

Project Proposal

SFWRTECH 4SA3: Software Architecture

Viet Long Cao – 400486606

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Fuel Tracker

SUMMARY:

In Canada, petrol costs are at an all-time high, and unless you drive an electric vehicle, you will undoubtedly feel the pain. Canadians spend over 4.4% of their yearly income only on filling up their automobiles, with the average price of petrol currently exceeding \$2 per litre. This is even higher than Americans who only pay about 3% overall because of subsidies.

How then can you save money if you don't currently own an electric car and aren't planning to? Our petrol consumption calculator will help you determine the approximate cost of your trip, which will at the very least enable you to manage your spending and prepare for the expense of driving.

TARGET MARKET:

- Driver
- Group (friends, family)
- Carpool
- Traveler

FUNCTIONALY:

With the use of this estimator, a user may calculate their estimated gasoline expenses based on their trip's distance to the destination, their car's fuel efficiency, and the overall cost of petrol in a variety of units. It also enables the computation of split invoices for shared group costs.

HOW TO USE:

1. Enter departure and destination
2. Select measurements type (Imperial | | Metric)
3. Enter vehicle details
4. Calculate

DESIGN PATTERNS:

1. Singleton
2. Command

TECHNOLOGY IMPLEMENTATIONS:

Technology	Use
Python	Primary programming language for application development
Google SQL Database	Provides vehicle information (Brand, gas efficiency, etc.)
Google Maps API	Calculate total distance and ETA
Fuel Price API	Provides different fuel prices in different gas stations

REQUIREMENTS:

ID	Category	Functionality	Priority
FR-01	Functional	The system retrieves vehicle information from the database	High
FR-02	Functional	The system returns ETA depends on the distance between departure and destination	High
FR-03	Functional	The system allows users to edit gas efficiency and price	Medium
FR-04	Functional	The system allows users to select measurement type (distance and gas efficiency)	Medium
NFR-01	Non-Functional (Performance)	All API system (Google Maps, gas price) shall return all data value that users requested within no more than 5 seconds	High

SCENARIO VIEW:

Concerns: Explaining how the system should behave in the process

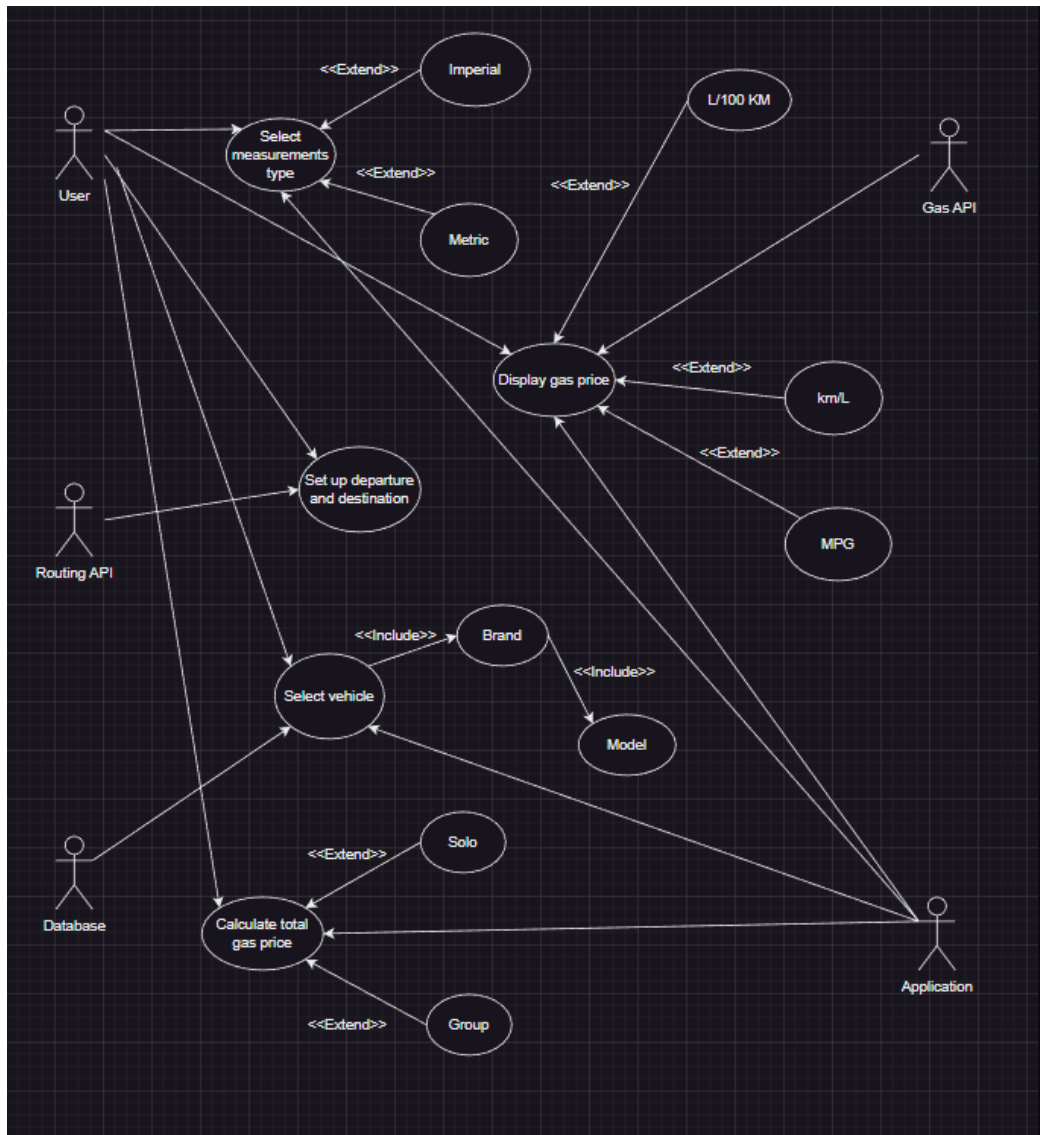
Stakeholders: All stakeholders

Modeling Techniques: UML Use Case Diagram

PROCEDURE:

1. Set measurement type (Imperial || Metric)
2. Select departure
3. Select destination
4. Choose fuel price from fuel price API
5. Select gas unit
6. Edit fuel price (if needed)
7. Estimate (Solo || Group)

USE CASE DIAGRAM:



PHYSICAL VIEW:

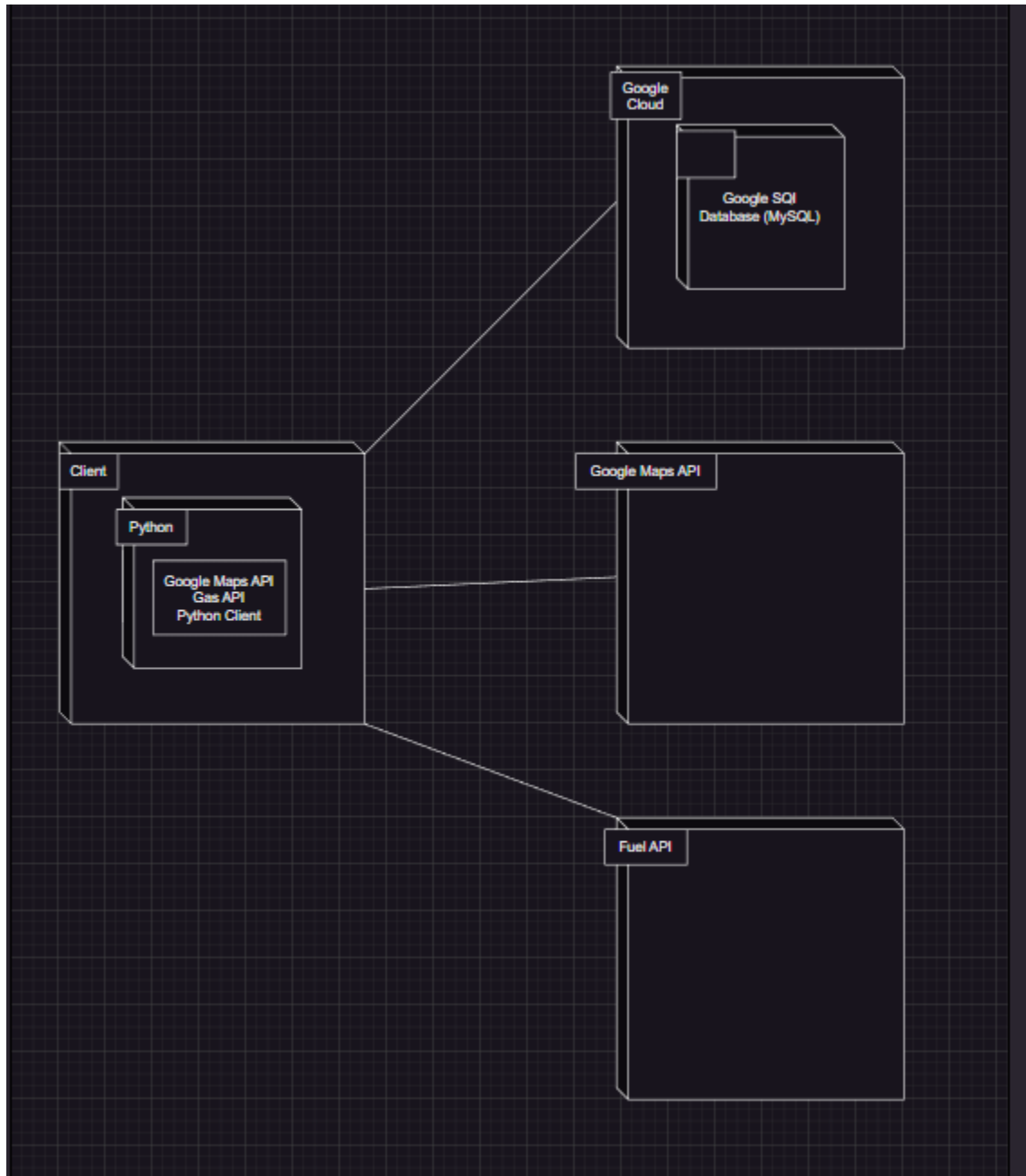
Concerns: Describe and depict the system's execution architecture, including the middleware that connects the various nodes, such as the software-to-hardware execution environments.

Stakeholders: Software architect, software developer

Modeling Techniques: UML Deployment Diagram (Physical Viewpoint)

The application communicates with Google Cloud database, Google Maps API, and fuel API.

DEPLOYMENT DIAGRAM:



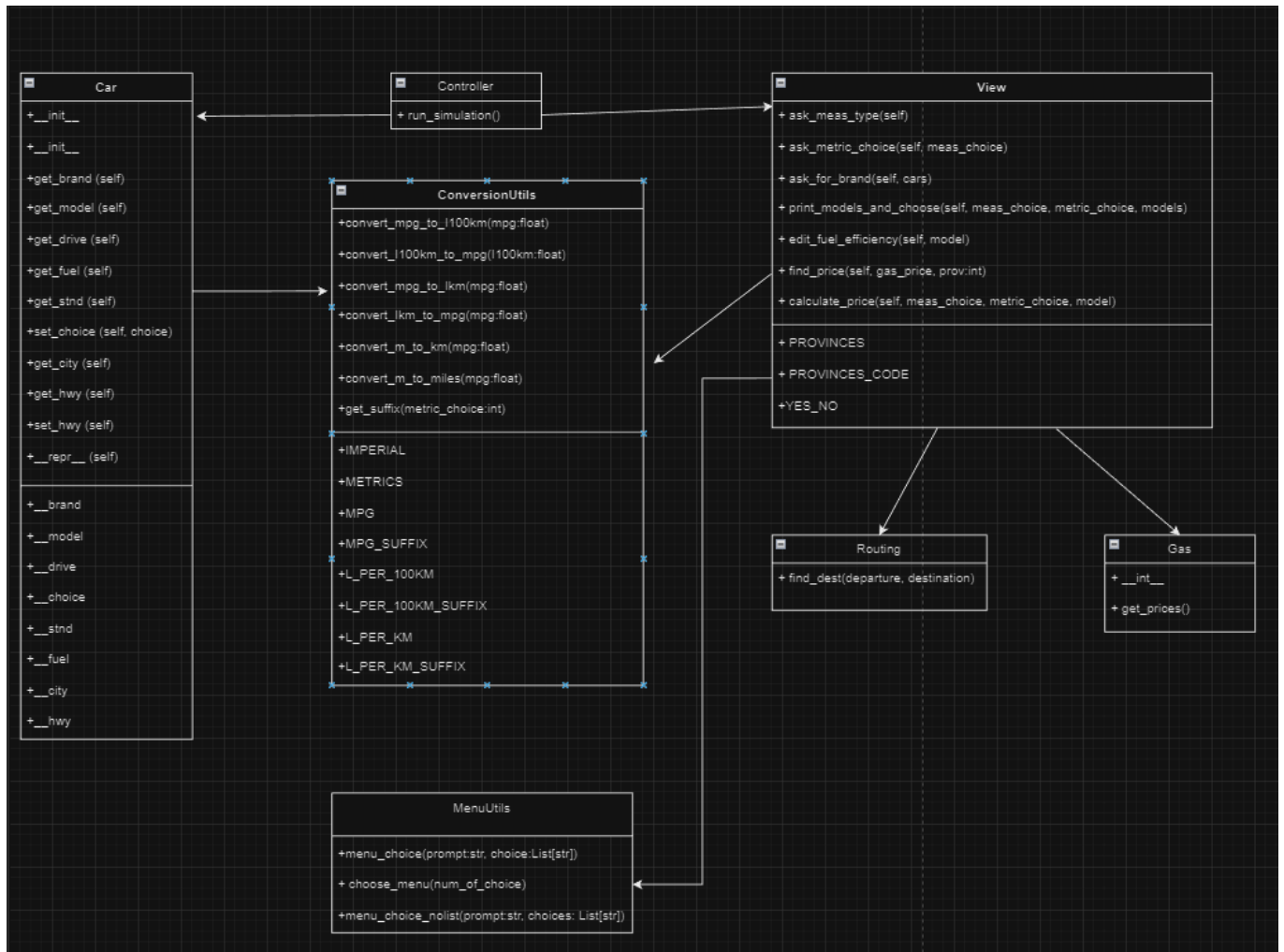
DEVELOPMENT VIEW:

Concerns: Describes the application's structure in its development environment.

Stakeholders: Software architecture, Software developer

Modelling technique: UML Class Diagram

CLASS DIAGRAM:



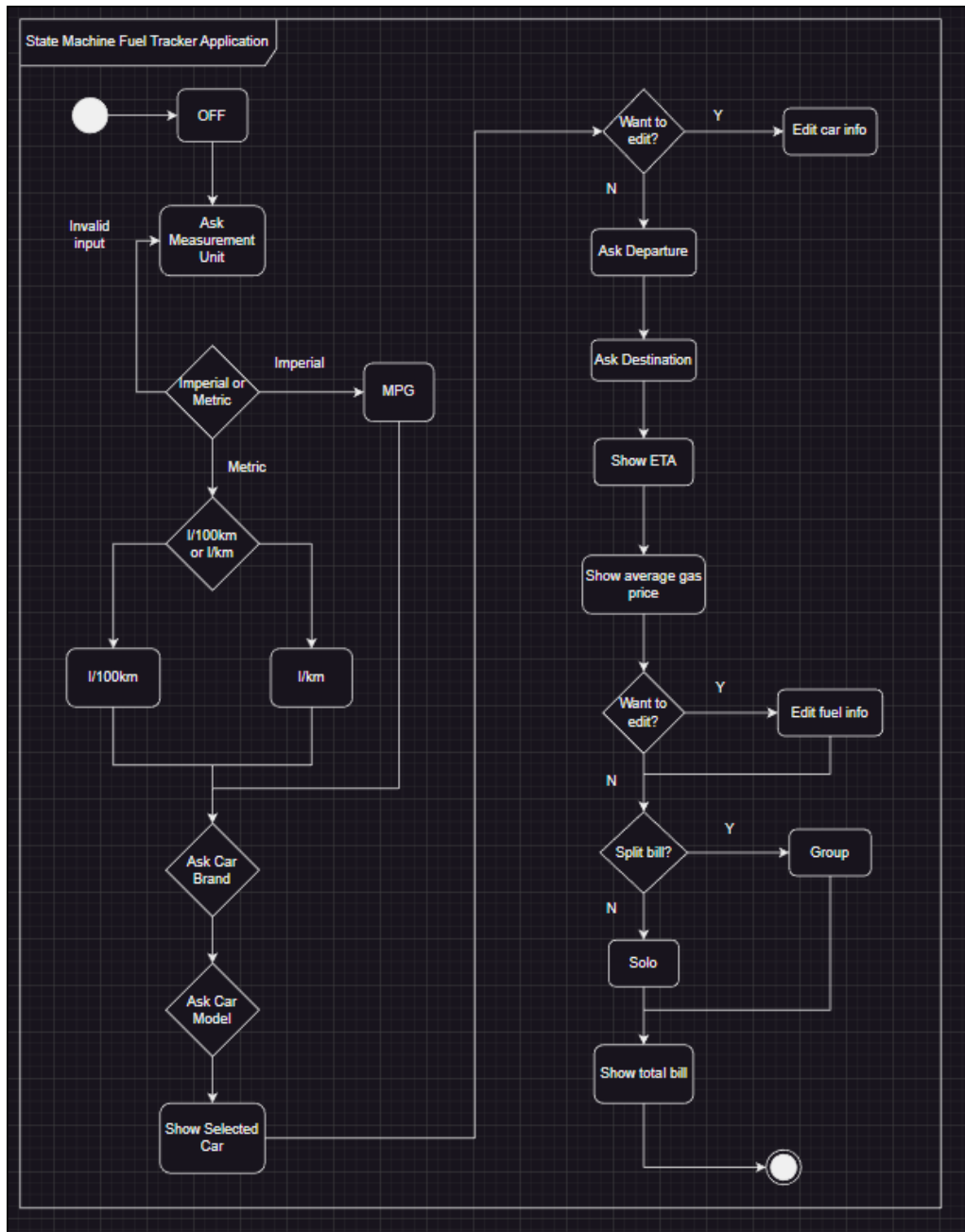
LOGICAL VIEW:

Concerns: Describe the features that the system offers to end users.

Stakeholders: Software architecture, End user

Modelling techniques: UML Deployment Diagram (Physical Viewpoint)

ACTIVITY DIAGRAM (LOGICAL VIEW):



The image above depicts a logical view of the system's behaviour. The console prompt will be used by this programme to show options and information.

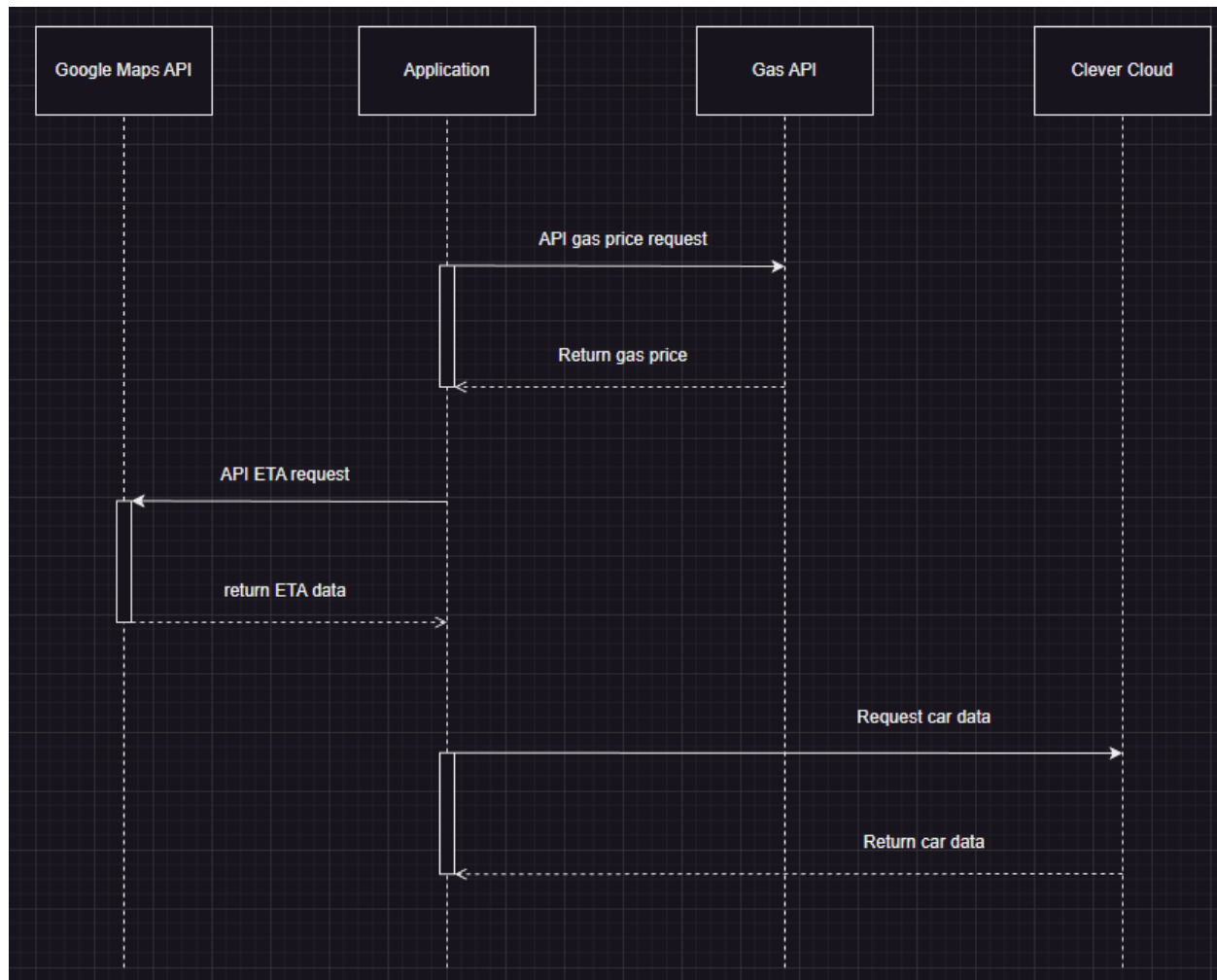
PROCESS VIEW:

Concerns: Describe and visualise the processes and how they communicate, with a focus on the system's runtime behaviour.

Stakeholders: Software architecture

Modelling techniques: UML Sequence Diagram

PROCESS VIEW DIAGRAM (SEQUENCE DIAGRAM):



This diagram depicts the interaction between the application, APIs, and cloud system where runtime communication takes place. The programme queries the smart cloud database for automotive information. In addition, the app requests ETA information from Google Maps and gas prices from the Gas API.