

CS4354 – Fall 2014 – Assignment 3

Due date: Wednesday, Oct. 8, 2014 at 12:00 noon.

Project Title: Used Cars Dealership (phase 3 – UML design)

In this assignment, we will attempt to analyze the requirements of a dealership management software, and come up with an appropriate UML design, which can be later translated into Java code.

This version of the software will have added functionality compared to the previous assignment. More specifically, the software should allow the following operations.

1. Inventory Management

The software should maintain information about the vehicles that are currently in the inventory of the dealership. The vehicle types are the same as in Assignment 2, with the only difference that, now, each vehicle will also have a short description and a picture. The software just needs to maintain a path to the picture file in the file system.

2. Transactions

There are now two types of transactions, sales and purchases of vehicles. For each completed transaction, the system will record the following information: VIN, Transaction date, Employee ID (who completed the transaction), and Invoice number. In addition, for sales, the Customer ID and the sale price will be recorded. For purchases, the Supplier ID and the Purchase Price will be recorded. The only way by which a vehicle can be added to the inventory, is via a purchase transaction. We will assume that all the transactions are completed using one-time cash payments.

3. Accounting Management

The accounting management part of the software, allows the software administrators to keep track of the income, expenses and profit, and print forms like Balance Sheets, Statements of Cash Flow and Invoices. To keep things simple, we will assume that all the income comes from vehicle sales and all the expenses come from vehicle purchases and employee salaries.

4. Dealership Website

The dealership has a website, whose main purpose is to advertise the vehicles available in the inventory and allow customers to search for vehicles they might be interested in. For each vehicle, the website shows its basic info, including the description and the photo. The customers have the option to search by year, make and model, and price range, or any combination of the above. The list of vehicles that match the criteria should be displayed.

The website also offers the option to the customers to contact the dealership by sending a message through a web form. To send a message, the customers need to enter their Name, Phone Number and Email, along with their Question text. When a customer sends a message to the dealership, they are automatically added to the system, if they are not already in system. Subsequently, an employee (whoever sees the message first) can respond to the customer via email. The response of the employee is also recorded, along with the Employee ID.

5. User Management

The system now supports three types of users: Customers, Employees and Administrators. For all user types, the system keeps some basic information, like their Name, Phone Number and Email. In addition, for customers, the system keeps record of their Driver License Number (only if they request to test drive a vehicle or purchase a vehicle). For employees, the system keeps records of their Monthly Salary, their Bank Account Number, a flag indicating if there are Active or Inactive and their PIN number. Past Employees remain in the system but are considered Inactive. Finally, the Administrators are special types of employees with some extra system access rights. For example, an administrator can add/delete/update an employee or another administrator to the system and can access the accounting management part of the software. The simple employees, can only complete sales and purchase transactions, add customers to the system, and respond to customer messages.

Tasks:

Assume that the above are the requirements of the system, as described by the owner of the Dealership.

You are asked to do the following:

1. Create a Use Case Diagram that describes the use cases captured by the requirements. Use free text to describe flows of events for individual use cases whenever necessary.
2. Create a Class Diagram for the dealership software, accompanied by the necessary class-responsibility-collaboration (CRC) cards.
3. Draw a Sequence Diagram for the sequence of operations taking place to complete a vehicle sale transaction.
4. Draw an Activity Diagram for the sequence of actions taking place from the moment a user decides to submit a question message to the dealership, until they receive back a response by email.

Logistics:

Submit your solutions as a single MS Word or PDF document. To create your diagrams, you can use any UML editor of your preference, which is compatible with the notation used in class.

There is no single correct solution. All solutions that are reasonable, well documented and achieve the required results, will be accepted. If you are unsure about certain decisions and need to make assumptions, please state your assumptions clearly in your document.

This assignment will be done and submitted **individually** by each student. Submit your answer in a single file (assign3_XXXXXX.docx). The XXXXXX is your TX State NetID.

Submit an electronic copy only, using the Assignments tool on the TRACS website for this class.