MGIS320 Database Management
Prof. Bui
Final Project

1. Introduction

In this final project, you will work in a team of **five or six** as a consulting group for Weihai Automobile Group LLC (WAG). This is a car dealership that sells with such brands as Volvo, Buick, Ford, Toyota, and Honda. Starting as a local dealership, the company has quickly grown to be one of the most profitable group of dealerships in Weihei city.

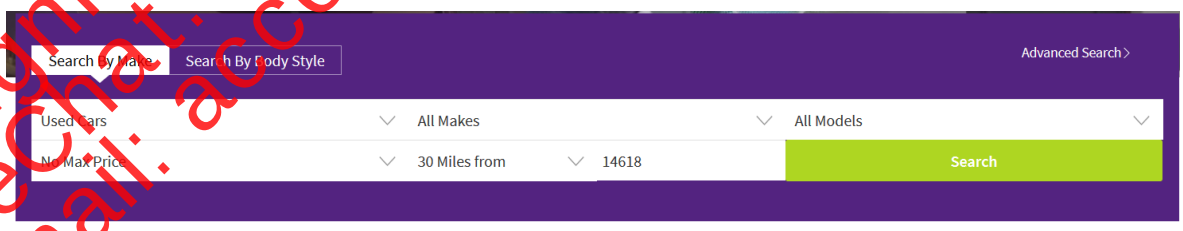
As the business grows, the CEO of WAG wants to modernize its IT system to minimize waste and increase efficiency. Currently, many locations still rely on Excel spreadsheets to support daily operations. The CEO has decided to hire your team to design a database system that supports operations in *all* locations.

The following background and requirements have been obtained from the CEO.

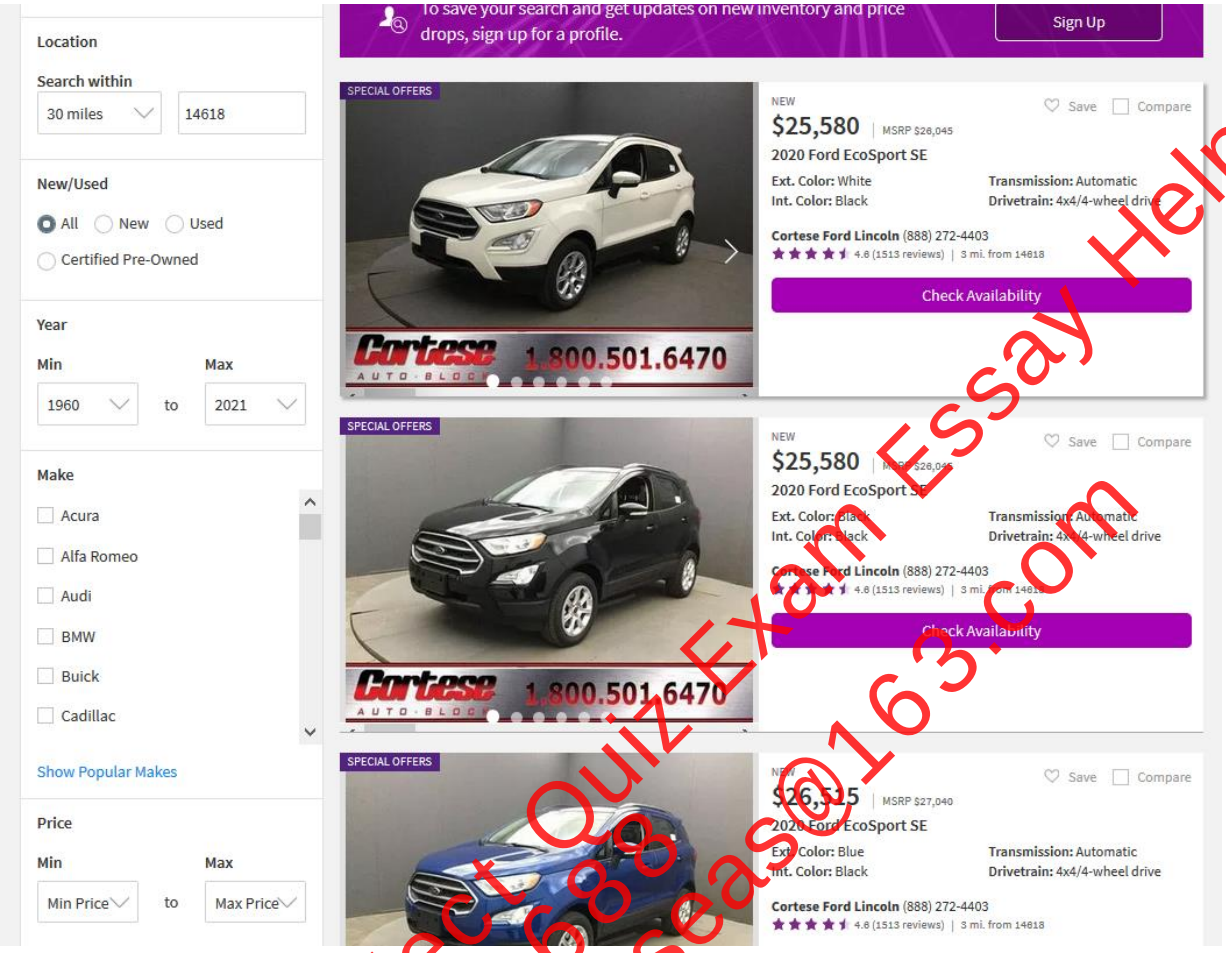
2. Company Background

Currently the WAG has three locations: one in Rongcheng, one in Huancui, and another one in Wendeng. Each location usually has one manager, one assistant manager, and 3-5 salesperson. While WAG sells all brands, each location has a "specialty" and carry more cars from specific manufacturers. Specifically, the Rongchen location carries more Japanese and US brands while the one in Huancui carries more European brands. And the Wendeng location carries more Chinese brands. Managers at each location often determine the number of cars to purchase at the end of each month after studying the market report and previous month performance.

The CEO wants the new database to support a search function that allows customers to search car availability across all locations before scheduling a test drive. The CEO expresses that he wants the search page looks similar to the search page in the pictures below. (Another similar website is https://autocango.com/usedcar)



Find New & Used Cars for Sale



When a customer schedules a test drive visit, a salesperson will be assigned to that customer. Before a test drive, the salesperson should get the basic information from the customer including name, phone number, email address, and driver license info. A customer can test several cars in one visit. During the car test when the customer has problems or questions, the salesperson wants to write down in a log. This log is very important for WAG because it helps its managers know what brand is most liked by the customers.

If a customer decides to purchase a car, the salesperson will help the customer through the sales process. If things go smoothly, the customer can pick up the car on the same day, or he/she can choose to come back another day to finalize the sales and pick up the car.

At the end of each day, a salesperson will update the information for all customers that they interact with. Particularly, they want to note down their customer's general information, their buying process (i.e., test drive, negotiation price, number of times visits etc.), whether the customer purchases a car, and what kind of payment is made. The managers can examine the information to determine how productive a salesperson is.

3. Business Requirements

The new database system consists of three sub-systems: *inventory*, *customer management*, and *sales*

3.1 Inventory sub-system

WAG wants to check the current inventory level of each car for a specific location. Each vehicle has a VIN number that stored in the system to keep track with the vehicle. Typically, each vehicle will be shipped from manufacturers when the number of vehicles in inventory drops to a certain number.

3.2 Customer management sub-system

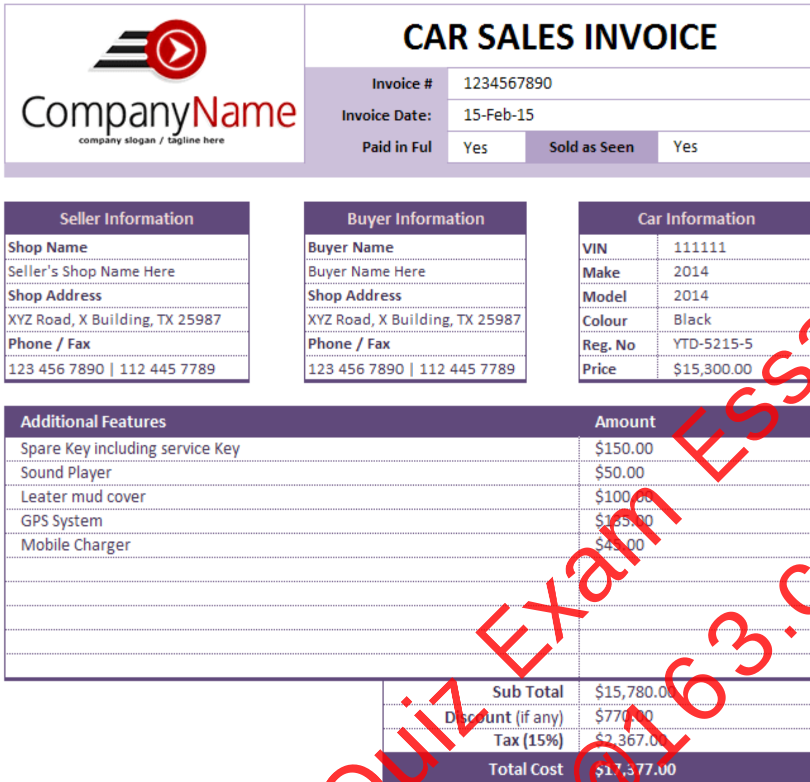
The CEO believes WAG needs to monitor the progress of all customers in the new system. A potential customer's general information should be recorded in the system. After an entry is created, the customer's progress should be monitored throughout the entire buying process, regardless of whether the customer purchases a car. Data entered in the system should fit certain categories such as types of cars the customer is interested in, price ranges, actions the customer has taken (e.g. test drove a car, purchase progress, etc.), and notes such as customer concerns/complaints (if any).

It is also important to note that if a customer currently exists in the system, another entry for that customer should not be created. All of WAG locations should be able to access this data to prevent duplicate customer data.

3.3 Sales

Finally, the CEO stresses that most important part of the database system is keeping track of sales and payments on those sales. A customer can make several payments, so the company needs to keep track of payment information for each customer (e.g., payment type, amount, credit card information).

A copy of the current sales invoice used by WAG is provided below. The CEO believes the salesperson information ***should*** also be included so commission can be calculated for the salesperson. Thus, each salesperson should have a unique ID number. This number should be included in all customer interactions, but especially in sales interactions.



CompanyName
company slogan / tagline here

CAR SALES INVOICE

Invoice #	1234567890		
Invoice Date:	15-Feb-15		
Paid in Ful	Yes	Sold as Seen	Yes

Seller Information
Shop Name
Seller's Shop Name Here
Shop Address
XYZ Road, X Building, TX 25987
Phone / Fax
123 456 7890 | 112 445 7789

Buyer Information
Buyer Name
Buyer Name Here
Shop Address
XYZ Road, X Building, TX 25987
Phone / Fax
123 456 7890 | 112 445 7789

Car Information	
VIN	111111
Make	2014
Model	2014
Colour	Black
Reg. No	YTD-5215-5
Price	$15,300.00

Additional Features	Amount
Spare Key including service Key	$150.00
Sound Player	$50.00
Leater mud cover	$100.00
GPS System	$135.00
Mobile Charger	$45.00
Sub Total	$15,780.00
Discount (if any)	$770.00
Tax (15%)	$2,367.00
Total Cost	$17,377.00

4. Project Requirements

As a group, your team will need to provide: 1) ERD, 2) SQL codes to create tables and populate the database with sample records, 3) SQL codes to create views and visualizations that satisfy the analytics requirements of the company, and 4) Access file to a switchboard. Each team will require to provide a written report in the end of the semester.

4.1 Deliverable #1: ERD

As part of the conceptual design step, your team needs to provide an ERD of the database system. The entities in the diagram should be normalized; and information about attributes and relationships should be based from the description above.

- Examine the provided screenshots as they will give you hints on what entities and attributes should be included
- Students should check out the website provided to learn more about the request of the CEO. Note that the list of features for a car can be extensive. Thus, you only need to consider information for 15 features for a car in your database. Choose features that you think will be most popular for a car.

4.2 Deliverable 2: Physical populated database

As part of the physical design step, your team needs to implement a physical copy of the database solution based on the ERD that you have developed. This database will be in MySQL Workbench. In addition, you need to populate the database with some sample data:

- Use the name of your team members as employees for one of the locations
- Each location should carry at least 30 cars for at least 4 different brands. The inventory of each location should reflect its specialty. (You can use car information from the website provided or car information you found online.)
- Each location should have at least 20 customers for the month of June 2024. Feel free to use the name of your friends/family/instructors.
- Each location should have at least 20 test drive and 10 sales for the month of June 2024.

4.3 Deliverable 3: Demonstrated functionalities

To help demonstrate the functionalities of the new database system, your team also need to create views to answer the following questions from the CEO:

1. How many cars were sold in the month of June across all locations?
2. What was the best-selling brand for each location?
3. Who was the best salesperson based on sales value in each location?
4. How many test drive visits were made in the month of June across all locations?
5. Who was the most productive salesperson with the highest number of test drive visits?
6. In the month of June, which *day of the week* was the busiest day in each location? (The day with the most visits)
7. In the month of June, what car brand was most often tested in each location?

4.4 Deliverable 4: Demonstrated interfaces

To help demonstrate the database to the CEO, your team decide to create a Microsoft Access Switchboard to show the different functionalities of the database. This means you will have to recreate the database in MySQL Workbench in Microsoft Access. The requirement for the switchboard is to have:

1. A button to link to a form to enter a new customer information
2. A button to the list of employees, grouped by locations
3. A button to show one of the reports in deliverable #3

5. Detailed Instructions

Submissions from **each team**:

1. Team Project Report
2. PDF copy of ERD (big enough for instructor to view each table)
3. SQL codes for database creation and population + creating views
4. An Access file with the switch board as required in the deliverable

For **each team member**, fill out this survey by the deadline:
https://rit.az1.qualtrics.com/jfe/form/SV_9GOkzwtyU2tMN6u

Project Report Guideline:

1. Cover page: include team information (section, group #) and team members
2. Executive Summary (1 page)
    a. Project description and its importance
    b. Project objectives
3. Conceptual Design
    a. Stating any business rules or assumptions in conceptual design
    b. Screenshots of Entity Relationship Diagram
4. Physical design
    a. Stating any constraints/integrity rules in the database
    b. Screenshots of each table with sample data
    c. Screenshots of views and the answer to the questions posed
5. Application design
    a. Screenshots of the switchboard and the content for each button
6. Conclusion (1 page)
    a. Problem encountered and project limitations
    b. Lesson learned
7. Appendix
    a. Individual responsibilities and contributions to the project