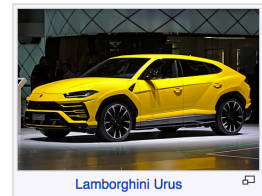


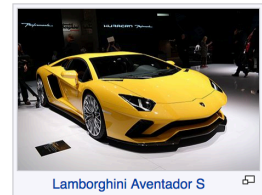
DESCRIPTION

The purpose of this assignment is to build skills in conceptual data modeling, logical database design and definition. To accomplish this goal, you will design and build a MySQL database using an existing dataset on Lamborghini car dealership sales. You should work on this assignment individually, although you are encouraged to seek guidance from outside reference materials, your professor and teaching assistants.

Background:¹ Automobili Lamborghini is an Italian brand and manufacturer of luxury supercars, sports cars, SUVs based in Sant'Agata Bolognese and tractors Lamborghini Trattori in Pieve di Cento, Italy. The company is owned by the Volkswagen Group through its subsidiary Audi. The company gained wide acclaim in 1966 for the Miura sports coupé, which established rear mid-engine, rear wheel drive as the standard layout for high-performance cars of the era. Lamborghini grew rapidly during its first decade, but sales plunged in the wake of the 1973 worldwide financial downturn and the oil crisis. New products and model lines were introduced to the brand's portfolio and brought to the market and saw an increased productivity for the brand. In the late 2000s, during the worldwide financial crisis and the subsequent economic crisis, Lamborghini's sales saw a drop of nearly 50 percent. Lamborghini produces sports cars and V12 engines for offshore powerboat racing. Lamborghini currently produces the V12-powered Aventador and the V10-powered Huracán along with the Urus SUV powered by a twin-turbo V8 engine.



Lamborghini Urus



Lamborghini Aventador S



Lamborghini Huracán

As an IS analyst at Lamborghini, it is your responsibility to analyze information concerning the sale of 500 cars from four selected dealerships. All of the cars have been sold – most above asking price, but the time on market varies from a few days to a few weeks. Each car also has a unique VIN, year of production, exterior color, and interior color. The cars have an original asking price and listing date AND a sale price and sale date. Each of the 500 cars represents a variety of models with different engine types, fuel consumption, and top speeds. Each car was sold by a salesperson who has various forms of contact information (i.e., first name, last name, employee ID, phone number, cell phone number, and email address). The salespeople work for a regional Lamborghini dealership each with its own information (i.e., name, website, regional location, dealership number, year opened).

You will be given a flat file that contains information for the sales of these 500 cars from the sales inventory office. Your manager asks that you design and build a relational database and then perform various analyses. A final written report should be submitted to your manager with details of your work and a final recommendation on which dealership location should be expanded.

¹ This is a fictitious case partially based on a project presented in *Information Systems Essentials* by Stephen Haag and Maeve Cummings and information on Lamborghini provided by Wikipedia (<https://en.wikipedia.org/wiki/Lamborghini>) and their corporate website (<https://www.lamborghini.com/en-en/>).

PROJECT REQUIREMENTS

You should design an entity-relationship diagram, create a data dictionary, build your database, import the data, analyze the data, and prepare a memo that summarizes your findings. The output of these activities should be summarized in a project report. Your project report must include the following components:

Part A: Data Modeling, Creation and Basic Queries – Worth 35 Points

1. An entity-relationship diagram in **third normal form** (use Visio, www.gliffy.com or a similar tool to create the model). Cardinality and modality must be depicted. The ERD should be included in your report as a single model (insert an image of your ERD into the report). (10 points)
2. A data dictionary for all entities and attributes with the following: field name, data type, description, and an example. The data dictionary template should be included in your report using the attached template (insert the data dictionary tables into the report). (5 points)
3. A database including the correct tables, relations and content. The database can be included by including two screen shoots of each table (take the screen shots from the structure and browse tabs) to show the table creation and the imported data (insert the 8 images into the report). (20 points)

Part B: Queries – Worth 35 Points

4. Analyze the data by performing various queries using SQL. The results should be ordered by a meaningful attribute using the ORDER BY function, have descriptive headings in the results using the AS function, and decimals should be rounded to two points using the ROUND function. You should include the SQL statement and the output (insert a screen shot of the query and results for each question into your report). You should investigate the following: (30 points)
 - a. Average sales price of all vehicles (not by dealership)
 - b. Average difference in selling and asking price (sale price – ask price) of all vehicles (not by dealership)
 - c. Average sales price of vehicles by dealership
 - d. Average difference in selling and asking price (sale price – ask price) by dealership
 - e. Average time on market by dealership
 - f. Total number of cars sold by model for each dealership
5. Create and execute a custom query (what additional query can you identify and analyze that will give useful information to support your analysis?). (5 points)

Part C: Business Memo – Worth 15 Points

6. Business Memo - Upon completing your analysis, provide detailed and thorough documentation (in narrative, numeric and graphic forms) to support your dealership expansion recommendation. State clearly what conclusion you derive from the results about Lamborghini cars – which dealership do you recommend for expansion and why? This portion of the assignment should be written in a professional / business style memo (with headings, bulleted lists, graphs, etc.). Assume your reader of this section is your manager and other executives at Lamborghini. (15 points)

A suggested outline:

- a. Statement of recommendation - which dealership to expand and why.
- b. Summarize the results of your queries and observations. Use meaningful ways to visualize the data. For example, you may include charts (e.g., bar graphs, pie charts, etc.) showing distribution of different parameters for each dealership. These charts will have to be generated with a tool other than your database (i.e., download the

results into Excel or a Google Doc to create the graphs). The goal of this section is to support your points about which dealership to expand.

- c. What additional data do you need to make a more informed recommendation?

Part D: Additional Data Considerations – Worth 15 Points

7. Next, assume one of the executives at Lamborghini have given you more information related to original price of the cars and the resale prices of pre-owned Lamborghinis by dealership location. You are now required to redesign your database given this data related to resale of cars.
 - a. What ERD modifications are needed? Include a revised ERD. (7 points)
 - b. Discuss three example analyses you could perform given this new information? (6 points)
 - c. Write (but do not query the data / or execute the query) ONE additional SQL query (original_cost and resaleprice) to perform the new analysis. (2 points)

Although you are not expected to create a database and run the query, the example you create should clearly bring out the value of the newly available information.

Project Assumptions, Structure and Submission

Assumptions:

1. The accompanying csv flat files contain the necessary data for the project.
2. Your analysis is limited to the Lamborghini models and locations included in the csv flat files. Other models, sales data and locations are not included in this analysis.
3. Assume fuel consumption and top speed are dependent on model not engine type.
4. The same models will be offered going forward at the same dealerships.

You should put your final ERD, data dictionary, screen shots of your database tables, queries and results, and supporting analysis in a single PDF file and submit it to Canvas. Your database accounts will be verified independently for the creation of the database portion of the assignment.

The assignment is due before class begins on April 15, 2019 to the dropbox in Canvas. Late submissions are allowed for two days until April 17, 2019 with a penalty of 10% for each delayed day. The database assignment is worth 15% of your final course grade.

Faculty and teaching assistants will be available to assist with the assignment during the semester as well on an as-needed basis or during office hours. Keep in mind that additional time may be required outside of classroom to complete the assignment.