



Dharmsinh Desai University, Nadiad

Faculty of Technology
Department of Computer Engineering

B. Tech CE Semester – VI

Subject: Object Oriented Software Engineering

Project Title:

R&R Parking (Online Parking Management System)

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CERTIFICATE

This is to certify that the Object Oriented Software Engineering project entitled **“R&R Parking (Online Parking Management System)”** is a bona fide report of the work carried out by

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Abstract

In today's world everyone has problem of traffic in the city, and the problem of traffic leads to the problem of parking. It's becoming very hard to find parking place and get it before anyone else got that. So, we come with the idea of making this process easy and efficient – online car parking. People can view the parking places and can reserve parking slots for their vehicles. This type of applications is necessary now.

Introduction

The objective of the project is to develop an application for providing online parking facility. Now it is becoming hard to find parking places and reserve it, because vehicles are increasing and parking places are very less. So, this application will make it easy for people to reserve their parking slot.

For parking reservation user has to follow some simple steps. User have to come to our portal and login. After that he/she has to search for the parking places where they want to park their vehicle, add vehicle details, select time slot, pay for the parking reservation and that's it. User can also see their reserved parking in their profile.

Admin can add the parking places in the system. Admin can also update or delete parking place.

Technology used:

- .Net framework
- Windows Forms Application
- Entity Framework 6

Platform used:

- Visual Studio 2019

Software Requirement Specifications

R.1 User

R.1.1 - Manage Account

Description: In this, user can do basic CRUD operation on account like Create, Add, Update, and Delete.

R.1.1.1 Create account

Input: First name, Last name, email, mobile no, gender, and password

Output: Account will be created

Exception: If any of the data is invalid or user is already existing then account will not be created.

R.1.1.2 Update account

Input: User will have to enter the updated details.

Output: Account updated successfully.

R.1.1.3 Delete account

Input: Click the delete account button.

Output: entry of the user will be removed from the database and appropriate message will be displayed.

R.1.2 – Login

Description: By this user can login into the system.

Input: Email id and password.

Output: user will be logged in.

Exception: If credentials provided are wrong then user can't login.

R.1.3 – Manage Parking

Description: User can reserve parking, view parking or cancel parking.

R.1.3.1 Reserve Parking Plot

Description: User can reserve parking plot by selecting parking area, adding vehicle details and making successful payment.

R.1.3.1.1 Add Details

Input: Vehicle type, model name, registration number, arrival time, departure time

Output: If parking plot available than redirected to payment page.

R.1.3.1.2 Make Payment

Input: Choose payment option and accordingly enter payment details.

Output: Successful message will be displayed if the payment is successful and parking plot will be reserved.

R.1.3.2 Show Reservations

Input: Click the Profile button.

Output: Currently active parking reservations will be displayed in reservations section.

R.1.3.3 – Cancel Reservation

Input: Cancel reservation tab selected.

Output: Parking reservation will be cancelled and appropriate message will be displayed.

R.1.4 – View Parking plots

Description: By this user view all the parking plots.

Input: Parking area

Output: All the parking plots will be displayed.

R.2 Admin

R.2.1 - Manage Parking

Description: Admin can add the new parking places or can delete some parking places as required. Admin can also update information in existing parking places.

R.2.1.1 Add Parking

Input: Parking details like parking name, capacity, rate and address

Output: The new parking places appears in appropriate category on portal.

R.2.1.2 Update Parking

Input: details to be update

Output: Parking place details will be updated.

R.2.1.3 Delete Parking

Input: User selection

Output: Parking will be deleted and appropriate message will be displayed.

R.2.2 – Manage Users

Description: Admin can add user, show all users, find specific user and delete the user.

R.2.1.1 Add User

Input: First name, last name, email, mobile no, gender, and password

Output: user will be registered

R.2.1.2 – Show Users

Input: User selection

Output: All the users with their details will be displayed.

R.2.1.3 – Find User

Input: Email id

Output: details of the user will be displayed.

R.2.1.4 – Delete User

Input: Email id

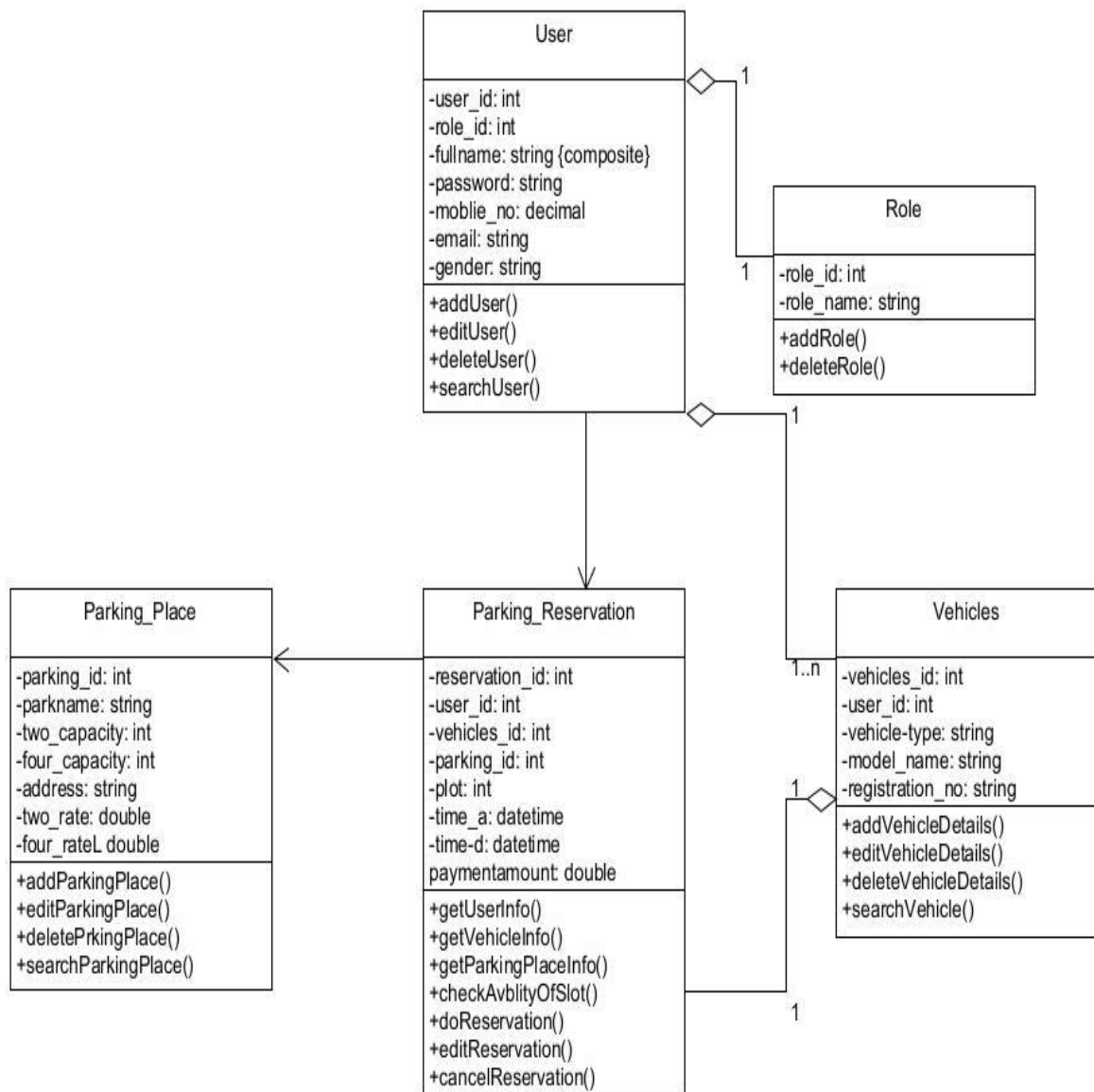
Output: User will be deleted and appropriate message will be shown.

Design

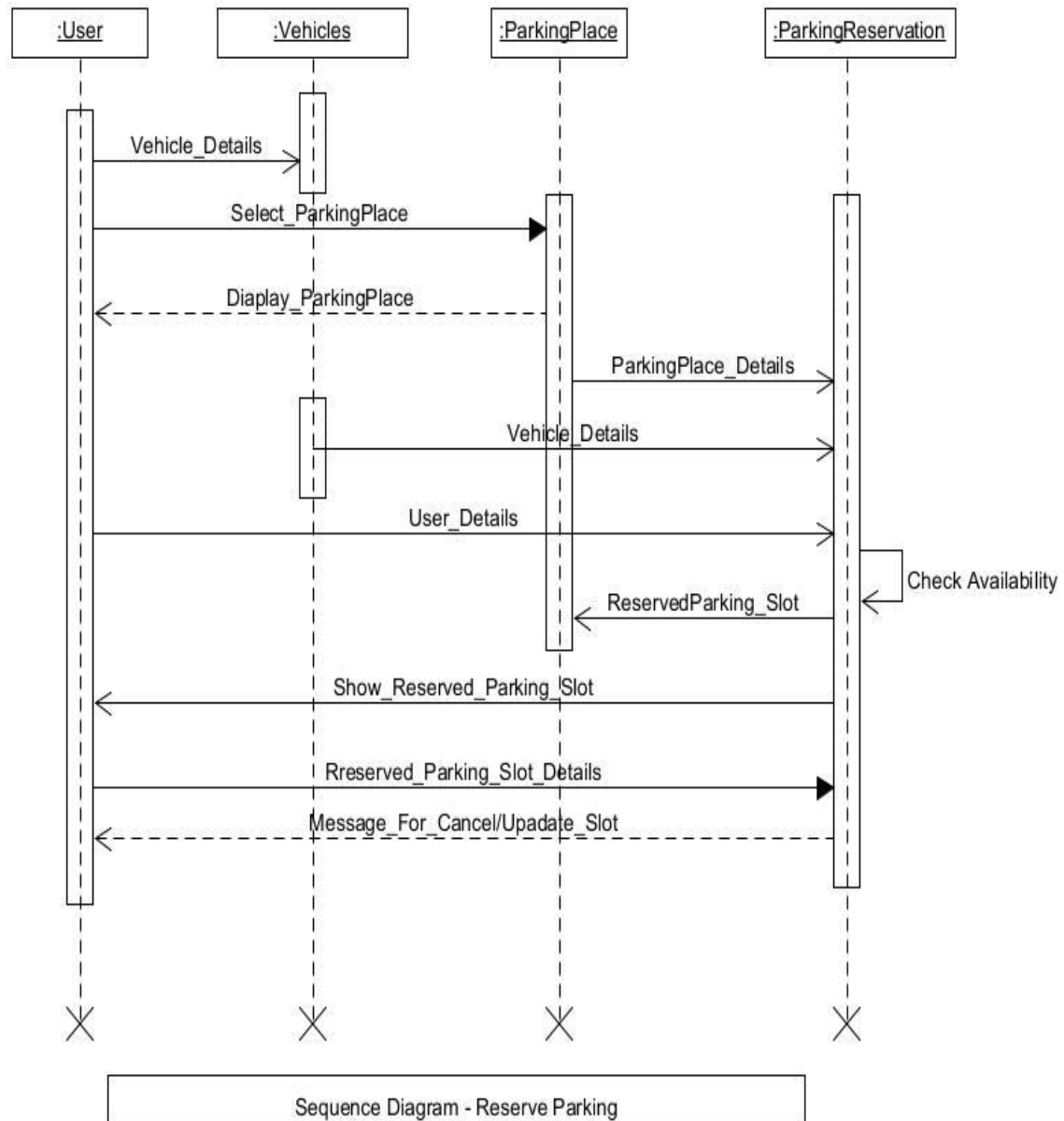
1) Use Case Diagram



2) Class Diagram



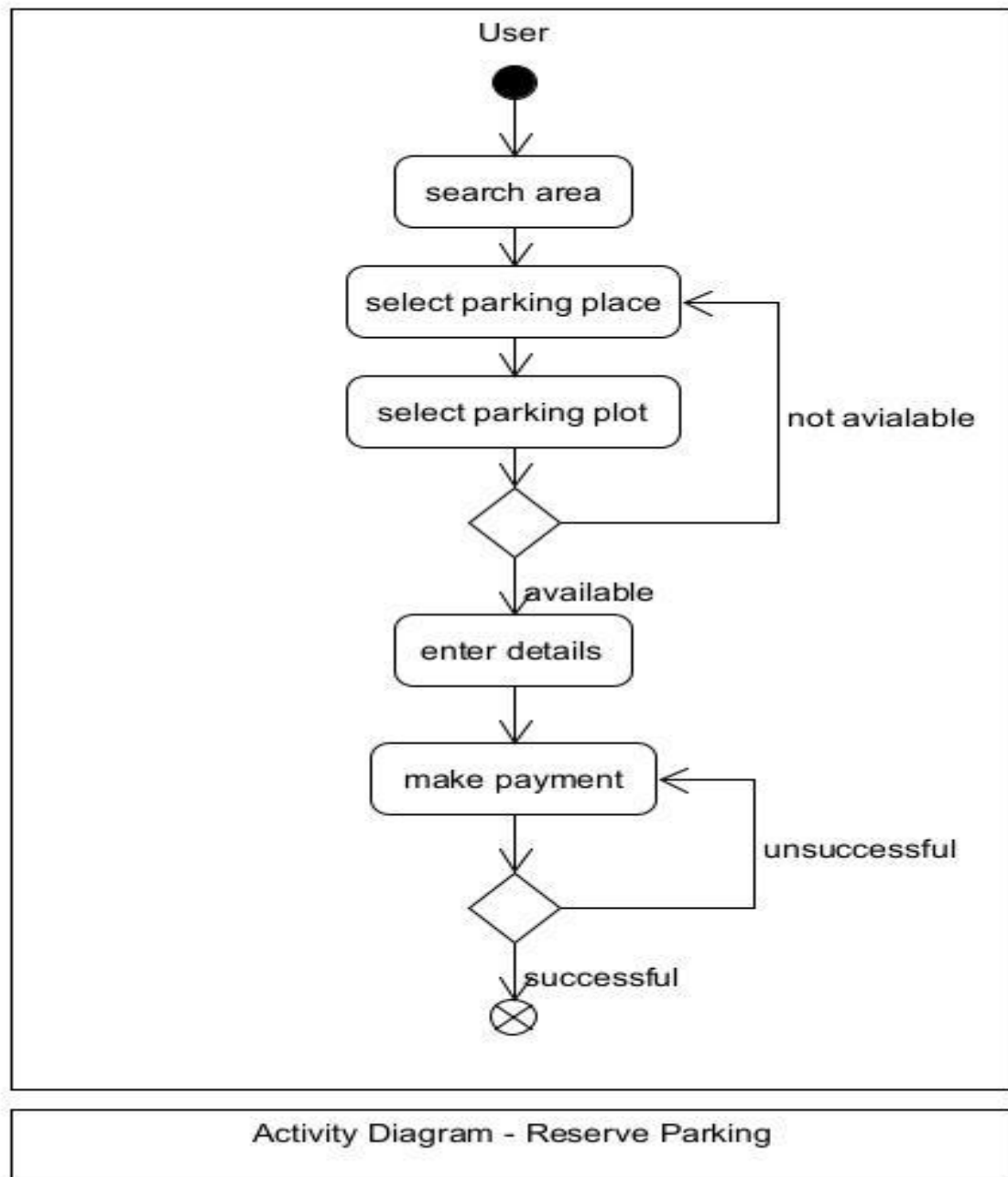
3) Sequence Diagram



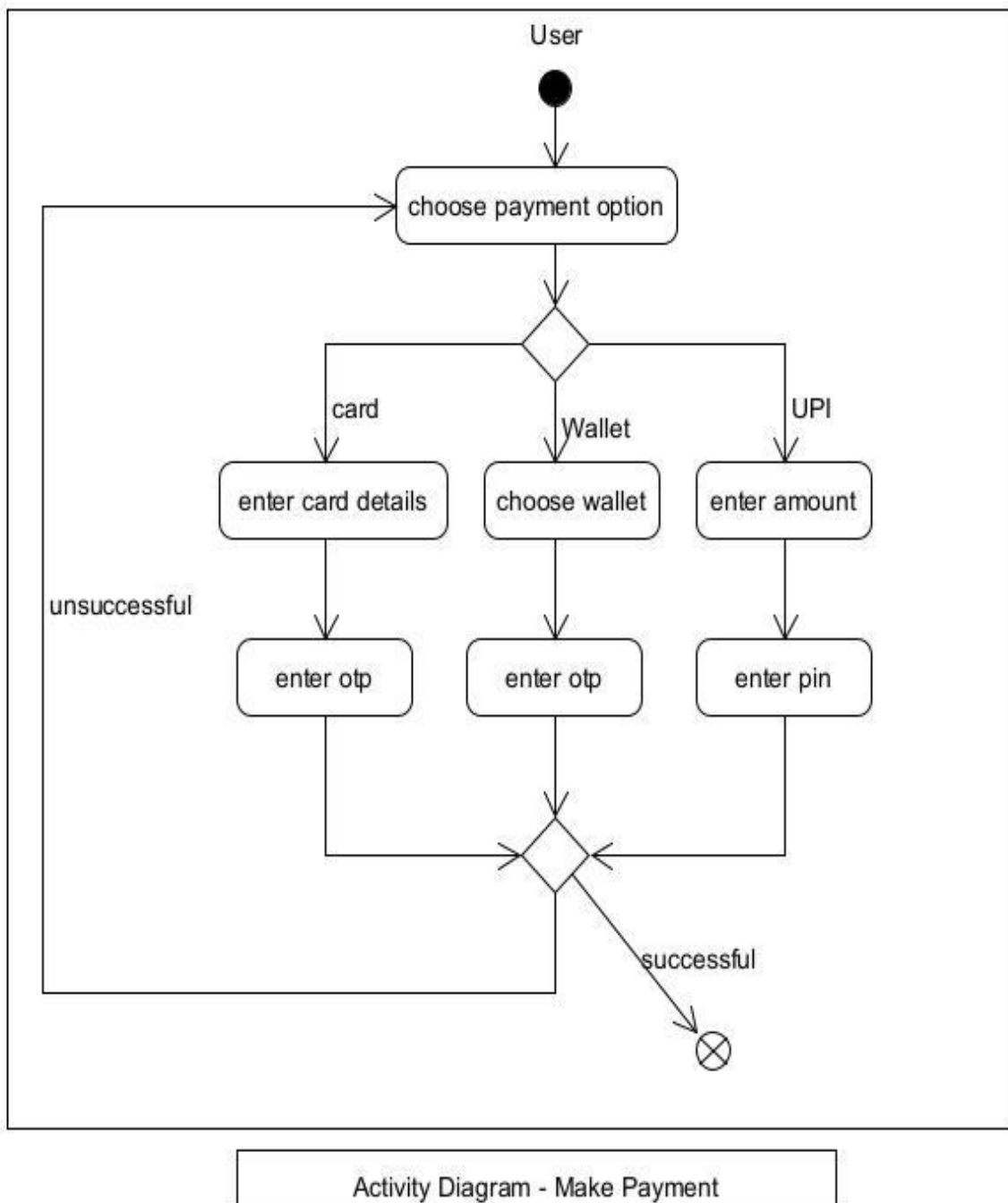
Sequence diagram for parking reservation

4) Activity Diagram

a) Activity diagram for parking reservation

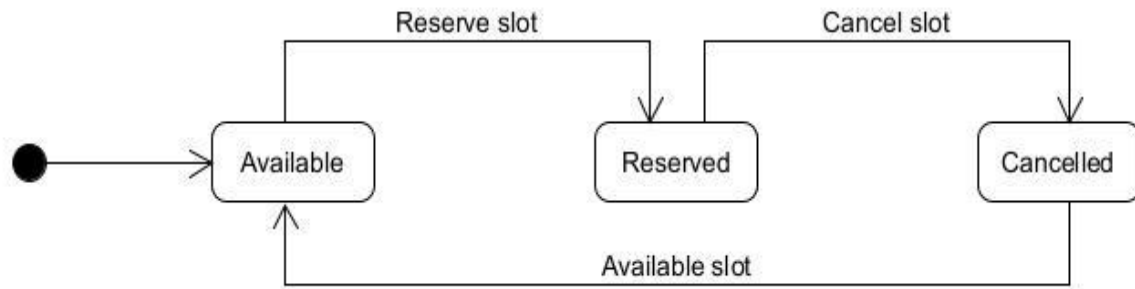


b) Activity diagram for make payment

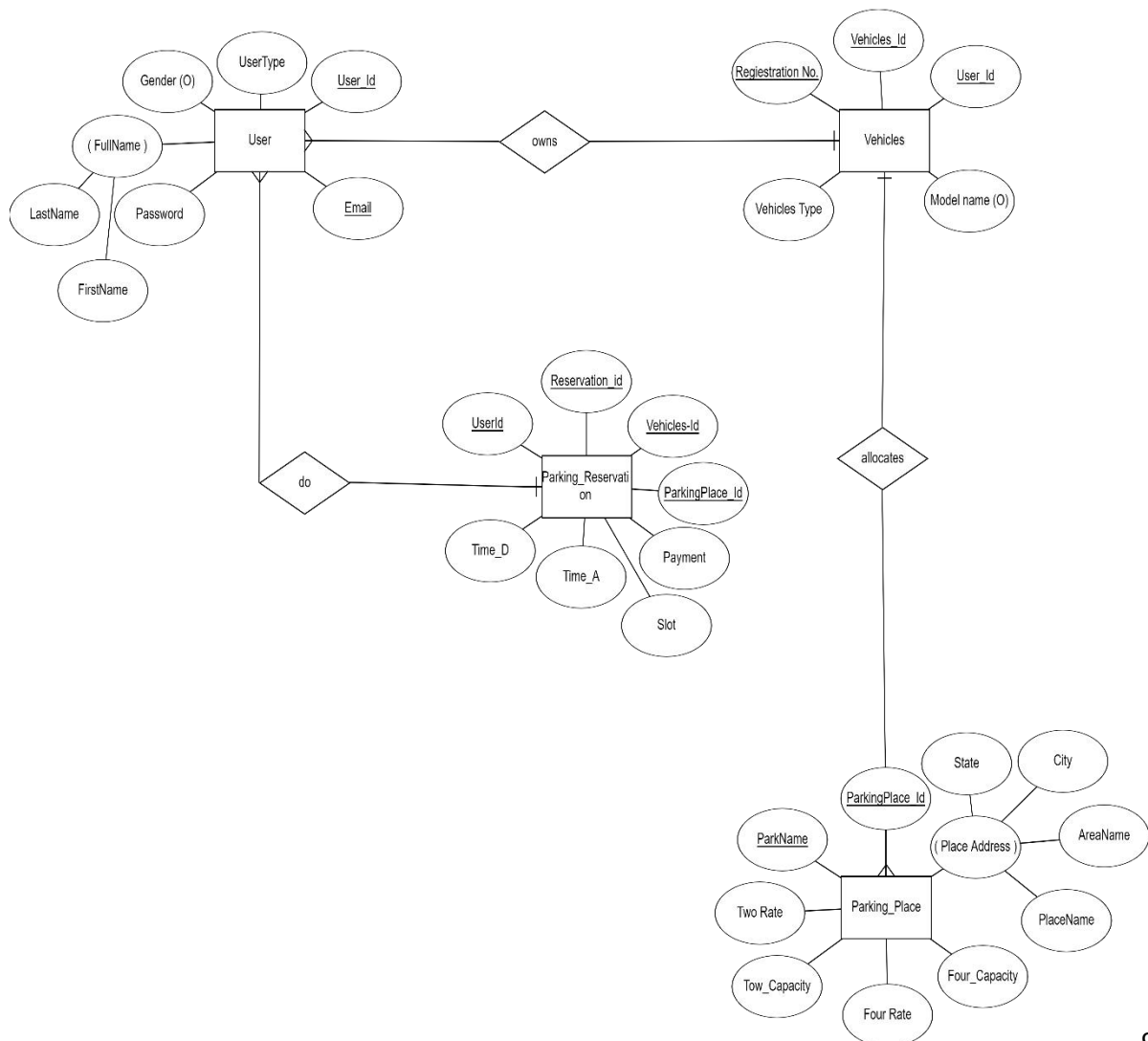


5) State Diagram

State diagram for parking plot



6) E-R Diagram



7) Data Dictionary

User								
Sr No	Field Name	Data Type	Width	Required	Unique	PK/FK	Referenced Table	Description
1	UserId	Number	20	Yes	Yes	PK		Primary Key for the user table
2	Full Name	Varchar2	30	Yes				First name and Last name of the user
3	Password	Varchar2	10	Yes				Password of the user
4	Mobile no.	Number	10	Yes	Yes			Mobile no. of the user
5	Email	Varchar2	40	Yes	Yes			Email ID of the user
6	Gender	Varchar2	10	Yes				Gender of the user

Parking_Place								
Sr No	Field Name	Data Type	Width	Required	Unique	PK/FK	Referenced Table	Description
1	ParkingId	Number	20	Yes	Yes	PK		Primary key for the parking table
2	ParkName	Varchar2	30	Yes	Yes			Name of the parking area
3	Address	Varchar2	50	Yes				Address of the parking place
4	Two_Capacity	Number	10	Yes				Capacity of the two wheelers
5	Four_Capacity	Number	10	Yes				Capacity of the four wheelers
6	Two_Rate	Number	10	Yes				Rates for the two wheelers
7	Four_Rate	Number	10	Yes				Rates for the four wheelers

Vehicle								
Sr No	Field Name	Data Type	Width	Required	Unique	PK/FK	Referenced Table	Description
1	VehicleId	Number	30	Yes	Yes	PK		Primary key for the vehicle table
2	UserId	Number	10	Yes		FK	User	User id
3	Vehicles Type	Varchar2	10	Yes				Type of vehicle
4	Model Name	Varchar2	10	Yes				Vehicle model name
5	Registration_number	Varchar2	40	Yes				Vehicle number plate

Parking_Reservation								
Sr No	Field Name	Data Type	Width	Required	Unique	PK/FK	Referenced Table	Description
1	ReservationId	Number	20	Yes	Yes	PK		Primary key for the parking reservation table
2	UserId	Number	20	Yes		FK	User	User id
3	VehicleId	Number	20	Yes		FK	Vehicle	Vehicle id
4	ParkingId	Varchar2	30	Yes		FK	Parking_Place	Parking Place id
5	Plot	Varchar2	10	Yes				Parking space number
6	Payment	Number	20	Yes				Payment amount
7	Time_A	DateTime	20	Yes				Date and Time of the client arrive in parking space
8	Time_D	DateTime	20	Yes				Date and time of the client departs from parking space

Implementation Detail

Home Module:

In the home module user can view all the parking places. In each row details of the parking place will be shown like Parking place name, Address, two-wheeler and four-wheeler capacity available, two-wheeler and four-wheeler parking charges. User can reserve for any parking place which has capacity greater than zero by clicking the reserve button.

Login/Signup Module:

In signup module user can register themselves by providing details like name, email, password and mobile no. User will be validated at time of registration that it is previously exist or not and the details provided by them is valid or not. After registering themselves user can login into the system by providing email and password. At the time of login user will be validated.

Parking Reservation Module:

User can reserve parking plot in any parking place for their vehicle. For that user has to provide few details. These details contain vehicle information like vehicle type (2-Wheeler/4-Wheeler), vehicle name (company name + model name), and vehicle registration number. After that user has to choose the time slot for which he/she want to park his/her vehicle. After submitting the details correctly and validated by system successful message will come with the information of parking plot and amount payable.

Admin Module:

Admin of the system can add parking places. Admin can also update or delete parking place. To add a parking place admin has to provide information regarding it, like Parking place name, Address, two-wheeler and four-wheeler capacity available, two-wheeler and four-wheeler parking charges. After successfully submitting information parking place will be added to the list of parking places. To update admin has to provide updated details and for deleting admin has to press the delete button for parking place.

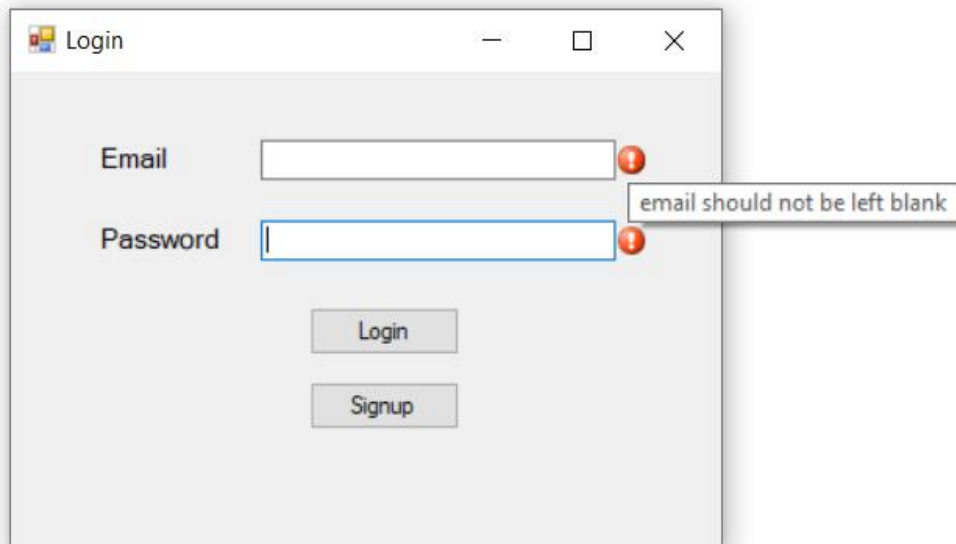
Profile Module:

In the profile page user can view their personal details. User can also view their reserved parking, It contains details of parking place and the user's vehicle.

Testing

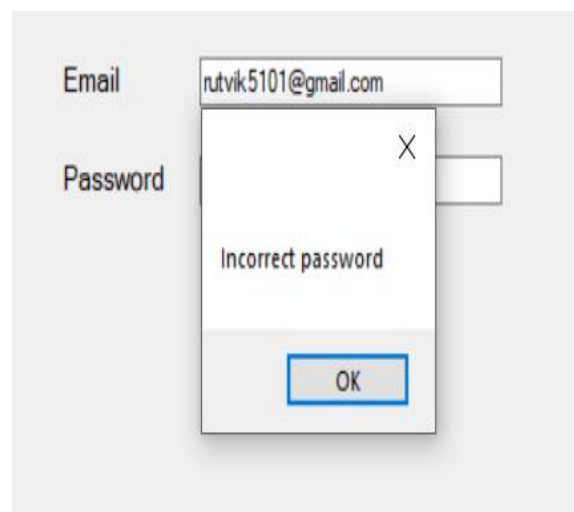
1) Login

If the login field are left blank then error message will be shown.

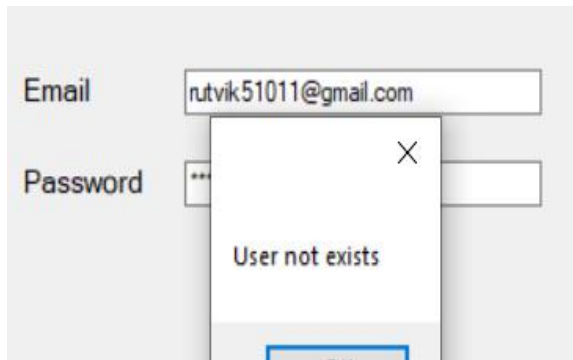


A screenshot of a 'Login' window. It contains two input fields: 'Email' and 'Password'. Both fields are empty. To the right of each field is a red circular icon with a white exclamation mark. A tooltip message 'email should not be left blank' is visible next to the Email field's error icon. Below the input fields are two buttons: 'Login' and 'Signup'.

If the username or password is wrong then appropriate message will be shown.



A screenshot of a 'Login' window. The 'Email' field contains the text 'rutvik5101@gmail.com'. The 'Password' field is empty. An error message dialog box is displayed in the foreground, containing the text 'Incorrect password' and an 'OK' button. The dialog box has a close button (X) in the top right corner.



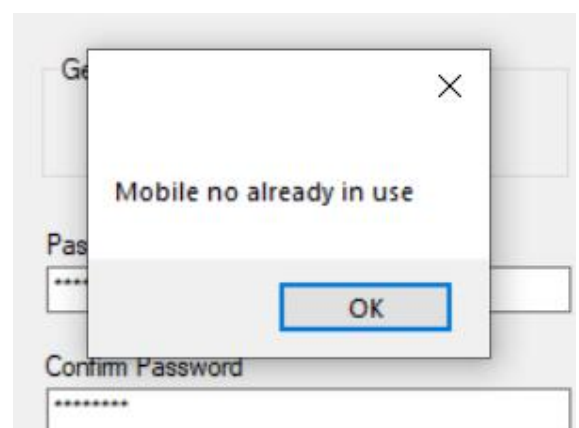
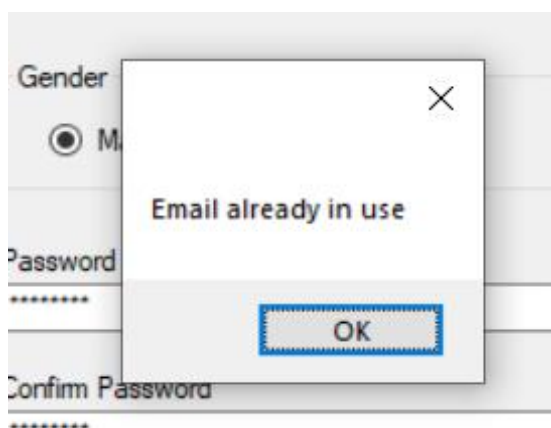
2) Signup

If the signup fields are left blank or both the passwords are not

A screenshot of a 'Registration Form' window. The form contains fields for Firstname, Lastname, Gender (Male/Female), Password, Confirm Password, Email, and Mobile No. Red exclamation mark icons are present next to the Firstname, Lastname, Password, Email, and Mobile No fields. A tooltip message 'first name should not be left blank' is visible next to the Firstname field. At the bottom are 'Signup' and 'Login' buttons.A screenshot of the 'Registration Form' window with the following values: Firstname: Rutvik, Lastname: Kathrecha, Gender: Male (selected), Password: ***** (masked), Confirm Password: ***** (masked), Email: rutvik5101@gmail.com, Mobile No: 9898893467. A red exclamation mark icon is next to the Confirm Password field, and a tooltip message 'both password should be same' is displayed. 'Signup' and 'Login' buttons are at the bottom.

matching then appropriate message will be shown.

Email and mobile no should be unique.



3) Parking Reservation

Reservation

Dharmasinh Desai University
Parking Reservation

Enter details

Vehicle type

Model name

Registration number

Arrival Time
18/04/2020 | 05:15 PM

Departure Time
18/04/2020 | 05:15 PM

Submit

Back

arrival time must be atleast 1 hour greater then current time

Arrival time must be greater than current time

Reservation

Dharmasinh Desai University Parking Reservation

Enter details

Vehicle type
4-Wheeler

Model name
Honda City

Registration number
GJ-03-HM-9999

Arrival Time
18/04/2020 | 05:15 PM

Departure Time
18/04/2020 | 04:16 PM

departure time must be greater then arrival time

Submit

Back

Departure time must be greater than arrival time

Screen-shots

Homepage

Online Car Parking

Profile Logout

ParkingName	Address	TwoWheelerCapacity	TwoWheelerRate(Rs)	FourWheelerCapacity	FourWheelerRate(Rs)	Make Reservation
Dharmasinh Desai Unive...	Collage road, Nadiad-38...	97	20	44	40	Reserve
Swapnalok Residency	Near Ramapir Chowkdi, ...	98	10	46	20	Reserve
Vaniyavad Public Parking	Vaniyavad Circle, college...	30	50	10	100	Reserve
Raiya Chowkdi - Public P...	Near Raiya chowkdi, 15...	50	10	20	30	Reserve
RaceCourse Ground	Race Course Ring road, ...	200	20	100	40	Reserve

Home Page

Profile

Your Profile

Back

Field	Value
First Name	Rutvik
Last Name	Kathrecha
Email	rutvik5101@gmail.com
Mobile No	9898893467

Your Reserved Parkings

ParkingName	Address	Slot	ModelName	RegistrationNumber	ArrivalDate Time	DepartureDate Time
Dharmasinh Desa...	Collage road, Nad...	100	Activa-3G	GJ-03-HL-8101	23-03-2020 13:00...	23-03-2020 15:00...
Dharmasinh Desa...	Collage road, Nad...	49	Land Rover - Dis...	GJ-03-HL-6101	23-03-2020 14:37...	23-03-2020 16:37...
Swapnalok Resid...	Near Ramapir Ch...	100	Royal Enfield - Th...	GJ-03-HL-5101	25-03-2020 14:30...	25-03-2020 15:30...
Dharmasinh Desa...	Collage road, Nad...	47	Honda Civic	GJ-03-LG-9999	17-04-2020 12:58...	17-04-2020 12:58...
Swapnalok Resid...	Near Ramapir Ch...	99	Bullet	GJ-05-HM-9889	17-04-2020 13:32...	17-04-2020 13:51...
Dharmasinh Desa...	Collage road, Nad...	98	Activa 4G	GJ-03-HM-5101	18-04-2020 10:50...	19-04-2020 10:50...
Dharmasinh Desa...	Collage road, Nad...	45	Honda City	GJ-03-HM-9999	18-04-2020 17:15...	18-04-2020 18:00...
Dharmasinh Desa...	Collage road, Nad...	99	Activa 3G	GJ-03-HL-8101	24-04-2020 11:00...	24-04-2020 17:00...

Profile Page

Reservation

Raiya Chowkdi - Public Parking Parking Reservation

Enter details

Vehicle type
2-Wheeler

Model name
TVS Jupyter

Registration number
GJ-03-MN-2341

Arrival Time
18/04/2020 | 07:00 PM

Departure Time
18/04/2020 | 08:00 PM

Submit

Back

X

Your parking reservation is successfull!!
Parking Plot:50
Amount Payable:10

OK

Parking Reservation Form with success message

Online Car Parking - Admin								
			AddParkingPlace		Profile		Logout	
ParkingName	Address	TwoWheelerCapacity	TwoWheelerRate(Rs)	FourWheelerCapacity	FourWheelerRate(Rs)	Upadte Parking		Delete Parking
Dharmasinh Desai U...	Collage road, Nadiad-...	97	20	44	40	Update		Delete
Swapnalok Residency	Near Ramapir Chowk...	98	10	46	20	Update		Delete
Vaniyavad Public Par...	Vaniyavad Circle, coll...	30	50	10	100	Update		Delete
Raiya Chowkdi - Publ...	Near Raiya chowkdi, ...	49	10	20	30	Update		Delete
RaceCourse Ground	Race Course Ring ro...	200	20	100	40	Update		Delete

Admin Page

AddParkingPlaces

Add Parking Place
Back

ParkingName
Raiya Chowkdi - Public Parking

Address
Near Raiya chowkdi, 150 feet ring road, rajkot-360007

TwoCapacity
50

FourCapacity
20

TwoRate
10

FourRate
30

Add

Add Parking Place Form for Admin

UpdateParkingPlace

Dharmasinh Desai University
Update Form

Back

TwoCapacity
250

FourCapacity
50

TwoRate
20

FourRate
40

Update

Parking place: Dharmasinh Desai University updated successfully!!

OK

Update parking details form with successful message

Homepage

Online Car Parking - Admin

AddParkingPlace Profile Logout

ParkingName	Address	TwoWheelerCapacity	TwoWheelerRate(Rs)	FourWheelerCapacity	FourWheelerRate(Rs)	Upadte Parking	Delete Parking
Dharmasinh Desai U...	Collage road, Nadiad...	250	20	50	40	Update	Delete
Swapnalok Residency	Near Ramapir Chowk...	98	10	46	20	Update	Delete
Vaniyavad Public Par...	Vaniyavad Circle, coll...	30	50	10	100	Update	Delete
RaceCourse Ground	Race Course Ring ro...	200	20	100	40	Update	Delete
Raiya Chowkdi - Publ...	Near Raiya Chowkdi, ...	100	10	50	20	Update	Delete

Parking Place: Raiya Chowkdi - Public Parking Deleted

OK

Message after successful deletion of parking place

Conclusion

In this project we have successfully build the online parking management application in which user can reserve the parking for their vehicles. Admin can add, update or delete the parking place. All the functionalities including login, signup and parking reservation are successfully implemented.

Limitation and Future Extension

Limitations

We have not implemented the process related to payment of amount. We are also not providing the cancellation of parking reservation at this moment.

Future Extension

- To support more features related to online parking.
- To support better functionalities.
- To support better UI.

Bibliography

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- <https://www.codeproject.com/>
- <https://stackoverflow.com/>