Oracle Car Rental Management System

Formal Project Documentation
Author: IRADUKUNDA Prince
Program: BSc Information Technology
Database: Oracle Database 21c

1. Introduction

The Oracle Car Rental Management System is a database-driven application designed to manage vehicle rentals efficiently. The system is implemented using Oracle SQL and PL/SQL and demonstrates professional database design, integrity constraints, stored procedures, functions, packages, triggers, and reporting queries.

2. Project Objectives

- Design a relational database for a car rental business.
- Enforce data integrity using constraints.
- Implement business logic using PL/SQL.
- Demonstrate reporting and analytics using SQL.
- Provide auditing and security using database triggers.

3. Technologies Used

- Oracle Database 21c
- SQL and PL/SQL
- VS Code with Oracle SQL Developer Extension (OEM-style interface)
- Git and GitHub

4. Database Design

The database consists of the following core tables: Vehicles, Customers, Rentals, Payments, Maintenance, and Audit_Log. Primary keys uniquely identify records, while foreign keys establish relationships between tables.

5. Business Logic Implementation

PL/SQL procedures and functions are used to encapsulate business rules such as adding vehicles, returning vehicles, calculating revenue, and checking vehicle availability. Packages are used to group related logic for better modularity.

6. Triggers and Auditing

Database triggers are implemented to restrict data modification operations on weekdays and to log all attempted DML operations into the Audit_Log table. This ensures accountability and enforces business rules at the database level.

7. Reporting and Analytics

The system provides advanced SQL reports including monthly revenue analysis, cumulative revenue using window functions, vehicle utilization statistics, and overdue rental tracking.

8. Conclusion

This project demonstrates a complete and professional Oracle database application. It reflects strong understanding of SQL, PL/SQL, database security, and reporting, making it suitable for academic evaluation and portfolio presentation.