MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VI Semester B.Tech. (IT)

ICT 3266: INTERNET TOOL AND TECHNOLOGY LAB

MINI-PROJECT IMPLEMENTATION DOCUMENT

CAR POOLING SYSTEM

A PROJECT REPORT

submitted by

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INTRODUCTION

Cab sharing is almost a necessity for MIT students when it comes to commuting to different places (such as airport, train station), considering the exorbitant prices. Students often seek to find someone to share a cab with, so they can split the cost of commuting. This idea will facilitate students to login, enter their travel details and get automatically grouped with other students looking to share a cab to the same location at the same time.

LANGUAGE DESCRIPTION

Backend:

The project was done using **NodeJS** platform that uses JavaScript runtime built on Chrome's V8 JavaScript engine and executes JavaScript code outside a web browser. Server-side scripting was used to produce dynamic web page content before the page is sent to the user's web browser. NodeJS represents the paradigm of "JavaScript everywhere" to unify web application development around one single language which is JavaScript.

Express.js web application framework was used with Node to build this application. Express is a minimal and flexible Node.js web application framework that provides a robust set of features to develop web and mobile applications. It facilitates the rapid development of Node based Web applications. It also allows to dynamically render HTML Pages based on passing arguments to templates.

Authentication and authrorization in this project is carried out with the help of JWT tokens. A JWT technically is a mechanism to verify the owner of some JSON data. It's an encoded string, which is URL safe, that can contain an unlimited amount of data, and it's cryptographically signed. For all private routes in this project, user data is passed via a middleware as it is verified against the already stored cookie(during login) to check whether user is authorized and authenticated to access that route

Database:

MongoDB was used for the database s it is compatible with JSON data interchange format. MongoDB is an open-source document database and leading NoSQL database. MongoDB is written in C++. NoSQL databases are often more scalable and provide superior performance. In addition, the flexibility and ease of use of their data models can speed development in comparison to the relational model, especially in the cloud computing environment.

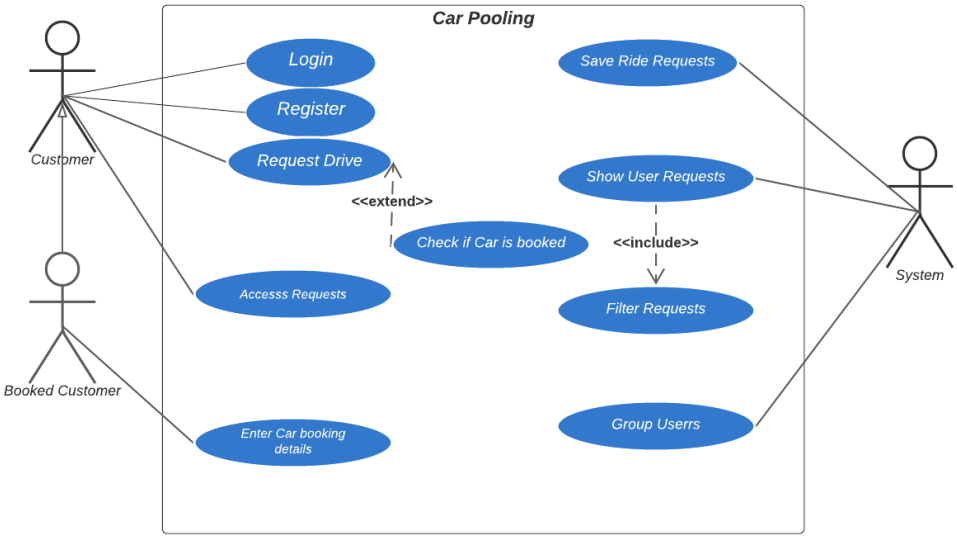
Frontend:

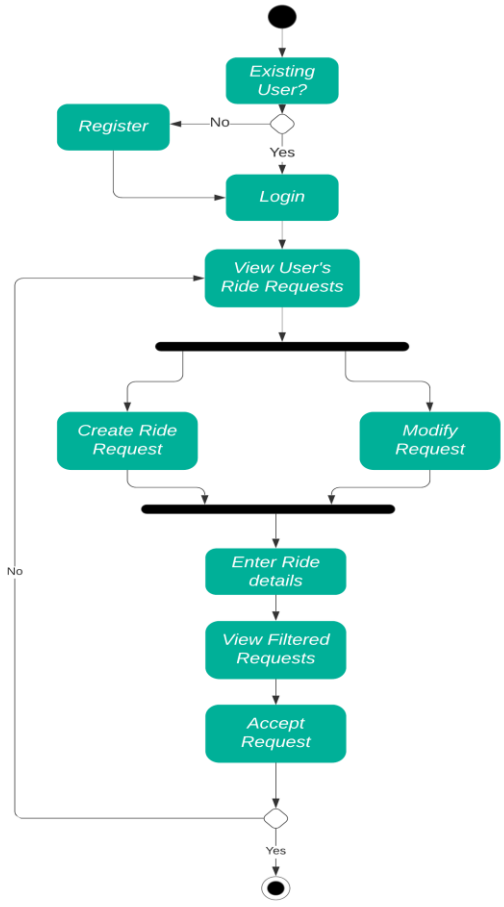
Google's MaterializeCSS framework was used to make the pages dynamic and aesthetically pleasing. MaterializeCSS is a modern responsive front-end framework based on Material Design. The framework incorporates components and animations that provide more feedback to users. Additionally, a single underlying responsive system across all platforms allow for a more unified user experience. It has detailed documentation as well as specific code examples to help new users get started, and is easy to work with.

The resulting development stack is completely JavaScript based and uses EJS for frontend and backend integrations. EJS or Embedded Javascript Templating is a templating engine used by Node.js. Template engine helps to create an HTML template with minimal code. It helps generate HTML markup with plain JavaScript. With the help of ejs data sent from the backend can be easily access in markup as it supports all functionalities offered by javascript

IMPLEMENTATION AND RESULTS

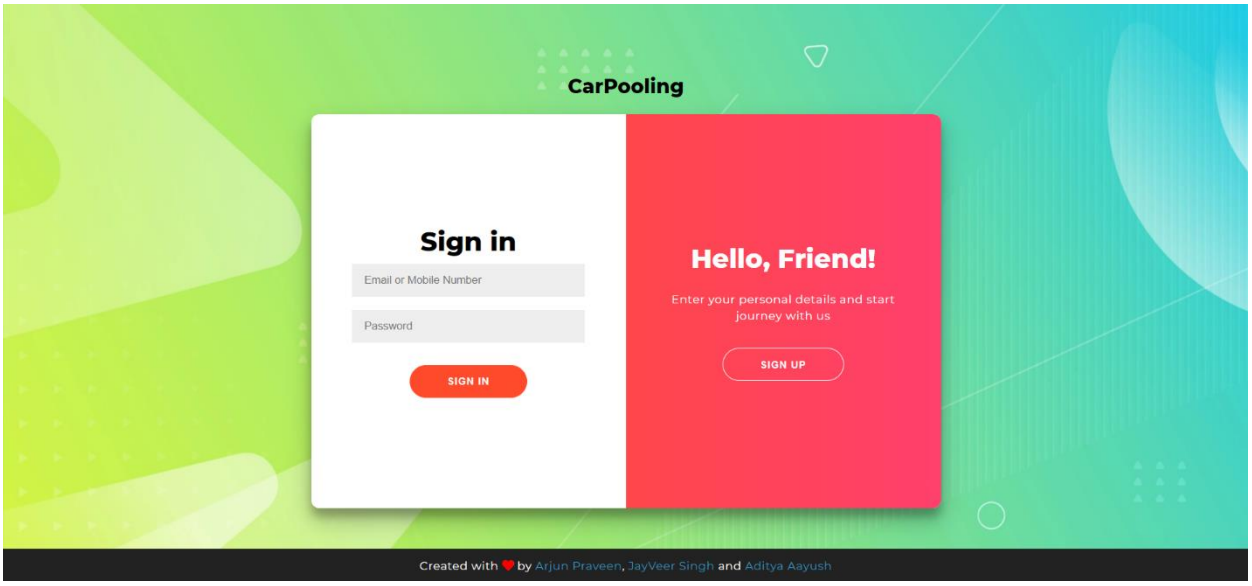
DESIGN DIAGRAMS



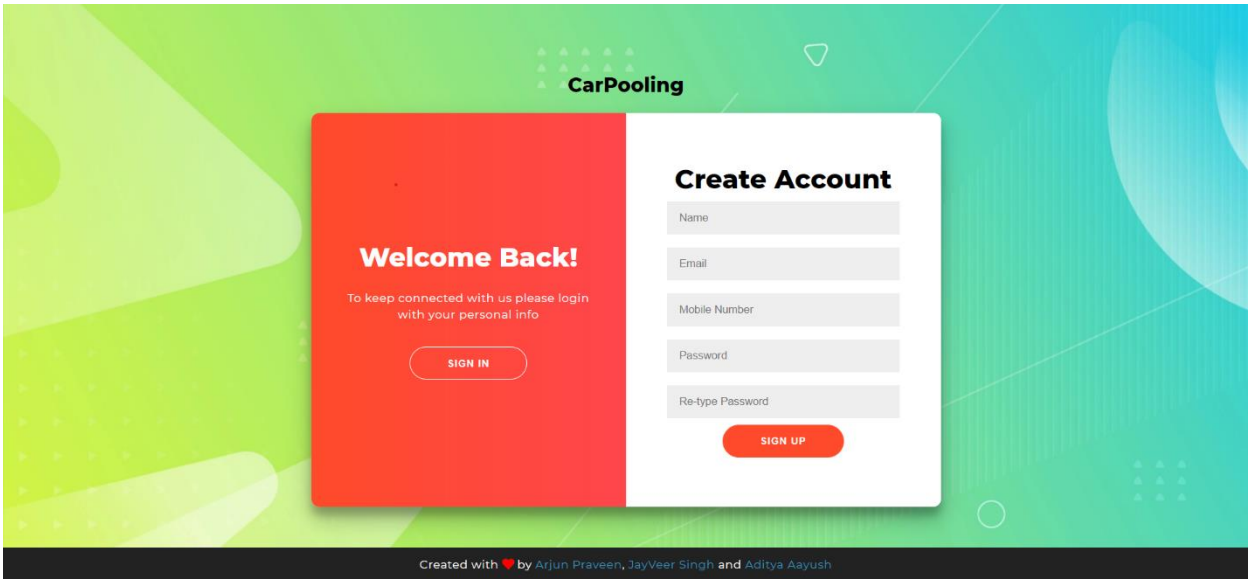


PAGES

Log In/Sign Up



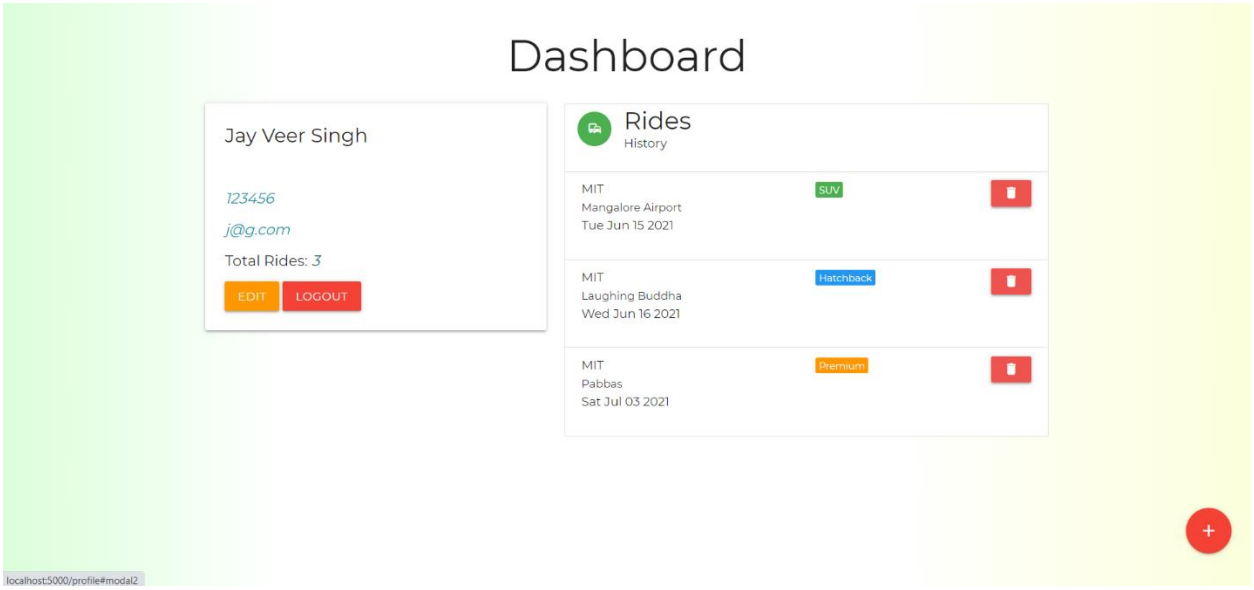
Overlay panels are used to switch between login and signup functionalities on the same page.



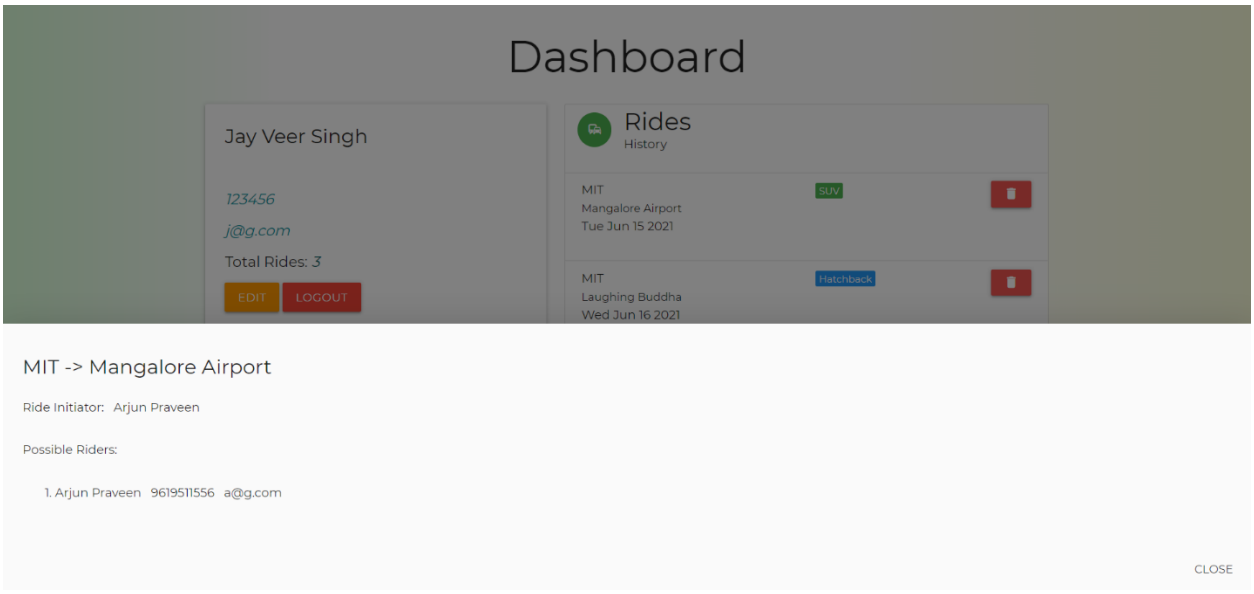
JSON Web Token is created when logging in to access the web app.

Profile

Used signed cookies to validate user. Pulls data corresponding to login credentials from DB to create profile page.

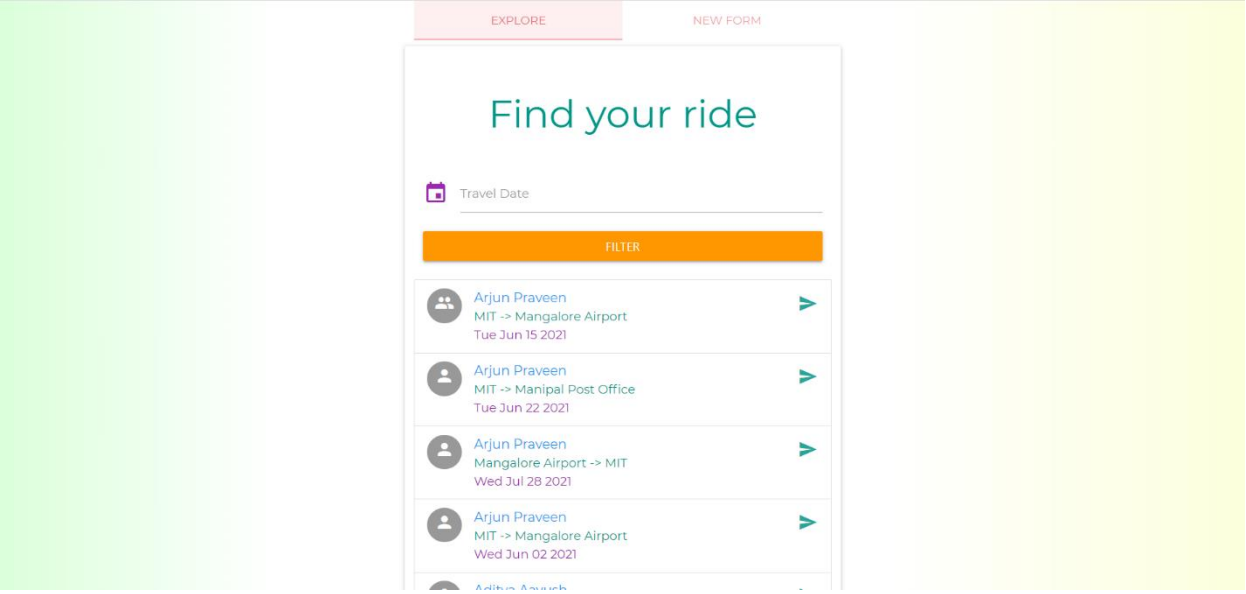


Modal shows Ride Details and status of other users related to the ride. User can delete rides from profile

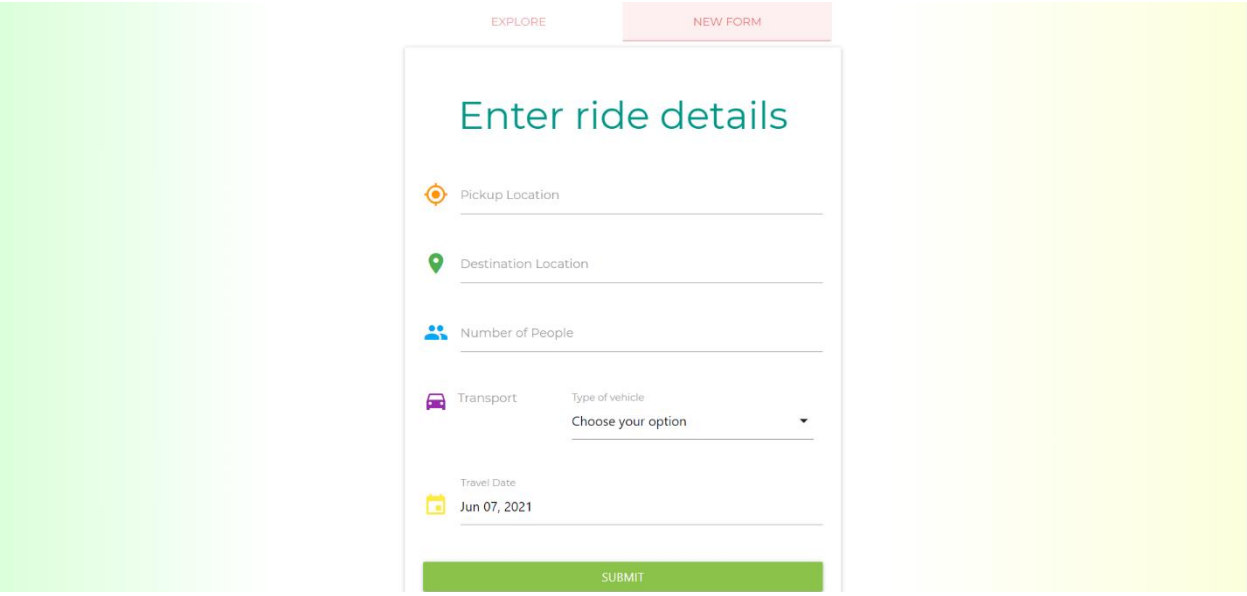


Explore Page/New Ride

Explore lets you check all rides that are currently active. The rides may be filtered to only show rides on the date you require.



New ride form creates a new file, reflects it in the MongoDB database, and shows the newly made rides to other users in realtime.



MODULES/DEPENDENCIES

Nodemon: Nodemon is a tool that helps develop node.js based applications by automatically restarting the node application when file changes in the directory are detected.

Express: provides small, robust tooling for HTTP servers, making it a great solution for single page applications, web sites, hybrids, or public HTTP APIs.

JSON Web Token: JWTs are credentials, which can grant access to resources. JSON Web Tokens are an open, industry standard method for representing claims securely between two parties.

Cookie-Parser: Cookie parser helps parse cookie header and populate req.cookies with an object keyed by the cookie names.

Mongoose: Mongoose is a MongoDB object modeling tool designed to work in an asynchronous environment. Mongoose supports both promises and callbacks.

Cors: CORS is a node.js package for providing a Connect/Express middleware that can be used to enable Cross-origin resource sharing with various options.

Bcrypt: Bcrypt is a node.js package which provides a secured way of storing passwords by providing various forms of hashing

Dotenv: Dotenv is node.js package used to access environment variables from the node environment so that api keys and other important keys used in the project

CONCLUSION

This project provides users with a simple easy to use web application for sharing expensive cab rides with other users. The idea for this project sprouted from the problems we ourselves face as students of Manipal, when we are looking for people to share cabs with to the airport, railway station, bus stand etc. when he head back home during vacations. The basic functionality of our carpooling system that allows people to match with others is applicable in a variety of situations, not limited to car sharing. There is lot of scope for this project as it has the potential to be modified to fit many different potential customer's needs.

FUTURE IMPLEMENTATION

Google Maps: Add Google Maps location picker for ride start and end locations to make it easier for users to look up information on shared rides.

Integration with Uber/Lyft/Ola: Allow users to share ride details directly from Cab booking apps into our cab pooling app.

RESOURCES

https://nodejs.org/en/

https://jwt.io/#libraries-io

https://materializecss.com/

https://ejs.co/