



Homework #5 Help

College Applications Problem

Background Information

The college application process is complex and affects many high school students and their families each year. A number of variables, including cost, location, and test scores, go into decision making process for each student and college.



Problem Statement

In this assignment, we will analyze the cost and student demographic statistics for a variety of colleges. From this data, we will conduct analyses to explore how the college application process works.

Instructions

IMPORTANT: This is not the actual Homework for your class. 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. **colleges.xml** – List of colleges [1].

Table: Colleges		
Field Name	Type	Description
CollegeID	AutoNumber	Primary key. Unique identifier for each college.
CollegeName	Short Text	College name.
PubliclyFunded	Yes/No	If yes, college is publicly funded.
State	Short Text	State of college.

- b. **expenses.xml** – Listing of tuition and expected personal expenses for 2015-2016 academic year [1].

Table: Expenses		
Field Name	Type	Description
CollegeID	Number	Primary key. Unique identifier for each college.
InStateTuition	Currency	In-state tuition.
OutOfStateTuition	Currency	Out-of-state tuition.
RoomBoard	Currency	Cost of room and board.



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- c. **applications.xml** – Information on 2015-2016 academic year applications [1].

Table: Applications		
Field Name	Type	Description
CollegeID	Number	Primary key. Unique identifier for each college.
ApplicationsReceived	Number	Number of applications received.
ApplicationsAccepted	Number	Number of students accepted.
AvgCritReadingSAT	Number	Average critical reading SAT score for applicants.
AvgMathSAT	Number	Average math SAT score for applicants.

- d. **criteria.rtf** – Report text file to format in Word [2]–[5].
e. **college.png** – Image of college graduates for use in PowerPoint.

Microsoft Access Portion

2. Create a new Microsoft Access database named **hwhelp5_cap_lastname_firstname.accdb**.
3. Import the following items into the database:
 - a. **colleges.xml** file – Import structure and data into a new table.
 - b. **applications.xml** file – Import structure and data into a new table.
 - c. **expenses.xml** file – Import structure and data into a new table.
4. Create the appropriate relationships for the following tables. Enforce referential integrity, but do not enable cascade updates or cascade deletes.
 - a. *Colleges* and *Applications*
 - b. *Colleges* and *Expenses*
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 application statistics. List the college name, state, if it is publicly funded, the number of applications received, and number of applications accepted. Also, include a calculated field to determine the acceptance rate.

You can calculate the acceptance rate using the formula:

$$\frac{[Applications.ApplicationsAccepted]}{[Applications.ApplicationsReceived]}$$

Format the acceptance rate as a percentage with one decimal place. Sort by college name in ascending order.

HINT: This query will show 40 records and 6 fields.

- b. Make a new query. For each state, calculate the average critical reading SAT score, average math SAT score, average in-state tuition, average out-of-state tuition, and average of room-and-board.

Only display records for colleges in West Virginia, Maryland, Ohio, Kentucky, and Virginia.

Format the average SAT scores as fixed-type numbers with no decimal places. Format the in-state tuition, out-of-state tuition, and room-and-board as currency with no decimal places.

HINT: This query will show 5 records and 6 fields.

- c. We want to know which colleges have a room-and-board cost of more than \$10,000 and more than 1,000 accepted applications. Copy-and-paste this SQL code into a new query:

```
SELECT Colleges.CollegeName, Expenses.InStateTuition,
Expenses.RoomBoard, Applications.ApplicationsAccepted,
Colleges.PubliclyFunded
FROM (Colleges INNER JOIN Applications ON Colleges.CollegeID =
Applications.CollegeID) INNER JOIN Expenses ON
Colleges.CollegeID = Expenses.CollegeID
WHERE (((Expenses.RoomBoard)>10000) AND
((Applications.ApplicationsAccepted)>1000));
```

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

HINT: This query will show 18 records and 5 fields.

- d. We would like to calculate the average total cost for a student to attend each college. Copy-and-paste this SQL code into a new query:



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```
SELECT Colleges.CollegeName, Colleges.PubliclyFunded,  
CCur(([InStateTuition]+[OutOfStateTuition])/2) AS AvgTuition,  
expenses.[RoomBoard], [AvgTuition]+[RoomBoard] AS TotalCost  
FROM Colleges INNER JOIN expenses  
ON Colleges.CollegeID = expenses.CollegeID  
ORDER BY Colleges.CollegeName;
```

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

HINT: This query will show 40 records and 5 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 **hwhelp5_cap_lastname_firstname.xlsx**.
8. We must adjust the sheets in our workbook.
 - a. Rename *Sheet1* to *Expensive Colleges*.
 - b. Add a new sheet named *All Colleges*.
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 *Expensive Colleges* 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 *All Colleges* sheet.

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

10. We would like to create a chart to display information on college expenses.

Create a new 2-D clustered column chart based on cells **A1** through **C19** of the *Expensive Colleges* sheet. Move the chart to a new sheet named *Expensive Colleges 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.



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- a. Create a new PivotTable based on the data in cells **A1** through **E41** of the *All Colleges* sheet. Place the PivotTable on a new sheet named *All Colleges PivotTable*.
- b. On the PivotTable, do the following:
 - i. Add the college name as a **Rows** field.
 - ii. Add the publicly funded indicator as a **Columns** field.
 - iii. Add the average tuition as a **Values** field.
- c. We need to perform some formatting on the PivotTable.
 - i. Format the cells as indicated below:
 - (1) **Sum of AvgTuition** field: currency with no decimal places

Microsoft Word Portion

12. Create a new Microsoft Word document named **hwhelp5_cap_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:** `College Applications`
 - c. **Subtitle:** `Selecting the best college`
 - 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 **criteria.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 *Expensive Colleges Chart* sheet in your Microsoft Excel workbook. Size the chart to be 4-inches high by 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:

$$\frac{\textit{Out - of - State Tuition}}{\textit{In - State Tuition}}$$



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:** College Selection Criteria
- ◇ **Name of web site:** StudentAid.com
- ◇ **Year:** 2013
- ◇ **Date accessed:** March 28, 2013
- ◇ **URL:**
<http://www.studentaid.com/Planning/Research/Selection-Criteria>

ii. **Type:** *Web site*

- ◇ **Name of web page:** College Selection Guide
- ◇ **Name of web site:** College View
- ◇ **Year:** 2013
- ◇ **Date accessed:** March 28, 2013
- ◇ **URL:**
<http://www.collegeview.com/articles/article/college-selection-guide>

iii. **Type:** *Web site*

- ◇ **Name of web page:** About the SAT
- ◇ **Name of web site:** Peterson's
- ◇ **Year:** 2013
- ◇ **Date accessed:** April 4, 2013
- ◇ **URL:** <http://www.petersons.com/college-search/sat-scores-about-test.aspx>

iv. **Type:** *Web site*

- ◇ **Name of web page:** Guide to State Residency
- ◇ **Name of web site:** College Board
- ◇ **Year:** 2012
- ◇ **Date accessed:** April 4, 2013
- ◇ **URL:**
<http://professionals.collegeboard.com/testing/international/state>



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- v. **Type:** *Web site*
- ◇ **Name of web page:** Student Financial Aid in the United States
 - ◇ **Name of web site:** Wikipedia
 - ◇ **Date:** March 28, 2013
 - ◇ **Date accessed:** March 28, 2013
 - ◇ **URL:**
http://en.wikipedia.org/wiki/Student_financial_aid_in_the_United_States
- b. Where indicated on the last page, insert a *Bibliography*-style bibliography using an APA style.

18. We must finish formatting the document.

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

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

- b. Ensure the 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. Begin by creating a new Microsoft PowerPoint presentation named **hwhelp5_cap_lastname_firstname.pptx**.

20. In the presentation, create the following slides:



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- 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 *Expensive Colleges*. Add the chart from the *Expensive Colleges 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. What are some pros and cons of attending an in-state college? Give reasons for your answer.
 - b. There is a large variation in room and board fees charged between different colleges. What are some possible reasons for the wide range of costs?
 - c. Why do publicly funded colleges generally charge lower rates for in-state tuition than out-of-state tuition?
 - d. Why might a college accept a relatively small percentage of the students who apply to it?
 - e. What are some possible causes that might lead to large year-to-year changes in the number of students applying to a college?
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 *Expensive Colleges* chart.
 - c. Apply slide transitions of your choice to all slides.
 - d. Edit the parent (top-most) slide master to add the **college.png** image to the bottom left corner of the slides. Size the image to be 0.6-inches high by 0.9-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.

References

- [1] "BigFuture," *College Board*. Available: <https://bigfuture.collegeboard.org/>.
- [2] "College Selection Guide," *CollegeView*. Available: <http://www.collegeview.com/articles/article/college-selection-guide>.
- [3] "SAT Scores: About the SAT," *Peterson's*. Available: <http://www.petersons.com/college-search/sat-scores-about-test.aspx>.
- [4] "International students and the SAT," *College Board*. Available: <https://professionals.collegeboard.com/testing/international/sat>.
- [5] "Student financial aid in the United States," *Wikipedia*. Available: https://en.wikipedia.org/wiki/Student_financial_aid_in_the_United_States.