



**INSTITUTE FOR ADVANCED
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Documentation On
“Online Car Parking System”
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Project Guide

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1. Introduction

Generally, in malls, theatres, airports car parking system is available which is managed by security staff. There is no automated system for finding vacant parking slot, so that customers can park his vehicle easily and save time. The Online Car Parking System allows customers to login with their own account and get vacant parking slots on the screen. Online Car Parking System is the website portal to provide hassle-free and secured car parking system.

Document Purpose

The purposes of this web application are to create a functional website for people to provide hassle-free car parking system.

Users of this website will need to register himself with car details which help in order to track check-in and check-out time of the car. Before checkout Security Staff will verify the payment status and allow customers to checkout.

Enhance Business Processes:

To be able to use internet technology to project to the global world instead of limiting their services to their local domain alone, thus increase their return on investment (ROI).

Online Parking Slot Management:

A tool through which admin can add parking slots. The admin also receives some set of functionalities which help to keep detailed reports.

Problem Statement

Existing parking system is based on our traditional way keeping car records and details on paper and registers. Finding place for parking is very difficult and time-consuming for customers. It gets really hard to maintain the records and then keep track of past records. Hence this system is proposed to overcome the flaws of the existing system and giving power to the admin so that he/she will be able to manage the parking system easily.

Product Scope

This system will allow Secure registration and profile management facilities for customers.

System will create full flex database containing customer details, car check-in, check-out time, and billing details.

Aims & Objectives

- To produce a web-based system that allow the admin to add parking slots, manage customer and parking details.
- To ease customers by providing different functionalities to it.
- To enhance security by keeping track of all details efficiently.

2. Overall Description

Functions

1. Customer Authentication and Registration:

- This system will allow to create customer profile by providing customer registration functionality.
- Customer can create his account with car information.
- System will also authenticate user credentials if customer is already registered.

2. Parking Slot Management:

- System will provide three QR codes: entrance gate, exit gate & parking slot to track car parking time & slot confirmation.
- On scanning entry gate QR code, system will provide vacant parking slots.
- Once customer scans parking slot QR code, that parking slot will be removed from vacant slots.
- On scanning exit gate QR code, parking slot which was acquired by exiting car will be added to vacant slots.

3. Payment:

- Cash Payment before Checkout

4. Check-out Process

- Payment status will be verified by security staff before customer exits with the vehicle.
- System will allow customer to exit the vehicle only if payment is received from customer.

Benefits of Online Car Parking System

- This online parking management solution is fully functional and flexible.
- It is very easy to use.
- This online parking management system helps in back-office administration by streamlining and standardizing the procedures.
- It saves a lot of time, money and labour.
- Eco-friendly: The monitoring of the parking management and the overall business becomes easy and includes the least of paper work.
- The application acts as an office that is open 24/7.
- It increases the efficiency of the management at offering quality services to the customers.
- It provides custom features development and support with the application.

Users and Characteristics:

Admin:

- Add Parking Place & Slots
- Delete Parking Slots
- Manage Customer Details
- Manage & Register Staff
- Manage Parking Details
- View Customer Invoices

Customer:

- View Vacant Parking Slots
- Choose Parking Slot
- Manage Booking History
- View Invoice History

Security Staff:

- View Payment Status
- Update Payment Status

Operating Environment:

Server Side:

Processor: Intel® Xeon® processor 3500 series

HDD: Minimum 500GB Disk Space

RAM: Minimum 2GB

OS: Windows 8.1, Linux 6

Database: MySQL

Client Side (minimum requirement):

Processor: Intel Dual Core

HDD: Minimum 80GB Disk Space

RAM: Minimum 1GB

OS: Windows 7, Linux

Design and Implementation Constraints:

- The application will use Spring Boot MVC as main web technologies. HTTP and FTP protocols are used as communication protocols.
- Several types of validations make this web application a secured one and SQL Injections can also be prevented.
- Since Car Parking System is a web-based application, internet connection must be established.
- The Car Parking System will be used on PCs and will function via internet or intranet in any web browser.

3. Requirements Specification

External Interface Requirements:

User Interfaces:

All the users will see the same page when they enter in this website. This page asks the users a username and a password.

After being authenticated by correct username and password, user will be redirect to their corresponding profile where they can do various activities. The user interface will be simple and consistence, using terminology commonly understood by intended users of the system. The system will have simple interface, consistence with standard interface, to eliminate need for user training of infrequent users.

Hardware Interfaces:

No extra hardware interfaces are needed.

The system will use the standard hardware and data communication resources. This includes, but not limited to, general network connection at the server/hosting site, network server and network management tools.

Application Interfaces:

OS: Windows 7, Linux

Web Browser:

The system is a web-based application; clients need a modern web browser such as Mozilla Firefox, Internet Explorer, Opera, and Chrome. The computer must have an Internet connection in order to be able to access the system.

4. System Diagram

Activity Diagram

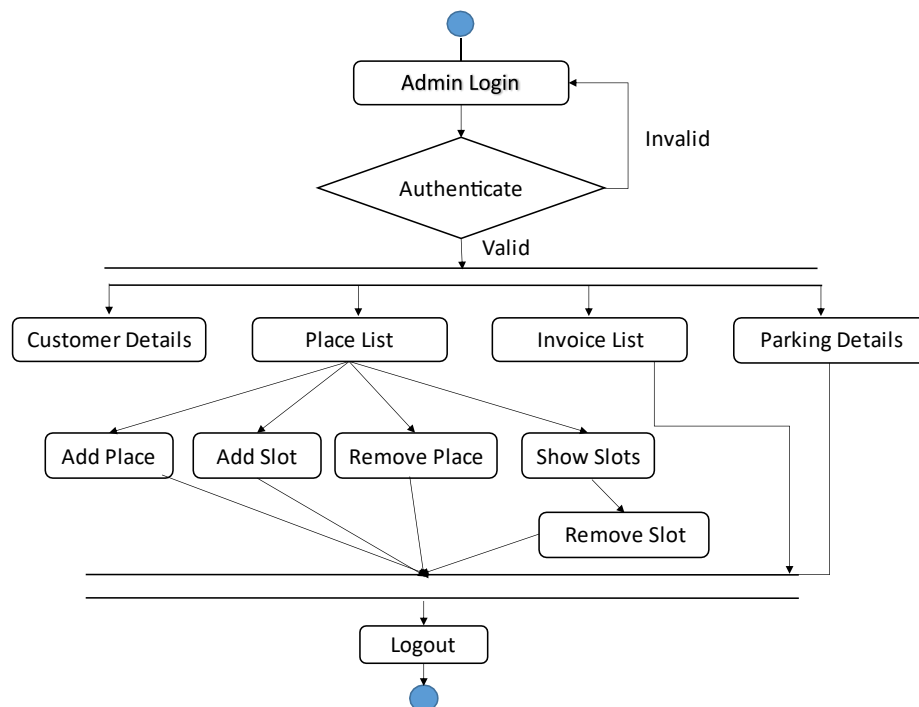


Figure 1: Admin Activity Diagram

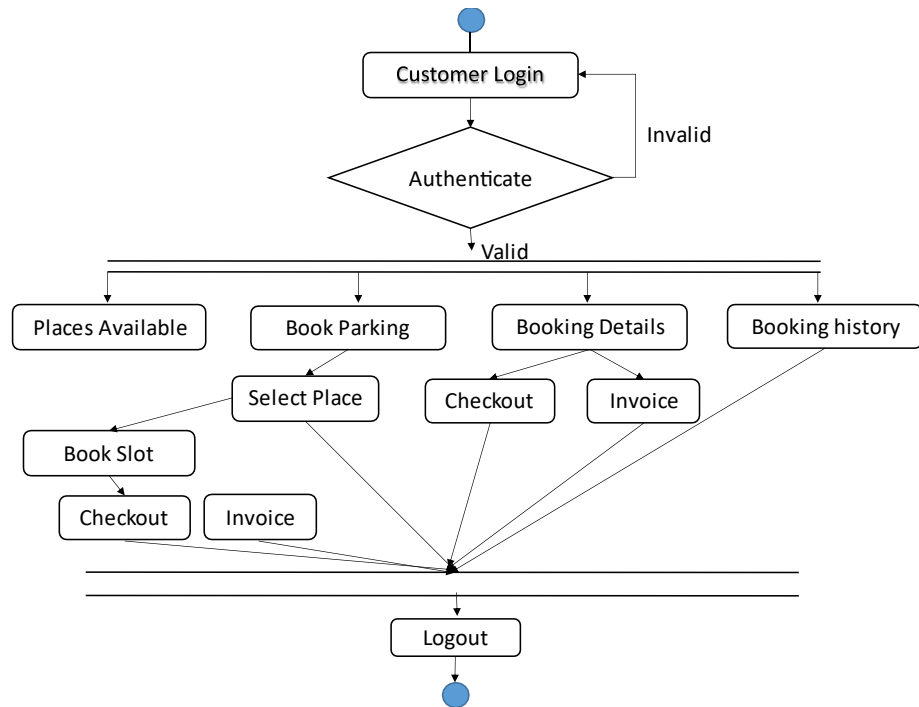


Figure 2: Customer Activity Diagram

Data Flow Diagram

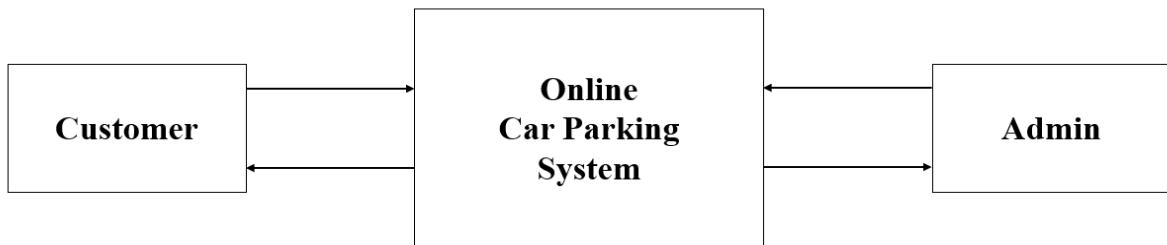


Figure 3: Level 0 Data Flow Diagram

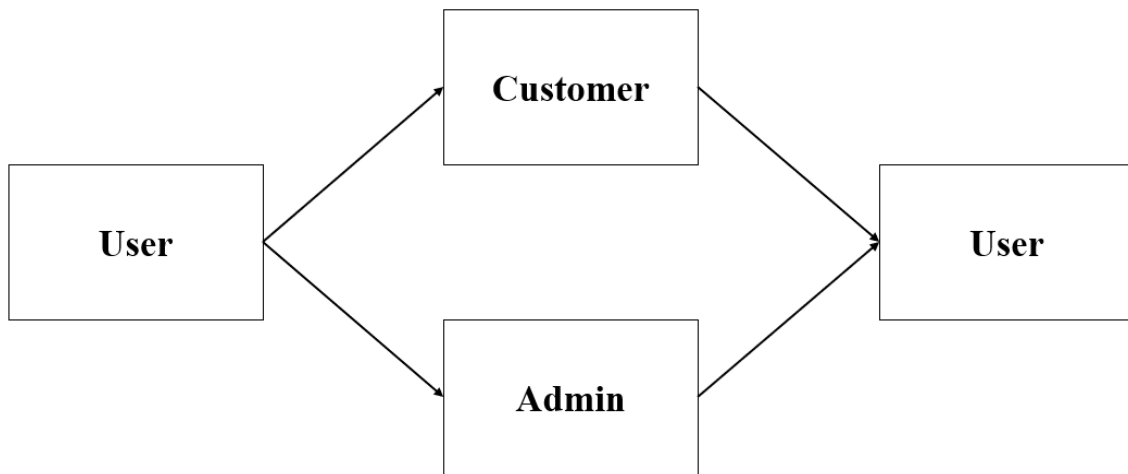


Figure 4: Level 1 Data Flow Diagram

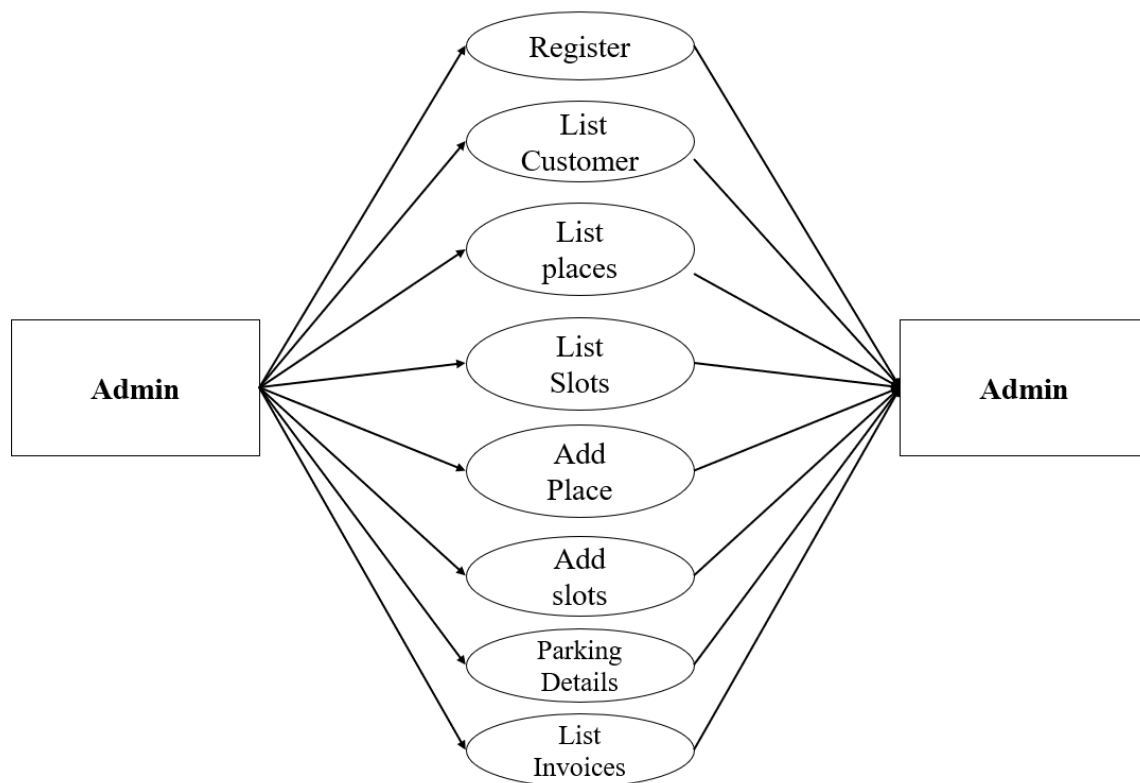


Figure 5: Level 2 Data Flow Diagram for Admin

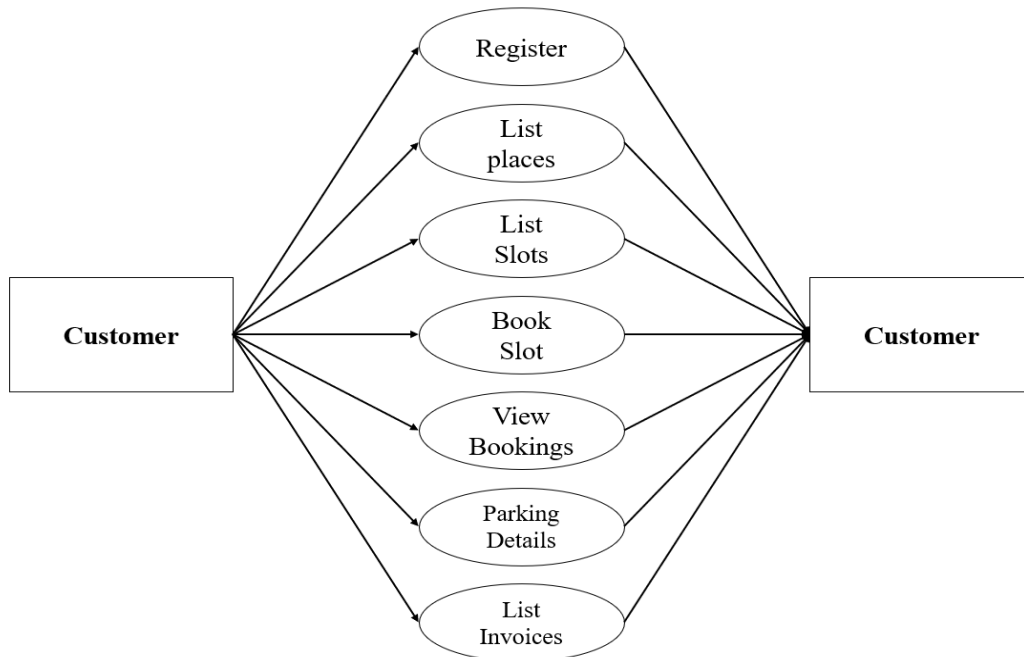


Figure 6: Level 2 Data Flow Diagram for Customer

Class Diagram

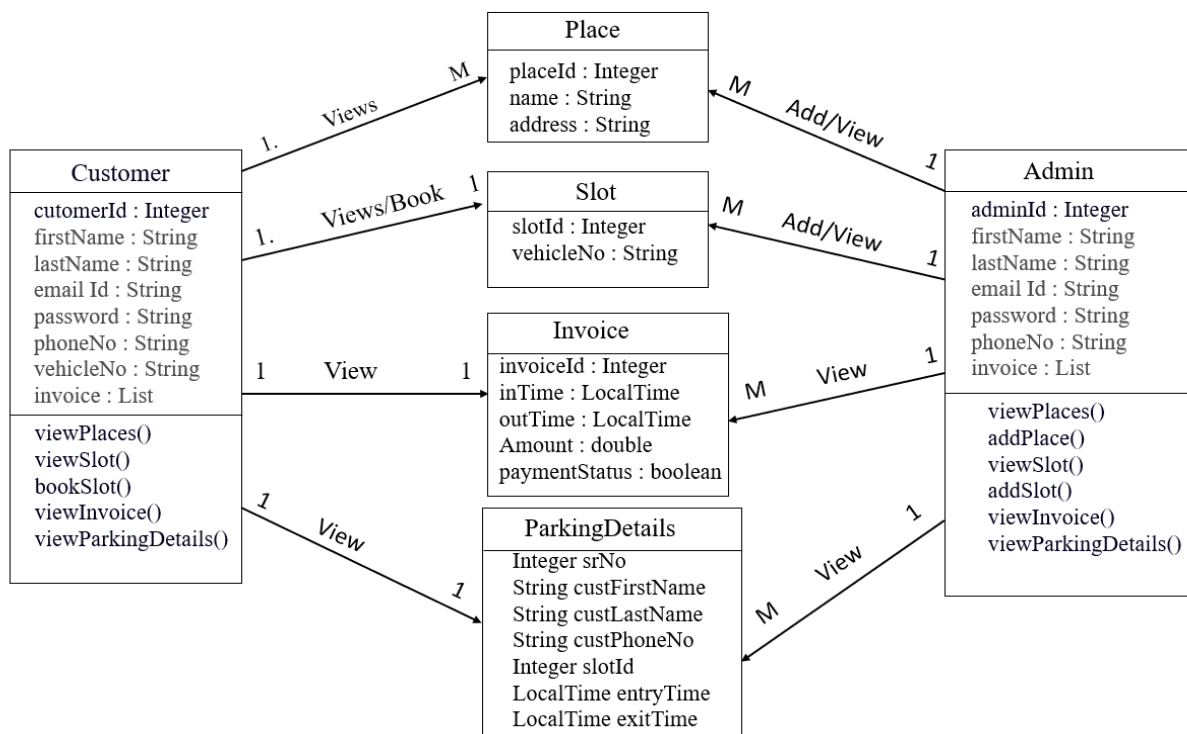


Figure 7: Class Diagram

Use Case Diagram

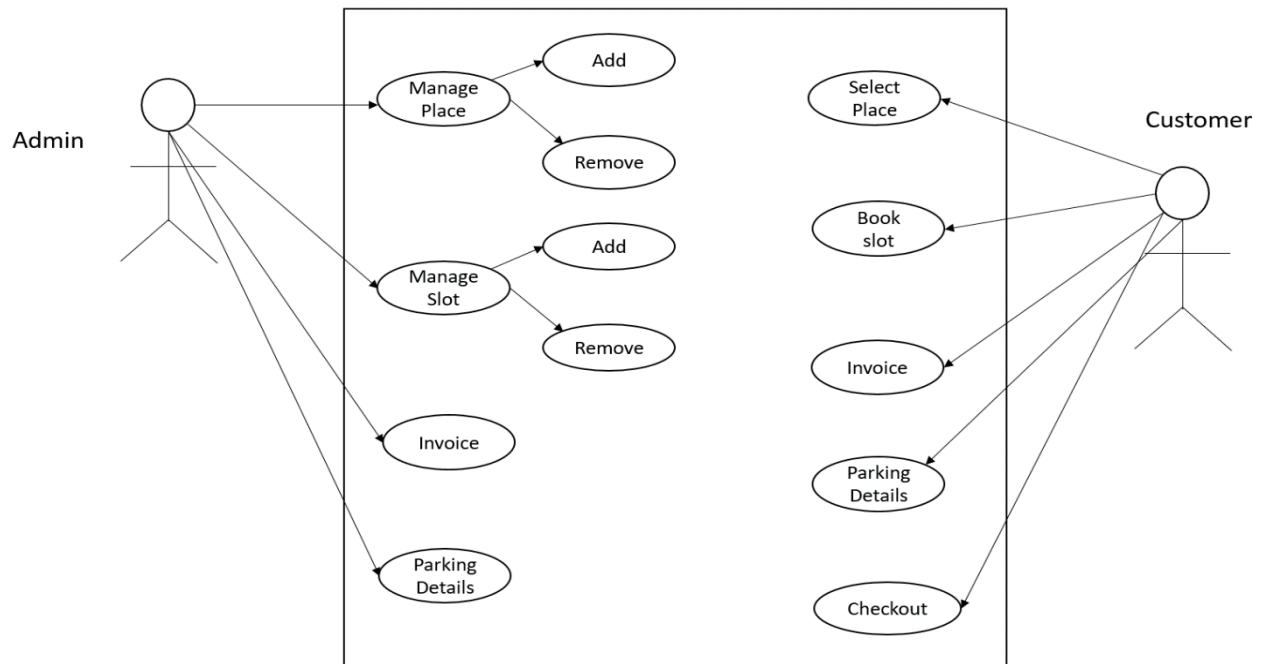


Figure 08: Use Case Diagram

ER Diagram

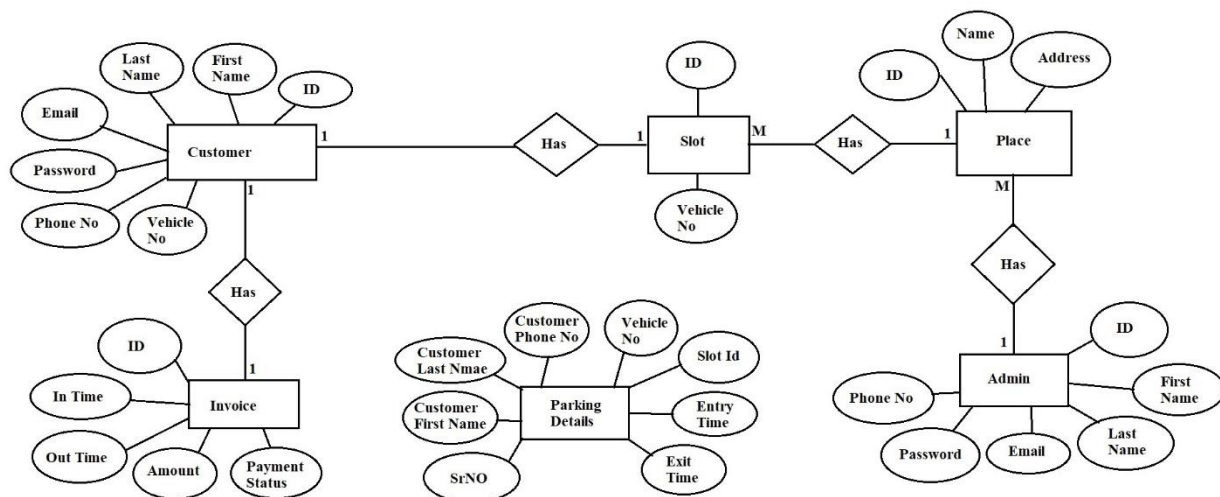


Figure 09: ER Diagram

5. Table Structure

Admin:

Field	Type	Null	Key	Default	Extra
admin_id	int	NO	PRI	NULL	auto_increment
first_name	varchar(20)	NO		NULL	
last_name	varchar(20)	NO		NULL	
email	varchar(50)	NO		NULL	
phone_no	number(10)	NO		NULL	
password	varchar(20)	NO		NULL	

Customer:

Field	Type	Null	Key	Default	Extra
customer_id	int	NO	PRI	NULL	auto_increment
first_name	varchar(20)	NO		NULL	
last_name	varchar(20)	NO		NULL	
email	varchar(50)	NO		NULL	
phone_no	number(10)	NO		NULL	
vehicle_no	varchar(20)	NO		NULL	
password	varchar(20)	NO		NULL	

Security Staff:

Field	Type	Null	Key	Default	Extra
staff_id	int	NO	PRI	NULL	auto_increment
first_name	varchar(20)	NO		NULL	

last_name	varchar(20)	NO		NULL	
email	varchar(50)	NO		NULL	
phone_no	number(10)	NO		NULL	
password	varchar(20)	NO		NULL	

Places:

Field	Type	Null	Key	Default	Extra
place_id	int	NO	PRI	NULL	auto_increment
address	varchar(255)	NO		NULL	
name	varchar(20)	NO		NULL	
amin_id	int	NO	MUL	NULL	

Slots:

Field	Type	Null	Key	Default	Extra
slot_id	int	NO	PRI	NULL	auto_increment
vehicle_no	varchar(20)	NO		NULL	
place_id	int	NO	MUL	NULL	

Invoice:

Field	Type	Null	Key	Default	Extra
invoice_id	int	NO	PRI	NULL	auto_increment
amount	double	YES		NULL	
date	date	YES		NULL	
in_time	time	YES		NULL	
out_time	time	YES		NULL	
payment_status	varchar(20)	YES		NULL	
customer_id	int	NO	MUL	NULL	

Parking Details:

Field	Type	Null	Key	Default	Extra
sr_no	int	NO	PRI	NULL	auto_increment
cust_first_name	varchar(20)	YES		NULL	
cust_last_name	varchar(20)	YES		NULL	
cust_phone_no	number(10)	YES		NULL	
date	date	YES		NULL	
entry_time	time	YES		NULL	
exit_time	time	YES		NULL	
slot_id	int	YES		NULL	
vehicle_no	varchar(20)	YES		NULL	

6. Conclusion

Online Car Parking System puts forth the actual working of a parking. Administration, slot management, customer management, record management, etc. are the key features of our project. User can access services and functionalities anywhere and anytime for hassle-free parking experience.

7. Future Scope

This project can be enhanced further by adding on the spot car care services like washing, cleaning, servicing. The software is flexible enough to be modified and implemented as per future requirements. We have tried our best to present this free and user-friendly website to malls, theatres, airports, etc. Message and Email alerts for various activities like check-in, check-out, invoice, etc can be added to the system.