CSE 4701 Fall 2025 Group Project: Automobile Sales Database (An Example)

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1 Project Timeline

The project has three deliverables;

- **ER Diagram**: each group should develop an ER Model for the application ("Automobile Sales Database"). The ER Diagram can be included in the report as any type of image file.
- **Relational Schema**: the second deliverable is a translation of the ER Model into a relational schema implemented as an SQL script. The script should use Oracle's SQL dialect. Besides from defining tables and constraints, this script may include views or indexes where appropriate. Please upload the script as a simple text file.
- **Application**: the last deliverable is an Automobile Sales Application that uses the relational schema defined in the first two deliverables. This application can be either a web or desktop application. Please feel free to use *GitHub* or *BitBucket* to manage/exchange the source codes with your teammates.
- **Submission (Deadline 12/10/2025)**: a report (including the ER Diagram, the screen shots of the application, each student's contributions, and necessary description), source codes, and an SQL script file.
- **Demo (in early December)**: demo can be done via a face-to-face meeting (scheduling a 10-min time slot with the instructor and TA) or video (taping a video for your application and sharing the link to the instructor and TA).

2 Overview

The application is an automobile company, such as General Motors, Ford, Toyota, or Volkswagen. In this company, it has been decided to redesign a major part of the database that underlies company operations. Unfortunately, the manager assigned to solicit database design proposals is not very computer literate and is unable to provide a very detailed specification at the technical level. Fortunately, you are able to do that. The company needs to keep quite a bit of data, but we shall focus on the following aspects of corporate operations.

- Vehicles: Each vehicle as a vehicle identification number (VIN).
- Brands: Each company may have several brands (for example, GM has Chevrolet, Pontiac, Buick, Cadillac, GMC, Saturn, Hummer, Saab, Daewoo, Holden, Vauxhall; Opel and Volkswagen has Volkswagen, Audi, Lamborghini, Bentley, Bugatti, Skoda, and SEAT).

- Models: Each brand offers several models (for example, Buick's models are the Enclave, LaCrosse, and Lucerne, and Mercury's models are the Mariner, Milan, Sable, and Grand Marquis). Each model may come in a variety of body styles (4-door, wagon, etc.)
- Options: We'll stick to color, and maybe engine and transmission.
- Dealers: dealers buy vehicles from the manufacturer and sell them to customers. We'll keep track of sales by date, brand, model, and color as well as the stock information (e.g., maximum number of vehicles, current number of vehicles); and also by dealer. Note that a dealer may not sell some of the car company's brands. Some vehicles are already sold, but the dealer still keeps track of that fact.
- Suppliers: suppliers supply certain parts for certain models.
- Company-owned Manufacturing Plants: Some plants supply certain parts for certain models; others do final assembly of actual cars.
- Customers: In reality, lots of demographic data are gathered. We'll stick to name, address, phone, gender, and annual income for individual buyers. The customer may also be a company (e.g., Hertz, Avis, or other companies that maintain corporate fleets, but we'll skip that).
- We'll skip data on corporate finance, pending bailouts, bankruptcy status, etc.

3 Application

The application should be developed for only one automobile company (e.g., GM, Ford, or Toyota). It should support the following actions:

- Every customer registers an account with an email and will be assigned an ID for automobile purchase from the current automobile company. If one customer purchases multiple vehicles from different dealers, the same ID is used.
- A customer holding an account can register/modify/delete the information for their account.
- A customer can check his/her purchase history.
- Employees at dealers can login, check and update the vehicle information in stock.
- Before new vehicles arrive any dealer, the system checks that if the dealer has enough space (not exceeding the maximum number of vehicles).

All the above data and application are only examples. If you would like to add more functionalities in the database and application, please feel free to do so.

4 Grading

- ER Diagram: 20 points
- SQL Scripts: 25 points
- Application Implementation: 40 points
- Demo Presentation & Report: 15 points

The scope (e.g., database, SQL queries, application) can be relatively reduced for groups of two students.