

**A**  
**Mini Project Report**  
**on**  
**Rent And Ride : Vehicle Rental System**  
Submitted in partial fulfillment of the requirements for the  
degree  
**Second Year Engineering – Computer Science & Engineering (Data Science)**  
by

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## CERTIFICATE

This to certify that the Mini Project report on **Rent And Ride: Vehicle Rental System** has been submitted by **Nihar Chavan (23107012)**, **Sanskriti Hande (23107039)**, **Srushti Khedekar (23107040)** and **Arav Palsule (23107036 )** who are bonafide students of A. P. Shah Institute of Technology, Thane as a partial fulfillment of the requirement for the degree in **Computer Science Engineering (Data Science)**, during the academic year **2024-2025** in the satisfactory manner as per the curriculum laid down by University of Mumbai.

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# **Chapter 1**

## **Introduction**

Rent and Ride is a vehicle rental management system designed to facilitate the seamless booking, management, and tracking of rental vehicles. The system provides an intuitive interface for users to register, rent vehicles, and manage their bookings efficiently. It enables administrators to handle customer and vehicle records while ensuring a smooth and organized rental process. The system is built with a user-friendly graphical interface using Tkinter and integrates with a MySQL database for secure data management. The Rent and Ride system enhances the rental experience by providing features such as vehicle recommendations, feedback collection, and analytics to monitor usage trends.

### **1.1. Purpose:**

The Rent and Ride – Vehicle Rental System is designed to streamline the process of renting vehicles by providing an efficient and user-friendly platform for both customers and administrators. It ensures seamless vehicle management by maintaining organized records of available vehicles, their types, and statuses. The system simplifies the booking process, allowing users to rent, modify, or cancel bookings effortlessly. Additionally, it enhances customer management by securely storing user details, ensuring better service and personalization. Through an integrated feedback system, customers can share their experiences, helping administrators improve service quality.

### **1.2. Problem Statement:**

Managing a vehicle rental system manually can be inefficient, error-prone, and time-consuming. Traditional methods rely on paperwork and manual record-keeping, making it difficult to track vehicle availability, manage customer details, and process bookings efficiently. This often leads to delays, misplaced information, and poor customer service. Additionally, the lack of an automated feedback system limits opportunities for service improvement. The Rent and Ride – Vehicle Rental System solves these challenges by providing a digital platform.

### **1.3. Objectives:**

The Rent and Ride – Vehicle Rental System aims to provide an efficient and automated solution for managing vehicle rentals. The key objectives of the system are to simplify the booking process, ensure accurate vehicle and customer management, and enhance user experience through a well-structured digital platform. It enables seamless tracking of vehicle availability, secure storage of customer information, and easy modifications to bookings. Additionally, the system integrates feedback collection and data analytics to improve service quality and optimize vehicle usage. By automating these processes, the system reduces manual workload, minimizes errors, and enhances operational efficiency for both customers and administrators.

### **1.4. Scope:**

The Rent and Ride – Vehicle Rental System is designed to streamline and automate the process of renting vehicles, making it more efficient and user-friendly. The system allows customers to browse available vehicles, make bookings, manage their profiles, and provide feedback, while administrators can oversee vehicle and customer management, track bookings, and analyze usage trends. It ensures secure authentication and role-based access, providing different functionalities for users and admins. The system also includes a recommendation feature to suggest suitable vehicles based on user preferences and a usage analytics module to track rental patterns. Built using Python with a Tkinter-based GUI and MySQL for data management, the system is scalable and can be expanded with additional features in the future. It is intended for rental businesses looking to enhance operational efficiency and improve customer satisfaction through digital transformation.

# Chapter 2

## Proposed System

The Rent and Ride – Vehicle Rental System is a digital platform that automates the vehicle rental process, making it more efficient and user-friendly. It enables users to register, browse available vehicles, make bookings, and provide feedback, while administrators can manage customer details, track vehicle availability, and oversee rental operations. The system ensures secure authentication, offers vehicle recommendations based on user preferences, and includes analytics to monitor usage trends. Developed using Python (Tkinter) and MySQL, it reduces manual errors, enhances operational efficiency, and provides a seamless experience for both customers and administrators.

### 2.1. Features and Functionality:

- **User Authentication** – Secure login and registration system with password recovery options for both customers and administrators.
- **Vehicle Management** – Allows administrators to add, update, delete, and track vehicle details, including model, type, and availability.
- **Booking System** – Enables users to browse available vehicles, book rentals, modify bookings, and track their rental history.
- **Customer Management** – Stores and manages customer information, allowing admins to update details and track user activity.
- **Feedback System** – Users can submit feedback and ratings, helping administrators improve service quality.
- **Vehicle Recommendation** – Suggests vehicles to users based on their preferences and past bookings to enhance the rental experience.
- **Usage Analytics** – Tracks rental patterns and provides insights into vehicle demand, helping businesses optimize fleet management.

# **Chapter 3**

## **Project Outcomes**

The Rent and Ride – Vehicle Rental System successfully addresses the challenges of traditional vehicle rental management by providing an automated and efficient platform for both customers and administrators. The system ensures a smooth and user-friendly booking process, allowing customers to easily browse available vehicles, make reservations, and manage their rentals. By replacing manual record-keeping with a structured digital database, the system minimizes errors and ensures that vehicle availability is updated in real time. For administrators, the system simplifies customer and vehicle management by providing an intuitive interface to store and update records. The role-based authentication ensures that only authorized users can access and modify sensitive data, enhancing security. The feedback system enables customers to share their rental experiences, allowing businesses to continuously improve their services based on user input.

Additionally, the vehicle recommendation feature enhances the user experience by suggesting suitable vehicles based on preferences and past bookings, making the selection process easier. The integrated analytics module helps administrators track rental trends and make data-driven decisions to optimize fleet management. By analyzing usage patterns, businesses can allocate resources more efficiently and identify opportunities for expansion. The Rent and Ride – Vehicle Rental System significantly improves operational efficiency by reducing the workload associated with manual processes. It enhances transparency, accuracy, and customer satisfaction by providing real-time updates and secure access to rental information. The system's scalable architecture ensures that it can be expanded with additional features in the future, making it a long-term solution for vehicle rental businesses. Overall, the project delivers a reliable, automated, and data-driven approach to vehicle rentals, benefiting both customers and administrators by simplifying operations, improving service quality, and optimizing resource management.



# Chapter 4

## Software Requirements

The Rent And Ride: Vehicle Rental System project requires specific software for development and deployment, as follows:

- **Operating System** : Windows 10 or later / Linux / macOS
- **Programming Language** : Python (Version 3.x)
- **Backend & Database** : MySQL (for storing customer, vehicle, and booking details) ,  
MySQL Connector for Python (to establish a connection between Python and MySQL)
- **Frontend & GUI Framework**: Tkinter (Python's built-in GUI library)
- **Development Tools & Libraries**:
- **IDEs**: PyCharm, Visual Studio Code, or any Python-supported IDE
- **Database Management**: MySQL Workbench or phpMyAdmin
- **Libraries**:
  - tkinter (for the user interface)
  - mysql-connector-python (for database connectivity)
  - matplotlib (for analytics and data visualization)

# Chapter 5

## Project Design

The Rent and Ride – Vehicle Rental System follows a structured design with a user-friendly interface, a secure database, and well-defined modules for smooth operation.

### User Interface Design

- **Main Menu:** Options include View Vehicles, Book Vehicle, My Bookings, Cancel Booking, Give Feedback.
- **View Vehicles:** Displays a list of available vehicles with details like model, type, availability status.
- **Book Vehicle:** Users select a vehicle, choose the rental duration, and confirm the booking.
- **My Bookings:** Shows booking details such as Booking ID, Vehicle Name, Rental Duration, and Status.
- **Cancel Booking:** Allows users to enter the Booking ID and confirm cancellation.
- **Home Page:** Title "Rent and Ride - Vehicle Rental System" with a menu bar for navigation.
- **Vehicle Search Panel:** Filters to search vehicles by type, model, and availability, along with a search button.
- **Booking Panel:** Displays selected vehicle details and provides options to confirm the booking.
- **Feedback Panel:** Users can submit feedback with a text box and submit button.

## Database Design

The database is structured to efficiently manage user details, vehicle data, bookings, and rental history. The system utilizes MYSQL for storing and retrieving information.

**Users** (for adding Details of Customer and Admin.)

**Vehicles** ( for maintaining records of available vehicles, including vehicle name, vehicle type, vehicle model, vehicle rental price, vehicle id, vehicle availability status.)

**Bookings** (for keeping track of all the rental details like Booking id, User id, Vehicle id, Start date, End date, Total cost, Booking Status.)

**Feedback** ( allows user to provide reviews and ratings with fields like Feedback id, User id, Vehicle id, Rating and Comments.)

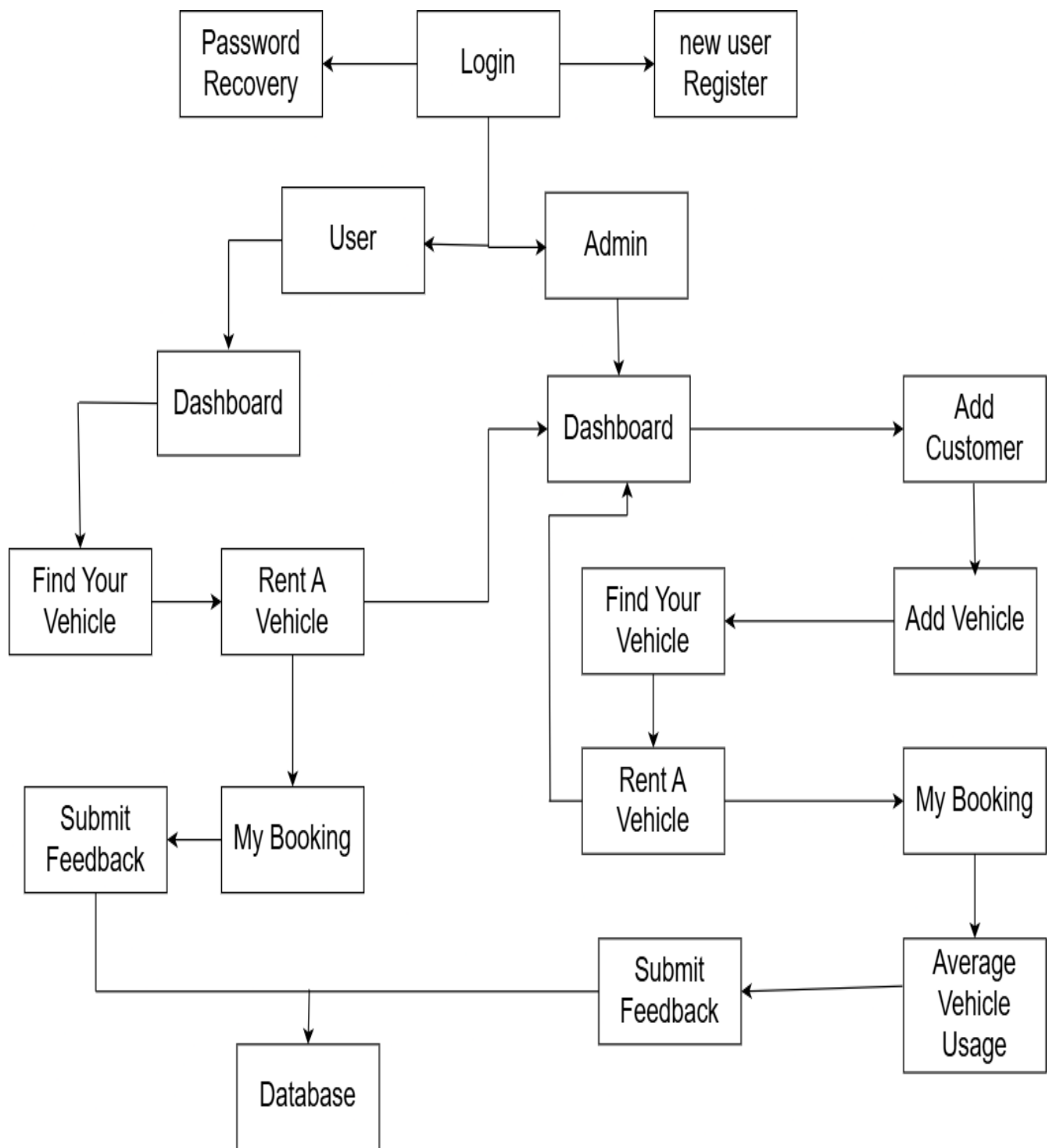
## Workflow Rent And Ride

This block diagram represents the flow of a Airwings airline reservation system. Here's an explanation of the different components and their relationships in Figure 5.1:

- 1. User Registration & Login :** New users register. Existing users log in. Password recovery available.
- 2. Dashboard Access :** Users and admins access their respective dashboards.
- 3. Vehicle Search & Booking :** Users find available vehicles. Users select and rent a vehicle.
- 4. Booking Management:** Users view their bookings. Admins manage bookings and vehicle availability.
- 5. Vehicle & Customer Management (Admin Only):** Admins add/edit/remove vehicles. Admins add new customers.
- 6. Usage Analysis & Feedback:** Users submit feedback. System tracks average vehicle usage.

Admins analyze data for improvements.

**7. Secure Logout:** Users log out securely to protect their data.



**Figure 5.1. Workflow of Rent And Ride: Vehicle Rental System**

## Chapter 6

### Project Scheduling

**Gantt Chart:** A Gantt chart is a visual project management tool that displays a timeline of a project. It consists of horizontal bars representing tasks or activities, with the length of each bar corresponding to the duration of the task.

In the second & third week of January Nihar Chavan, Sanskruti Hande, Srushti Khedekar, Arav Palsule formed a group for our mini project. We have discussed and finalized the project's topic, scope, and objectives during this meeting. In the following weeks Nihar Chavan, Sanskruti Hande, Srushti Khedekar, Arav Palsule used a paper prototype to explore and refine project ideas, completing this phase by the 3<sup>rd</sup> week of January.

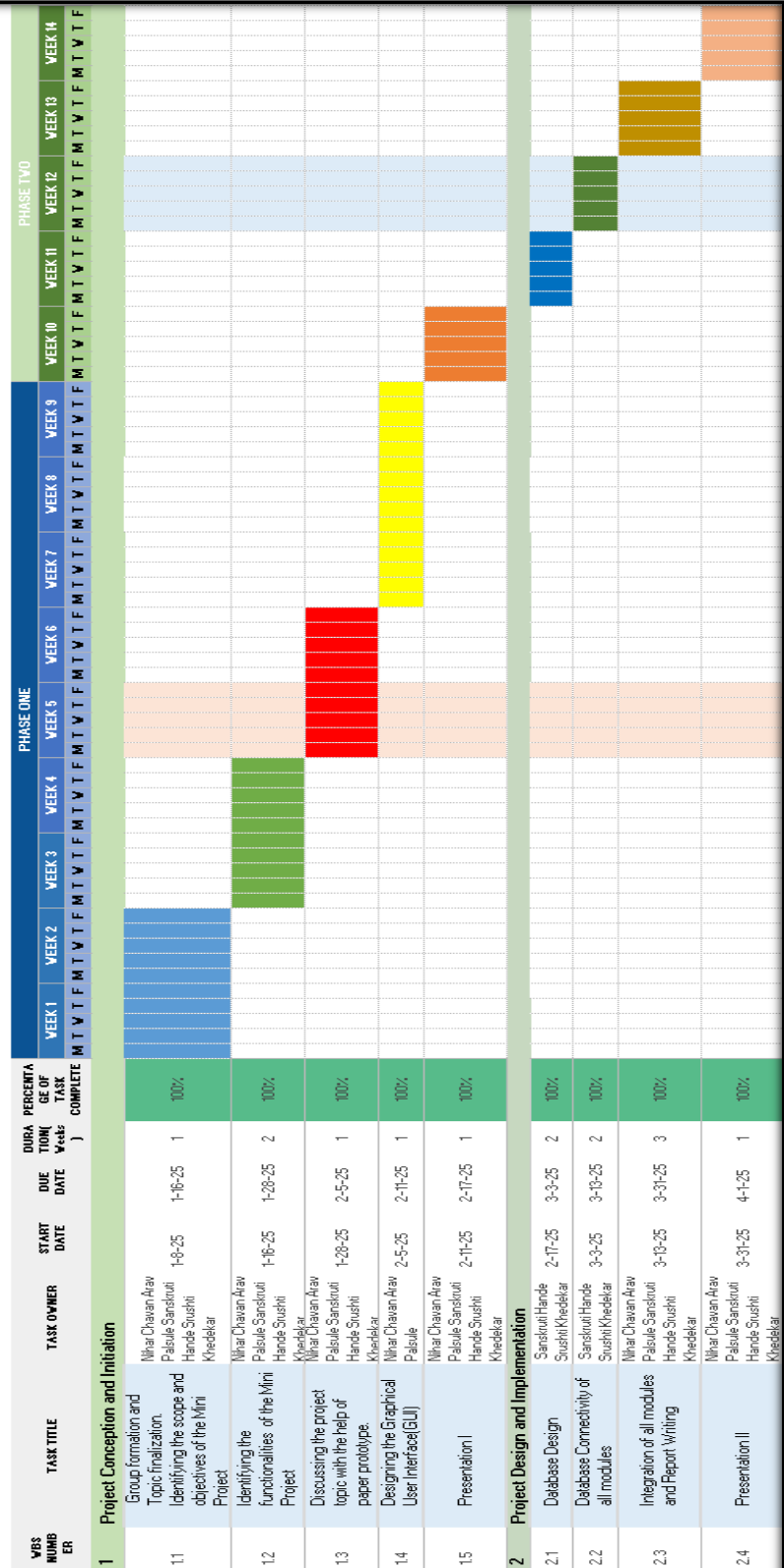
In late January Nihar Chavan, Sanskruti Hande, Srushti Khedekar, Arav Palsule executed the design and integration of the graphical user interface (GUI). Afterward, on 10th of February the first project review took place, and the faculty suggested some changes to the GUI, which were subsequently approved. Following this Nihar Chavan, Sanskruti Hande, Srushti Khedekar, Arav Palsule collaborated to create a structured database system, facilitating the systematic storage of information.

This, in turn, made it easier for Nihar Chavan and Arav Palsule to connect the database to the project. This database work was completed by 2nd week of March. Finally, the team integrated all modules and completed the report writing, resulting in our final presentation on 2<sup>nd</sup> of April, which was approved by the faculty.

**Smartsheet Tip** - see details about each task as well as project dependencies.

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DATE: 1-8-25



### Figure 6.1: Gantt Chart

# Chapter 7

## Results

The development and implementation of the Python-based "Rent and Ride" Vehicle Rental System have yielded a fully functional, efficient, and easy-to-use solution tailored to simplify and automate the vehicle rental process. The system was designed with simplicity, clarity, and usability in mind, and the final result reflects these priorities through its clean architecture and intuitive user interface. Users can register and log into the system securely, after which they can view a list of available vehicles, categorized clearly to help in making informed choices. The booking process is streamlined, allowing users to select their preferred vehicle based on basic information like vehicle name, model, and availability status—without involving complex inputs like payment details or specific pickup/return times, in adherence to the project's scope.

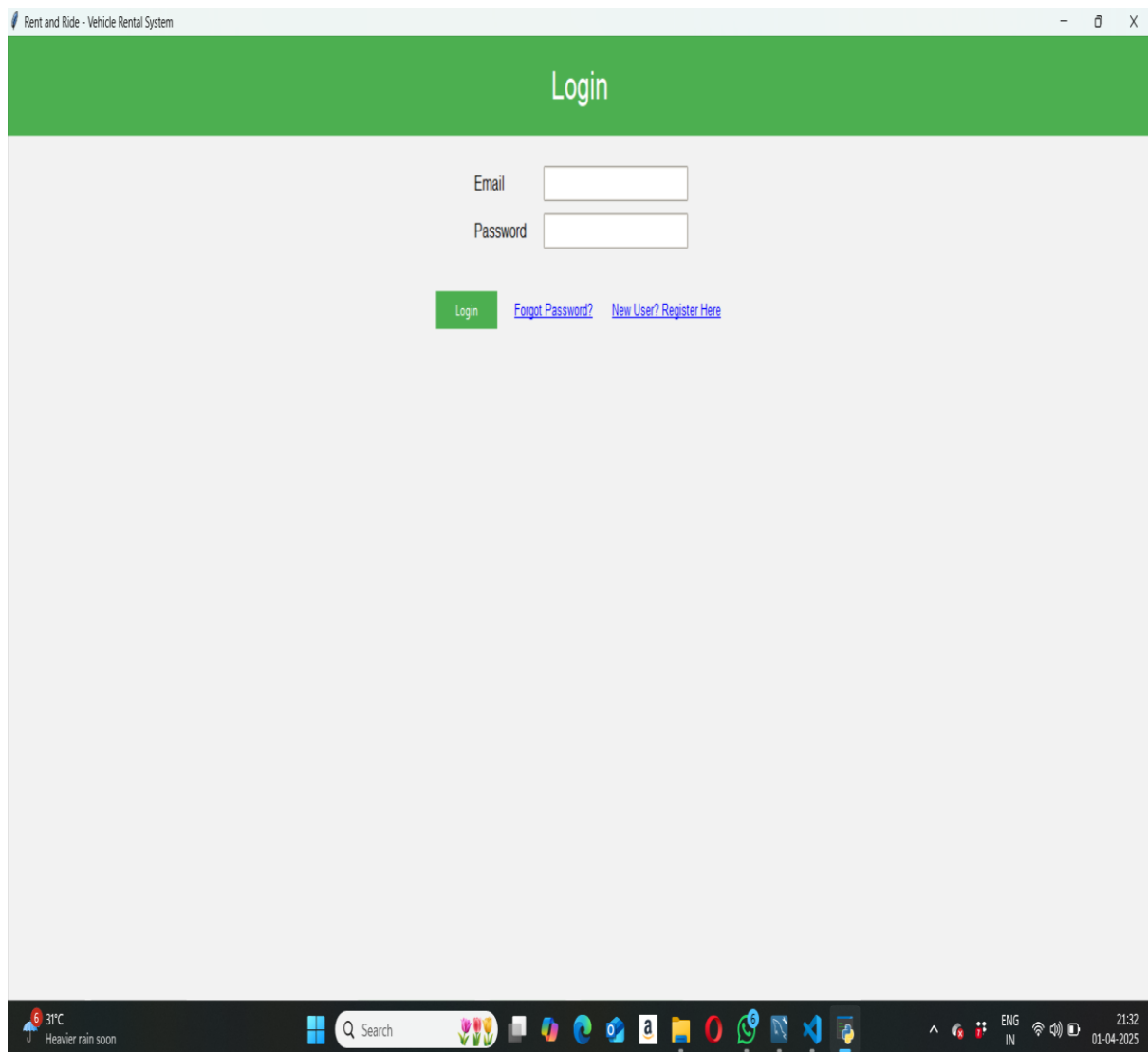
From an administrative perspective, the system offers powerful management features. Admins can add, update, or delete vehicle listings, view customer details, track booking activity, and monitor vehicle usage, all from a centralized dashboard. The integration of a recommendation feature enhances user interaction by suggesting popular or frequently used vehicles, thus improving the overall experience and potentially increasing vehicle utilization. Feedback collection is another valuable module that allows users to share their opinions, enabling service providers to continuously improve the quality of the rental process.

The entire system is developed using Python and its standard GUI library Tkinter, supported by SQLite for lightweight database operations. This choice of technology ensures that the system remains platform-independent, resource-efficient, and easy to deploy or extend in future versions. Moreover, the code is modular and well-documented, which allows for straightforward maintenance and scalability.

In conclusion, the project achieves its primary goal of offering a simple, functional vehicle rental system that eliminates manual handling, minimizes administrative workload, and improves the user experience. The successful implementation of core features—such as user

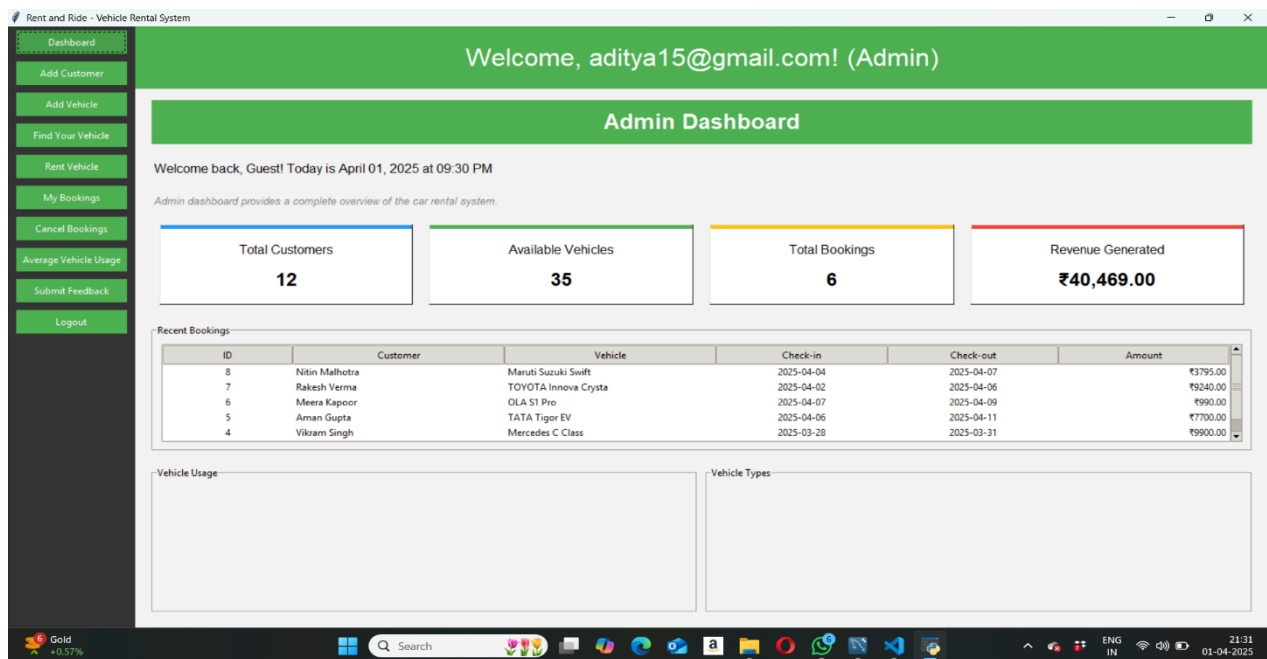


authentication, vehicle browsing, booking, feedback, and usage tracking—demonstrates the effectiveness of Python in building practical, real-world applications. This result lays the groundwork for future enhancements, such as incorporating live vehicle tracking, detailed analytics, or expanded administrative controls, should the system need to evolve further.



**Figure 7.1: Rent And Ride: Vehicle Rental System: User and Admin Login Page**

In Figure 7.1. Page showing User and Admin Login Page where user or admin can enter their credentials and enters the next page, Home Page.



**Figure 7.2: Rent And Ride : Vehicle Rental system: Admin Home page**

In Figure 7.2. This is Dashboard of Rent And Ride for Admin, showing Details like Total Customer, Available vehicles, Total Bookings, Revenue Generated.

### Add Customer

Full Name

Father's Name

Pincode

Mobile Number

Email Address

Nationality

ID Proof Number

Gender ☒ Male ☐ Female

ID Proof Type

**Figure7.3: Rent And Ride: Vehicle Rental System: Add Customer**

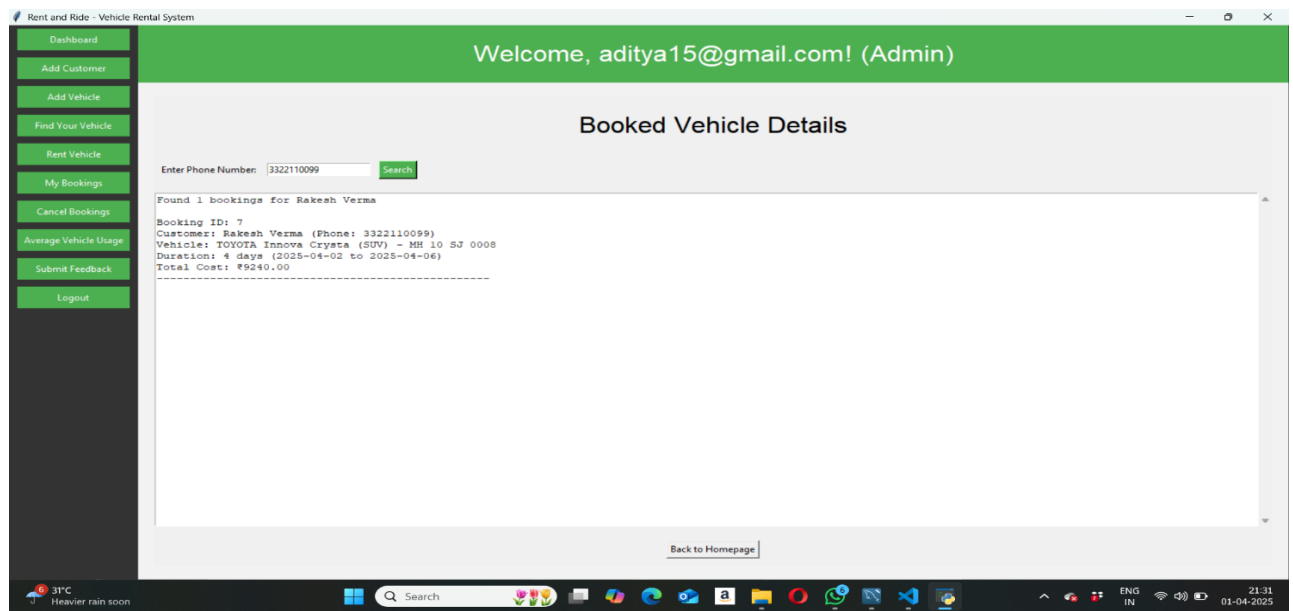
In Figure 7.3. This is Add Customer page where user can fill his personal details.

**Figure 7.4: Rent And Ride: Vehicle Rental System: Add Vehicle**

In Figure 7.4. This is Add Vehicle page where Admin will add new vehicle in the system.

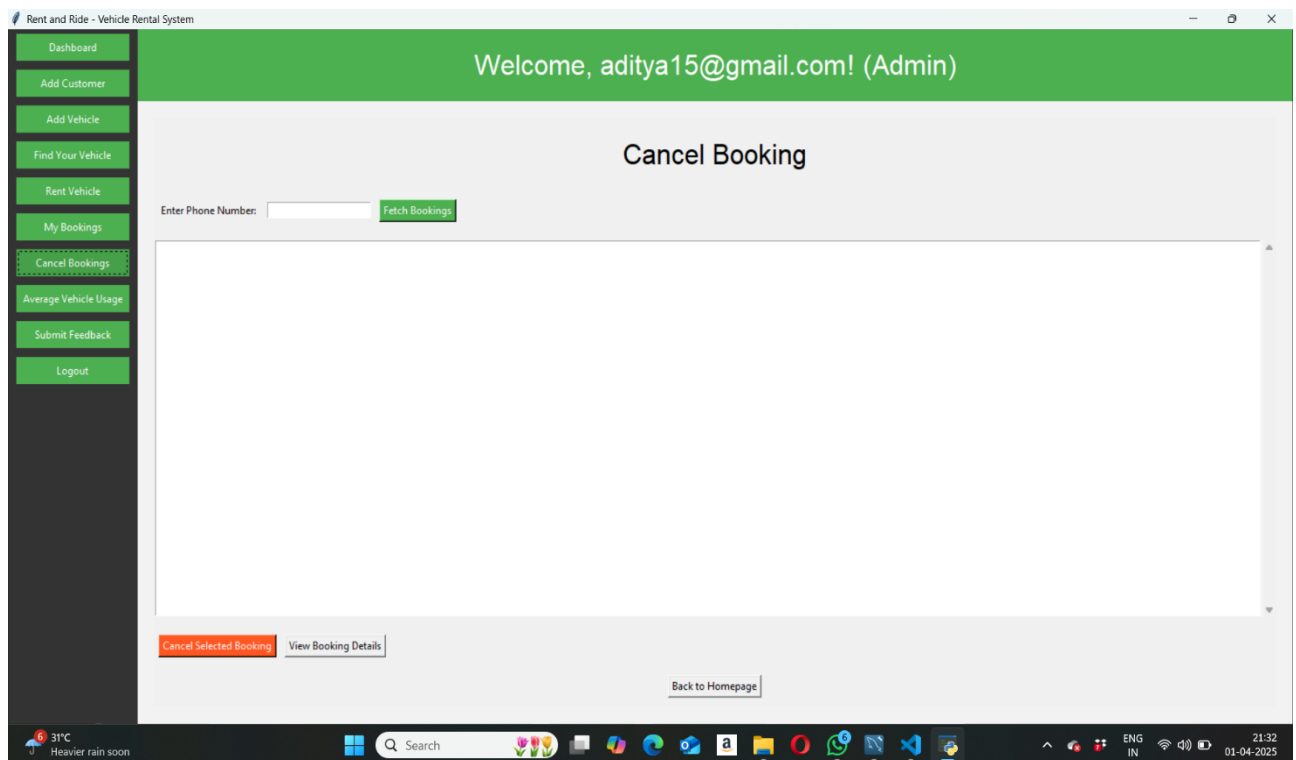
**Figure 7.5: Rent And Ride: Vehicle Rental System: Rent Vehicle**

In Figure 7.5. This is Rent Vehicle Page where user can rent(Book) vehicle using Personal details with mobile no user fetch details & rent vehicles.



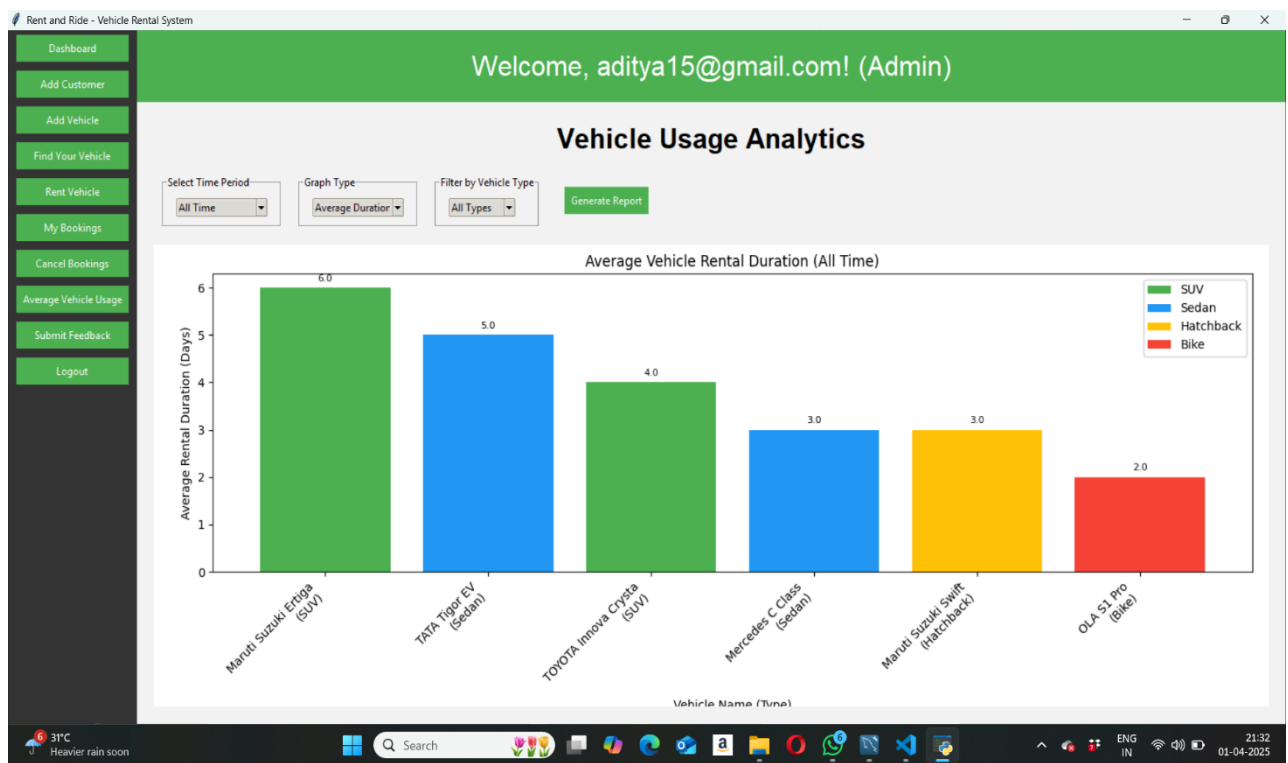
**Figure 7.6: Rent And Ride: Vehicle Rental System: Booked Vehicle Details**

In Figure 7.6. User can enter their phone number and View Booked Vehicle Details.



**Figure 7.7: Rent And Ride: Vehicle Rental System : Cancel Booking**

In Figure 7.7. If Customer want to cancel his rental booking using this page with phone no , he can cancel his booking.



**Figure 7.8: Rent And Ride: Vehicle Rental System: Average usage page**

In Figure 7.8. Admin can understand the average vehicle duration using graph in this page.

Find Your Vehicle

Answer a few questions to get personalized vehicle

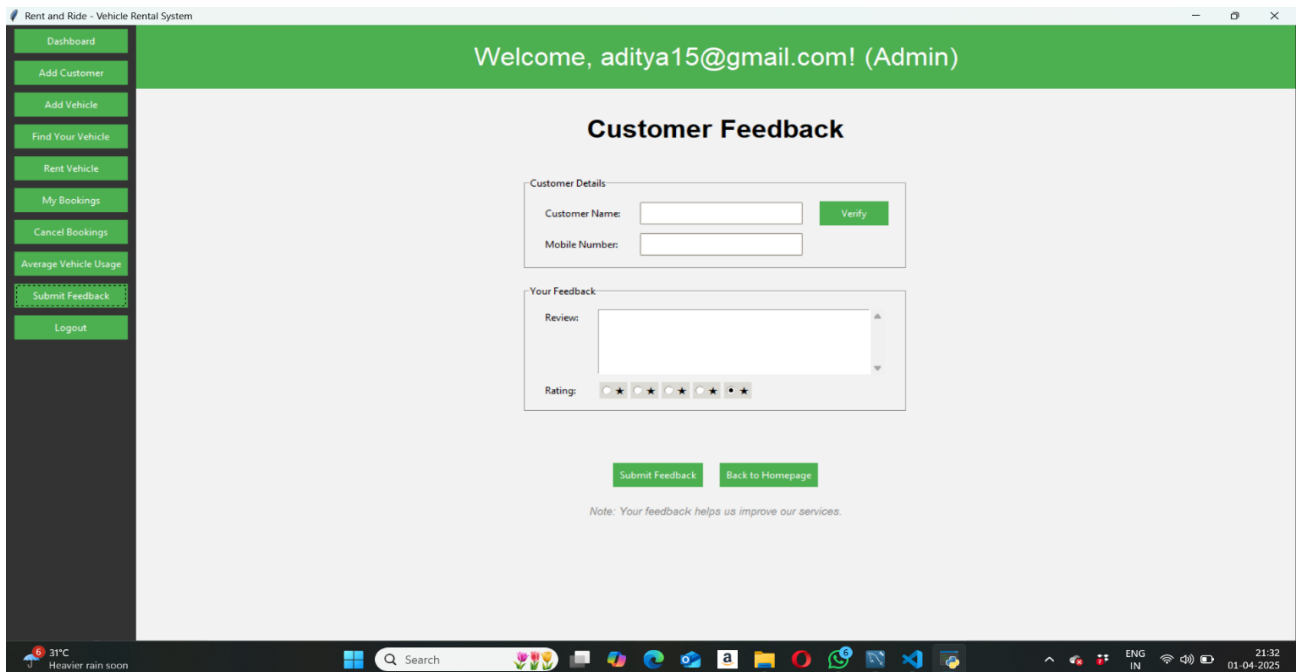
- Purpose of Rental**  
☐ Business ☒ Leisure ☐ Family Trip ☐ Adventure
- Number of People**  
2 People
- Luggage Capacity Needed**  
2 Bags
- Preferred Fuel Type**  
☒ Petrol ☐ Diesel ☐ Electric
- Rental Duration (Days)**  
3 Days
- Budget per day (₹)**  
₹2000

**Recommendations**  
Your vehicle recommendations will appear here...

Get Recommendations | Reset Form | Back to Homepage

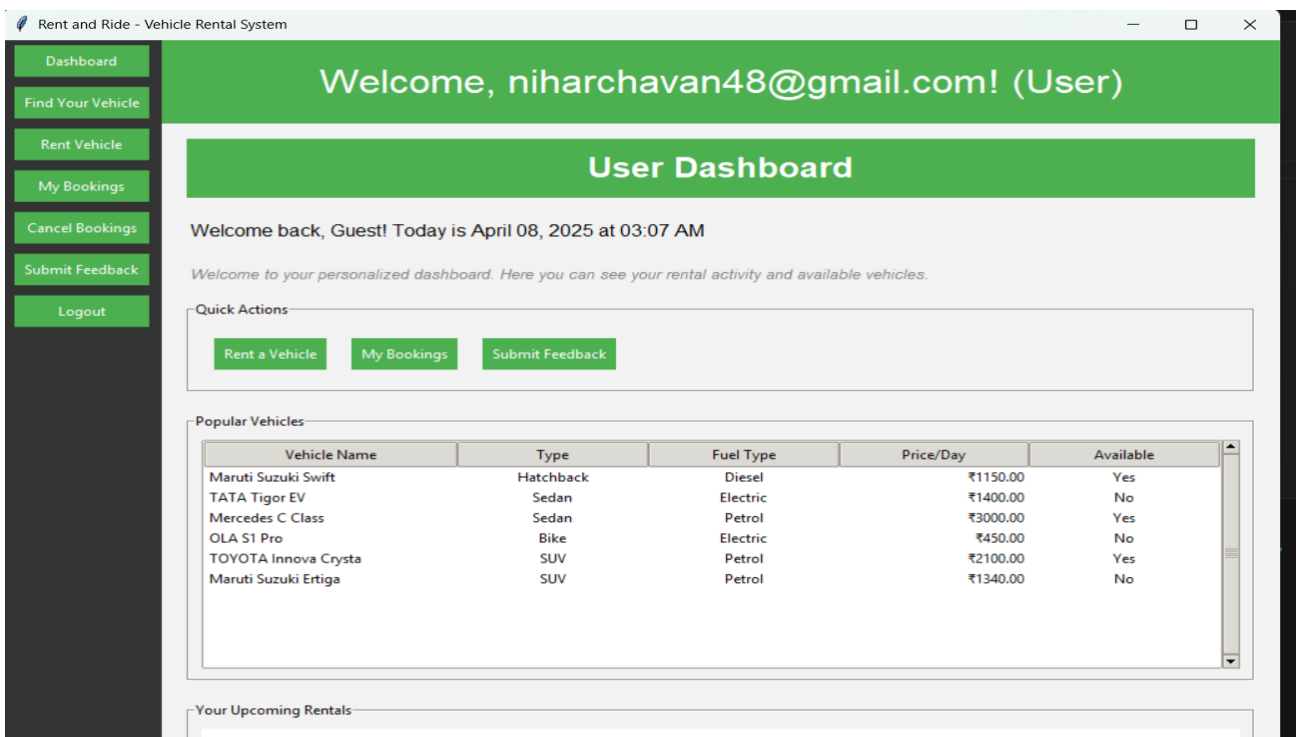
**Figure 7.9: Rent And Ride: Vehicle Rental System: Find Your Vehicle**

In Figure 7.9. Customer gets vehicle suggestion by giving some preferences in this page.



**Figure 7.10: Rent And Ride: Vehicle Rental System: Customer Feedback**

In Figure 7.10. Customer can give their ratings and reviews in this page .



**Figure 7.11: Rent And Ride: Vehicle Rental System: User Dashboard**

In Figure 7.10. This is Dashboard of Rent And Ride for user, showing popular vehicles and its details , It also includes quick actions buttons in this dashboard.

# **Chapter 8**

## **Conclusion**

The Rent and Ride Vehicle Rental System revolutionizes the traditional vehicle rental process by offering a seamless, automated, and highly efficient solution. With the transition from manual booking methods to a centralized digital platform, the system eliminates common issues such as booking conflicts, mismanagement of vehicle availability, and customer dissatisfaction. By incorporating features like an intuitive dashboard, vehicle recommendations, and customer feedback, the system not only enhances user convenience but also provides valuable insights for business owners to improve operations. The user-friendly interface ensures that customers can quickly find and rent vehicles with minimal effort, reducing delays and enhancing the overall rental experience. One of the key strengths of the system is its ability to offer a structured and secure workflow for both users and administrators. Users can log in, explore available vehicles, make bookings, and provide feedback with ease. The dashboard-driven control system ensures that administrators have complete oversight of customer data, vehicle availability, and booking trends. The secure authentication process guarantees that only authorized users can access the system, enhancing data protection. Furthermore, the inclusion of an automated vehicle management system allows businesses to keep track of their fleet, ensuring that vehicles are properly maintained and readily available for customers.

Another significant advantage is the data-driven approach to decision-making. The system generates valuable insights through usage graphs and booking analytics, helping businesses optimize their services. With real-time tracking of vehicle demand, companies can identify peak usage times, allocate resources more effectively, and make informed decisions regarding fleet expansion. Additionally, the feedback mechanism allows businesses to gather customer opinions and improve their services based on real-time user experiences. This fosters a customer-centric approach, increasing user satisfaction and retention rates.

By eliminating paper-based processes and manual errors, the system also reduces administrative workload, allowing rental companies to focus on growth and service enhancement. The automation of vehicle management, customer registration, and booking history tracking ensures that all operations run smoothly without unnecessary delays. The system also fosters transparency,

as customers can view available vehicles and past bookings without depending on manual records.

In conclusion, the Rent and Ride Vehicle Rental System is a transformative solution for the vehicle rental industry, offering efficiency, security, and user convenience. The centralized and automated approach enhances business productivity, reduces operational errors, and improves customer experience. With a strong emphasis on data analytics, customer feedback, and secure management, this system is poised to redefine the way vehicle rentals are managed. By adopting this modern digital system, rental businesses can scale their operations, maintain high levels of customer satisfaction, and stay ahead in an increasingly competitive market.



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