PROJECT REPORT

ON

Parking Management System

B.Tech (CE) Sem-VI

In the Subject of

Service Oriented Computing (CE-619)

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CERTIFICATE

This is to certify that the term work carried out in the subject of **Service Oriented Computing** and recorded in this report is bonafide work of

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Abstract

There are many issues associated with the local parking practices, starting from minor issues like not having certainty of available parking slot to some major issues like faults in Parking Fee Calculation. Hence these practices can't be considered as reliable.

To overcome these issues of local parking practices, there arise a need for online Parking System. Parking Management System Project is an online web application providing Reliable, Fast, Error Free and Efficient Solution to handle the daily-life parking problems.

1. Introduction

1.1 Introduction of Parking Management System

Parking Management System is an online web application designed in .NET framework, C# programming language created as ASP.NET web application and Windows forms. Main motive of building this system is to make Parking Management Easier and Accessible from throughout the world. By using this System, Parking will be lot easier and certain than the current situation. Users will be able to reserve their parking slots in advance and also pay their parking fees online, saving a lot of time of users.

Features of Parking Management System :-

- Users will be able to reserve Parking Slot, based on given Vehicle Type, arrival and exit time and choice of slots. Particular booked slot will remain available for the given Time Stamps. Cancellation of already booked slots is also possible.
- System Records history of each and every parked vehicle, which can be viewed only by admin.
- Software System calculates the parking fee and there are provisions for online payment of fees..
- Account Management is also supported by this System, through which users can create, update or delete their profiles online.

1.2 Technology/Platform/Tools Used

.NET Framework:

The .NET framework is a software development framework from Microsoft. It provides a controlled programming environment where software can be developed, installed and executed on Windows-based operating systems.

C# Language:

C# is a general-purpose, multi-paradigm programming language encompassing strong typing, lexically scoped, imperative, declarative, functional, generic, object-oriented, and component-oriented programming disciplines.

Windows Form:

Windows Forms is a free and open-source graphical class library included as a part of Microsoft .NET Framework or Mono Framework, providing a platform to write rich client applications for desktop, laptop, and tablet PCs.

ASP.NET:

ASP.NET is an open-source server-side web-application framework designed for web development to produce dynamic web pages developed by Microsoft to allow programmers to build dynamic web sites, applications and services.

SQL Server:

Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications—which may run either on the same computer or on another computer across a network.

2. Software Requirement Specifications

Parking Management System

R.1 Manage Users

Description: Admin or GateKeeper can Manage user's data.

R.1.1 Add User

Description: Admin Register new user here.

Input: User Personal Details

Output: Generate user Id

R.1.2 Remove User

Description: Admin can Remove user here.

Input: User Id

Output: Success message

R.1.3 Update User Credit

Description: System Accepts credit balance amount.

Input: User Id, Amount

Output: Success message

R.1.4 View All Users

Description: Admin can view all users here

Input: User Selection

Output: List of users

R.1.5 Search Users

Description: Admin can search user here.

Input: User Id or name

Output: List of users

R.2 Manage Slots

Description: Admin can Manage Total Slots.

R.2.1 Add Slots

Description: Admin adds slots.

Input: Slot Info

Output: Generate Slot Id

R.2.2 Remove Slot

Description: Admin can Remove Slot here.

Input: Slot Id

Output: Success message

R.3 Booking Module

Description: Slots can be viewed, booked or emptied through here.

R.3.1 Vehicle Entry

Description: Slot is confirmed here.

Input: Plate number, Username, Arrival Time, Exit Time, Slot Id

Output: Generate Booking Id

R.3.2 Vehicle Exit

Description: Departure is noted.

Input: Booking Id

Output: Success message

R.3.3 Show Availabe Slots

Description: Gatekeeper can see available slots

Input: User Selection, Type of Slots

Output: List of Slots

R.4 Manage Transactions

Description: Admin can notice & record of all issued books by user.

R.4.1 Calculate Cost

Description: Cost is calculated based on departure time and fine

Input: Booking Id, Departure Time

Output: Cost of Booking

R.4.2 Generate Receipt

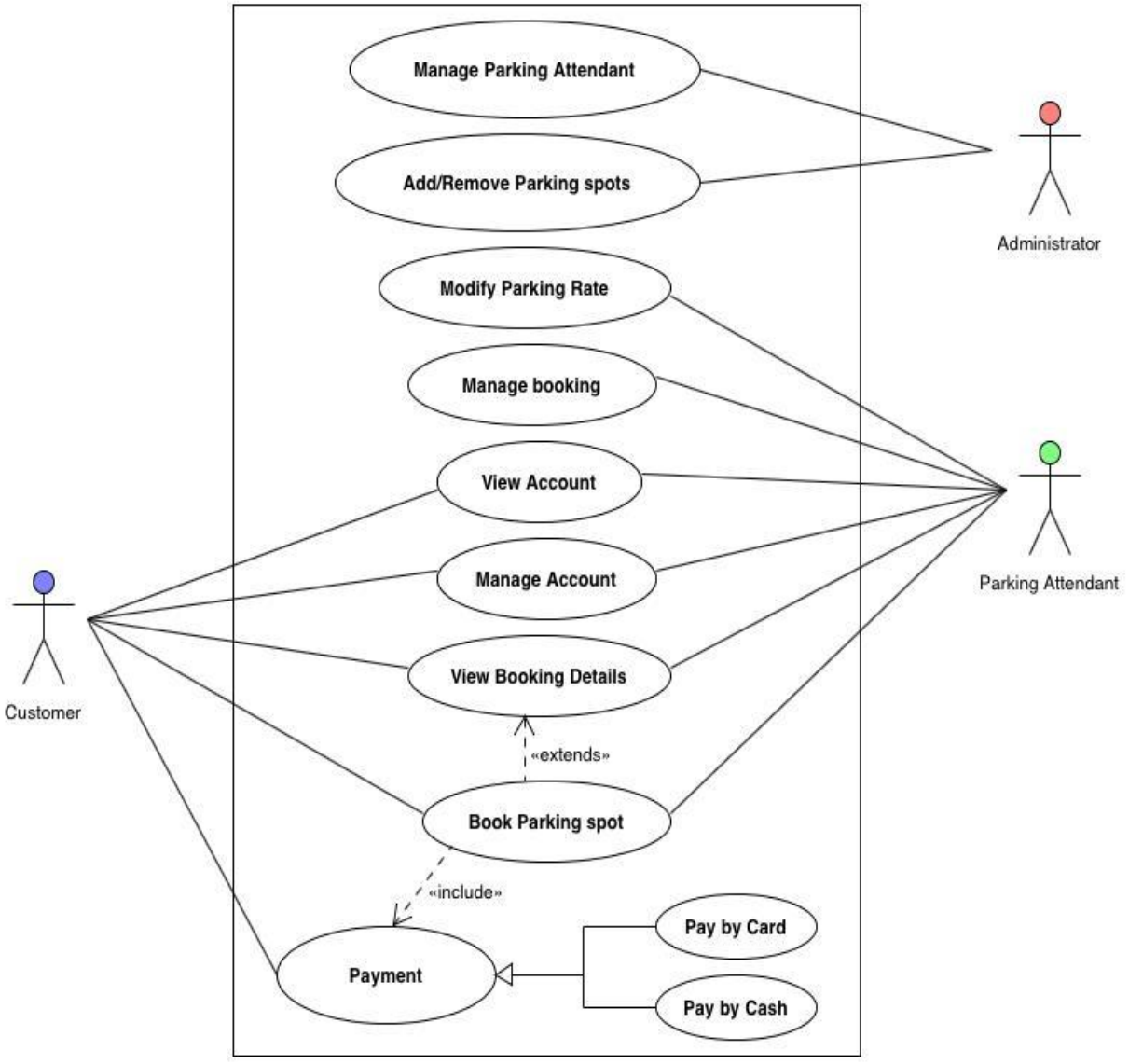
Description: System Generates receipt for payment

Input: Booking Id, Calculated cost

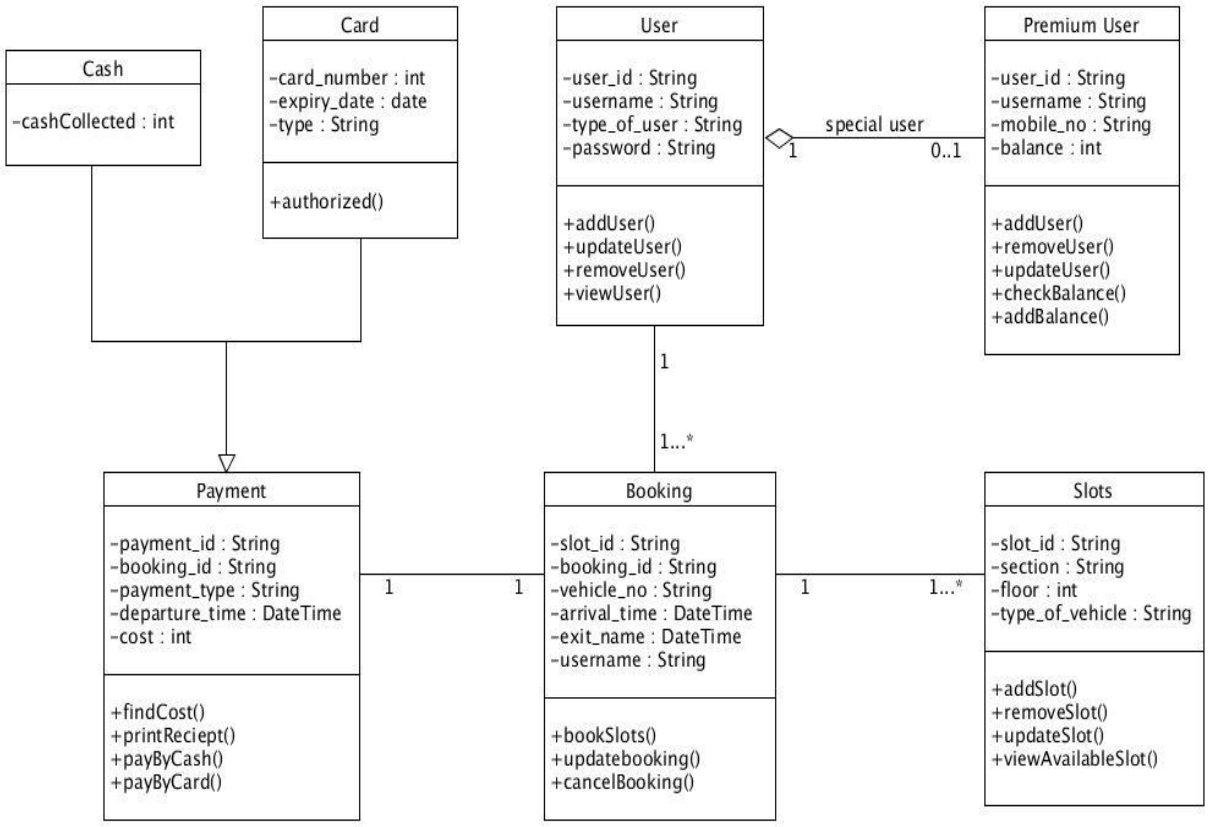
Output: Payment Receipt

3. Designs

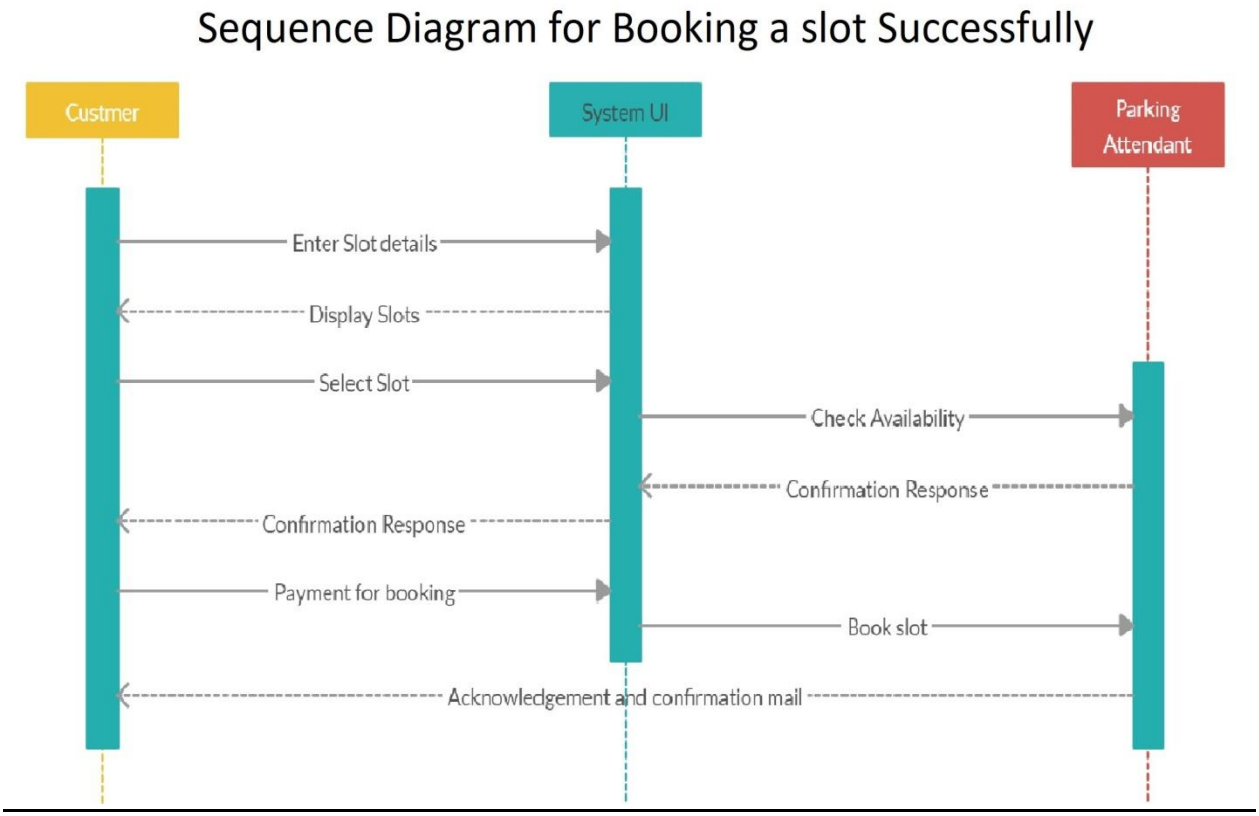
1. Usecase Diagram :-



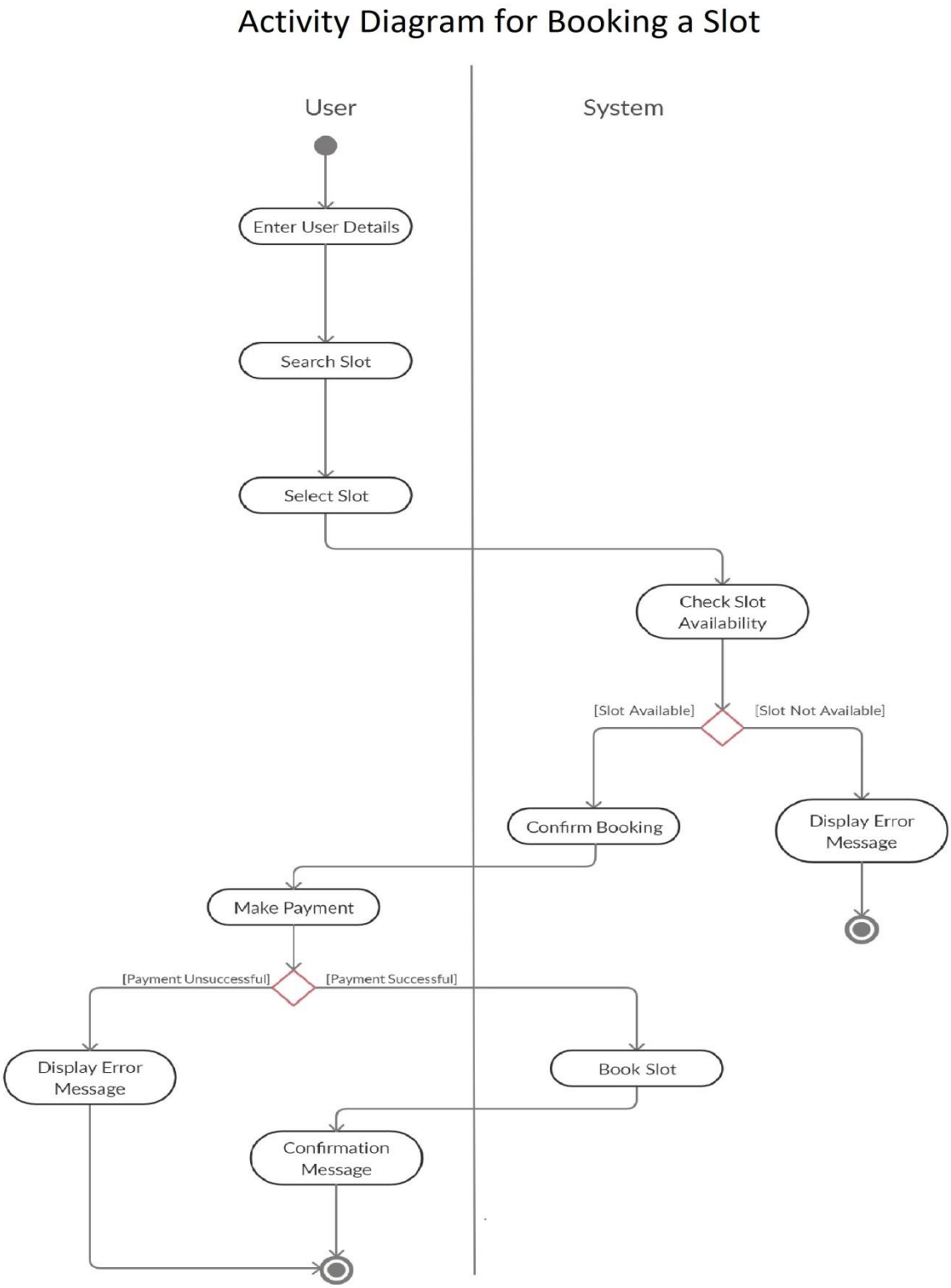
2. Class Diagram :-



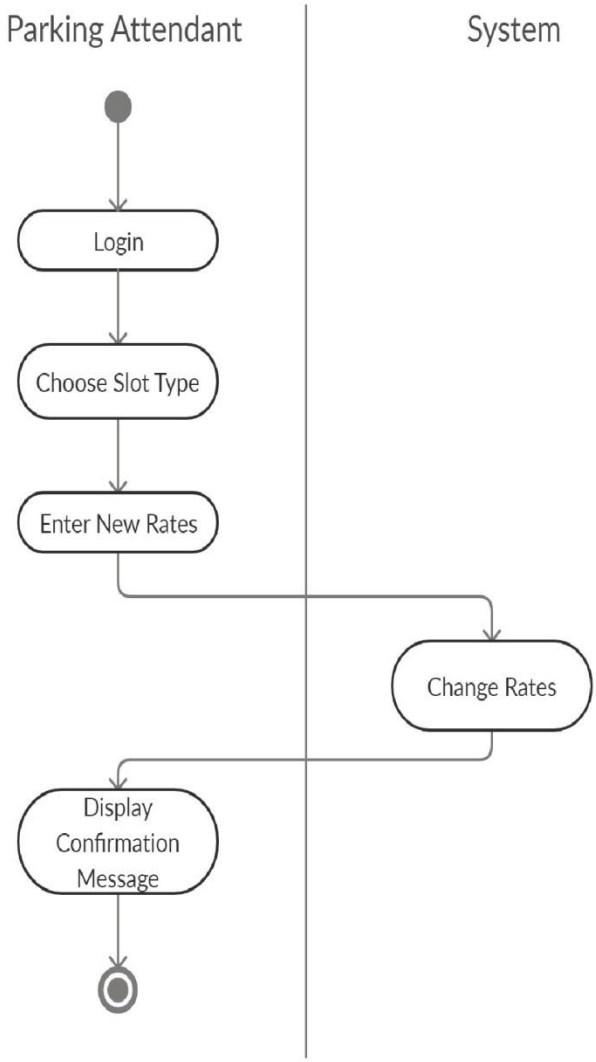
3. Sequence Diagram :-



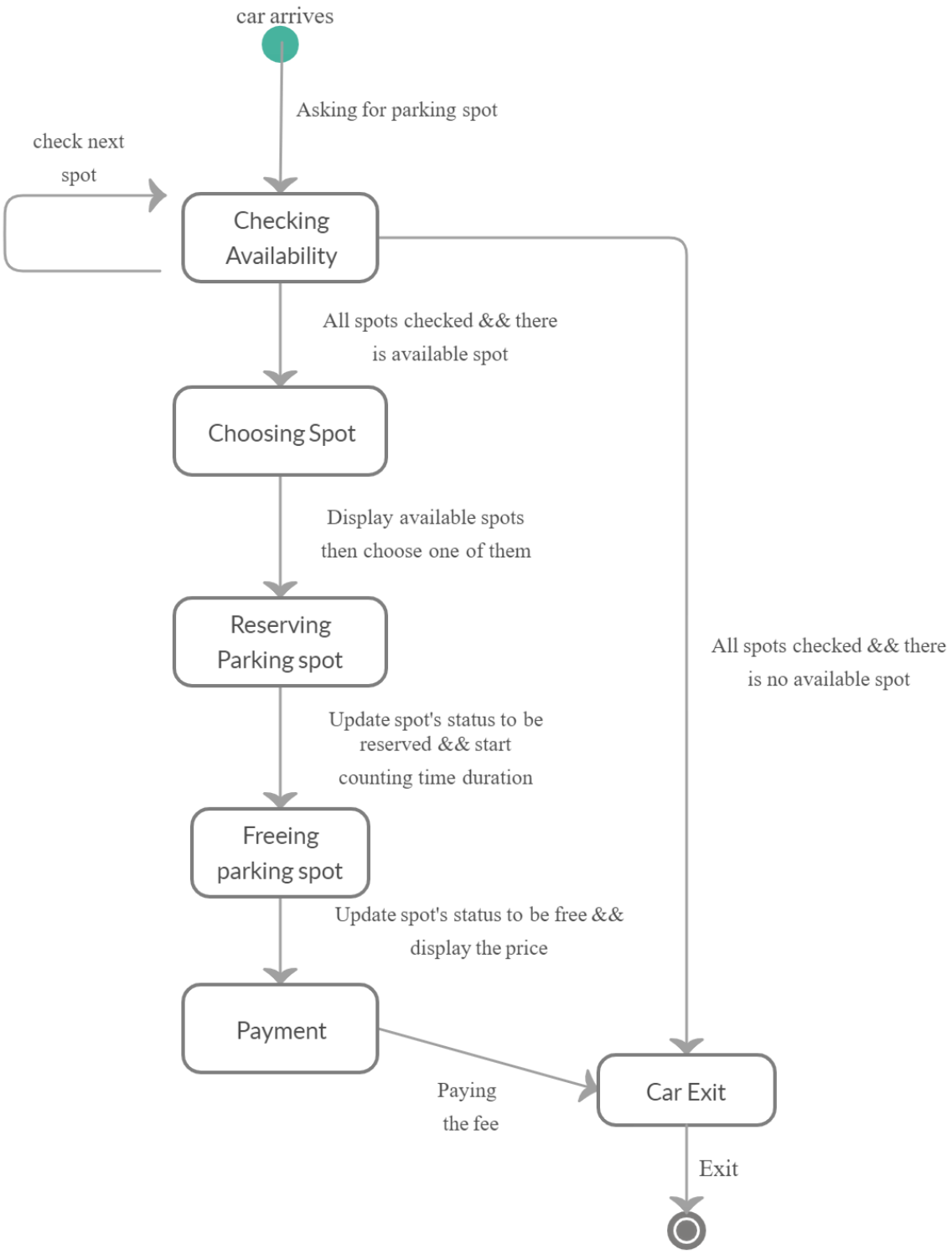
4. Activity Diagram :-



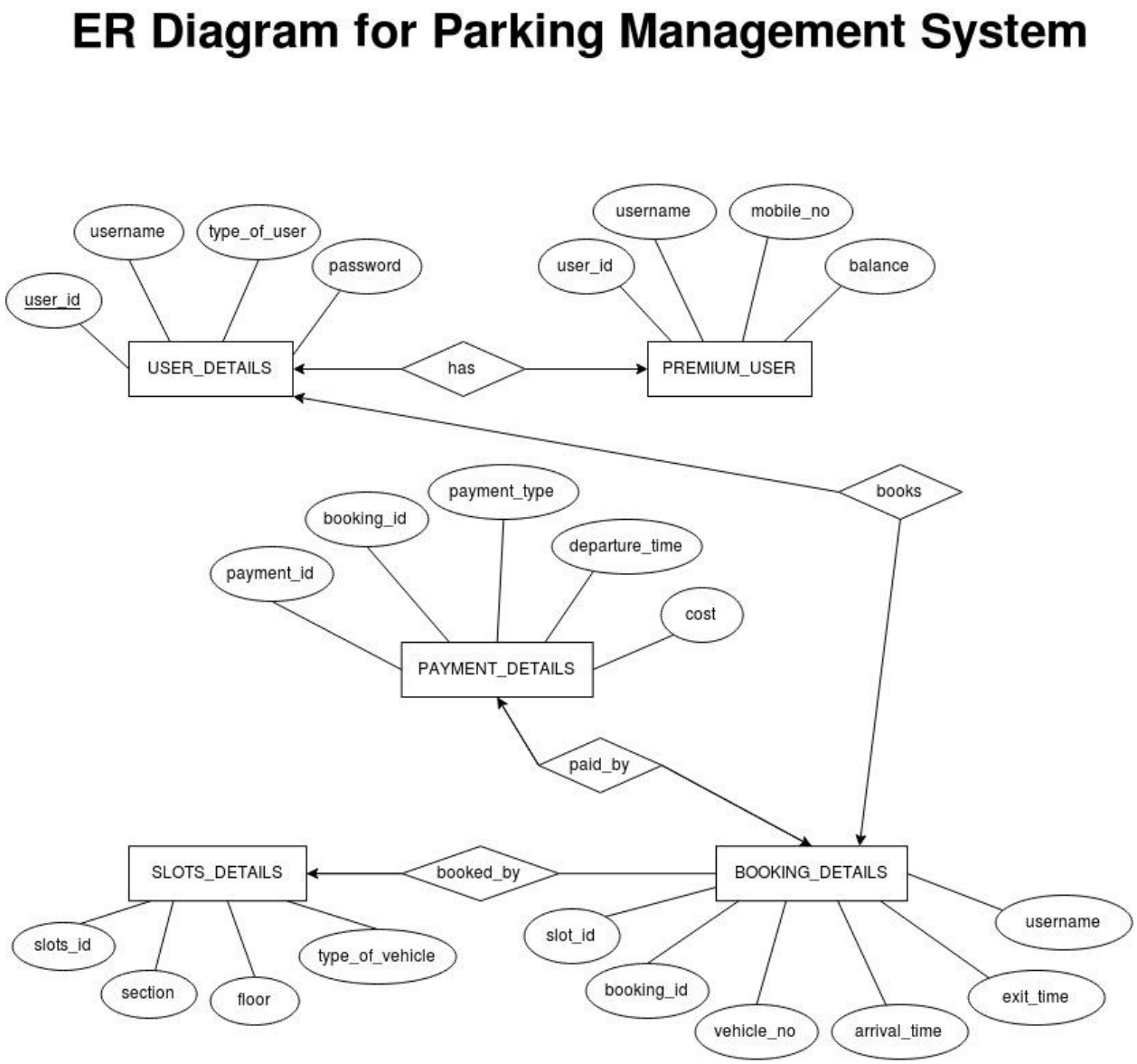
Activity Diagram for managing slot rates



5. State Diagram :-



6. ER Diagram :-


ER Diagram for Parking Management System
username
type_of_user
password
user_id
USER_DETAILS
has
username
mobile_no
user_id
balance
PREMIUM_USER
books
payment_type
booking_id
departure_time
payment_id
cost
PAYMENT_DETAILS
paid_by
SLOTS_DETAILS
booked_by
BOOKING_DETAILS
slots_id
section
floor
type_of_vehicle
slot_id
booking_id
vehicle_no
arrival_time
username
exit_time

7. Data Dictionary :-

User_Details

Name of Field	Type	Size
User_Id	Varchar2	20
Username	Varchar2	20
Type of User	Varchar2	10
Password	Varchar2	20

Premium_User

Name of Field	Type	Size
User_Id	Varchar2	20
Username	Varchar2	20
Mobile_No	Number	10
Balance	Number	10

Payment_Details

Name of Field	Type	Size
Payment_Id	Varchar2	20
Booking_Id	Varchar2	20
Payment_Type	Varchar2	10
Departure_Time	DateTime	
Cost	Number	5

Slots_Details

Name of Field	Type	Size
Slots_Id	Varchar2	20
Section	Varchar2	10
Floor	Number	3
Type of Vehicle	Varchar2	20

Booking_Details

Name of Field	Type	Size
Slot_Id	Varchar2	20
Username	Varchar2	20
Booking_Id	Varchar2	20
Arrival_Time	DateTime	
Exit_Time	DateTime	
Vehicle_No	Varchar2	10

4. Implementation Details

4.1 Description of Modules :-

1. Register User Module

Basic information of user is taken by system and stored in database.

2. Login User Module

Users are able to login themselves. System logs user in, then and only then user can use other functionalities of system.

3. Slot Management Module

Basic function of slot management include Add Slots and Remove Slots. Only admin can use this module for registering any changes in parking environment.

4. Booking Module

Booking module is main Module of this System. The functions inside this module are Book Slot, Cancel Booking and Show Available Slots. These are some of the major functions of this System.

5. Payment Module

This module has functions like Calculate Cost and Online Payment Facility which handles economic side of System.

6. Admin Module

Admin panel to manage slots (add/remove slots) , view user details and booking history of the entire system.

4.2 Function prototype which implements major functionality

Major Functions along with the prototypes according to C# language is as shown below:

1. Account Management Functions

User **loginUser**(string Email, string Password);

int **registerUser**(User User);

void **updateUser**(User user, string Email);

void **deleteUser**(string Email);

2. Booking Management Function

bookingResult **bookSlot**(string section, int floor, string type, int userid, string vehicleno, DateTime arrivaltime, DateTime exittime);

int **cancelBooking**(int bookingId, int userId);

List<Booking> **showBookings**(int userId);

3. Make Payment Function

int **makePayment**(int paymentId, string paymentType);

exitResult **exitVehicle**(int bookingId, DateTime exitTime);

4. Slots Management Function

int **addSlots**(string section, int floor, string type,int normalCharge, int overtimeCharge, int amount);

int **removeSlots**(string section, int floor, string type, int amount);

5. Testing

For Testing the System, a mixed approach comprised of Integration Testing and Regression Testing is used.

Any module is Tested using Integration Testing where we test the unit parts and then combine those unit parts to form a Module.

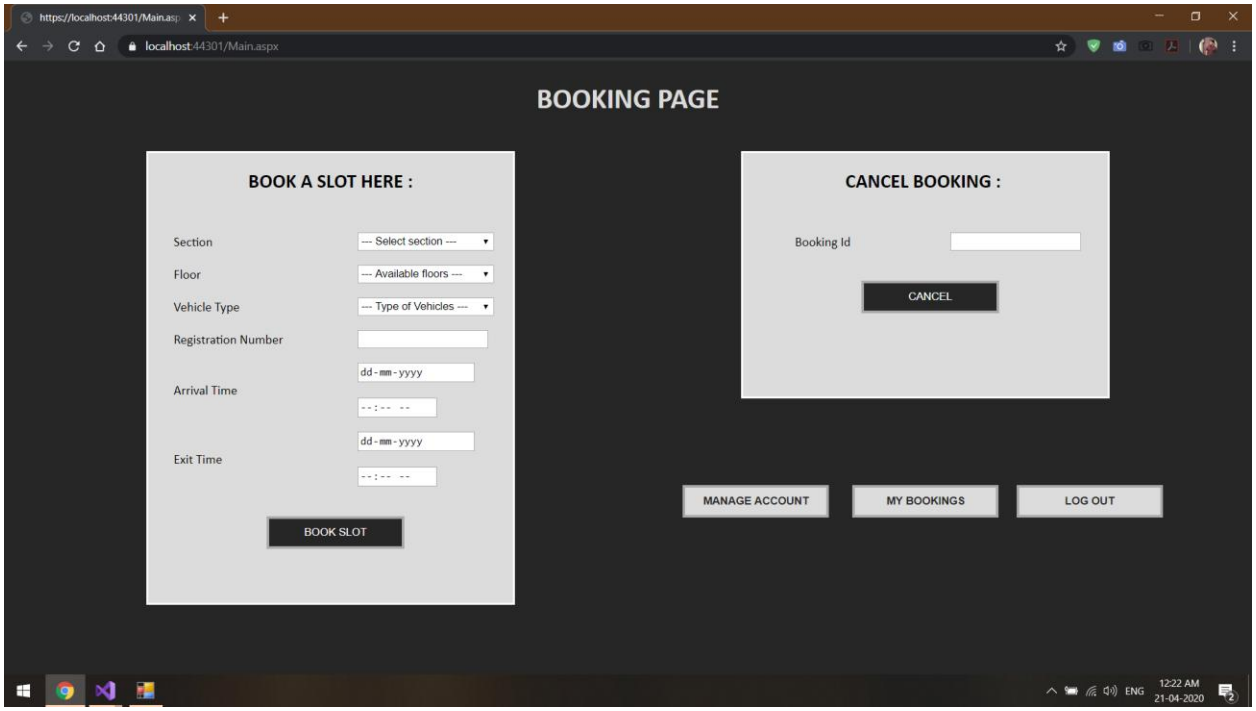
For ex. For creating Slot Management Module, first basic functions like Add slot and Remove slot are tested, then the Slot Management is Created and Tested if it works properly.

After any module is created, now by the rules of Regression Testing, this module is added to the whole system and then whole system is tested and it is made sure that the whole system works as desired after adding module to system.

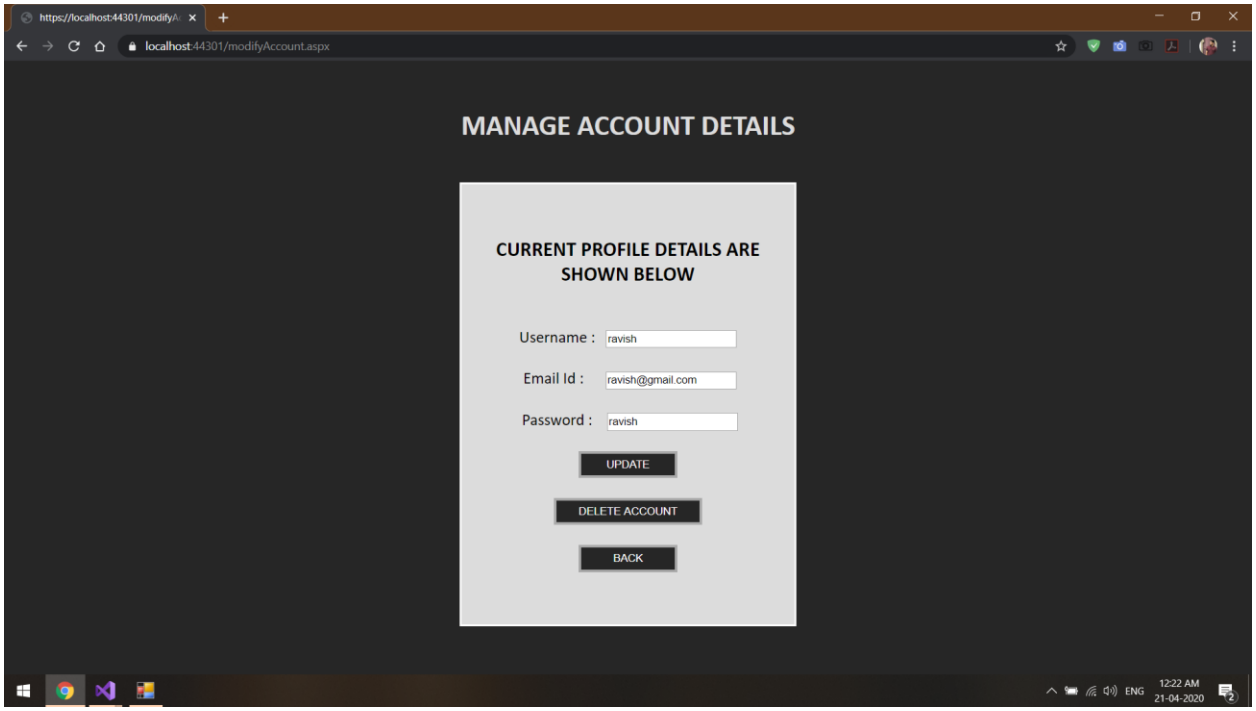
For ex. After successfully creating Slot Management Module, it is added to System and then whole current System is tested to ensure proper working.

6. Screenshots

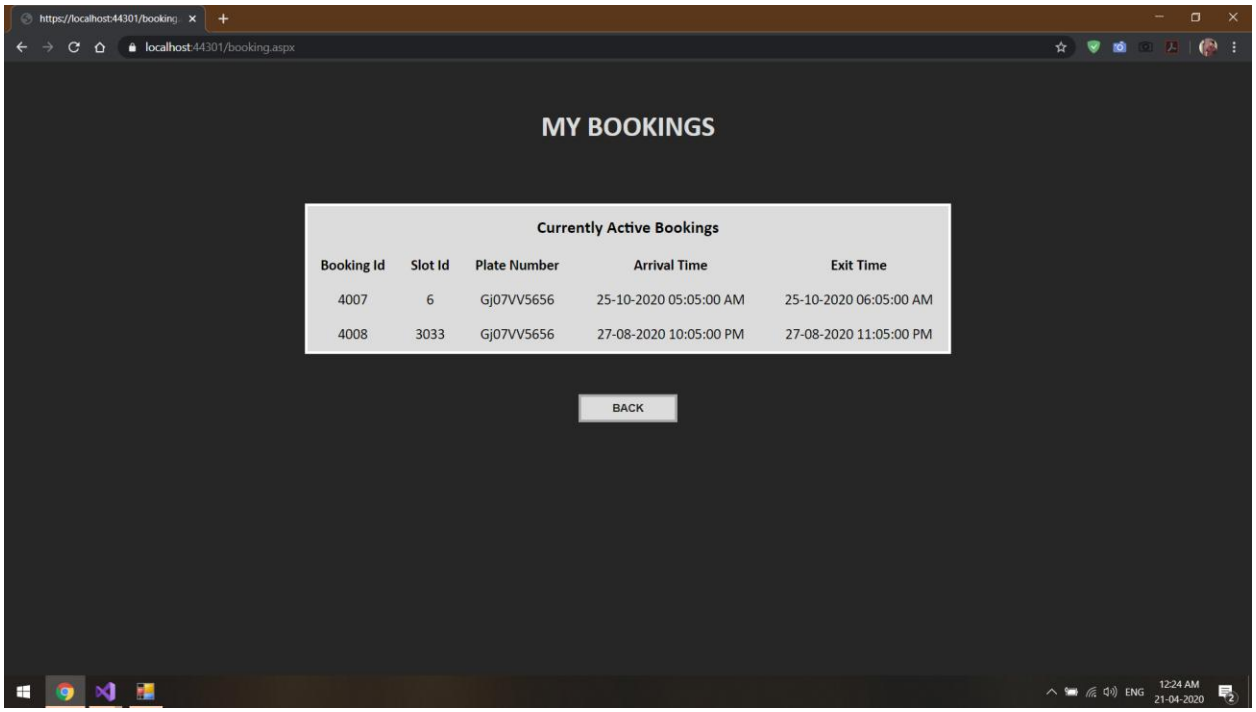
1. Booking Panel for User :-



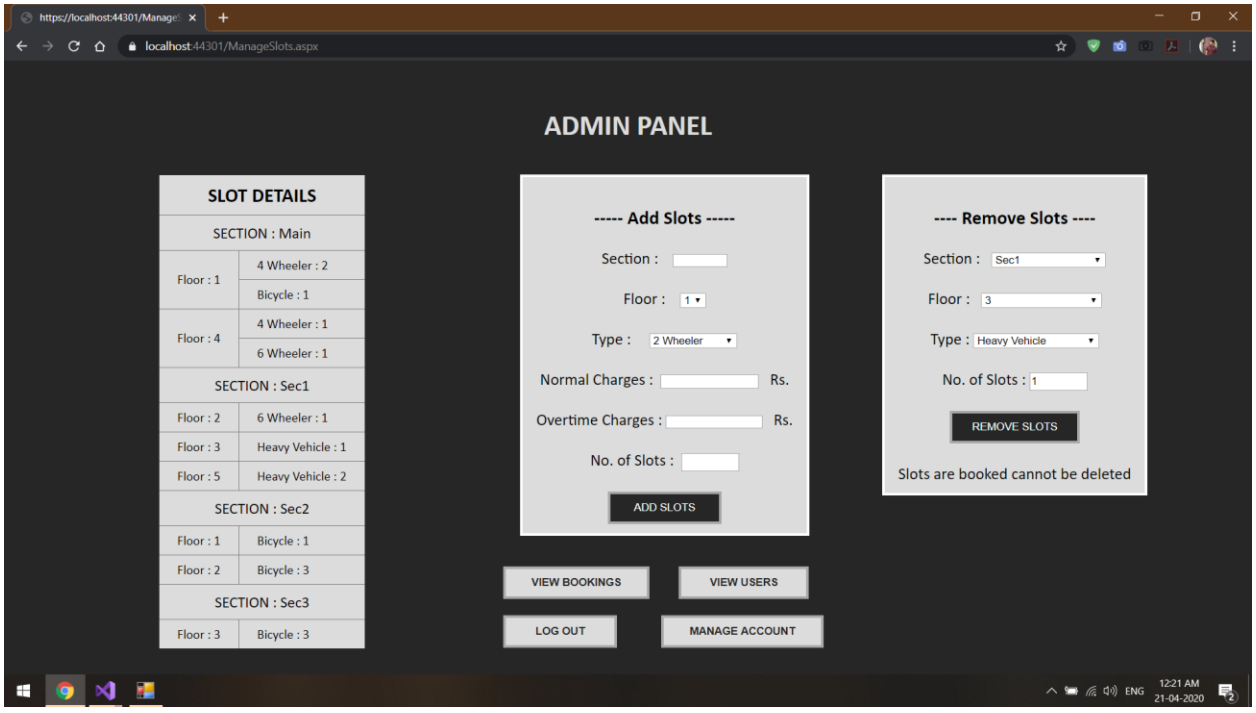
2. Account Management Panel :-



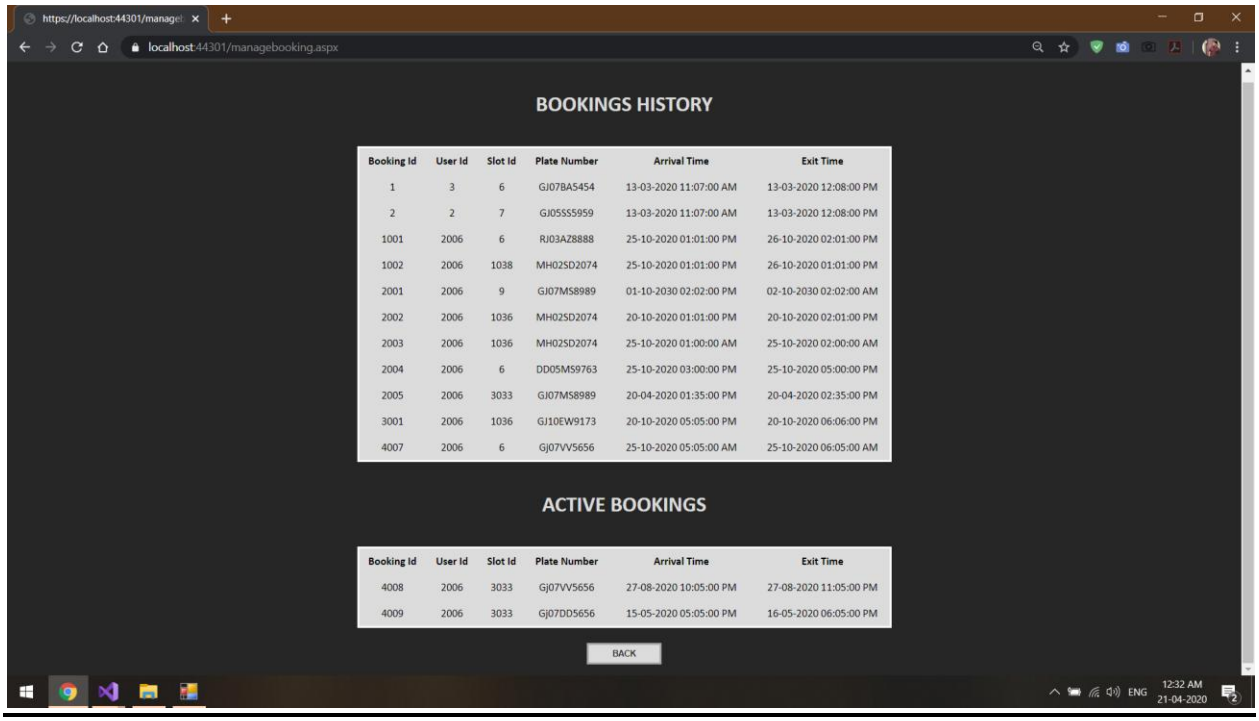
3. Personal Booking history (Based on User) :-



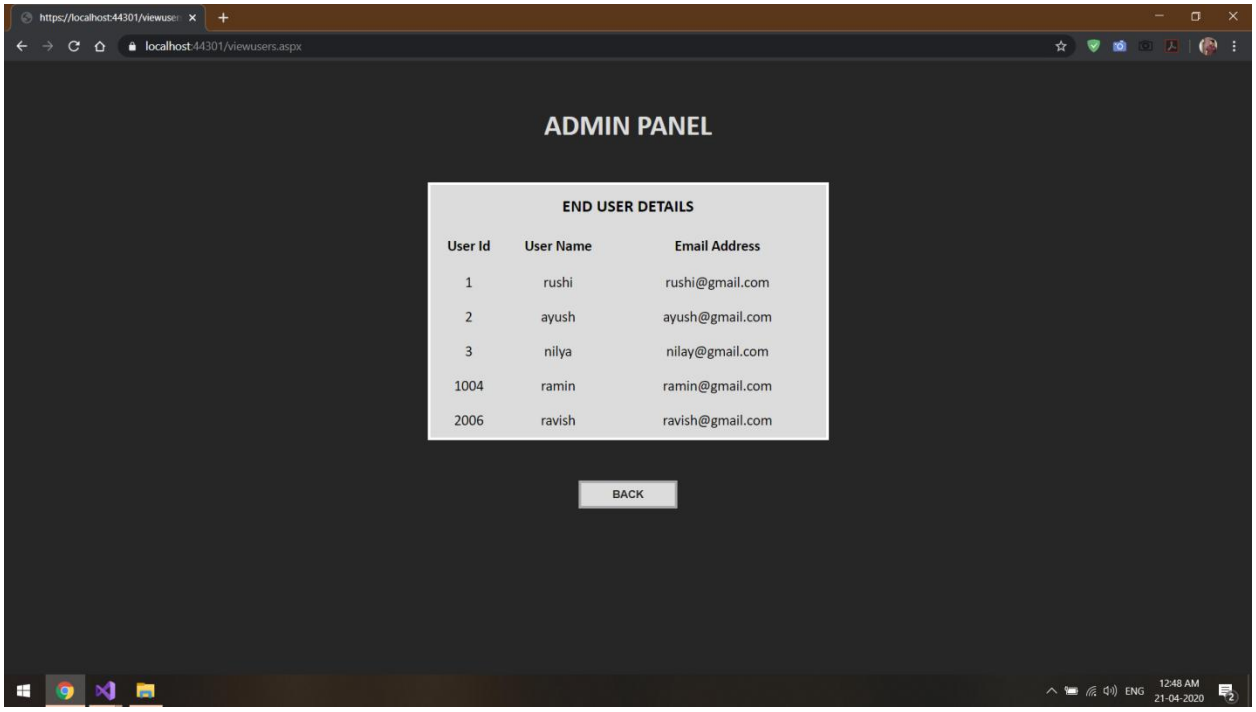
4. Admin Panel :-



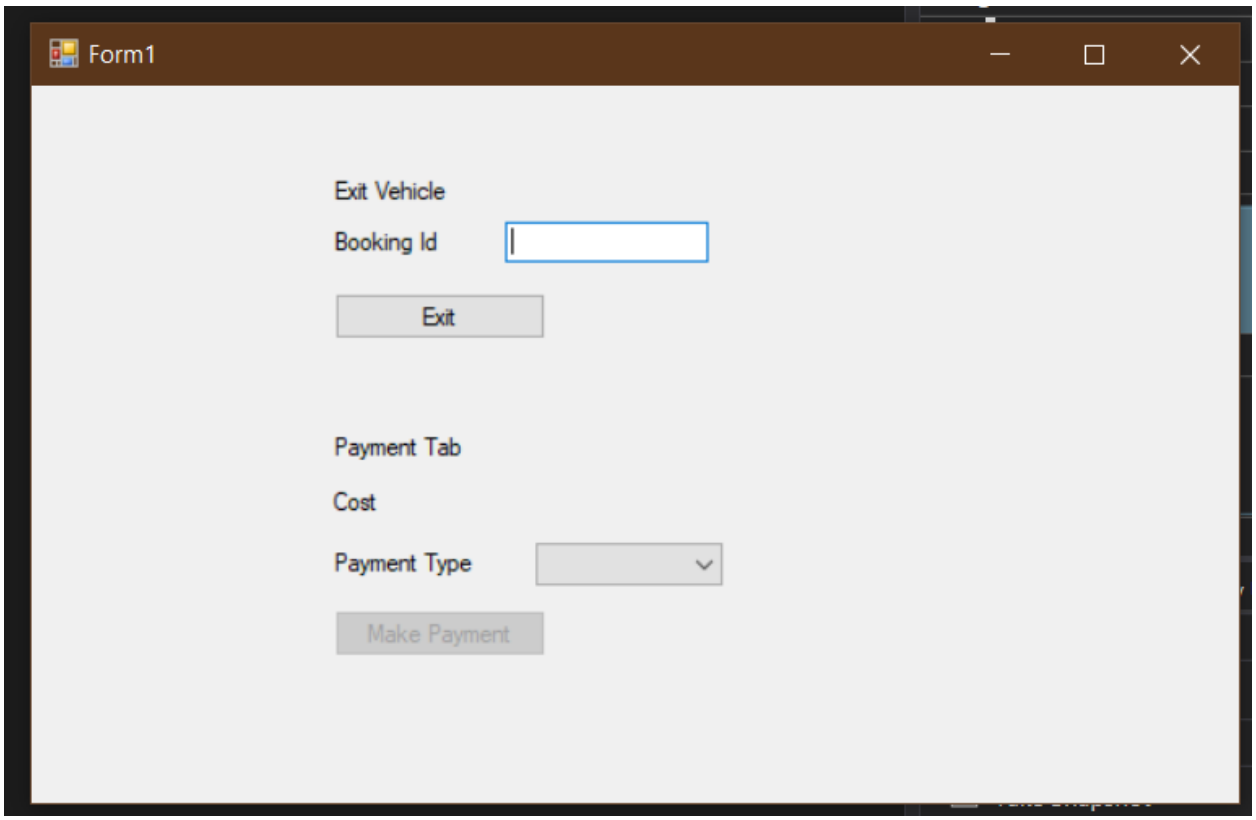
5. All Booking Details (Admin) :-



6. End User Details Panel (Admin) :-



7. WindowsForm for GateKeeper :-



7. Conclusion

Parking management system is one of the most adopted and fastest growing Smart City Solution across the world. Smart Parking involves the use of low cost sensors, real-time data and applications that allow users to monitor available and unavailable parking spots. The goal is to automate and decrease time spent manually searching for the optimal parking floor, spot and even lot. A parking solution can greatly benefit both the user and the lot owner.

8. Limitation and future extension

Limitation:

This system is still in beta version. User interface can be improved for better communication between system and user.

Future Extension:

User interface of the system will be improved. Functionality and Front End will be improved to provide better interaction with system.

9. Bibliography

Book : C# Programming yellow book, Rob miles

Websites : www.tutorialspoint.com

https://docs.microsoft.com/

Search Engine: www.google.com