Exam #2 Review

Motorcycle Registration Problem

Background Information

Millions of people ride motorcycles for a variety of reasons. While many enjoy the sense of freedom they can provide, a number of people use them because they are cheaper to operate than a car.

Problem Statement

In this assignment, students will explore statistics related to motorcycle, moped, and motorized tricycle registrations in the United Kingdom from 2020 to 2024.

Instructions

WARNING: This is not the actual Exam for your section. You will not receive any credit for completing this project.

IMPORTANT: This assignment requires the Windows version of Microsoft 365. macOS users can access a ready-to-use version through Azure Virtual Desktop by following the instructions at https://cs101.wvu.edu/avd.

IMPORTANT: Complete the steps below in the order they are given. Completing the steps out of order may complicate the assignment or result in an incorrect result.

1. Download and extract the provided Data Files ZIP file. It contains the following files for use in this assignment:
   a. **chart.xlsx** – Microsoft Excel workbook with motorcycle registrations chart for use in PowerPoint.
   b. **registrations.xml** – Information on United Kingdom motorcycle, moped, and motorized tricycle registrations from 2020 to 2024 [1].

Table: *Registrations*		
Field Name	**Type**	**Description**
DataYear	Number	Part of composite key. Year of the data.
CategoryAbbrv	Short Text	Part of composite key. Abbreviation of vehicle category.
Registrations	Number	Number of newly registered vehicles.

   c. **categories.xml** – Information on vehicle categories.

Table: *RegistrationsByType*		
Field Name	**Type**	**Description**
CategoryAbbrv	Short Text	Primary key. Abbreviation of vehicle category.
CategoryName	Short Text	Name of the vehicle category.
TypeAbbrv	Short Text	Abbreviation of vehicle type.

d. **motorcycle.jpg** – Image of a motorcycle for use in PowerPoint [2].

Microsoft Access Portion

2. Create a new Microsoft Access database named **examreview2_mrp_*lastname_firstname*.accdb**.
3. Import the following items into the database:
   a. **registrations.xml** file – Import structure and data into a new table.
   b. **categories.xml** file – Import structure and data into a new table.
4. We need to create a new table to store information about motorcycle types.
   a. Create a table named *Types* with the fields below. Use appropriate field types and designate a good primary key.

Table: *Types* Field Name	Description
TypeAbbrv	Abbreviation of the vehicle type.
TypeName	Full name of the vehicles type.
Tax	Annual vehicle tax, converted to US dollars using 7/31/2025 conversion rate.

   b. Enter records for all types below [3].

   HINT: The *Types* table will contain 4 records.

TypeAbbrv	TypeName	Tax
M	Motorcycle	$162.48
P	Moped	$34.91
T	Tricycle	$162.48
O	Other	$162.48

5. Create the appropriate relationships for the following tables. Enforce referential integrity, but do not enable cascade updates or cascade deletes.
   a. *Types* and *Categories*
   b. *Categories* and *Registrations*
6. Create separate queries to provide the information requested below. Name each query after the step in which it appears (e.g., name the query in Step 6a as *Query6a*).

   HINT: Run your queries to test them. Make sure that they display all and only the records that you would expect to appear.

a. Create a query to calculate the number of vehicles that are likely not replacements for existing vehicles. List the year, category name, number of registrations, and number of registrations that likely were not replacements of existing vehicles.

   About 1% of registrations in the United Kingdom annually are for new vehicles that are not replacing existing vehicles [4]. You can calculate the percentage of vehicles that were not replacements using the formula:

   $$[Registrations.Registrations] * 0.01$$

   Format the calculated field as a standard-type number with no decimal places. Sort by the calculated field in descending order.

   HINT: This query will show 70 records and 4 fields.

b. We wish to display information for moped registrations. Create a query listing the year, type name, category name, number of registrations, and total tax revenue.

   You can calculate the total tax revenue using the formula:

   $$[Registrations.Registrations] * [Types.Tax]$$

   Only display registrations for the moped type.

   Format the calculated field as currency.

   HINT: This query will show 15 records and 4 fields.

c. Create a query to calculate statistics for each category. List, for each category name, the average number of annual registrations.

   Format the average as a standard-type number with no decimal places. Sort by category name in ascending order.

   HINT: This query will show 14 records and 2 fields.

d. We wish to summarize the annual number of motorcycle registrations. Create a query listing, for each year, the sum of registrations.

   Only display records for the motorcycle type. Do not display the type in the results.

   Format the sum as a standard-type number with no decimal places.

   HINT: This query will show 5 records and 2 fields.

e. We want to determine the total number of categories for each type. Create a query listing, for each type name, the count of its categories.

Your results must include all types, even if they have no categories.

Format the count as a standard-type number with no decimal places.

HINT: This query will show 4 records and 2 fields.

f. We would like to generate statistics on registrations by type. Copy-and-paste this SQL code into a new query:

```
SELECT Registrations.DataYear AS [Year], Types.TypeName AS
VehicleType, Sum(Registrations.Registrations) AS Registrations
FROM Types INNER JOIN (Categories INNER JOIN Registrations ON
Categories.CategoryAbbrv = Registrations.CategoryAbbrv) ON
Types.TypeAbbrv = Categories.TypeAbbrv
GROUP BY Registrations.DataYear, Types.TypeName;
```

IMPORTANT: Do not make any modifications to this query other than entering the above SQL code.

HINT: This query will show 15 records and 3 fields.

7. Using the Form Wizard, create a form with subform. The main form should display the full category name. The subform must display a datasheet with all *Registrations* table fields.

   Name the main form *CategoriesData* and the subform *CategoriesDataSubform*.

8. Using the Report Wizard, create a report to show the results of the *Query6b* query. Display all fields from the query.

   Group by year and sort by category name in ascending order. Use a stepped layout and portrait page orientation. Name the report *TaxRevenueSummary*.

   Ensure the full widths of all columns are visible on the report.

9. Run the Compact and Repair Database utility on your database. Ignore any errors you receive when running the utility.

Microsoft PowerPoint Portion

10. Create a new Microsoft PowerPoint presentation named **examreview2_mrp_*lastname_firstname*.pptx**.

11. In the presentation, create the following slides:
    a. *Title Slide*-type slide listing a title for the presentation, your full name, course section, and an automatically updating date.
    b. *Title and Content*-type slide titled `Annual Registrations`. Add the chart from the *Annual Registrations Chart* sheet of the **chart.xlsx** Microsoft Excel workbook to the content area of the slide.
12. Create *Title and Content*-type slides to answer four of the five analysis questions below. Respond to one question per slide. Title each slide with the name of the question being answered (e.g., "Question 12a").
    a. Cars tend to cost more than motorcycles, yet there are many times more cars than motorcycles in many western countries. (In the U.K. in 2024, there were about 25 cars for every motorcycle. [5]) Why do you think this is the case?
    b. Is there any noticeable trend in the number of registrations over the time period surveyed? If there is, what is the trend and what is a possible explanation?
    c. The overwhelming majority of motorcycles registered had engine sizes of less than 1.0 liter. A normal car engine is at least 1.8 liters. Even though motorcycle engines are much smaller than those found in cars, motorcycles are generally able to drive at least as fast as cars. How is this possible?
    d. According to the National Highway Traffic Safety Administration, motorcyclists are 24 times more likely to be killed in an accident than occupants of passenger cars [6]. Why might this be the case?
    e. Motorcycles are taxed at a higher rate than moped. Why do you think this is the case?
13. We wish to apply formatting to the presentation. Use your best judgment to create a professional-looking presentation.
    a. Apply one design theme of your choice to all slides.
    b. Apply an animation of your choice to the *Annual Registrations* chart.
    c. Apply slide transitions of your choice to all slides.
    d. Edit the parent (top-most) slide master to add the **motorcycle.jpg** image to the top right corner of the slides. Size the image to be 0.7-inches high by 1.1-inches wide.

        NOTE: Depending on the design theme used, the image may not appear on title slides. This is acceptable as long as the image is correctly added to the slide master.

e. Add your name, an automatically updating date, and the slide number to the footer of all slides except the title slide.

Grading Rubric

This is a practice assignment and is worth no points. A comparable Exam would be worth 200 points and graded using this rubric, with partial credit awarded as appropriate:

Step 3	5 points	Step 8	12.5 points
Steps 4a-b	12.5 points	Steps 10a-b	12.5 points
Step 5	10 points	Steps 12a-e (pick 3 of 5)	10 points each
Steps 6a-f	15 points each	Steps 13a-e	15 points
Step 7	12.5 points		

The analysis questions in Steps 12a-e can be evaluated using this rubric:

Standard	Meets Requirements (5 points)	Does Not Meet Requirements (0 points)
Answer is reasonable.	Answer addresses the question prompt and is factually correct or a reasonable interpretation of available data.	Answer does not address the question prompt, is factually incorrect, or is an unreasonable interpretation of available data.
Answer is supported.	Logical rationale is provided to support the given answer.	Logical rationale is not provided to support the given answer.

Acknowledgments

The image in the introduction appears courtesy of Jacek Halicki [2].

References

[1] "Press Statistics," *MotorCycle Industry Association*, July 2025. Available: *https://mcia.co.uk/press-statistics*.
[2] J. Halicki, *Yamaha XV 535 Virago (1987–2003)*. 2014. Available: *https://commons.wikimedia.org/wiki/File:2014_Yamaha_XV_535_Virago.JPG*.
[3] "Vehicle tax rates," *GOV.UK*. Available: *https://www.gov.uk/vehicle-tax-rate-tables/other-vehicle-tax-rates*. Accessed: July 30, 2025.
[4] "Vehicle licensing statistics, United Kingdom: 2024," *GOV.UK*, June 11, 2025. Available: *https://www.gov.uk/government/statistics/vehicle-licensing-statistics-2024/vehicle-licensing-statistics-united-kingdom-2024*.
[5] "General facts and figures about roads and road use." Available: *https://www.racfoundation.org/motoring-faqs/mobility*. Accessed: July 31, 2025.

[6] "Motorcycle Safety," *NHTSA*. Available: *https://www.nhtsa.gov/book/countermeasures-that-work/motorcycle-safety*. Accessed: July 31, 2025.