**DCIT 201 ASSIGNMENT**

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**VEHICLE RENTAL MANAGEMENT SYSTEM**

This document provides an overview of the Vehicle Rental Management System, explaining the implementation of Object-Oriented Programming (OOP) principles such as Abstraction, Inheritance, Encapsulation, Polymorphism, and Composition  
**Abstraction**

The Vehicle class is an abstract base class that defines the common properties and methods for all vehicle types. It includes abstract methods calculateRentalCost(int days) and isAvailableForRental() which are implemented by the subclasses.  
The Car, Motorcycle, and Truck classes inherit from the Vehicle class and provide specific implementations for the abstract methods  
**Encapsulation**

Each vehicle class uses private fields, public getter and setter methods, and input validation in setters to protect sensitive data from direct modification.

**Polymorphism**

The Rentable interface and the RentalTransaction class demonstrate polymorphism through method overriding and interface implementation.  
**Composition**

The RentalAgency class manages the vehicle fleet and rental transactions, demonstrating composition  
**Loyalty Program**

Implemented using interfaces to add loyalty points for customers.

**Custom Exceptions**

Created custom exceptions for rental scenarios.

**Rating System**

Added a rating system for vehicles and customers.

**Immutability**

Used the final keyword for immutability  
**Testing**

Unit tests were created for each class to validate encapsulation, inheritance, polymorphic behaviour, and abstraction implementations.