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WEB SYSTEM FOR SELF BUILD CAR DASHBOARD

Distributed Systems project

Supervisor

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BsC

Author's declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

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(signature)

Date: Month Day, Year

List of abbreviations and terms

API	Application Programming Interface
ERD	Entity Relations Diagram
CAN	Controller Area Network

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1. Introduction

There are many free Apps for both PC and Android to diagnose your car via OBD2 port. These Apps give access to data such as fault codes, current rpm, oil temperature and many more. Since older cars don't have fancy touch screens it would make sense to have some app running and reading this data to show out on screen.

To have more general statistics for a driver it would make sense to sync them up to some database so that you could access the data also outside your car. This would also give the possibility to see stats containing many cars and compare different car marks / models stats to one another.

1.1 Project scope

The scope of this project is to build web application and database system capable of storing and querying data from multiple users at once. Building an app capable of reading desired data from a car is not in the scope of this project and will be done at a later time. Although there will be no actual client to upload data, proper API endpoints shall still be made. During the course, possibly android app made last year will be used to get mock data.

Must haves:

- ERD schema.
- Controllers for desired CRUD operations with entities.
- Views for Refills, tracks and statistics.
- Detailed view for a track.
- Server must be scalable to allow numerous clients.
- Api endpoints must be secured.

Nice to haves:

- Comparison mode for statistics (car vs type average etc.).
- Live data for tracks.
- Heatmaps.

2. ERD schema

Application ERD schema is shown on Figure 1

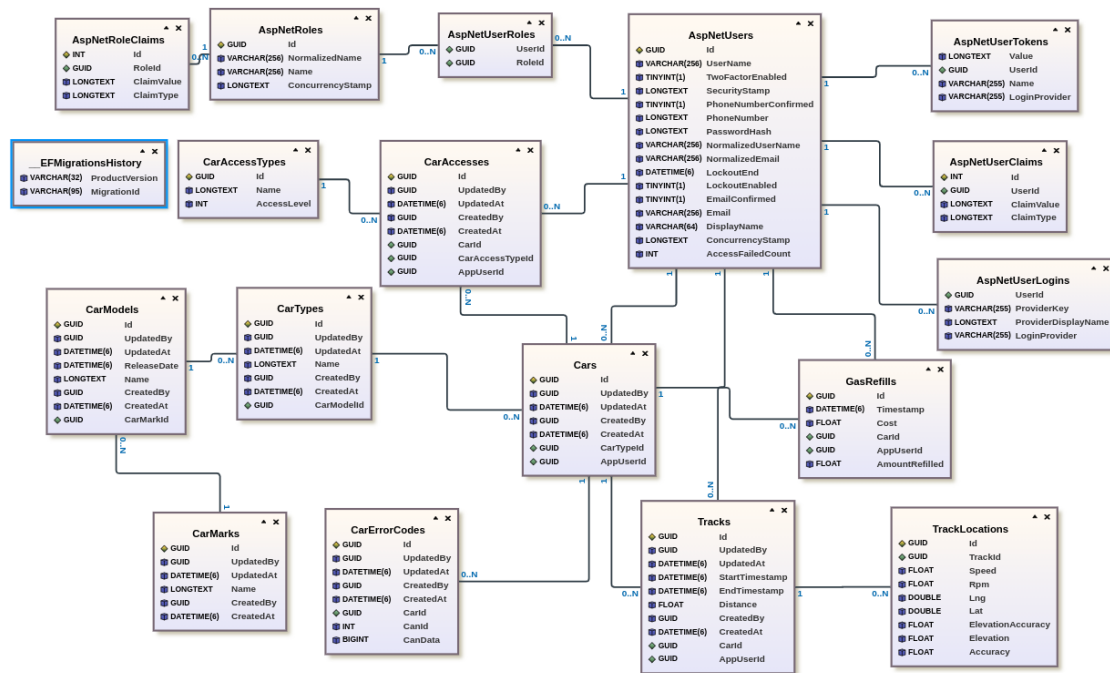
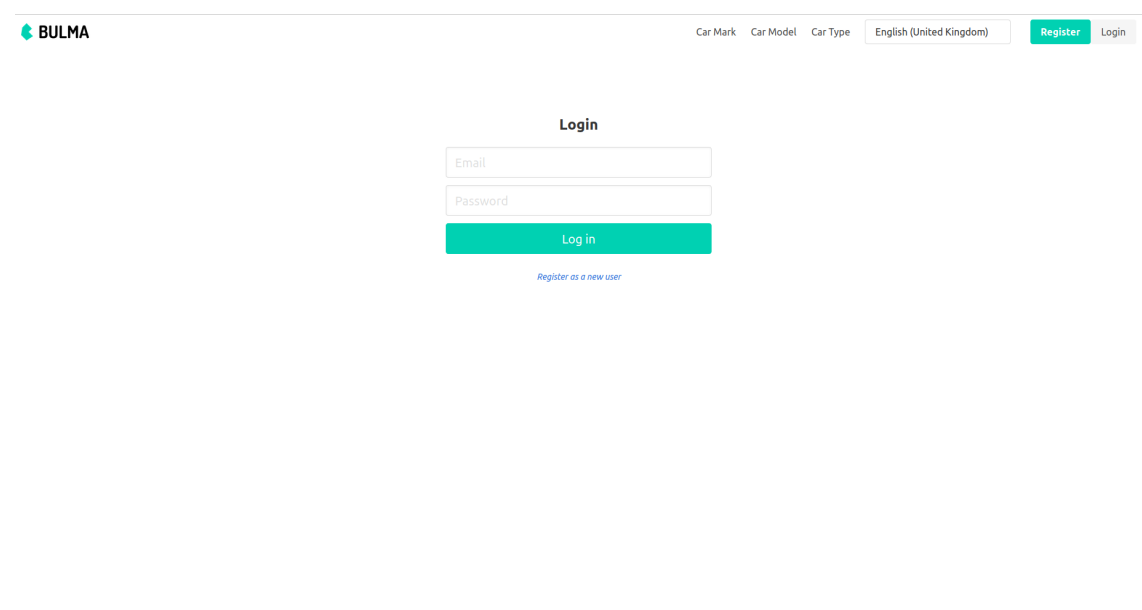


Figure 1. ERD schema

Primary keys are marked with yellow, foreign keys are green and rest of the attributes are color coded to blue.

3. Client flow screens


3.1 Login page



The screenshot shows the login page of the BULMA application. At the top left is the BULMA logo. The top right navigation bar includes links for 'Car Mark', 'Car Model', and 'Car Type', a language selector set to 'English (United Kingdom)', and buttons for 'Register' and 'Login'. The main content area is titled 'Login' and contains two input fields: 'Email' and 'Password'. Below these fields is a teal 'Log in' button. A link labeled 'Register as a new user' is positioned below the 'Log in' button.

User can log in from this page to access his/her vehicles data.

3.2 Refills page



Car

Error

Car Access Type

Car Access

Gas Refill

Track

Track Location

Car Mark

Car Model

Car Type

English (United Kingdom)

Logout


Create

Id	Amount refilled	Cost	Timestamp	Car id
cb4c3c79-4ca9-4945-15e6-08d91b9d3473	345	3456	14:40 04/04/2021	31098c07-2380-42c1-5b74-08d91b9b2835

Id	Amount refilled	Cost	Timestamp	Car id
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This page shows all gas refills in last month (or possibly custom period). Data is showed in table and total amounts are in a header.

3.3 Tracks page



Car

Error

Car Access Type

Car Access

Gas Refill

Track

Track Location

Car Mark

Car Model

Car Type

English (United Kingdom)

Logout

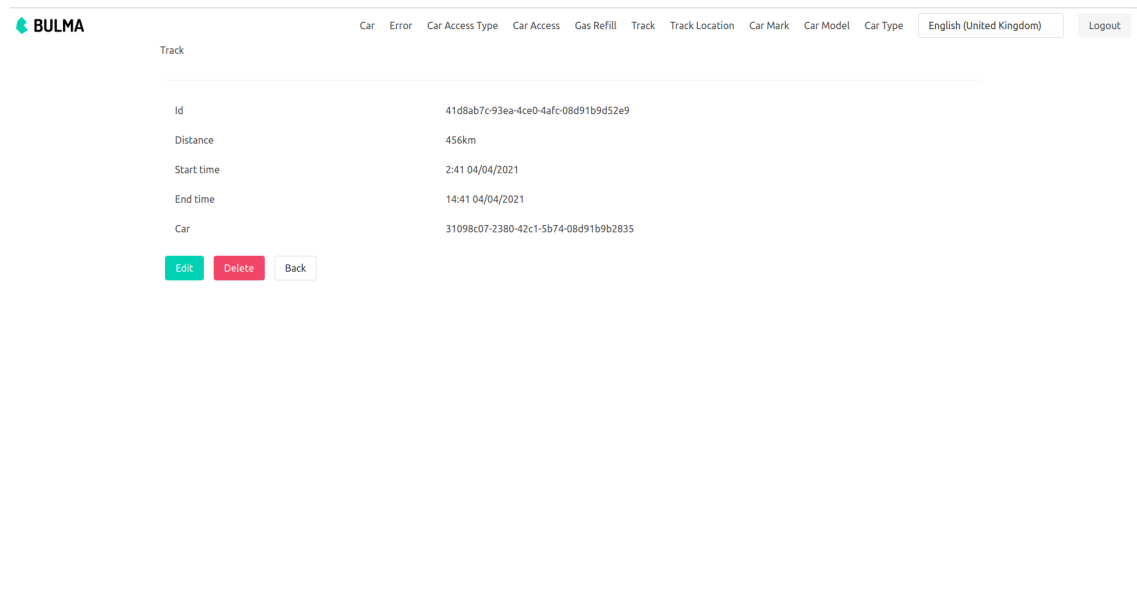
Create

Id	Car	Distance	Start time	End time
41d8ab7c-93ea-4ce0-4afc-08d91b9d52e9	31098c07-2380-42c1-5b74-08d91b9b2835	456km	2:41 04/04/2021	14:41 04/04/2021

Id	Car	Distance	Start time	End time
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This page shows all tracks in last month. Total statistics are showed in header and rest of the data is in a table. Clicking in table row will take you to track details page where you can see more detailed statistics and data about the track.

3.4 Track detail page



This page visualizes single track data. There will be a map that shows path traveled (possibly color coded for speed). Underneath will be graphics that show rpm, speed and maybe some other useful data

3.5 Statistics page

This page will show general statistics for single user. Data shown here highly depends on what kind of graphs can be made without having to generate huge amounts of mock data. Possibly heatmap for drive speed / fuel consumption. Simple area / line graphs for average speed, average rpm and gas consumption.

4. Summary

Appendices