Homework #3 Help
Road Fatalities Problem

Background Information

Traffic deaths and injuries remain an important public health problem across the globe. While steps are being taken in many countries to improve road safety, much still needs to be done if the rising trend in road traffic deaths is to be halted or reversed.

Problem Statement

In this assignment, students will analyze fatalities caused by various road accidents in different countries of the world.

Instructions

IMPORTANT: This is not the actual Homework 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 Windows Virtual Desktop by following the instructions at https://cs101.wvu.edu/wvd.

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. **countries.xml** – Information on countries [1]–[3].

Table: *Countries*		
Field Name	**Type**	**Description**
CountryAbbrv	Short Text	Primary key. Abbreviation for the country.
CountryName	Short Text	Name of the country.
RegionAbbrv	Short Text	Abbreviation for the region where country is located.
Population	Number	Population of the country.
GDP	Currency	Gross domestic product of the country.

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b. **fatalities.xml** – Information on reported vehicular fatalities [4].

Table: *Fatalities*		
Field Name	**Type**	**Description**
CountryAbbrv	Short Text	Primary key. Abbreviation for country.
EstimatedFatalities	Number	Estimated number of deaths due to road traffic fatal injury in the specified year.
CarPctg	Percentage	Percentage of fatalities for cars and trucks.
MotorcyclePctg	Percentage	Percentage of fatalities for motorcycles.
BicyclePctg	Percentage	Percentage of fatalities for bicycles.
PedestrianPctg	Percentage	Percentage of fatalities for pedestrians.
UnknownPctg	Percentage	Percentage of fatalities for unknown victims.

2. Create a new Microsoft Access database named **hwhelp3_rfp_*lastname_firstname*.accdb**.

3. Import the following items into the database:

   a. **countries.xml** file – Import structure and data into a new table.

   b. **fatalities.xml** file – Import structure and data into a new table.

4. We need to create a table to store data on the regions of the world.

   a. Create a table named *Regions* with the fields below. Use appropriate field types and designate a good primary key.

Field Name	**Description**
RegionAbbrv	Abbreviation for the region.
RegionName	Name of the region.

   b. Enter the records for all regions below.

   HINT: The *Regions* table will contain 9 records.

RegionAbbrv	RegionName
AF	Africa
AS	Asia
CA	Caribbean/Central America
EE	Eastern Europe
ME	Middle East
NA	North America
PA	Pacific Rim/Pacific Islands
SA	South America
WE	Western Europe

5. Create the appropriate relationships for the following tables. Do not enforce referential integrity.

   a. *Fatalities* and *Countries*

   b. *Countries* and *Regions*

6. Create separate queries to provide the information requested below. Name each query after each 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 view basic statistics for each country. List the country name, population, GDP, and number of estimated fatalities.

        Sort by country name in ascending order.

        HINT: This query will show 112 records and 4 fields.

    b. We wish to find information on countries with a large percentage of fatalities involving cars. Create a query listing the region name, country name, number of estimated fatalities, and the percentage of fatalities involving cars.

        Sort by region name and then by country name, both in ascending order.

        Only display records where at least 50% of fatalities involved cars.

        HINT: This query will show 45 records and 4 fields.

    c. Create a query to compare statistics for large countries in South America versus those in Asia. Display the country name, region name, population, GDP, and number of estimated fatalities.

        Only display records for countries in the South America or Asia regions with a population of at least 10 million (≥ 10000000).

        Sort by country name in ascending order.

        HINT: This query will show 12 records and 9 fields.

d. We wish to estimate the number of fatalities on a per 100,000 person basis. Create a query listing the country name, region name, population, and number of estimated fatalities. Also, include a field to calculate the estimated fatality rate per 100,000 people.

You can calculate the estimated fatality rate per 100,000 people using the formula:

$$100000 * \left(\frac{[Fatalities.EstimatedFatalities]}{[Countries.Population]} \right)$$

Format the calculated field as a fixed-type number with 1 decimal place.

HINT: This query will show 112 records and 5 fields.

e. Create a query to see if there is any relationship between the GDP per capita and the percentage of deaths involving pedestrians. List each country name, region name, number of estimated fatalities, and the percentage of fatalities involving pedestrians. Also, include a field to calculate the GDP per capita.

You can calculate the GDP per capita using the formula:

$$\frac{[Countries.GDP]}{[Countries.Population]}$$

Only display records where the percentage of accidents involving pedestrians is greater than 0% (> 0).

Format the calculated field as currency with no decimal places.

HINT: This query will show 107 records and 5 fields.

f. We wish to summarize the fatalities data. Create a query listing, for each region name, the count of its countries, the sum of the population, and the sum of estimated fatalities.

Format the sums as standard-type numbers with no decimal places.

HINT: This query will show 8 records and 4 fields.

g. We want to determine the raw number of fatalities for each type of accident. Copy-and-paste this SQL code into a new query:

```
SELECT Countries.CountryName, Fatalities.EstimatedFatalities,
[Fatalities.EstimatedFatalities]*[Fatalities.CarPctg] AS
CarFatalities,
[Fatalities.EstimatedFatalities]*[Fatalities].[MotorcyclePctg]
AS MotorcycleFatalities,
[Fatalities].[EstimatedFatalities]*[Fatalities].[BicyclePctg]
AS BicycleFatalities, [Fatalities].[EstimatedFatalities]*
[Fatalities].[PedestrianPctg] AS PedestrianFatalities,
[Fatalities].[EstimatedFatalities]*[Fatalities].[UnknownPctg]
AS UnknownFatalities
FROM Countries INNER JOIN Fatalities ON Countries.CountryAbbrv
= Fatalities.CountryAbbrv
ORDER BY Fatalities.EstimatedFatalities DESC;
```

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

HINT: This query will show 112 records and 7 fields.

7. We need to create a new table to store analysis questions responses.

a. Create a table named *AnalysisQuestions* with the fields below. Use appropriate field types and designate a good primary key.

Table: *AnalysisQuestions*	
Field Name	**Description**
QuestionNumber	Question being answered.
Response	Response to the analysis question prompt.

8. In the *AnalysisQuestions* table, answer three of the five analysis questions below. Respond to one question per record.

a. Is there any correlation between a country's GDP per capita and the percentage of deaths involving pedestrians? Why might this be the case?

b. Why might it be more difficult to get accurate fatality statistics and estimates in developing countries than those that have been stable developed nations?

c. In 11 of the 112 countries surveyed, the "unknown victim" category made up at least 25% of the estimated deaths. Could having better statistics with fewer people in the unknown category help to make roads safer? Explain your reasoning.

d. Why might it be better to display the estimated fatality rate on a per 100,000 people basis rather than per capita?

e. Are there things that governments can do to impact the number of fatalities on their roads?

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

Grading Rubric

This assignment is worth 60 points. It will be graded by your instructor using this rubric, with partial credit awarded as appropriate:

Step 3	3 points	Steps 6a-g	5 points each
Steps 4a-b	5 points total	Step 7a	4 points
Step 5	4 points	Steps 8a-e (pick 3 of 5)	3 points each

The analysis questions in Steps 8a-e will be evaluated using this rubric:

Standard	Meets Requirements (1.5 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 perthhdproductions [5].

References

[1] "ISO 3166-1," *Wikipedia*. Available: *https://en.wikipedia.org/wiki/ISO_3166-1*.
[2] "GDP, PPP (current international $)," *World Bank*. Available: *http://data.worldbank.org/indicator/NY.GDP.MKTP.PP.CD*.
[3] "Population, total," *World Bank*. Available: *http://data.worldbank.org/indicator/SP.POP.TOTL*.
[4] "Distribution of road traffic deaths by type of road user," *World Health Organization*. Available: *http://apps.who.int/gho/data/node.main.A998?lang=en*.
[5] perthhdproductions, *Crashed Hyundai Excel in Stirling, Perth*. 2012. Available: *http://www.flickr.com/photos/perthhdproductions/7981572879/*.