# Project: Parking Rental System

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Submitted To

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# 1.Introduction

ParkEasy is a comprehensive parking rental system with three user roles (Renter, Owner, Admin) and a complete web application stack including frontend, backend, and database components.

# 2.Usage Case

The Parking Rental System allows three types of users—Renters, Owners, and Admins—to interact with the platform for managing parking spaces. Renters register, log in, and browse available listings posted by Owners, then book parking slots by selecting time periods, with the system automatically calculating the optimal price (hourly, daily, or monthly). Owners register, log in, and add listings with details like location, pricing, and availability, and they can view bookings made for their spaces along with renters' contact information and track their earnings. Admins, seeded with predefined accounts, log in to oversee the entire system by managing users, listings, and bookings, with the ability to remove inappropriate records when necessary. All data—including users, listings, bookings, and payments—is stored in a PostgreSQL database, with the Node.js backend handling business logic and the HTML/JS frontend providing user interaction. This ensures a smooth process where renters can conveniently secure parking, owners can monetize unused spaces, and admins maintain overall system integrity.

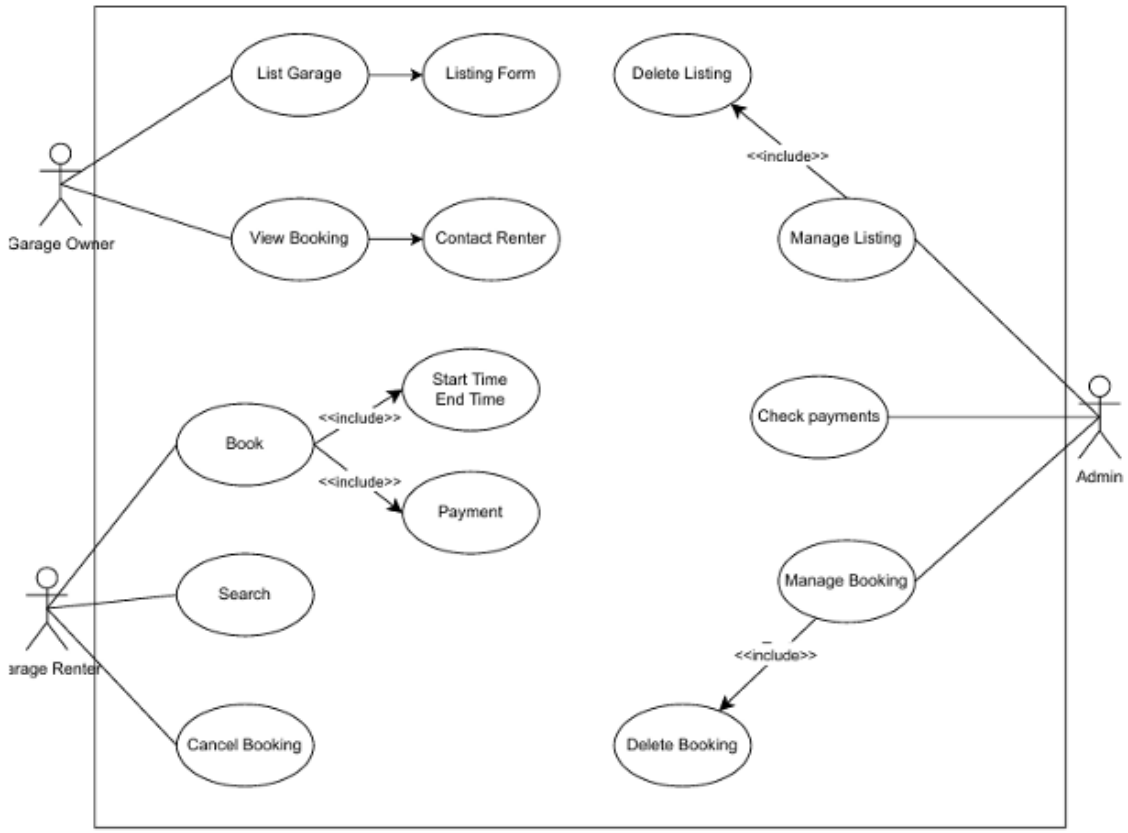
# 3.Stakeholders

The stakeholders of the Parking Rental System include **Renters**, who need a convenient way to find and book parking spaces at fair prices; **Owners**, who want to list their available parking spots and earn income by renting them out; and **Admins**, who oversee and manage the platform to ensure smooth operation, security, and fairness. Beyond direct users, there are also **system developers** who maintain the application, and **business operators or institutions** that may benefit from efficient parking management. Each stakeholder interacts with the system differently but contributes to its overall value—Renters gain accessibility, Owners generate revenue, and Admins maintain integrity and reliability of the service.

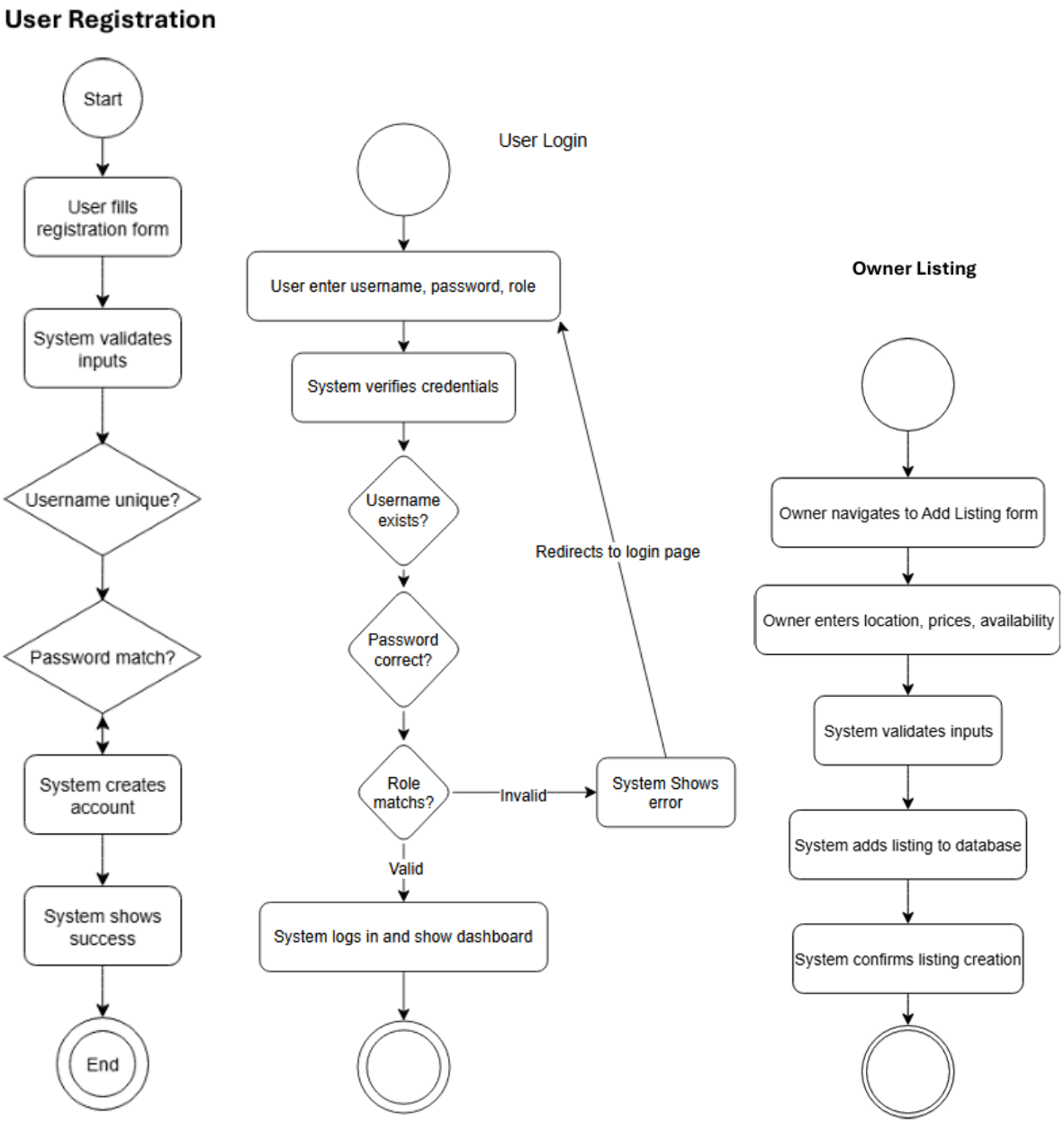
# 4.Technology

- Frontend: HTML/CSS/JavaScript single-page application
- Backend: Node.js/Express.js REST API server
- Database: PostgreSQL with connection pooling
- Authentication: Token-based session management

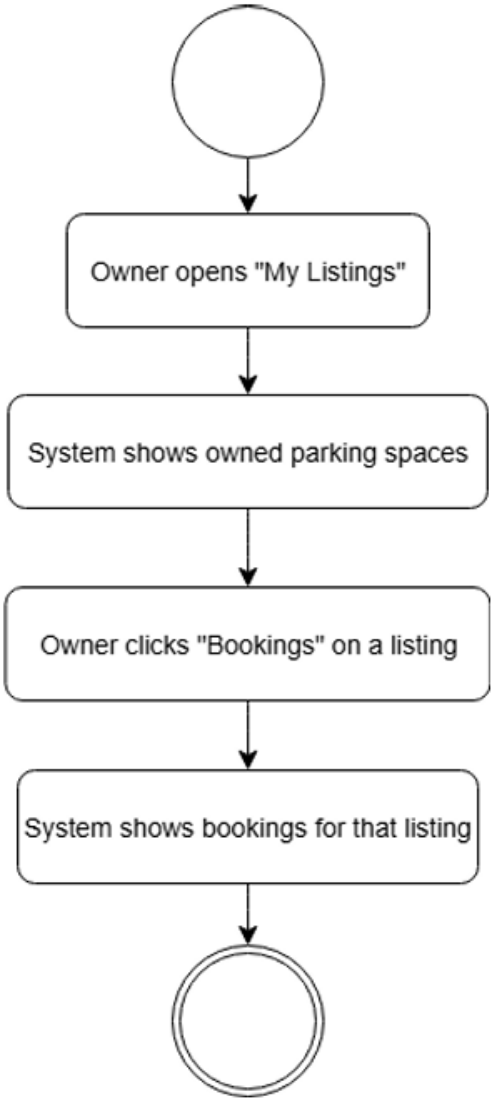
# 5.Use Case Diagram

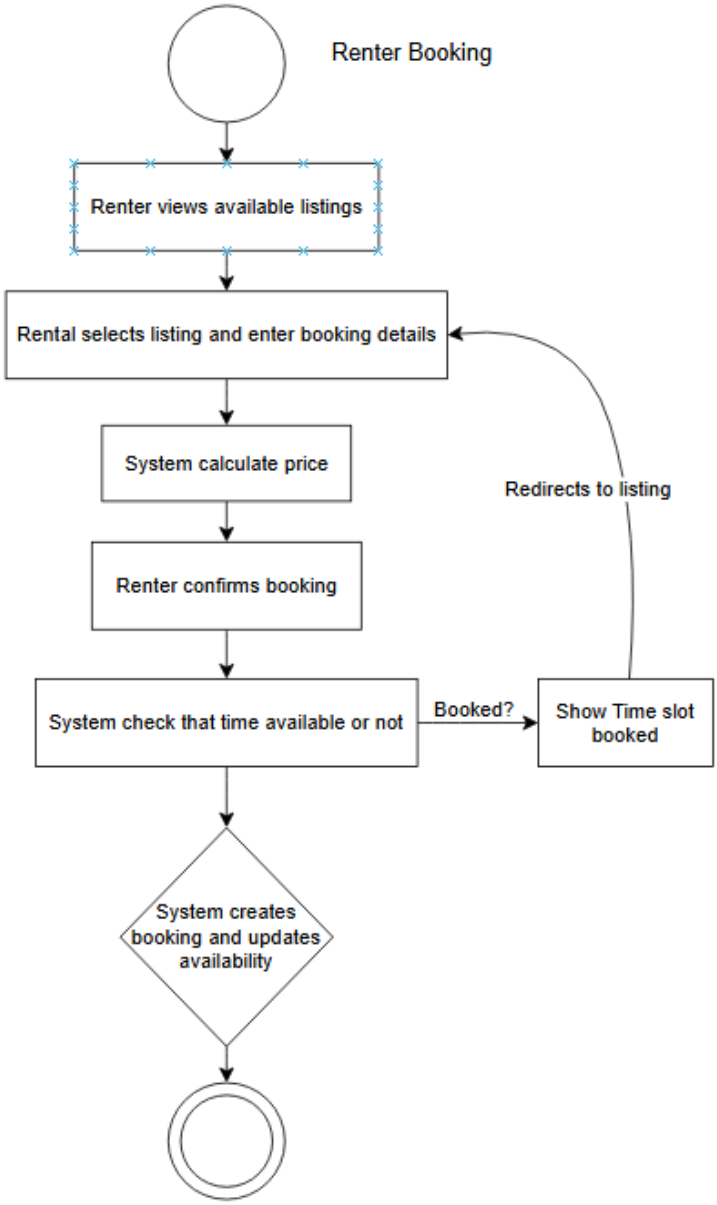


# 6.Activity Diagram

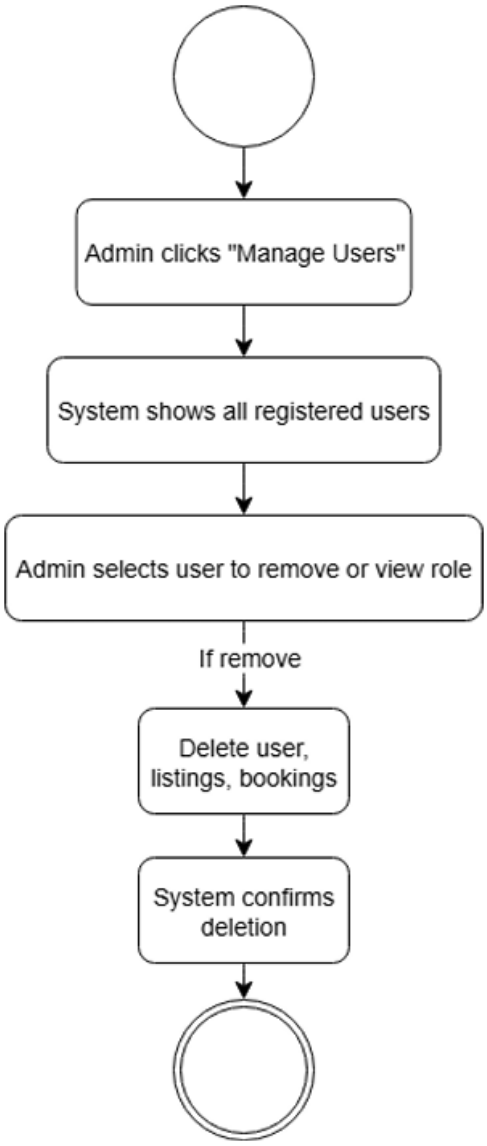


**Owner View Booking**

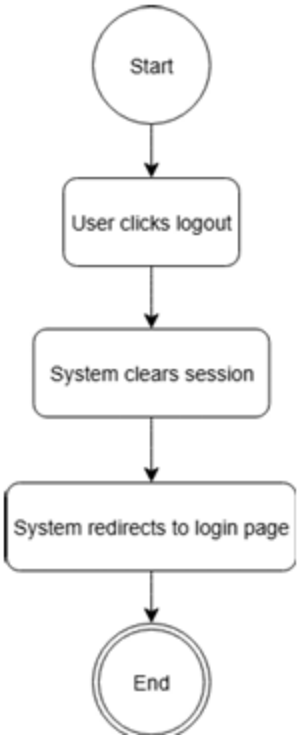


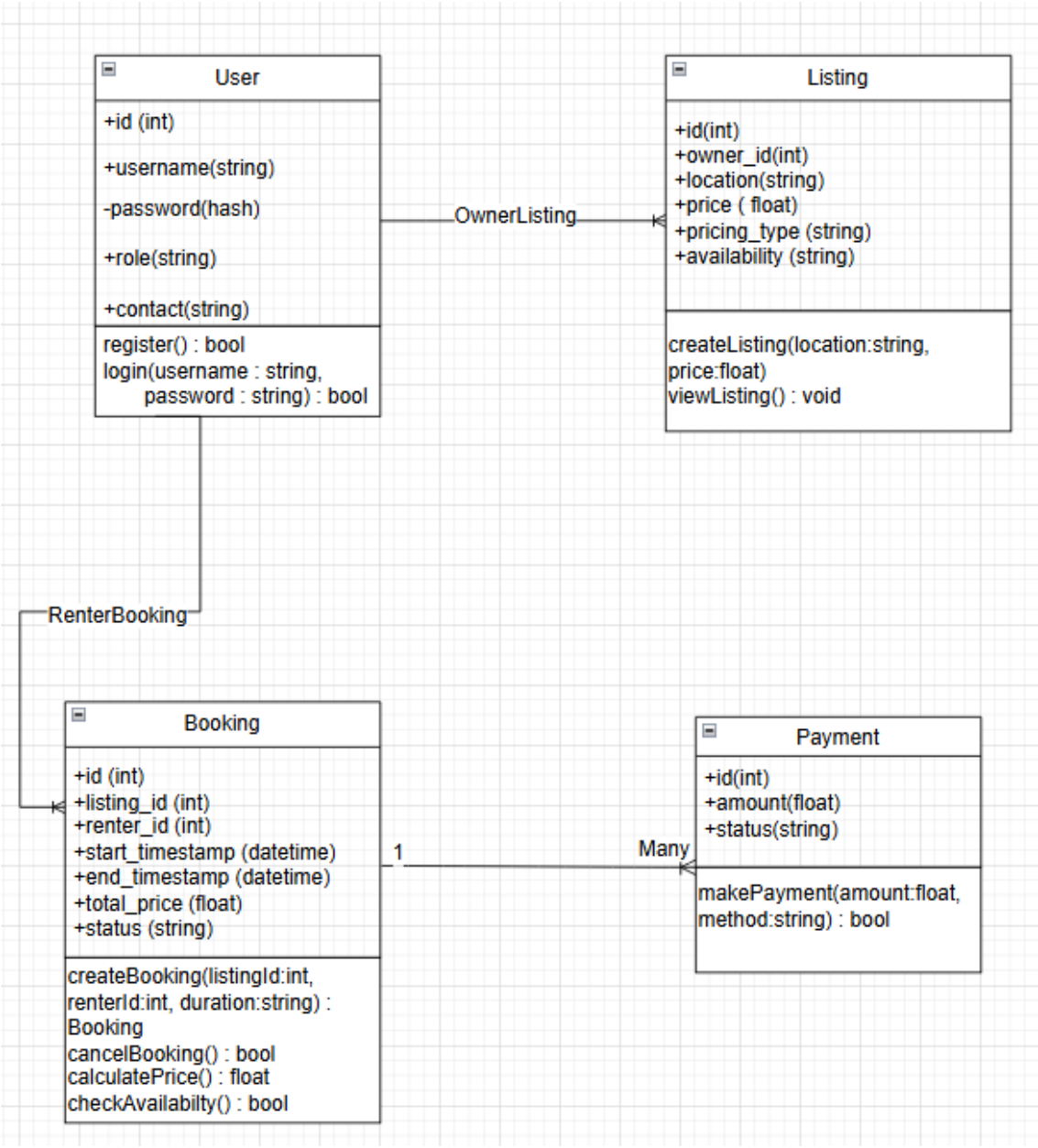
**Admin Manage**




**Logout**

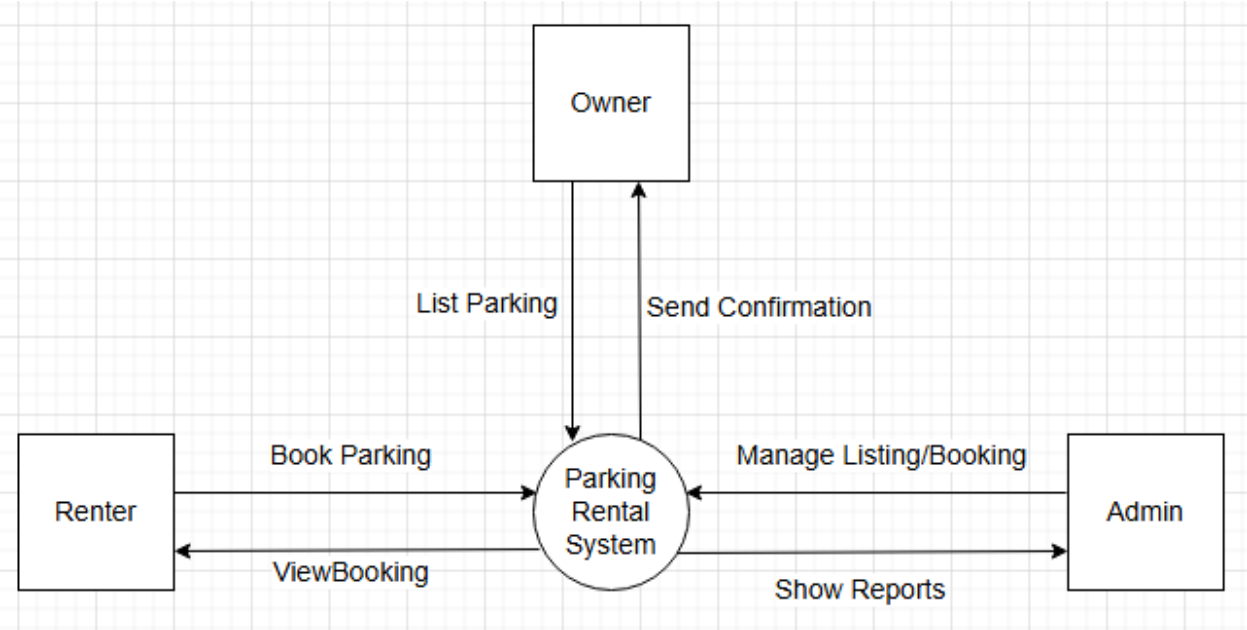


# 7.Class Diagram

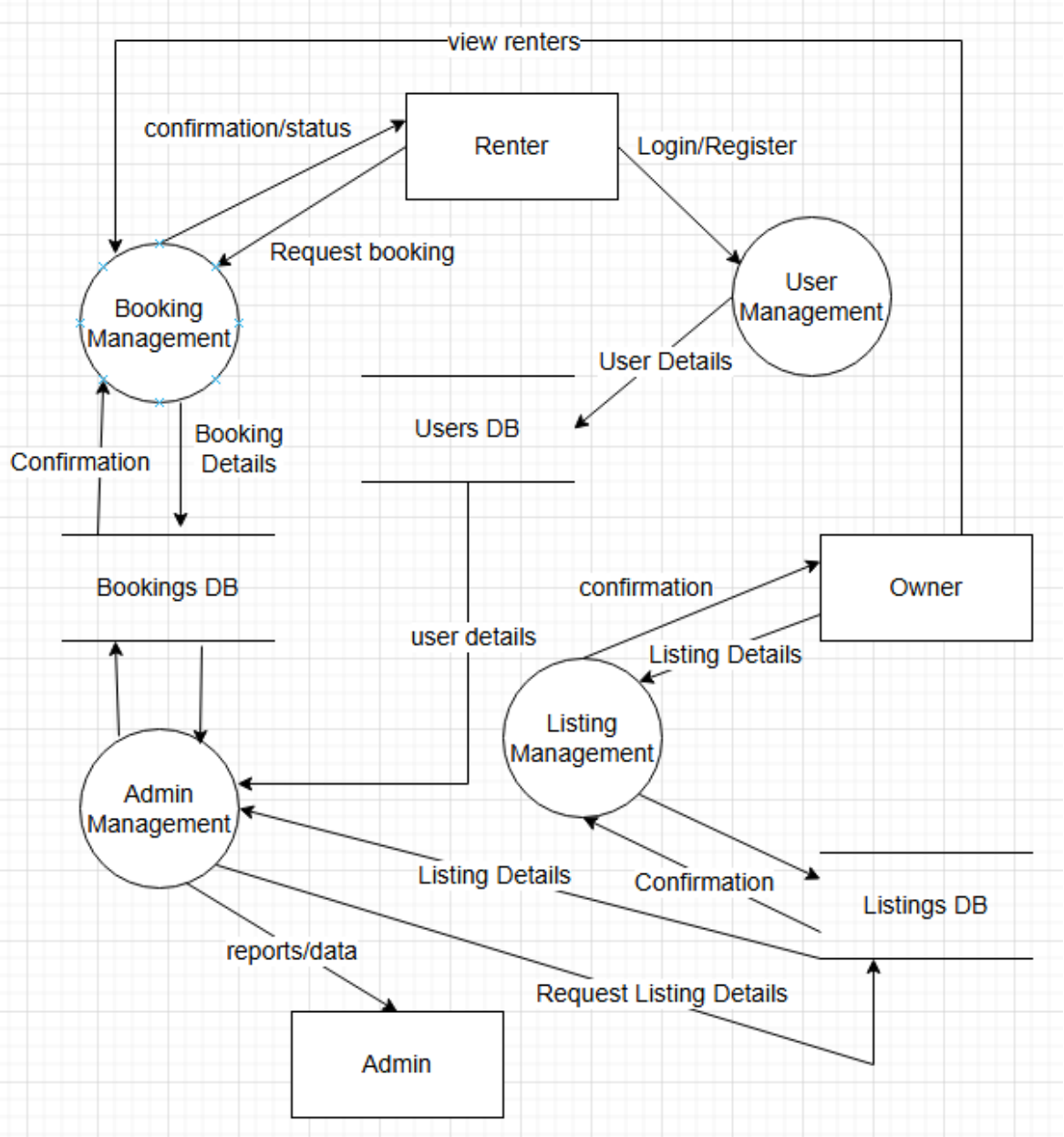


# 8.Data Flow Diagram

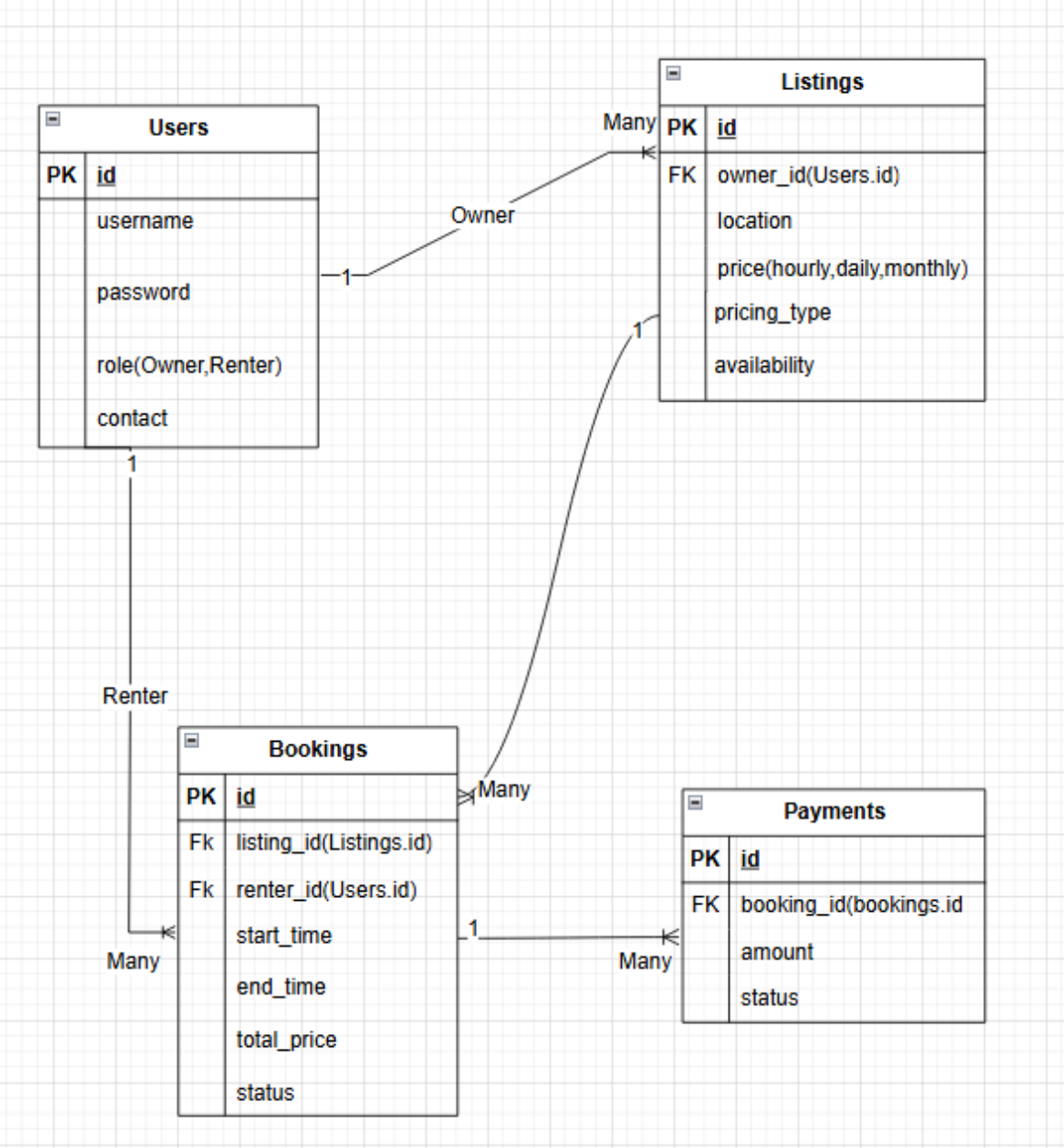
## Level 0:



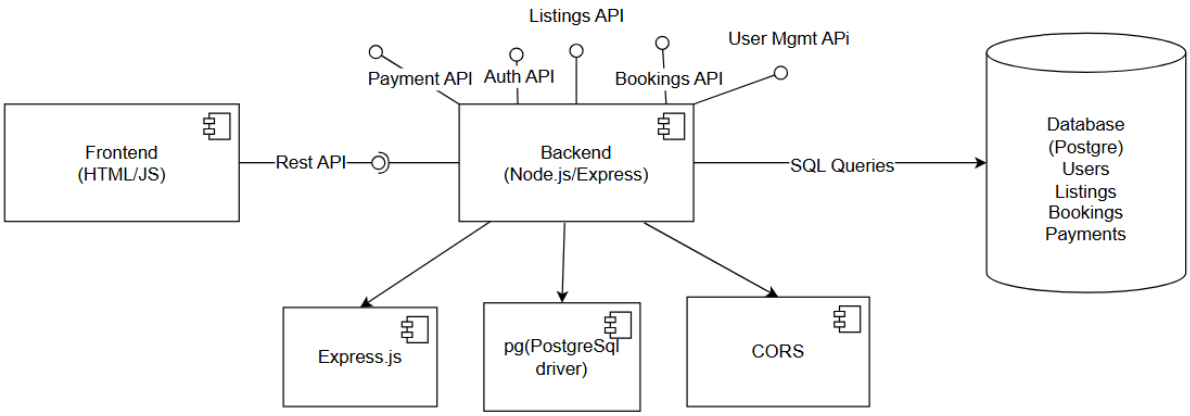
Level 1:


view renters
confirmation/status
Renter
Login/Register
Request booking
Booking Management
User Management
User Details
Users DB
Booking Details
Confirmation
Bookings DB
confirmation
Owner
user details
Listing Details
Listing Management
Admin Management
Listing Details
Confirmation
Listings DB
reports/data
Request Listing Details
Admin

# 9.Er Diagram:

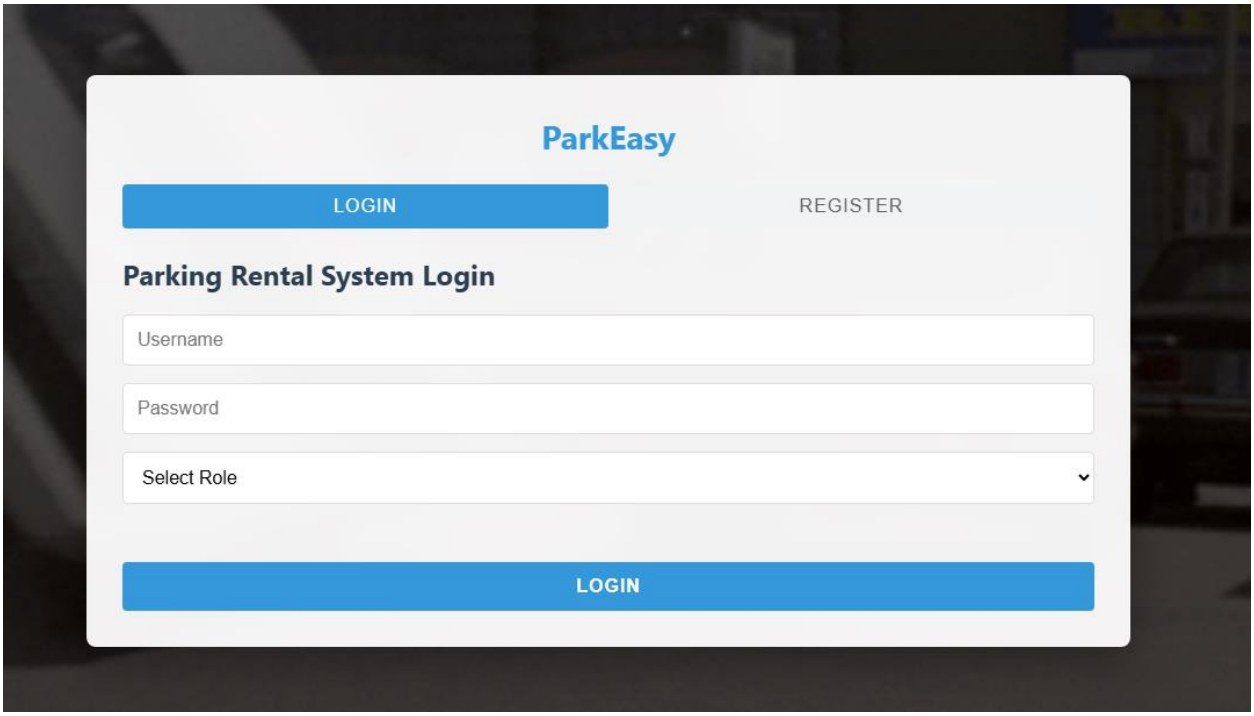

Users
PK
id
username
password
role(Owner,Renter)
contact
Listings
PK
id
FK
owner_id(Users.id)
location
price(hourly,daily,monthly)
pricing_type
availability
Bookings
PK
id
Fk
listing_id(Listings.id)
Fk
renter_id(Users.id)
start_time
end_time
total_price
status
Payments
PK
id
FK
booking_id(bookings.id
amount
status
Owner
Many
1
1
1
Renter
Many
Many
1
Many

# Component Diagram:

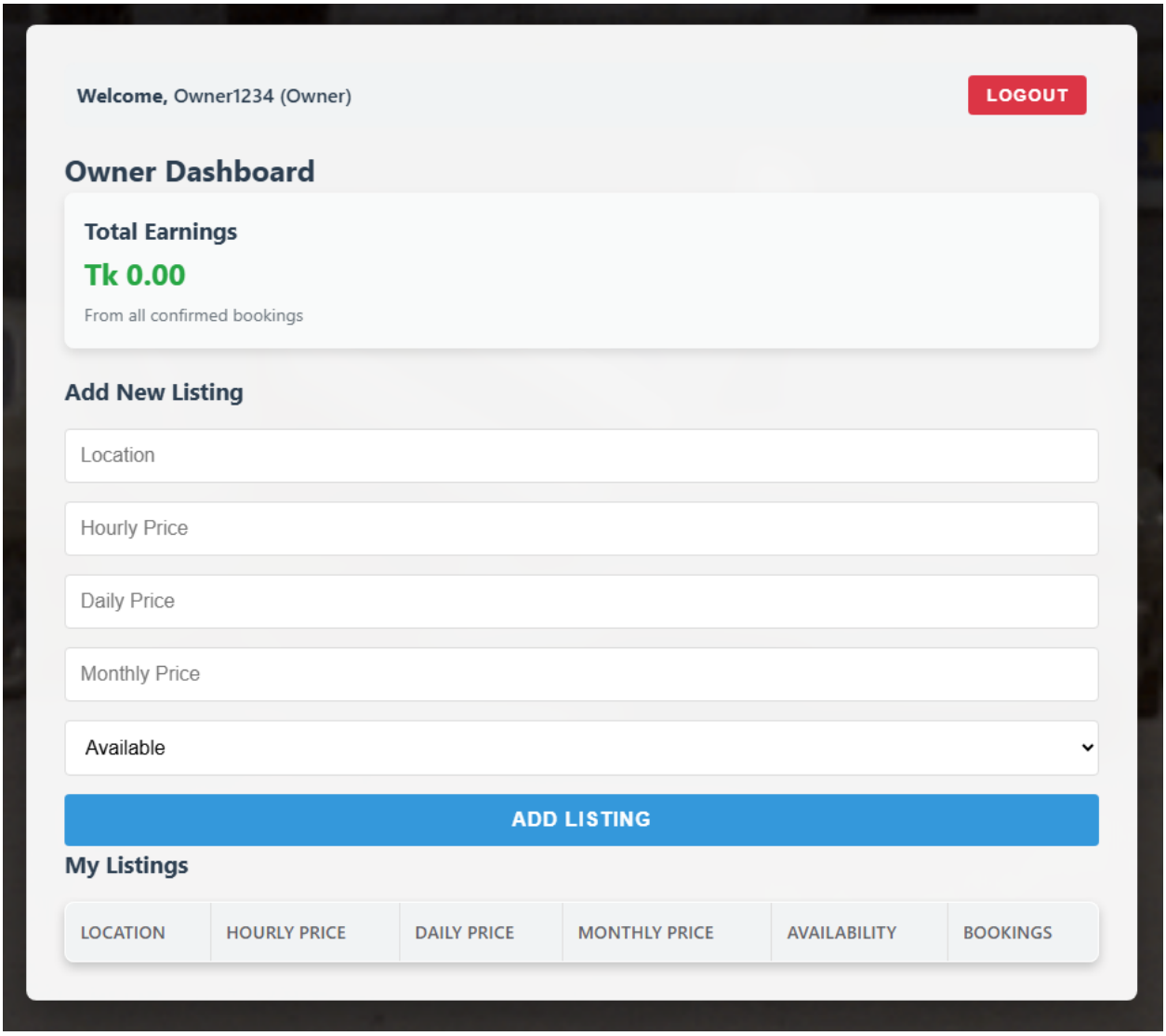


# 10.Project Scanpshot

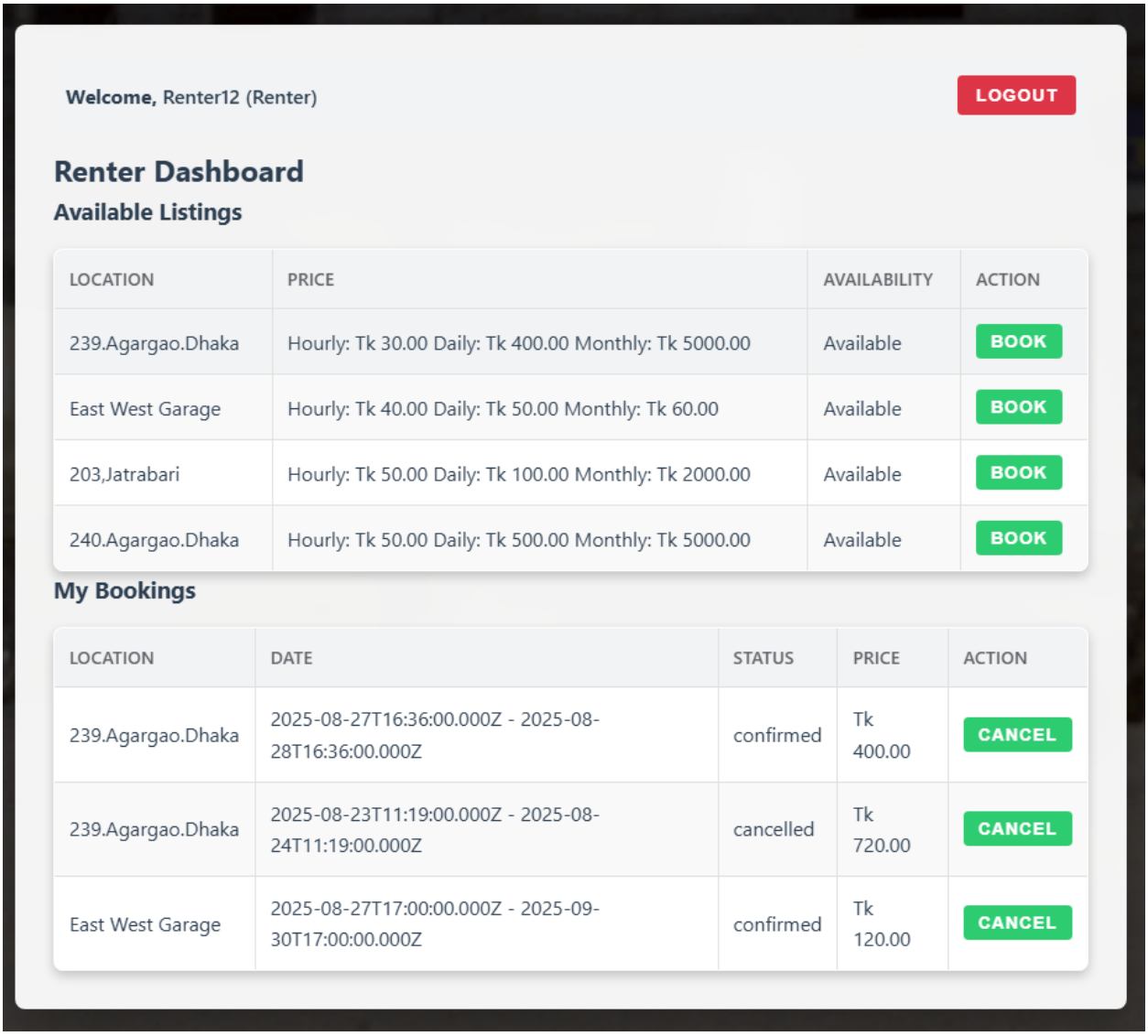
## 10.1 Login/Register Page:



## 10.2 Owner Dashboard



## 10.3 Renter Dashboard



**Welcome,** Renter12 (Renter) LOGOUT

### Renter Dashboard

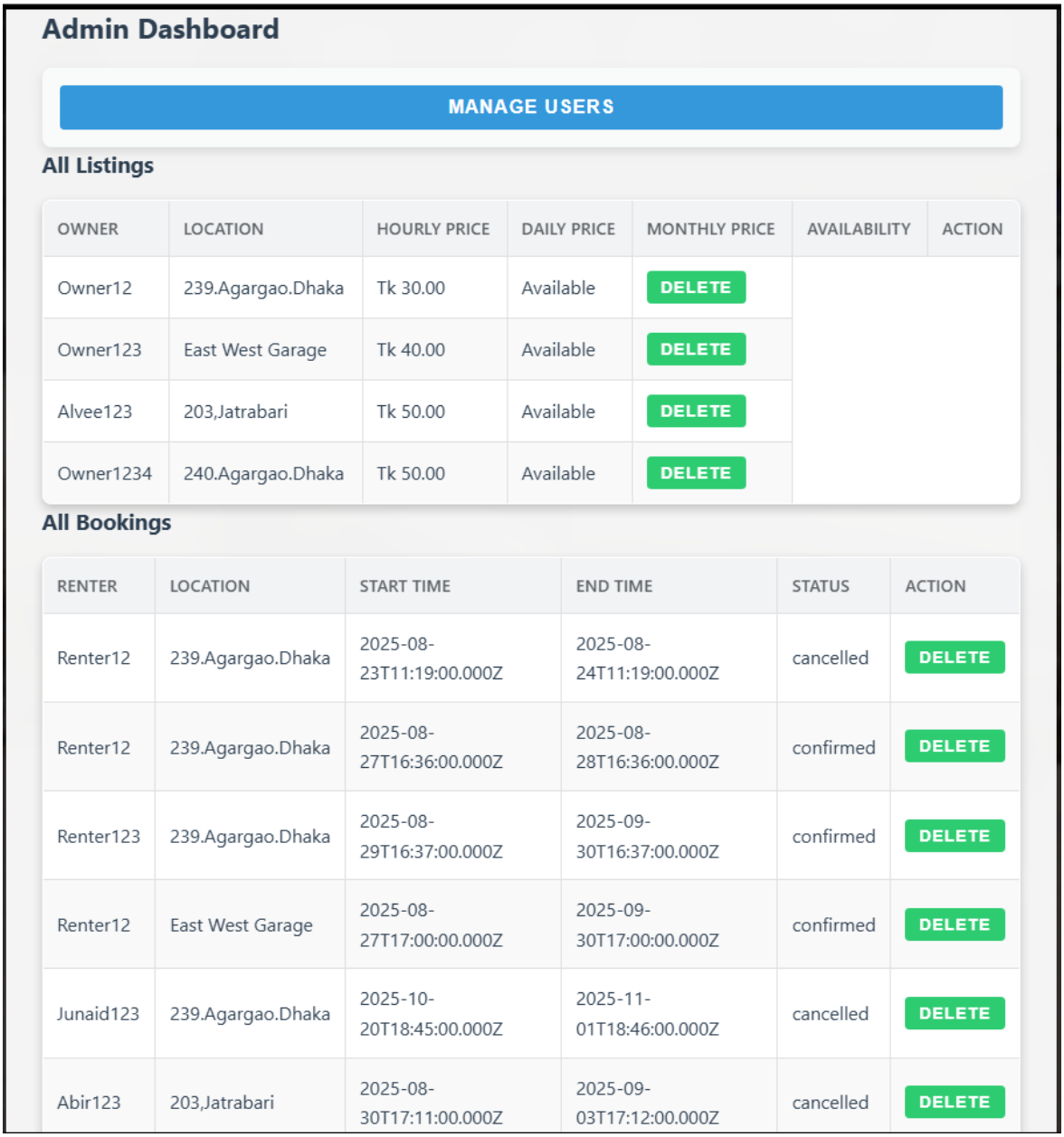
#### Available Listings

| LOCATION | PRICE | AVAILABILITY | ACTION |
|---|---|---|---|
| 239.Agargao.Dhaka | Hourly: Tk 30.00 Daily: Tk 400.00 Monthly: Tk 5000.00 | Available | BOOK |
| East West Garage | Hourly: Tk 40.00 Daily: Tk 50.00 Monthly: Tk 60.00 | Available | BOOK |
| 203,Jatrabari | Hourly: Tk 50.00 Daily: Tk 100.00 Monthly: Tk 2000.00 | Available | BOOK |
| 240.Agargao.Dhaka | Hourly: Tk 50.00 Daily: Tk 500.00 Monthly: Tk 5000.00 | Available | BOOK |

#### My Bookings

| LOCATION | DATE | STATUS | PRICE | ACTION |
|---|---|---|---|---|
| 239.Agargao.Dhaka | 2025-08-27T16:36:00.000Z - 2025-08-28T16:36:00.000Z | confirmed | Tk 400.00 | CANCEL |
| 239.Agargao.Dhaka | 2025-08-23T11:19:00.000Z - 2025-08-24T11:19:00.000Z | cancelled | Tk 720.00 | CANCEL |
| East West Garage | 2025-08-27T17:00:00.000Z - 2025-09-30T17:00:00.000Z | confirmed | Tk 120.00 | CANCEL |

## 10.4 Admin Dashboard



# 11.Limitation:

One limitation of the Parking Rental System is that when an Owner clicks **“Contact Renter”** from the bookings view, the renter’s contact number does not properly display, even though it exists in the database. This creates a communication gap between Owners and Renters, limiting the system’s usefulness in real-world scenarios where direct contact is essential. Another limitation is that the **price calculation is sometimes inaccurate**, with the system occasionally miscomputing the optimal cost for a booking duration, which may lead to unfair charges or confusion for users.

# 12.Conclusion:

In conclusion, the Parking Rental System provides a digital platform that connects renters seeking convenient parking with owners looking to monetize their available spaces, while allowing admins to manage users and maintain system integrity. Built with PostgreSQL for data storage, Node.js for backend logic, and a simple HTML/JavaScript frontend, the project demonstrates how modern web technologies can be combined to deliver a functional booking solution. Although there are some limitations, such as incomplete contact display and basic payment handling, the system successfully meets its primary goal of simplifying the process of listing, booking, and managing parking spaces.