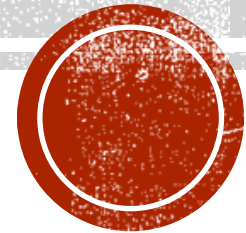


VEHICLE TO GRID ENERGY BUY BACK



Team I -GM-

Capstone I – Spring 2022

Khaled Ras Guerriche, Sebastian Canales, Julio Sibrian, Carson Partee, William Taylor



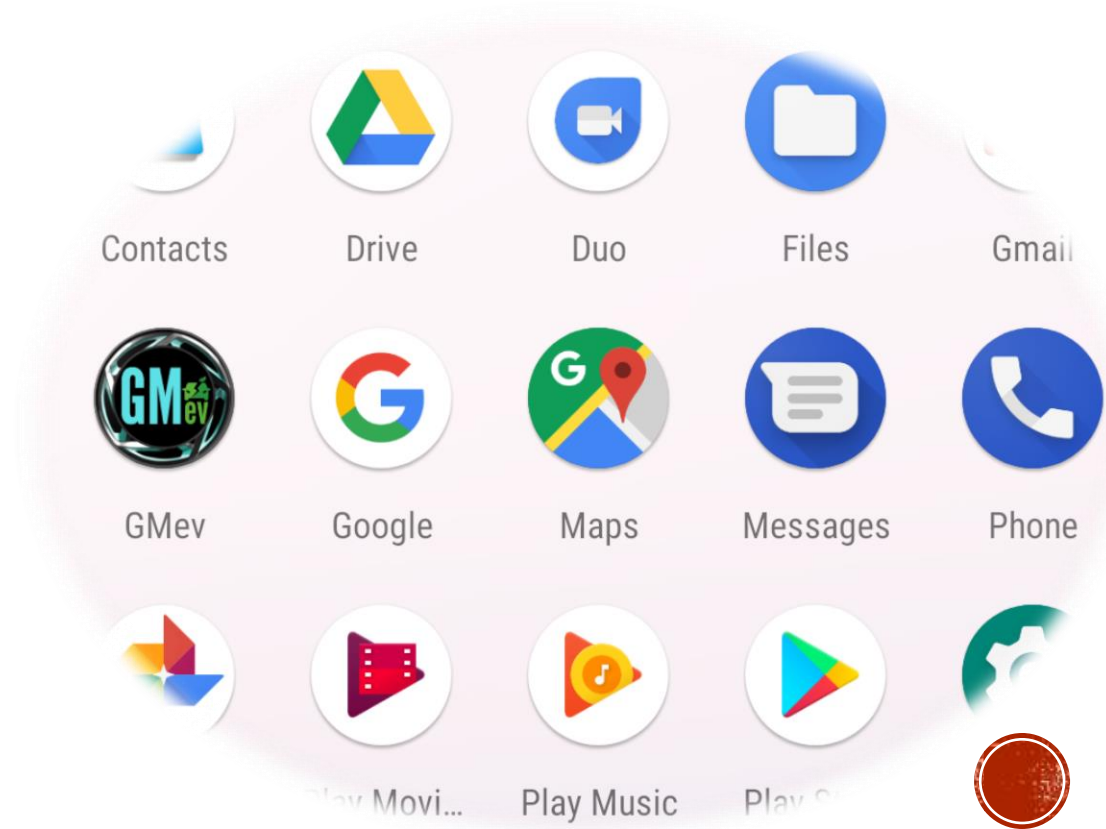
OBJECTIVE

- The objective of this project is to create a mobile application that enables EV owners/users to sell back energy to energy providers.



FUNCTIONALITY

- Account setup/management
- Track vehicle charge level
- Locate charger stations
- Identify grid areas of need
- Connect to third-party payment accounts



DEVELOPMENT STAGES

Planning

- Background research
- Identify use cases
- Select technologies
- Create schedule

Design

- User story
- App interface
- Database schema

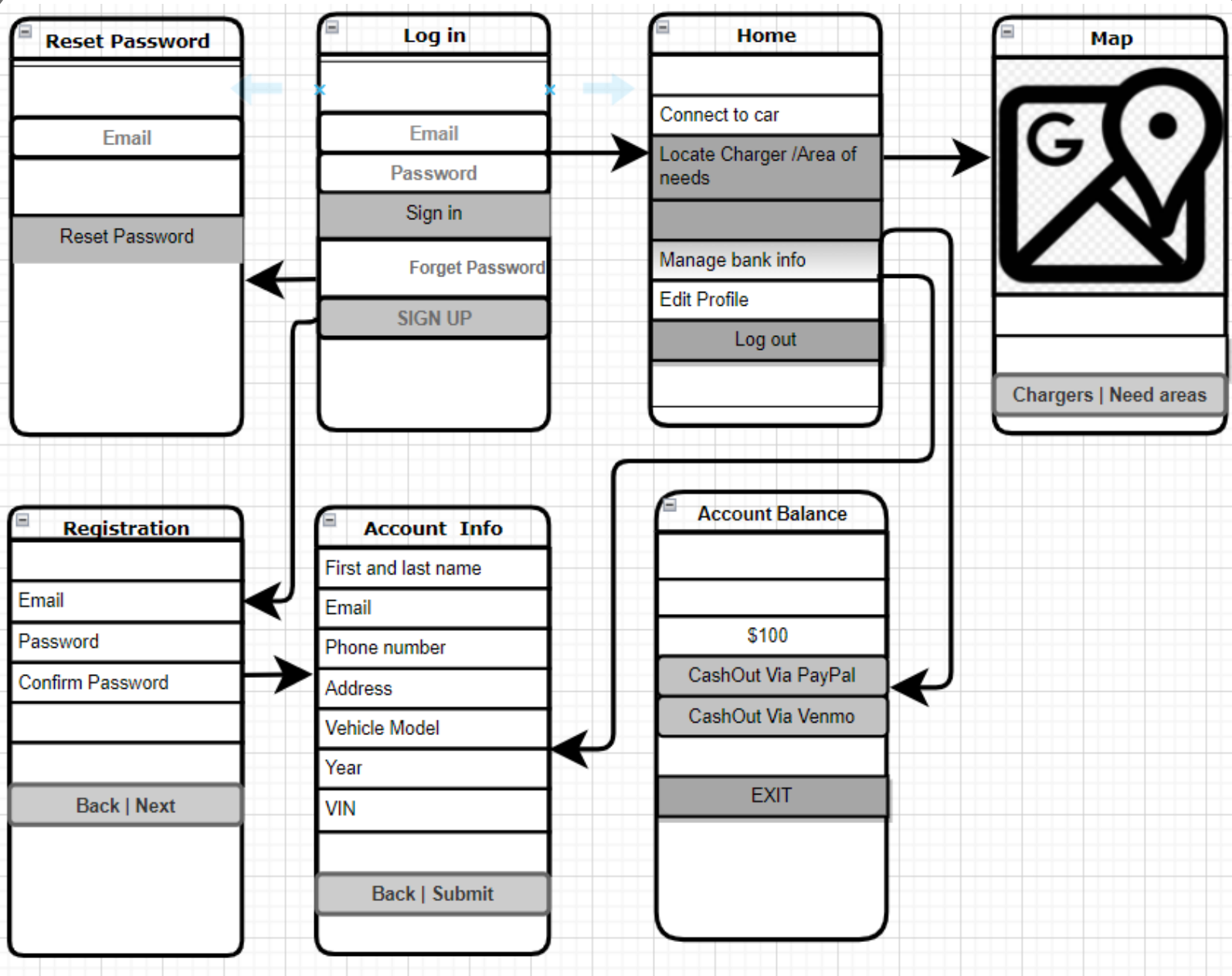
Implementation

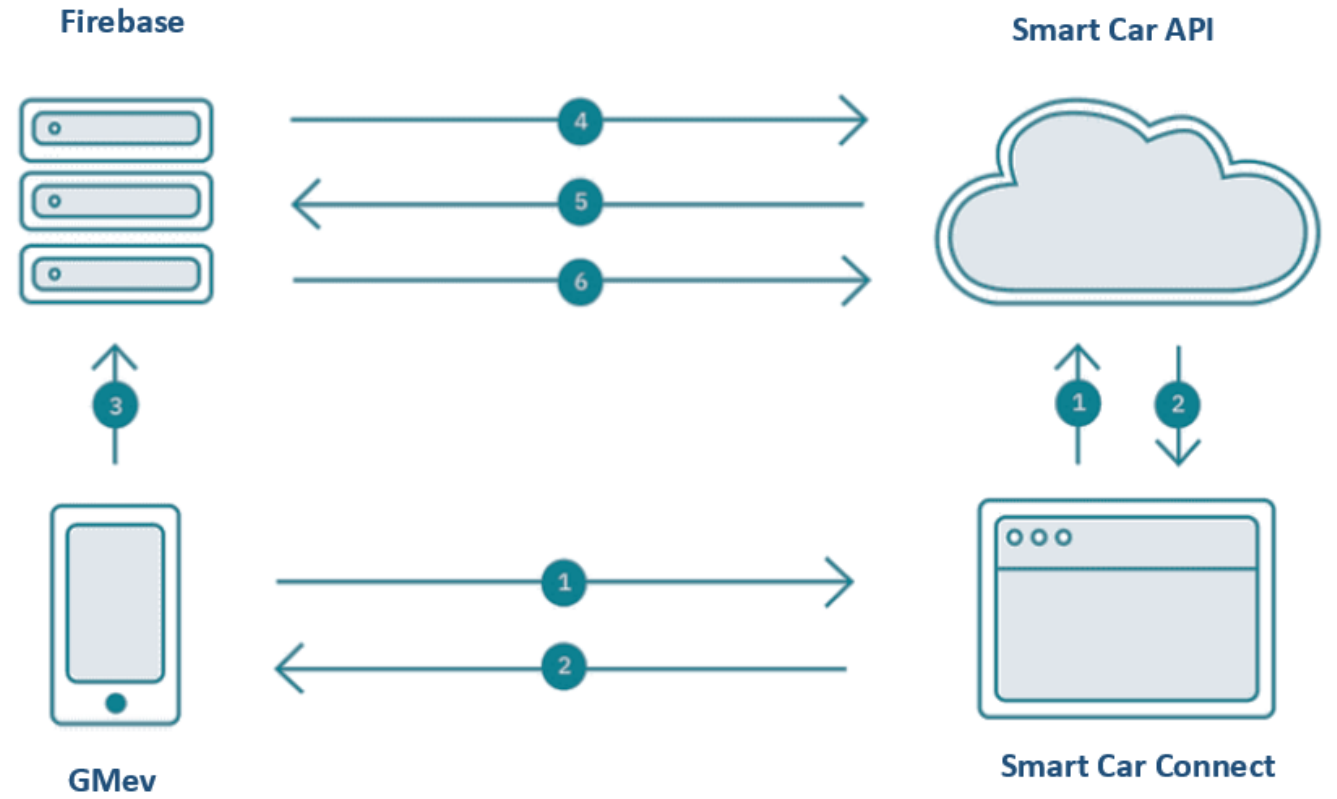
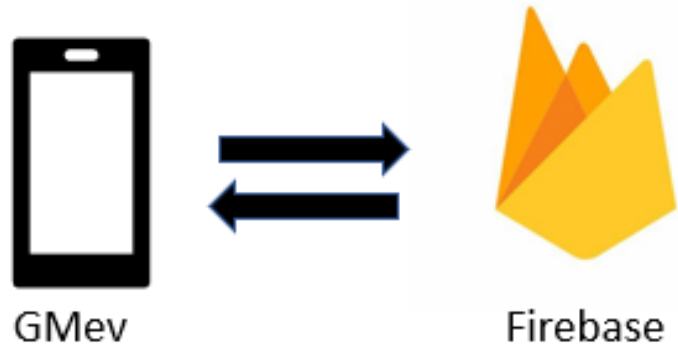
- Setup Google Firebase
- Create views
- Implement account functionality
- Implement car connectivity
- Implement map functionality

Testing/Maintenance

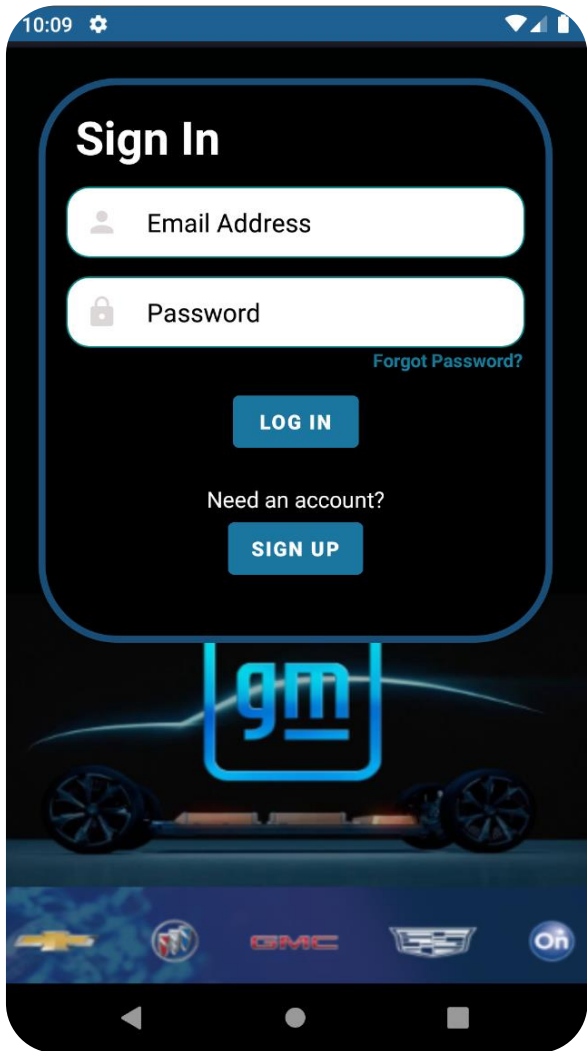
- Test app interface
- Test API connections
- Fix errors
- Update screens







HIGH LEVEL DESIGN



SIGN IN



10:09

Registration

Email

Password

Confirm Password

BACK NEXT

SIGN UP

10:10

Account Information

First and last name

Email

Phone Number

Address

Vehicle Model

Year

VIN

EXIT SUBMIT

ACCOUNT INFO

10:11

Forgot Password

Enter your email below, and we will send you a link to reset your password.

Email Address

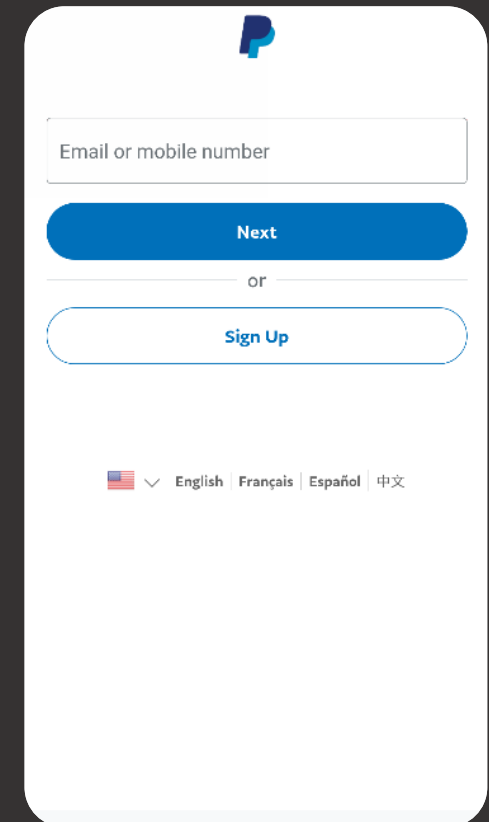
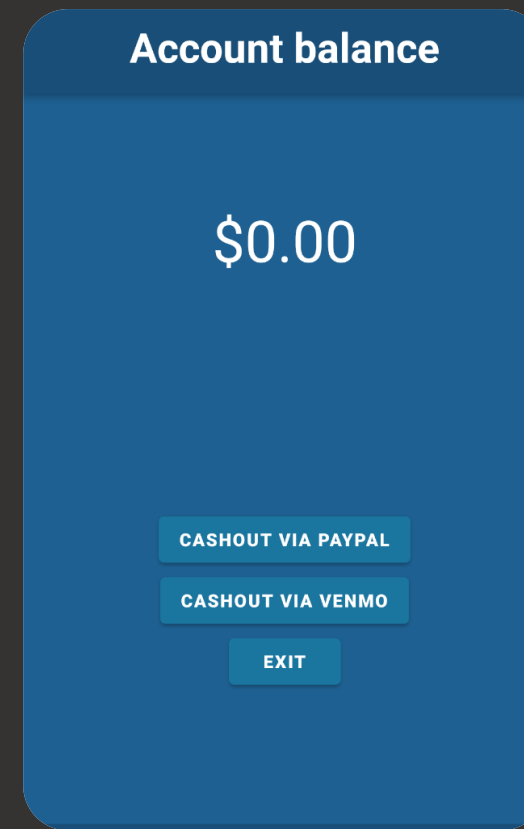
EXIT RESET

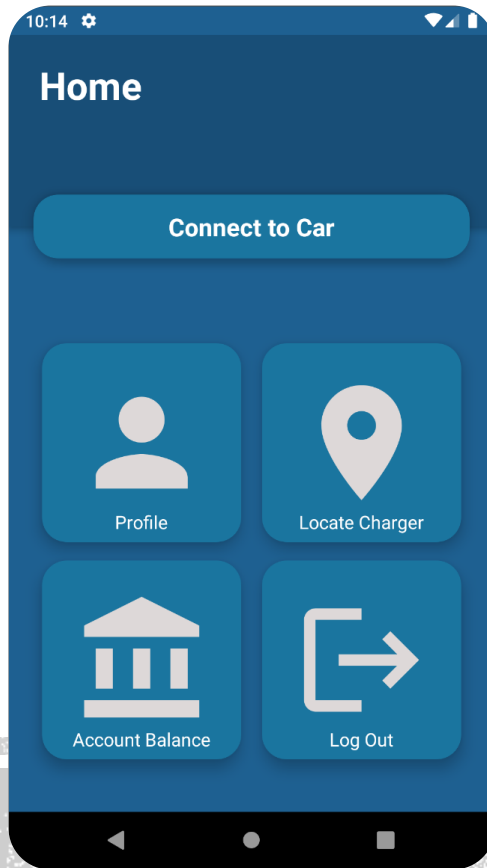
RESET PASSWORD



PAYMENT

- PayPal API
- Minimum \$5 cash out
- Energy sold and total earned history





SmartCar API

- Connect to car
- Wide manufacturer support
- Uses manufacturer account

Firestore Functions

- Handle app/API interaction

Firestore Authentication

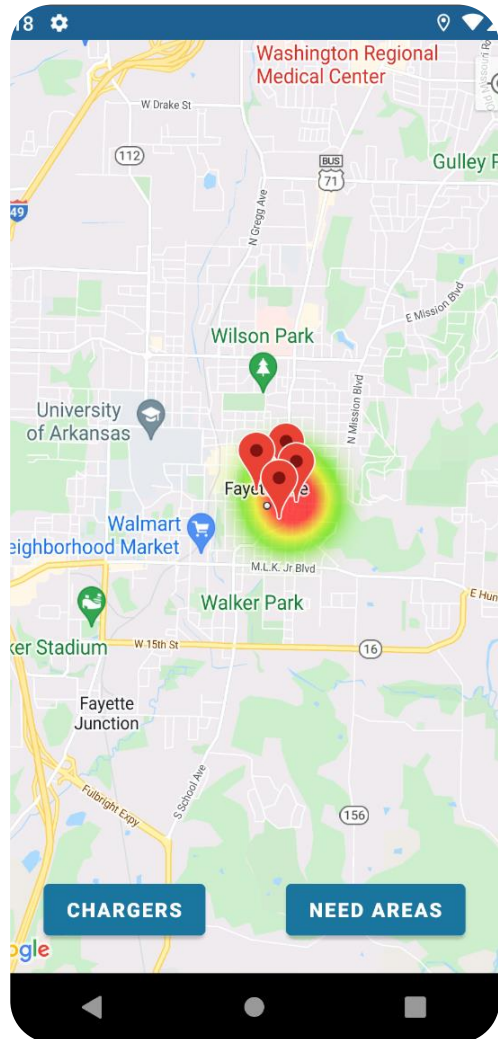
- User state management



MAIN MENU

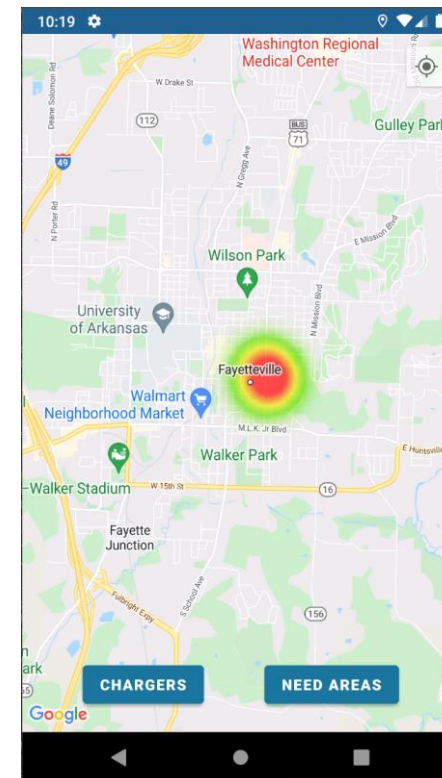


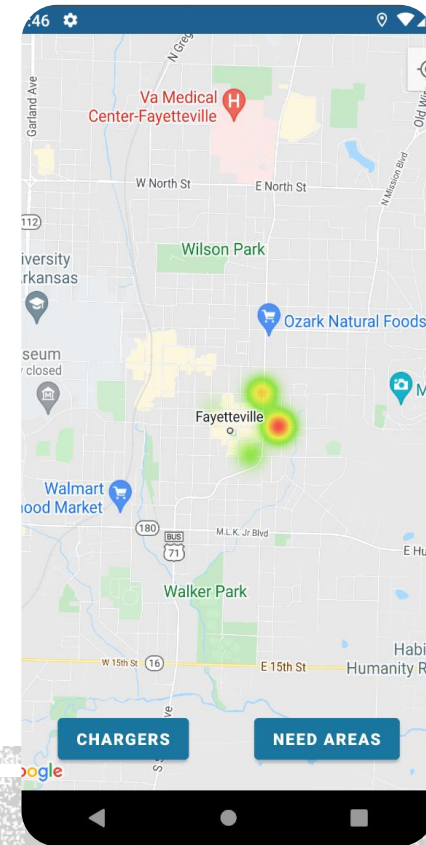
MAP — SETUP



Google Maps SDK for Android

- Google Maps Geocoding API
- Google Maps Android Heatmap Utility
- Google Maps Distance Matrix API
- Google Maps Directions API



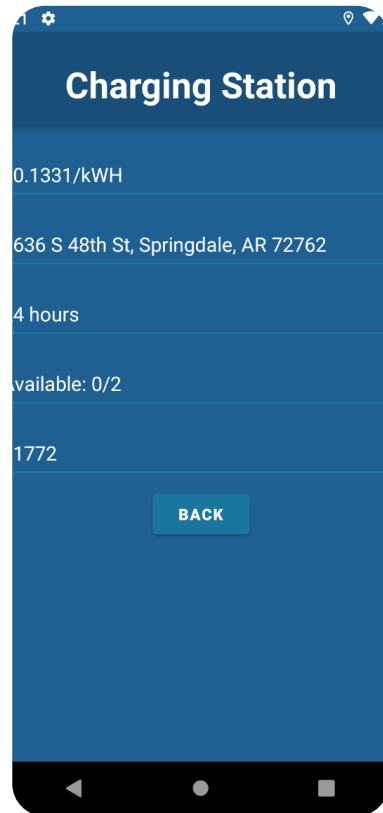


MAP — PINS

- Prices of selected charging station
- Distance from the device using the app to the selected charging station
- Amount of energy available to put back onto the grid



MARKER CLICK



On Marker click

- Shows information about the charging station
- Price per kilowatt hour, address, time open, charging stations available, and charger type

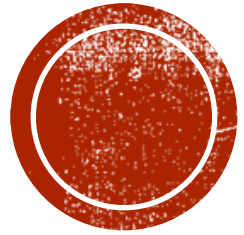




DEMO

- <https://photos.app.goo.gl/GNOkOqjXGhDyRSu7A>





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*We would like to thank **General Motor's team** for being available, flexible, and for the feedback they provided that greatly improved our project.*

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*And finally, thanks to **All Team-01- members** for the hard work and commitment.*



THANK YOU

■ **TEAM -1-**

