app/create-exercise

Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

Create an Exercise

Date: dd/mm/yyyy

Date is required

Exercise Name: Enter Name of Exercise

Exercise name is required

Weight: Enter Weight in kg

Weight is required

Sets & Reps: Enter Sets and Reps in format (Set, Reps)

Set and Reps are required

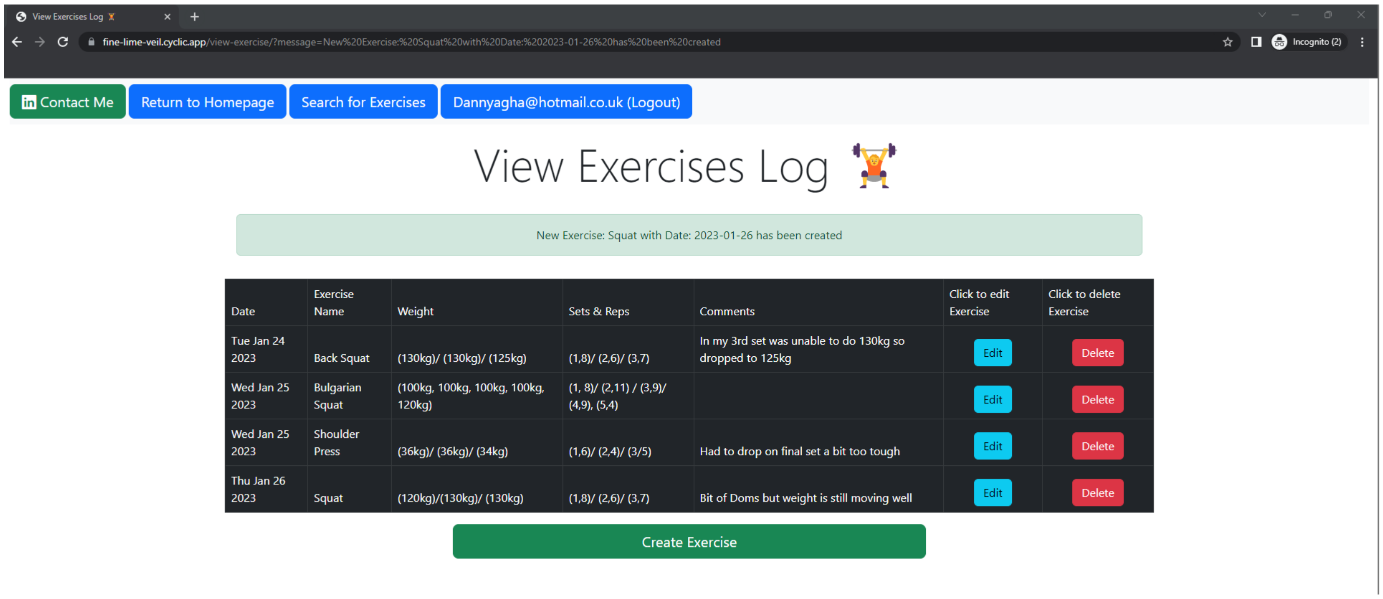
Comments: Enter Comments

Submit

In this image I have implemented error validation that will alert the user if they are missing required information when creating an exercise.

```
const mongoose = require("mongoose");
const { Schema } =  mongoose;

const exerciseSchema = new Schema(
    {
        date:{type:Date, required:[true, 'Date is required']},
        exerciseName:{type:String, required:[true, 'Exercise name is required']},
        weight:{type:String, required:[true, 'Weight is required']},
        setAndReps:{type:String, required:[true, 'Set and Reps are required']},

        // I have ommitted comments since I want it to be an optional input for the user.
        comments:{type:String},
        user: { type: Schema.Types.ObjectId, ref: 'User', required:true}
    }
)

exerciseSchema.index({'$**': 'text'});
module.exports = mongoose.model("Exercise", exerciseSchema);
```

As you can see in the exercise schema the only attribute that is optional when creating an exercise is comments everything else excluding the user in the form is required when creating an exercise.

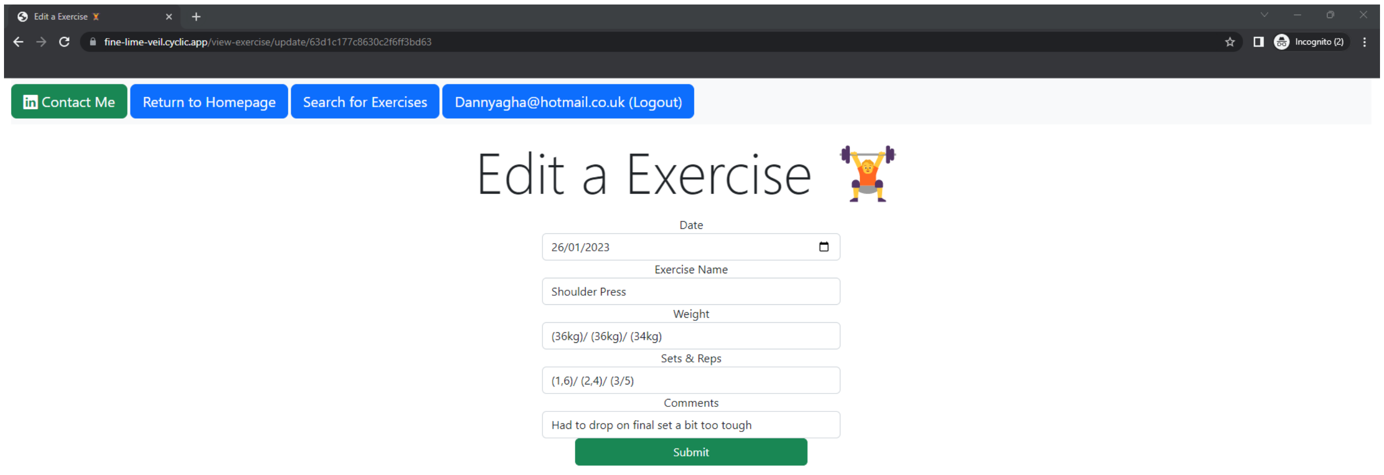

View Exercises Log
fine-lime-veil.cyclic.app/view-exercise/?message=New%20Exercise:%20Squat%20with%20Date:%202023-01-26%20has%20been%20created
Incognito (2)
Contact Me
Return to Homepage
Search for Exercises
Dannyagha@hotmail.co.uk (Logout)

View Exercises Log

New Exercise: Squat with Date: 2023-01-26 has been created

Date	Exercise Name	Weight	Sets & Reps	Comments	Click to edit Exercise	Click to delete Exercise
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg	Edit	Delete
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)		Edit	Delete
Wed Jan 25 2023	Shoulder Press	(36kg)/ (36kg)/ (34kg)	(1,6)/ (2,4)/ (3/5)	Had to drop on final set a bit too tough	Edit	Delete
Thu Jan 26 2023	Squat	(120kg)/(130kg)/ (130kg)	(1,8)/ (2,6)/ (3,7)	Bit of Doms but weight is still moving well	Edit	Delete

Image of a successful creation of an exercise log where a success message is displayed to the user.


Edit a Exercise

fine-lime-veil.cyclic.app/view-exercise/update/63d1c177c8630c2f6ff3bd63

Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

Edit a Exercise

Date: 26/01/2023

Exercise Name: Shoulder Press

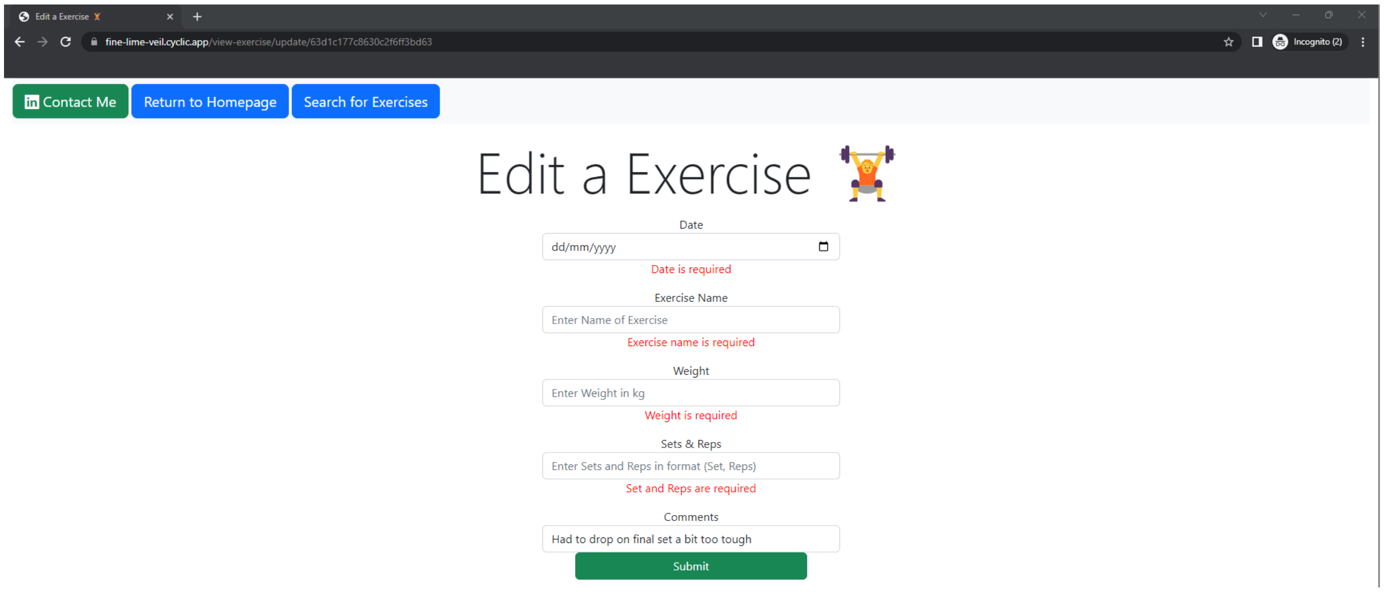
Weight: (36kg)/ (36kg)/ (34kg)

Sets & Reps: (1,6)/ (2,4)/ (3/5)

Comments: Had to drop on final set a bit too tough

Submit

Edit exercise page


Edit a Exercise

fine-lime-veil.cyclic.app/view-exercise/update/63d1c177c8630c2f6ff3bd63

Contact Me | Return to Homepage | Search for Exercises

Edit a Exercise

Date: dd/mm/yyyy

Date is required

Exercise Name: Enter Name of Exercise

Exercise name is required

Weight: Enter Weight in kg

Weight is required

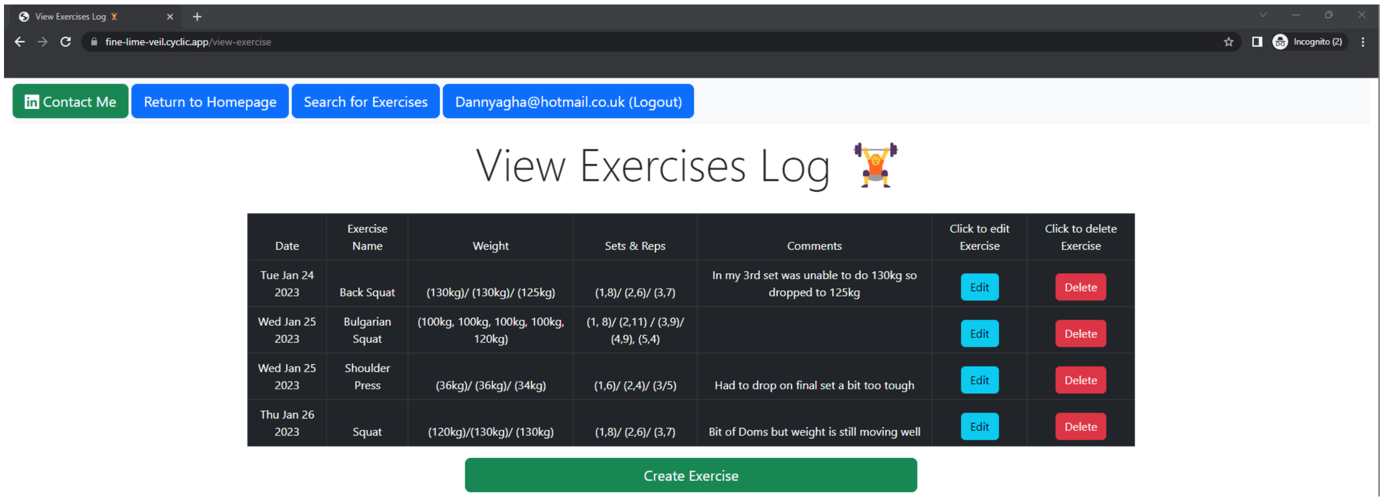
Sets & Reps: Enter Sets and Reps in format (Set, Reps)

Set and Reps are required

Comments: Had to drop on final set a bit too tough

Submit

In this image I have implemented error validation for editing as well, same with create an exercise if there are any required fields that are missing the application will alert the user if any required information is missing


View Exercises Log

fine-lime-veil.cyclic.app/view-exercise

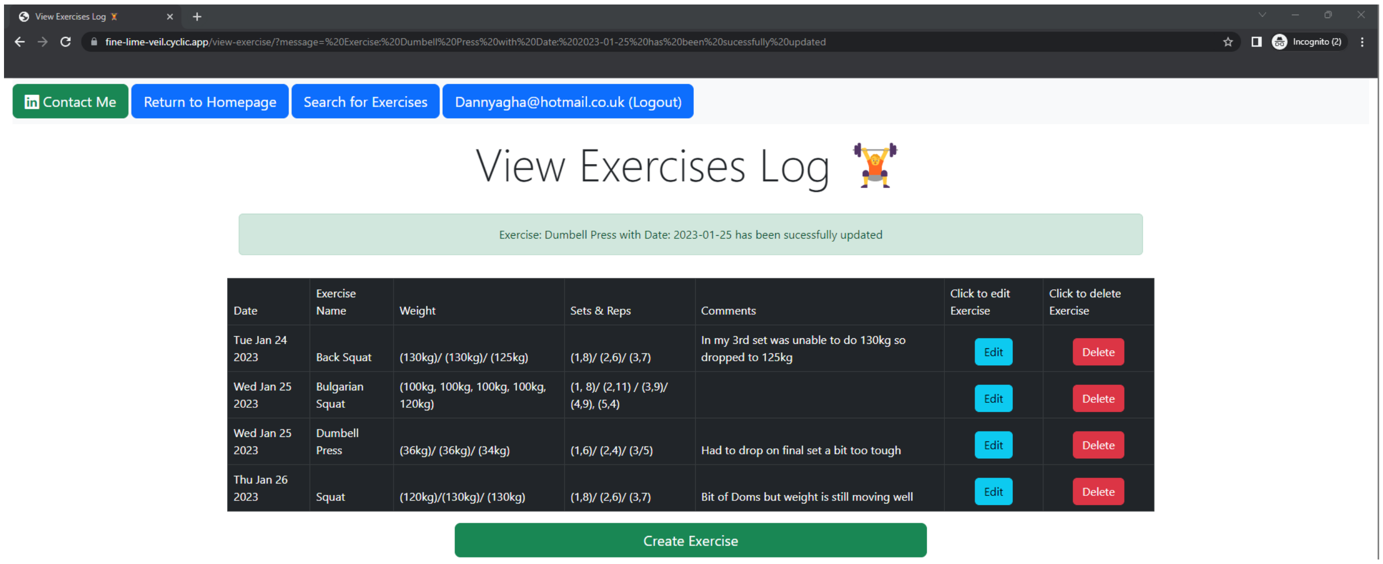
Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

View Exercises Log

Date	Exercise Name	Weight	Sets & Reps	Comments	Click to edit Exercise	Click to delete Exercise
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg	Edit	Delete
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)		Edit	Delete
Wed Jan 25 2023	Shoulder Press	(36kg)/ (36kg)/ (34kg)	(1,6)/ (2,4)/ (3/5)	Had to drop on final set a bit too tough	Edit	Delete
Thu Jan 26 2023	Squat	(120kg)/(130kg)/ (130kg)	(1,8)/ (2,6)/ (3,7)	Bit of Doms but weight is still moving well	Edit	Delete

Create Exercise

Before edit(Shoulder Press)


View Exercises Log

fine-lime-veil.cyclic.app/view-exercise/?message=%20Exercise:%20Dumbell%20Press%20with%20Date:%202023-01-25%20has%20been%20sucessfully%20updated

Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

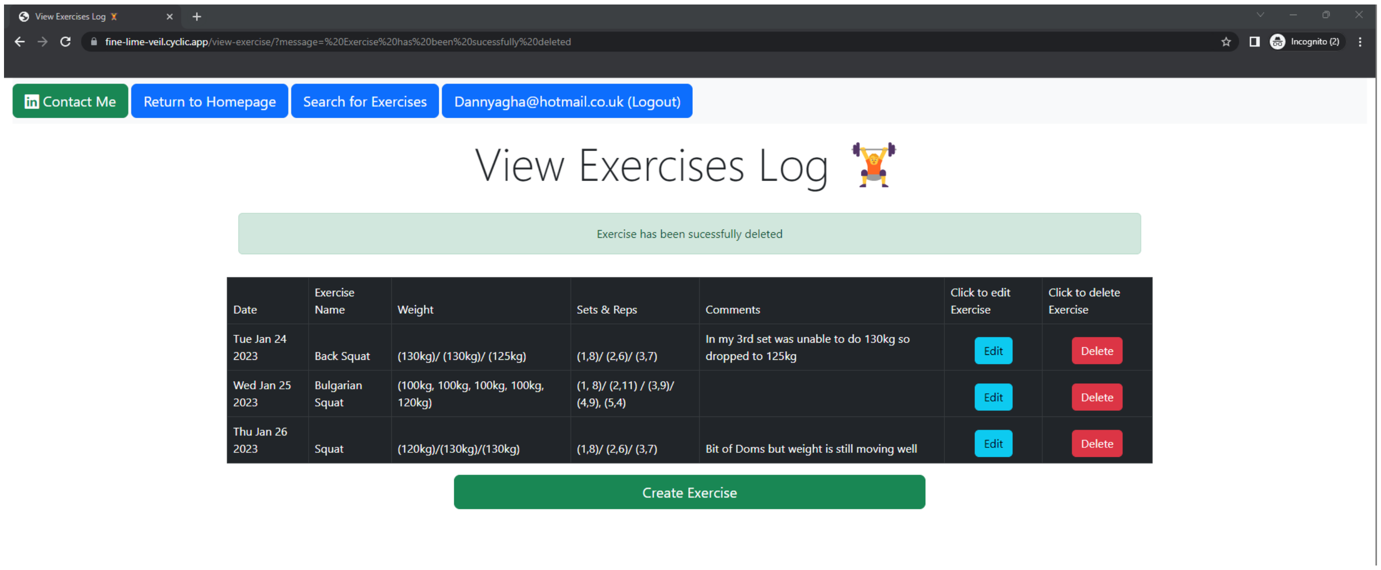
View Exercises Log

Exercise: Dumbell Press with Date: 2023-01-25 has been sucessfully updated

Date	Exercise Name	Weight	Sets & Reps	Comments	Click to edit Exercise	Click to delete Exercise
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg	Edit	Delete
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)		Edit	Delete
Wed Jan 25 2023	Dumbell Press	(36kg)/ (36kg)/ (34kg)	(1,6)/ (2,4)/ (3/5)	Had to drop on final set a bit too tough	Edit	Delete
Thu Jan 26 2023	Squat	(120kg)/(130kg)/ (130kg)	(1,8)/ (2,6)/ (3,7)	Bit of Doms but weight is still moving well	Edit	Delete

Create Exercise

Successful edit (Shoulder Press -----> Dumbbell press)


View Exercises Log

fine-lime-veil.cyclic.app/view-exercise/?message=%20Exercise%20has%20been%20sucessfully%20deleted

Contact Me | Return to Homepage | Search for Exercises | Dannyagha@hotmail.co.uk (Logout)

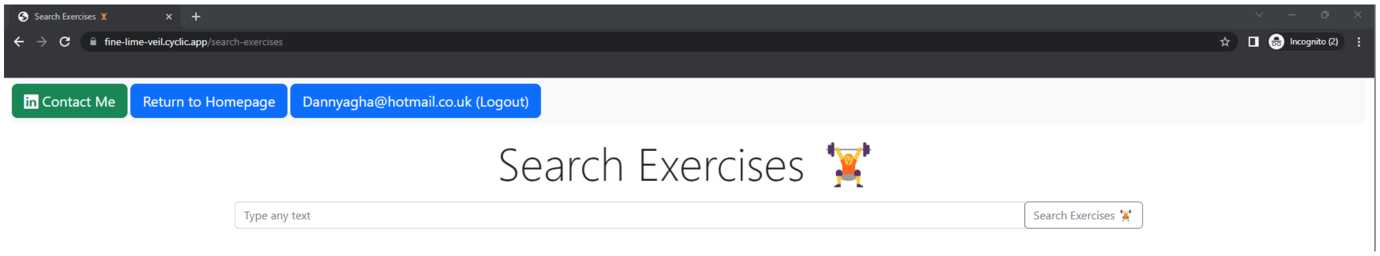
View Exercises Log

Exercise has been sucessfully deleted

Date	Exercise Name	Weight	Sets & Reps	Comments	Click to edit Exercise	Click to delete Exercise
Tue Jan 24 2023	Back Squat	(130kg)/ (130kg)/ (125kg)	(1,8)/ (2,6)/ (3,7)	In my 3rd set was unable to do 130kg so dropped to 125kg	Edit	Delete
Wed Jan 25 2023	Bulgarian Squat	(100kg, 100kg, 100kg, 100kg, 120kg)	(1, 8)/ (2,11) / (3,9)/ (4,9), (5,4)		Edit	Delete
Thu Jan 26 2023	Squat	(120kg)/(130kg)/(130kg)	(1,8)/ (2,6)/ (3,7)	Bit of Doms but weight is still moving well	Edit	Delete

Create Exercise

Successfully deleting Dumbbell Press exercise.


Search Exercises

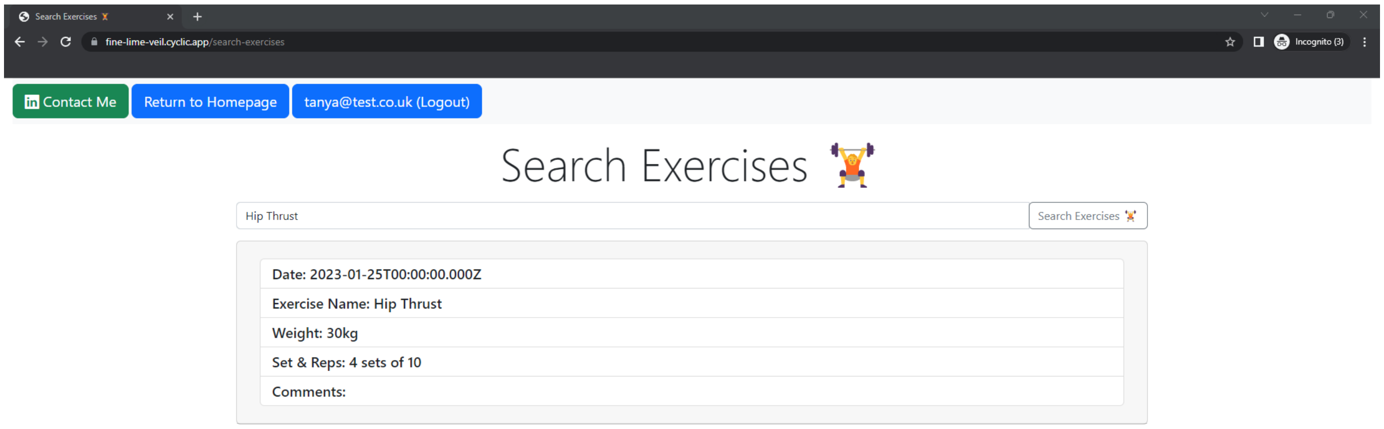
fine-lime-veil.cyclic.app/search-exercises

Contact Me | Return to Homepage | Dannyagha@hotmail.co.uk (Logout)

Search Exercises

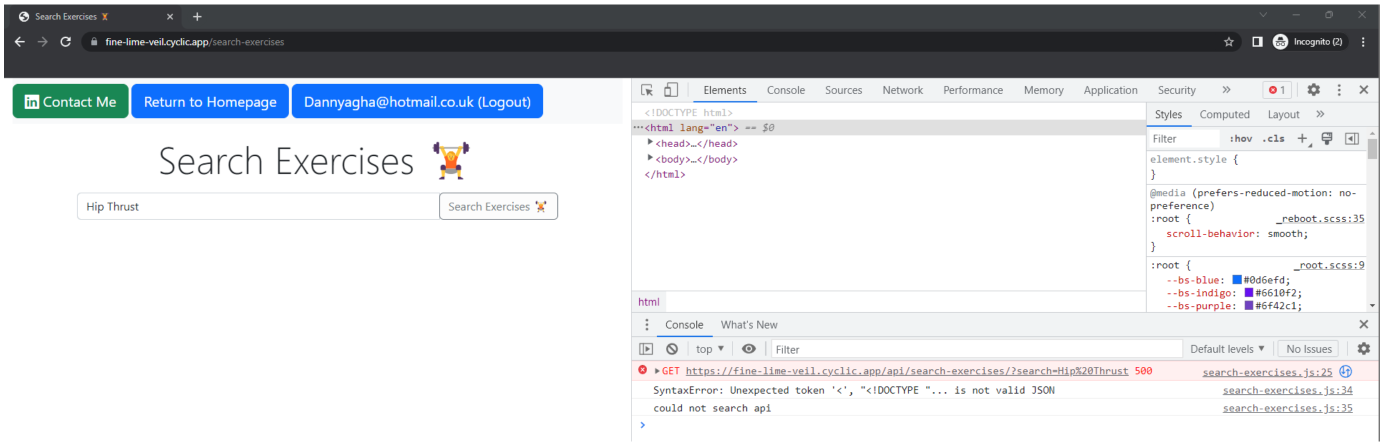
Type any text | Search Exercises

Search functionality allowing the user to search for an exercise that they created.



Date: 2023-01-25T00:00:00.000Z
Exercise Name: Hip Thrust
Weight: 30kg
Set & Reps: 4 sets of 10
Comments:

Search functionality successfully returning an exercise that is associated with the user.



```
GET https://fine-lime-veil.cyclic.app/api/search-exercises/?search=Hip%20Thrust 500    search-exercises.js:25
SyntaxError: Unexpected token '<', "<!DOCTYPE "... is not valid JSON                    search-exercises.js:34
could not search api                                                                    search-exercises.js:35
```

One key functionality I was able to successfully implement through the use of good database relationship, in this image I have a different user where the exercise "Hip Thrust" is not associated with the user, that user is only allowed to search for exercises that are associated with that user. As you can see the application is returning an error when the user tries to search for an exercise that is not associated with that user.

Key Design Decisions

The whole application as previously mentioned has a database that is stored on a cloud solution called MongoDB and within that database has 2 collections "users" and "exercises".

Users Collection

The users collection stores information about each user and it is utilised within the user authentication. Each user has an Email and Password.

```
const userSchema = new Schema(
    {
        email: { type: String, required: [true, 'email is required'], unique: true },
        password: { type: String, required: [true, 'password is required'] },
    },
    { timestamps: true }
);
```

User collection schema

```
{
  "_id": {
    "$oid": "63d1820e5c0b71249c89f084"
  },
  "email": "Dannyagha@hotmail.co.uk",
  "password": "$2b$10$.NjMfB9T46/hccJUo.wZmuAgTT39zK6EqthpmmC0XGeLYCTZwNQG.",
  "createdAt": {
    "$date": "2023-01-25T19:25:02.306Z"
  },
  "updatedAt": {
    "$date": "2023-01-25T19:25:02.306Z"
  },
  "__v": 0
}
```

Example of a document from the user collection

Exercises Collection

The exercise collection stores information about a single exercise that is created by a user. Also an exercise has a relationship with a user/user_id. For security purposes the password is stored in hashed value.

```
const mongoose = require("mongoose");
const { Schema } =  mongoose;

const exerciseSchema = new Schema(
    {
        date:{type:Date, required:[true, 'Date is required']},
        exerciseName:{type:String, required:[true, 'Exercise name is required']},
        weight:{type:String, required:[true, 'Weight is required']},
        setAndReps:{type:String, required:[true, 'Set and Reps are required']},

        // I have ommitted comments since I want it to be an optional input for the user.
        comments:{type:String},
        user: { type: Schema.Types.ObjectId, ref: 'User', required:true}
    }
)

exerciseSchema.index({'$**': 'text'});
module.exports = mongoose.model("Exercise", exerciseSchema);
```

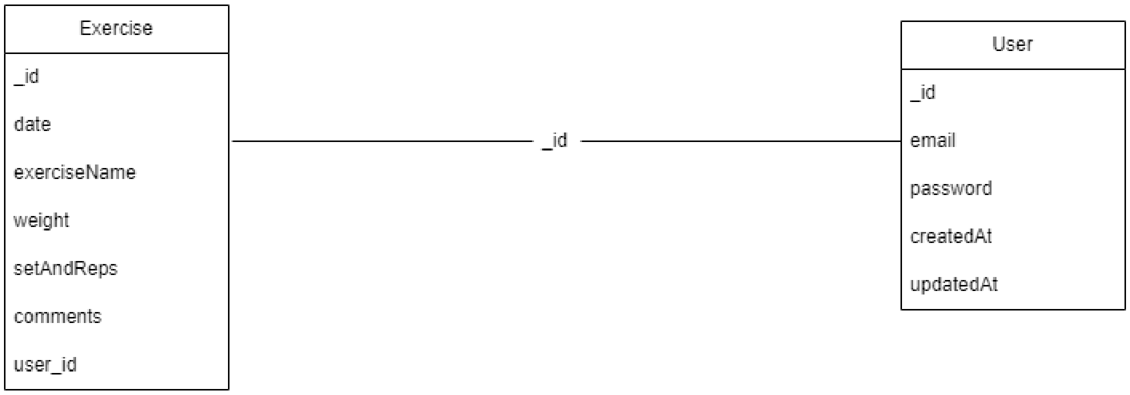
As you can see in the last line of the schema I make a reference to a userID.This mean every exercise created will have a relationship to a user. Some key things to note from this schema is that the create and edit error validation for missing information is only vital because of the attributes that have the keyword "true:" followed by the message.If that specific information is missing when creating or editing an exercise than that specific message will be shown for the missing attribute.

```
{
  "_id": {
    "$oid": "63d189082eca8e10c3e09d22"
  },
  "date": {
    "$date": "2023-01-24T00:00:00Z"
  },
  "exerciseName": "Back Squat",
  "weight": "(130kg)/ (130kg)/ (125kg)",
  "setAndReps": "(1,8)/ (2,6)/ (3,7)",
  "comments": "In my 3rd set was unable to do 130kg so dropped to 125kg",
  "user": {
    "$oid": "63d1820e5c0b71249c89f084"
  },
  "__v": 0
}
```

Here is an example of a document from the exercise collections as you can see with the user attribute there is a objectID referenced with that user attribute which is the userID that created that exercise.

As you can see with the two collection schemas that I created I was able to structure a relationship between the two collections. This is because when analysing and designing the database, I wanted to create a relationship where a user has many exercises associated to them in a one(User) to many(exercises) relationship.

The relationship that I created was vital for my application to work effectively as this associated an exercise to a user, this functionality made it so that a user on my application would only be able to do CRUD and search operations for exercises that were associated with that user. The relationship association also locked the users from accessing or altering other users exercise data which is another reason why this relationship was vital to implement.



In this entity relationship diagram that I created you can see the two collections, the collections attributes and how they relate to each other. The image illustrates the relationship as it shows the user_id being connected to the exercise to form the relationship and thus associating an exercise object to a user. Bare in mind that the database technology that I have chosen is a non-relational database, but this class diagram that I created showcases how the attributes are associated to create the vital relationship that I have implemented into my application.

Security and Scalability

One key implementation that I made for ensuring security for my users is securing their private passwords in a secure manner. In order to reduce the risk of outside malicious interaction, I have made sure to store the user's password in a hashed format and not plain text through the use BCrypt. BCrypt is a slow algorithm which is good for security as this forces a long amount of time for a malicious outsider to brute force a users password on my application. As this application is only a proof of concept it is open to updates and further improvements, one improvement would be to utilise a third party authentication service that is used quite allot by the public such as facebook,google mail or appleID. This improvement would streamline single signup/on, allowing the user an easier alternative to signing up and logging into the application.

Through testing with myself and friends I was able to attain that my application and it's various aspects such as UI and the database communication is very scaleable. With the use of MongoDB as my cloud database this helps with scalability as I can rely on a cloud database never faulting when handling large amounts of data compared to a physical database.

Conclusion and Reflection

In conclusion I have been able to implement CRUD operations in my application to a high standard where error validation is implemented for both create and edit forcing the users to be policed when inserting or updating data. User authentication works amazingly when signing up and logging in and the relationship between a user and exercises works effectively as a security purpose as users are only able to search for exercises that are associated with them. The use of API to search for specific exercise logs that I implemented is a big positive as users can search for specific exercise logs and compare the progress within that exercise. Finally for the views I loved playing around with Bootstrap and making some clean designs for my views on my application and I really think I made some great clean views on my application without the use of bootstrap templates.

The application is only a proof of concept, but going forward I would look at implementing a way of allowing users to upload videos, this would give more detail and imagery to raw data for the user. I would also look at improving some of the views, even though I believe my views are polished and clean, there are some areas where I could look at improving to make the design part of my application better.

References

- Vikramsaha7, 2022, MVC Framework Introduction[Viewed on 26th January 2023], Available from: https://www.geeksforgeeks.org/mvc-framework-introduction/

Appendices

Issues with Cyclic hosting

When it came to hosting the application onto the recommended hosting platform which was Cyclic there were a couple of issues that I ran into from the local version of my application compared to hosted application on Cylic.

An issue when it came to cylic deployment is how it handled new user sessions. When a new user signs up their user session variable is never read on first instance, the user is forced to log out first and then log back in with their newly created login details for the application to read the user's session variable. As all the CRUD operations were protected and not accessible for non logged in users to protect the data on the database. Cylic having issues with reading the user session variables on first sign up forced users to log out and log back in, so that the user session variable can be read so that the user can do CRUD and search operations on my application.

Another issue with Cylic is that I had to sometimes check if my application was running or not since sometimes during the day it was down and I would have to go into cylic to redeploy it to get it hosted and working again.

In the next iteration of my application I will look for an alternative in regards to a hosting provider so these issues don't crop up again.