



Background Information

Forests cover approximately 31% of the world's land surface, providing many benefits to society and the economy. They also play an important role in the preservation of natural biodiversity and the mitigation of climate change.



Problem Statement

In this assignment, students will explore statistics related to land usage and forested areas of various countries around the world.

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 installation 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. **chart.xlsx** – Microsoft Excel workbook with the forest area chart for use in PowerPoint.
 - b. **countries.xml** – Information on land area and population of various countries [1], [2].

Table: Countries		
Field Name	Type	Description
CountryAbbrv	Short Text	Primary key. Abbreviation for country.
CountryName	Short Text	Name of country.
RegionAbbrv	Short Text	Abbreviation for region where country is located.
LandArea	Number	Land area in square kilometers in 2020.
Population	Number	Population in 2020.

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- c. **forest.jpg** – Image of a forest for use in PowerPoint [3].



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- d. **forests.xml** – Information on forested areas of various countries [4].

Table: Forests		
Field Name	Type	Description
CountryAbbrv	Short Text	Part of composite key. Abbreviation for country.
DataYear	Number	Part of composite key. Year of the data.
ForestArea	Number	Forested area in square kilometers.

Microsoft Access Portion

2. Create a new Microsoft Access database named **examreview2_fap_lastname_firstname.accdb**.
3. Import the following items into the database:
 - a. **countries.xml** file – Import structure and data into a new table.
 - b. **forests.xml** file – Import structure and data into a new table.
4. We need to create a new table to store information about each region.
 - a. Create a table named *Regions* with the fields below. Use appropriate field types and designate a good primary key.

Table: Regions	
Field Name	Description
RegionAbbrv	Abbreviation of the region.
RegionName	Full name of the region.

- b. Enter records for all regions below.

HINT: The *Regions* table will contain 13 records.

RegionAbbrv	RegionName
ANT	Antarctica
CAM	Central America
CB	Caribbean
EAS	East Asia
ESAF	Eastern-Southern Africa
EUR	Europe
NAM	North America
NAF	Northern Africa
OC	Oceania
SAM	South America
SEAS	Southeast Asia
WCAF	Western-Central Africa
WCAS	Western-Central Asia



5. Create the appropriate relationships for the following tables. Enforce referential integrity, but do not enable cascade updates or cascade deletes.
 - a. *Regions* and *Countries*
 - b. *Countries* and *Forests*
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 percentage of each country that was forested over time. List the country name, year, forested area, and land area. Also, include a field to calculate the percentage of land area that was forested.

You can calculate the percentage of land area that was forested using the formula:

$$\frac{[Forests.ForestArea]}{[Countries.LandArea]}$$

Format the calculated field as a percentage with 1 decimal place. Sort by the calculated field in descending order.

HINT: This query will show 1,194 records and 5 fields.

- b. We wish to summarize information about Asian countries in 2020. Create a query listing the country name, region name, land area, and population. Also, include a field to calculate the population density (number of people per square kilometer).

You can calculate the population density using the formula:

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

Only display records for the East Asia, Southeast Asia, and Western-Central Asia regions.

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

HINT: This query will show 45 records and 5 fields.



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- c. Create a query to calculate statistics for each country. List, for each country name, the average of forested area.

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

HINT: This query will show 199 records and 2 fields.

- d. We wish to summarize land usage on a regional basis. Creating a query listing, for each region name, the sum of forested area, sum of land area, and count of countries.

Only display records for the year 2020. Do not display the year in the result.

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

HINT: This query will show 12 records and 4 fields.

- e. We want to determine the population of each region. Create a query listing, for each region name, the sum of its population.

Your results must include all regions, even if they have no countries.

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

HINT: This query will show 13 records and 2 fields.

- f. We would like to compare the total amount of forested area over time. Copy-and-paste this SQL code into a new query:

```
SELECT Forests.DataYear, Sum(Forests.ForestArea) AS ForestArea
FROM Regions INNER JOIN (Countries INNER JOIN Forests ON
Countries.CountryAbbrv = Forests.CountryAbbrv) ON
Regions.RegionAbbrv = Countries.RegionAbbrv
GROUP BY Forests.DataYear
ORDER BY Forests.DataYear;
```

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

HINT: This query will show 6 records and 2 fields.



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

Name the main form *RegionData* and the subform *RegionDataSubform*.

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

View by region name and sort by country name in ascending order. Use a stepped layout and portrait page orientation. Name the report *AsianSummary*.

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_fap_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 `Worldwide Forest Area`. Add the chart from the *Forest Area 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 three 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. Is there any relationship between the land area of a region and the area of its forests other than that larger land areas allow for larger forests? Explain your reasoning.
- b. How might industrialization affect a country's forests?
- c. List at least two examples of environmental problems that can be caused or worsened by deforestation.
- d. In the U.S., whether trees in national forests should be treated as a crop to be harvested or as a resource to be conserved has been a controversial topic. Where do you stand on this issue? Explain your thinking.
- e. List at least two steps that can help reduce deforestation.



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 *Worldwide Forest Area* chart.
- c. Apply slide transitions of your choice to all slides.
- d. Edit the parent (top-most) slide master to add the **forest.jpg** image to the top right corner of the slides. Size the image to be 1.0-inch high by 1.0-inch 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 Brian M. Powell [5].



References

- [1] "Land area (sq. km)," *World Bank*. Available:
<http://data.worldbank.org/indicator/AG.LND.TOTL.K2>. Accessed: Dec. 10, 2023.
- [2] "Population, total," *World Bank*. Available:
<http://data.worldbank.org/indicator/SP.POP.TOTL>. Accessed: Dec. 10, 2023.
- [3] B. M. Powell, *West Fork Greenbrier Overlook*. 2016.
- [4] "Forest area (sq. km)," *World Bank*. Available:
<http://data.worldbank.org/indicator/AG.LND.FRST.K2>. Accessed: Dec. 10, 2023.
- [5] B. M. Powell, *Blackwater Canyon from Lindy Point*. 2017.