INSTITUTE FOR ADVANCED COMPUTING ANDSOFTWARE DEVELOPMENT (IACSD),AKURDI, PUNE

Documentation On

Online Car parking System

PG-DAC March 2023

Submitted By:

Group No: 07

Roll No.	Name:
233010	Aniket N. Gonjare
233037	Sham B. Girhe

Mrs. Sonali Mogal
Project Guide

Mr. Rohit Puranik
Center Coordinator

ABSTRACT

The purpose of Car Parking System is to automate the existing manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. The required software and hardware are easily available and easy to work with.

Car Parking System, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrate on the record keeping. Thus it will help organization in better utilization of resources. The organization can maintain computerized records without redundant entries. That means that one need not be distracted by information that is not relevant, while being able to reach the information.

The aim is to automate its existing manual system by the help of computerized equipments and full-fledged computer software, fulfilling their requirements, so that their valuable data/information can be stored for a longer period with easy accessing and manipulation of the same. Basically the project describes how to manage for good performance and better services for the clients.

ACKNOWLEDGEMENT

A project usually falls short of its expectation unless aided and guided by the right persons at the right time. We avail this opportunity to express our deep sense of gratitude towards **Mrs.Sonali Mogal** and **Mr. Rohit Puranik**,(Center Coordinator, IACSD Pune) .

We are deeply indebted and grateful to them for their guidance, encouragement and deep concern for our project. Without their critical evaluation and suggestions at every stage of the project, this project could never have reached its present form. Last but not the least we thank the entire faculty and the staff members of IACSD, Pune for their support.

Aniket N. Gonjare(233010)

Sham B. Girhe(233037)

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Chapter 1 : Introduction

1.1 Brief Overview of Work

The "Car Parking System" has been developed to override the problems prevailing in the practicing manual system. This software is supported to eliminate and insome cases reduce the hardships faced by this existing system. Moreover this system is designed for the particular need of the company to carry out operations in a smooth and effective manner.

The application is reduced as much as possible to avoid errors while entering the data. It also provides error message while entering invalid data. No formal knowledge is needed for the user to use this system. Thus by this all it proves it is user-friendly. Car Parking System, as described above, can lead to error free, secure, reliable and fast management system. It can assist the user to concentrate on their other activities rather to concentrateon the record keeping. Thus it will help organization in better utilization of resources.

Every organization, whether big or small, has challenges to overcome and managing the information of Parking, Car, Parking Slot, Parking Fees, Parking Area. Every Car Parking System has different Car needs, therefore we design exclusive employee management systems that are adapted to your managerial requirements. This is designed to assist in strategic planning, and will help you ensure that your organization is equipped with the right level of information and details for your future goals. Also, for those busy executive who are always on the go, our systems come with remote access features, which will allow you to manage your workforce anytime, at all times. These systems will ultimately allow you to better manage resources.

This project is to build a Vehicle Parking management system that enables the time management and control of vehicles using number plate recognition.The system that will track the entry and exit of cars, maintain a listing of cars within the parking lot, and determine if the parking lot is full or not. It will determine the cost of per vehicle according to their time consumption.

1.2 Objective

The main objective of the Project on Car Parking System is to manage the details of Car, Parking, Parking Space, Parking Slot, Parking Area. It manages all the information about Car, Parking Fees, Parking Area, Car. The project is totally built at administrative end and thus only the administrator is guaranteed the access. The purpose of the project is to build an application program to reduce the manual work for managing the Car, Parking, Parking Fees, Parking Space. It tracks all the details about the Parking Space, Parking Slot, Parking Area.

1.3 Scope

- Can be easily used in public parking lot.
- The congestion and collision of vehicle due to previous manual method will be little to no longer exist.

1.4 Project Modules

- **Admin Login**: The system is under supervision of admin who manages the bookings made.
- **User login/registration**: Users have to first register themselves to login into the system.
- **Three Parking areas**: The system will provide users with three parking areas of different locations.
- **Parking availability check**: User can click on spaces to view the availability. If the space is already booked it will be marked yellow and the available ones will be seen in normal color.
- **Parking booking online for date and time**: Users can book parking space for their required date and time.
- **Automatic cost calculation**: The system calculates the total cost incurred for parking based on the time that user has asked for booking.
- **Parking cancellation**: User may even cancel their bookings by login into the system anytime.

- **Email on successful parking booking**: When user is successful in parking the space, system sends a confirmation and 'thank you' email regarding the space booked.
- **Feedback**: The system has a feedback form, where user can provide feedback into the system.

1.5 Project Requirements

1.5.1 Hardware

The system requires the following hardware:

- RAM: 1 GB (further increase that as per requirement.)
- Hard Disk: 80 GB (further increase that as per requirement.)
- Display: 1024 * 768, True Type Color-32 Bit
- Mouse: Any Normal Mouse.
- Keyboard: Any window Supported Keyboard.

1.5.2 Software

- Database Server : MySQL Server
- Web Server : Internet Information Server
- Technologies : React js, CSS, SPRING BOOT

Chapter 2 : System Analysis

2.1 System Analysis

This chapter describes the different fact-finding techniques that were used for achieving the goals and objectives of the project such as Population of the study, Data Collection and Analysis, system analysis, system design and implementation, Testing and validation. The study was conducted in New Road Parking.

2.2 Requirement Analysis

Project has the following functional and non functional requirements

i. Functional Requirement

FR1: Admin must be able to Define new parking areas, specify a range of parking lots, the parking cost per minute/hour, and other details.

FR2: admin must be able to update data of existing parking areas.

FR3: admin must be able to view the information of all registered parking areas.

FR4: The parking operator must be able to Send the vehicle plate number and reservation password (Session ID) to a central server for verification once users check in.

FR5: parking operator must be able to Issue bills to users on checkout.

FR6: User must be able to Register for the service and enter personal and vehicle details.

FR7: User must be able to find a parking area from the list of areas, registered by parking admins.

FR8: User must be able to view the details of a selected parking area such as the name, worth per minute, number of total available lots.

FR9: The user must be able to Reserve an obtainable parking space and specify the duration of the reservation.

FR10: Backend management system must be able to Authenticate users and admins before updating any sensitive information.

FR11: Backend management system must be able to Accept reservation of parking lots based on availability.

FR12: The backend management system must be able to Generate a Session ID for every reservation and send it to the userii. Non Functional Requirement

FR13: Backend management system must be able to enable modification of parking lot status by operators.

FR14: Backend management system must be able to Auto-cancel reservation if the user fails to succeed in among the window period.

ii. NON FUNCTIONAL REQUIREMENTS:

NFR 1: Parking overview should have data displayed in real time.

NFR 2: Booking should take place no more than 15 seconds.

NFR 3: An email confirmation about successful booking should come in less than 5 minutes.

NFR 4: User should be notified upon unsuccessful booking of a parking slot.

NFR 5: System should not stale if accessed by multiple users.

NFR 6: System should not allow the booking of the same parking slot by multiple users at the same time.

NFR 7: System should not allow the booking of parking slots which are occupied (notbooked).

NFR 8: User should see the parking occupancy data on the map in real time.

NFR 9: User should not be allowed to see any data until logged in.

NFR 10: User should see unresponsive parking slots as occupied.

2.3 Project Feasibility Study

2.3.1 Technical Feasibility

Our project results a very simple and user-friendly outcome. The technical feasibility in the proposed system deals with the technology used in the system. It deals with the hardware and software used in the system whether they are of latest technology or not. It happens that after a system is prepared a new technology arises and the user wants the system based on that technology. This system uses windows platform, PHP, MYSQL making our project Vehicle parking management system technically feasible.

2.3.2 Economical Feasibility

This project is economically feasible in the sense that the money which were invested in purchasing register to keep data during short periods are now to be invested in a computer which do not need to be changed every year. So, a onetime investment in computer reduces expenses of the company. And a project itself is feasible as every software used to make it are easily available in internet.

2.3.3 Operational Feasibility

This project is operationally feasible in a sense that this is done in a Computer. so data are more secure than before, reduces risk of loss of data and updates in automated manner reduces the error occurring chances. And this software does not require any other technical person to operate it as a person with very less computer do as fine.

2.4 NEED OF ONLINE CAR PARKING SYSTEM

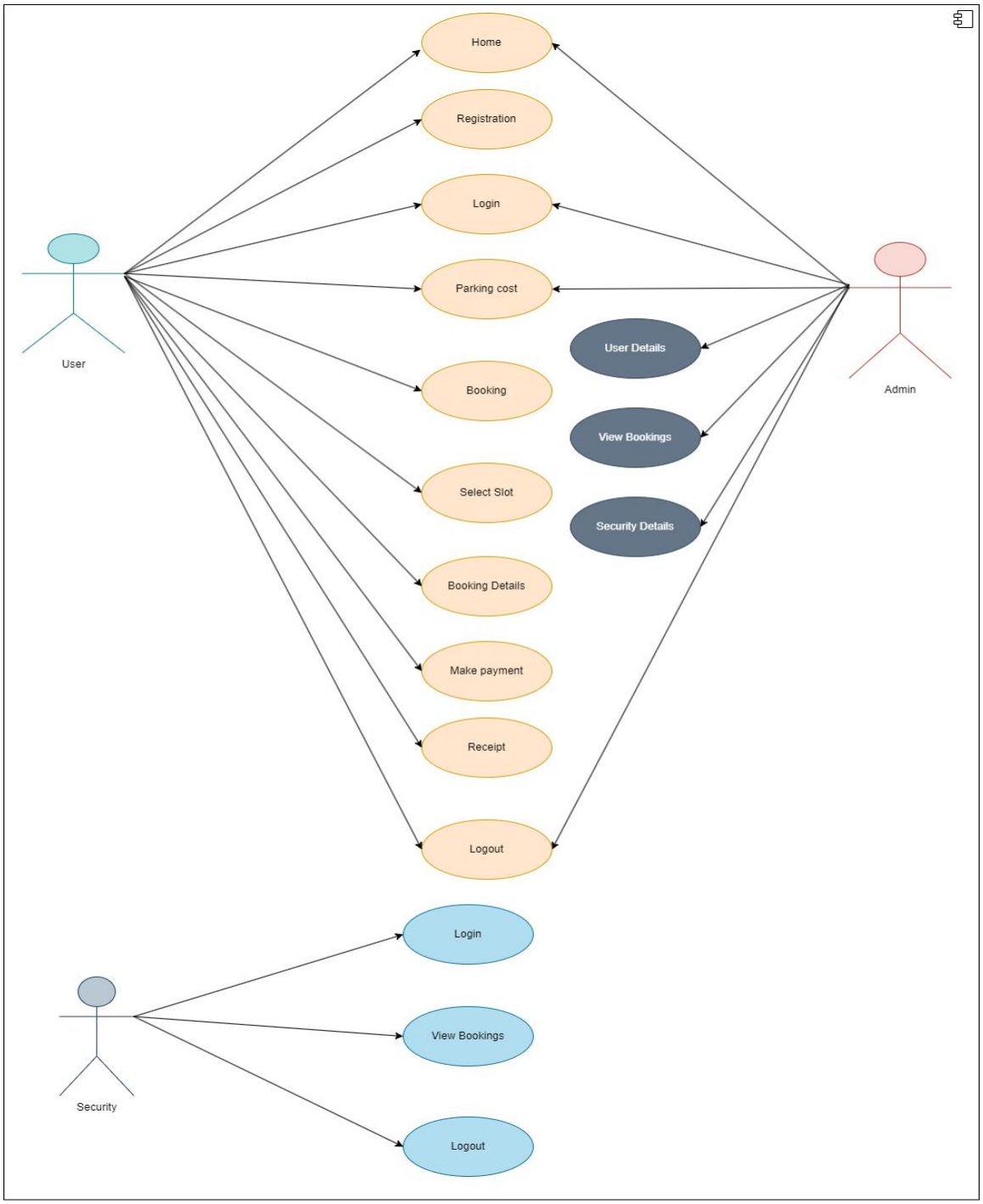
An online car parking management system can provide numerous benefits, including:

- **Improved Efficiency:** With an online car parking management system, drivers can easily find available parking spots, while parking attendants can better manage the parking lot to ensure optimal use of space.
- **Cost Savings:** By automating the parking management process, the need for manual labour and associated costs can be reduced. Additionally, the system can help prevent revenue loss due to unauthorized parking or unpaid parking fees.
- **Increased Security:** The system can provide real-time monitoring of the parking lot, including the ability to detect and address any security threats or issues that may arise.
- **Improved Customer Satisfaction:** Drivers can enjoy a more streamlined and convenient parking experience, with the ability to quickly find available parking spots and pay for parking without having to physically interact with parking attendants.
- **Enhanced Data Collection:** The system can generate useful data about parking usage patterns, which can be used to inform future decisions and improvements in the parking management process.

Overall, an online car parking management system can lead to a more efficient, secure, and satisfying parking experience for drivers, while also providing cost savings and valuable data insights for parking lot operators.

Chapter 3 : System Design

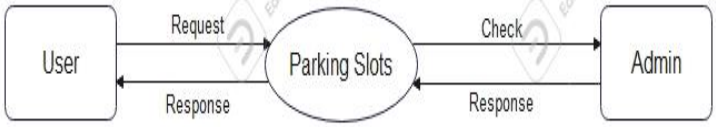
3.1 Use Case Diagrams



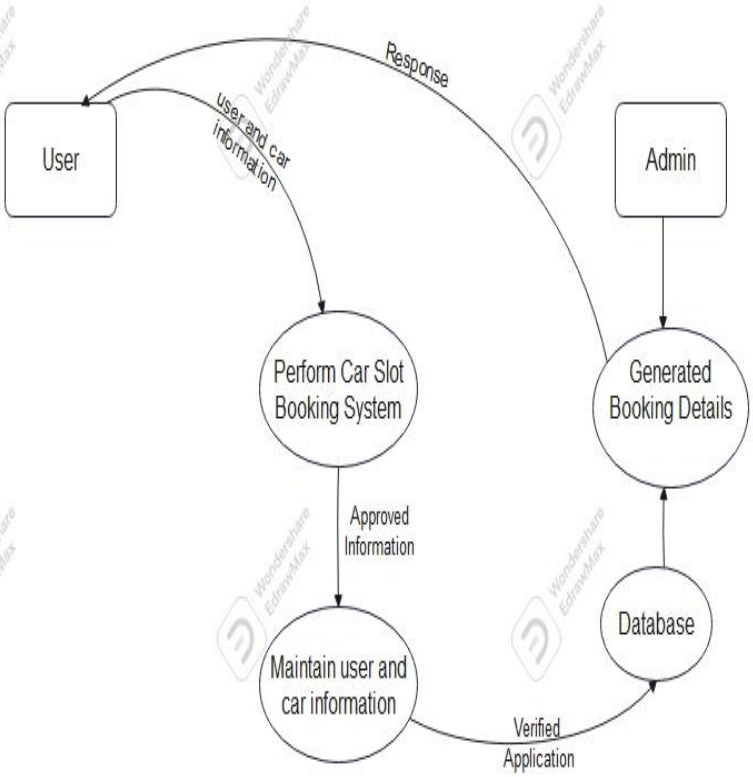
3.2 Data Flow Diagrams

3.2.1 Context-Level (Level 0) DFD and Level 1 DFD

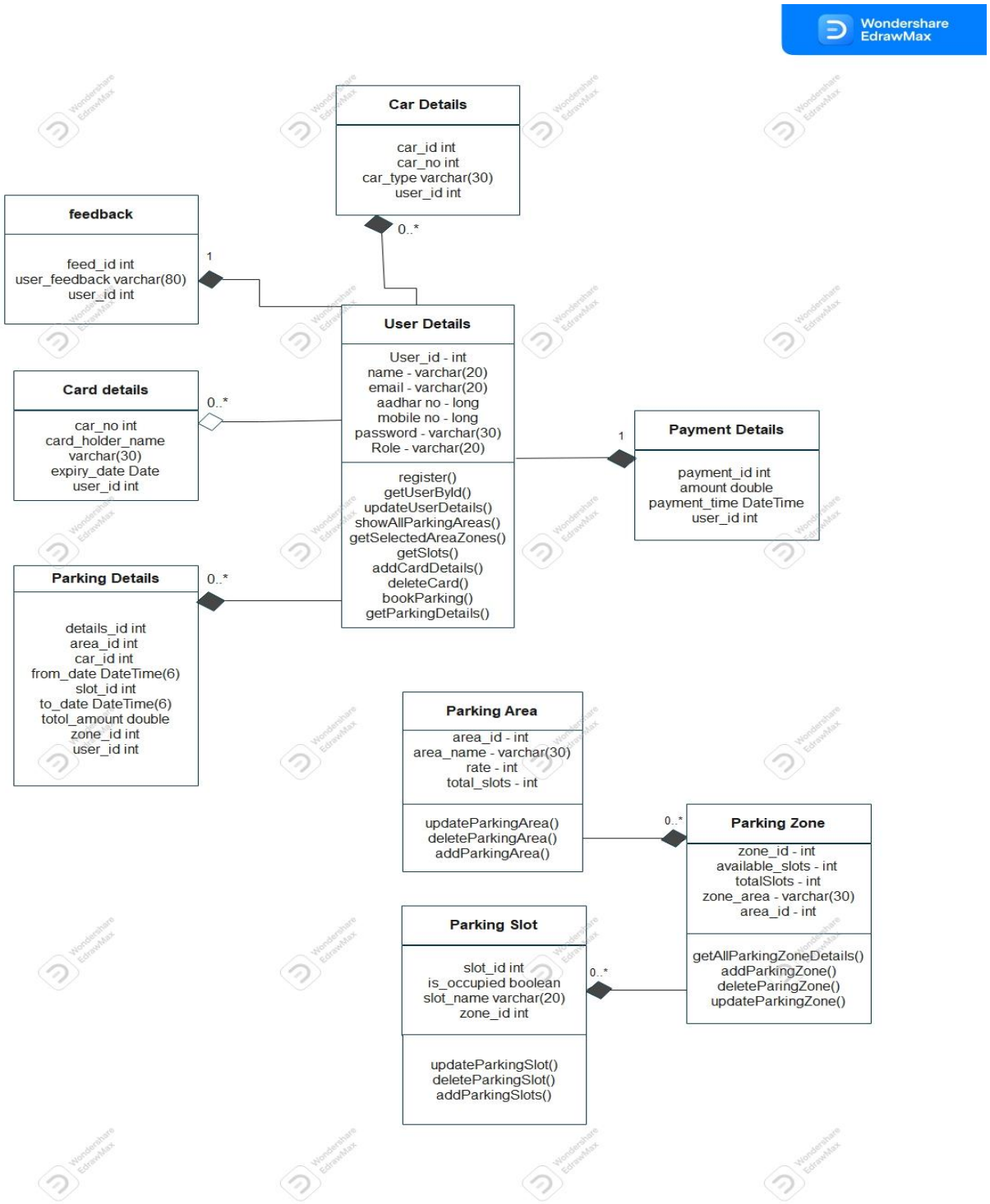
Level-0 :



Level-1 :

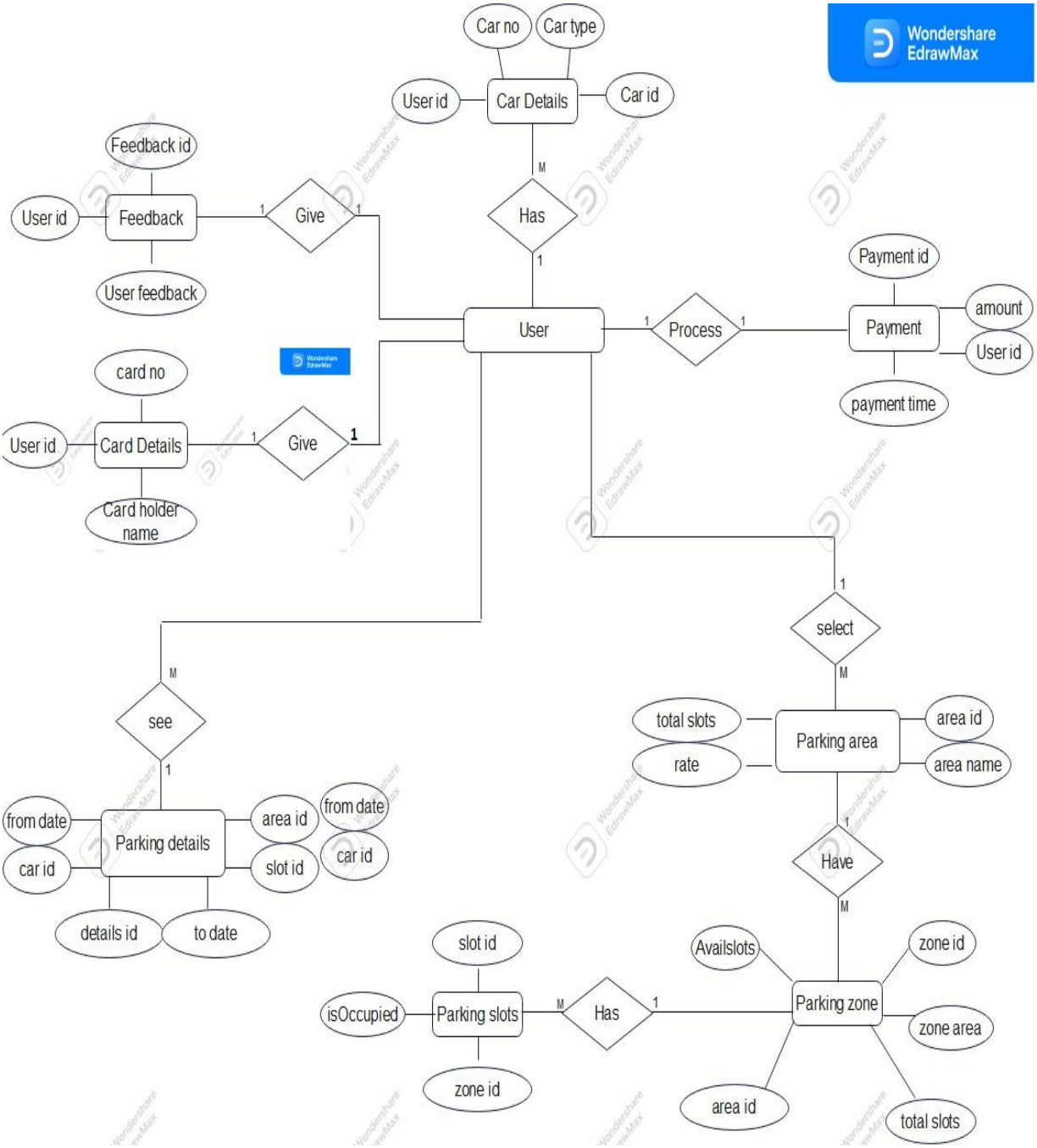


3.3 Class Diagram

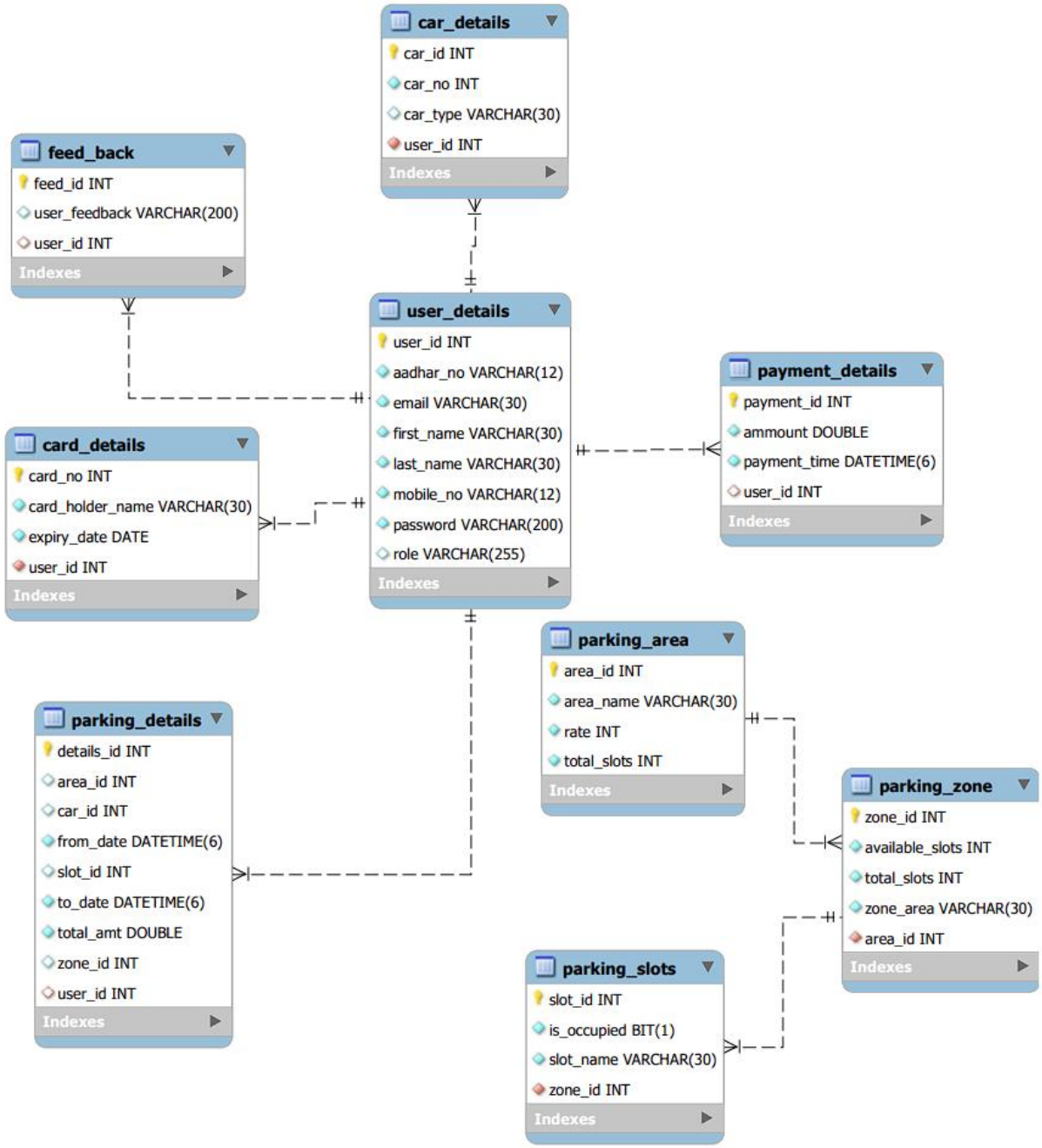


3.4 Entity Relationship Diagram

I.

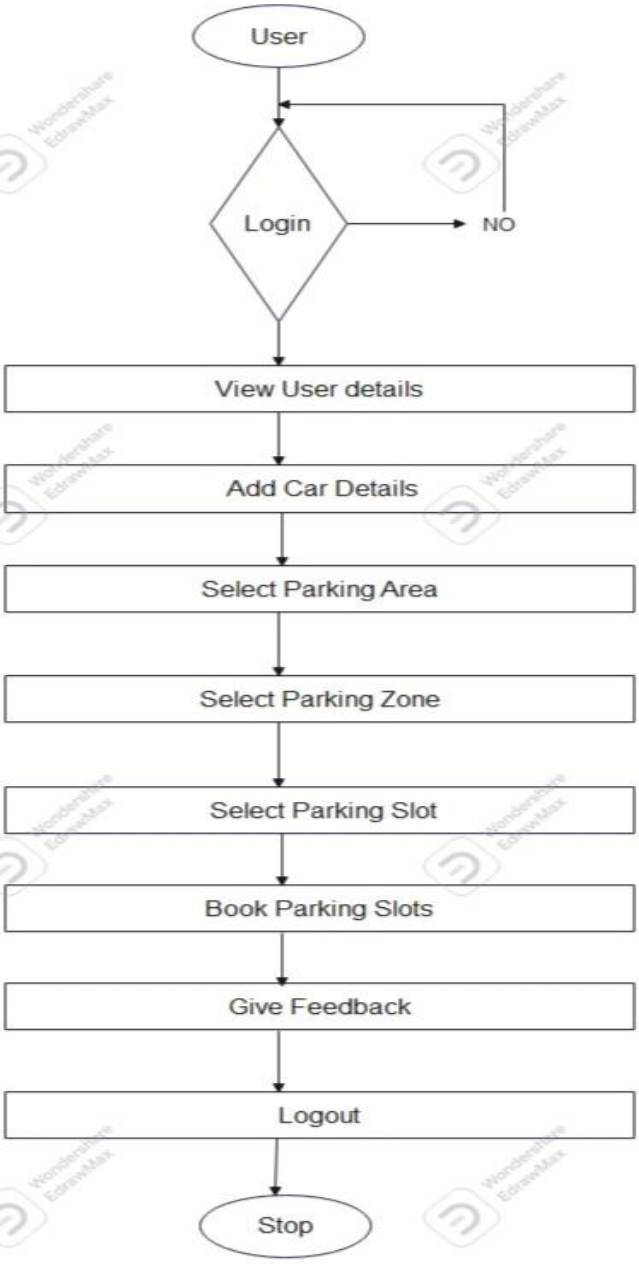


II.

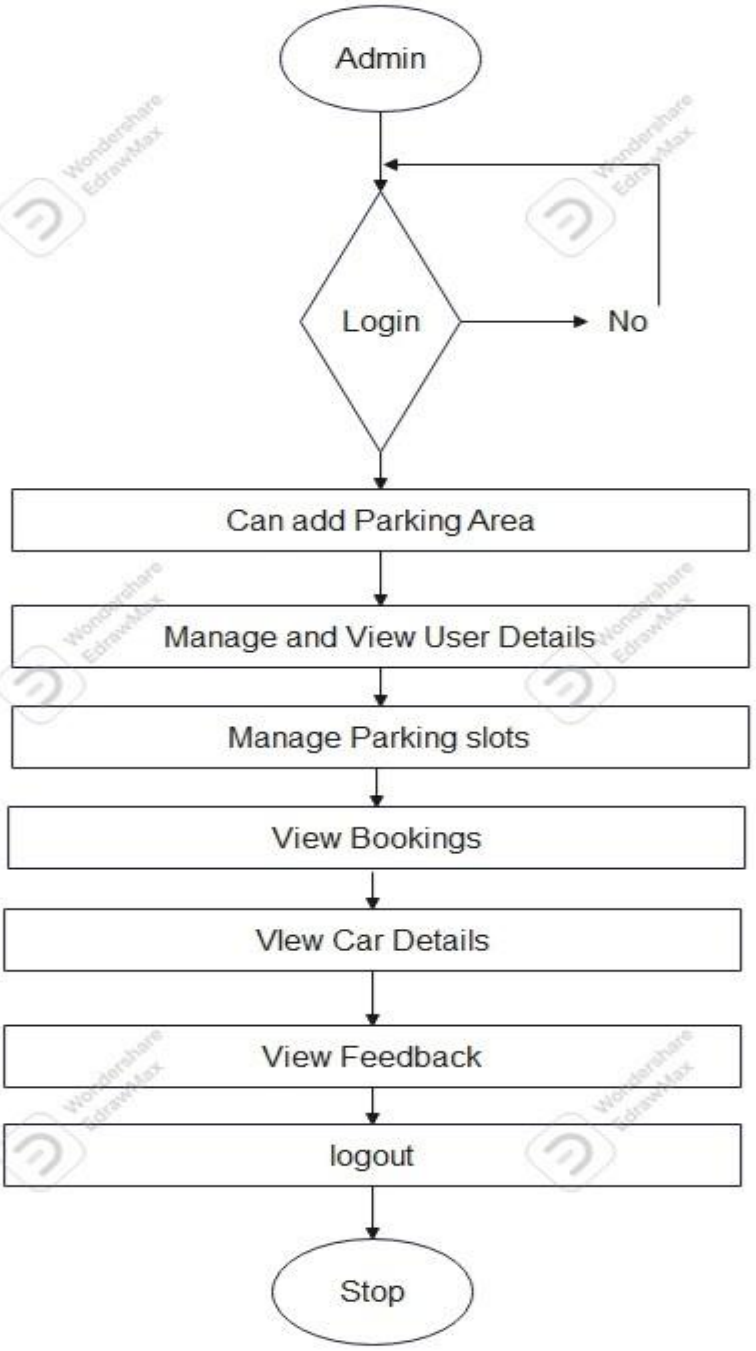

car_details
car_id INT
car_no INT
car_type VARCHAR(30)
user_id INT
Indexes
feed_back
feed_id INT
user_feedback VARCHAR(200)
user_id INT
Indexes
user_details
user_id INT
aadhar_no VARCHAR(12)
email VARCHAR(30)
first_name VARCHAR(30)
last_name VARCHAR(30)
mobile_no VARCHAR(12)
password VARCHAR(200)
role VARCHAR(255)
Indexes
payment_details
payment_id INT
ammount DOUBLE
payment_time DATETIME(6)
user_id INT
Indexes
card_details
card_no INT
card_holder_name VARCHAR(30)
expiry_date DATE
user_id INT
Indexes
parking_area
area_id INT
area_name VARCHAR(30)
rate INT
total_slots INT
Indexes
parking_details
details_id INT
area_id INT
car_id INT
from_date DATETIME(6)
slot_id INT
to_date DATETIME(6)
total_amt DOUBLE
zone_id INT
user_id INT
Indexes
parking_zone
zone_id INT
available_slots INT
total_slots INT
zone_area VARCHAR(30)
area_id INT
Indexes
parking_slots
slot_id INT
is_occupied BIT(1)
slot_name VARCHAR(30)
zone_id INT
Indexes

3.5 Activity Diagram

3.5.1 User



3.5.2 Admin


Admin
Login
No
Can add Parking Area
Manage and View User Details
Manage Parking slots
View Bookings
Vlew Car Details
View Feedback
logout
Stop

3.6 Data Dictionary

Table 1: User_Details:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
user_id	int	4	0
aadhar_no	varchar	12	0
email	varchar	30	0
first_name	varchar	30	0
last_name	varchar	30	0
mobile_no	varchar	12	0
password	varchar	30	0
role	varchar	255	1

Table 2: Payment Details:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Payment_id	int	4	0
Amount	double	8	0
Payment_time	date	6	0
status	bit(1)	1	0
User_id	int	4	1

Table 3: Parking Zone:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Zone_id	int	4	0
Available_slots	int	4	0
Total_slots	int	4	0
Zone_area	varchar	30	0
Area_id	int	4	0

Table 4: Parking Slots:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Slot_id	int	4	0
Is_occupied	bit	1	0
Slot_name	varchar	30	0
Zone_id	int	4	0

Table 5: Parking Details:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Details_id	Int	4	0
From_date	datetime	6	0
Payment_mode	varchar	255	1
Slot_id	int	4	1
To_date	datetime	6	0
Total_amt	double	8	0
User_id	int	4	1
Zone_id	int	4	1

Table 6:Parking Area :

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Area_id	int	4	0
Area_name	varchar	30	0
Availabl_slots	int	4	0
Rate	int	4	0
Total_slots	int	4	0

Table 7:Feedback:

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Feed_id	int	4	0
User_feedback	varchar	200	1
User_id	int	4	1

Table 8:Card Details :

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Card_no	int	4	0
Card_holder_name	varchar	30	0
Expiry_date	date	6	0
User_id	int	4	0

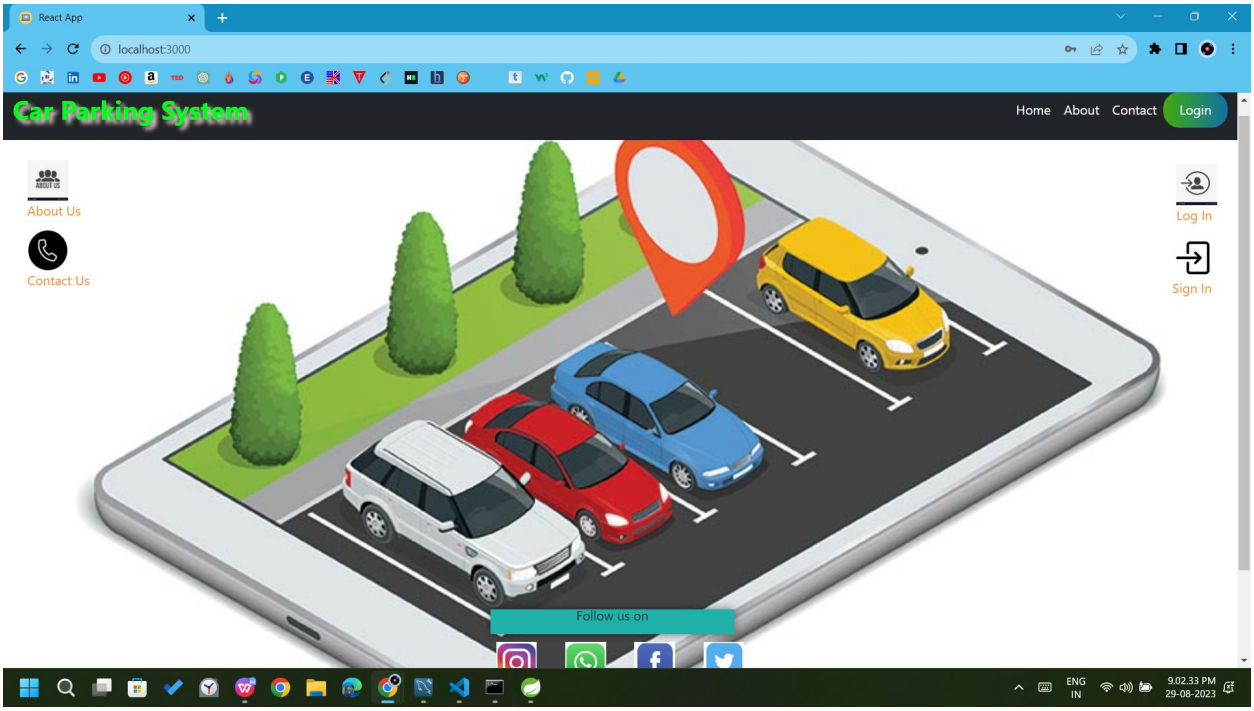
Table 9:Car Details :

Column Name	Data Type	Length	Allow Null (1=Yes;0=No)
Car_id	int	4	0
Car_no	int	4	0
Car_type	varchar	30	0
User_id	int	4	0

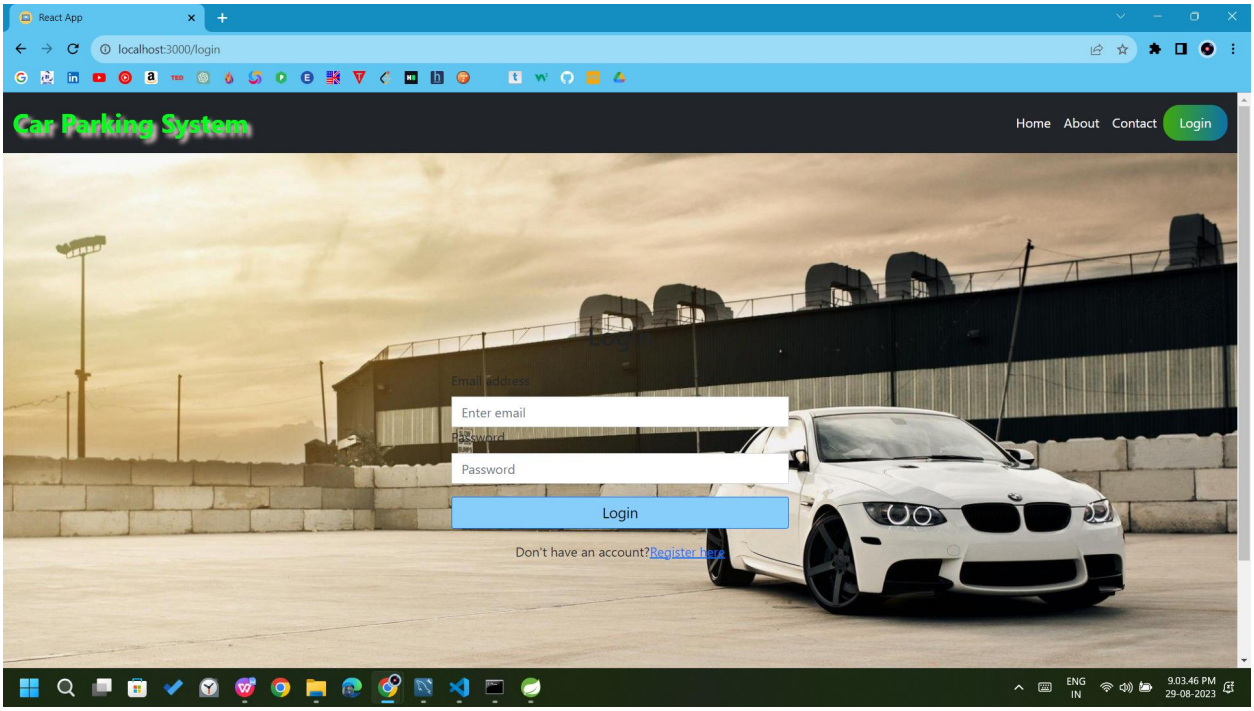
Chapter 4 : Implementation

4.1 User Interface and snapshots

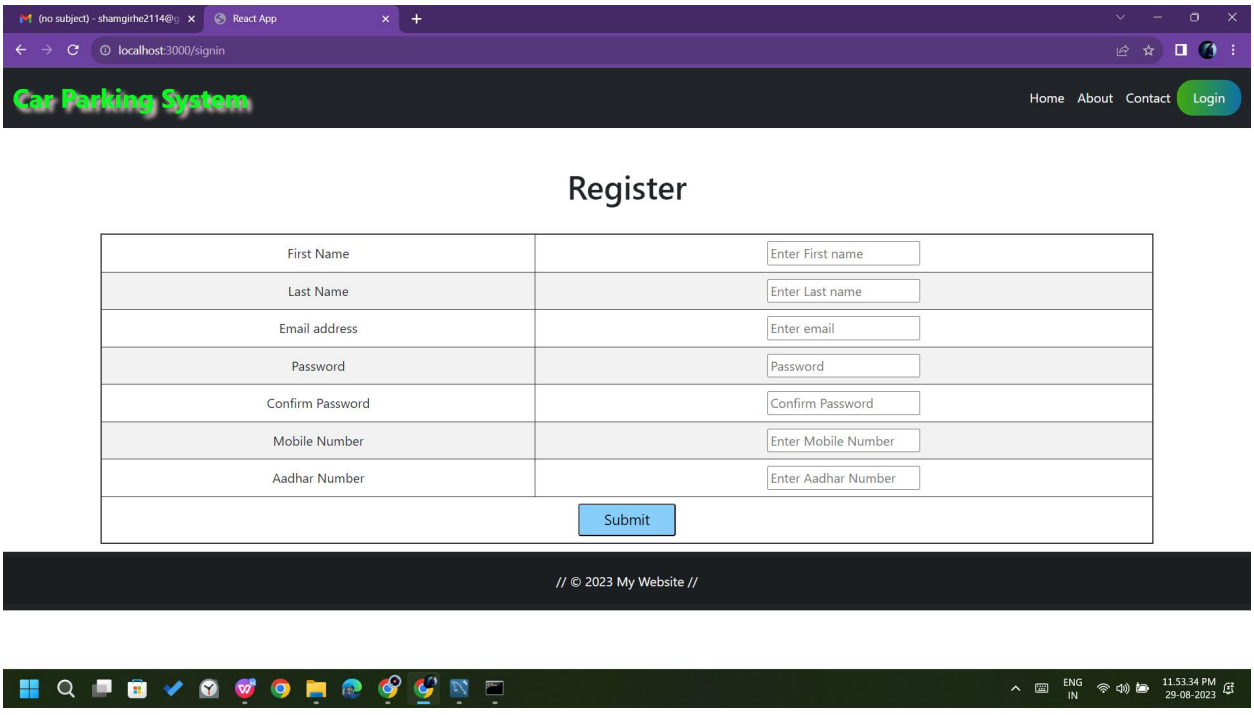
Home Page:



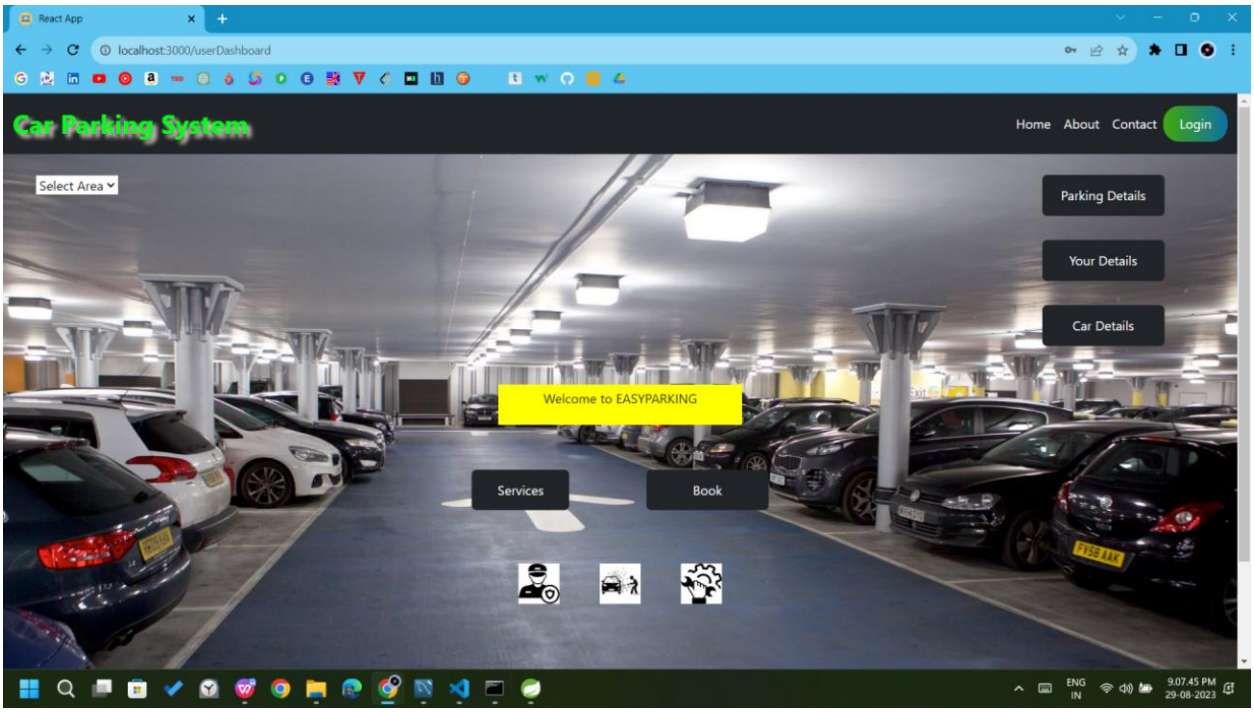
Login:



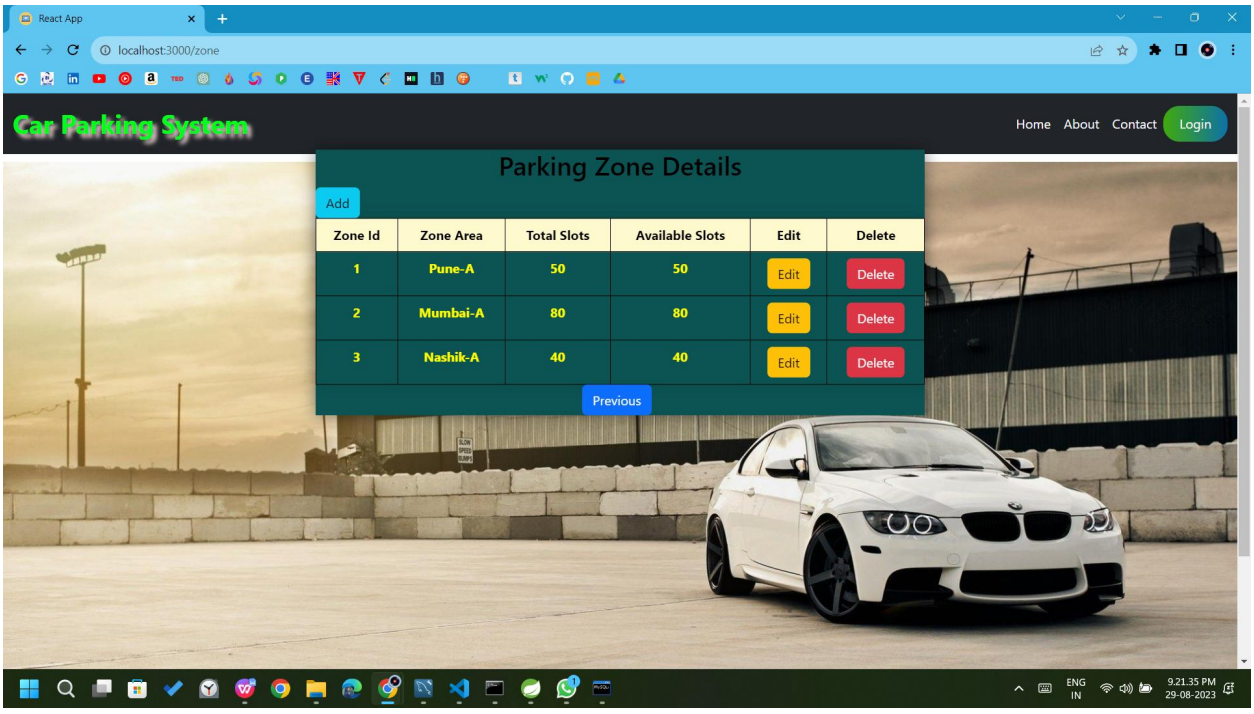
Signin:



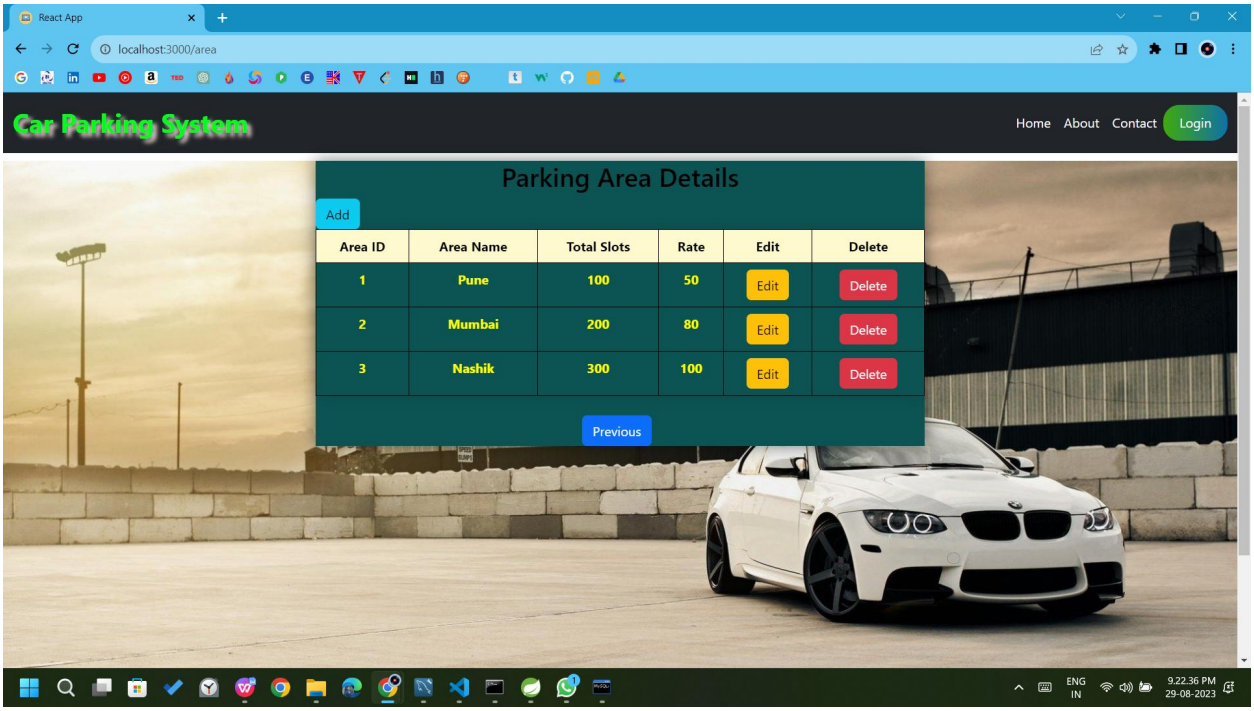
User Dashboard



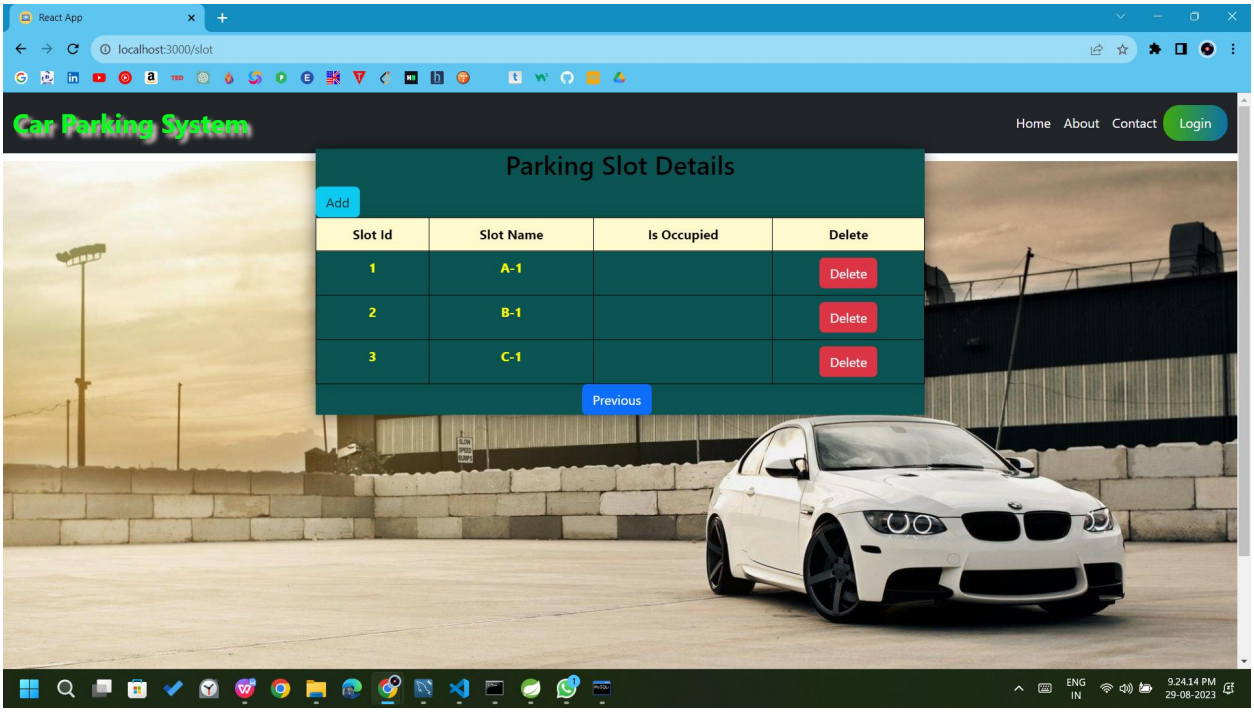
Zone Details



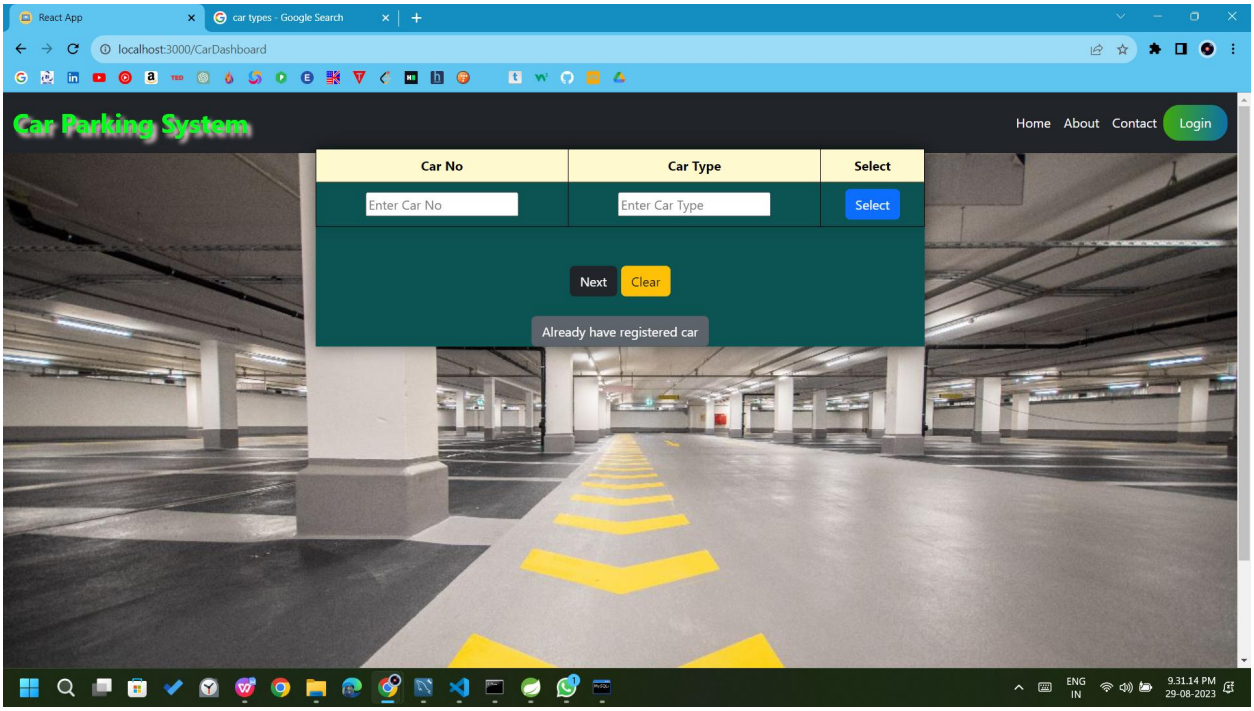
Area Details:



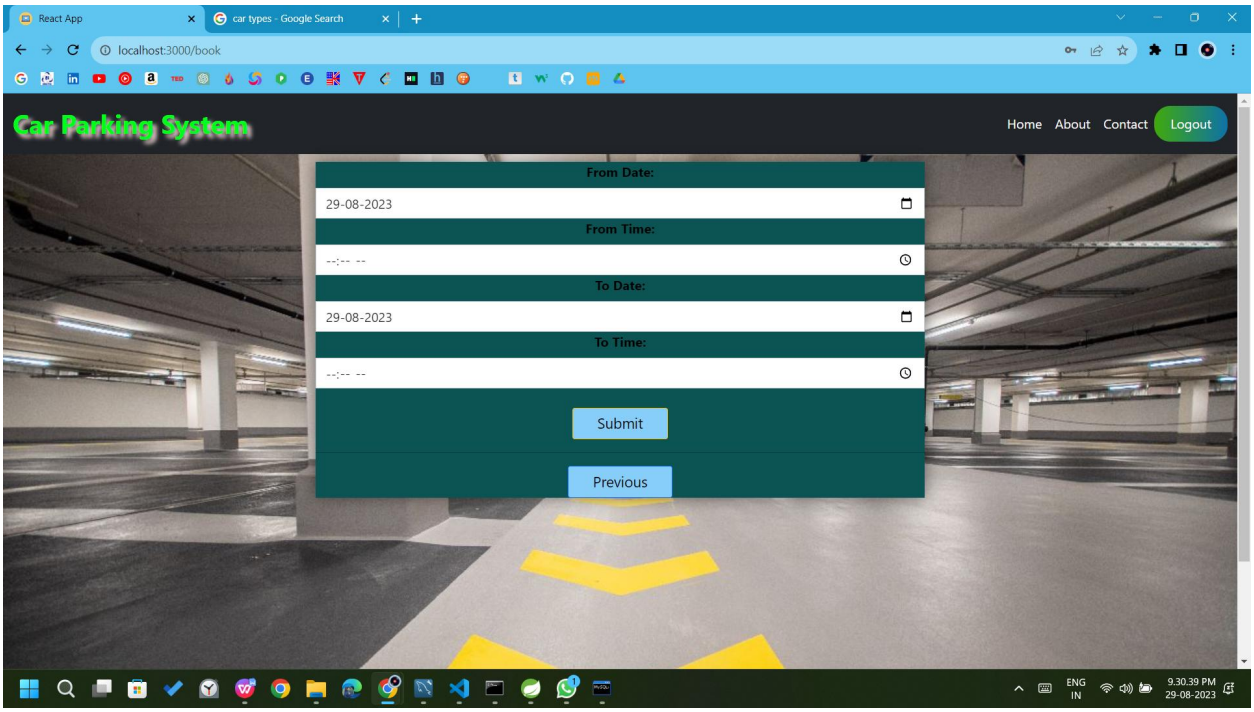
Slots Details:



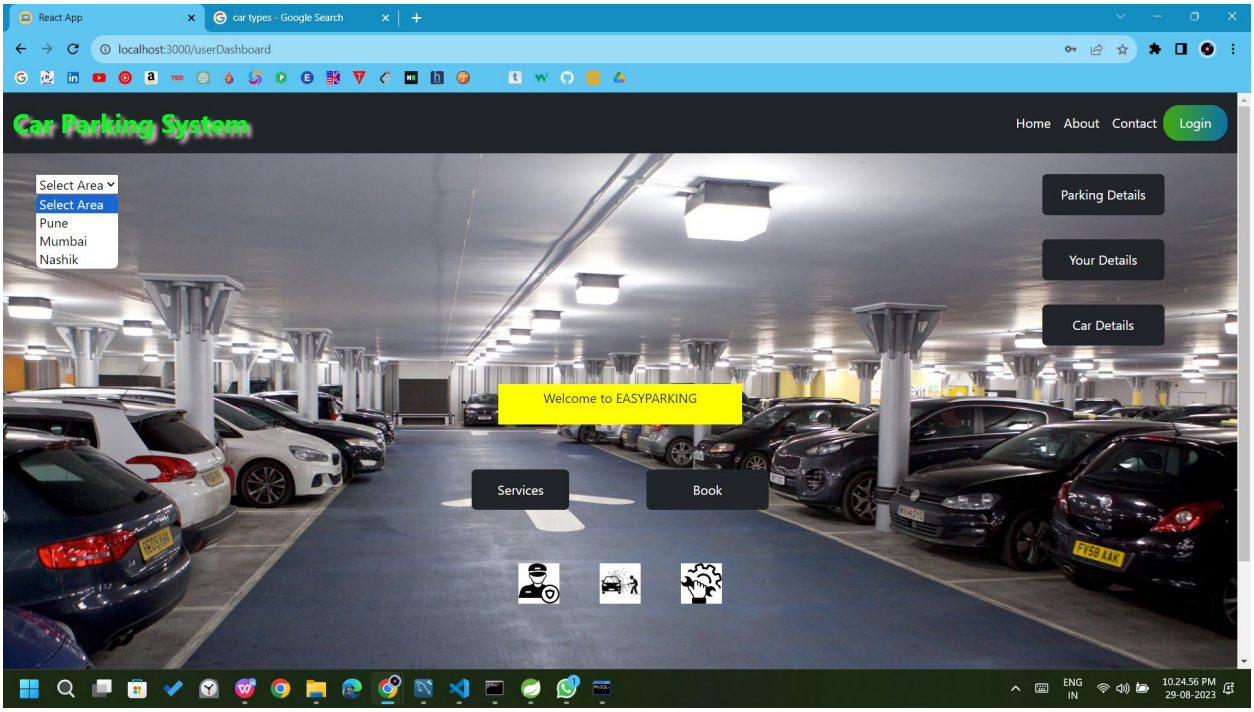
Select Car details :



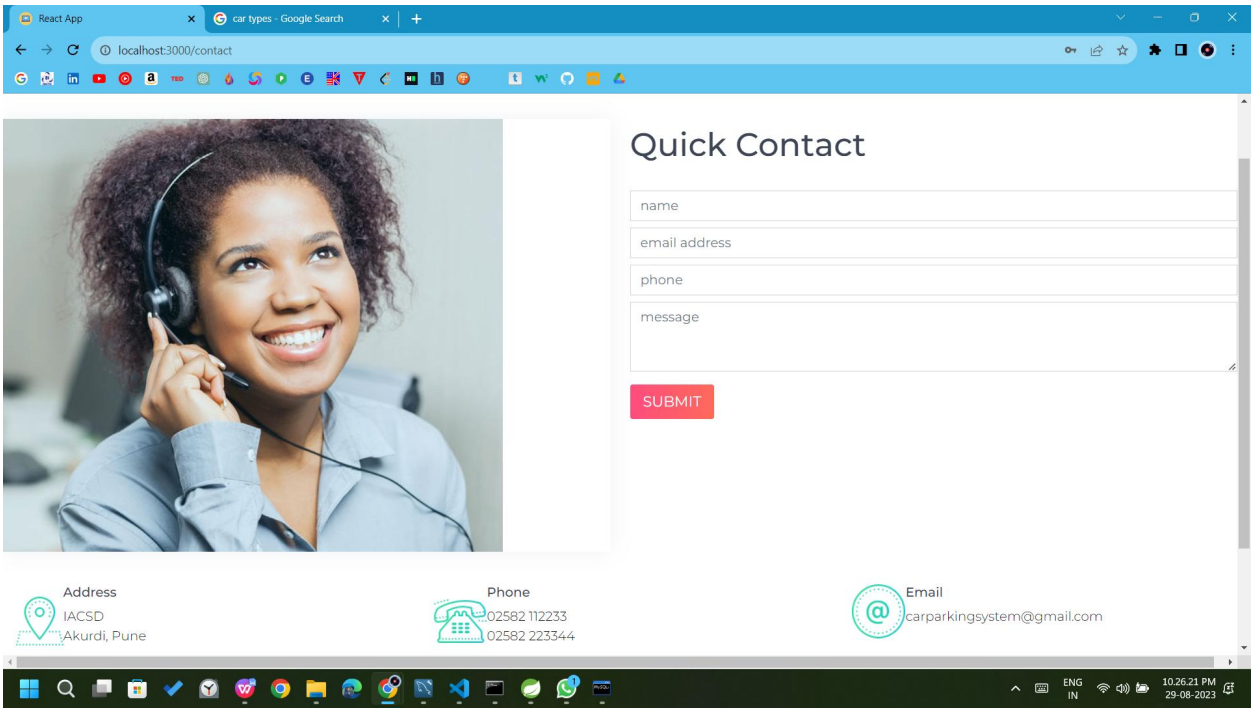
Selecting Time Details:



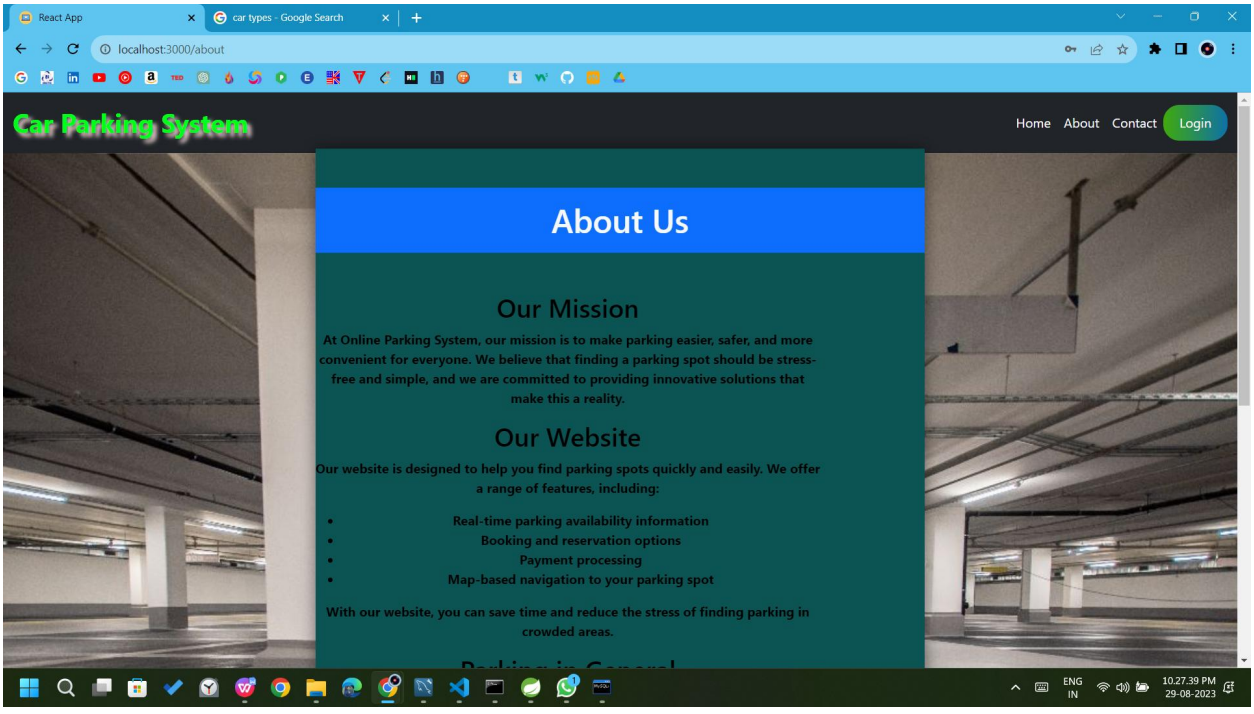
User:



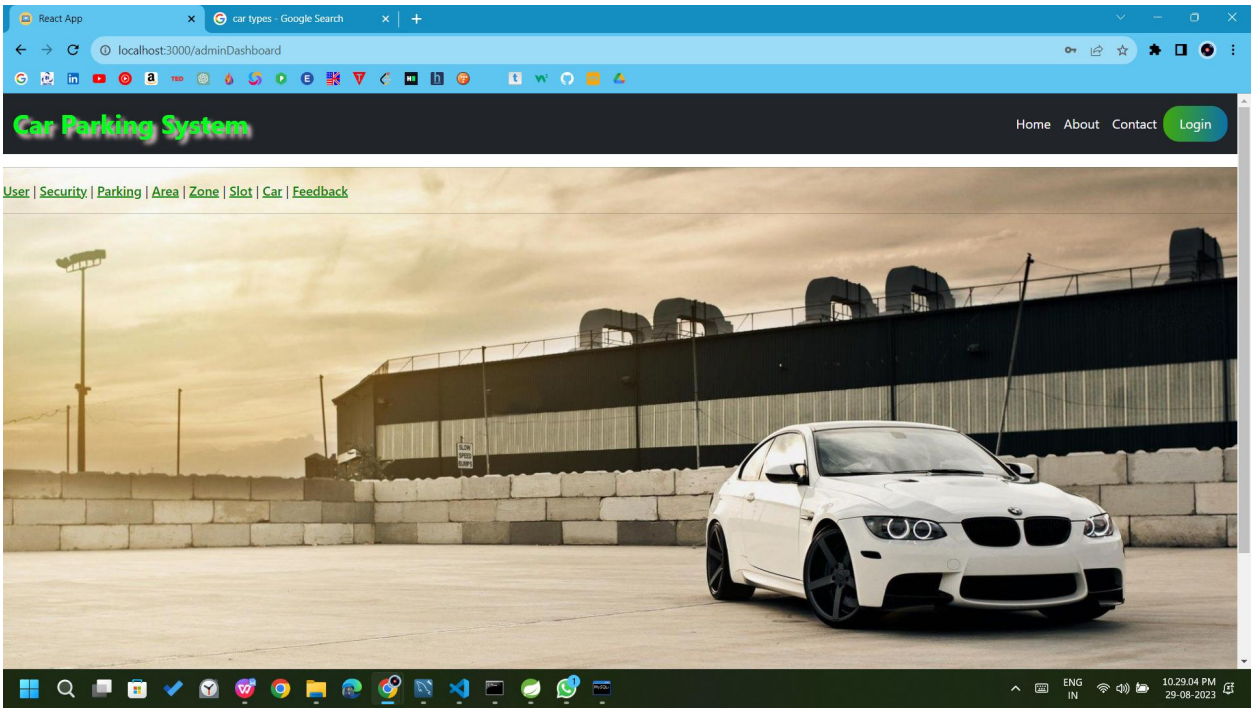
Contact:



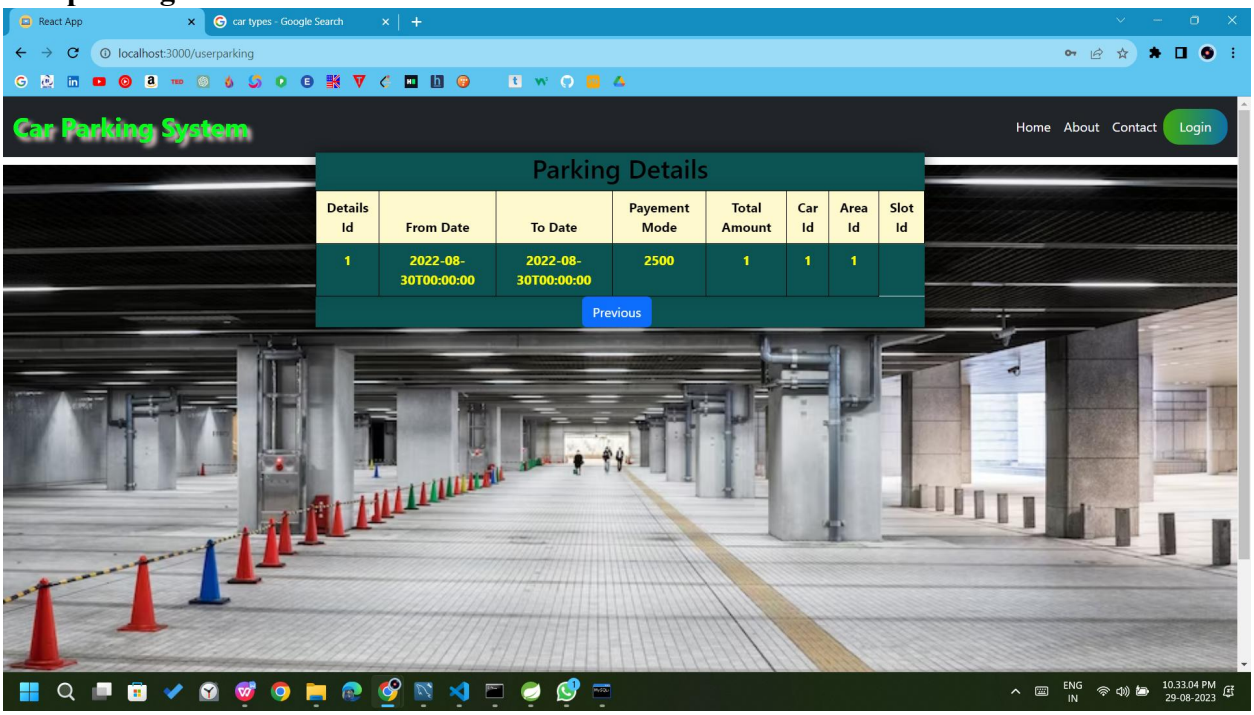
About Us:



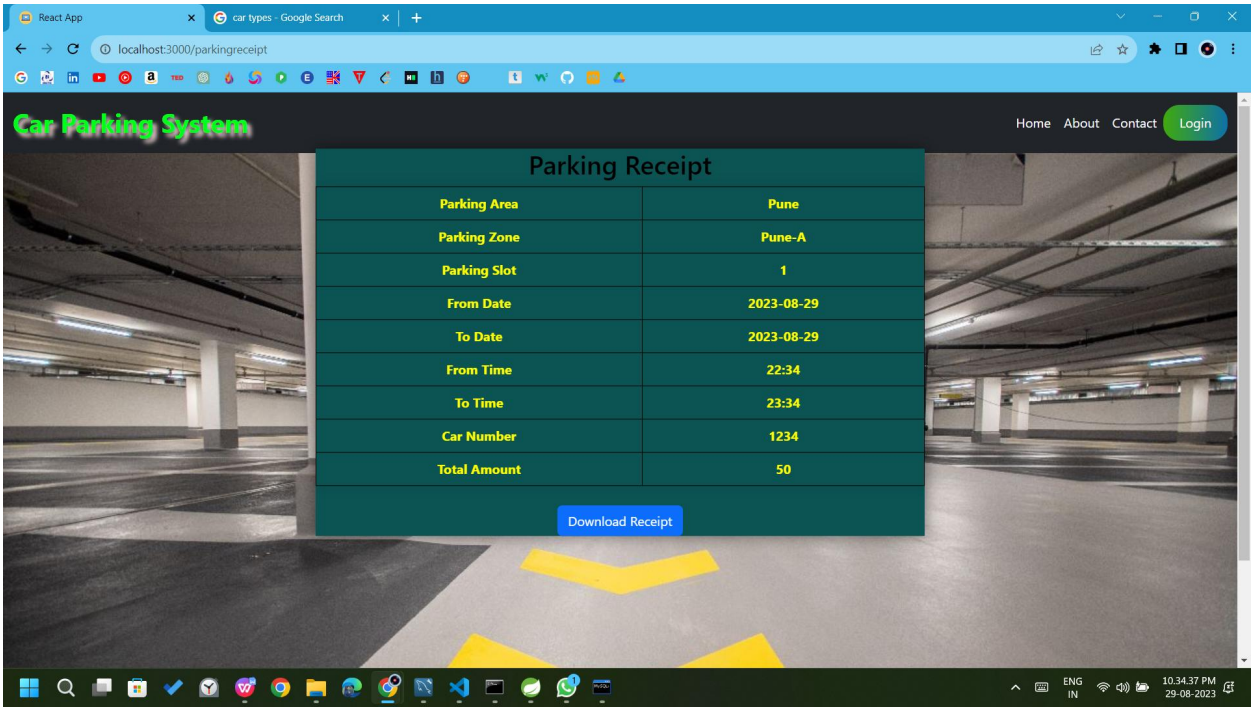
Admin Dashboard:



Userparking:



Parkingreceipt:



Conclusion & Future work

It has been a great pleasure for me to work on this exciting and challenging project. This project proved good for me as it provided practical knowledge of not only programming in Java web based application and no some extent Windows Application and SQL Server, but also about all handling procedure related with online job portal. It also provides knowledge about the latest technology used in developing web enabled application and client server technology that will be great demand in future. This will provide better opportunities and guidance in future in developing projects independently.

Our System Online Car Parking Management System is mainly used in big cities where now finding parking space can cause a lot of traffic problems to other vehicle and can take much time. So, this version of computerized program will now help in those fields. It can only be managed by one people efficiently. Although we have achieved many of our thoughts for this project but there are still some which we need to work. In future we would now like to improve financial transaction in computerized method according to time. We will be thankful for your honest review of this software so we can make it even more efficient and update with new feature.

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