بسم الله الرحمن الرحيم

An-Najah National University

Faculty of Engineering & Information Technology

Software Graduation Project

FLY CAR

Rent Car & Order Taxi

Done by

Rahaf Ahmad Rasheed Melhem

11821193

Seema Mohammed Abd-Alhameed Nassar

11820036

Supervisors

Dr. Abdallah Rashed

Fall 2022

Acknowledgement

The success and end result of this project required a lot of guidance and assis- tance from many people, and we are very pleased to have had this throughout the project.

First, we give all the glory to God, the source of our strength for granting us both the mental and physical endurance to complete this project.

The most, we would like to express appreciation to Dr.Abdallah Rasheed our super- vision and guidance, for his invaluable assistance throughout our project We are extremely grateful to our families and dear friends for support and guid- ance. Last but not least, all thanks and gratitude to everyone who cooperated and contributed to the completion of this work.

Abstract

Nowadays technology occupies a large space in our lives, especially in applications aimed at solving a problem. It is good that technology has recently been added to create modern technological solutions

This project is based on two parts, the first is to solve the problem of road crises through the taxi order section, and the other part is car rental.

The first is a taxi order, where taxis are distributed at specific locations. The application displays the k-nearest neighbors' algorithm (three nearest taxis), so that these three cars are colored in a color (yellow), different from the color of the other cars. Of these three, the closest one is identified and colored (red). This is how they show the user the three closest ones on their site, plus the other part is car rentals. Any company or car showroom sends a request to the application administrator in a request to join our application to display their cars, so that the supervisor accepts or rejects them. Cars are booked through the calendar by specifying the days each user wants and others. We will talk about it in the next items. This project includes a mobile application. The Flutter framework, which is based on the Dart programming language, was used to create a mobile application. It also provides an API, which is an open-source server environment used by Node js to enable core features of applications and to handle the two types of databases used, 'MySQL'. And a web page was made for the admin in PHP

Introduction

Problem

One of the problems that we have considered is the problem of crowding people on the roads waiting for a means of transportation (taxi), so we see a number of them crowding in the streets, in addition to the delay in the means of transportation in responding to emergencies. We aim to reduce these congestions and provide a means of transportation

as soon as possible, so the user creates an account on our application and enjoys the service through the map, so that it shows him, according to his location, several taxis distributed in different locations, and shows him the three nearest taxis and the closest ones.

As for the other problem, which is renting a car, our application allows the user to book any car he wants while he is at home with ease. When he chooses to request a car rental, a calendar appears to him, through which he can choose the period he wants by specifying the first day and the last day, and the application can be classified according to company names, rental prices, and car names.

Objective

The main goal is to facilitate people's lives by facilitating the transportation process and facilitating the process of renting cars at any time and from anywhere through our application

Scope Of the Work

Taxi request focuses on locating the user, showing taxis in different locations, and showing the nearest three taxis according to KNN.

Car rental booking from anywhere through our application, which includes several car companies.

Importance

1. Order taxi:

   Reducing the crowding of people in the streets by providing a fast taxi system

   Safety through the driver's wire main paths

2. Car rental

   Facilitating the rental process for people without the need to visit any showroom

   Facilitate anyone from outside the country to search for exhibitions,

Report Organization

The report is often broken down into seven sections: introduction,

Constraints, codes, and standards are followed by a focus on the major difficulties and previous courses used in the project, a chapter on literature study, and finally the methodology chapter, which will cover the work and the tools and technologies used to construct this project.

Then, in light of our findings and conversation, we will emphasize the challenges we faced and the accomplishments we made. Finally, the conclusion chapter contains our recommendations and future work development objectives.

Constraints, Standards and Earlier coursework

Constraints and Limitations

In each project, the constraint can appear during each stage of the project, starting with the selection of the title of that project. The following are the constraints encountered during the completion of this project:

1. The problem: Correctly identifying the issue took a lot of time and work.
2. Limited Resources: Some programming-related resources were quite hard to find, making it necessary to make two separate efforts to learn from various sources.
3. Lack of time: Such projects cannot be finished in 4 months, beginning with the search for a problem.
4. Fixed cost: halting some uses due to the expense.

Standards

MVC (Model View controller)

The entire project has been divided into 3 main phases using the Module View Console style in our system. These components are as follows:

1. The Model: Represents the database we used, MySQL. It will respond to both the view request and the controller request to keep updating itself.
2. The View: It is a graphical user interface that users use to request a taxi from the map, track taxi locations, and also rent cars, and a web interface for the admin who sees all.
3. The Controller: Represents the back-end server built with NodeJS, and facilitates coordination and collaboration between Model and View. It is also responsible for managing the logic of the application...

Agile Model

The agile model is the scope and requirements of the project at the beginning of the development process. Plans for the number of iterations, the duration of each iteration and its scope are clearly defined in advance. It was divided into five categories, which are:

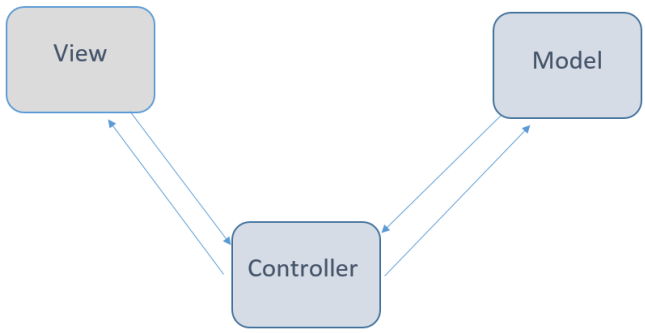


Figure 1: MVC Structure of the system

1. Plan: Planning and researching the two ideas
2. Design: We designed a UML diagram to show the functionality of the new features and how they will interact with our system.
3. Code and Test: We designed a UML diagram to show the functionality of the new features and how they will interact with our system.
4. Release: We release the project for the user's work environment.

Earlier coursework

During the last 4 years, we studied many courses in the Computer Engineering Department that added a lot of knowledge and Skills like programming. Some of these courses helped us with this project:

- Object-Oriented Programming.
- Web Programming.
- Artificial intelligence.

Plus, we’ ve taken online courses at:

- Node.js.
- Flutter.
- MySQL.

- PHP
- that helped implement and develop our project.

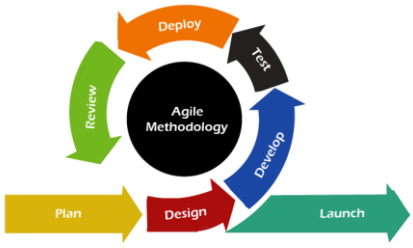


Figure 2: Agile model

LITERATURE REVIEW

The importance of smart phone applications in being one of the most important and latest smart phone applications Modern technology programs that have been able It affects all areas of contemporary life because it is based on solving many problems, The main problem is the problem of congestion in the streets. Citizen uses

The application appears on the map to know the taxis and their locations near them, so that all cars appear to it in black, and the nearest three cars are calculated on them, which are colored in yellow, and the closest of these three are calculated in red through the gate and (K-nearest neighbor) on it so that the user sees the three nearest And closer to them, so that the citizen clicks on the taxi and a box appears to send a message to the driver or call him to request this taxi , And what if it is busy or not, the application contains taxi sites so that any car rental company joins our application by sending a request to the application admin, then it is rejected or accepted. If accepted, the company becomes part of our application, it can enter its car and display it in our application through a web page They are set up as their own, so the user can get to know all the companies and their vehicles. The car can be reserved through the calendar. The user chooses the days he wants by specifying the first day and the last day. The cars available at that time appear to him (cars that have not been permanently booked and cars reserved for him, but at other times). The user chooses the car he wants, And he can choose the option to filter the application so that the filter is applied through the company' s website, which makes it easy if he is in a city and wants to see only the companies of this city, and he can filter through the name of the car, the rental price, and the name of the company, and he can search by the name of the car, so when he chooses the car The one he wants to click on, and additional information about the car will appear to him, as well as moving to the payment page through a credit card. If the user has enough money in his wallet, the process will be completed successfully. If there is not enough money, he is told that there is not enough money. , according to the number of rental days with this car rent per day.

Methodology

We came to the conclusion that the project idea was a great one that would help the citizens based on the findings of the research and review of the literature done in this respect. This chapter will cover data gathering, analysis, and processing as well as the procedures, apparatus, and systems applied during the development process and the outcomes.

Tools, Methods and Programming Languages

Many programming languages and frameworks had to be used when designing the app for mobile devices, Here is an explanation for that:

Client Side

Design: We started working on the application after choosing an idea, and the prototypes were prepared for its application. Then we chose the color theme file for the app, and I used a simple, easy-to-use, and basic design.

Frameworks: A framework has been used that enables you to work on Android and iPhone applications. Through Flutter which saved a lot of time and effort in cross-platform development. Apart from that, Flutter also provides several ready-to-use (UI) tools for creating a modern app. These tools are optimized because they preserve 1 pixel of the screen, ensuring that our design looks the same on any mobile device with a screen (including older ones), all in a short amount of time. Although it is a relatively young language, it contains a large number of libraries that facilitate code generation and add elegance to the application. And, we design web page using php.

Server Side

Servers Design: We used client and server architecture. We have used it like this many of our customers (in mobile applications), admin, citizen and driver will each have a programming interface.

IDEs and Code Editors

To edit the code, we used Visual Studio Code. It offers exceptional capabilities through downloadable plugins, making the development process more adaptable. Debugging, code formatting, and code completion. Since we were developing for iOS, we needed Android Studio, and we only needed one IDE to do this.

Version Control

For a project of this size, such as ours, backup and version control are critical. We created one GitHub repositories, for the application, to which we regularly uploaded All code and its documentation live in one place by combined the work done by the two

individuals on their respective devices to avoid any data loss or substantial conficts.by GitHub makes easier for team members to collaborate and track code changes.

Server and API Testing

As we all know, we need to test portions of the server on a regular basis to determine if the API is usable and what happens when we submit the necessary data. All of this is done with Postman. Postman is often used to accept and dis- play data to the user. Postman is an API platform for building and using APIs. Postman simplifies each step of the API lifecycle and streamlines collaboration so you can create better APIs—faster.

Database Design

We can't develop a mobile phone or build a website without a database that saves and stores everything that is used in the app. MySQL was chosen because the most important aspect of this type is the database, which is a dynamic and flexible scheme. So, we created a database called Fly car, which contains tables that store all the data.

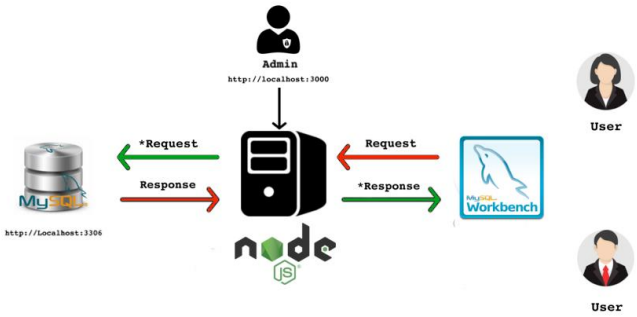


Figure 4: MySQL Server

To create the database, we followed these steps:

- Split the entire application into a collection, then install a file Document attribute.
- Determine the relationships between collections.
- Implement each type of relationship in the right way using primary and foreign keys.

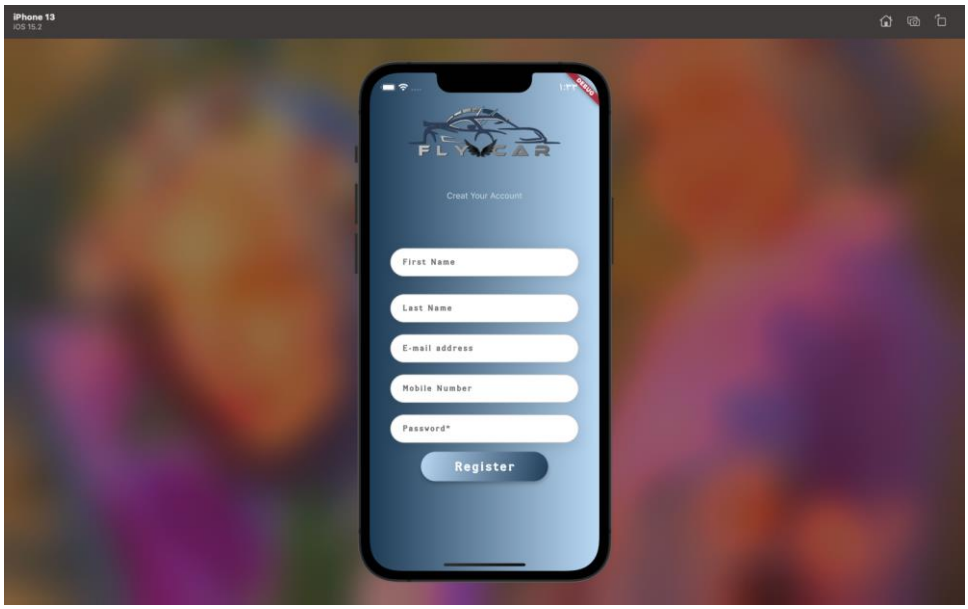
System Features and Implementation

They can be categorized in groups as the following:

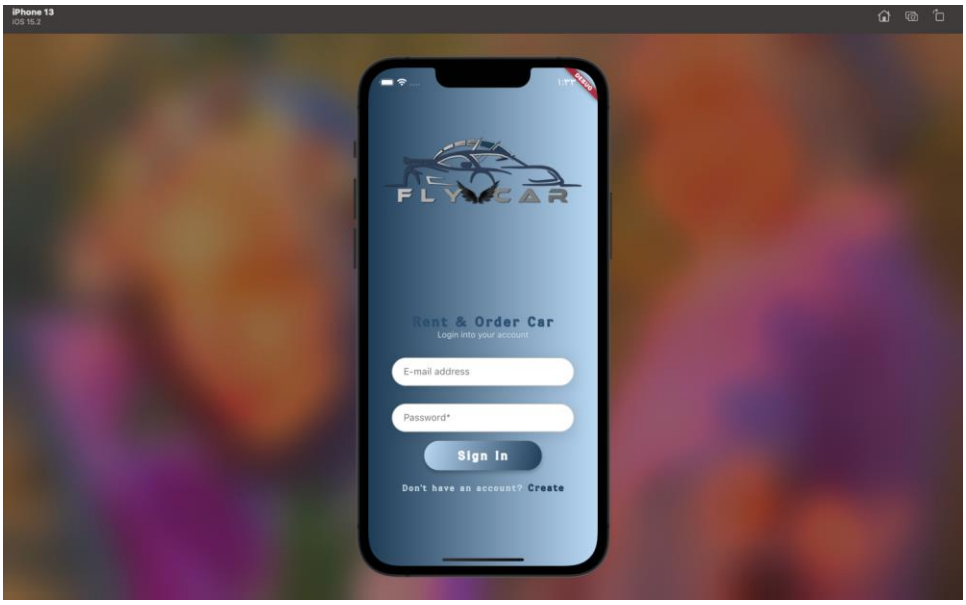
Login and Registration feature

Starting from the splash screen which is the starting page of the project, then to allow users to enter the system and take advantage of its features, they must create an account on the registration page and add the required information that includes your name, phone number, email and password. So, this data has certain conditions. A citizen cannot create an account without fulfilling these conditions, after which you can log into the system via email and password.

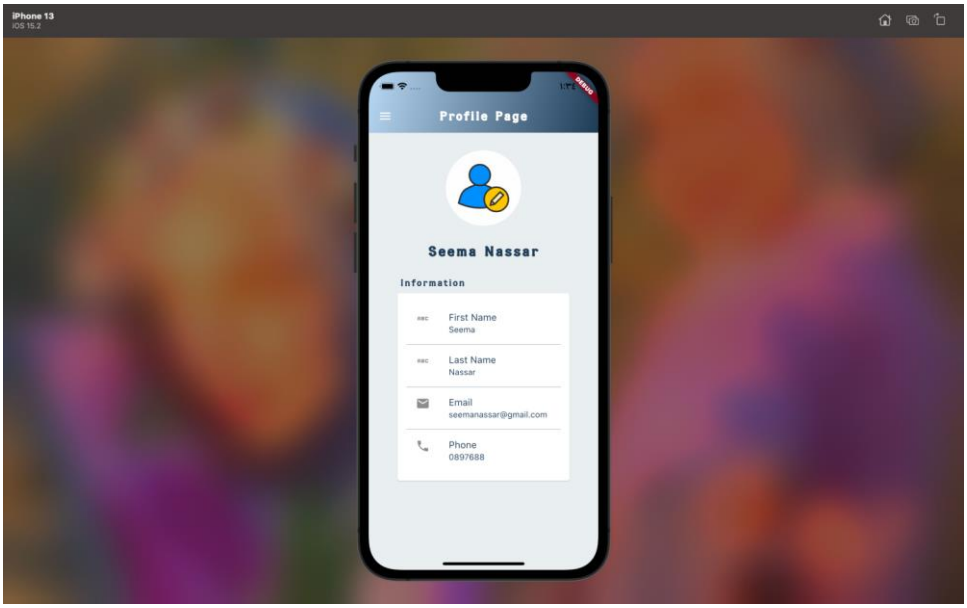
signup



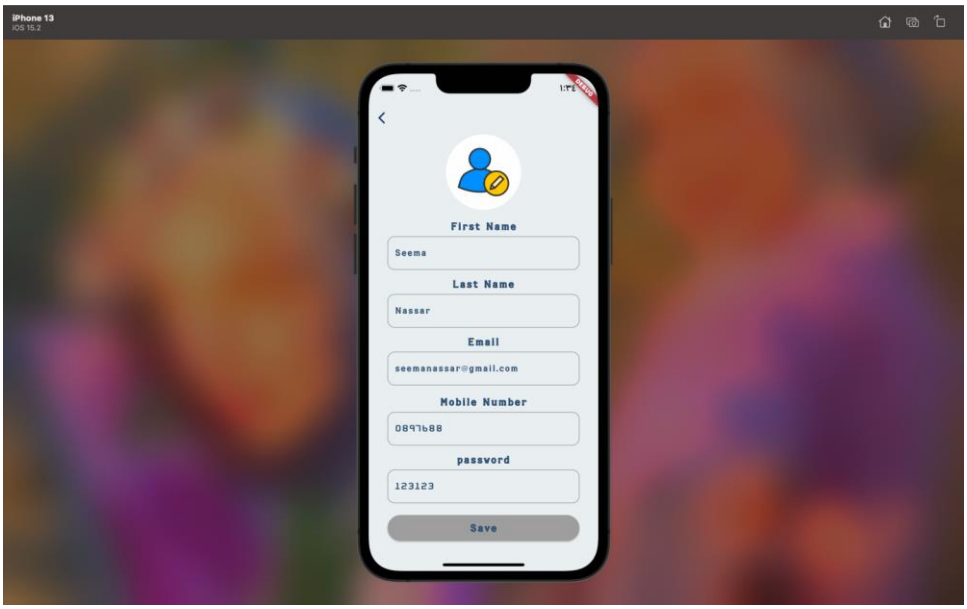
Login page



The personal page of each user and the information can be modified

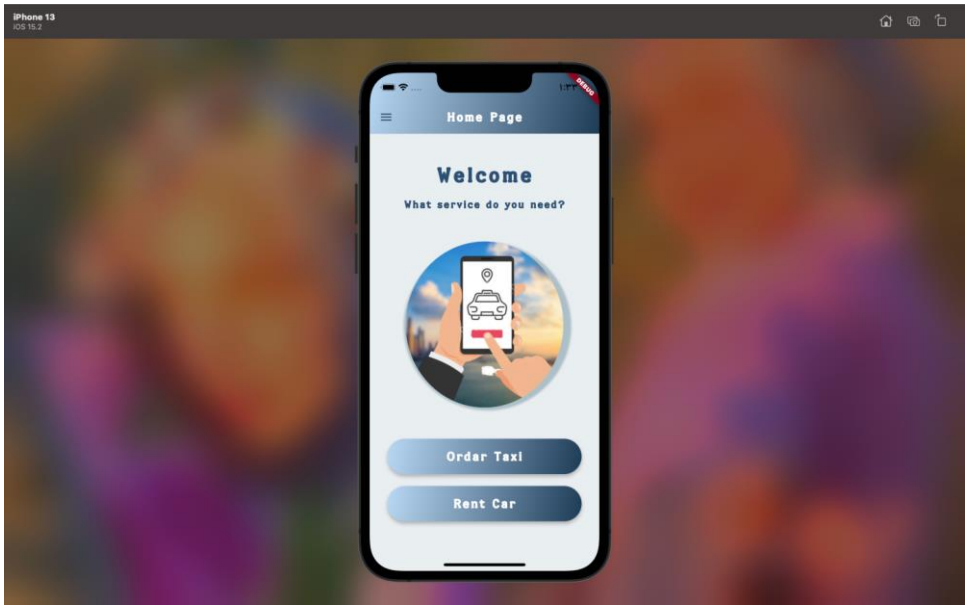


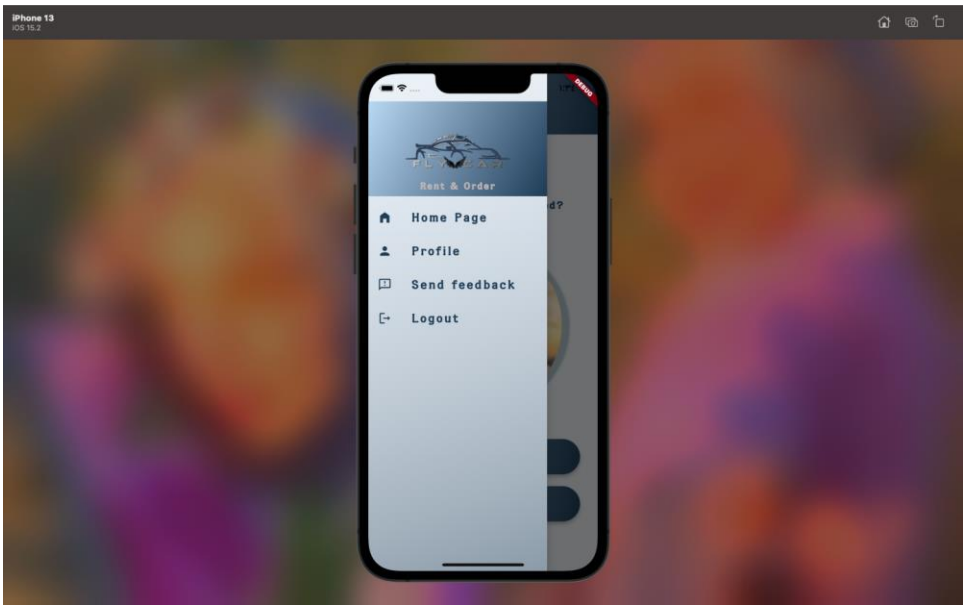
Page to edit the information



First page

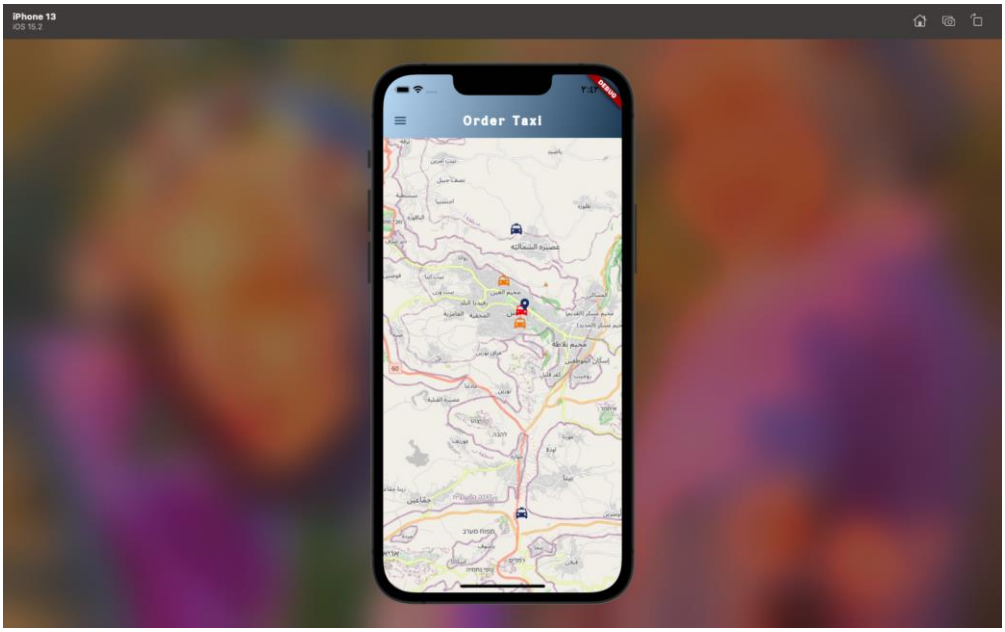
When logging in, the main page appears, which contains two buttons,
one if the user wants to **Order Taxi**, and the other if he wants to **Rent Car**



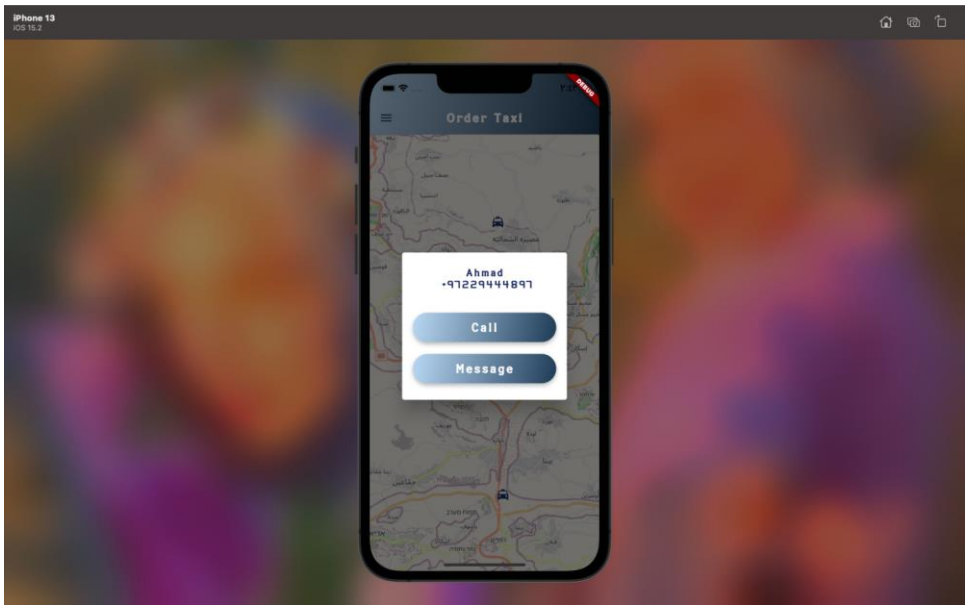


Taxi feature

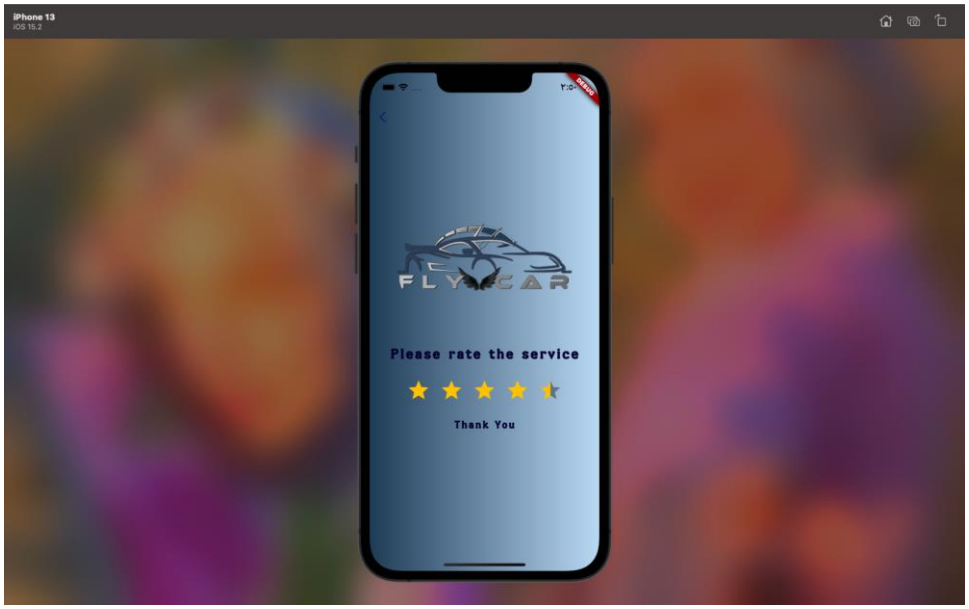
1- Adding the location feature to the taxi: After logging in successfully and selecting the taxi request, the first page that the user sees is the map. The map contains several taxis distributed in specific locations. The three nearest taxis are shown to the user through the k-nearest neighbors' algorithm and colored (yellow). and the closest ones (red).



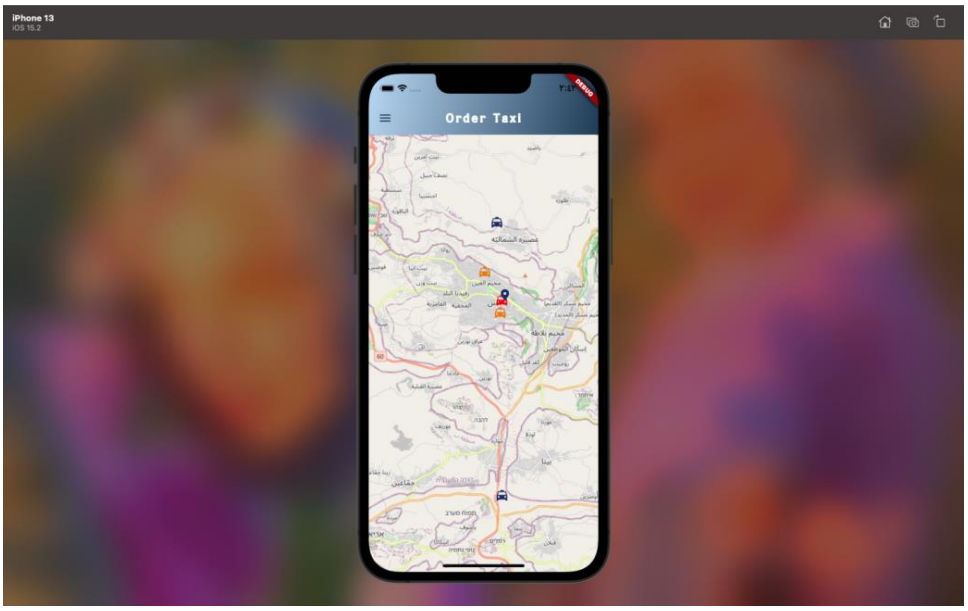
When you click on the taxi, the possibility of calling or sending a message to the driver appears


iPhone 13
iOS 15.2
Order Taxi
Ahmad
+972294444897
Call
Message

2-Rating Service’ s feature: Service evaluation by selecting stars from 1 to

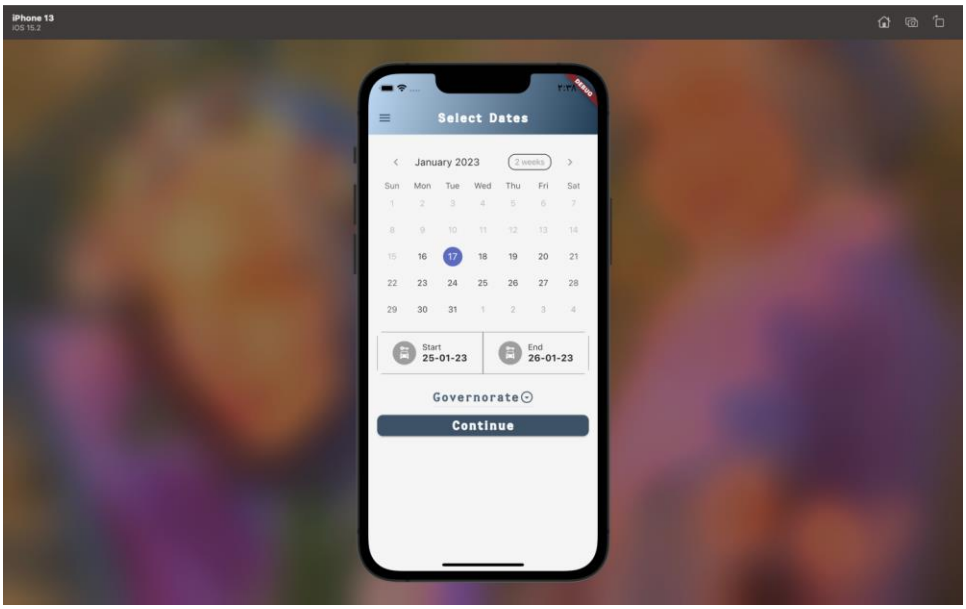


citizens feature: adds the user's location to be shown on this map

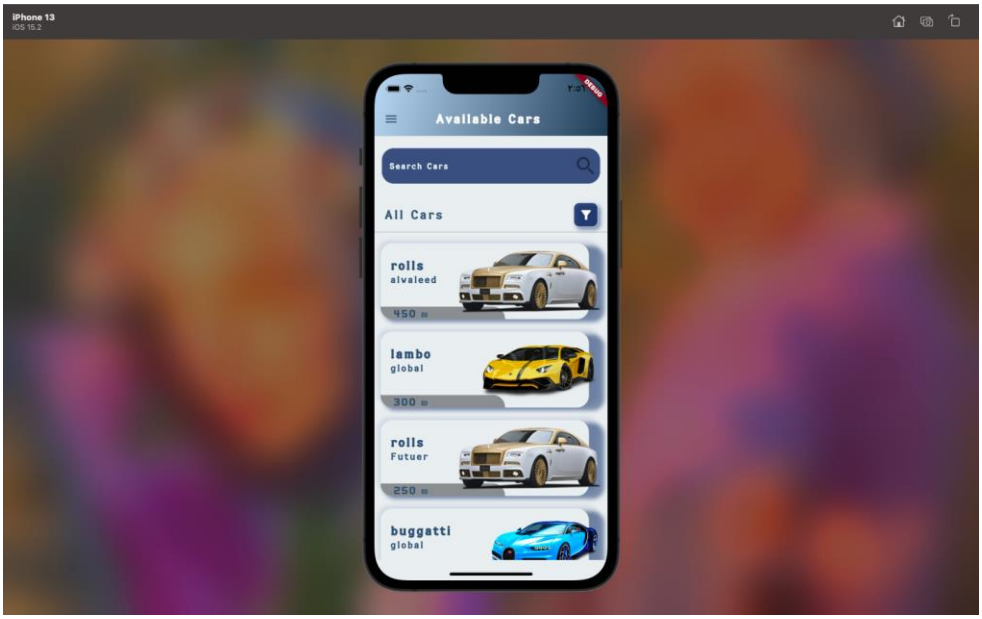


Rent Car Features

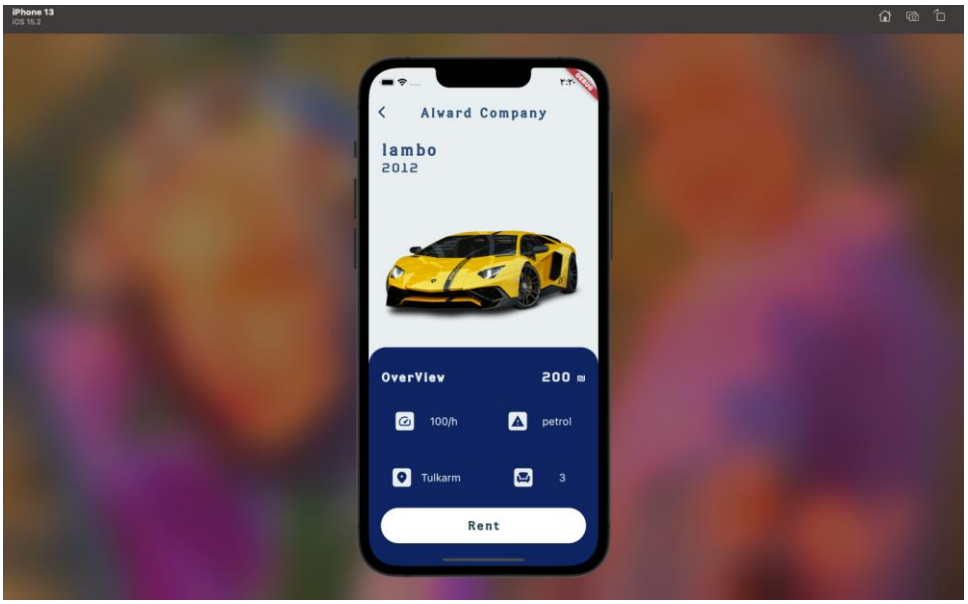
When choosing to rent a car, when choosing to rent a car, a calendar appears, in which the user selects the time period in which he wants to rent the car, and all cars that are not reserved in these days are shown to him. If one of the cars is reserved for a day within this period, he does not show it to him



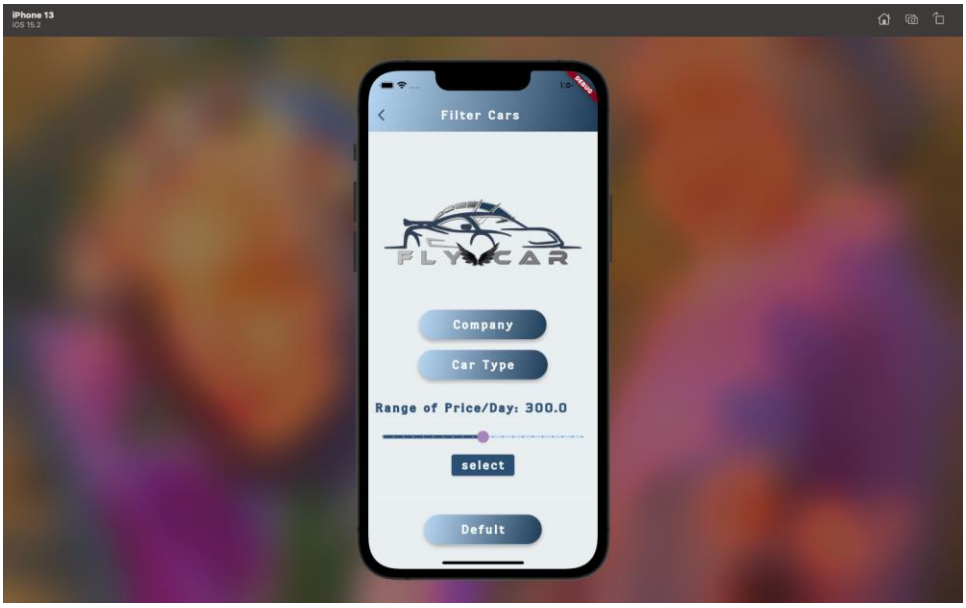
When user select the date then the car will show



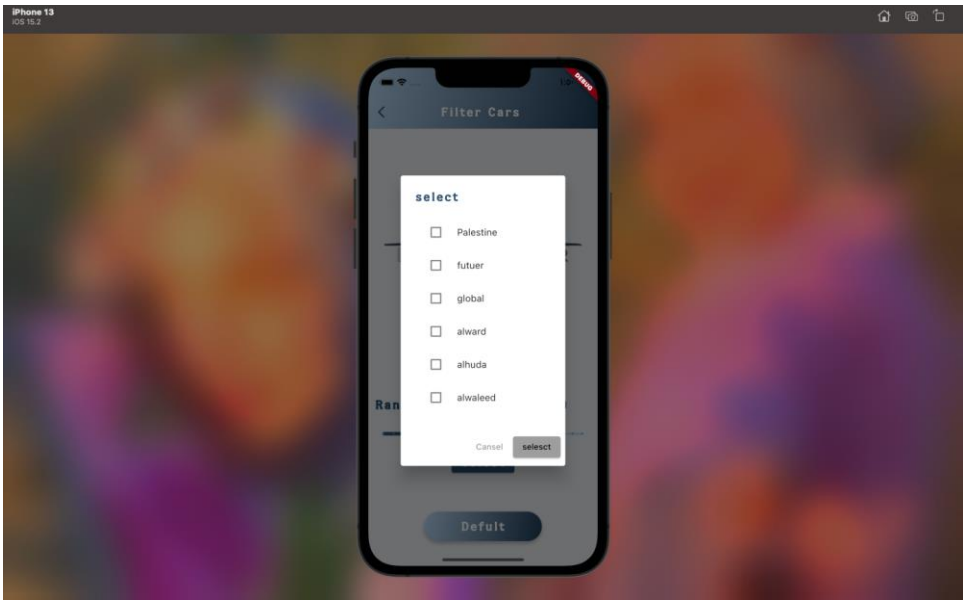
When we press in car, we will see more details



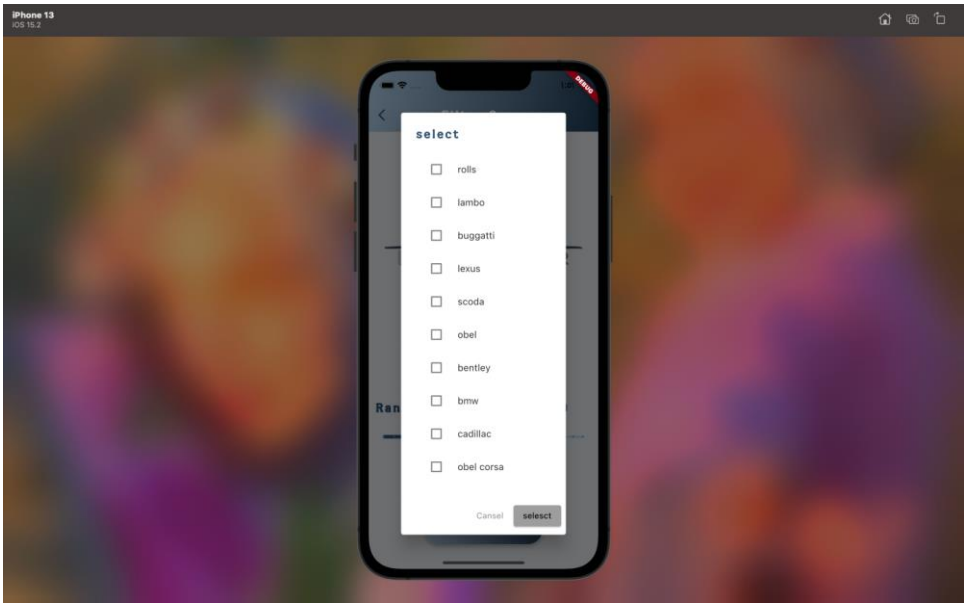
Filter **Features:** the user can choose to filter these cars through the rental price, through the names of the companies, or through the names of the cars, so that when choosing the name of the company, the names of all the companies appear to him, so he chooses any company he wants, and these companies appear with their cars on The page, and when choosing according to the price, it shows him (slider) that is in a range according to the available prices, he chooses the price range he wants, and the cars that are at this price appear, and also when choosing the name of the car, all cars with this name are displayed, regardless of the company We also have a search field where you can search for cars by their name



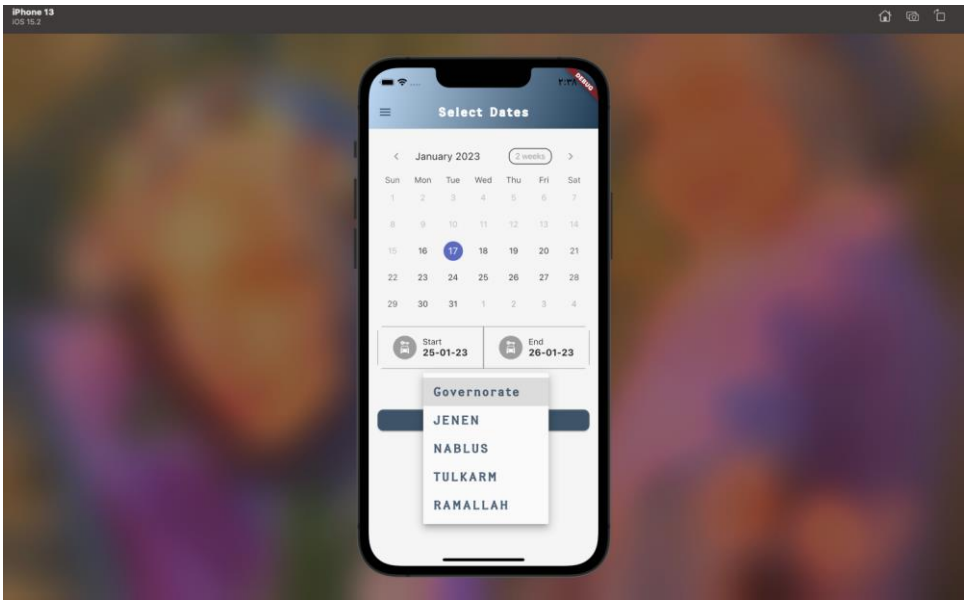
Filter company:



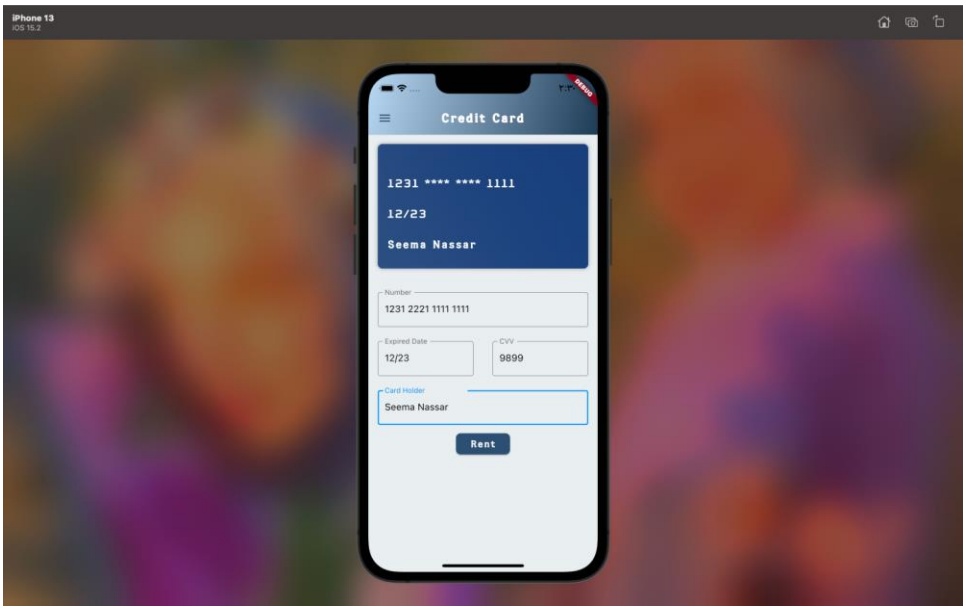
Filter car name



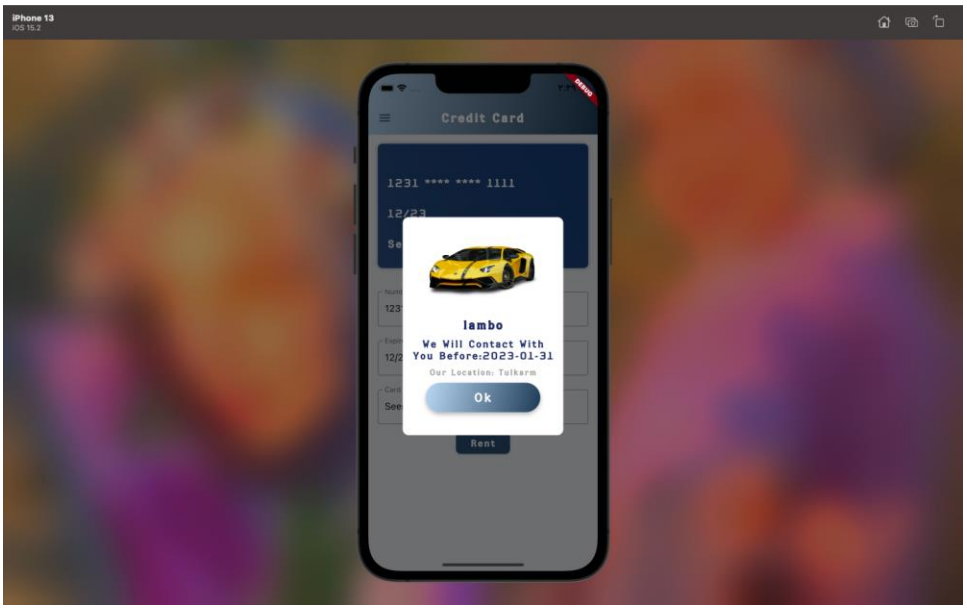
And filter by company location so,,it helps the user, if he is in a specific city, to search by name of this city and display all the companies in it with cars



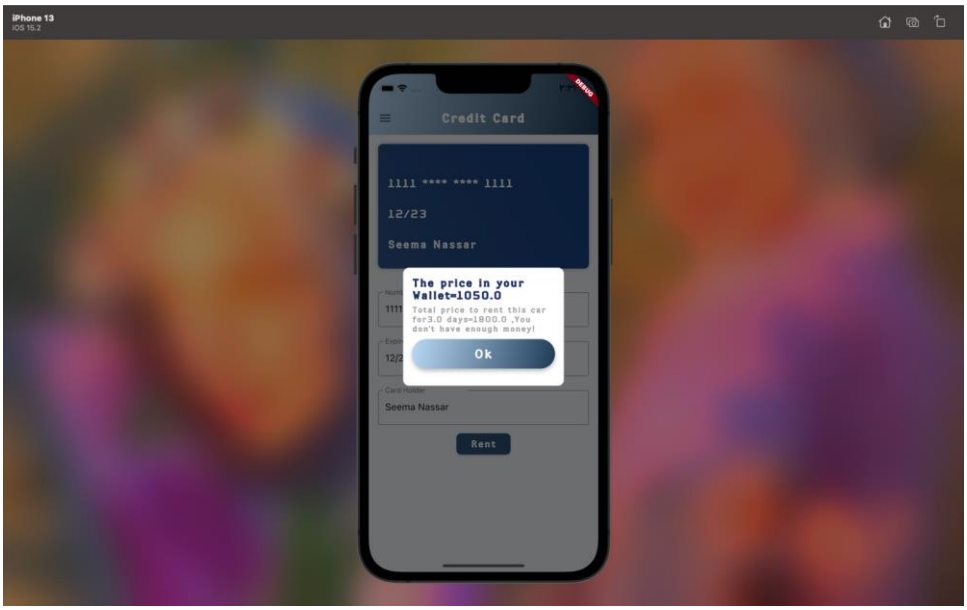
Payment feature: When the reservation process is completed, the user pays through the credit card, then fills in the credit card information, then the number of selected days is multiplied by the price of the reservation and the discount is completed, and the process is completed successfully. If the amount in the wallet is not enough, he will show him a notification



The rental process was completed successfully



. If the amount in the wallet is not enough, he will show him a notification



Admin feature

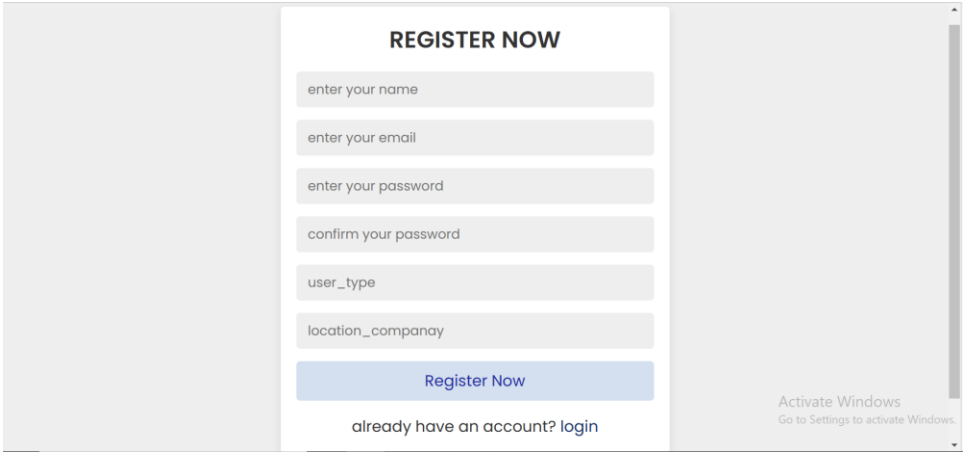
1- An account for the manager of our application, so that the tables are displayed on the manager's own page:

Car Rental: It contains all the information such as the companies with which it has been agreed to show their cars to us and information about these cars and it can add, modify and delete

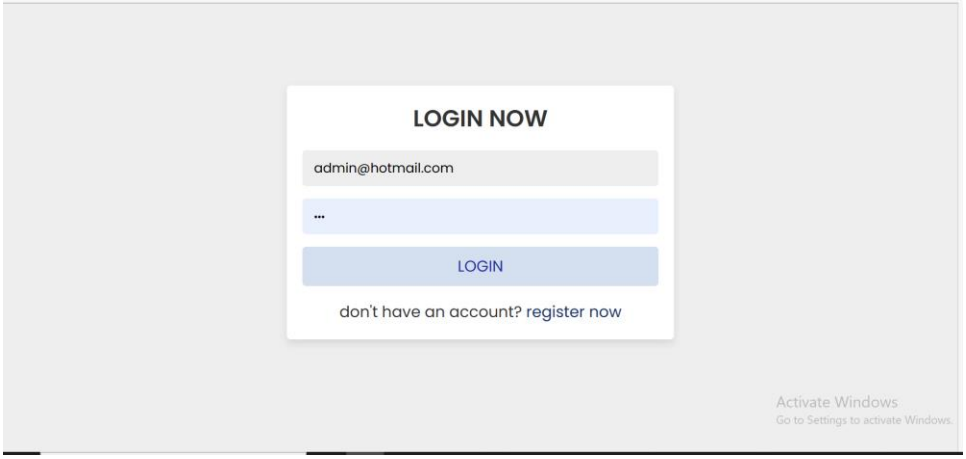
- It contains the taxi schedule in terms of adding the taxi's location through a map on its page, the driver's name and the phone number to be contacted.

First signup and login page:

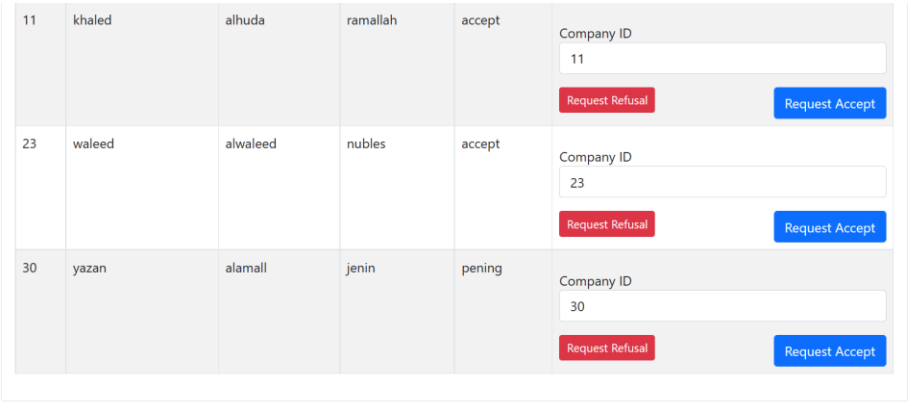
Register by full this information:



Login using email and password:



When a certain car company makes an application to join, it fills in its data, this appears on the addict's page, and the case is not allowed (pending) if the addict accepts to join, it is modified to accept, so the company has an account and access to add cars



And here, when the addict accepted this request, it changes from pending to acceptance, and then the company is able to log into her account and enter her cars

					Request Refusal Request Accept
11	khaled	alhuda	ramallah	accept	Company ID 11 Request Refusal Request Accept
23	waleed	alwaleed	nubles	accept	Company ID 23 Request Refusal Request Accept
30	yazan	alamall	jenin	accept	Company ID 30 Request Refusal Request Accept

By pressing Request accept and if he does not respond, he presses request refusal and this company is removed So, this table contains all the requests from companies to join our application that are accepted or rejected, and then add them

ADMIN FLYCAR PAGE TABELS

Requests for companies to join the application

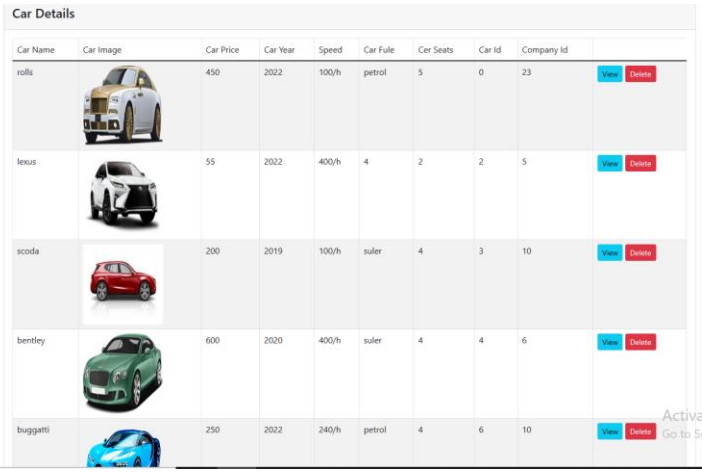
Id	Name	user type	location	stutes	Accept or Refusal The Request
4	admin page	admin		accept	Company ID 4 Request Refusal Request Accept
5	rahaf	Palestine	jenen	accept	Company ID 5 Request Refusal Request Accept
6	seema	futuer	nubles	accept	Company ID 6 Request Refusal Request Accept
8	Mohammad	global	tulkarm	accept	Company ID 8 Request Refusal Request Accept

2 -The second table contains the added companies and the possibility of deleting them from our application, after which they become unable to enter and add their cars

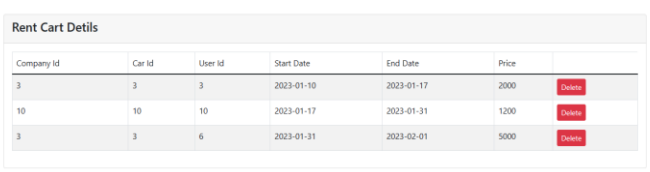
Car rental companies

Company Id	Company Admin Name	Company Name	Company Location	
4	admin page	admin		Delete
5	rahaf	Palestine	jenen	Delete
6	seema	futuer	nubles	Delete
8	Mohammad	global	tulkarm	Delete
9	Ali	al-amal	nablus	Delete
10	jawnaa	alward	tulkarm	Delete
11	khaled	alhuda	ramallah	Delete
23	waleed	alwaleed	nubles	Delete
24	ahmad	fly company	jenin	Delete

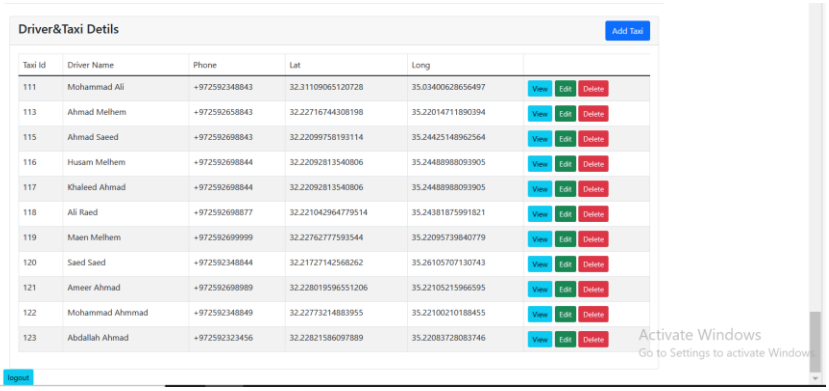
3 The third table contains the cars, their information and the subsidiary company of each car so that all cars from all companies are displayed inside this table



4 -The Fourth Schedule, which contains the cars and their booking dates



The last table, which contains taxi information, driver names and taxi locations



When you click on Add taxi, a new page appears containing a map, the location of the taxi is determined, the location value is stored, and the driver's name and phone number are specified

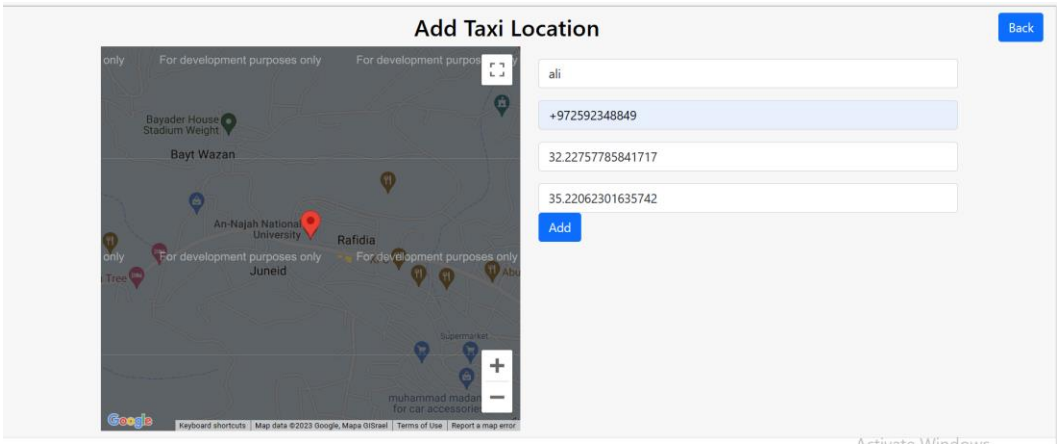
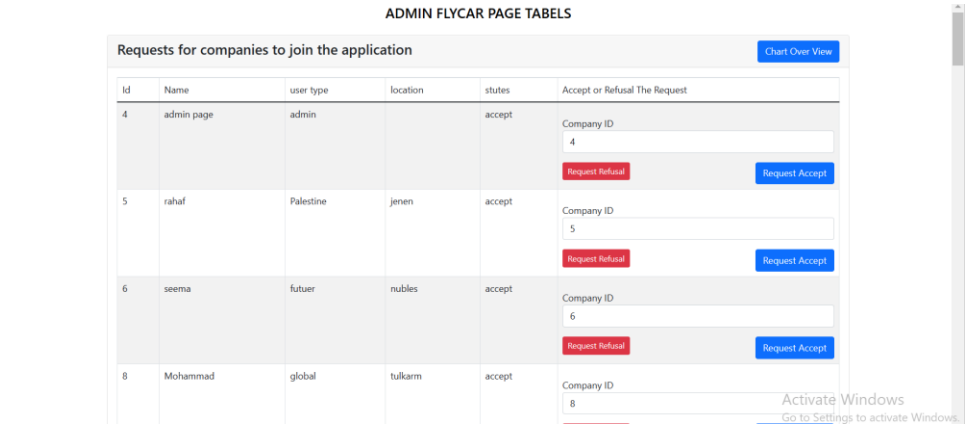
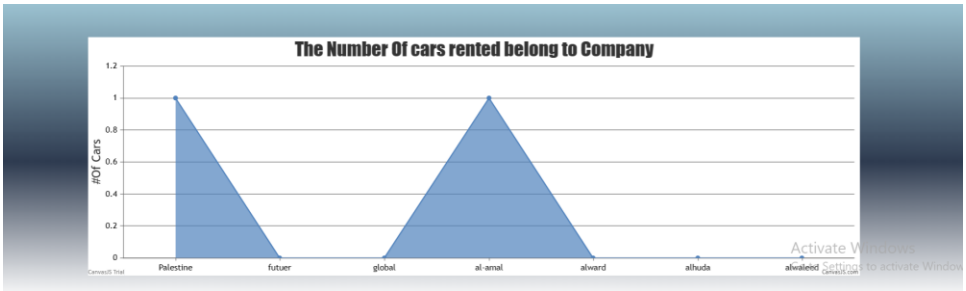


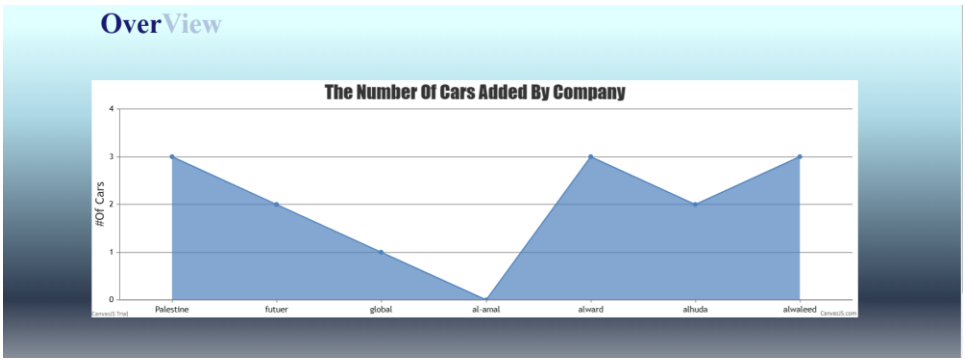
Chart feature



The Number Of cars rented belong to Company

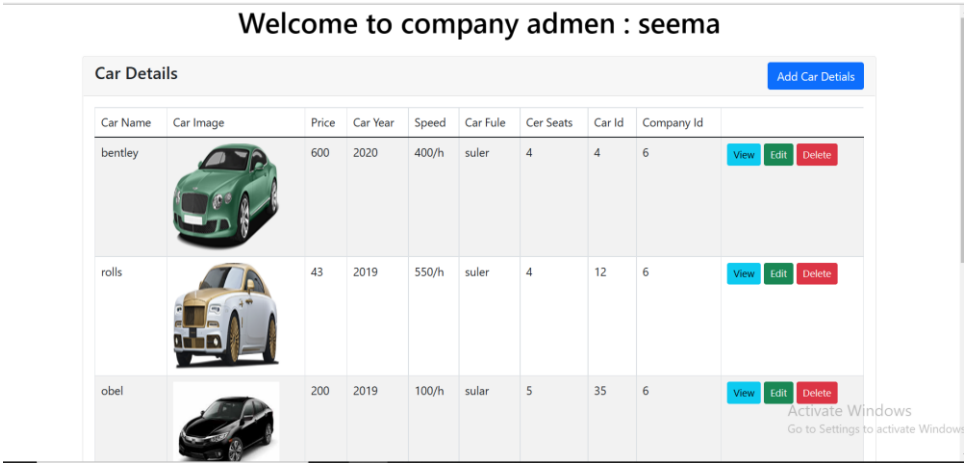


The Number of Cars Added by Company



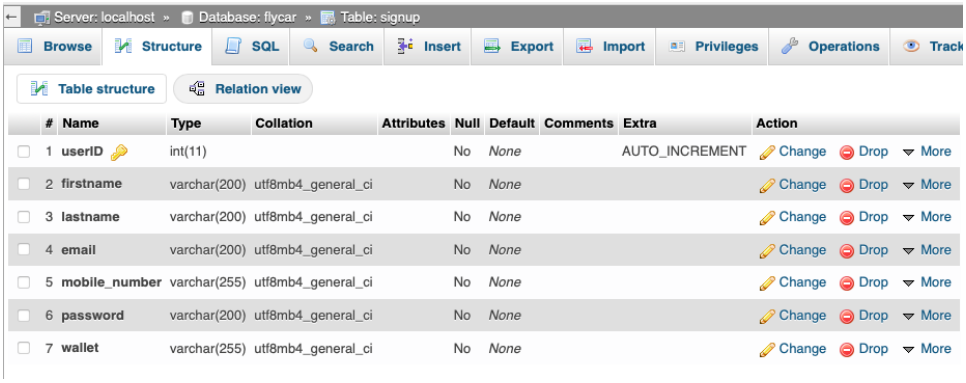
2- An account for the company manager who creates an account so that the company sends a request to the admin of our application, so he either accepts the request or rejects it. If the request is accepted, the company has the authority to add its cars to the application, modify and delete cars.

Here is an example of the page of one of the companies so that after logging in from the email and his pin, he is entered into the site to add cars, edit and delete, and also, he can see who booked the cars and the dates of their booking



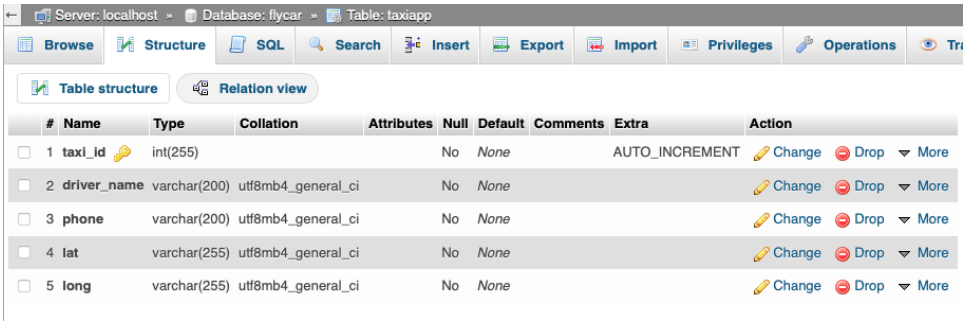
MYSQL database feature:

Signup table



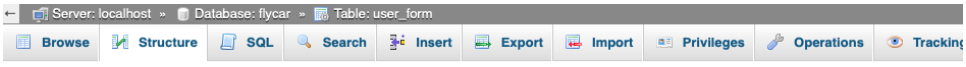
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	userID	int(11)			No	None		AUTO_INCREMENT	Change Drop More
2	firstname	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
3	lastname	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
4	email	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
5	mobile_number	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
6	password	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
7	wallet	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Taxi app table



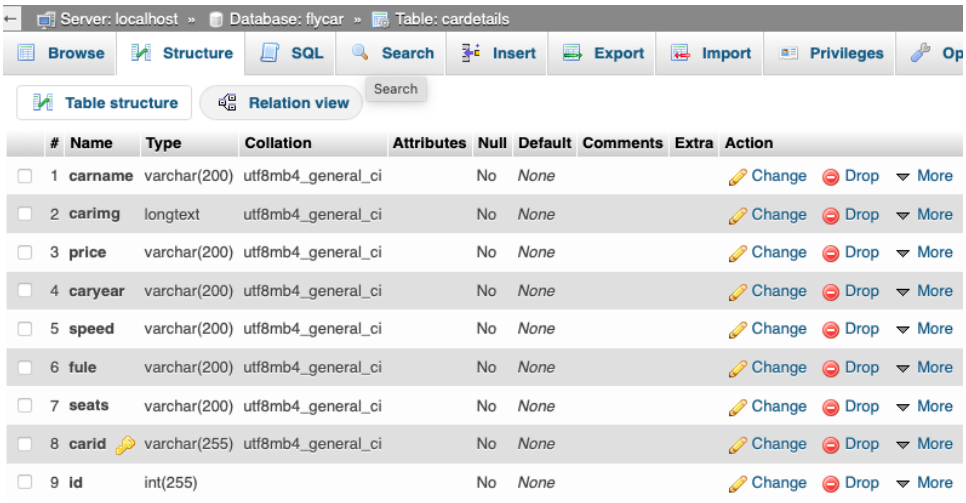
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	taxi_id	int(255)			No	None		AUTO_INCREMENT	Change Drop More
2	driver_name	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
3	phone	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
4	lat	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
5	long	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

User company table



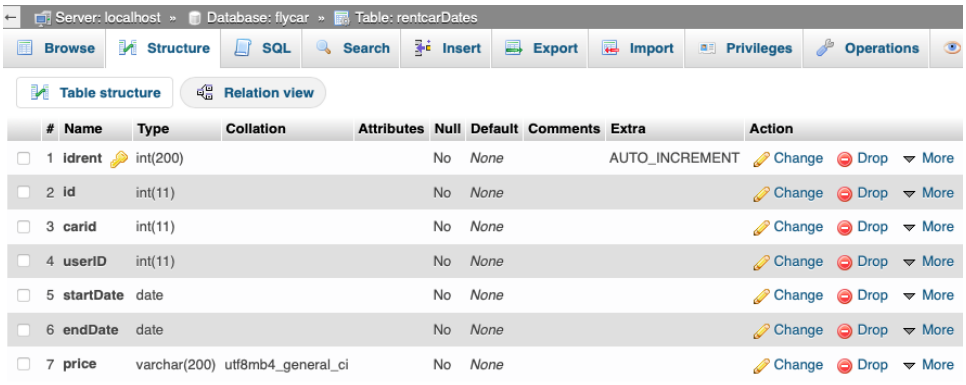
#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	id	int(244)			No	None		AUTO_INCREMENT	Change Drop More
2	name	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
3	email	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
4	password	varchar(244)	utf8mb4_general_ci		No	None			Change Drop More
5	user_type	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
6	location_company	varchar(266)	utf8mb4_general_ci		No	None			Change Drop More
7	stutes	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More

Car details table



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	carname	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
2	carimg	longtext	utf8mb4_general_ci		No	None			Change Drop More
3	price	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
4	caryear	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
5	speed	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
6	fule	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
7	seats	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More
8	carid	varchar(255)	utf8mb4_general_ci		No	None			Change Drop More
9	id	int(255)			No	None			Change Drop More

Car rent date table



#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
1	idrent	int(200)			No	None		AUTO_INCREMENT	Change Drop More
2	id	int(11)			No	None			Change Drop More
3	carid	int(11)			No	None			Change Drop More
4	userID	int(11)			No	None			Change Drop More
5	startDate	date			No	None			Change Drop More
6	endDate	date			No	None			Change Drop More
7	price	varchar(200)	utf8mb4_general_ci		No	None			Change Drop More

Result and Discussion

The nearest path to you is a multi-platform mobile application that organizes the process of requesting a taxi or renting a car by showing the available cars at the required time with the least possible time and effort. It helps in determining taxi locations and the user knows the nearest taxi to his location through (k-nearest neighbors Shortest Path Algorithm). We have gained and learned a great deal of experience. We were able to build a cross-platform app, as mentioned earlier.

Conclusion and recommendations

Conclusion

Building this project, gained us many skills and knowledge, including:

- Dealing with git and GitHub.

- Creating a cross-platform mobile app with Flutter and the Dart program- Ming language.
- Collaborating with many Flutter packages that important to achieve the project.
- Used Node.js to implement the back-end and dealing with MySQL.

- Working with maps and learning more about open-source maps.

Recommendations

1.1 With the proliferation and growth of technology in the smart mobile phone industry, which enables both the user and the service provider to get around many obstacles and supply the service fully, it is essential to develop it, listen to comments, and keep making improvements.

Future work

In the future, we will improve this project in different ways. An application for the taxi driver and the idea of booking appointments on the part of the user and agreeing on them on the part of the driver

References

https://pub.dev/

https://github.com/OpenConsultingGroup/Taxi-App

CHECKBOXLISTTILE IN FLUTTER APP DEVELOPMENT || JOOKATE'S FLUTTER

https://blog.logrocket.com/how-to-create-search-bar-flutter/