Car Dealership Database Management System

Project Proposal

Introduction

This project represents a self-directed educational initiative aimed at gaining hands-on experience in database management and creation. The goal is to design and implement a robust database-driven application designed to streamline and enhance the efficiency of the dealership's day-to-day activities**.**

Problem Statement

Modern car dealerships handle vast amounts of data, including customer information, inventory tracking, service records, and transaction histories. Without an efficient database system, managing this data becomes cumbersome, error-prone, and inefficient.

Solution

This project involves the creation of a relational database to streamline the operations of a simulated car dealership. The database will be designed to:

- Store and organize customer, employee, and vehicle data.
- Track transactions, repair appointments, and inventory levels.
- Generate insightful reports to aid in decision-making.

The focus is on implementing a small-scale database (6-10 tables) that meets the needs of a dealership and demonstrates practical database management techniques.

Functional Requirements

1. Customer Data Management
    - Store customer contact details, addresses, and transaction histories.
2. Inventory Tracking
        - Manage vehicle details, including model, year, mileage, and colour.

3. Employee and Task Management
    - Record employee information and assign tasks related to repair appointments.
4. Service Scheduling
    - Schedule and manage repair appointments, including parts usage.
5. Reporting
    - Generate actionable reports, such as:
        - Customer transaction summaries.
        - Sales trends and inventory analysis.
        - Employee performance metrics.
        - Service and parts usage statistics.

Database Design

Entity Relationship Diagram (ERD)

The ERD depicts the relationships between tables such as Customers, Cars, Transactions, Employees, and Appointments, ensuring normalization to the third normal form (3NF).

Data Dictionary

Customer table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
Customer ID	Int	N/A	N/A	PK	Yes	100000 - 999999	1001	Unique identifier for customers
Last Name	VARCHAR	50	N/A	No	Yes	N/A	“Oxlong”	Last name of the customer
First Name	VARCHAR	50	N/A	No	Yes	N/A	“Mike”	First name of the customer
Phone Number	VARCHAR	15	N/A	No	Yes	N/A	+1234567890	Phone number of the customer
Address	VARCHAR	20	N/A	No	Yes	N/A	“1222 Tompkins Street ON”	Address of the customer

Car Table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
CarID	INT	N/A	N/A	PK	Yes	N/A	1090	Unique Identifier for the car
Car Model	VARCHAR	50	N/A	No	Yes	1000-9999	Toyota Camry	Model of the car
Year	INT	N/A	N/A	No	Yes	N/A	2022	Manufacturing year of the car
Mileage	INT	N/A	N/A	No	Yes	N/A	45000	Current mileage of the car
Color	VARCHAR	20	N/A	No	Yes	N/A	Blue	Color of the car
Drive Mode	VARCHAR	10	N/A	No	Yes	N/A	Automatic	Drive mode of the car (e.g., Manual)

Transaction table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
TransactionID	INT	N/A	N/A	PK	Yes	N/A	9011	Unique identifier for transactions
TransactionType	VARCHAR	50	N/A	No	Yes	N/A	“Purchase”	Type of transaction
TransactionDate	DATE	N/A	N/A	No	Yes	N/A	2023-12-5	Date of the transaction
CarID	INT	N/A	N/A	FK	Yes	N/A	1090	Unique Identifier for the car
CustomerID	Int	N/A	N/A	FK	Yes	1000-9999	1001	Unique identifier for customers
AppoinmentID	INT	N/A	N/A	FK	Optional	N/A	2001	Unique identifier for services

Service(Repair) Table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
ServiceID	INT	N/A	N/A	PK	Yes	N/A	2001	Unique identifier for services
RepairType	VARCHAR	50	N/A	N/A	Yes	N/A	“Engine Tune-up”	Type of repair service
PartsID	INT	N/A	N/A	FK	Yes	N/A	1011	The foreign key for parts table

Part table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
PartsID	INT	N/A	N/A	PK	Yes	N/A	1011	Unique identifier for parts table
Description	VARCHAR	100	N/A	No	Yes	N/A	“Spark Plugs”	Description of the part
Quantity	INT	N/A	N/A	No	Yes	N/A	10	Number of parts in inventory
Price	DECIMAL	10, 2	N/A	No	Yes	N/A	19.99	Price of one unit in currency

Appointment table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
AppointmentID	INT	N/A	N/A	PK	Yes	N/A	3011	Unique identifier for appointments
Date	DATE	100	N/A	No	Yes	N/A	2023-12-05	Date of the appointment
Time	TIME	N/A	N/A	No	Yes	HH:MM format	10:00 AM	Time of the appointment
EmployeeID	INT	N/A	N/A	FK	Yes	N/A	5001	Foreign key for employee
ServiceID	INT	N/A	N/A	FK	Yes	N/A	2001	Foreign key for services

Employee table:

Column	Data Type	Size, Precision	Default	Pk/Fk	Required	Range	Sample Data	Notes
EmployeeID	INT	N/A	N/A	PK	Yes	N/A	5001	Unique identifier for employees
LastName	VARCHAR	50	N/A	No	Yes	N/A	“Hugh”	Last name of the employee
FirstName	VARCHAR	50	N/A	No	Yes	HH:MM format	“Jass”	First name of the employee
Position	VARCHAR	50	N/A	No	Yes	N/A	“Employee”	Job position of the employee
Department	VARCHAR	50	N/A	No	Yes	N/A	“Maintaina nce”	The department where the employee works

Entity Relationship Diagram: