Car Rental system

Students participated

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The system consists of two primary modules: Customer-facing and Staff-facing modules. Both modules interact through a shared database to ensure data consistency.

Customer-facing Module:

- Enables users to log in, sign up, and access the dashboard.
- Login: Supports username/password authentication and password recovery.
- Signup: Collects user information and validates registration.
- Dashboard: Allows users to view and manage their reservations, search for cars, and update their profile.

The system also implements secure authentication mechanisms, including password hashing, to protect user/customer accounts.

Staff-facing Module:

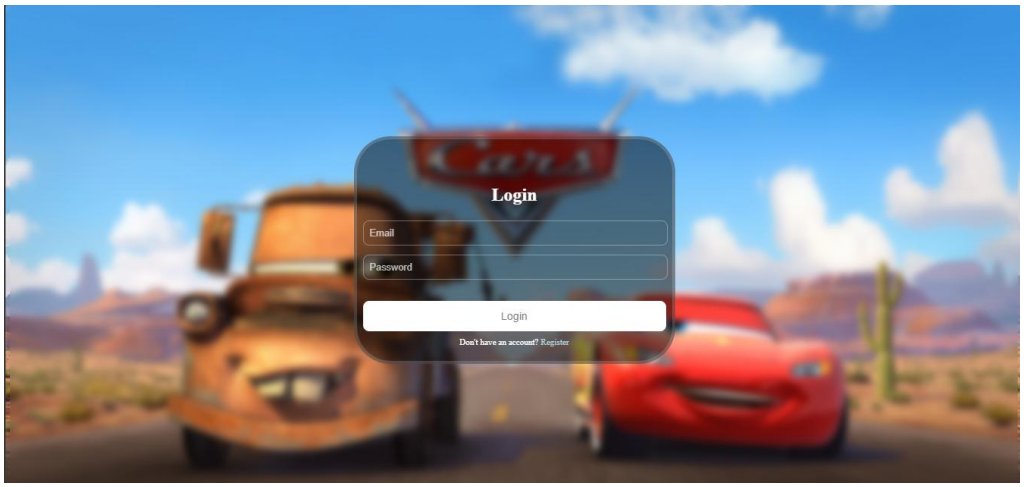
The Staff-facing Module requires staff members to log in using their unique credentials. Upon successful login, staff members are granted access to their respective dashboards with appropriate role-based access control.

- Provides functionalities for staff to manage car registrations, monitor system activity, and generate reports.
- Car Registrations: Allows staff to add new cars, edit car details, and manage car availability.
- Monitoring: Enables real-time tracking of reservations, customer inquiries, and system performance.
- Reporting: Generates various reports, including customer demographics, reservation trends, and car usage statistics.

- **First part**

Customer Module

1. LOGIN PAGE:

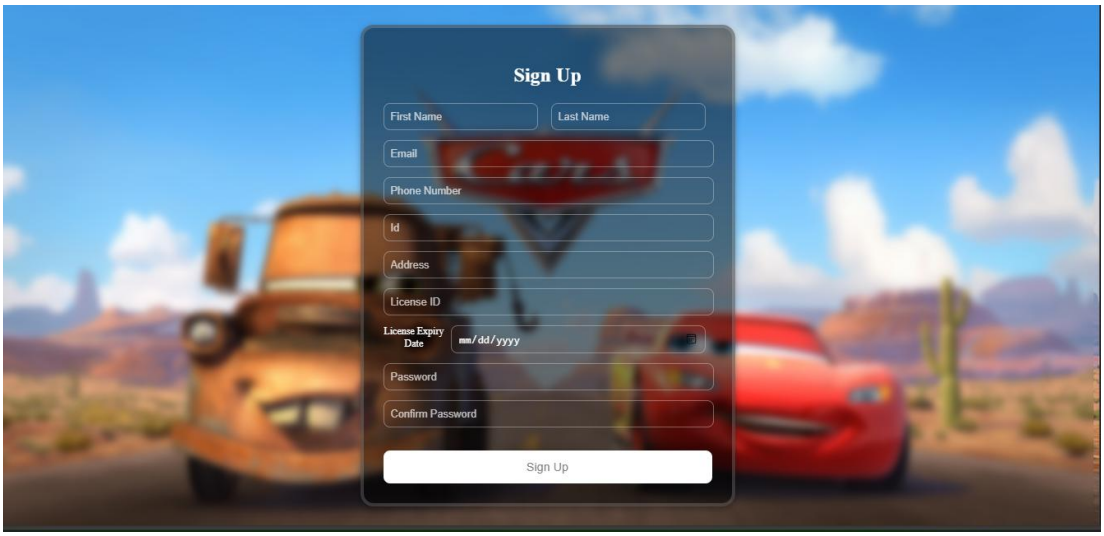


Functionality:

- **Email Field:**
  - Allow users to enter their registered email address.
- **Password Field:**
  - Allow users to enter their password

- If the customer has no account, they can register a new account from the Register redirection link.

2. REGISTER PAGE



Functionality:

- **Required Fields:** The page requires users to provide the following information:
  - First Name
  - Last Name
  - Email
  - Phone Number
  - Address
  - License ID
  - License Expiry Date
  - Password
- **Email**:
  - The system enforces email validation to ensure that the entered email address is in a valid format (e.g., contains an "@" symbol and a domain name).
  - The system checks if the entered email address is already associated with an existing account. This prevents duplicate registrations and ensures data integrity.
- **Phone Number**:
  - The system validates the phone number format to ensure it adheres to a specific pattern or standard.
  - The system checks if the entered phone number is already associated with an existing account, ensuring that each user has a unique phone number associated with their account.
- **Password**:

- The system has a minimum length password requirement.
- The user also must match the password field with the confirm password field for imitation of real-life implementations.

3. DASHBOARD PAGE

The next page is the Dashboard interface if the customer is redirected after successfully logging in or creating a new account.

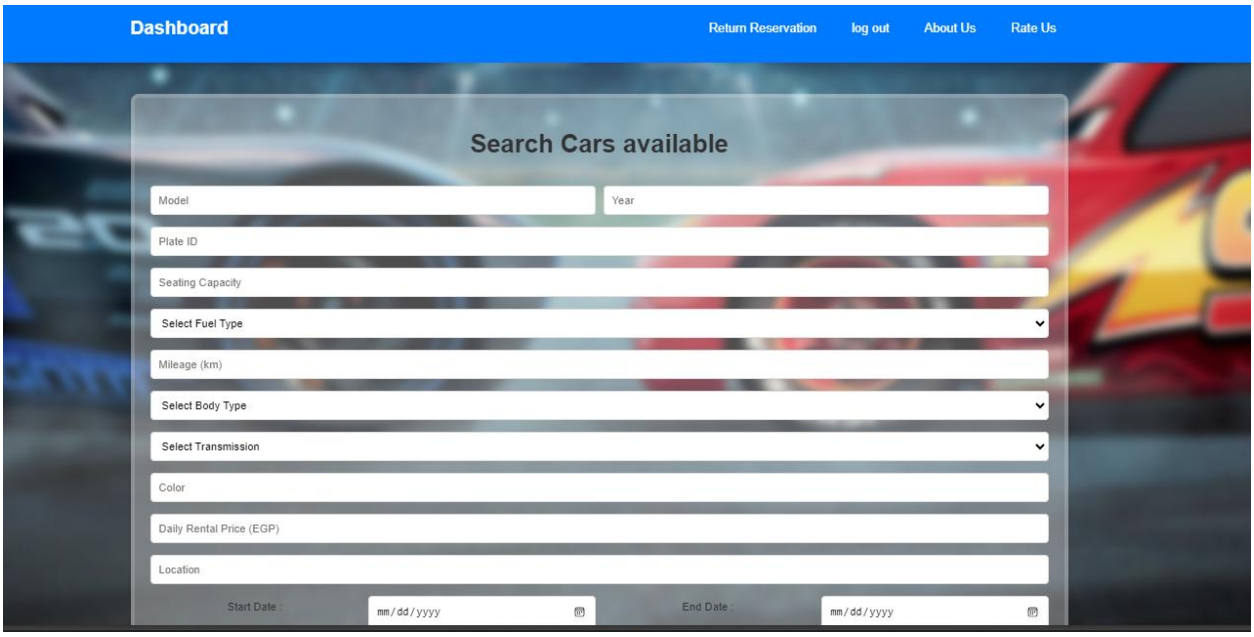
The navigation bar at the top provides quick access to essential functionalities, including:

- **Return Reservation:** Allows users to return their rented vehicles if the reservation start date hasn't come yet.
- **Log Out:** acts as a home link to return the customer to the login page.
- **About Us & Rate Us:** Offers options to learn more about the service and provide feedback.

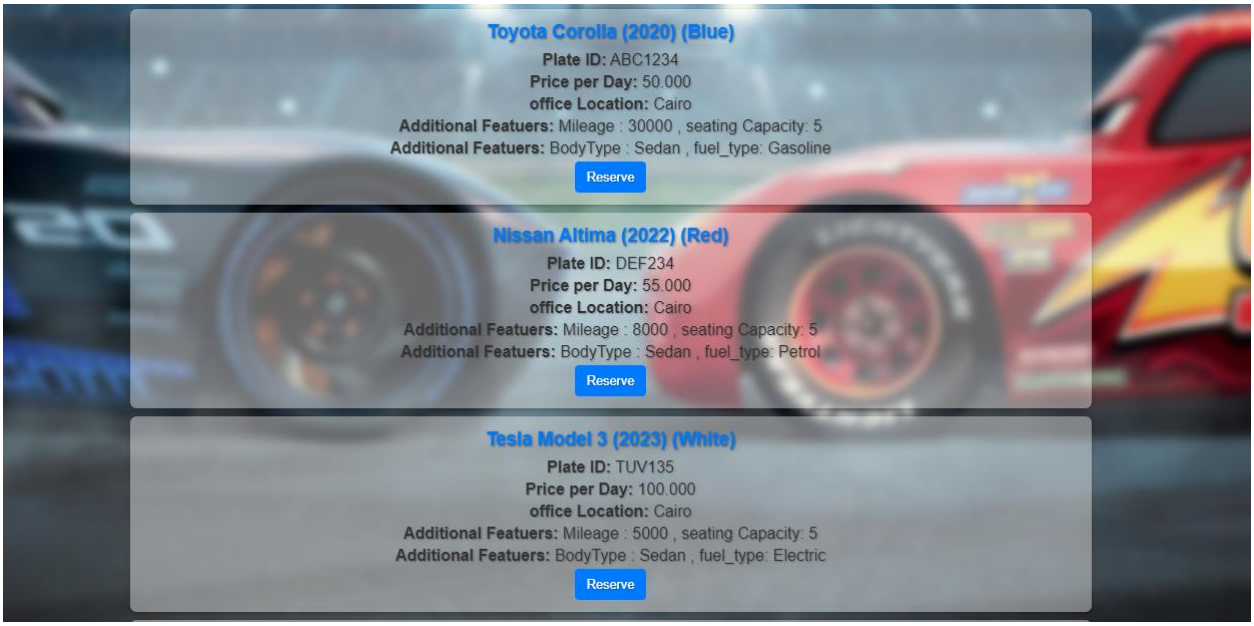
The dashboard allows customers to search for available cars using various filters such as

- Model
- Year
- seating capacity
- fuel type
- body type
- transmission, and more.

The customer has to select a start and end date to showcase available cars and reserve if one of the cars meets their specifications



- Example of car search on the available cars on **Sedan Body type** constraint , the following is a snap shot of part of the results

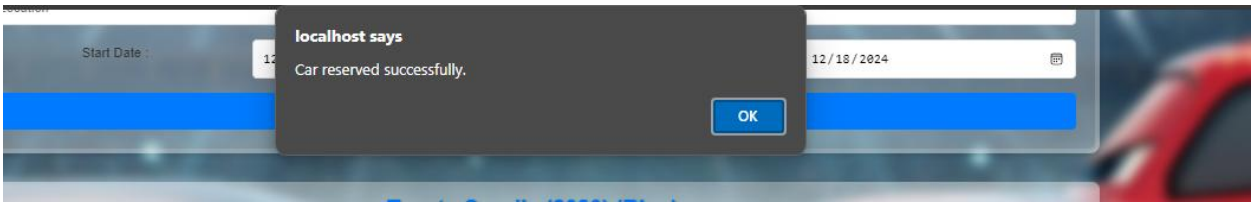


If the customer chooses to reserve a car from one of the results,

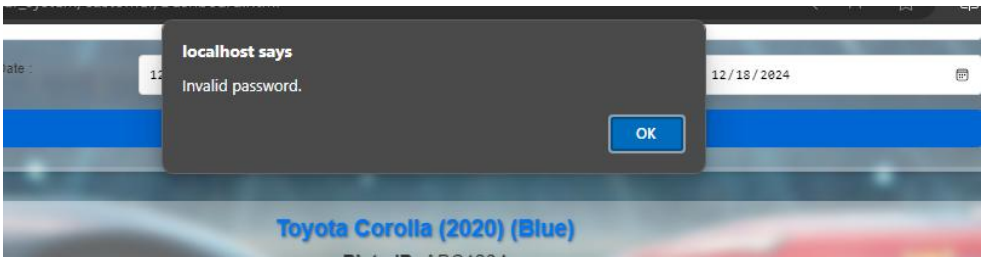
They can click the reserve button, and a prompt/window of the customer password will be displayed

If the customer wrote his password right, the reservation will be confirmed else, a warning will be displayed indicating customer can't reserve without confirming their password

- If password correct, reservation successful



- If password incorrect , reservation fails



4. RETURN RESERVATION PAGE

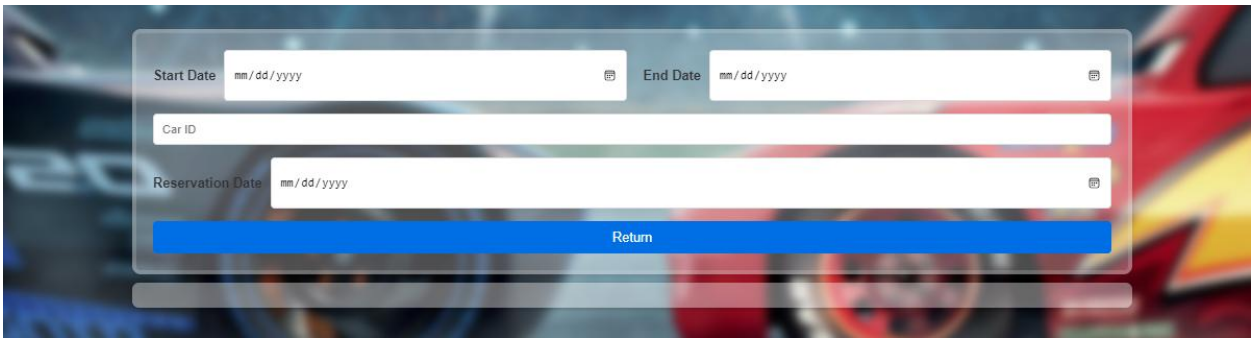
The "Return Reservation" page, designed for customers to return a previously made car reservation.

A navigation link ("Home") at the top provides quick access back to the main dashboard.

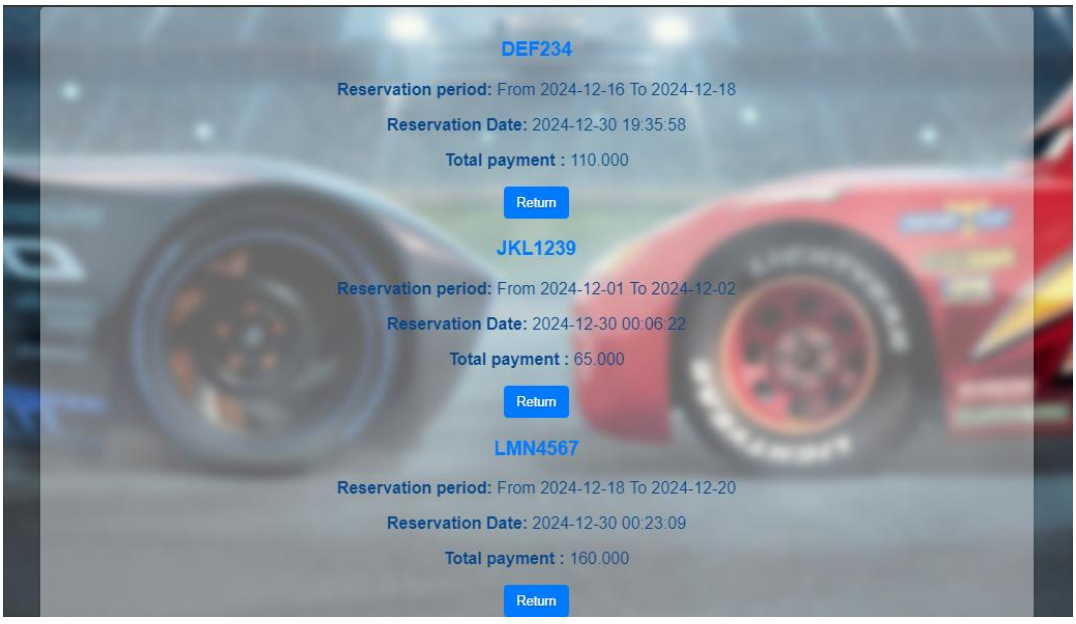
The interface allows users to input the following details:

- **Start Date:** The beginning date of the rental period.
- **End Date:** The end date of the rental period.
- **Car ID:** The unique identifier of the rented car.
- **Reservation Date:** The date when the reservation was originally made.

A prominent **"Return"** button at the bottom enables the user to submit the entered information and complete the return process.



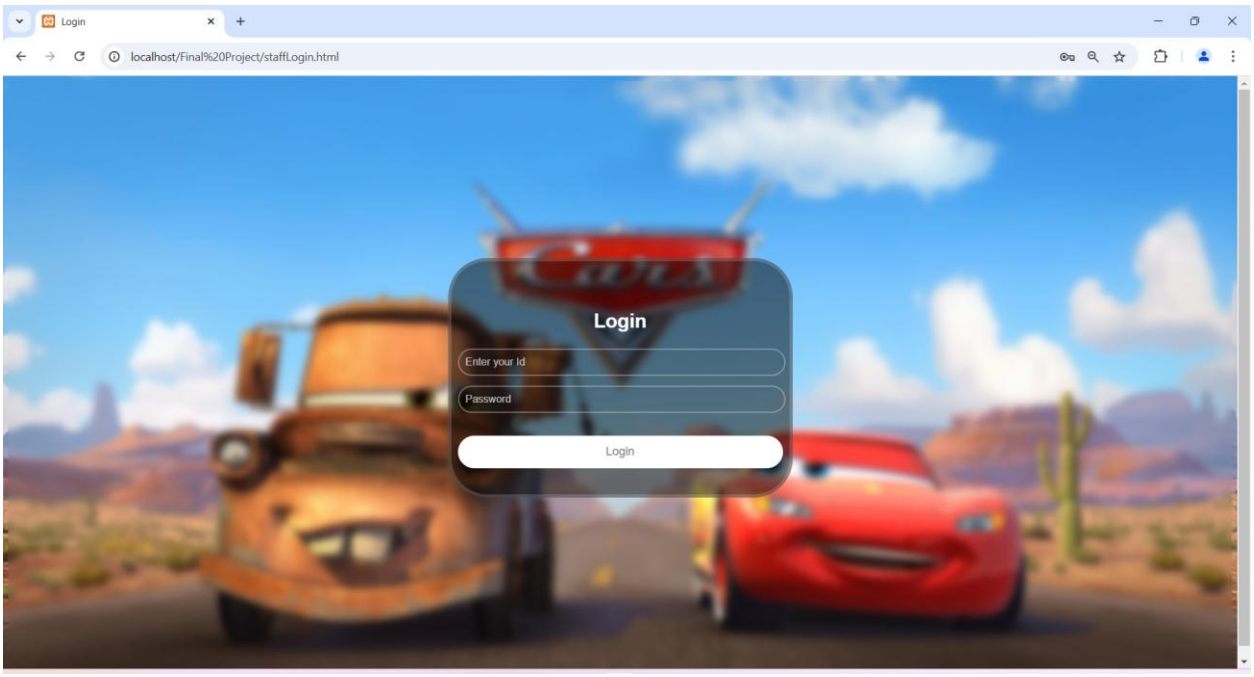
- Example of the reservations of the customer on a certain constraint, the following is a snapshot of part of the results of the constraint reservation date = 30-12-2024



➢ Second part

Staff Module

1. **Login Page**
    - **Purpose**: for secure access to the website for staff members.
    - **Features**:
        - User authentication with a username and password.
        - If staff's Id and password exists in the database (staff table), the page redirects to the main page and a message is displayed with the user's full name, else, error message "Invalid email or password." is displayed.



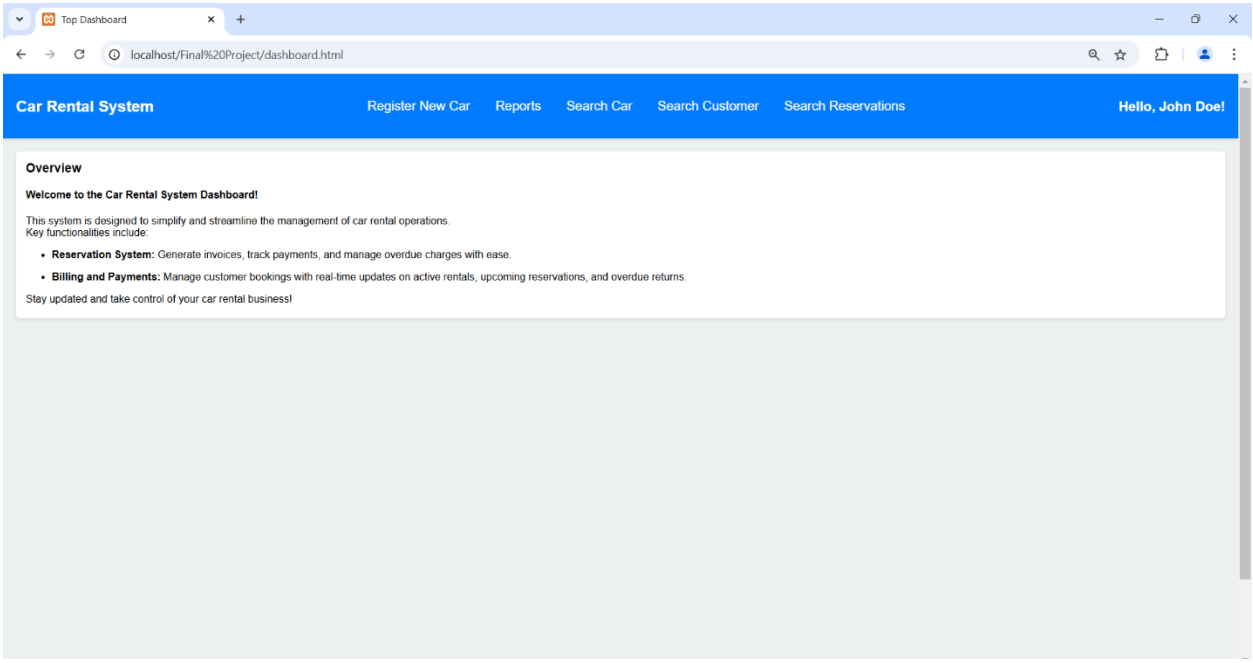
2. **Main Page**
    - **Purpose:** navigates the staff members to multiple webpages so he can access the backend and manage backend functionalities.
    - **Features:**

        Header: Has multiple buttons:

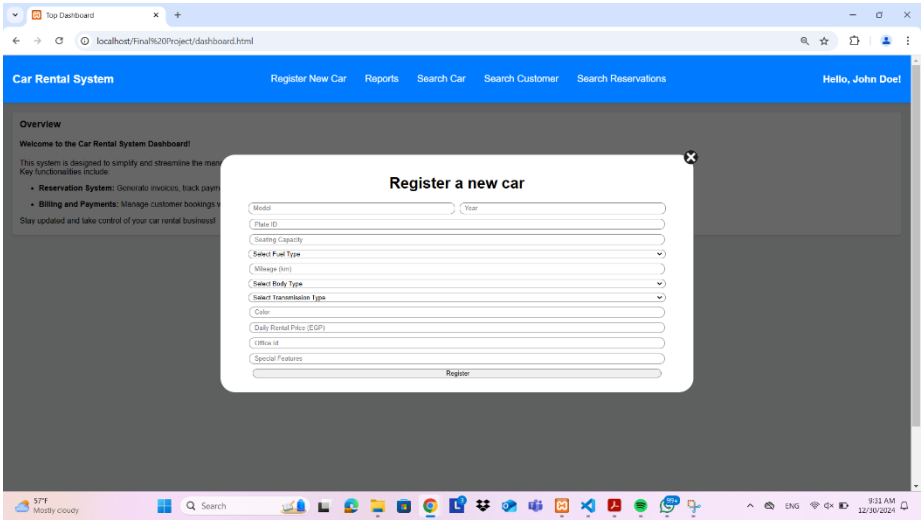
        - Register New Car
        - Reports
        - Search Car
        - Search Customer

- Search Reservations

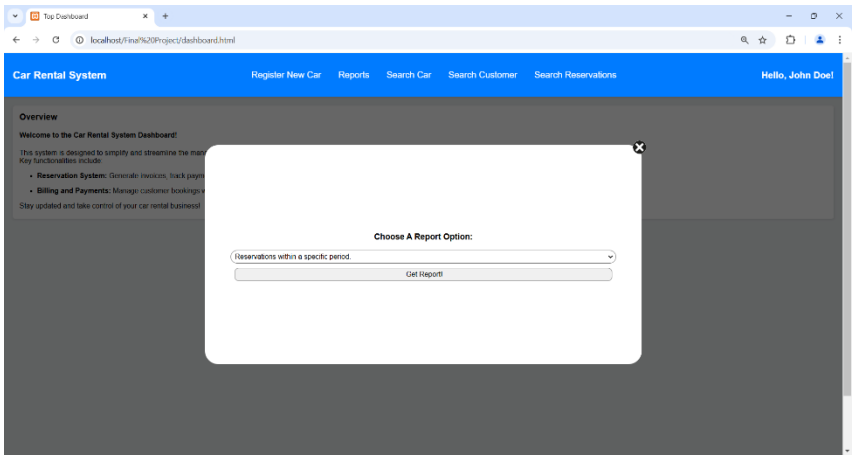
Overview: Has description a description of the website objective.



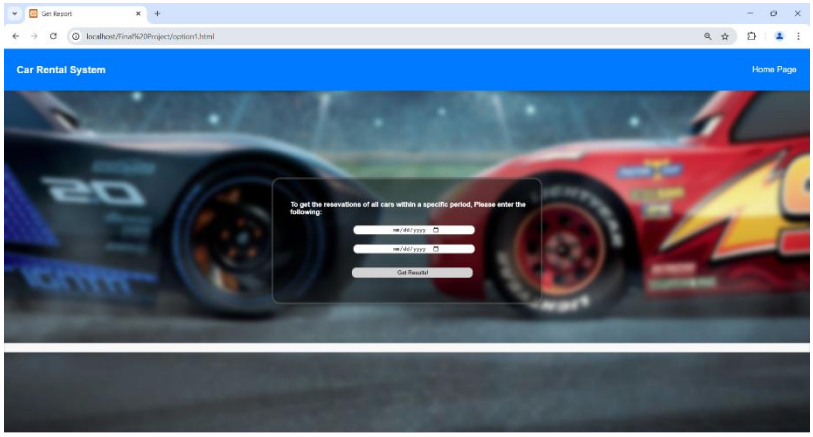
3. **Register New Car:** a popup window for the staff member to register a new car to the system. The user enters car's features (Model, year, plate ID, etc.). User should enter a unique plate Id that isn't yet registered to the system. Also, he should enter an existing office id.



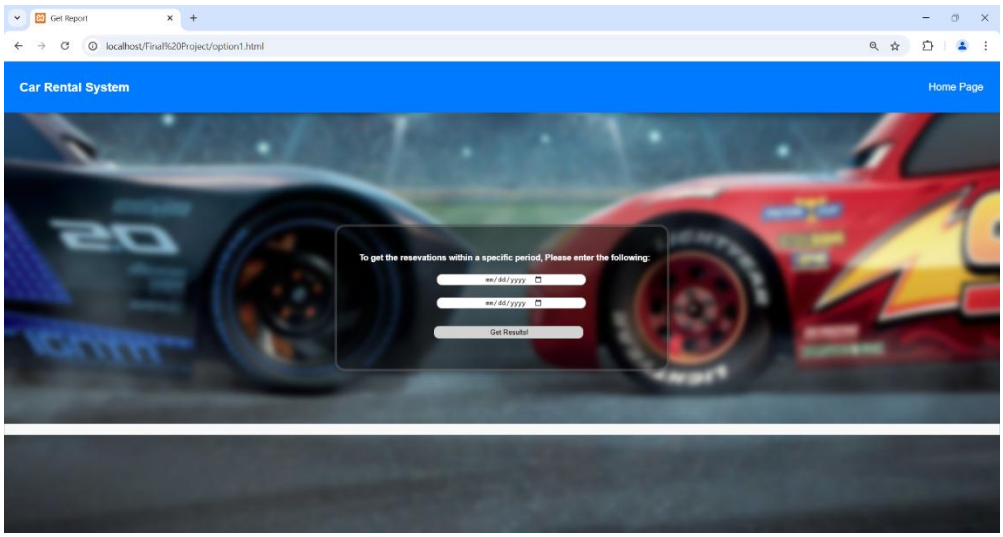
4. **Reports:** opens a popup window for the staff member to select the report he wants to be displayed. <u>He has multiple options:</u> Reservations within a specific period, Reservations of any car, Status of cars on a specific day, Reservations of a specific customer, Daily Payments within a specific period.



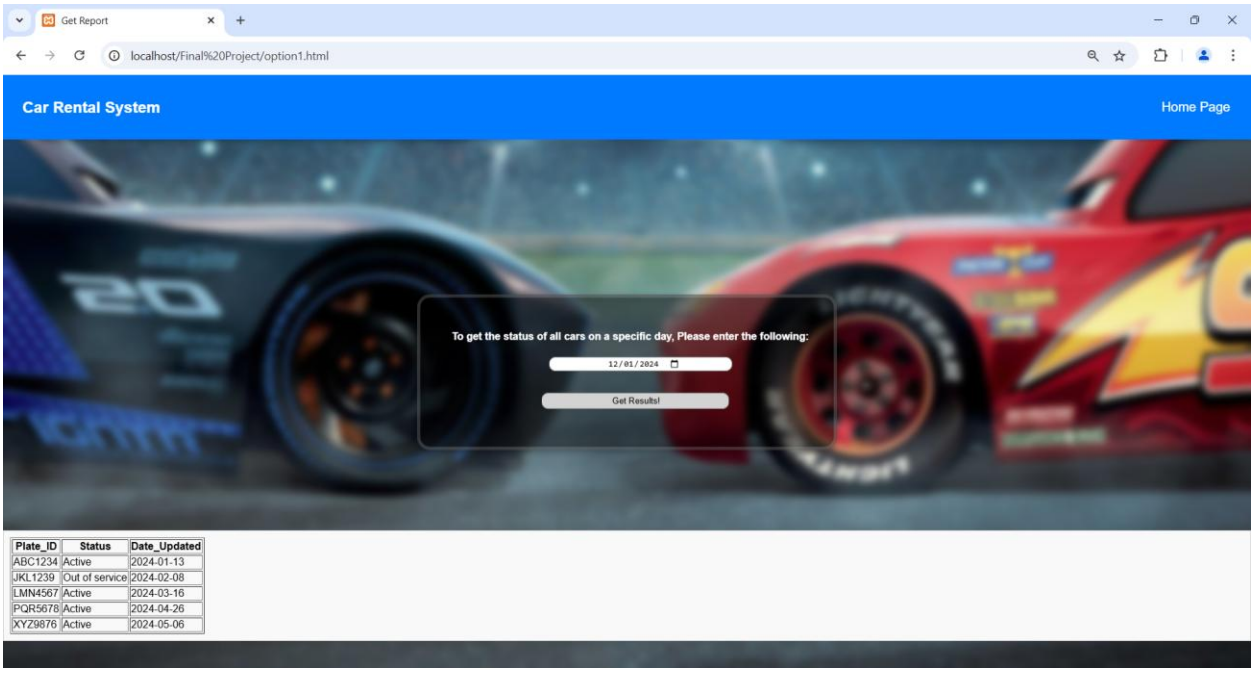
- <u>Reservations of any car within a specific period:</u> The user should enter the fields required to get the report; the start date and end date of the desired period.



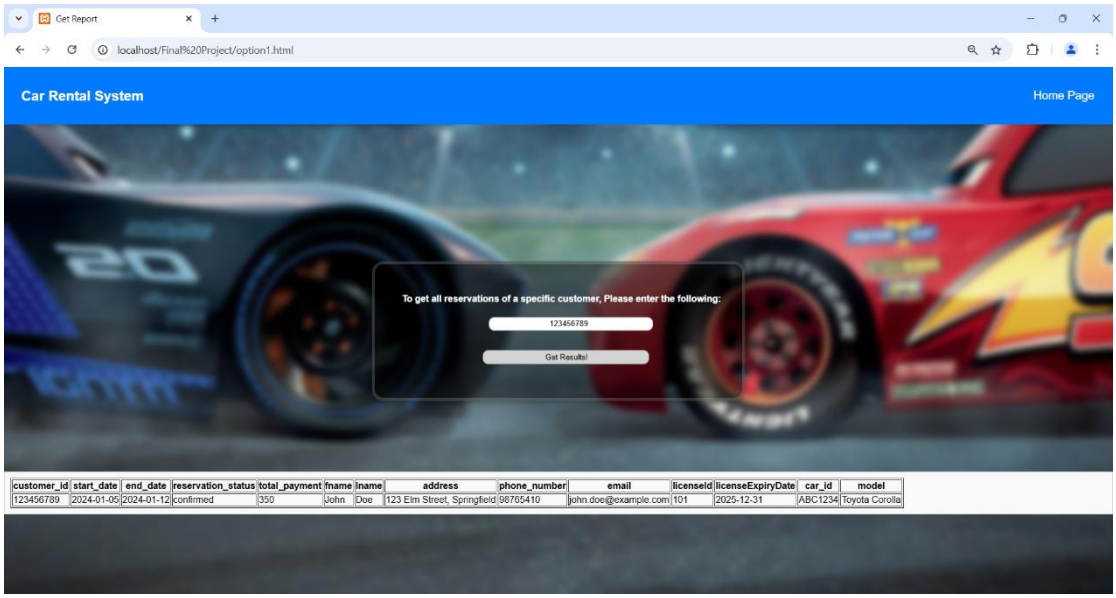
- <u>All reservations within a specific period:</u> The user should enter the fields required to get the report; the start date and end date of the desired period.



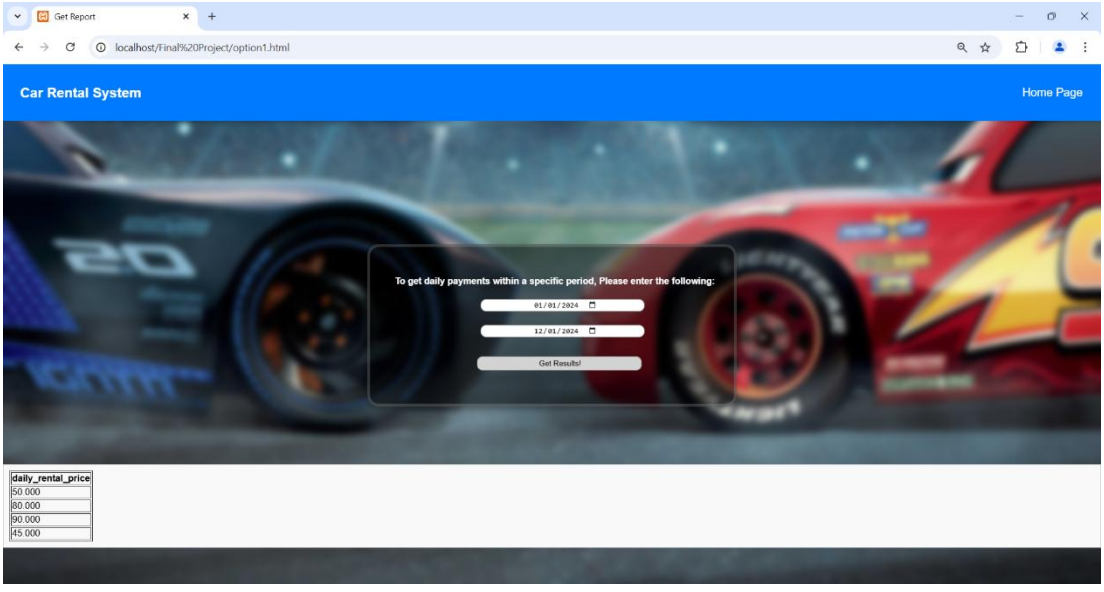
- <u>The status of all cars on a specific day:</u> The user should enter the fields required to get the report; the desired day to get the cars' status on.



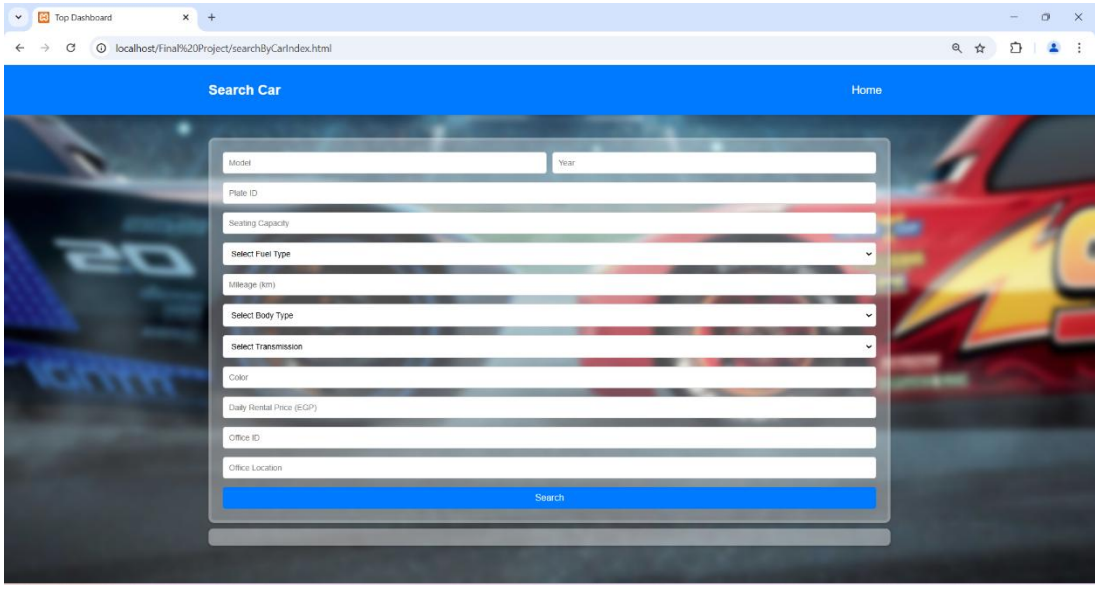
- <u>All reservations of a specific customer:</u> The user should enter the customer's id to get the desired report.



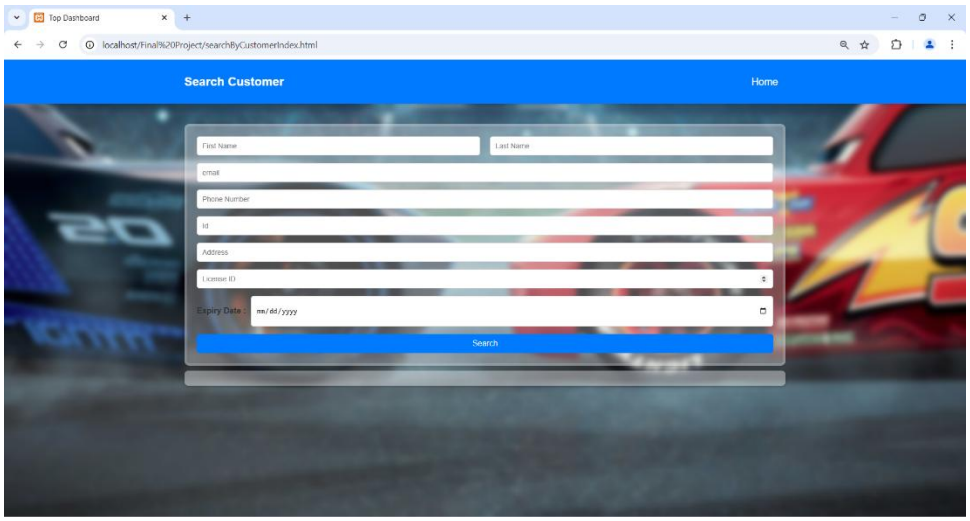
- Daily Payments within a specific period: The user should enter the start date and the end date of the desired period of time.



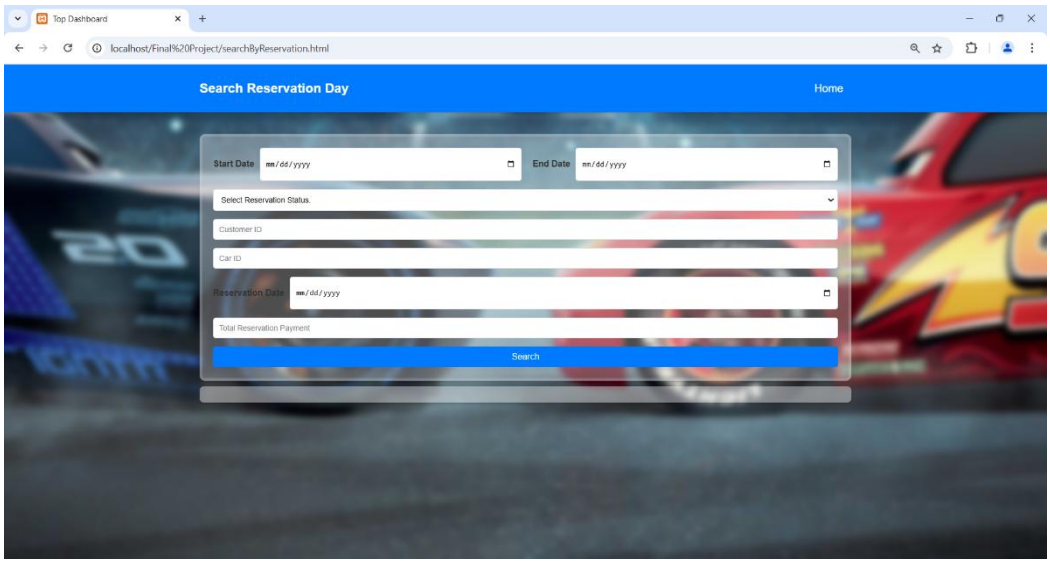
5. **Search Car:** User has the option to search for a car by any of the car's features (model, year, plate Id, etc.).



6. **Search Customer:** User has the option to search for a customer by any of the customer's details (First Name, Last Name, Email, Phone Number, etc.).



7. **Search Reservation:** User has the option to search for a reservation day using any of the reservation day's details (Start Date, End Date, Reservation Status, etc.)

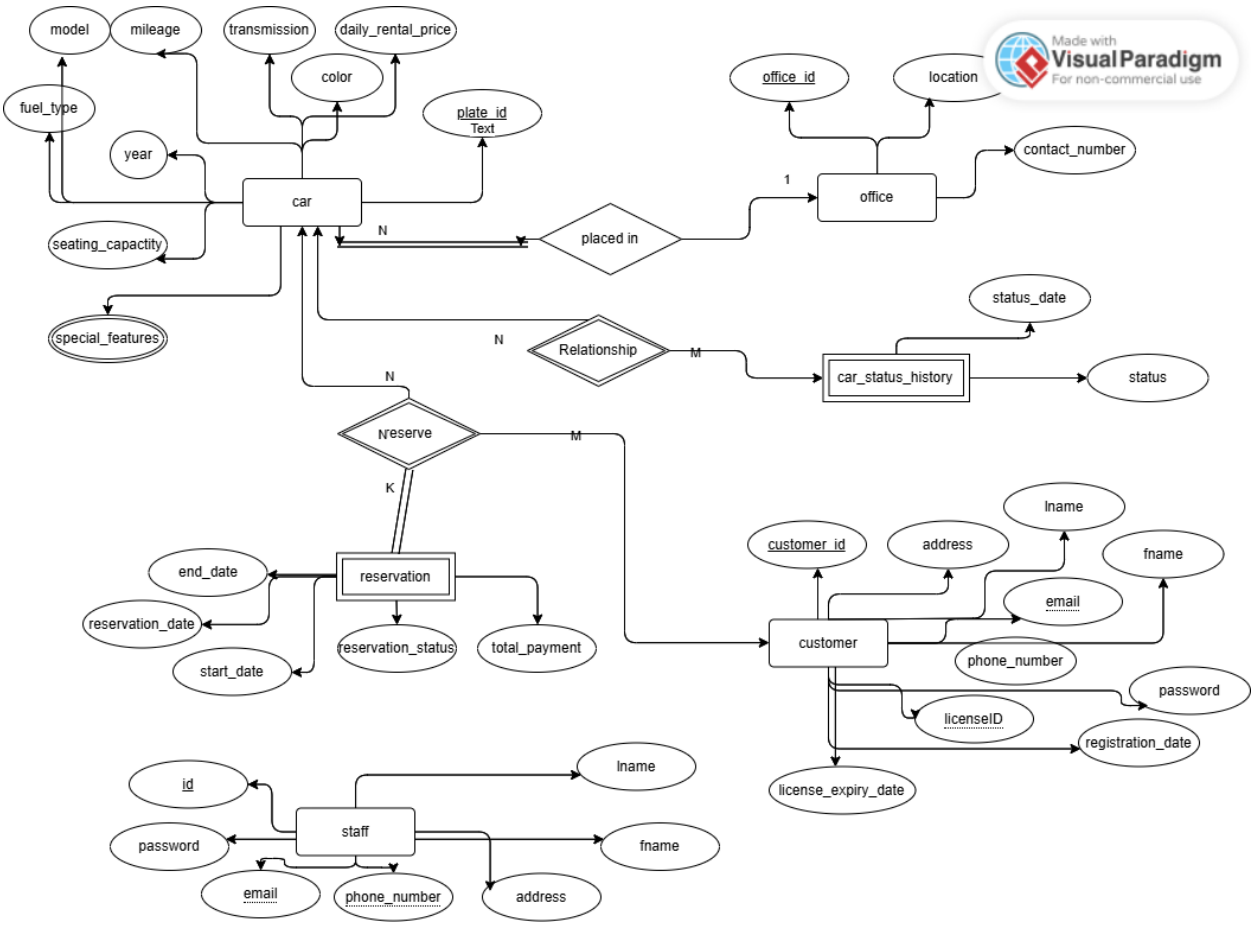


Database schema displayed using DDL statements

```
CREATE DATABASE car_rental_system;

CREATE TABLE customer (

customer_id int(15) PRIMARY KEY,

fname varchar(50),

lname varchar(50),

address varchar(50),

phone_number int(15) ,

email varchar(255) UNIQUE KEY,

licenseId int UNIQUE KEY,

licenseExpiryDate date,

`password` varchar(255),

registration_date timestamp default CURRENT_TIMESTAMP

);

CREATE TABLE office (

office_id int AUTO_INCREMENT PRIMARY KEY,

location varchar(50),

contact_number int(15)
```

```
);
CREATE TABLE car_system (
plate_id VARCHAR(10) PRIMARY KEY,
`year` INT, model VARCHAR(100),
seating_capacity INT,
fuel_type VARCHAR(50),
mileage INT, body_type VARCHAR(50),
transmission VARCHAR(100),
color VARCHAR(50),
daily_rental_price DECIMAL(12,3),
car_status ENUM('Active', 'Out of service', 'Rented'),
office_id int,
FOREIGN KEY (office_id) REFERENCES office(office_id)
);
CREATE TABLE special_features (plate_id VARCHAR(10) PRIMARY KEY, additional_features VARCHAR(500));
ALTER TABLE special_features ADD FOREIGN KEY(plate_id) REFERENCES car_system(plate_id);
CREATE TABLE reservation (
customer_id varchar(255) ,
car_id VARCHAR(10) ,
start_date date,
end_date date,
reservation_status ENUM('confirmed','cancelled') DEFAULT 'confirmed',
reservation_date timestamp default CURRENT_TIMESTAMP,
total_payment int,
PRIMARY KEY (customer_id , car_id,reservation_date),
FOREIGN KEY (customer_id) REFERENCES customer(customer_id),
FOREIGN KEY (car_id) REFERENCES car_system(plate_id)
);
CREATE TABLE staff( staff_id INT PRIMARY KEY, password VARCHAR(255), phone_number VARCHAR(20), address
VARCHAR(255), email VARCHAR(255) UNIQUE);
 ALTER TABLE staff
ADD fname VARCHAR(255) AFTER staff_id,
ADD lname VARCHAR(255) AFTER fname;
```

ERD DIAGRAM


model
mileage
transmission
daily_rental_price
color
fuel_type
plate_id
Text
year
car
seating_capactity
special_features
N
placed in
1
office
office_id
location
contact_number
Made with
Visual Paradigm
For non-commercial use
N
Relationship
M
car_status_history
status_date
status
N
reserve
M
K
reservation
end_date
reservation_date
start_date
reservation_status
total_payment
customer
customer_id
address
lname
fname
email
phone_number
password
licenseID
registration_date
license_expiry_date
id
staff
password
email
phone_number
address
lname
fname