PROJECT REPORT

CAR RENTAL APPLICATION

420-DA4-AS C9_ANDROID MOBILE DEV._ONLINE

GROUP MEMBERS

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Overview

The Car Rental Management App is designed to transform the car rental industry by streamlining operations and improving customer satisfaction. This centralized platform efficiently manages a few aspects of car rental services, from car inventory management to booking tracking, payment processing, and report generation. The app optimizes rental workflows and provides real-time insights for better decision-making. The primary purpose of developing this app is to create a seamless, user-friendly experience for both customers and rental agencies. It provides personalized services that cater to the evolving needs of users.

Key features:

Customer's Side

1. **User Authentication**
    - **Login**: Securely access your account using Google Email or Email and password based authentication(Firebase SDK Authentication)
    - **Register**: Create a new account using Password-Based Account (Firebase SDK Authentication)
2. **Car Search and View Available Cars**
    - **Search Cars**: Easily find the perfect car based on your search for a car name and any other available details.
    - **Browse Information**: Explore detailed information about cars, including:
        - Brand
        - Model
        - Pricing
        - Availability
        - Location
        - Seats
        - Car description
3. **Car Rental Process**

- **Rent a Car**: Select your desired car for rental.
- **Set Dates**: Choose valid start and end dates for your rental period.

4. **Payment Options**
    1. **Flexible Payment Methods**: Select your preferred payment option (e.g., card, Klarna).
    2. **Make Payments**: Complete your transaction and see the total fee.
    3. **Payment Information format**:
        - Choose the Visa card and enter a valid Card Number as an example: 4242 4242 4242 4242 .
        - Enter the month and year in future
        - Enter the card CVC which has to be three numbers
        - Enter the Zip Code and have to meet the Canadian format. An example of a valid Canadian format: H7Y8U9.
        - Then you can click on the pay button.
5. **Post-Rental Management**
    - **View Contracts**: Navigated to your rental contract(s) anytime after booking.
6. **Account Management**
    - **Account Details**: View your personal information which are: name, gmail, Date of account creation and Set your avatar.
    - **Logout**: Securely exit your account.

Admin's Side

1. **User Authentication**
    - **Login**: Securely access your account using Google Email or Email and password based authentication(Firebase SDK Authentication)
2. **Car Management**
    - **Add New Cars**:
        - Enter details such as car model, brand, seating capacity, location, price, and upload photos(optional).

- **View All Cars**:
  - Browse the complete list of cars available in the system.
- **Edit Car Details**:
  - Update information like pricing, brand, model, availability, location, image or car's description.
- **Update Car Detail**:
  - Modify existing records to keep car details accurate and up-to-date.

3. **Contract Oversight**
   - **View Customer's Contracts**:
     - Access and edit the status of rental contracts associated with user bookings. From completed to canceled and active.
4. **Account Management**
   - **Account Control Functions**: View all users and block a user.
   - **Logout**: Securely exit your account.

Technologies Used

1. **Frontend**
   - **Android Studio Koala (2024.1.1 Patch 2)**: IDE used for developing the Android App.
   - **XML 1.0**: For designing the user interface (UI) components.
   - **Java 8**: Processes the business logic and user interactions.
   - **Gradle**: Build automation tool for managing dependencies.
2. **Backend**
   - **Authentication:** Integrating **email/password** based Firebase SDK authentication and **Google Sign-in**, into the Car Rental Management App provides a secure and user-friendly way for customers to log in.

- **Secure Session Management**

  Firebase automatically manages session states, enabling customers to stay logged in across sessions without compromising security.

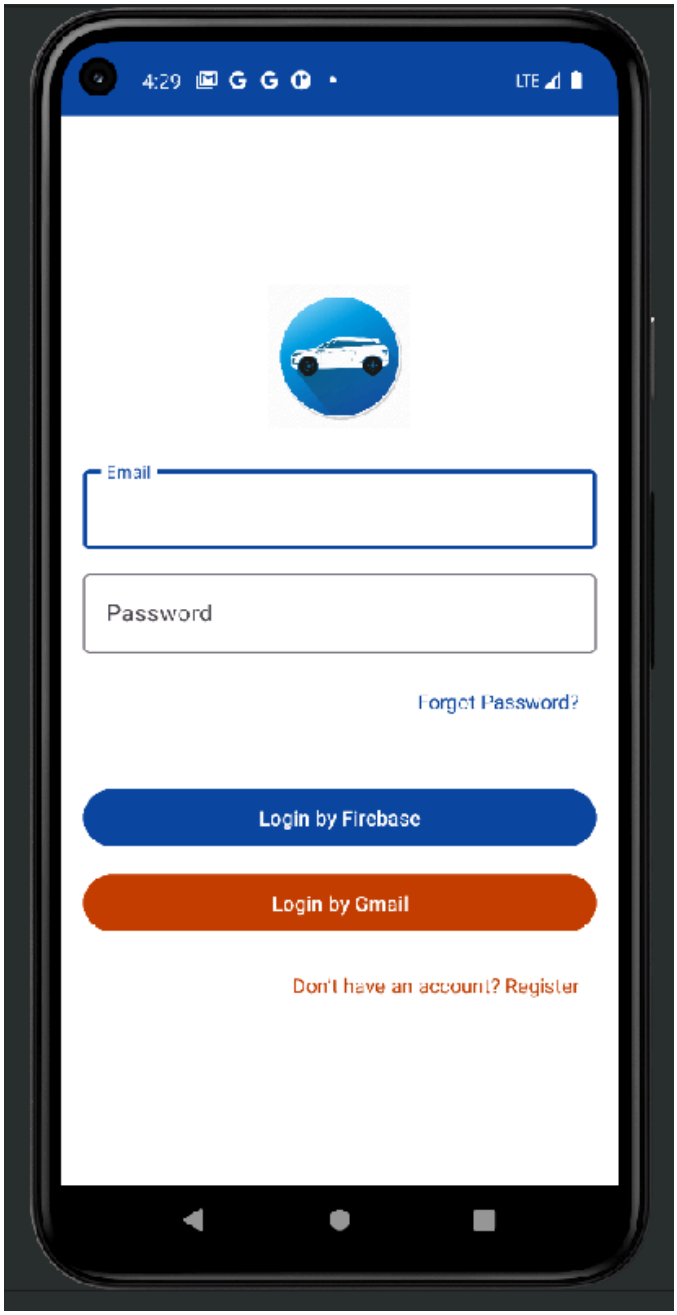
- **Firebase Storage**

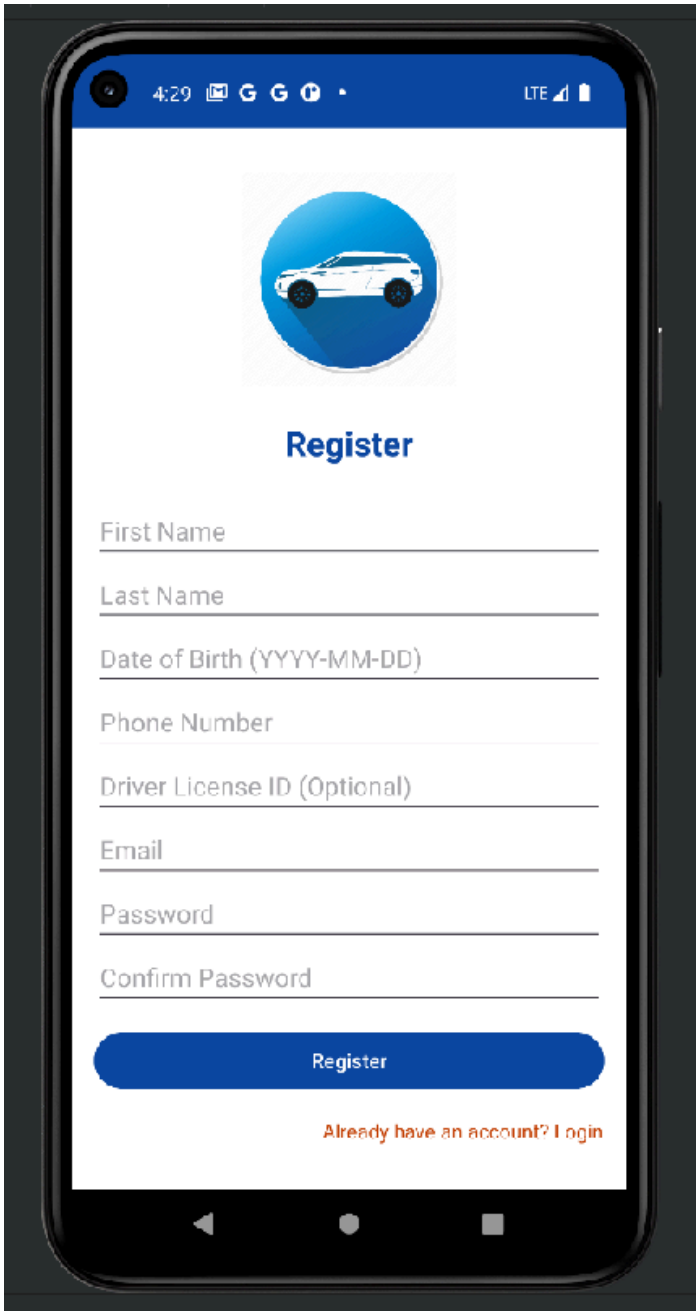
  Utilized Firebase Storage to securely store and manage high-resolution images of cars, ensuring efficient retrieval and scalability integration with the system's database for an enhanced user experience.

3. **APIs**
   - **Google Login API**: Establishes user sign-in and account management.
   - **Stripe API**: Secure online payment processing.
   - **Google Location API**: Provide valid and dynamic location services, including car's pickup location.
   - **Google Calendar API**: For integrating booking schedules and reminders into customers gmail calendar.
4. **Platforms**
   - **Firebase Console**: For monitoring app performance, usage analytics, and push notifications.
   - **GitHub**: Allows version control and updates, and collaboration.
5. **Testing**
   - **Emulators**: Used Pixel 5 API 30 for app testing.

User Interface

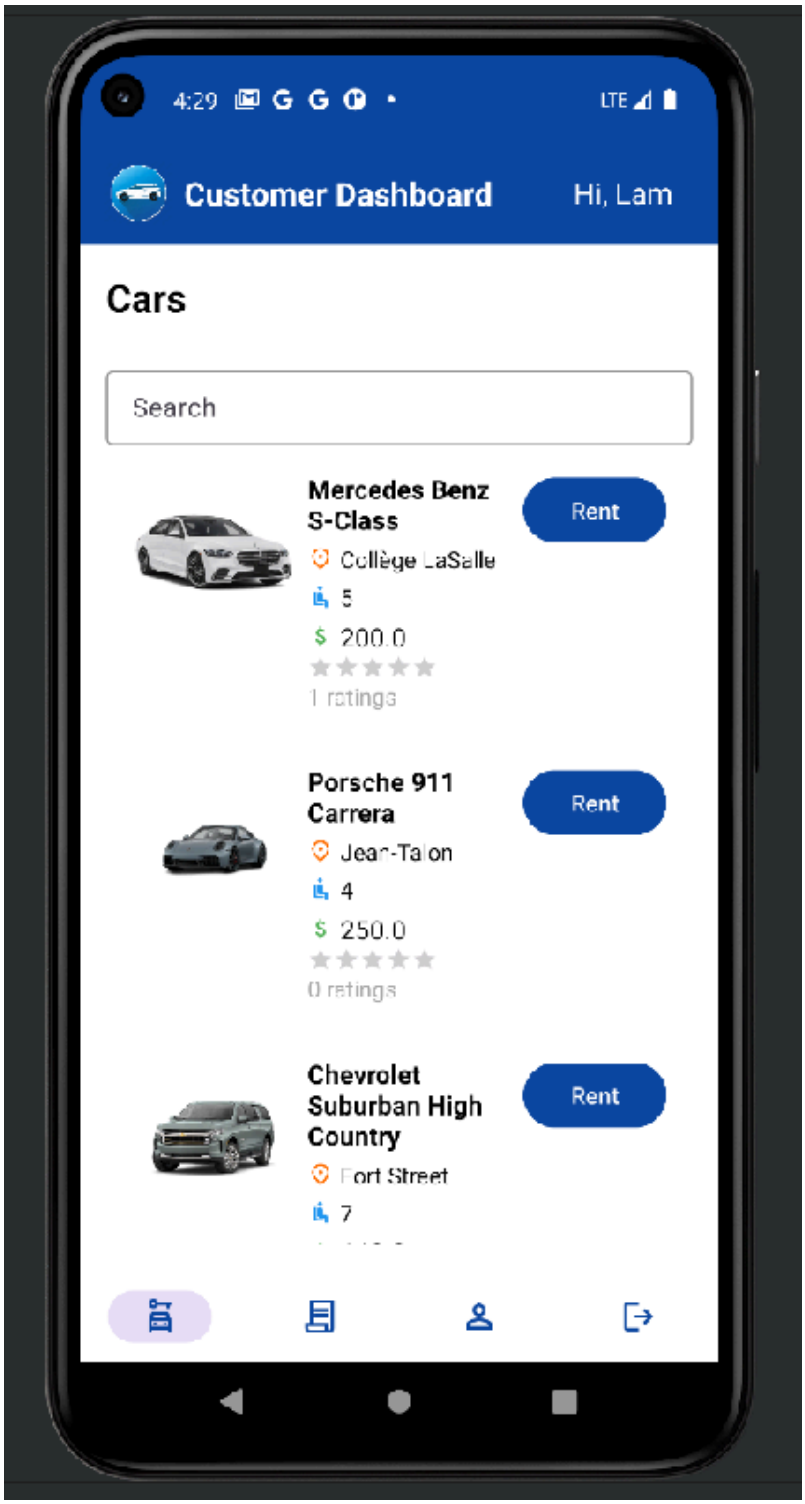
Login and Register UI :



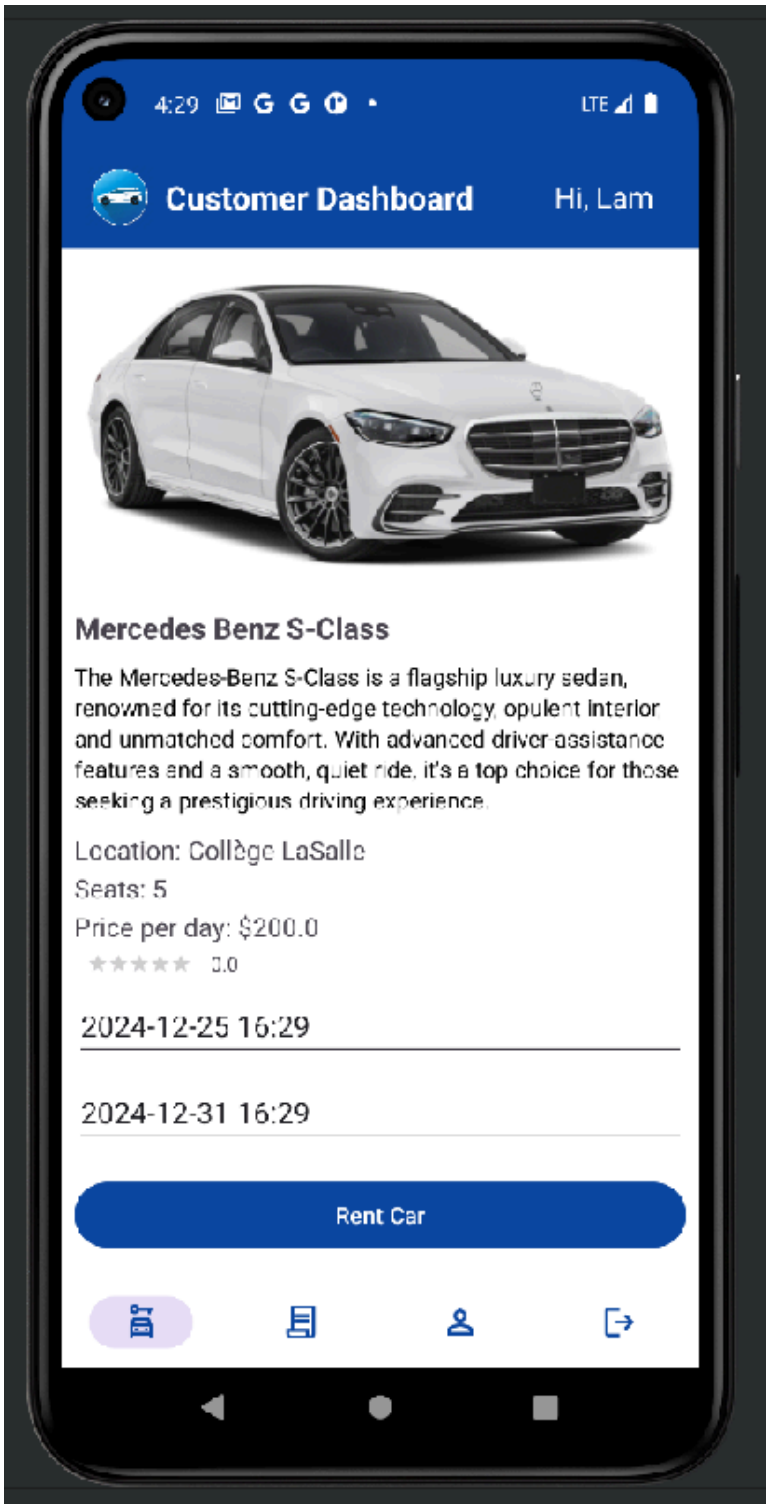


Customer Dashboard:

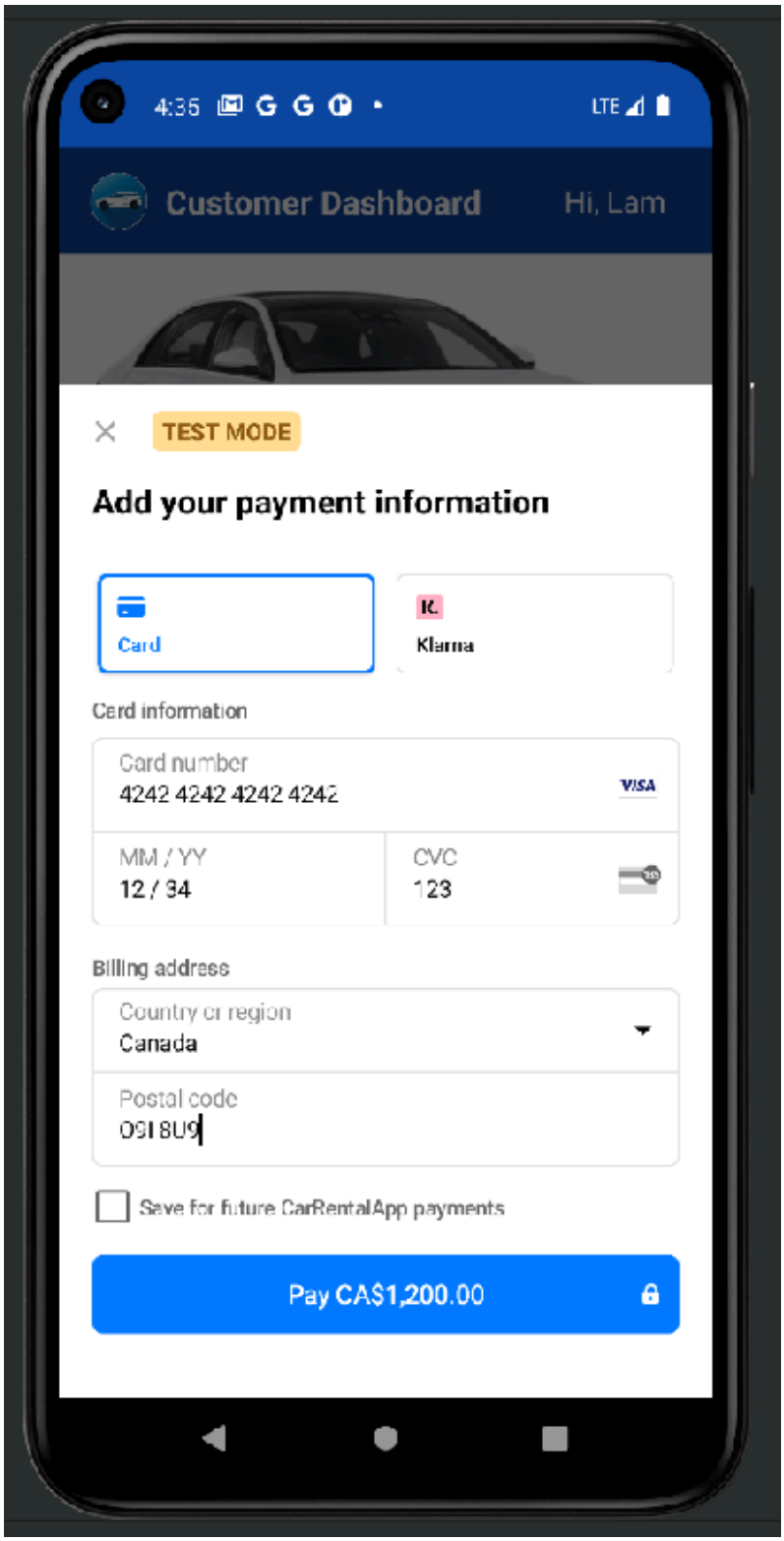
Main UI:



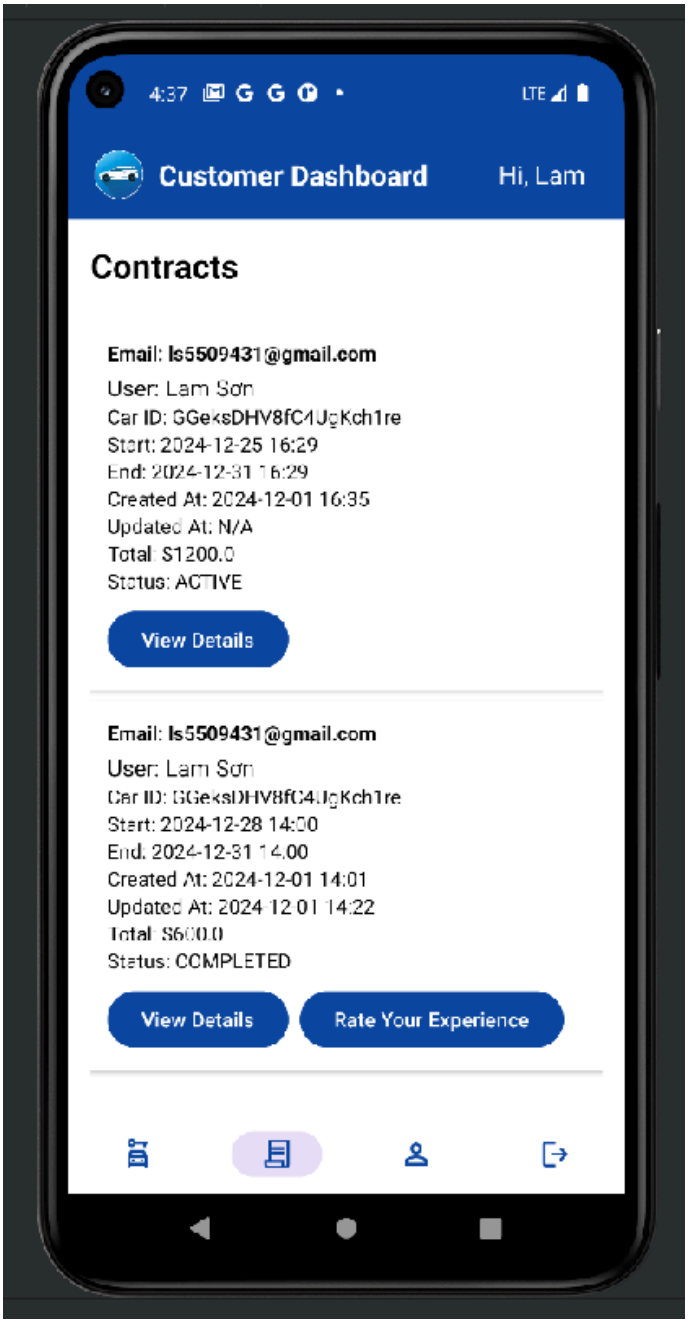
Rent Car UI:

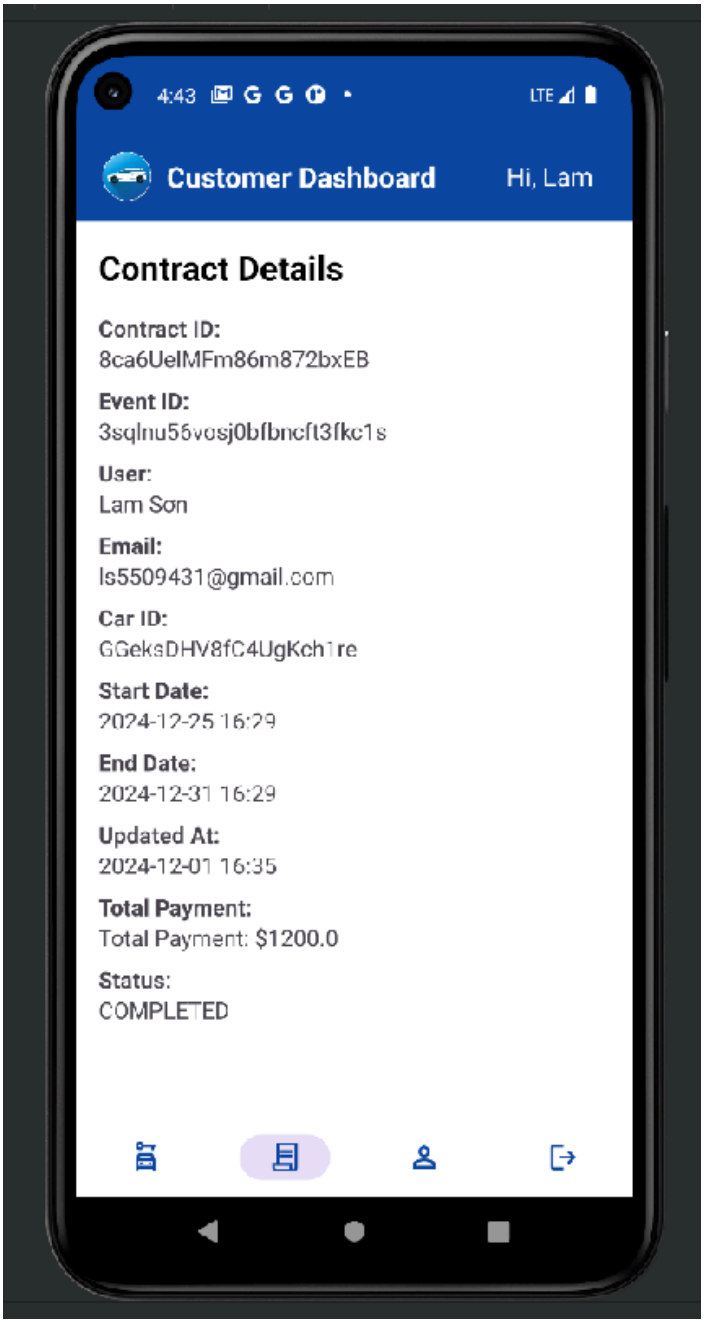

4:29
LTE
Customer Dashboard
Hi, Lam
Mercedes Benz S-Class
The Mercedes-Benz S-Class is a flagship luxury sedan, renowned for its cutting-edge technology, opulent interior and unmatched comfort. With advanced driver assistance features and a smooth, quiet ride, it's a top choice for those seeking a prestigious driving experience.
Location: Collège LaSalle
Seats: 5
Price per day: $200.0
3.0
2024-12-25 16:29
2024-12-31 16:29
Rent Car

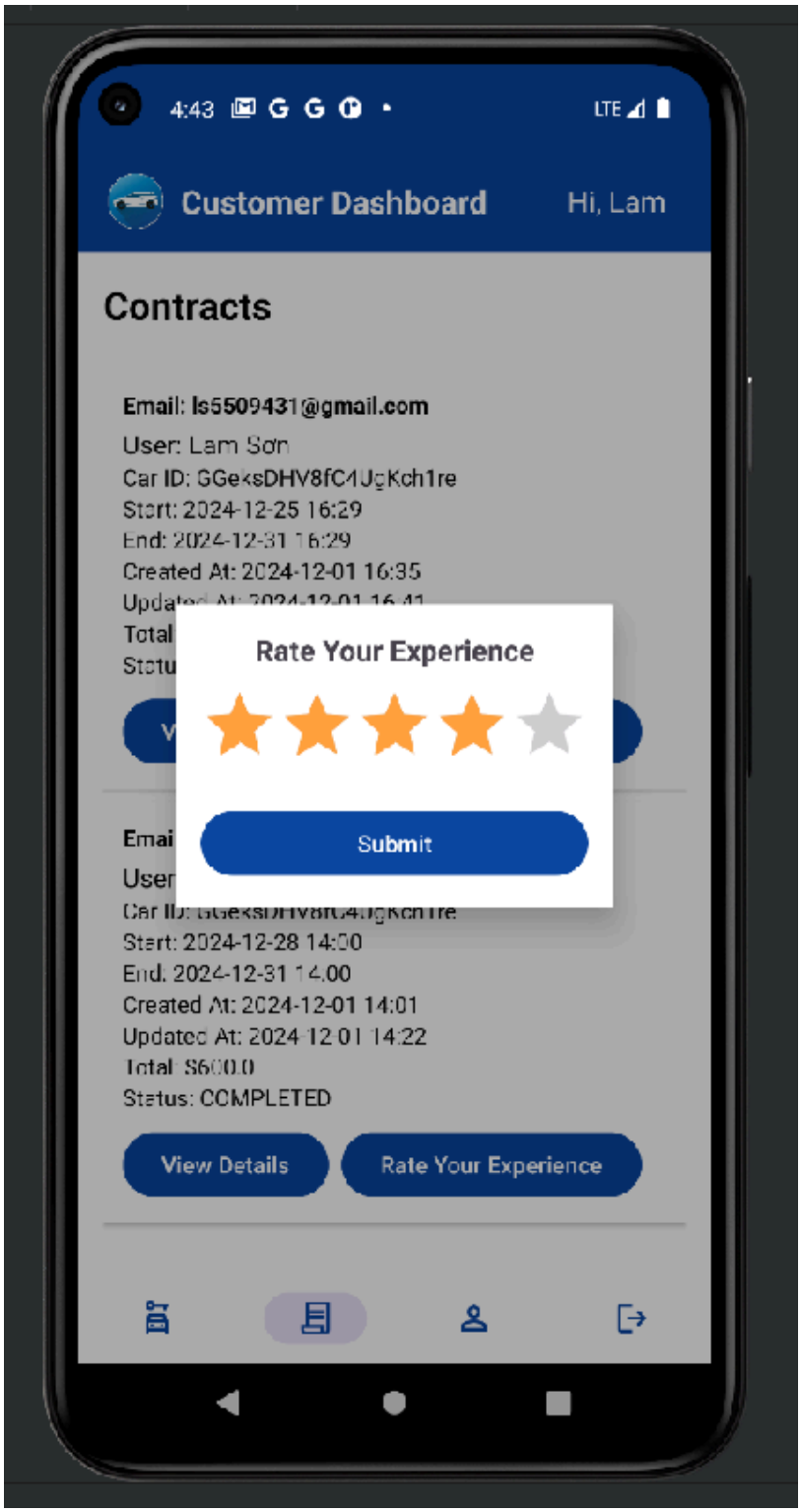
Payment UI:


4:36
LTE
Customer Dashboard
Hi, Lam
TEST MODE
Add your payment information
Card
Klarna
Card information
Card number
4242 4242 4242 4242
VISA
MM / YY
12 / 34
CVC
123
Billing address
Country or region
Canada
Postal code
09I 8U9
Save for future CarRentalApp payments
Pay CA$1,200.00

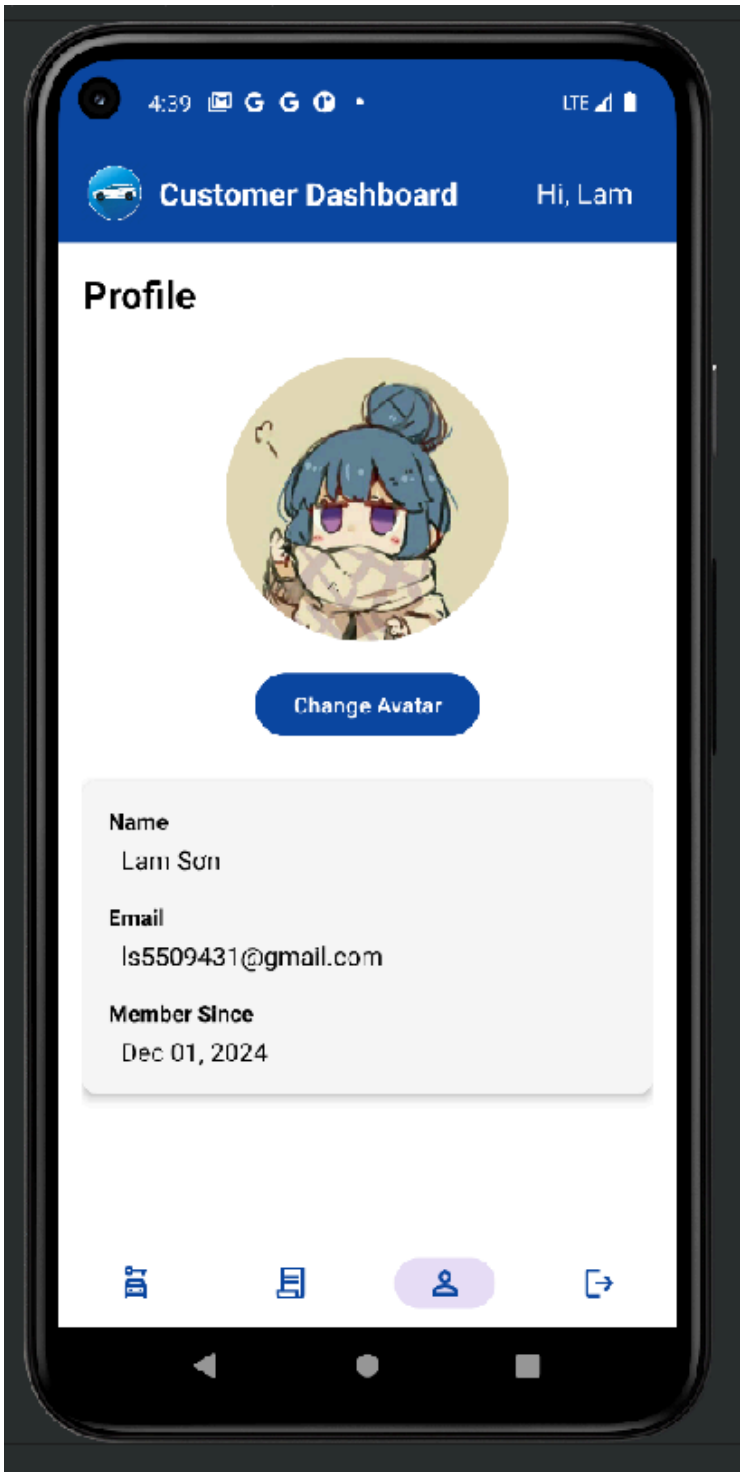
Contracts UI:





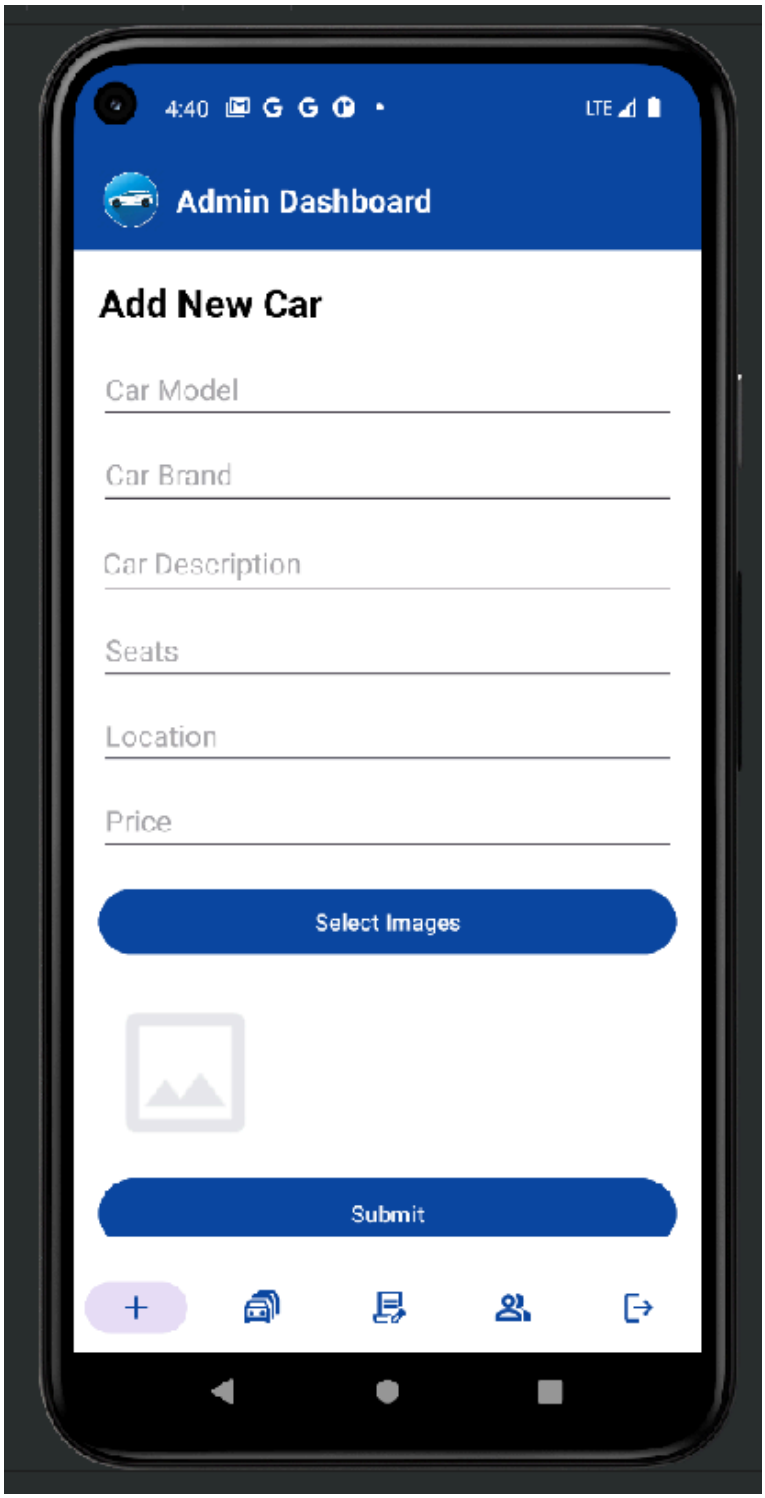

4:43
LTE
Customer Dashboard
Hi, Lam
Contracts
Email: ls5509431@gmail.com
User: Lam Son
Car ID: GGeksDHV8fC4UgKch1re
Start: 2024-12-25 16:29
End: 2024-12-31 16:29
Created At: 2024-12-01 16:35
Rate Your Experience
Submit
Start: 2024-12-28 14:00
End: 2024-12-31 14:00
Created At: 2024-12-01 14:01
Updated At: 2024-12-01 14:22
Total: $600.0
Status: COMPLETED
View Details
Rate Your Experience

Profile UI:

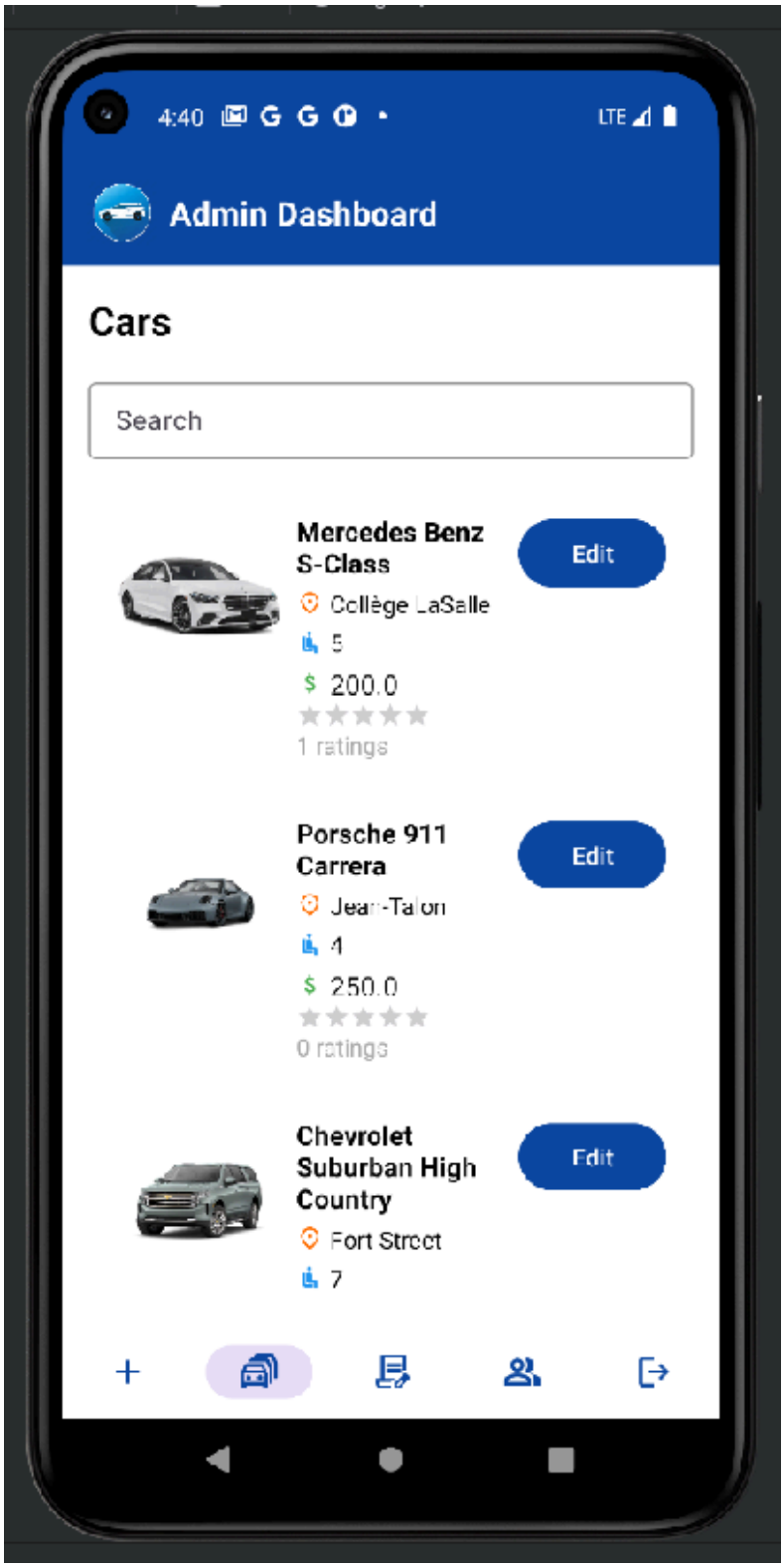

4:39
LTE
Customer Dashboard
Hi, Lam
Profile
Change Avatar
Name
Lam Sơn
Email
ls5509431@gmail.com
Member Since
Dec 01, 2024

Admin Dashboard:

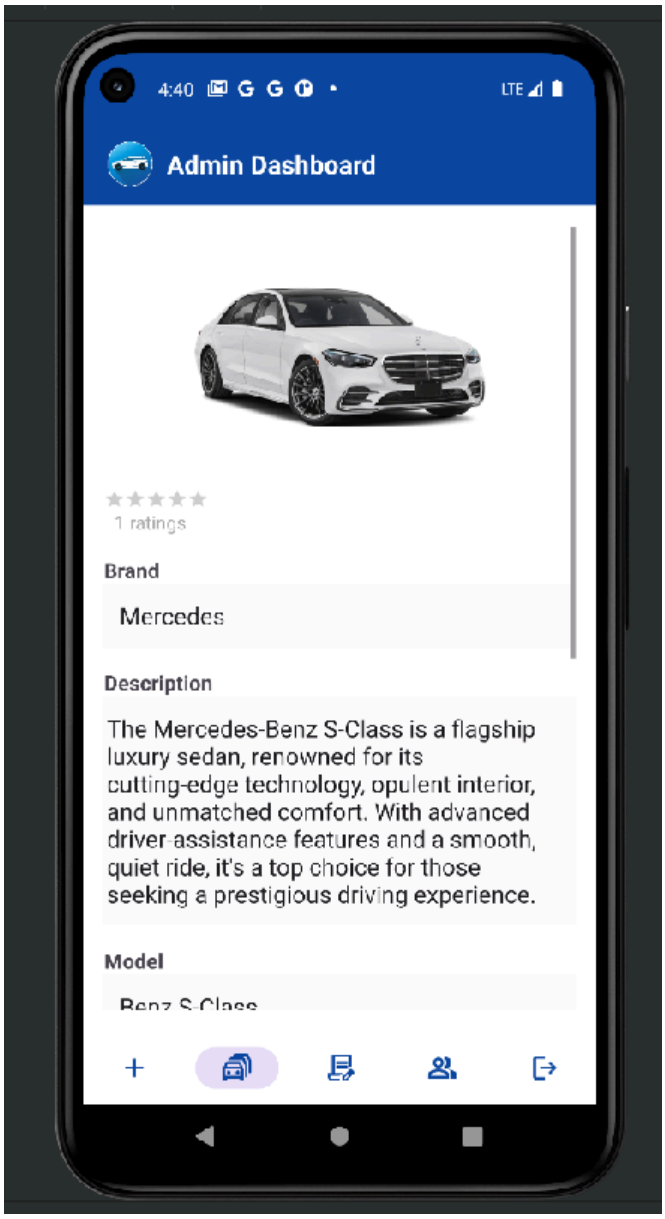
Add Car UI:

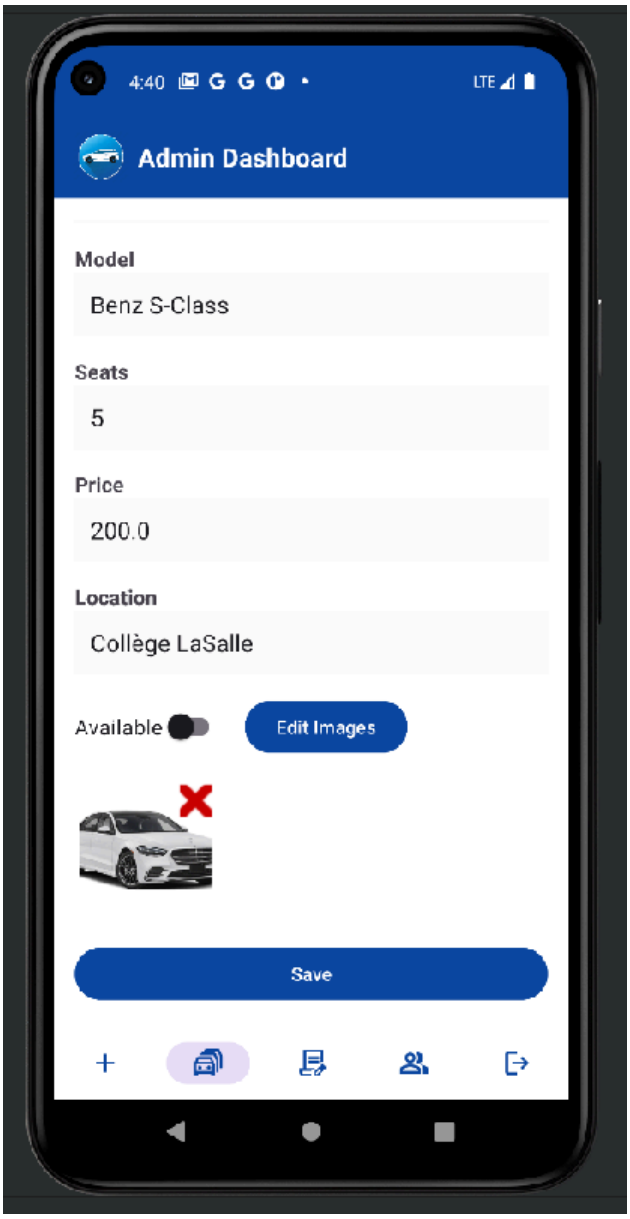


View Car List UI:

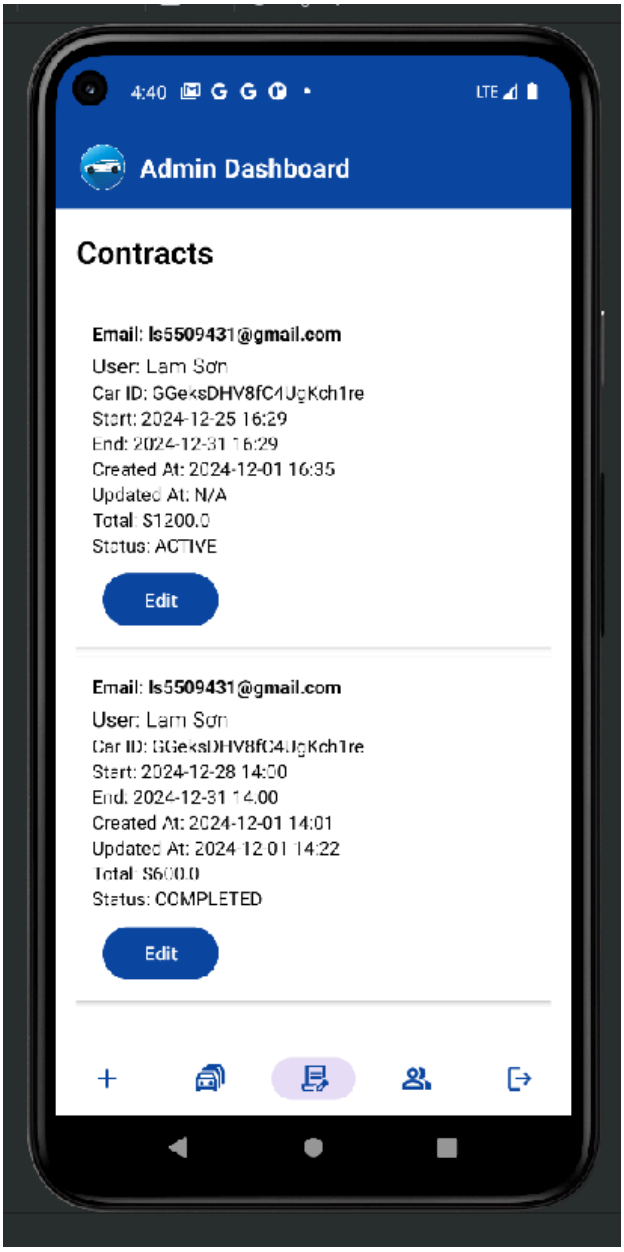


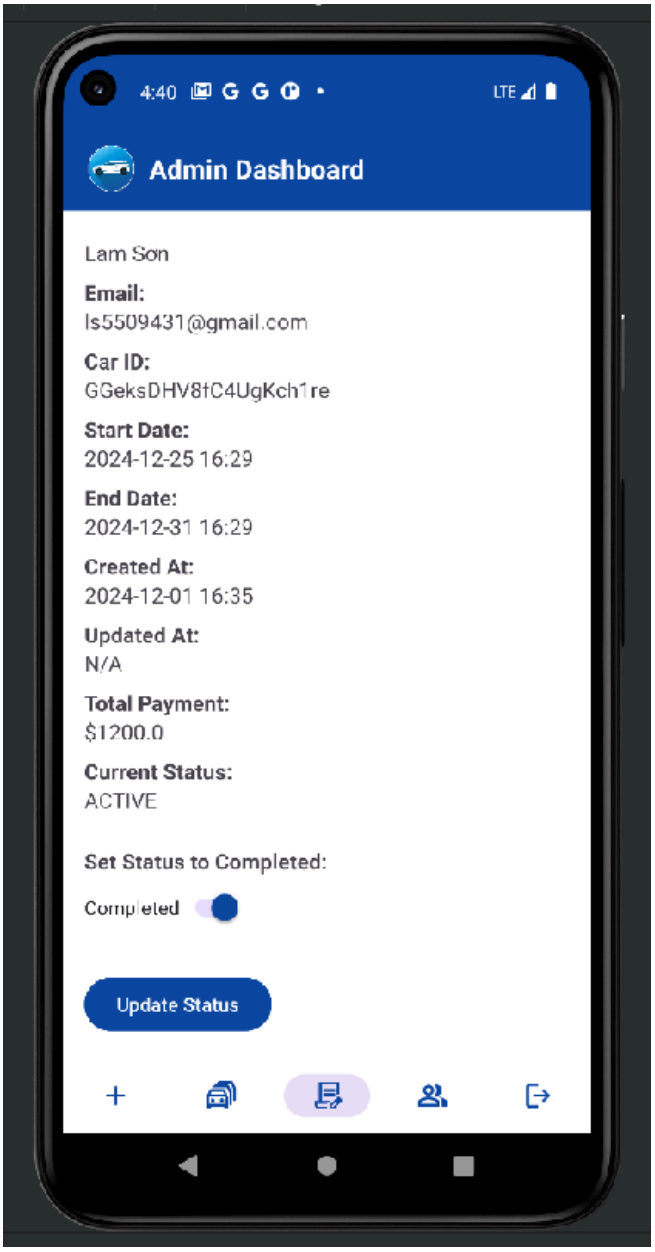
Edit Car UI:

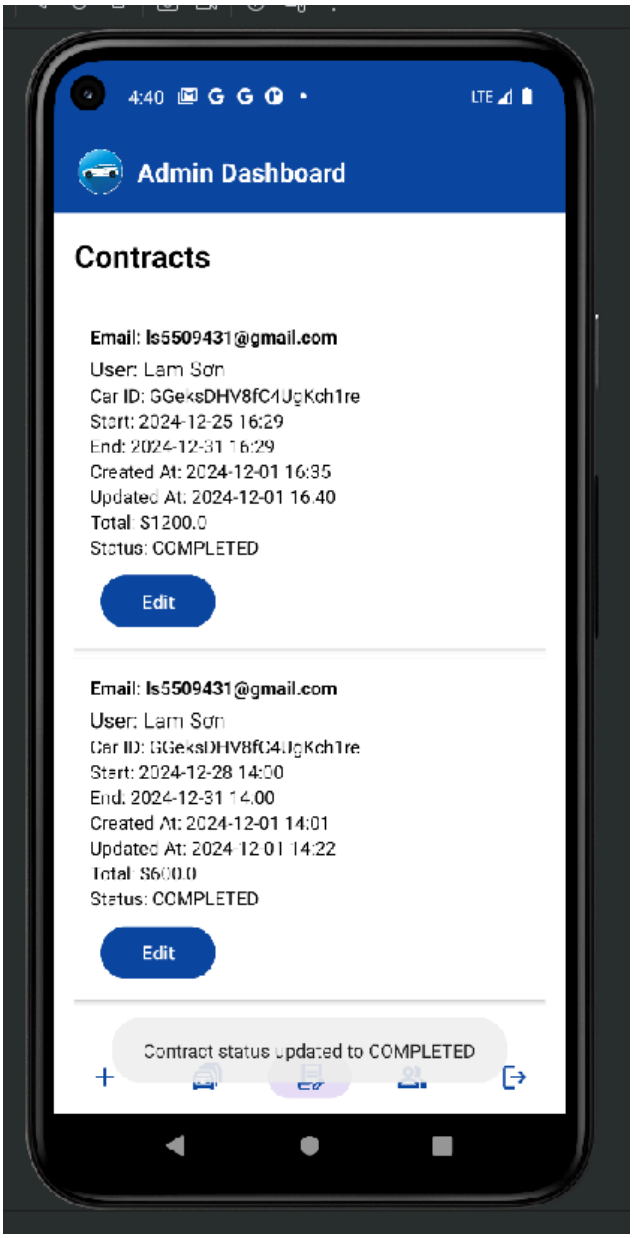

4:40
LTE
Admin Dashboard
1 ratings
Brand
Mercedes
Description
The Mercedes-Benz S-Class is a flagship luxury sedan, renowned for its cutting-edge technology, opulent interior, and unmatched comfort. With advanced driver-assistance features and a smooth, quiet ride, it's a top choice for those seeking a prestigious driving experience.
Model

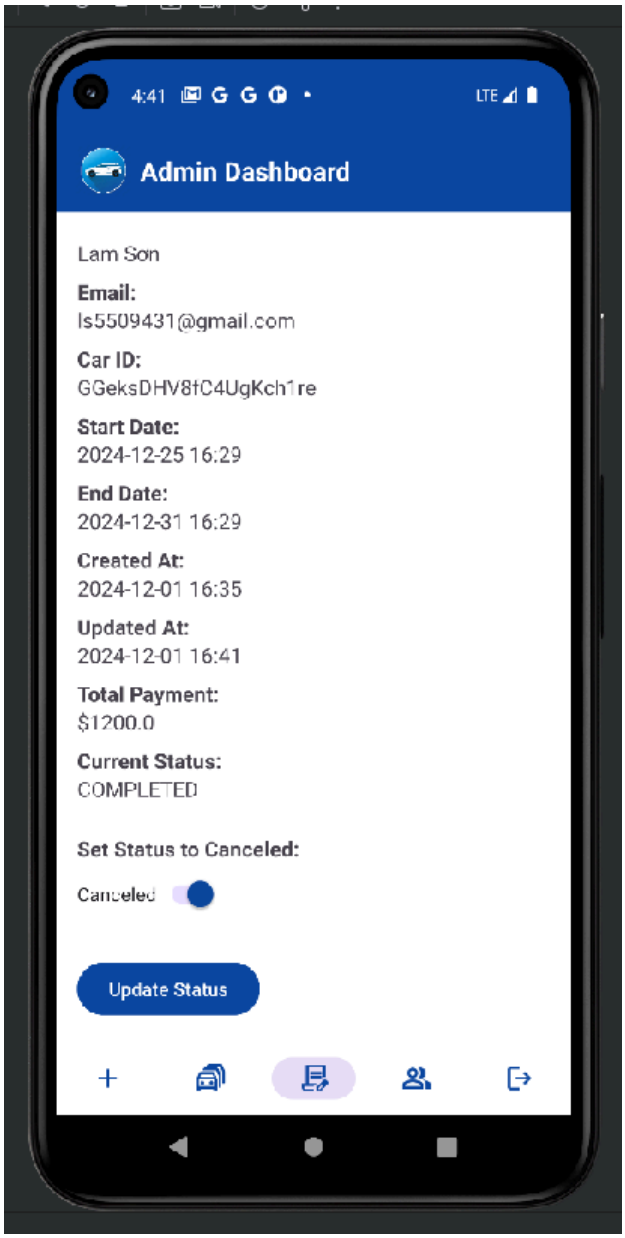

4:40
LTE
Admin Dashboard
Model
Benz S-Class
Seats
5
Price
200.0
Location
Collège LaSalle
Available
Edit Images
Save

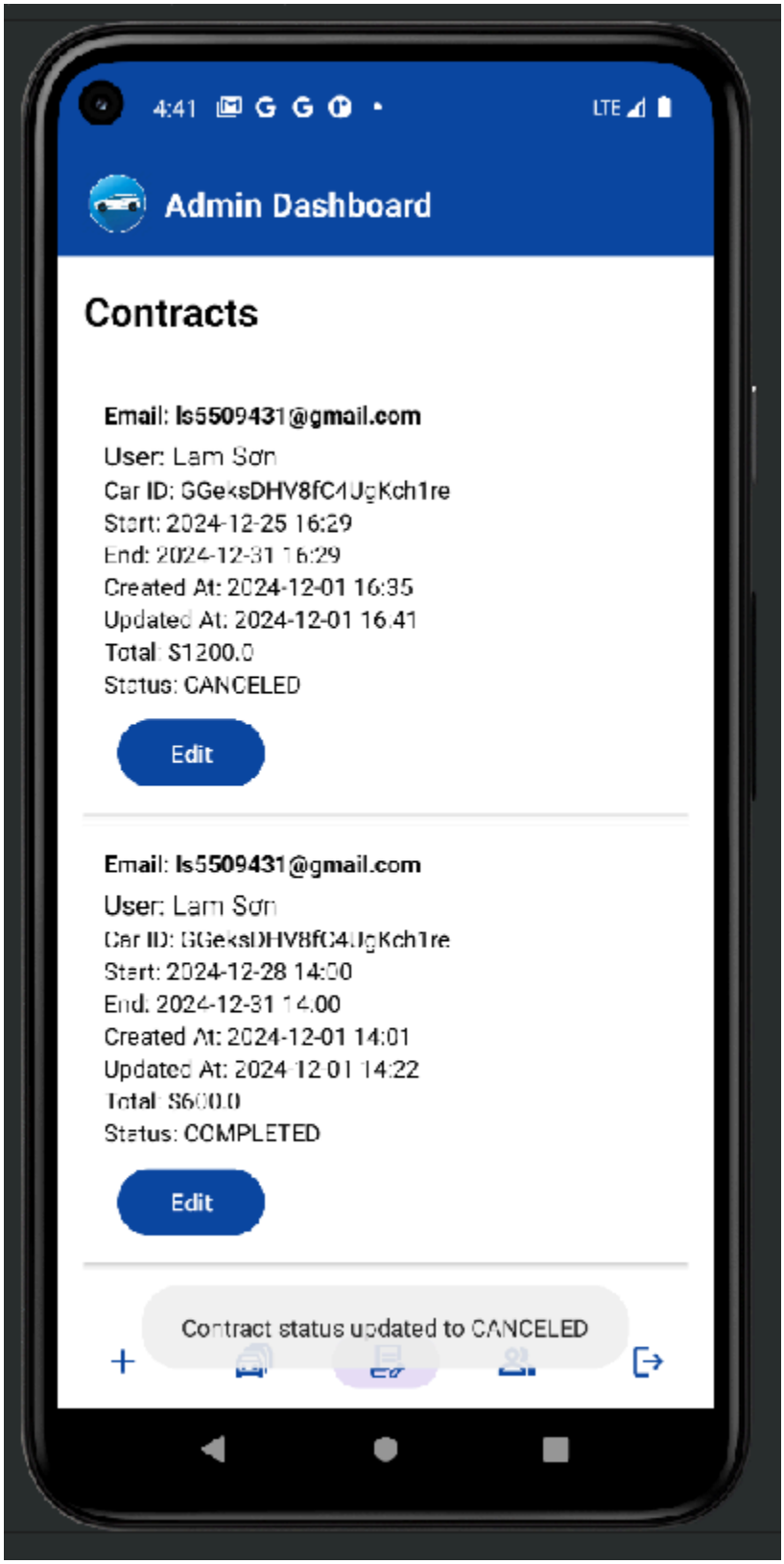
View Contracts & Edit Contract UI:



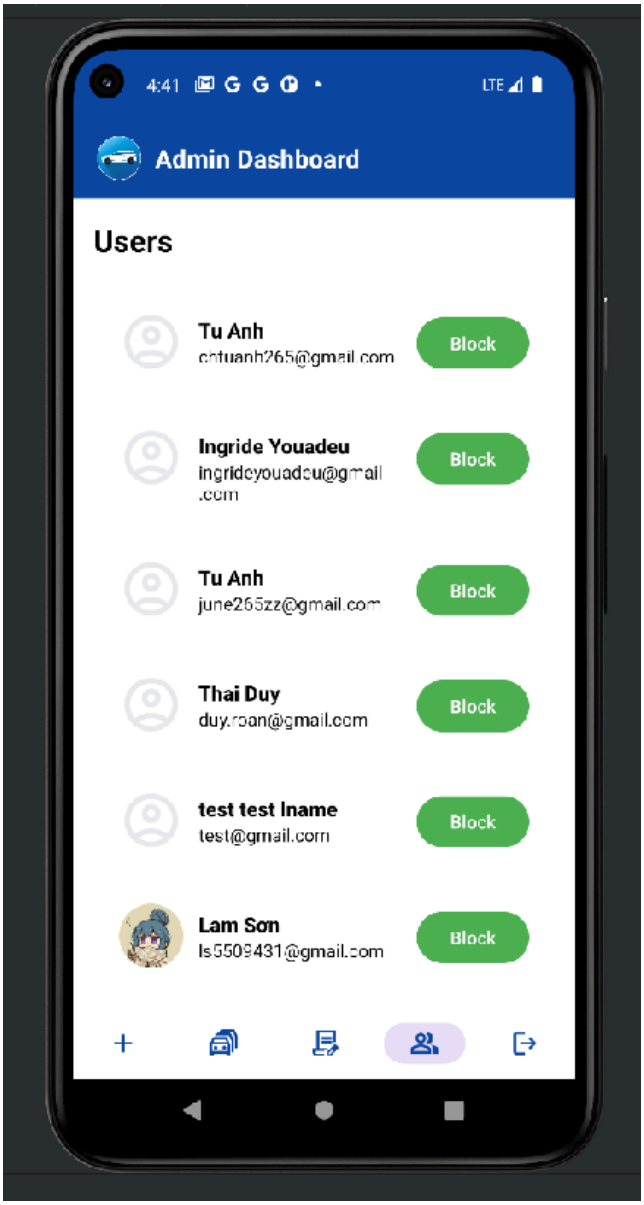


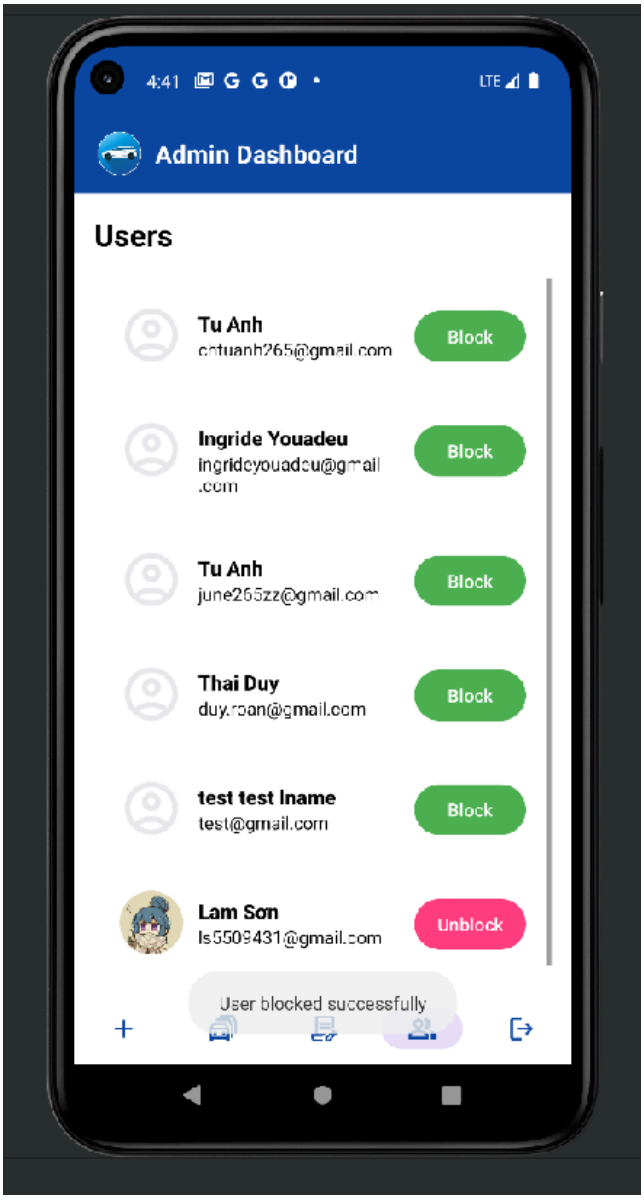

4:40
LTE
Admin Dashboard
Contracts
Email: ls5509431@gmail.com
User: Lam Son
Car ID: GGeksDHV8fC4UgKch1re
Start: 2024-12-25 16:29
End: 2024-12-31 16:29
Created At: 2024-12-01 16:35
Updated At: 2024-12-01 16:40
Total: $1200.0
Status: COMPLETED
Edit
Email: ls5509431@gmail.com
User: Lam Son
Car ID: GGeksDHV8fC4UgKch1re
Start: 2024-12-28 14:00
End: 2024-12-31 14:00
Created At: 2024-12-01 14:01
Updated At: 2024-12-01 14:22
Total: $600.0
Status: COMPLETED
Edit
Contract status updated to COMPLETED


4:41
LTE
Admin Dashboard
Lam Son
Email:
ls5509431@gmail.com
Car ID:
GGeksDHV8fC4UgKch1re
Start Date:
2024-12-25 16:29
End Date:
2024-12-31 16:29
Created At:
2024-12-01 16:35
Updated At:
2024-12-01 16:41
Total Payment:
$1200.0
Current Status:
COMPLETED
Set Status to Canceled:
Canceled
Update Status


4:41
LTE
Admin Dashboard
Contracts
Email: ls5509431@gmail.com
User: Lam Sơn
Car ID: GGeksDHV8fC4JgKch1re
Start: 2024-12-25 16:29
End: 2024-12-31 16:29
Created At: 2024-12-01 16:35
Updated At: 2024-12-01 16:41
Total: $1200.0
Status: CANCELED
Edit
Email: ls5509431@gmail.com
User: Lam Sơn
Car ID: GGeksDHV8fC4JgKch1re
Start: 2024-12-28 14:00
End: 2024-12-31 14:00
Created At: 2024-12-01 14:01
Updated At: 2024-12-01 14:22
Total: $600.0
Status: COMPLETED
Edit
Contract status updated to CANCELED

View User's Profiles UI:





How to set up the Application

FIRST STEP:
Project >> New >> Java Class

Firebase Configuration Class:

```
public class FirebaseConfig extends Application {
   public void onCreate() {
       super.onCreate();

       FirebaseOptions options = new FirebaseOptions.Builder()
               .setApiKey("AIzaSyBdfg_G19mw5tWqsHupVOb56gLvOl5cLeY")

.setApplicationId("1:655767929093:android:62d9fdc09cc7a93f17376c")

.setDatabaseUrl("https://carrentalmanagment-default-rtdb.firebaseio.com")
               .setProjectId("carrentalmanagment")
               .setStorageBucket("carrentalmanagment.appspot.com")
               .build();

       FirebaseApp.initializeApp(this, options);
       Log.d("FirebaseInit", "Firebase initialized in
CarRentalAppApplication");
   }
}
```

SECOND STEP:
Modify AndroidManifest.xml:

```
<application
   ……
   //add this line
   android:name=".FirebaseConfig"
   …….
</application>
```

THIRD STEP:
Gradle (App level):

```
// comment out this line
alias(libs.plugins.google.gms.google.services)
```

FOURTH STEP:
Gradle (Project level):

```
// comment out this line
alias(libs.plugins.google.gms.google.services) apply false
```

!!! SYNC PROJECT WITH GRADLE FILES BEFORE RUNNING

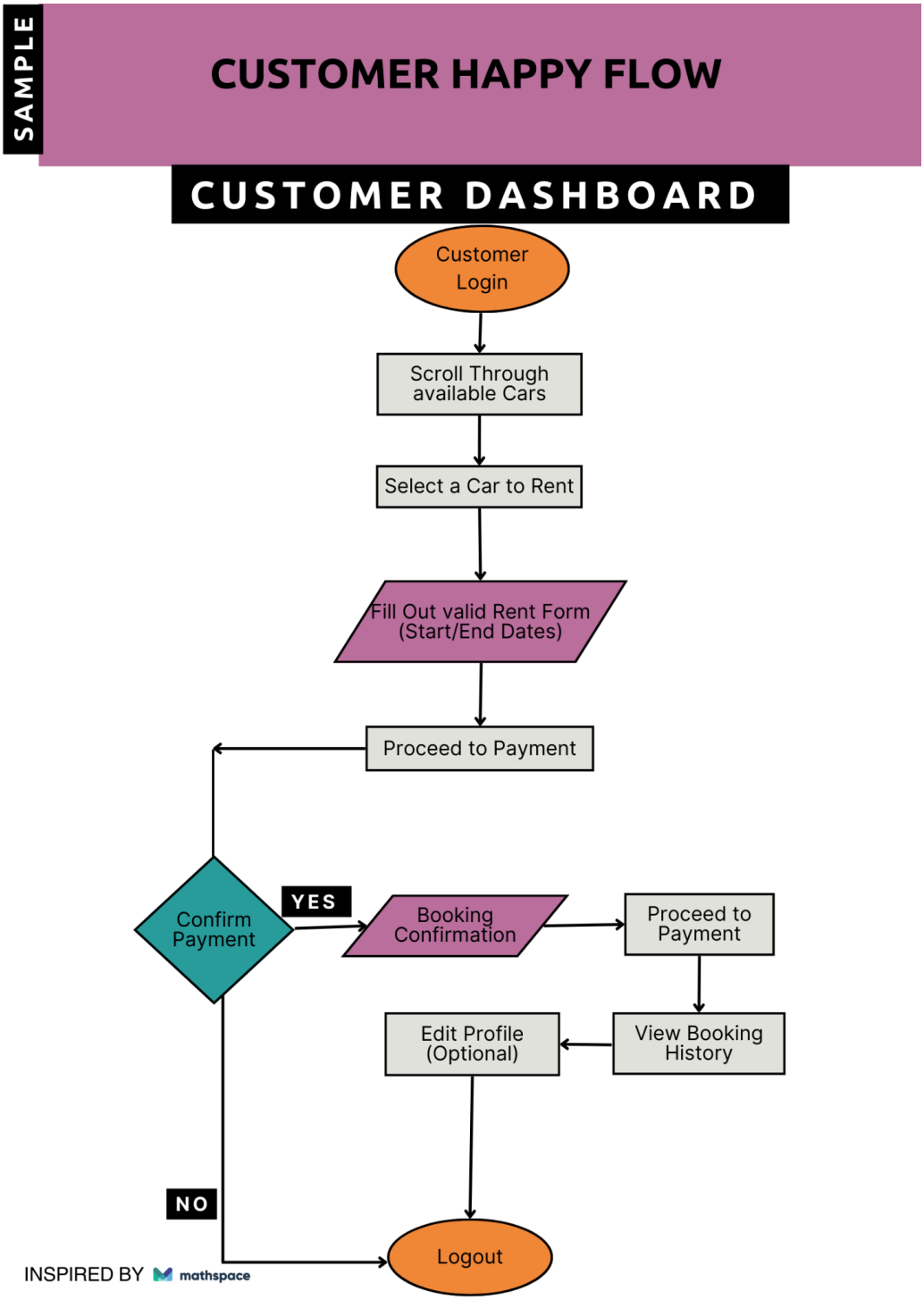
FINAL STEP:
Run this command line in Terminal of the project:

- node server .js

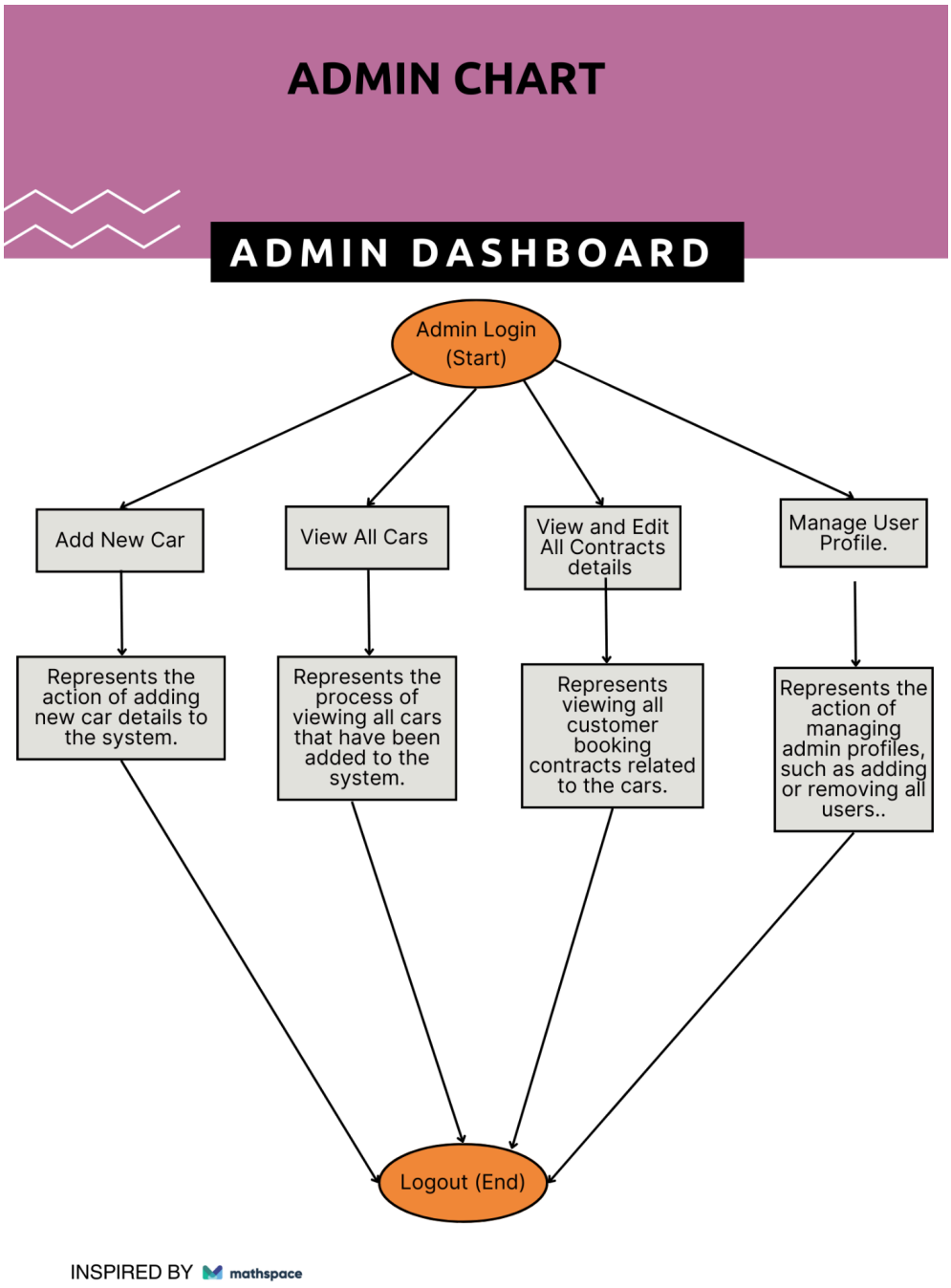
=> Enable Stripe API

Happy Flow

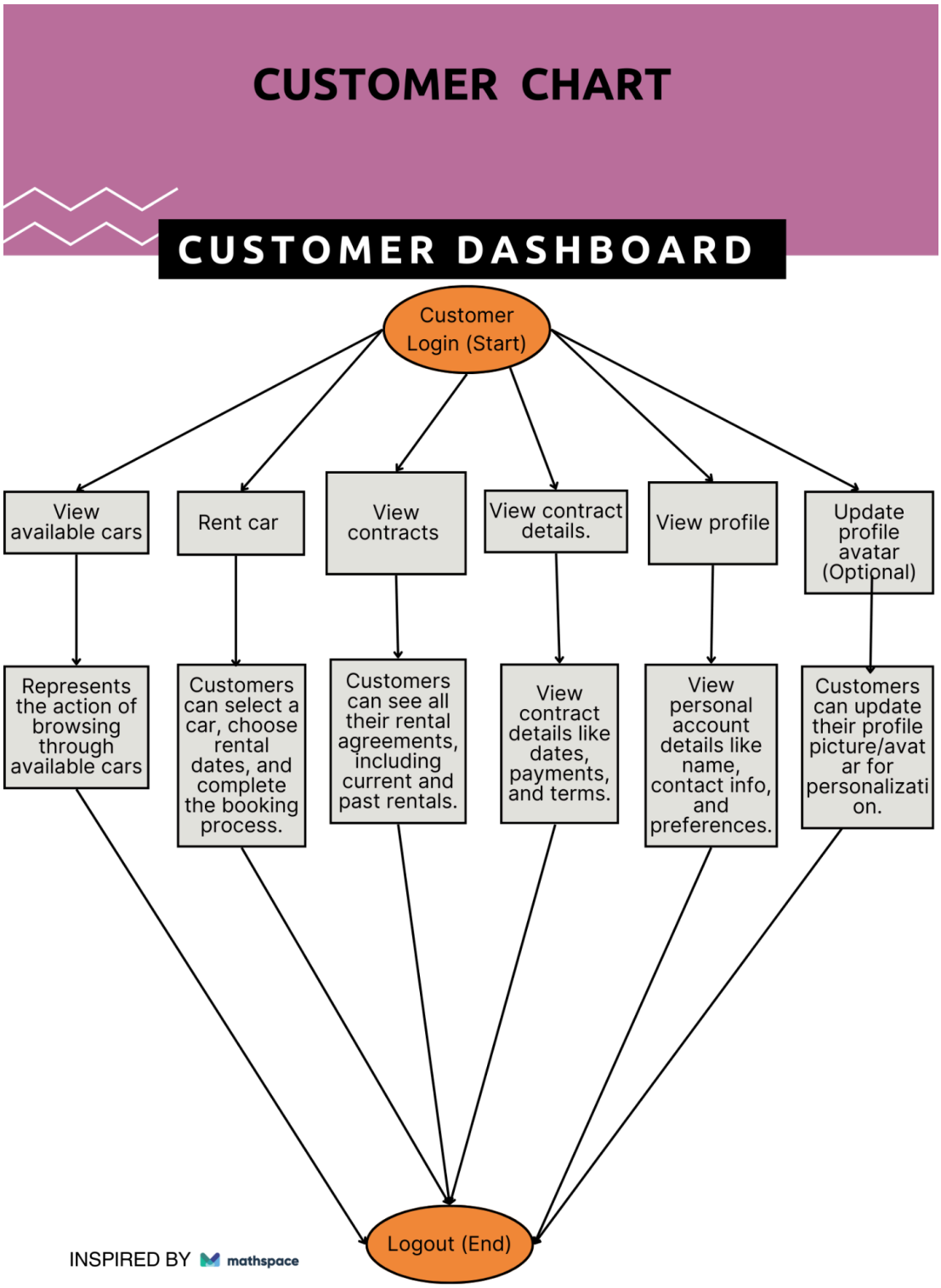
Customer's Flow:



Admin's Chart:



Customer's Chart:



Sample Password:

Password For Customer registration:

```
99
100     private void updatePasswordStrengthUI(int strength) {
101         switch (strength) {
102             case 0:
103
104                 passwordStrengthText.setText("Very Weak");
105                 passwordStrengthText.setTextColor(getResources().getColor(R.color.holo_red_dar
106                 break;
107             case 1:
108             case 2:
109                 //pass or Pass or pass12
110                 passwordStrengthText.setText("Weak");
111                 passwordStrengthText.setTextColor(getResources().getColor(R.color.secondaryDar
112                 break;
113             case 3:
114                 //Pass12
115                 passwordStrengthText.setText("Good");
116                 passwordStrengthText.setTextColor(getResources().getColor(R.color.secondaryCol
117                 break;
118             case 4:
119                 //password%12
120                 passwordStrengthText.setText("Strong");
121                 passwordStrengthText.setTextColor(getResources().getColor(R.color.secondaryLig
122                 break;
123             case 5:
124                 //Password%12
125                 passwordStrengthText.setText("Very Strong");
126                 passwordStrengthText.setTextColor(getResources().getColor(R.color.colorActive)
127                 break;
128         }
129     }
```