Final Exam Review

Background Information

Forests cover approximately 30% 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 in the world.

Instructions

IMPORTANT: 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 Office.

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 total and inland water areas 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.
InlandWaterArea	Number	Inland water area in square kilometers.
LandArea	Number	Land area in square kilometers.

    b. **forests.xml** – Information on forest areas of various countries [3].

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.

    c. **forest.jpg** – Image of a forest for use in PowerPoint.

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Forest Area Problem

Microsoft Access Portion

2. Begin by creating a new Microsoft Access database named *lastname_firstname_**erf_fap.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
CA	Central America
CB	Carribean
EAS	East Asia
ESAF	Eastern-Southern Africa
EU	Europe
NA	North America
NAF	Northern Africa
OC	Oceania
SA	South America
SEAS	Southeast Asia
WCAF	Western-Central Africa
WCAS	Western-Central Asia

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

   a. *Countries* and *Regions*

   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 statistics for each country. List, for each country name, the average of forest 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 198 records and 2 fields.

    b. We wish to summarize information about Asian countries. Create a query listing the country name, year, region name, forest 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:
    $$\frac{[Forests.ForestArea]}{[Countries.LandArea]}$$

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

    Format the calculated field as a percentage with no decimal places.

    HINT: This query will show 235 records and 6 fields.

    c. Create a query to calculate regional statistics. List, for each region name and year, the sum of forest area, sum of land area, and count of countries.

    Only display records for the years 1995 and 2015.

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

    HINT: This query will show 24 records and 5 fields.

d.   We would like to compare the amount of worldwide 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 5 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.

Group by country name and sort by year 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 Excel Portion

10. Create a new Microsoft Excel workbook named **lastname_firstname_erf_fap.xlsx**.

11. We must adjust the sheets in our workbook.

   a.   Rename *Sheet1* to *Worldwide Forests.*

12. Import the following item into the workbook:

   a.   *Query6D* query from the Microsoft Access database: Import as a table starting in cell **A1** of the *Worldwide Forests* sheet.

13. We wish to apply formatting to the *Worldwide Forests* sheet.

   a.   For the table, turn on the **First Column** option.

   b.   Format the cells as indicated below:

      i.   **B2** through **B6**: number with no decimal places, use 1000 separator

c. Apply *Green-Yellow-Red* color scale conditional formatting to cells **B2** through **B6**.

14. We would like to create a chart to display information on the worldwide forested area.

a. Create a new 2-D line chart based on cells **A1** through **B6** of the *Worldwide Forests* sheet. Move the chart to a new sheet named *Worldwide Forests Chart*.

    Ensure the years are shown as labels for the horizontal (category) axis, not plotted as chart data. Specify appropriate chart and axis titles.

b. Add a trendline based on the worldwide forested area. Use the trendline type that best fits the data and project values forward 5 periods (through 2040). Display the **R-squared** value on the chart.

    NOTE: You cannot use the *Moving Average* type for your trendline.

15. To better understand our data, we wish to create a PivotTable.

a. Create a new PivotTable based on the data in cells **A1** through **B6** of the *Worldwide Forests* sheet. Place the PivotTable on a new sheet named *Worldwide Forests PivotTable*.

b. On the PivotTable, do the following:

    i.   Add the year as a **Rows** field.

    ii. Add the forest area as a **Values** field.

c. We need to perform formatting on the PivotTable.

    i.   Group the years into sets of 5 starting at 1995.

    ii.   Summarize the forest area figures by averaging them.

    iii. Format the cells as indicated below:

        (1) **Average of ForestArea** field: number with no decimal places, use 1000 separator

Microsoft PowerPoint Portion

16. Create a new Microsoft PowerPoint presentation named *lastname_firstname_erf_fap.pptx*.

17. 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 *Worldwide Forests Chart* sheet in your Microsoft Excel workbook to the content area of the slide.

c. *Title and Content*-type slide titled `Forest Area Prediction`. In the content area of the slide, indicate which trendline type was used on *Worldwide Forests Chart* and the projected forest area at the end of the forecasting period.

18. 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 A").

   a. Is there any relationship between the land area of a region and its percentage of forest area? 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 exacerbated by deforestation.

   d. Does there appear to be a relationship between where a region is located and its percentage of forested area? Explain your answer.

   e. List at least two steps that can help reduce deforestation.

19. 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 Forested 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 1.35-inches high by 1.33-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 150 points and graded using this rubric, with partial credit awarded as appropriate:

Step 3	5 points	Step 12	5 points
Steps 4a-b	10 points total	Steps 13a-c	5 points total
Step 5	5 points	Steps 14a-b	15 points total
Steps 6a-d	7.5 points each	Steps 15a-c	15 points total
Step 7	5 points	Steps 17a-c	9 points total
Step 8	5 points	Steps 18a-e (pick 4 of 5)	7.5 points each
Step 11a	3 points	Steps 19a-e	8 points total

The analysis questions in Steps 18a-e can be evaluated using this rubric:

Standard	Meets Requirements (3.75 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 Valerius Tygart [4].

References

[1] "Global Forest Resources Assessment," 2010. Available: *http://www.fao.org/docrep/013/i1757e/i1757e14.pdf*.
[2] "Land area (sq. km)," *World Bank*, Jul. 06, 2016. Available: *http://data.worldbank.org/indicator/AG.LND.TOTL.K2*.
[3] "Forest area (sq. km)," *World Bank*, Jul. 06, 2016. Available: *http://data.worldbank.org/indicator/AG.LND.FRST.K2*.
[4] V. Tygart, *Monongahela National Forest*. 2007. Available: *https://commons.wikimedia.org/wiki/File:MonNatForest.jpg*.