

School of Computing & Information Sciences

Spring 2024 Capstone II Project

Commute Connect

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PROBLEM

- Currently, there are very few cost-effective and environmentally friendly commuting options outside of public transportation. It is of utmost importance to create new solutions to further promote environmental awareness. Commute Connect is an application developed to achieve these goals while at the same time foster a sense of community by presenting carpooling options in your area.
- Our application is designed to reduce carbon emissions, decrease traffic congestion, and to cut down travel costs for our users. It also offers a possibility to interact with your community
- We created this application from scratch this semester and successfully included most of the core systems that we wanted to implement. These include: user authentication, trip creation, trip request and activity history.
- Some systems need certain improvements such as:
 - The route needs to update when a new passenger joins the trip.
 - When the destination is reached, the trip needs to end.
 - The route progress needs to be displayed to the passenger.
- We also made the decision as a team to not implement business logic into our application and focus purely on the system design.

SYSTEM DESIGN

- Our application follows a very popular technology stack commonly known as “FlutterFire”. This stack is composed of Firebase for the backend and Flutter for the frontend. These two technologies together offer simplicity to the development process
- Firebase was used for most of the database operations and authentication for the application. We used mostly the Real Time database option as it offered many functions such as real-time synchronization.
- Our UI was created in Flutter which offered a multiplatform option. While we only tested the application on the android platform, the Flutter framework offers the possibility to develop to other platforms without changing the codebase. It also offered a lot of simplicity.

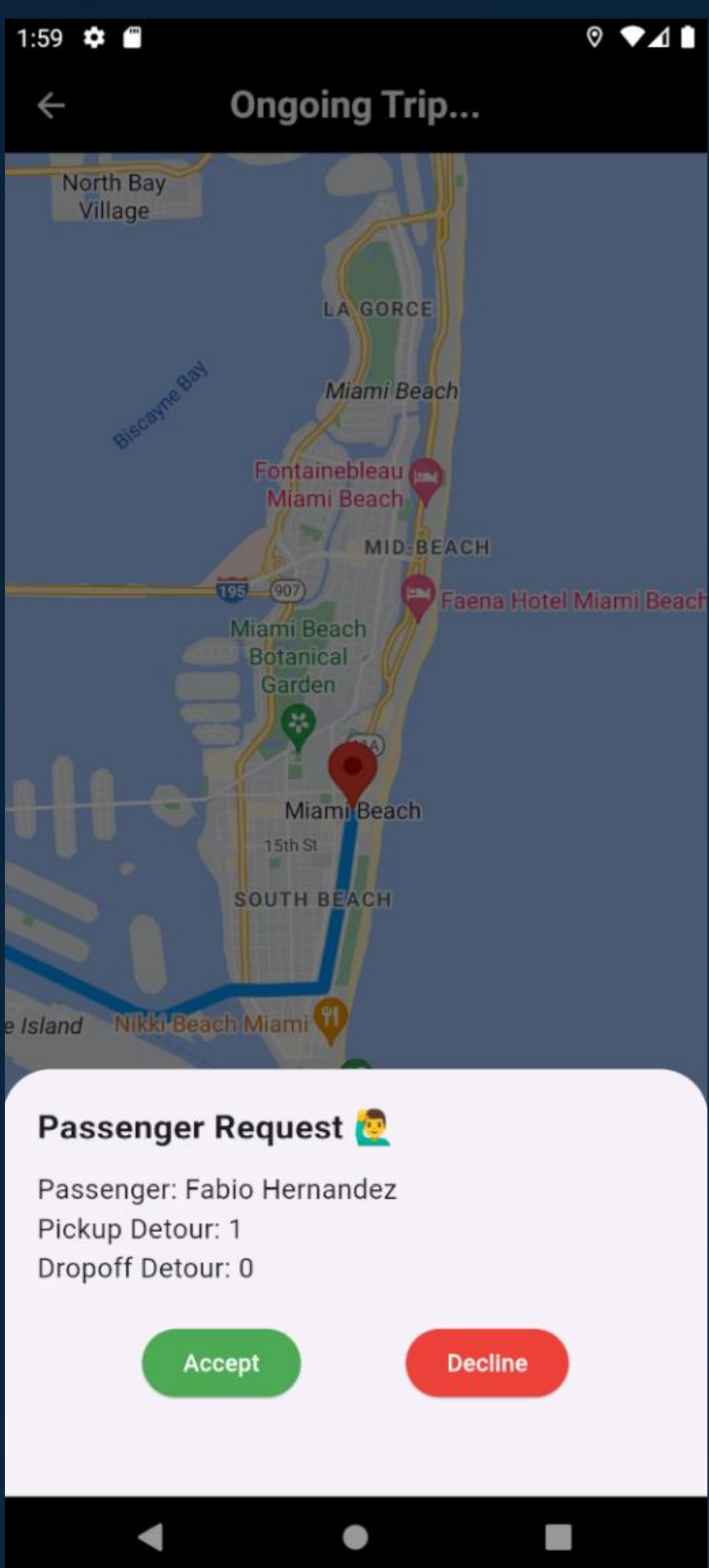
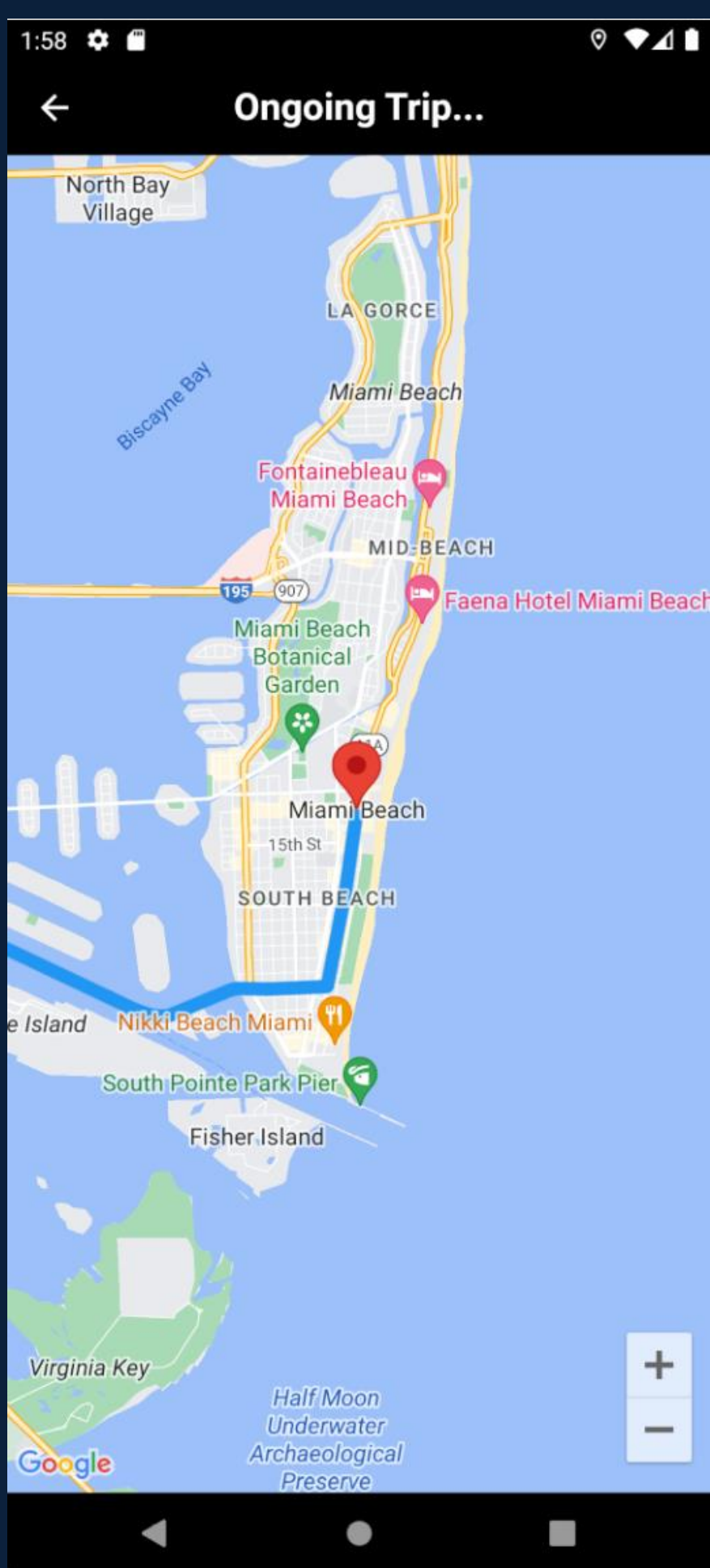
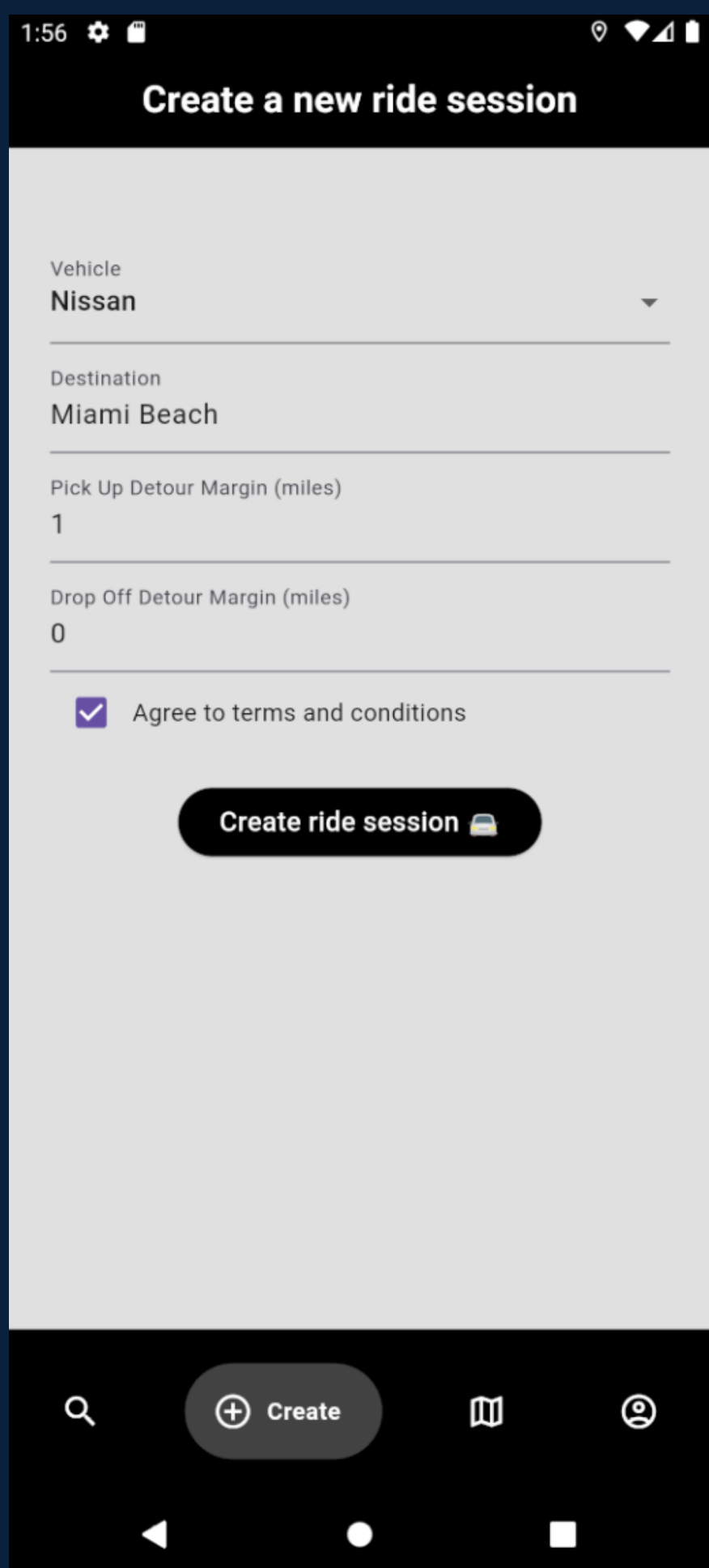
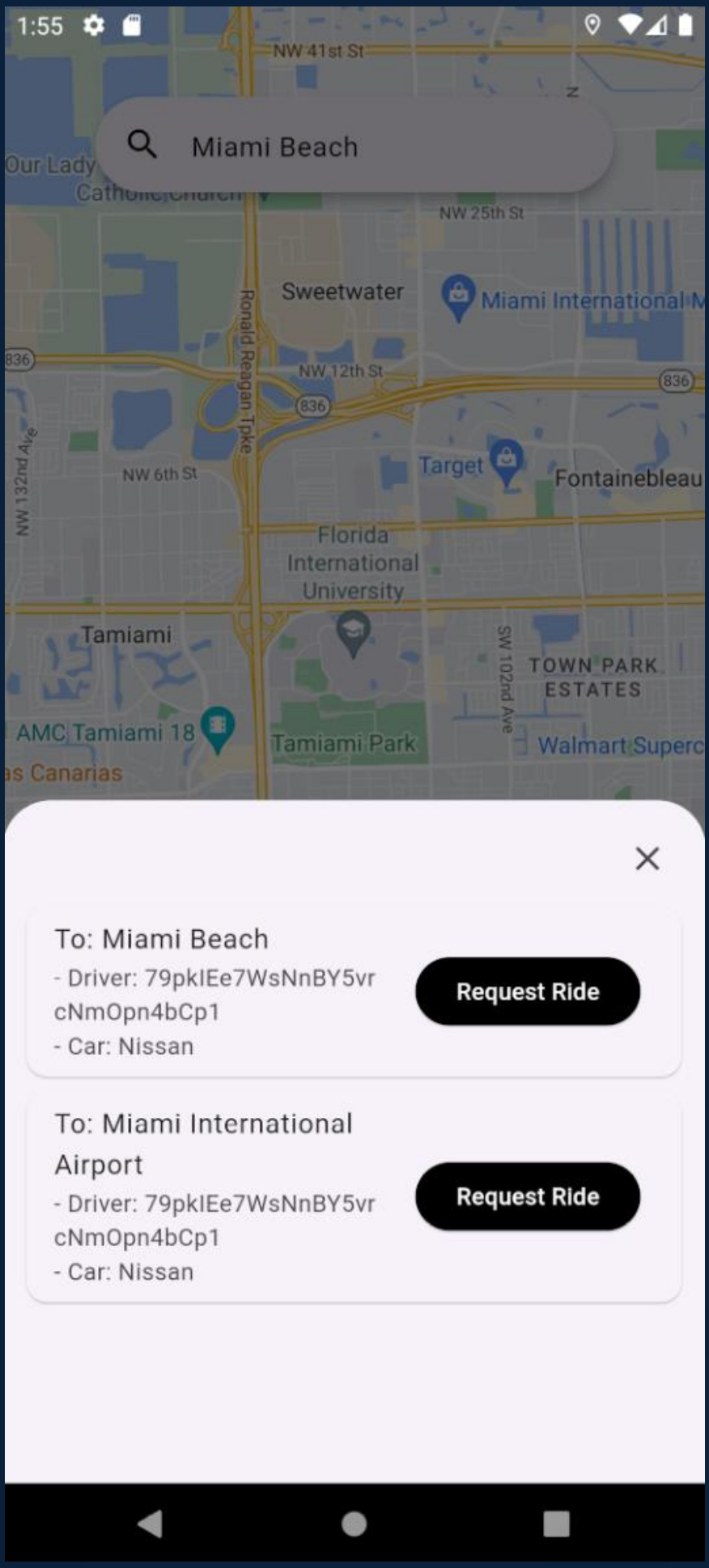
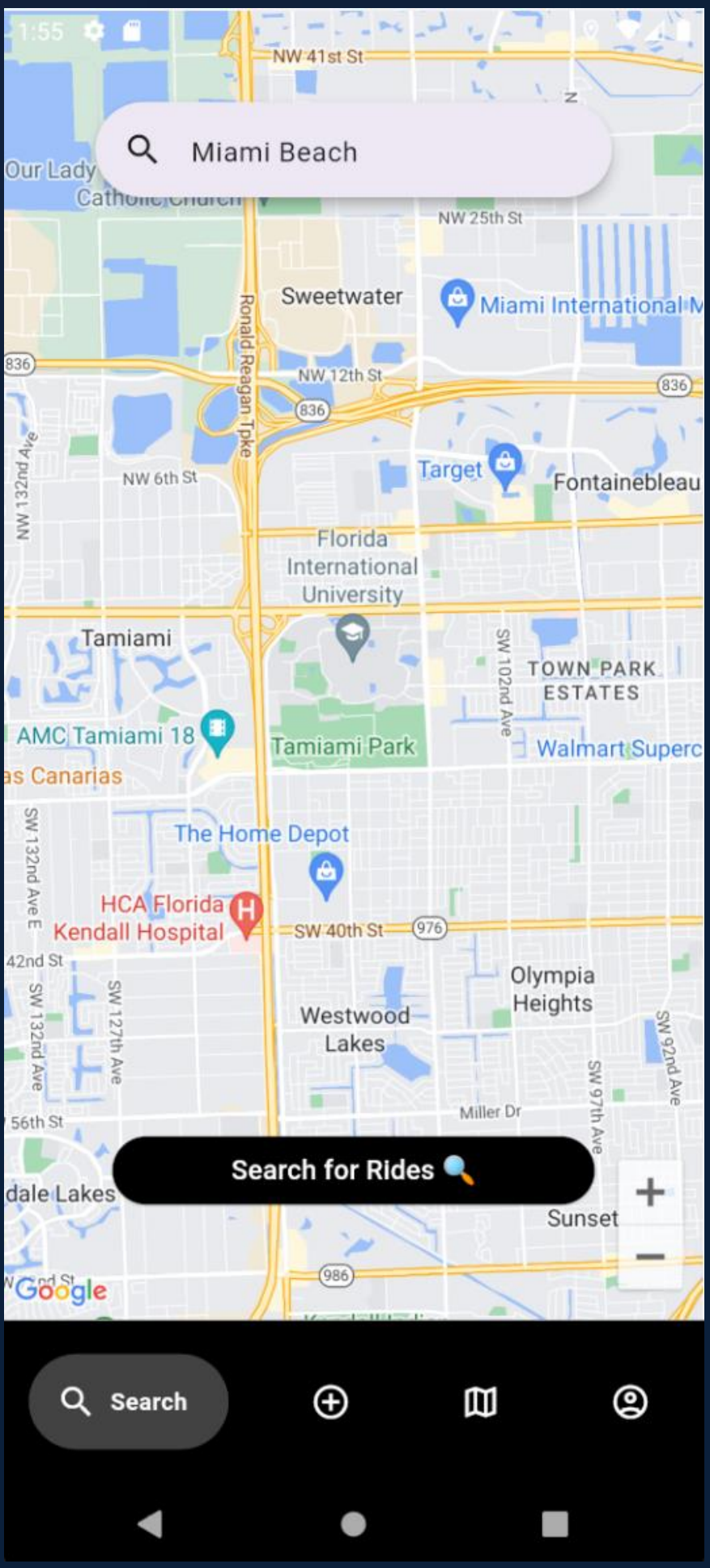
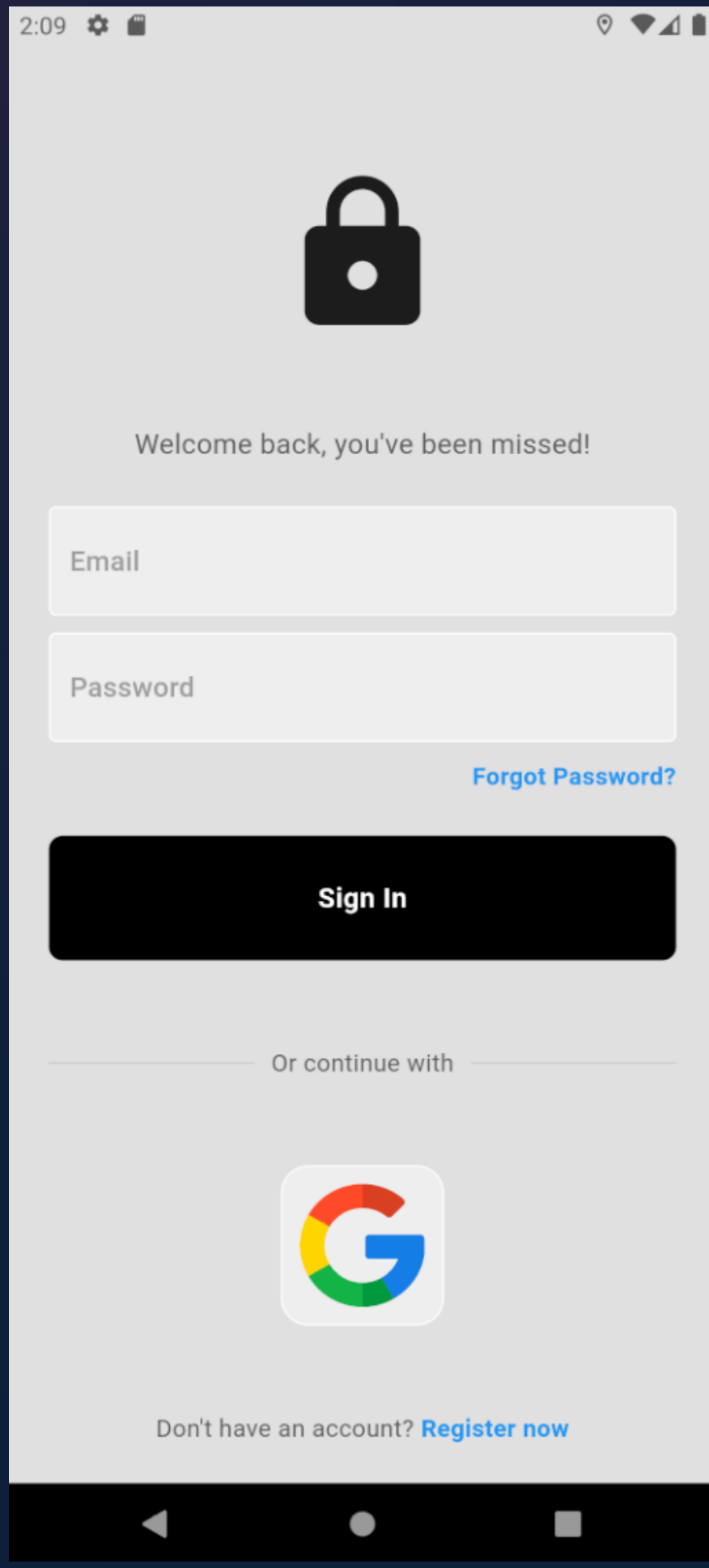


Firebase



Flutter

APP DESIGN



IMPLEMENTATION

- Created part of the authentication for the application. This includes creating the UI and the backend logic.
- Worked on creating the “search trip” and “create trip” pages.
 - UI components
 - Database architecture
 - CRUD operations with the database
 - Optimizing communication between driver and passenger.
 - Geolocation features:
 - Converting addresses to coordinates
 - Converting coordinates to addresses
 - Calculating distance between two locations
 - Requesting user’s current location
 - User’s input validation and testing
- Assisted other group members on the implementation of several other features such as the map component, profile page, authentication page, and profile page.

REQUIREMENTS

Commute Connect is composed of multiple technologies. These technologies are required for the application to run on a Windows environment.

- Android Studio
- GitHub
- Firebase
- Flutter
- Google maps API

If the application needs to be executed on an Android environment, it needs to be compiled into a .APK using the Windows environment first and then it can be executed. The only technology that needs to be present after compile is the Firebase database.

SUMMARY

Commute Connect is a brand-new application created to promote a new and more environmentally friendly alternative to transportation. The application is currently in a promising spot for new implementations to be added in the future.



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ACKNOWLEDGEMENT

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