**COSC2081 GROUP ASSIGNMENT AUTO168 CAR DEALERSHIP MANAGEMENT SYSTEM**

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## Introduction

**Project Overview:** A software solution called the Auto136 auto Dealership Management System was created for the family-run Auto136 auto dealership, which has been in business for more than 20 years. The system is intended to replace their antiquated manual records with an electronic platform that effectively handles their client contacts, car parts, sales, and services.

**Objective:** This project's main goal is to automate sales, service, and part management procedures inside Auto136 in order to improve efficiency within the dealership. Employees may maintain inventory, organize service appointments, log sales, and provide customer assistance with the system.

## Scope:

● Management of sales and services

● Management of customer information, encompassing membership programs

● Control of automobile and auto part inventories.   
  
● Access control based on roles for clients, staff, and managers.   
  
Analyzing and reporting on sales and service information.

## Stakeholders:

* Manager: Takes charge of staff, monitors transactions and services, keeps an eye on inventories, and oversees operations.
* Salesperson: Manages client relations and keeps track of sales transactions.
* Mechanic: Oversees the provision of services and keeps track of the services rendered.
* Client: Buys vehicles and auto components and makes servicing requests.

## Project Description

* **System Architecture:** The Auto136 system follows a multi-role architecture that provides role-specific functionalities:
* **Salesperson role:** oversees sales transactions and examines individual sales data.
* **Mechanic role:** schedules services, keeps track of them, and documents services rendered.
* **Manager role:** has complete access to view, add, amend, and remove vehicle, service, part, and transaction records. Reports can also be generated by the management.

## Core Features:

1. **Inventory Management:**

* **Cars:** tracks vehicle information, including price, sale status, mileage, make, model, and year.
* **Auto Parts:** oversees car parts with attributes like manufacturer, pricing, condition, and warranty.
* **CRUD operations** for adding, updating, and removing cars and parts.

## Sales Transactions:

* The system monitors sales, including transaction parameters like salesperson, customer, sale date, and income.
* Salespeople may record automobile and part sales.
* Depending on their overall expenditure, clients are promoted to Silver, Gold, or Platinum membership levels.

## Service Management:

* Mechanics are able to track components used during services, add and amend services, and determine the entire cost.
* The management possesses the ability to compute the service income produced by every mechanic throughout designated timeframes.

## User Authentication and Role-based Permissions:

* Separate access credentials are granted to managers, personnel (such as salespeople and technicians), and clients.
* Permissions govern the range of actions that any user is able to do.

## Technology Stack:

* **Language:** Java.
* **Database:** Data stored in .OBJ files (cars.obj, transactions.obj, parts.obj, services.obj, users.obj).
* **User Interface:** Command-line interface with role-based menus.
* **External Libraries:** None (as per project constraints).

## Challenges Addressed:

* Maintaining data integrity for components, transactions, and services across various roles.
* Enforcing appropriate permissions and user authentication.

1. **Implementation Details**

# Key Components:

## Car Management Module:

* + Car records may be added, updated, and deleted. Car details are handled and kept. When a car is sold, managers and salespeople may change the status of the vehicle using the auto sales capability.

## Auto Part Management:

* + Maintains track of parts inventories and permits sales with automated inventory updates. Discounts are given according to the membership level of the consumer.

## Service Management:

* enables technicians to keep track of components used, record service information, and provide reports on service income.

## Sales Transactions:

* + Keeps track of automobile and part sales. Along with logging information like the customer, salesperson, and date of sale, the system also creates a unique transaction ID.

## Role-based Menus:

* + Depending on the job of the user (management, salesperson, or mechanic), the system offers different functions and data access.

# Key Methods:

* + **sellCarOperation(User user, Scanner scanner):** This method allows a salesperson or manager to sell a car, asking for the car ID and sale date. It updates the car’s status and records the sale in the transactions file.
  + **calculateSalespersonRevenue(salespersonId, startDate, endDate):** This method calculates the total revenue generated by a salesperson within a specified period.
  + **calculateMechanicRevenue(mechanicId, startDate, endDate):** Calculates the revenue generated by a mechanic through services performed during a specified period.

# Error Handling:

* Validate input for dates, numbers, and appropriate error messages for actions that are not allowed, such selling automobiles or components that are not available.

## Conclusion

After much research, I was able to finish a portion of this job on my own, and I now feel more comfortable using Java to do a variety of tasks. I hope to be able to keep this system updated and maintained in the future.