Naan Mudhalvan – IoT Project

Project Name: Traffic Management

Project Description: Use IoT devices and data analytics to monitor traffic flow and congestion in real-time. This information can be accessible on a platform or through mobile apps, aiding commuters in choosing optimal routes.

Team Name: Proj_224783_Team_2

Idea Name: GPS manager

Team Member Details

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Mentor Name: Pratheeba R S

Evaluator Name: Jeba Sundar

Developer Perspective

Description:

- Tracker installed in the vehicle relays real-time location to the database
- Users can log into the site to manage their tracker(s) by creating an account
- Google maps API is used to create a map view with addtional traffic layer data
- Allows multiple vehicles to be monitored effectively in a remote manner

Tech stack:

- Wokwi
- HTML, CSS, JS
- Firebase
- ESP32 with GPS component
- Google Maps API

Consumer Perspective

Model:

- Base tier – Use 1 device with free access to the site indefinitely
- Subscription – Connect upto 5 different devices for an yearly subscription fee
- Enterprise – Customisable no. of trackers with advanced admin dashboard

Requirements:

- Latest version of any popular browser
- Consent for allowing us to store your data
- Stable internet connection to ensure reliability

Innovation

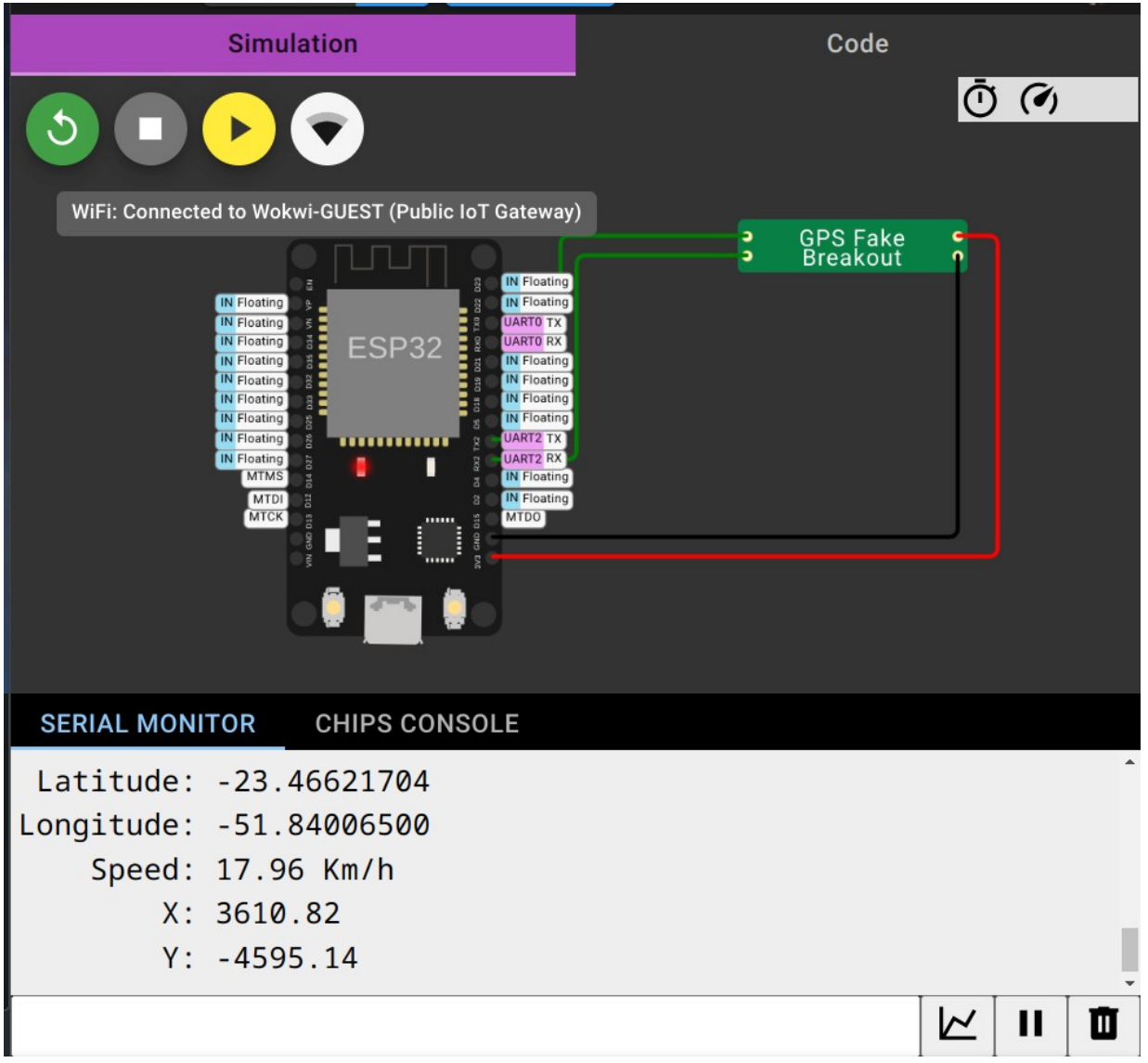
Steps:

- Connect a custom chip with esp32 board at appropriate pins
- Write the C/C++ code for simulating a GPS using NMEA library
- Compile the code onto the physical device and start testing
- Send the data to a database with the help of an WiFi

Innovation

Steps:

- Create and host a web application for user to interact with
- After authentication fetch and display the data on the site
- Integrate google maps API to show map view with Traffic insights

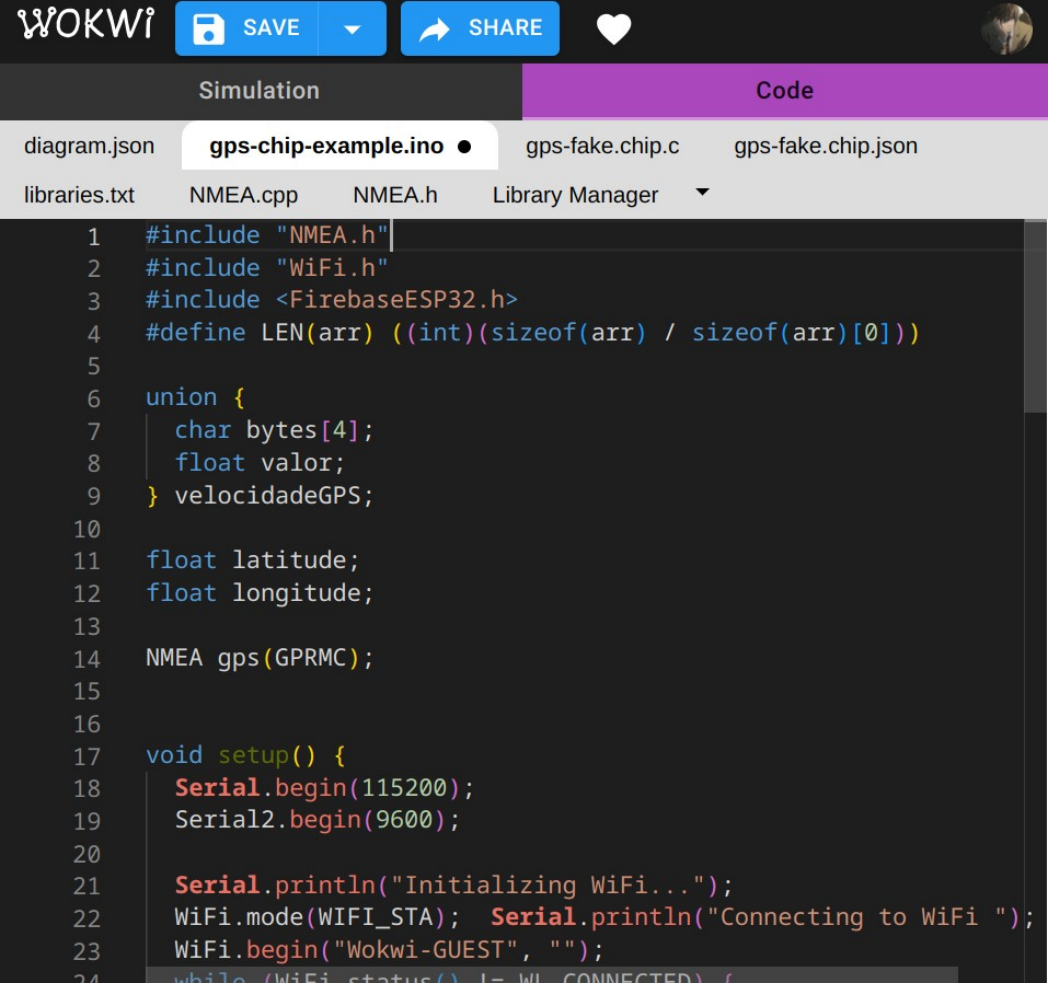


Simulation:

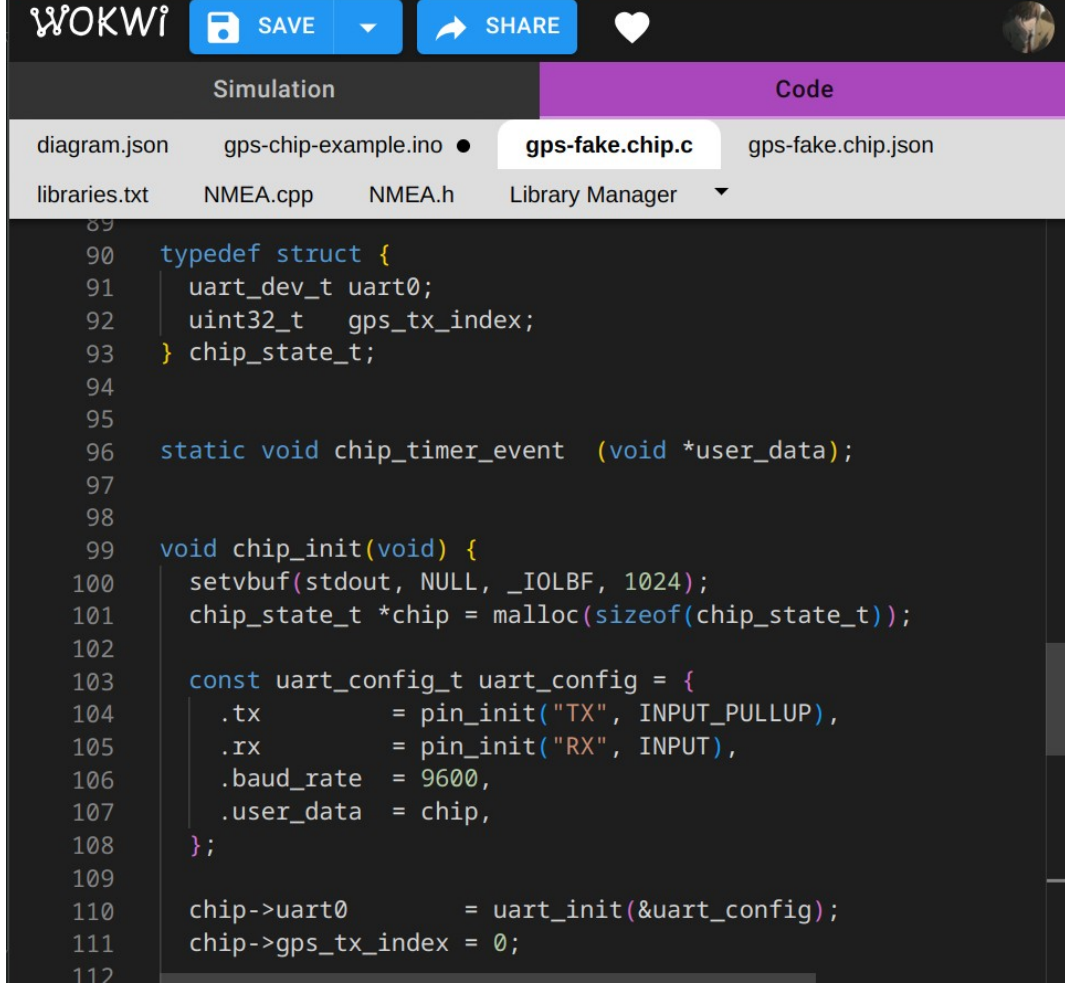
ESP32 is connected with a GPS chip through uart pins

The device is sends data with the help of wokwi's wifi

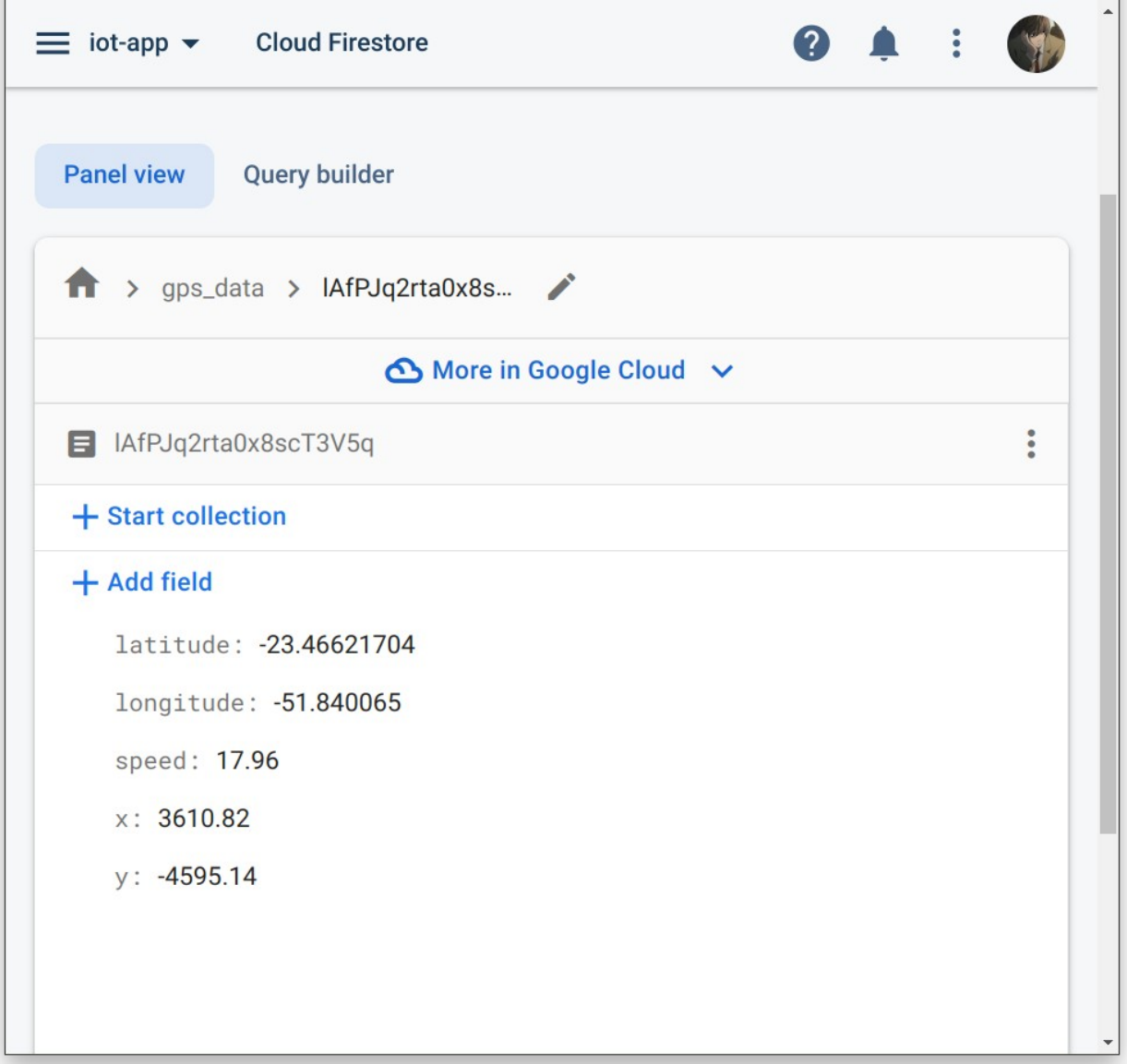
Sample output data is logged in the serial monitor



Main driver code for the esp32 board



Custom code that simulates the functioning of a gps



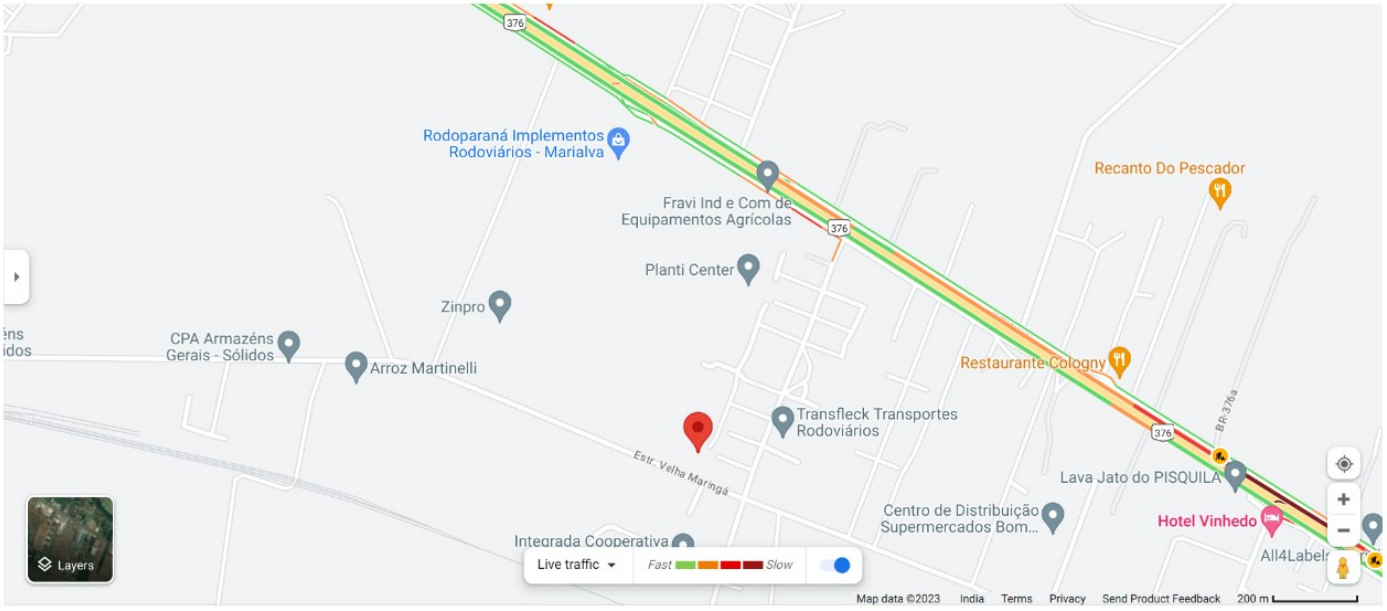
Web application:

Data is sent from the iot to a firestore database

It is then fetched to be displayed on the site

Map API from google cloud platform is used to view the location with traffic data

latitude	longitude	speed	x	y
-23.46621704	-51.840065	17.96	3610.82	-4595.14



Sample view, colors indicate intensity of traffic in surrounding roads

Conclusion

Thus the course objective has been achieved, an iot device for helping users navigate through traffic was created and deployed successfully

Thank You!