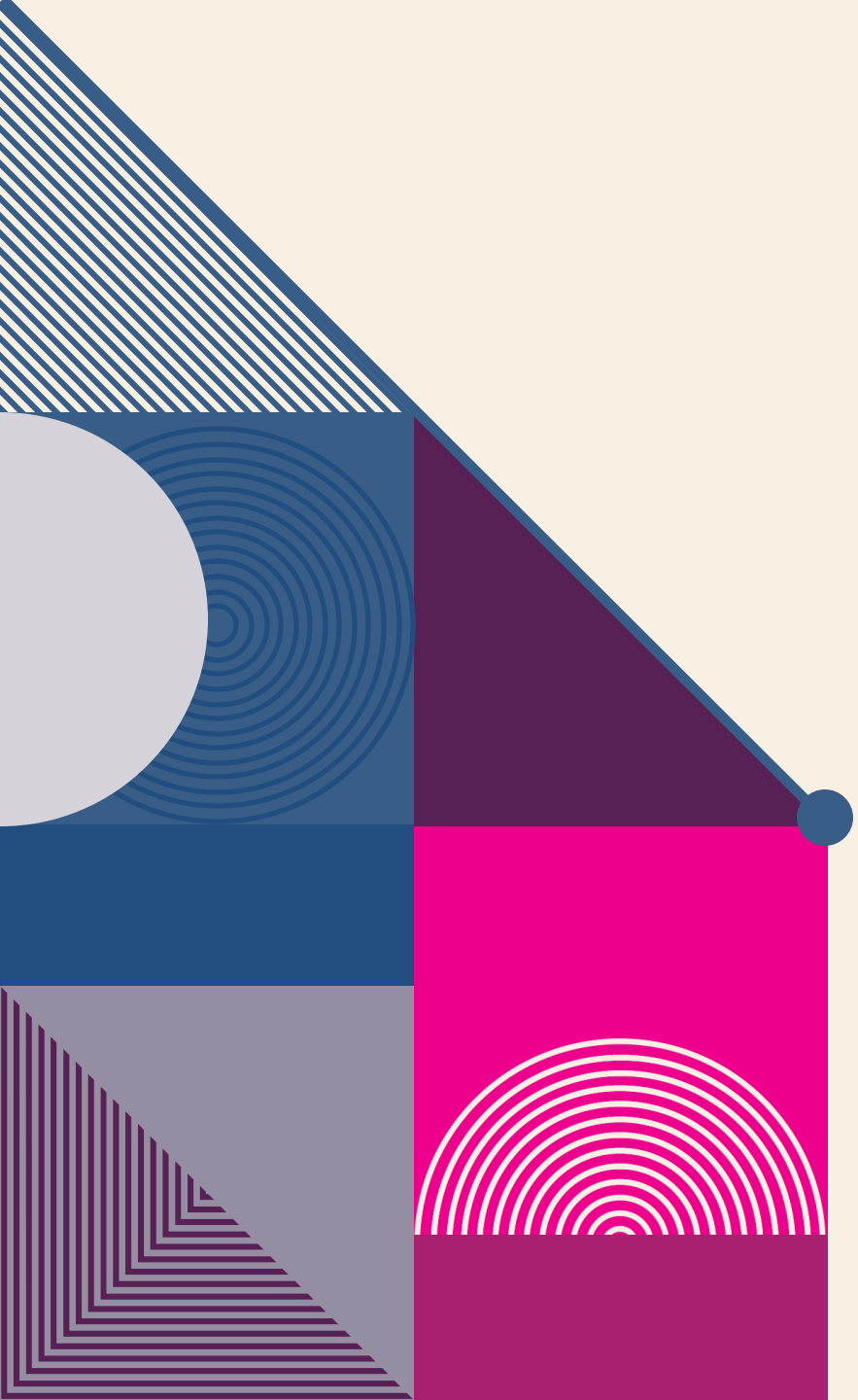
DASS PROJECT RELEASE-2

Team - 15

Team Members - Akshit Sharma, Ishit Bansal, Bhumika Joshi

Client: Mr. Gaurav Kumar,
Cyrrup Solutions Pvt. Ltd.



OVERVIEW

Cyrrup provides comprehensive fleet telematics and management solutions. It develops devices for notifications, vehicle tracking and diagnostics, and surveillance systems. It offers emergency services for both healthcare as well as personal safety and can be personalized and used for other situations such as setting a customized reminder, live vehicle tracking, etc.

Vehicle BlackBox is a Driving Behavior Monitoring Device, designed to keep a check on rash driving, thus ensuring safety on the road.

MOTIVATION

TRACK FUEL THEFT

Fuel theft is a major problem faced by truck fleet owners. Drivers often steal the fuel in the vehicle thus costing additional charges for buying more fuel than required.

TRACKING VEHICLE LOCATION

Vehicle owners need to keep track of multiple vehicles simultaneously. Getting all this information consolidated in a single app would be beneficial.

EASE OF USE

Added text-to-speech and speech-to-text functionality will make the app easier to use and increase accessibility.

MADE IN INDIA SOLUTION

Similar kinds of apps did exist before, however they were mostly created in foreign countries with Indian truck owners not an intended user group. This made in India solution is targeted towards them and is beneficial in providing customer support not available in foreign apps

PROBLEM STATEMENT

EXISTING APP

The existing app provides the following features:

- Theft and Inlet Alerts
- Vehicle Information
- GPS Services
- Trip Reports
- Theft Statistics

ADDITIONS

For ease of use and increased accessibility, two functionalities will be added to the existing features of the app:

- Text-to-Speech- for vehicle notifications
- Speech-to-Text – For login purpose, map query, etc.

PRODUCT OVERVIEW

As part of our project, we have made a software application with the following functionality

GPS TRACKING

Simulates the live-tracking of a vehicle during its journey using GPS on a map.

FUEL THEFT STATUS

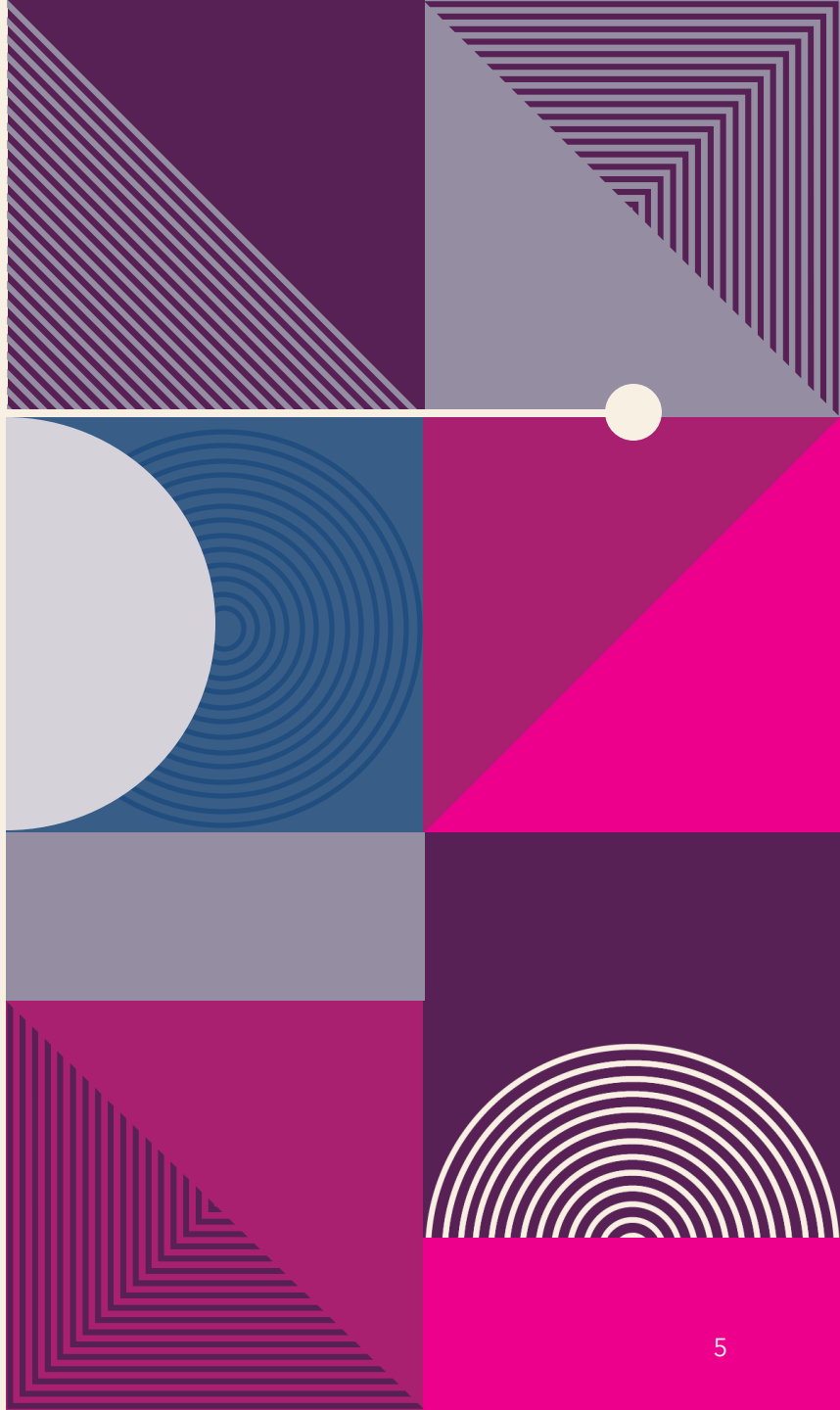
Shows the fuel theft information including the statistics of theft in the past week and month. This is enhanced by a text-to-speech based announcement.

SPEECH ENABLED LOGIN

Login page which supports speech recognition and allows form-filling through voice.

NOTIFICATIONS AND ALERTS WITH SPEECH

Notifications, alerts and vehicle information is presented along with an option for text-to-speech based announcement.



TECH STACK

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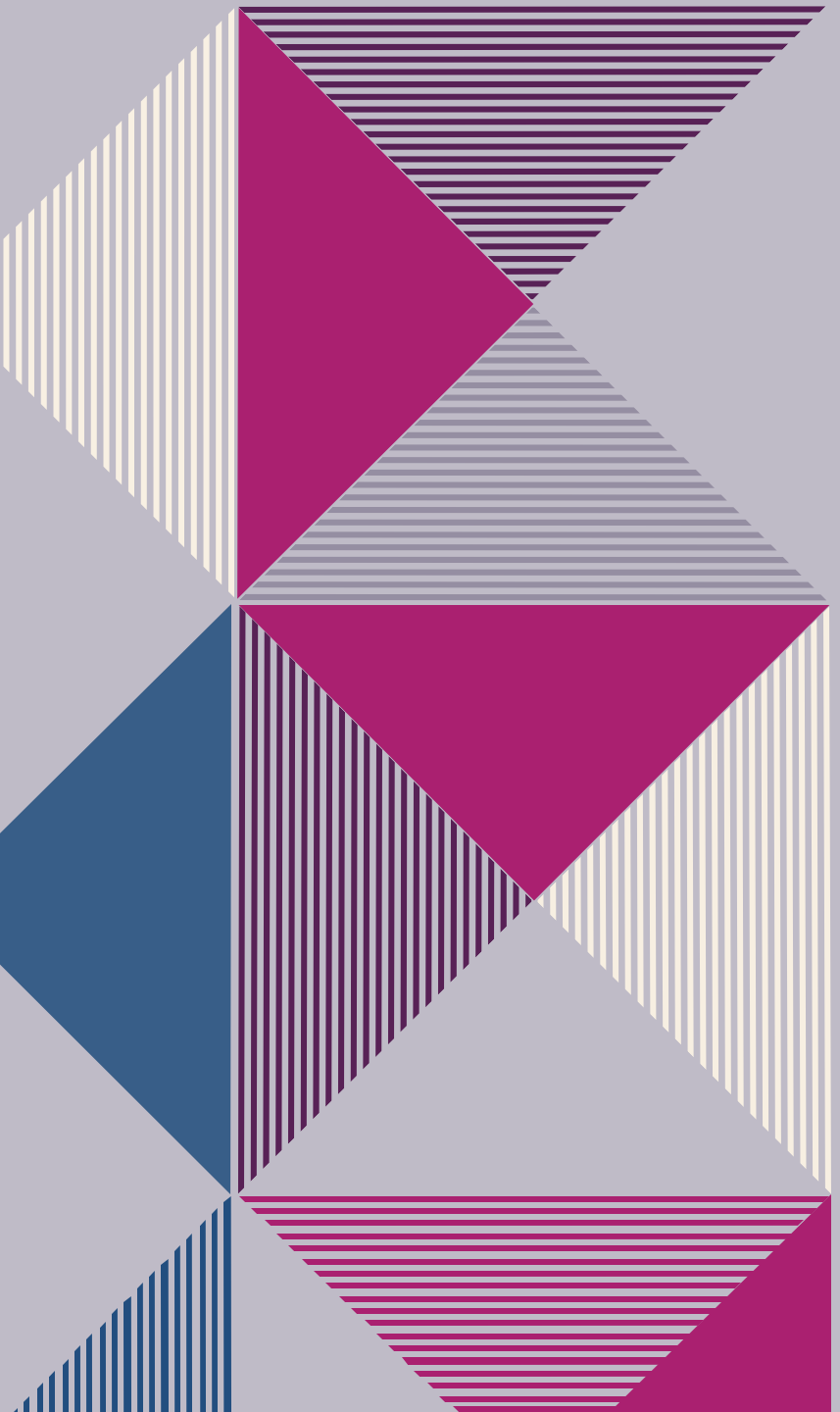
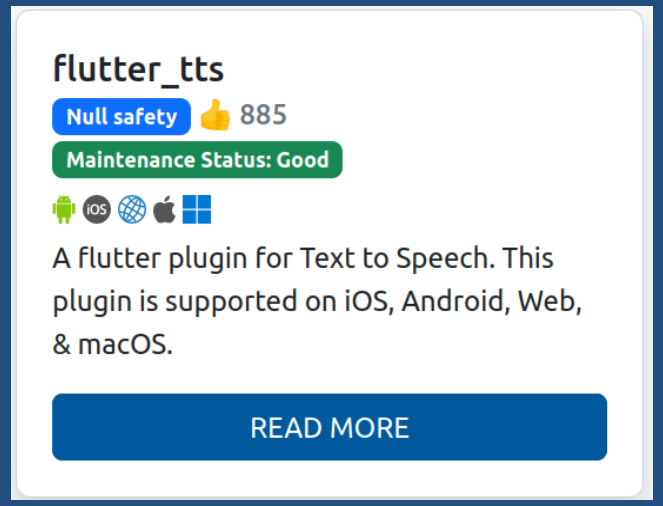


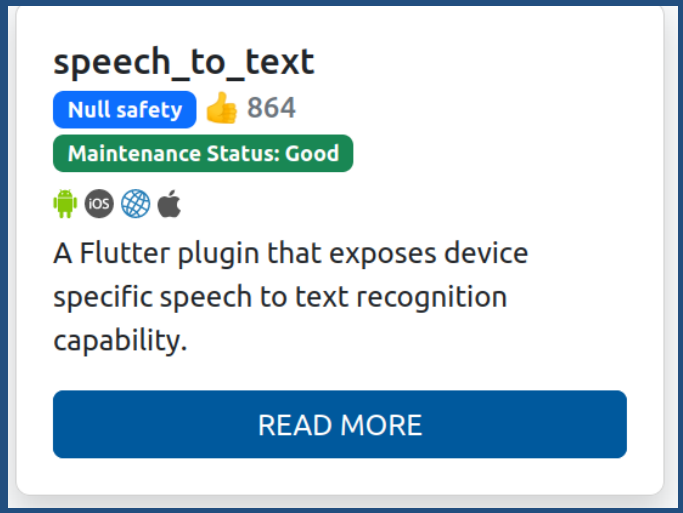
PLUGINS AND API'S

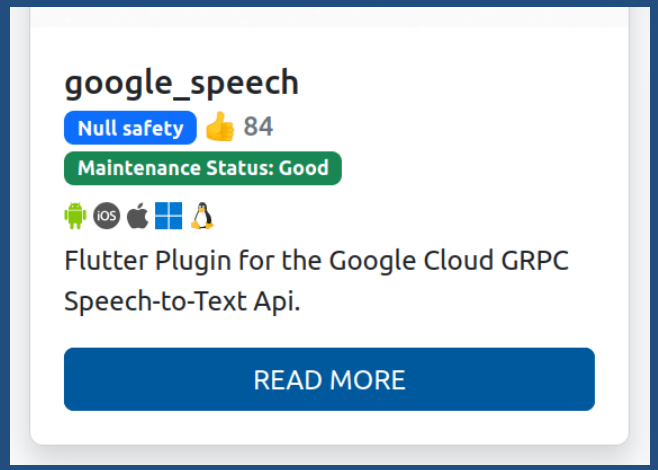
- We made use of the flutter speech_to_text plugin to implement the speech to text functionality of the app.
- We used flutter_tts package for text to speech functionality.
- Used Open Street Maps for diplaying live location of vehicle using data from firebase with the flutter_maps package.

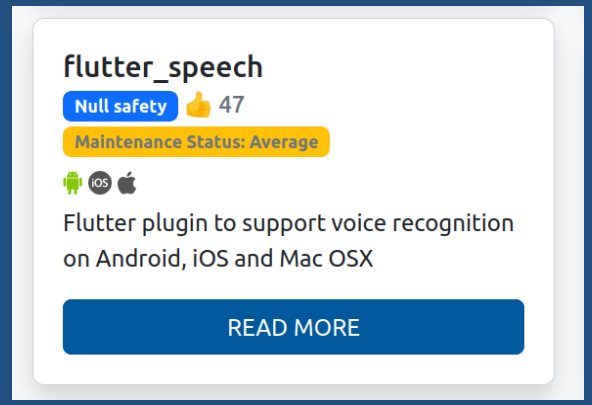
DEVELOPMENT TIMELINE

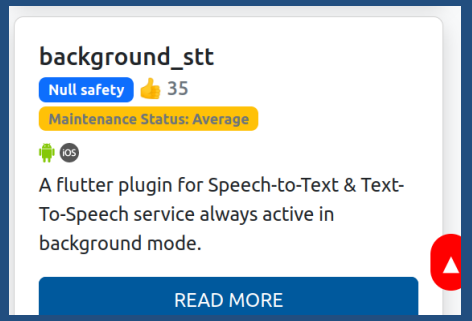
1) Research Free Flutter Text-to-Speech and Speech-to-Text APIs

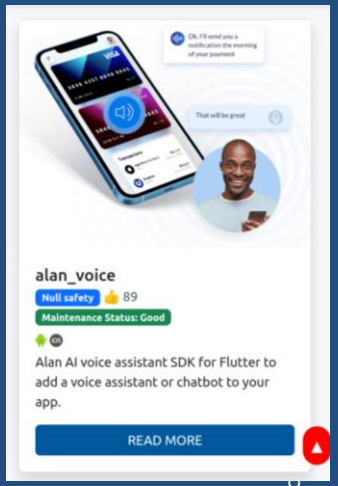






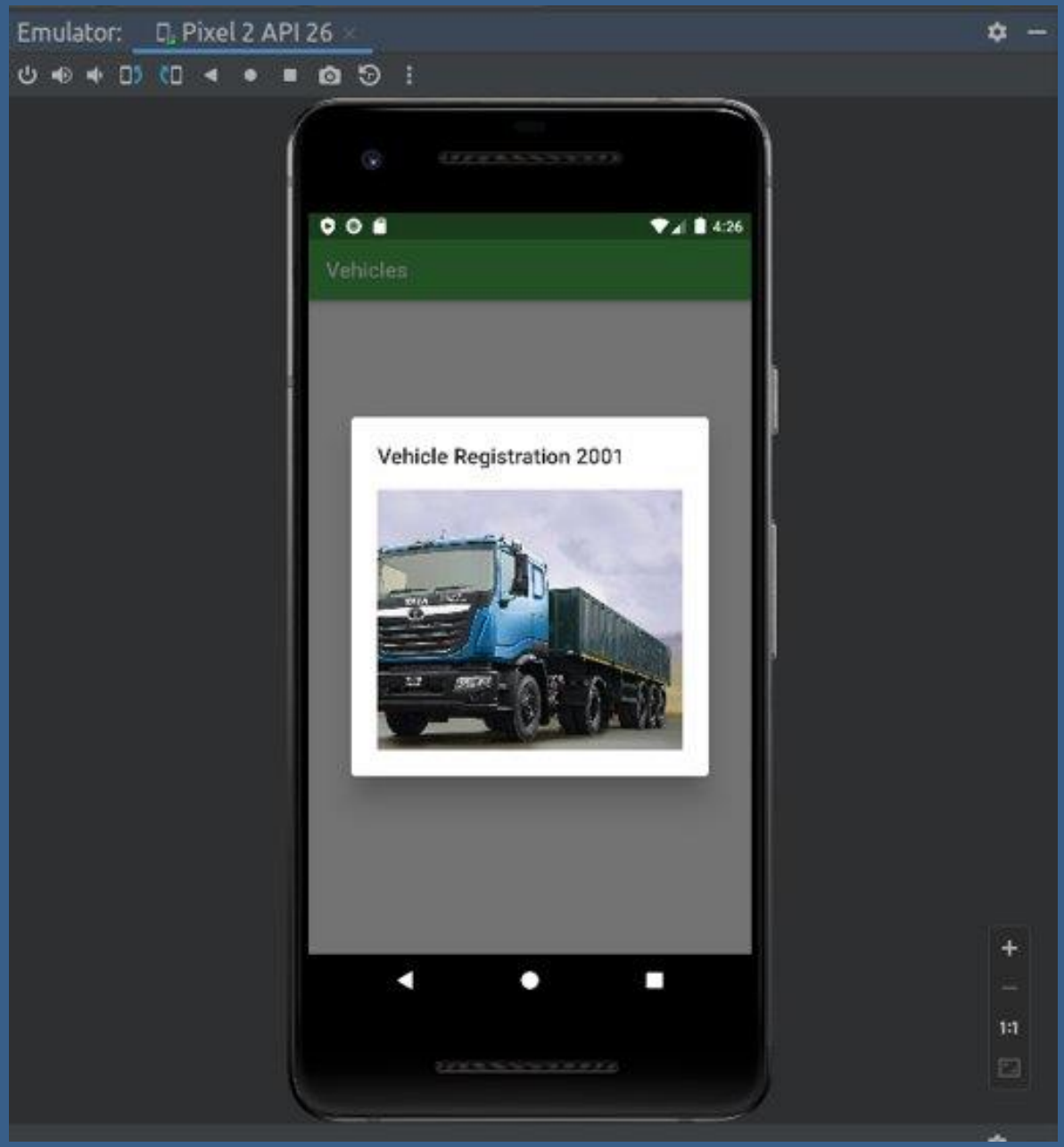






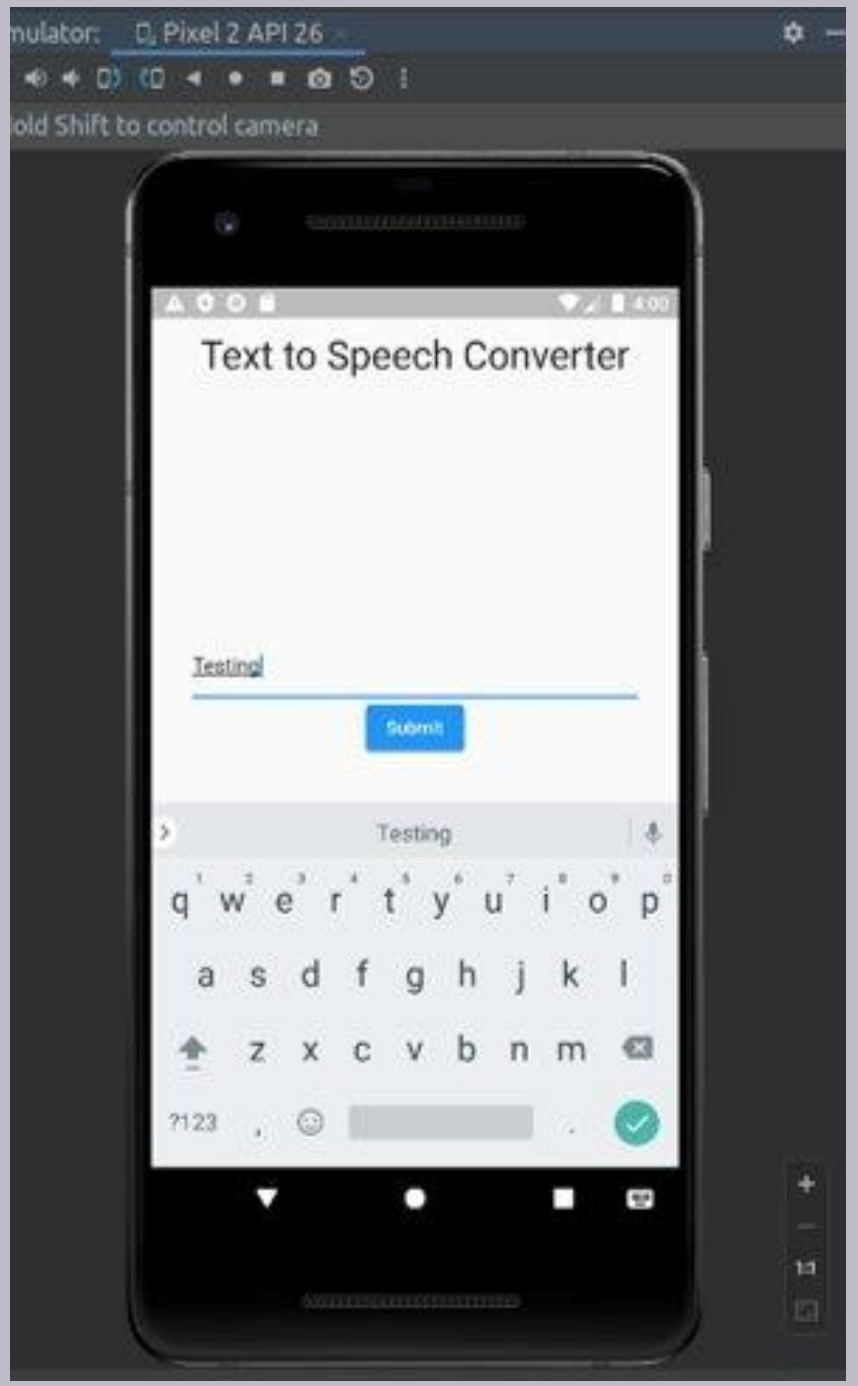
2) Learn Basic Flutter and Make App with pop-up and image

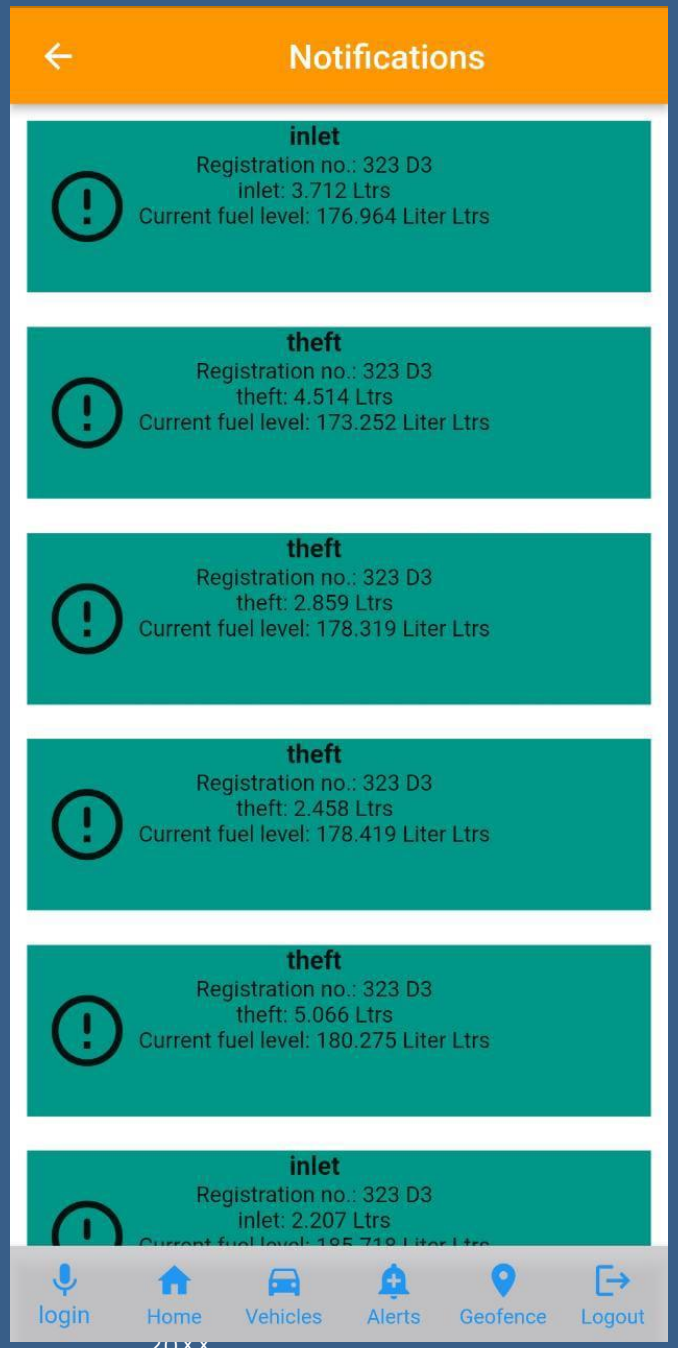
Familiarized ourselves with the language learnt how to make a basic screen with a button and a pop-up with a picture.



3) Text to Speech Convertor with Text input field and voice output

Created basic text-to-speech applet which took input through a text input field and produced speech output of the entered text.



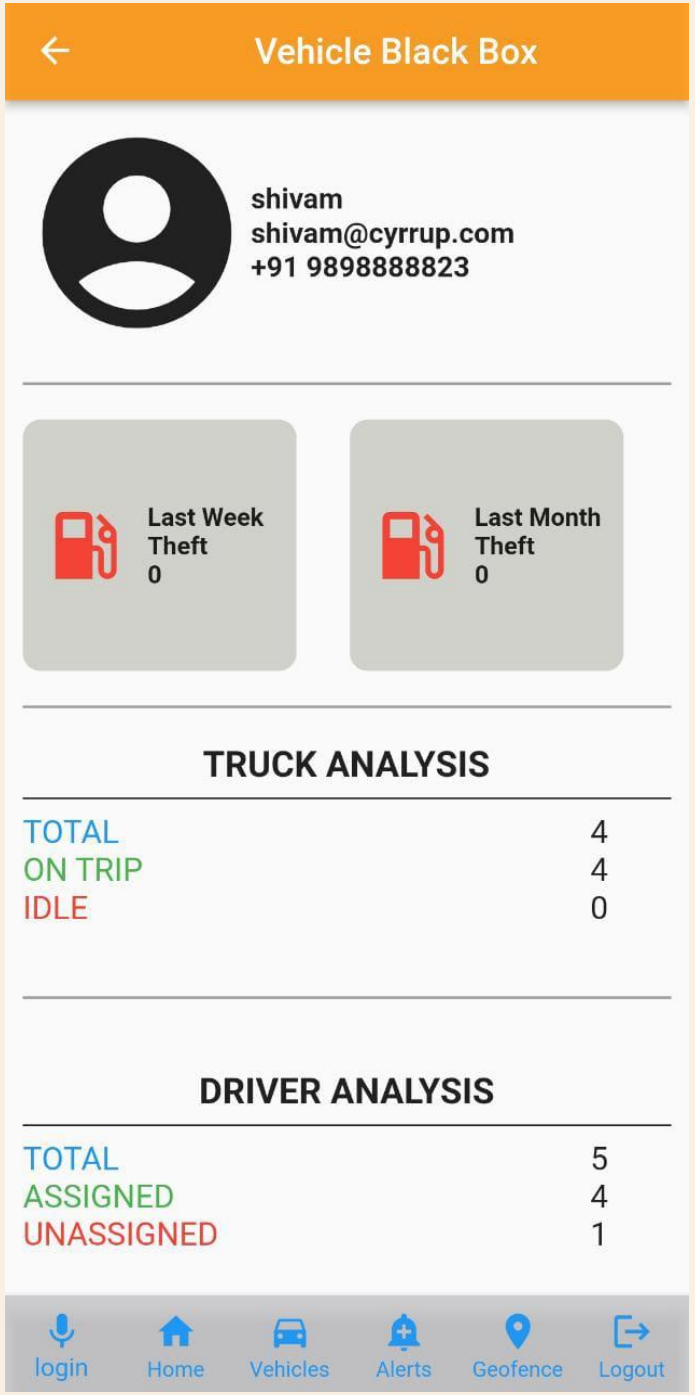


4) Parse Json file for notifications and display them along with text to speech

Taking input from a JSON file, the information was displayed in cards using a list view builder.

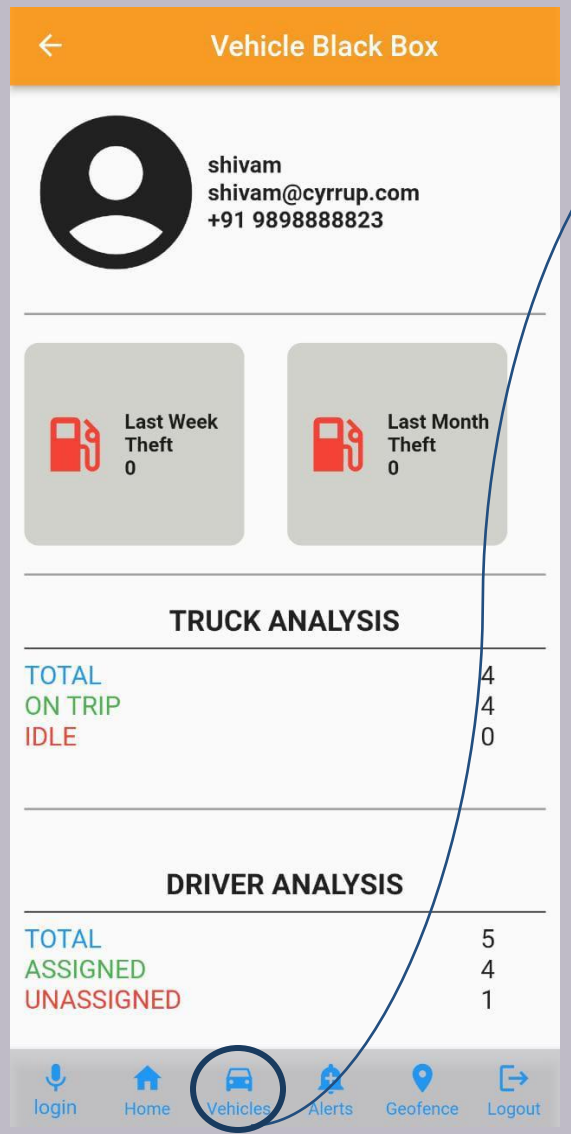
5) Create Dashboard with text-to-speech announcement of fuel theft statistics

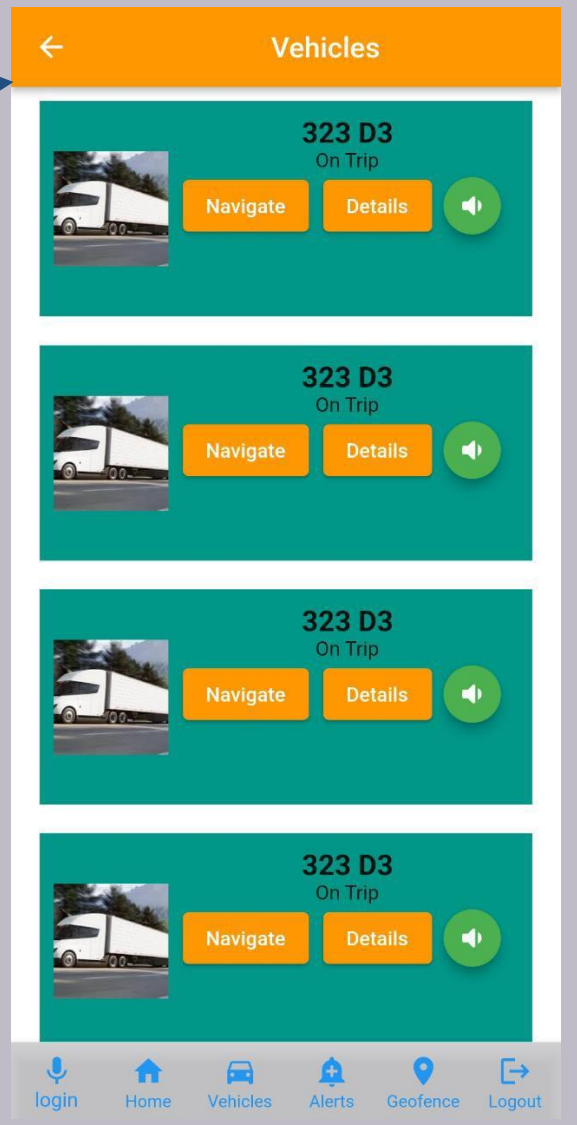
Created a dashboard page for the app which displays the user info, statistics regarding the user's trucks and drivers and displays and announces the weekly and monthly fuel theft statistics.

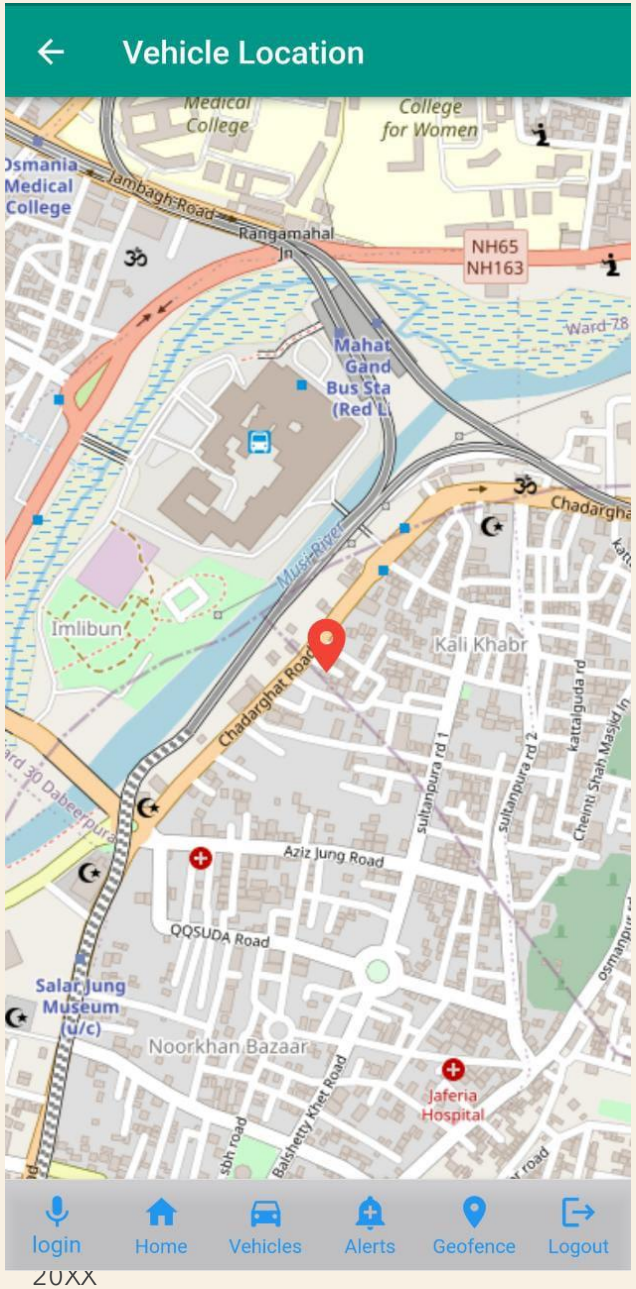


6) Add pages and combine them together in an app with multiple screens. Integrate app with firebase.

Consolidated the different pages into a single app. Integrated the app with firebase so that data is fetched from the database created there.





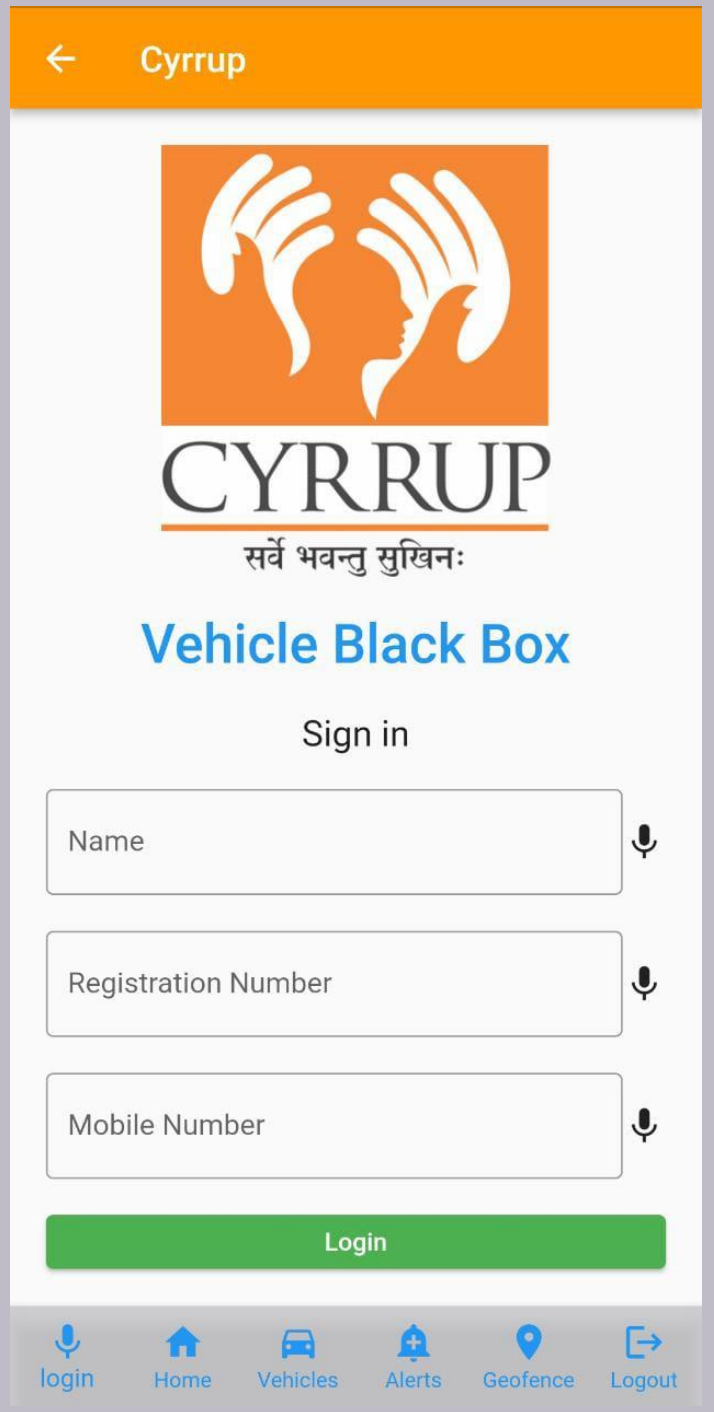


7) Add map with live tracking simulation using python script connected to firebase.

Created a map with a marker showing current location fetched from the firebase database using Open Street Maps. Created a python script which periodically updates the current location of the vehicle in the database to simulate the live tracking of the vehicle.

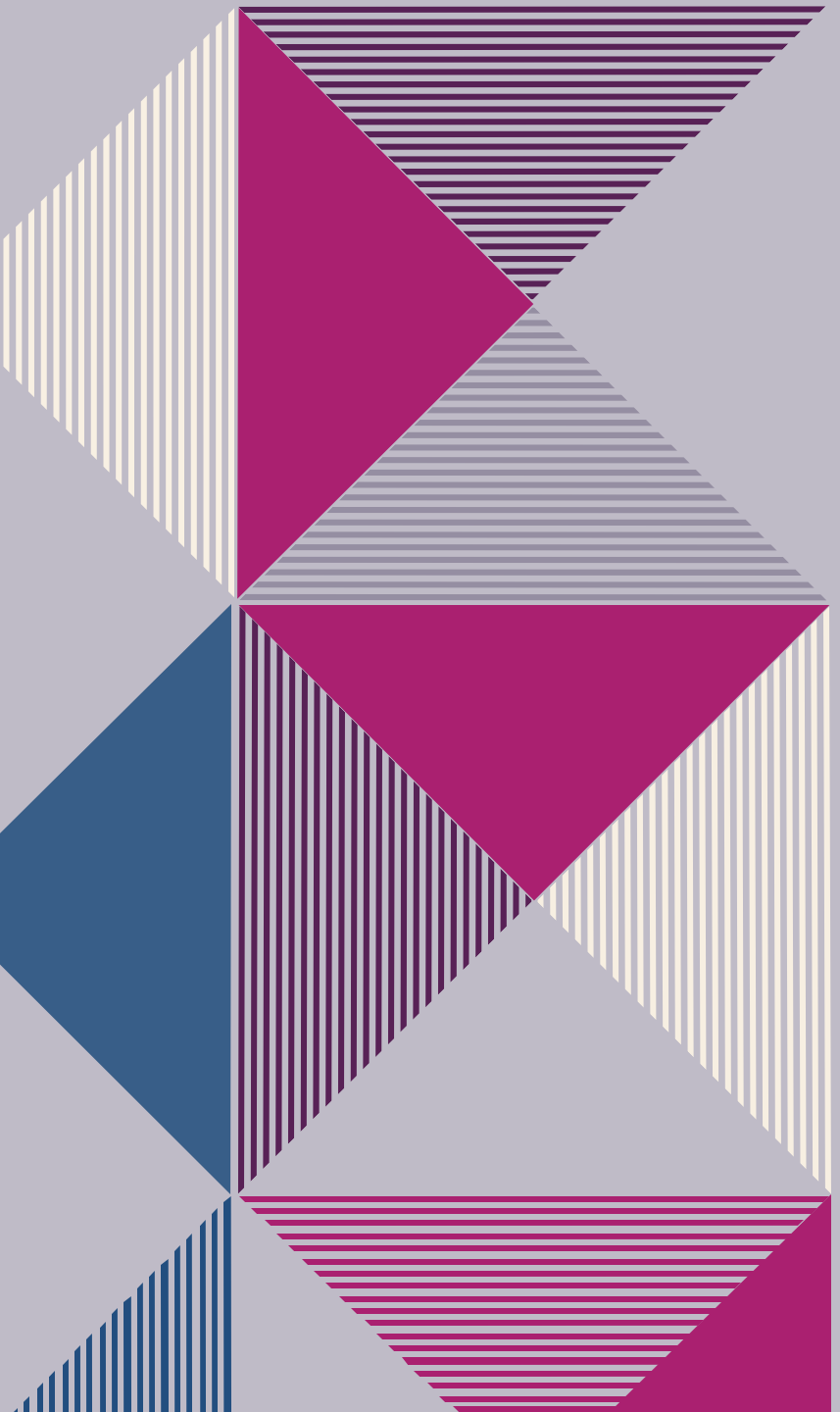
8) Create login form with speech to text functionality.

Created a login form which can take input through speech. When the mic button is pressed, the app takes in audio input and recognizes the words spoken and fills the text field accordingly.



9) Create Login authentication and logout functionality.

Created login and signup functionality to provide authentication. User can sign-up with a username and password and then login to the app using these credentials. After using the app, the user can log out of the app which will bring him/her back to the login screen.



COMPLETED AND PENDING TASKS

RELEASE-1

MILESTONE-1 and 2

Status: Completed

SETTING UP AND GETTING FAMILIAR

- Setting up android studio, flutter , android emulator.
- Getting familiar with Dart programming language.
- Learning about the working environment of android studio.
- Research about different text to speech and speech to text API's.
- Decided to use flutter_tts for text to speech and speech_to_text for speech to text features.

RELEASE-1(CONTD.)

MILESTONE-3 : CODING PHASE – 1

Status: Completed

TEXT TO SPEECH

- Made a Hello World program in Flutter with a clickable image and button.
- Made a flutter program that takes a text input and converts it into speech on pressing submit button using flutter_tts.
- Made a flutter app with multiple navigatable screens and vehicle options on a particular screen which announces vehicle information on clicking along with a pop up for the vehicle.
- Made the above flutter app with the vehicle information as input from local JSON file by parsing it.

TOWARDS RELEASE-2

MILESTONE-4 : CODING PHASE – 2

Status : Completed

FIREBASE BACKEND

- Started working with Firebase for backend.
- Pushed JSON data for vehicle information on Firebase Realtime Database.
- Fetched data in flutter app and displayed vehicle information on app screen.
- Created a navigation bar for the app. Has multiple icons for each app screen. Added more screens later.

VEHICLE NOTIFICATIONS

- Added Text to Speech functionality for vehicle notifications. Clicking speech button on a notification gives speech output for the notification. Done using flutter_tts.
- Created a vehicles page for listing the vehicle along with their current status as per fetched data.
- Created home page to mimic client's app. Displayed monthly and weekly fuel theft, fleet analysis (listing status, no. of vehicles, etc.) and the driver analysis (no. Of assigned and unassigned).
- Added text to speech on this page for speaking the monthly and weekly fuel theft on opening the page.

TOWARDS RELEASE-2

MILESTONE-4 : CODING PHASE – 2 (Contd.)

Status: Completed

MAPS FUNCTIONALITY

- Adding the maps functionality to share live vehicle location.
- Used Open Street Maps from the flutter_maps package.
- Created a python script to push data from local device to Firebase Realtime Database.
- The script updated the location of the vehicle in every few seconds.
- Fetched the location from firebase in flutter app after a fixed interval and updated marker on the real time map to show latest location of vehicle.
- Map supports zoom and pinch functionality.

TOWARDS RELEASE-2

MILESTONE-4 (Contd.)

Status: Completed

SPEECH TO TEXT

- Created a Login page to simulate the speech to text functionality.
- Added mic buttons to input fields of login form to take speech input from user on click.

USER AUTHENTICATION FOR APP

- Created a login and signup page in the app for user authentication, firebase realtime database used as backend.
- Added animations to login and signup page as part of UI improvements.

TOWARDS RELEASE-2

android

MILESTONE-5 : INTEGRATION AND TESTING

Status: Completed

- Independently tested all the pages.
- Integrated all the pages in a single app.
- Thoroughly tested all the functionalities of the app.
- Installed the app on an Android device.
- Made UI changes for making app responsive and work with all devices.
- Created APK for sharing with client for final approval.

Status: Pending

Separation of speech_to_text functionality into a separate module so that it can be imported in any screen if wanted.

CHALLENGES FACED IN PROJECT

TECH

Inexperience of app development, new technologies like Flutter, Firebase along with Python

TIME MANAGEMENT

Development of a flutter app requires proper coordination and time management. Taken out time from hectic course work was challenging.

COLLABORATION AND COMMUNICATION

Need for proper communication, coordination and collaboration from team members to meet deadlines and requirements.

THANK YOU!

ANY QUESTIONS?