Homework #5 Help
Wildfires Problem

Background Information

Wildfires are integral to maintaining forest ecosystems, but they also pose a great risk to human lives and property. In the United States, about 38% of homes are located in wildfire-prone areas and about $1 billion is spent each year on wildfire supression.

Large fires account for less than 2% of all wildfires but represent 94% of total suppression costs. Despite huge increases in money, resources, and personnel being devoted to fire suppression, the number of acres burned continues to increase.

Problem Statement

In this assignment, we will study data on large wildfires to analyze the areas affected, the cost, and effort required to contain the wildfires.

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. **coordinationcenters.xml** – Information on coordination centers for wildfire management in the United States [1].

Table: *CoordinationCenters*		
Field Name	**Type**	**Description**
CenterCode	Short Text	Primary key. Code representing the coordination center.
CenterName	Short Text	Name of the coordination center.

    b. **states.xml** – Listing of states and their abbreviations.

Table: *States*		
Field Name	**Type**	**Description**
StateAbbrv	Short Text	Primary key. Abbreviation of the state.
StateName	Short Text	Full name of the state.

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c. **wildfires.xml** – Data on large wildfires (those with more than 40,000 acres burned) between the years 2007-2012 in the United States [2].

Table: *Wildfires*		
Field Name	**Type**	**Description**
WildfireID	AutoNumber	Primary key. Unique identifier for the wildfire.
Name	Short Text	Name given for the wildfire.
StateAbbrv	Short Text	Abbreviation of the state where the fire occurred.
CenterCode	Short Text	Wildfire coordination center
StartDate	Date/Time	Date the fire was reported.
ControlDate	Date/Time	Date the fire was contained/controlled.
Area	Number	Area affected by the fire (in acres).
Cause	Short Text	Cause of the wildfire.
EstimatedCost	Currency	Estimated cost to contain the wildfire.

d. **wildfires.rtf** – Report text file to format in Word.

e. **wildfire.png** – Image of a wildfire to use in PowerPoint.

Microsoft Access Portion

2. Create a new Microsoft Access database named **hwhelp6_wfp_*lastname_firstname*.accdb**.

3. Import the following items into the database:

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

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

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

4. Create the appropriate relationship for the following tables. Enforce referential integrity, but do not enable cascade updates or cascade deletes.

   a. *Wildfires* and *CoordinationCenters*

   b. *Wildfires* and *States*

5. 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 5a as *Query5A*).

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

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a. Create a query to display statistics on each wildlife. List the wildfire name, state name, coordination center name, start date, control date, area, and estimated cost. Also, include a field to calculate the cost per acre.

You can calculate the cost of wildfires per acre using the formula:
$$\frac{[Wildfires.EstimatedCost]}{[Wildfires.Area]}$$

Format the calculated field as currency with 2 decimal places. Sort by coordination center name and then by state name, both in ascending order.

HINT: This query will show 154 records and 8 fields.

b. We wish to calculate statistics by coordination center. Create a query listing, for each coordination center name, the wildfire cause, number of wildfires, total area, and total estimated cost.

Only include records for fires caused by lightning or humans.

HINT: This query will show 17 records and 5 fields.

c. We would like to know the number of wildfires, the average area burned, the average estimated cost, and the average number of days taken to contain a fire for each state. Copy-and-paste this SQL code into a new query:

```
SELECT States.StateName, Avg(Wildfires.EstimatedCost) AS
AverageCost, Avg([Wildfires]![ControlDate]-
[Wildfires]![StartDate]) AS AverageDaystoControl,
Avg(Wildfires.Area) AS AverageArea, Count(Wildfires.Name) AS
NumberOfFires
FROM States INNER JOIN Wildfires ON States.StateAbbrv =
Wildfires.StateAbbrv
GROUP BY States.StateName
ORDER BY States.StateName;
```

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

HINT: This query will show 20 records and 5 fields.

d. We would like to gather annual statistics on wildfires in areas controlled by different coordination centers. Copy-and-paste this SQL code into a new query:

```
SELECT CoordinationCenters.CenterName, Year([StartDate]) AS
[Year], Wildfires.Cause, Count(Wildfires.Name) AS
NumberOfFires, Sum(Wildfires.Area) AS TotalArea,
Sum(Wildfires.EstimatedCost) AS TotalCost
FROM CoordinationCenters INNER JOIN Wildfires ON
CoordinationCenters.CenterCode = Wildfires.CenterCode
GROUP BY CoordinationCenters.CenterName, Year([StartDate]),
Wildfires.Cause
ORDER BY CoordinationCenters.CenterName, Year([StartDate]),
Wildfires.Cause;
```

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

HINT: This query will show 62 records and 6 fields.

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

Microsoft Excel Portion

7. Create a new Microsoft Excel workbook named **hwhelp6_wfp_*lastname_firstname*.xlsx**.

8. We must adjust the sheets in our workbook.

   a. Rename *Sheet1* to *Wildfires by State*.

   b. Add a new sheet named *Wildfires by Center*.

9. Import the following items into the workbook:

   a. *Query5C* query from the Microsoft Access database – Import as a table starting in cell **A1** of the *Wildfires by State* sheet.

   NOTE: Microsoft Access must be closed before importing the query.

   b. *Query5D* query from the Microsoft Access database – Import as a table starting in cell **A1** of the *Wildfires by Center* sheet.

   NOTE: Microsoft Access must be closed before importing the query.

10. We would like to create a chart to display information on the average estimated wildfire costs for each state.

    Create a new 2-D clustered column chart based on cells **A1** through **B21** of the *Wildfires by State* sheet. Move the chart to a new sheet named *Average Cost Chart*.

    Specify appropriate chart and axis titles. Format the vertical (value) axis as currency with no decimal places.

11. To better understand the data, we wish to create a PivotTable.

    a. Create a new PivotTable based on the data in cells **A1** through **F63** of the *Wildfires by Center* sheet. Place the PivotTable on a new sheet named *Total Area PivotTable*.

    b. On the PivotTable, do the following:

        i. Add the coordination center name as a ***Rows*** field.

        ii. Add the cause as a ***Columns*** field.

        iii. Add the total area as a ***Values*** field.

    c. We need to perform some formatting on the PivotTable.

        i. Format the cells as indicated below:

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

Microsoft Word Portion

12. Create a new Microsoft Word document named **hwhelp6_wfp_*lastname_firstname*.docx**.

13. At the beginning of the document, insert a cover page using either of the built-in *Sideline* or *Whisp* styles. On the cover page, include the information noted below.

    a. ***Company:*** The words `Computer Science 101 Section` followed by the section number in which you are enrolled.

    b. ***Title:*** `Wildfires`

    c. ***Subtitle***: `Description and Management Techniques`

    d. ***Author:*** Your first and last name.

    e. ***Date:*** The current date.

14. Add a second page if one does not already exist. On it, insert the contents of the **wildfires.rtf** file.

    NOTE: The inserted text contains instructions (inside of "<>" symbols) for use in formatting the document. You must remove these instructions once you have applied the specified formatting.

15. Where indicated, include the chart from the *Average Cost Chart* sheet in your Microsoft Excel workbook. Size the chart to be 4-inches high and 6.5-inches wide. Add a caption for the chart.

16. Where indicated, insert a new equation using the Microsoft Word equation tool representing the formula below. Your formula must identically reproduce:

$$\frac{Estimated\ Cost}{Area}$$

17. At the end of the document, we wish to create a bibliography page.

    a. Define the following sources as references for your report:

        i. ***Type:*** *Web site*

            ◇ ***Name of web page:*** Good Fire, Bad Fire

            ◇ ***Name of web site:*** Firefighters United for Safety, Ethics and Ecology

            ◇ ***Date:*** 2003

            ◇ ***Date accessed:*** October 11, 2013

            ◇ ***URL:*** http://www.fusee.org/docs/Ecology/GoodFire-BadFire.pdf

        ii. ***Type:*** *Book*

            ◇ ***Author:*** Medina, Kian V.

            ◇ ***Title:*** Wildfires and Wildfire Management

            ◇ ***Year:*** 2010

            ◇ ***City:*** New York, NY

            ◇ ***Publisher:*** Nova Science Publishers

   iii. ***Type:*** *Book*

    ◊ ***Author:*** Arno, Stephen F.

    ◊ ***Title:*** Flames in Our Forest

    ◊ ***Year:*** 2002

    ◊ ***City:*** Washington, DC

    ◊ ***Publisher:*** Island Press

  b. Where indicated on the last page, insert a *Bibliography*-style bibliography using an APA style.

18. We must finish formatting our document.

  a. Apply the formatting and changes to the report text as specified by the included comments.

   Remove the included comments from the document once you have applied the required formatting.

  b. Ensure your document conforms to the following requirements:

   i. Modify the *Normal* formatting style to specify Verdana 11-point as the default font.

   ii. In the right-hand corner of the header on all pages after the cover page, list your last name followed by the page number. The page number should begin at 1 on the first actual page of text (the page after the cover page).

   iii. The first line of your text paragraphs should be indented by 0.5-inch. Do not indent the cover page, headings, images, captions, equations, or bibliography.

   iv. Except on the cover page, use double line spacing.

   v. Ensure there is no (0-point) line spacing before and after each paragraph except on the cover page.

   vi. Use 1.0-inch margins on all sides.

Microsoft PowerPoint Portion

19. Create a new Microsoft PowerPoint presentation named **hwhelp6_wfp_*lastname_firstname*.pptx**.

20. In the presentation, create the following slides:

  a. *Title Slide*-type slide listing a title for the presentation, your name, course section, and an automatically updating date.

b. *Title and Content*-type slide titled `Average Cost per State`. Add the chart from the *Average Cost Chart* sheet of your Microsoft Excel workbook to the content area of the slide.

21. 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. Aside from the costs of suppression and to repair property damages, how else do wildfires affect the economy? List at least two examples.

    b. About 80% of all wildfires are caused by human activities, with most of the rest caused by lightning. Does the same ratio hold true for large wildfires? Why do you think this is the case?

    c. Wildfires and their impacts have increased in severity and frequency in recent years. What are two possible causes for this increase?

    d. Which regions of the country are most prone to wildfires? What might make these regions more likely to have wildfires?

    e. Do you think wildfires represent a public health concern? Why or why not?

22. 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 *Average Cost per State* chart.

    c. Apply slide transitions of your choice to all slides.

    d. Edit the parent (top-most) slide master to add the **wildfire.png** image to the bottom left corner of the slides. Size the image to be 0.5-inches high by 0.5-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.

Assignment Requirements

You must submit all four files (Microsoft Access, Microsoft Excel, Microsoft PowerPoint, and Microsoft Word) for this assignment.

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Grading Rubric

This is a practice assignment and is worth no points. A comparable Homework would be worth 60 points and graded using this rubric, with partial credit awarded as appropriate:

Steps 3-4	3 points total	Step 15	2.5 points
Step 5a-b	3 points each	Step 16	2.5 points
Steps 5c-d	2 points total	Steps 17a-b	5 points total
Steps 8-9	3 points total	Steps 18a-b	5 points total
Step 10	4 points	Steps 20a-b	3 points total
Steps 11a-c	5 points total	Steps 21a-e (pick 3 of 5)	3 points each
Step 13	3 points	Steps 22a-e	5 points total
Step 14	2 points		

The analysis questions in Steps 21a-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 the U.S. Forest Service [3].

References

[1] "Wildland Fire Summary and Statistics: Annual Report 2013," National Interagency Coordination Center, 2013. Available: *http://www.predictiveservices.nifc.gov/intelligence/2013_Statssumm/intro_summary13.pdf*.

[2] "Wildland Fire Annual Reports," *National Interagency Coordination Center*. Available: *http://www.predictiveservices.nifc.gov/intelligence/intelligence.htm*.

[3] U.S. Forest Service, *Forest Fire*. 2005. Available: *https://commons.wikimedia.org/wiki/File:Forestfire2.jpg*.