Car Rental System Report.docx

by xing liu

Car Rental System Report

When I first designed this car rental system, my goal was to create something simple yet practical - something that would actually work in real-world situations. It might not be the biggest or most complex system out there, but it has all the essential features a basic car rental service needs.

After checking out real car rental websites, I noticed two main ways people rent cars:

1. Book online and pay when you pick up the car
2. Book and pay completely online
   I went with the first option because implementing real payment systems would require bank integrations, so I used mock data for this part instead.

The system has six key components:

· **User Manager** - The brain behind user accounts. It handles:

   Registration and login

   Profile updates (like adding driver's license info)

   Order management

   Personal details storage

· **Car Manager** - Keeps track of our vehicle fleet. It's responsible for:

   Adding/removing cars from the system

   Updating car details (pricing, availability, specs)

   Tracking which cars are currently rented

· **Admin Manager** - The control panel for staff. It enables:

   Viewing all user accounts

   Managing car listings

   Moderating reviews

   Processing special requests

- **Order Manager** - Handles the rental process end-to-end:

    Creating new reservations

    Calculating rental durations and costs

    Managing pickup/return times

- **Review Manager** - Deals with customer feedback:

    Posting new reviews

    Calculating average ratings

    Moderating inappropriate content

    Showing/hiding reviews based on admin settings

- **Database Handler** - The foundation that keeps everything running:

    Safely stores all system data

    Handles connections between components

    Uses singleton pattern to prevent multiple connections

    Manages transactions and data integrity

I broke the project into three phases (with maybe an extra one if time allowed). Here's how it went:

Phase 1:

- Built the core database
- Created test data in main.py
- Made sure all five main components could access the database
- Implemented basic create/update functions

Then came a tough choice - should I use a framework for the frontend or stick with command line? After researching frameworks (which seemed too complex for this project), I decided on simple HTML/CSS/JS with Flask handling the backend. Frontend work definitely took some getting used to!

Phase 2:

- Added login, registration, and car search

- Started building actual web pages (not my strongest skill, I'll admit)
- Implemented ordering, user profiles, order details, etc.
- As features piled up, the workload grew much bigger than expected - some planned features had to be cut

Final Phase:

- Implemented singleton pattern for the database class
- Added admin functions
- Shifted focus to testing, bug fixes, and frontend tweaks rather than new features
- After submitting the first version, I had some additional time, so I added the admin manager frontend and the review functionality.

How to run it:

1. Install Flask (just run `pip install flask` in VS Code terminal)
2. Start the server with `python app.py`
3. Open your browser to: http://localhost:5000

Test account:

- Email: test13@example.com
- Password: test123
  (Or register a new account)

Admin login:

- Email: admin@premiumrentals.com
- Password: securepassword123

Below are screenshots of the main features' interfaces

🚗

Premium Rentals

🧑 User Center

👤

My Profile

View and update your personal information

🗒

My Orders

View your rental history and current bookings

Premium Rentals

👤 Edit Profile

← Back

First Name

James

Last Name

Ponti

Phone Number

0221231234

Driver License Number

License Country

🇫🇷 ▾   France

License Expiry Date

05/30/2025

Cancel

Save Changes

🚗

Premium Rentals

🔍 Find Available Cars

📍 Location

-- Choose location --

🗓 Pickup Date

05/29/2025, 11:50 PM

🗓 Return Date

06/01/2025, 11:50 PM

🔍 Search Cars

🚘 Currently Available Cars

🚗 Currently Available Cars

Toyota Corolla
🚗 hybrid ⚙ automatic 👥 5 seats
📍 Auckland airport

$69.99 /day + **$18.00** insurance

🗓 Book Now

No reviews yet

Toyota Corolla
🚗 gas ⚙ automatic 👥 5 seats
📍 Auckland airport

$79.99 /day + **$25.00** insurance

🗓 Book Now

★★★★★★★★★☆ good car, I like it! by test13@example.com (2025-06-01)

Toyota Corolla
🚗 gas ⚙ automatic 👥 5 seats
📍 Auckland airport

$59.99 /day + **$15.00** insurance

🗓 Book Now

No reviews yet

Toyota Corolla
🚗 gas ⚙ automatic 👥 5 seats
📍 Auckland airport

$79.99 /day + **$15.00** insurance

🗓 Book Now

★★★★★★★★★☆ good, good by test13@example.com (2025-06-01)

📋 My Orders

← Back to User Center

Order #19
5/31/2025, 12:06:56 PM

Car: Toyota Corolla
Dates: 5/31/2025, 12:06:00 PM — 6/3/2025, 12:06:00 PM
Total: $314.97

👁 View Details

★ Review

Order #18
5/30/2025, 12:57:59 AM

Car: Toyota Corolla
Dates: 5/30/2025, 12:57:00 AM — 6/2/2025, 12:57:00 AM
Total: $314.97

👁 View Details

Order #17
5/29/2025, 3:01:26 PM

Car: Toyota Corolla
Dates: 5/29/2025, 2:48:00 PM — 6/1/2025, 2:48:00 PM
Total: $284.97

👁 View Details

Order #16
5/29/2025, 11:31:58 AM

Car: Toyota Corolla
Dates: 7/6/2025, 11:31:00 AM — 7/11/2025, 11:31:00 AM
Total: $374.95

👁 View Details

Order #2
5/29/2025, 11:30:58 AM

Order #3
5/29/2025, 11:30:58 AM

Order Date: 7/1/2025 at 3:59:00 AM

Toyota Corolla ⛽ gas ⚙ automatic 👥 5 seats

Rental Details

Pickup Location: Auckland airport

Pickup Date: 7/1/2025, 3:59:00 AM

Return Date: 7/5/2025, 3:59:00 AM

Duration: 4 days

Price Breakdown

Base Rate: $319.96

Insurance: $60.00

Taxes & Fees: $32.00

Total: $417.96

👤 Back to User Center

★ Submit Your Review

Car: Toyota Corolla
Order Dates: 2025-07-01 - 2025-07-05

Ranking (1-10):

★★★★★★★★★

Your Review:

Share your experience...

Submit Review

Login	Register

Create an Account

Email

Password

Confirm Password

Register

👤 Admin Login

Admin Login

Email

admin@premiumrentals.co|

Password

●●●●●●●●●●●●●●●●

Login

🧑‍✈️ Admin Center

Manage cars, orders, and reviews

| Add Car | Cars List | Order List | Review Manage |

Manage Orders

Start Date 08/01/2025   End Date 08/01/2025   User Email Filter by email

Apply Filters

ID	Car	User	Start Date	End Date	Price	
1	Toyota Corolla	test9@example.com	2025-08-01T10:00:00	2025-08-05T10:00:00	$351.96	Returned
2	Toyota Corolla	test13@example.com	2025-07-01T06:14:00	2025-07-05T06:14:00	$379.96	Returned
3	Toyota Corolla	test13@example.com	2025-07-01T06:35:00	2025-07-05T06:35:00	$351.96	Returned
4	Toyota Corolla	test14@aa.com	2025-07-01T12:57:00	2025-07-05T12:57:00	$351.96	Returned
5	Toyota Corolla	test13@example.com	2025-07-01T14:26:00	2025-07-05T14:26:00	$351.96	Returned

👥 Admin Center

Manage cars, orders, and reviews

Add Car | **Cars List** | Order List | Review Manage

Manage Cars

ID	Name	Fuel	Gear	Seats	Price	Insurance	Actions
1	Toyota Corolla	hybrid	automatic	5	$69.99	$18.00	Edit Delete
2	Toyota Corolla	gas	automatic	5	$79.99	$25.00	Edit Delete
3	Toyota Corolla	gas	automatic	5	$59.99	$15.00	Edit Delete
4	Toyota Corolla	gas	automatic	5	$79.99	$15.00	Edit Delete

👥 Admin Center

Manage cars, orders, and reviews

Add Car | Cars List | Order List | Review Manage

Add New Car

Car Name

Car Image

Choose File no file selected

Fuel Type

Gas

Gear Type

Automatic

Number of Seats

👥 Admin Center

Manage cars, orders, and reviews

Add Car | Cars List | Order List | **Review Manage**

Manage Reviews

ID	Car	User	Rating	Review	Visible	Actions
1	14	2	8/10	good car, I like it!	Yes	Hide Delete

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