CSE370 : Database Systems
Project Report
Project Title : Car Rental System

Group No : __ , CSE370 Lab Section : _16_ , Spring 2025		
ID	**Name**	**Contribution**
22301344	Maria Zaman Oyshi	Owner-post, owner-car, register
2201104	Mahir Muntasir Rafsan	Complete_Ride, Payment
23101379	Mohammad Tahmid Chowdhury	renter-book,renter-bookings,dashboard

Table of Contents

Introduction

This project involves the design and implementation of a relational database system for a car rental service, which basically manages vehicle rentals, customer records, and associated transactions. The database has been developed using MariaDB and executed through phpMyAdmin. It is designed to store critical information such as car listings, customer bookings, payment records, user accounts, and vehicle ownership details.
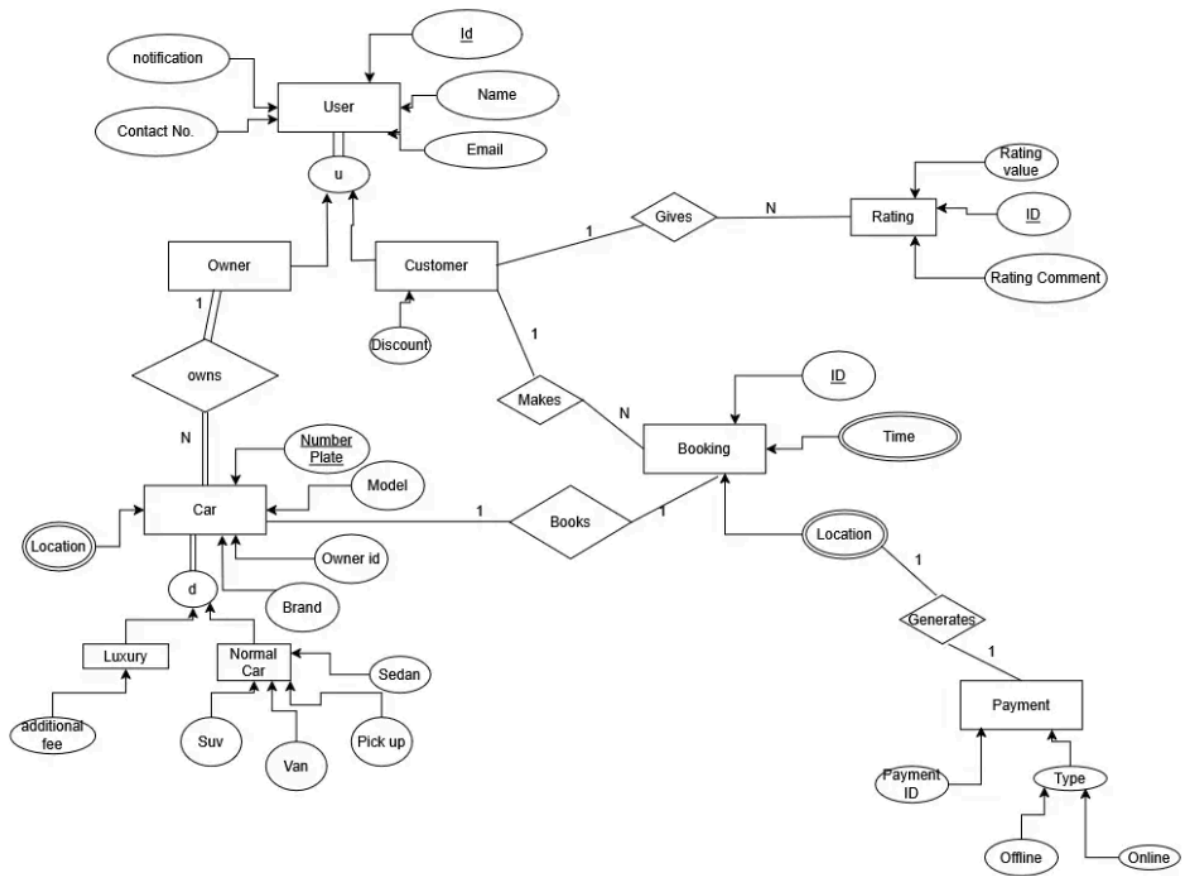
The database schema is designed to handle both normal and luxury cars, offering flexibility in managing various vehicle types. It distinguishes between customers and owners while maintaining secure user authentication through a dedicated login system. Key functionalities such as booking tracking, payment modes (online/offline), and customer feedback through ratings and comments are also incorporated. Proper normalization and the use of foreign keys ensure data integrity and support complex queries and relationships among different entities in the system.

This report presents the database structure, rationale behind the design choices, and a detailed explanation of each table and its role within the overall system. The goal is to provide a robust backend foundation for a scalable and user-friendly car rental platform.
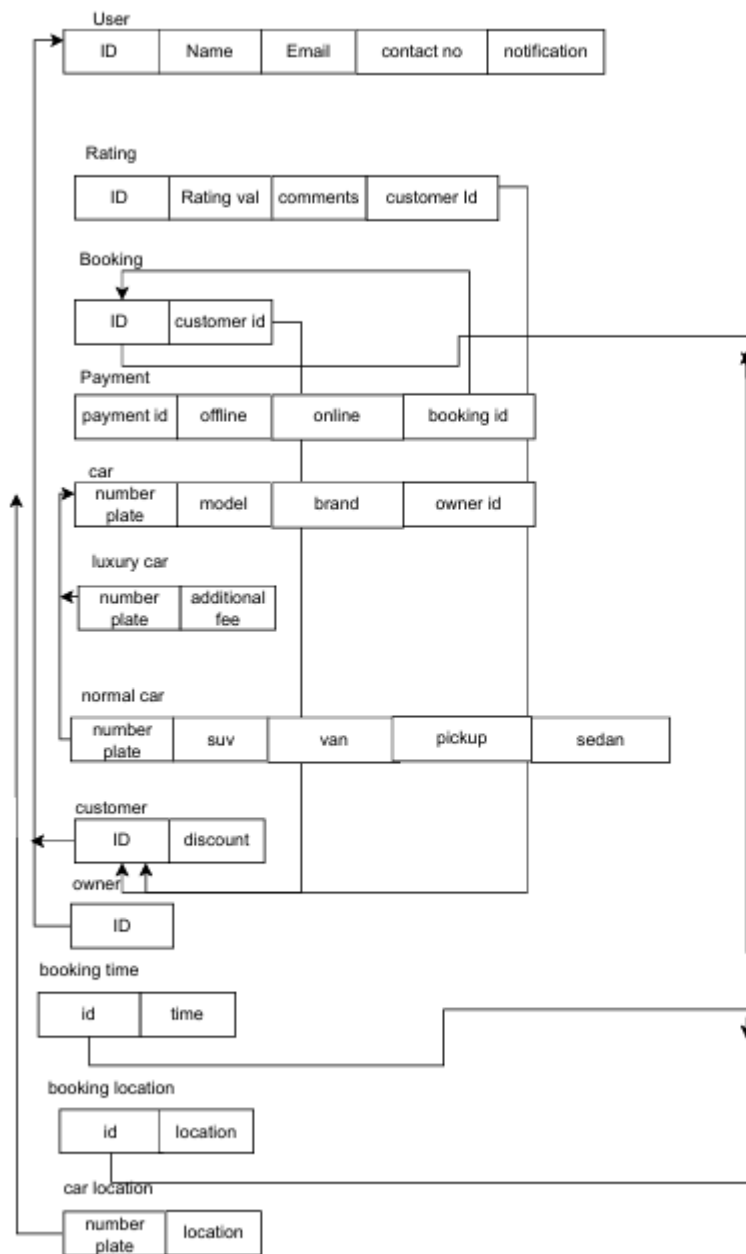
Project Features

1. Booking
2. Rating
3. Car Database
4. Luxury Car
5. Payment
6. Owner Dashboard
7. Renter Dashboard

ER/EER Diagram

Schema Diagram

User

ID	Name	Email	contact no	notification

Rating

ID	Rating val	comments	customer Id

Booking

ID	customer id

Payment

payment id	offline	online	booking id

car

number plate	model	brand	owner id

luxury car

number plate	additional fee

normal car

number plate	suv	van	pickup	sedan

customer

ID	discount

owner

ID

booking time

id	time

booking location

id	location

car location

number plate	location

Frontend Development

Contribution of ID : 23101379, Name : Mohammad Tahmid Chowdhury
renter-book

```html
36  <!DOCTYPE html>
37  <html>
38  <head>
39      <title>Book a Car - Car Rental System</title>
40      <link rel="stylesheet" href="css/style.css">
41  </head>
42  <body>
43      <div class="container">
44          <h2>Book a Car</h2>
45          <?php if (isset($success)): ?>
46              <div class="success"><?php echo $success; ?></div>
47          <?php endif; ?>
48          <?php if (isset($error)): ?>
49              <div class="error"><?php echo $error; ?></div>
50          <?php endif; ?>
51
52          <h3>Available Cars</h3>
53          <?php if (empty($cars)): ?>
54              <p>No cars available at the moment.</p>
55          <?php else: ?>
56              <table>
57                  <tr>
58                      <th>Number Plate</th>
59                      <th>Model</th>
60                      <th>Brand</th>
61                      <th>Location</th>
62                      <th>Action</th>
63                  </tr>
64                  <?php foreach ($cars as $car): ?>
65                      <tr>
66                          <td><?php echo $car['Number_Plate']; ?></td>
67                          <td><?php echo $car['Model']; ?></td>
68                          <td><?php echo $car['Brand']; ?></td>
69                          <td><?php echo $car['Location']; ?></td>
70                          <td>
```

```html
71                          <form method="POST">
72                              <input type="hidden" name="car_id" value="<?php echo $car['Number_Plate']; ?>">
73                              <button type="submit">Book Now</button>
74                          </form>
75                          </td>
76                      </tr>
77                  <?php endforeach; ?>
78              </table>
79          <?php endif; ?>
80
81          <a href="dashboard.php" class="back">Back to Dashboard</a>
82      </div>
83  </body>
84  </html>
```

renter-bookings

```php
22  <!DOCTYPE html>
23  <html>
24  <head>
25      <title>My Bookings - Car Rental System</title>
26      <link rel="stylesheet" href="css/style.css">
27  </head>
28  <body>
29      <div class="container">
30          <h2>My Bookings</h2>
31
32          <?php if (empty($bookings)): ?>
33              <p>You haven't made any bookings yet.</p>
34          <?php else: ?>
35              <table>
36              <td class="status-<?php echo strtolower($booking['Status']); ?>">
37      <?php echo $booking['Status']; ?>
38  </td>
39                  <tr>
40                      <th>Booking ID</th>
41                      <th>Car</th>
42                      <th>Model</th>
43                      <th>Brand</th>
44                      <th>Location</th>
45                      <th>Booking Date</th>
46                      <th>Status</th>
47                      <th>Action</th>
48                  </tr>
49                  <?php foreach ($bookings as $booking): ?>
50                      <tr>
51                          <td><?php echo $booking['ID']; ?></td>
52                          <td><?php echo $booking['Car_ID']; ?></td>
53                          <td><?php echo $booking['Model']; ?></td>
54                          <td><?php echo $booking['Brand']; ?></td>
55                          <td><?php echo $booking['Location']; ?></td>
56                          <td><?php echo $booking['Booking_Date']; ?></td>
57                          <td><?php echo $booking['Status']; ?></td>
58                          <td>
59                              <?php if ($booking['Status'] === 'confirmed'): ?>
60                                  <a href="complete-ride.php?booking_id=<?php echo $booking['ID']; ?>" class="btn">Complete Ride</a>
61                              <?php endif; ?>
62                          </td>
63                      </tr>
64                  <?php endforeach; ?>
65              </table>
66          <?php endif; ?>
67
68          <a href="dashboard.php" class="back">Back to Dashboard</a>
69      </div>
70  </body>
71  </html>
```

Contribution of ID : 22301344, Name : Maria Zaman Oyshi

Register

```html
<!DOCTYPE html>
<html>
<head>
    <title>Register - Car Rental System</title>
    <link rel="stylesheet" href="css/style.css">
</head>
<body>
    <div class="container">
        <h2>Register</h2>
        <?php if (isset($error)): ?>
            <div class="error"><?php echo $error; ?></div>
        <?php endif; ?>
        <form method="POST">
            <div class="form-group">
                <label>Name:</label>
                <input type="text" name="name" required>
            </div>
            <div class="form-group">
                <label>Email:</label>
                <input type="email" name="email" required>
            </div>
            <div class="form-group">
                <label>Contact No:</label>
                <input type="text" name="contact" required>
            </div>
            <div class="form-group">
                <label>Username:</label>
                <input type="text" name="username" required>
            </div>
            <div class="form-group">
                <label>Password:</label>
                <input type="password" name="password" required>
            </div>
            <div class="form-group">
                <label>Register as:</label>
                <select name="user_type" required>
                    <option value="owner">Car Owner</option>
                    <option value="renter">Renter</option>
                </select>
            </div>
        </div>
            <div class="form-group">
                <label>Register as:</label>
                <select name="user_type" required>
                    <option value="owner">Car Owner</option>
                    <option value="renter">Renter</option>
                </select>
            </div>
            <button type="submit">Register</button>
        </form>
        <p>Already have an account? <a href="login.php">Login here</a></p>
    </div>
</body>
</html>
```

Owner-Cars

```html
<!DOCTYPE html>
<html>
<head>
    <title>My Cars - Car Rental System</title>
    <link rel="stylesheet" href="css/style.css">
</head>
<body>
    <div class="container">
        <h2>My Cars</h2>

        <?php if (isset($success)): ?>
            <div class="success"><?php echo $success; ?></div>
        <?php endif; ?>
        <?php if (isset($error)): ?>
            <div class="error"><?php echo $error; ?></div>
        <?php endif; ?>

        <table>
            <tr>
                <th>Number Plate</th>
                <th>Model</th>
                <th>Brand</th>
                <th>Status</th>
                <th>Rented By</th>
                <th>Current Location</th>
                <th>Actions</th>
            </tr>
            <?php foreach ($cars as $car): ?>
                <tr>
                    <td><?php echo htmlspecialchars($car['Number_Plate']); ?></td>
                    <td><?php echo htmlspecialchars($car['Model']); ?></td>
                    <td><?php echo htmlspecialchars($car['Brand']); ?></td>
                    <td class="status-<?php echo strtolower($car['booking_status'] ?? 'available'); ?>">
                        <?php echo $car['booking_status'] ?? 'Available'; ?>
                    </td>
                    <td><?php echo htmlspecialchars($car['renter_name'] ?? '-'); ?></td>
                    <td>
                        <?php if (!empty($car['current location'])): ?>
```

```html
<?php if (!empty($car['booking_status']) && $car['booking_status'] === 'pending'): ?>
                        <form method="POST" style="display: inline-block;">
                            <input type="hidden" name="booking_id" value="<?php echo $car['booking_id']; ?>">
                            <input type="hidden" name="action" value="confirm">
                            <button type="submit" class="btn-confirm">Confirm</button>
                        </form>
                        <form method="POST" style="display: inline-block;">
                            <input type="hidden" name="booking_id" value="<?php echo $car['booking_id']; ?>">
                            <input type="hidden" name="action" value="reject">
                            <button type="submit" class="btn-reject">Reject</button>
                        </form>
                        <?php endif; ?>
                    </td>
                </tr>
            <?php endforeach; ?>
        </table>

        <a href="dashboard.php" class="back">Back to Dashboard</a>
    </div>
</body>
</html>
```

Owners-Post

```html
<!DOCTYPE html>
<html>
<head>
    <title>Post a Car - Car Rental System</title>
    <link rel="stylesheet" href="css/style.css">
</head>
<body>
    <div class="container">
        <h2>Post Your Car for Rent</h2>
        <?php if (isset($success)): ?>
            <div class="success"><?php echo $success; ?></div>
        <?php endif; ?>
        <?php if (isset($error)): ?>
            <div class="error"><?php echo $error; ?></div>
        <?php endif; ?>
        <form method="POST">
            <div class="form-group">
                <label>Number Plate:</label>
                <input type="text" name="number_plate" required>
            </div>
            <div class="form-group">
                <label>Model:</label>
                <input type="text" name="model" required>
            </div>
            <div class="form-group">
                <label>Brand:</label>
                <input type="text" name="brand" required>
            </div>
            <div class="form-group">
                <label>Car Type:</label>
                <select name="car_type" required>
                    <option value="luxury">Luxury Car</option>
                    <option value="suv">SUV</option>
                    <option value="van">Van</option>
                    <option value="pickup">Pickup</option>
                    <option value="sedan">Sedan</option>
                </select>
            </div>
            </div>
            <div class="form-group">
                <label>Hourly Cost ($):</label>
                <input type="number" name="hourly_cost" step="0.01" required>
            </div>
            <div class="form-group">
                <label>Location:</label>
                <input type="text" name="location" required>
            </div>
            <button type="submit">Post Car</button>
        </form>
        <a href="dashboard.php" class="back">Back to Dashboard</a>
    </div>
</body>
</html>
```

Contribution of ID : 22201104, Name : Mahir Muntasir Rafsan

Payment :

```html
<!DOCTYPE html>
<html>
<head>
    <title>Payment - Car Rental System</title>
    <link rel="stylesheet" href="css/style.css">
</head>
<body>
    <div class="container">
        <h2>Payment and Rating</h2>
        <?php if (isset($success)): ?>
            <div class="success"><?php echo $success; ?></div>
        <?php endif; ?>
        <?php if (isset($error)): ?>
            <div class="error"><?php echo $error; ?></div>
        <?php endif; ?>

        <h3>Booking Details</h3>
        <p>Car: <?php echo $booking['Brand'] . ' ' . $booking['Model']; ?></p>
        <p>Number Plate: <?php echo $booking['Car_ID']; ?></p>

        <form method="POST">
            <div class="form-group">
                <label>Payment Method:</label>
                <select name="payment_method" required>
                    <option value="online">Online Payment</option>
                    <option value="offline">Cash Payment</option>
                </select>
            </div>

            <div class="form-group">
                <label>Rate your experience (1-5):</label>
                <input type="number" name="rating" min="1" max="5" required>
            </div>

            <div class="form-group">
                <label>Comments (optional):</label>
                <textarea name="comments"></textarea>
            </div>

            <button type="submit">Submit Payment and Rating</button>
        </form>

        <a href="renter-bookings.php" class="back">Back to My Bookings</a>
    </div>
</body>
</html>
```

Backend Development

Contribution of ID : 22301344, Name : Maria Zaman Oyshi

Register

```php
<?php
require_once 'db.php';
session_start();

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $name = $_POST['name'];
    $email = $_POST['email'];
    $contact = $_POST['contact'];
    $username = $_POST['username'];
    $password = password_hash($_POST['password'], PASSWORD_DEFAULT);
    $user_type = $_POST['user_type'];

    try {
        // Insert into user table
        $stmt = $pdo->prepare("INSERT INTO user (Name, Email, Contact_No, username, password) VALUES (?, ?, ?, ?, ?)");
        $stmt->execute([$name, $email, $contact, $username, $password]);
        $user_id = $pdo->lastInsertId();

        // Insert into owner or customer table
        if ($user_type === 'owner') {
            $stmt = $pdo->prepare("INSERT INTO owner (ID) VALUES (?)");
        } else {
            $stmt = $pdo->prepare("INSERT INTO customer (ID, Discount) VALUES (?, 0.00)");
        }
        $stmt->execute([$user_id]);

        $_SESSION['user_id'] = $user_id;
        $_SESSION['user_type'] = $user_type;
        $_SESSION['username'] = $username;

        header("Location: dashboard.php");
        exit();
    } catch (PDOException $e) {
        $error = "Registration failed: " . $e->getMessage();
    }
}
?>
```

Owner-Cars

```php
<?php
require_once 'db.php';
session_start();

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'owner') {
    header("Location: login.php");
    exit();
}

// Get owner's cars with their current status and location
$stmt = $pdo->prepare("
    SELECT
        c.*,
        b.Status AS booking_status,
        u.Name AS renter_name,
        b.ID AS booking_id
    FROM
        car c
    LEFT JOIN (
        SELECT
            b1.*
        FROM
            booking b1
        WHERE
            b1.Status IN ('pending', 'confirmed')
        AND
            b1.ID = (
                SELECT
                    MAX(b2.ID)
                FROM
                    booking b2
                WHERE
                    b2.Car_ID = b1.Car_ID
            )
    ) b ON c.Number_Plate = b.Car_ID
    LEFT JOIN
        user u ON b.Customer_ID = u.ID
    WHERE
        c.Owner_ID = ?
    ORDER BY
```
```php
    ORDER BY
        c.Number_Plate
");
$stmt->execute([$_SESSION['user_id']]);
$cars = $stmt->fetchAll();

// Handle booking confirmation/rejection
if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $booking_id = $_POST['booking_id'];
    $action = $_POST['action'];

    try {
        $new_status = ($action === 'confirm') ? 'confirmed' : 'canceled';
        $stmt = $pdo->prepare("UPDATE booking SET Status = ? WHERE ID = ?");
        $stmt->execute([$new_status, $booking_id]);

        if ($stmt->rowCount() > 0) {
            $success = "Booking has been " . $new_status . "!";
            // Refresh the page to show updated status
            header("Location: owner-cars.php");
            exit();
        } else {
            $error = "Failed to update booking status.";
        }
    } catch (PDOException $e) {
        $error = "Database error: " . $e->getMessage();
    }
}
?>
```

Owners-post

```php
<?php
require_once 'db.php';
session_start();

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'owner') {
    header("Location: login.php");
    exit();
}

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $number_plate = $_POST['number_plate'];
    $model = $_POST['model'];
    $brand = $_POST['brand'];
    $car_type = $_POST['car_type'];
    $hourly_cost = $_POST['hourly_cost'];
    $location = $_POST['location'];

    try {
        $pdo->beginTransaction();

        // Insert into car table
        $stmt = $pdo->prepare("INSERT INTO car (Number_Plate, Model, Brand, Owner_ID) VALUES (?, ?, ?, ?)");
        $stmt->execute([$number_plate, $model, $brand, $_SESSION['user_id']]);

        // Insert into car_location table
        $stmt = $pdo->prepare("INSERT INTO car_location (Number_Plate, Location) VALUES (?, ?)");
        $stmt->execute([$number_plate, $location]);

        // Insert into appropriate car type table
        if ($car_type === 'luxury') {
            $stmt = $pdo->prepare("INSERT INTO luxury_car (Number_Plate, Additional_Fee) VALUES (?, ?)");
            $stmt->execute([$number_plate, $hourly_cost]);
        } else {
            $stmt = $pdo->prepare("INSERT INTO normal_car (Number_Plate, SUV, Van, Pickup, Sedan) VALUES (?, ?, ?, ?, ?)");
            $suv = ($car_type === 'suv') ? 1 : 0;
            $van = ($car_type === 'van') ? 1 : 0;
            $pickup = ($car_type === 'pickup') ? 1 : 0;
            $sedan = ($car_type === 'sedan') ? 1 : 0;
            $stmt->execute([$number_plate, $suv, $van, $pickup, $sedan]);
        }
    }

        $pdo->commit();
        $success = "Car posted successfully!";
    } catch (PDOException $e) {
        $pdo->rollBack();
        $error = "Failed to post car: " . $e->getMessage();
    }
}
?>
```

Contribution of ID : 23101379, Name : Mohammad Tahmid Chowdhury

```php
<?php
require_once 'db.php';
session_start();

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'renter') {
    header("Location: login.php");
    exit();
}

// Get available cars
$stmt = $pdo->prepare("
    SELECT c.*, cl.Location
    FROM car c
    LEFT JOIN car_location cl ON c.Number_Plate = cl.Number_Plate
    WHERE c.Number_Plate NOT IN (
        SELECT Car_ID FROM booking WHERE Status IN ('pending', 'confirmed')
    )
");
$stmt->execute();
$cars = $stmt->fetchAll();

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $car_id = $_POST['car_id'];

    try {
        $stmt = $pdo->prepare("INSERT INTO booking (Customer_ID, Car_ID, Status) VALUES (?, ?, 'pending')");
        $stmt->execute([$_SESSION['user_id'], $car_id]);

        $success = "Car booked successfully! The owner will confirm your booking.";
    } catch (PDOException $e) {
        $error = "Failed to book car: " . $e->getMessage();
    }
}
?>
```

Renter-bookings

```php
<?php
require_once 'db.php';
session_start();

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'renter') {
    header("Location: login.php");
    exit();
}

// Get renter's bookings
$stmt = $pdo->prepare("
    SELECT b.*, c.Model, c.Brand, cl.Location
    FROM booking b
    JOIN car c ON b.Car_ID = c.Number_Plate
    LEFT JOIN car_location cl ON c.Number_Plate = cl.Number_Plate
    WHERE b.Customer_ID = ?
");
$stmt->execute([$_SESSION['user_id']]);
$bookings = $stmt->fetchAll();
?>
```

Contribution of ID : 22201104, Name : Mahir Muntasir Rafsan

```php
<?php
require_once 'db.php';
session_start();

if (!isset($_SESSION['user_id']) || $_SESSION['user_type'] !== 'renter') {
    header("Location: login.php");
    exit();
}

if (!isset($_GET['booking_id'])) {
    header("Location: renter-bookings.php");
    exit();
}

$booking_id = $_GET['booking_id'];

// Get booking details
$stmt = $pdo->prepare("
    SELECT b.*, c.Model, c.Brand
    FROM booking b
    JOIN car c ON b.Car_ID = c.Number_Plate
    WHERE b.ID = ? AND b.Customer_ID = ?
");
$stmt->execute([$booking_id, $_SESSION['user_id']]);
$booking = $stmt->fetch();

if (!$booking) {
    header("Location: renter-bookings.php");
    exit();
}

// Update booking status to completed
$stmt = $pdo->prepare("UPDATE booking SET Status = 'completed' WHERE ID = ?");
$stmt->execute([$booking_id]);

header("Location: payment.php?booking_id=" . $booking_id);
exit();
?>
```

Source Code Repository

Conclusion

The development of the backend for our car rental system played a vital role in ensuring secure, efficient, and reliable functionality. By integrating PHP and MySQL, we successfully established a system that handles user authentication, booking management, payment processing, and role-based access control. The structured database design and well-organized backend logic allow seamless communication between users and the system, enabling smooth operations for both renters and car owners. This project not only strengthened our understanding of backend development principles but also enhanced our practical skills in web application development, teamwork, and real-world problem-solving.

References

https://youtube.com/playlist?list=PLJW6cU20q-SOQB1Dqj2vF9mcNqgh4-z_j&feature=shared

▶ **Hostel Management System Project in PHP**