Homework #4
West Virginia Higher Education Funding Problem

Background Information

In West Virginia, as in most states, the state government provides public colleges with annual appropriations to fund part of each college's operations. These funds are intended to allow the colleges to charge lower tuition for in-state students as compared to out-of-state students, with the appropriations replacing the tuition revenue lost from the lower in-state rate.

Over the past several years, West Virginia has made significant changes to how it manages its colleges. These changes culminated with the 2022 passage of House Bill 4008, which replaced the previous ad hoc method of determining the size of each college's appropriation with a new funding formula that is designed to reward colleges for achieving better student outcomes.

Problem Statement

In this assignment, students will analyze enrollment figures and state appropriations for all 4-year degree-granting public colleges and universities in West Virginia.

Instructions

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. Create a new Microsoft Access database named **hw4_*lastname_firstname*_wvhefp.accdb**.

2. We would like to begin by making a table to store the college.

    a. Create a table named *Colleges* to store the names of the colleges and their abbreviations. Designate the abbreviation as primary key.

b. Enter records for all colleges below.

HINT: The *Colleges* table will contain 12 records.

College Abbreviation	College Name
BSU	Bluefield State University
CU	Concord University
FSU	Fairmont State University
GSU	Glenville State University
MU	Marshall University
SU	Shepherd University
WLU	West Liberty University
WVSOM	West Virginia School of Osteopathic Medicine
WVSU	West Virginia State University
WVU	West Virginia University
WVUIT	WVU Institute of Technology
WVUPSC	Potomac State College of WVU

3. We need to store information on the Carnegie classifications in our dataset.

   a. Create a table named *CarnegieClassifications* to store the names of the classifications and their abbreviations. Designate the abbreviation as primary key.

   b. Enter records for all classifications below [1].

   HINT: The *CarnegieClassifications* table will contain 8 records.

Classification Abbreviation	Classification Name
AS	Associate's College
BAC	Baccalaureate College
BAA	Baccalaureate/Associate's College
DOC	Doctoral University
MAS	Master's University
MED	Medical School
TEC	Technical Professions School
LAW	Law School

4. To finish adding our dataset, we must store information about college enrollment, appropriations, and Carnegie classifications.

   a. Create a table named *AnnualStatistics* to store information on each of the college statistics records (listed below under Step 4b). Some requirements for this table appear below.

   IMPORTANT: Completely define the *AnnualStatistics* table before entering records.

   i. For the primary key, use an AutoNumber-type field to store an ID number.

ii. Provide a field to store the year the academic year the data is for (e.g., 2022 is used for the 2022-2023 academic year). Using a lookup field, allow the user to select the year from a dropdown list. Permit the user to choose only from these values:

  ◇ 2014

  ◇ 2018

  ◇ 2022

iii. Provide a field to store the college. Using a lookup field referencing the *Colleges* table, allow the user to select the college abbreviation and name (e.g., "WVU | West Virginia University") from a dropdown list.

  Do not hide the key column. Store the value of the college abbreviation field. Enable data integrity, restricting deletes, on the relationship created by the Lookup Wizard.

iv. Using a lookup field referencing the *CarnegieClassifications* table, allow the user to select the classification abbreviation and name (e.g., "DOC | Doctoral University") from a dropdown list.

  Do not hide the key column. Store the value of the classification abbreviation field. Enable data integrity, restricting deletes, on the relationship created by the Lookup Wizard.

v. Provide a standard-type number field with 1 decimal place to store the number of in-state students (headcount). Use the *Double* field size.

vi. Provide a standard-type number field with 1 decimal place to store the number of out-of-state students (headcount). Use the *Double* field size.

vii. Provide a currency field with no decimal places to store the amount of state appropriations, which is the money provided by the State of West Virginia to help operate the college.

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b. Enter the college data below into your *AnnualStatistics* table as appropriate [1]–[3].

HINT: The *AnnualStatistics* table will contain 36 records.

Year	College	Classification Name	In-State Students	Out-of-State Students	Appropriations
2014	Bluefield State	Bacc/Associate's	1,358	202	$5,856,558
2018	Bluefield State	Baccalaureate	1,085	181	$5,600,993
2022	Bluefield State	Baccalaureate	905	390	$6,648,770
2014	Concord	Baccalaureate	2,061	470	$9,040,548
2018	Concord	Master's	1,650	387	$8,552,843
2022	Concord	Master's	1,327	425	$10,836,709
2014	Fairmont State	Baccalaureate	3,571	440	$15,842,394
2018	Fairmont State	Master's	3,487	455	$15,111,777
2022	Fairmont State	Master's	3,108	389	$19,273,190
2014	Glenville State	Baccalaureate	1,549	216	$6,318,177
2018	Glenville State	Baccalaureate	1,365	221	$5,885,700
2022	Glenville State	Baccalaureate	1,395	250	$6,678,535
2014	Marshall	Master's	10,106	3,275	$61,567,058
2018	Marshall	Doctoral	10,169	3,035	$56,048,588
2022	Marshall	Doctoral	8,368	2,463	$56,234,896
2014	Potomac State	Associate's	1,067	472	$4,177,993
2018	Potomac State	Bacc/Associate's	1,066	273	$3,834,937
2022	Potomac State	Bacc/Associate's	939	226	$4,709,664
2014	Shepherd	Baccalaureate	2,476	1,616	$9,941,104
2018	Shepherd	Baccalaureate	2,217	1,159	$9,671,542
2022	Shepherd	Baccalaureate	1,902	1,405	$13,026,830
2014	West Liberty	Baccalaureate	1,743	864	$8,255,151
2018	West Liberty	Master's	1,691	831	$7,823,727
2022	West Liberty	Master's	1,452	862	$9,552,600
2014	WVSOM	Medical School	264	543	$7,058,218
2018	WVSOM	Medical School	192	633	$6,683,018
2022	WVSOM	Medical School	154	630	$5,247,095
2014	WVSU	Baccalaureate	2,598	261	$10,380,591
2018	WVSU	Baccalaureate	3,733	300	$9,861,240
2022	WVSU	Master's	3,508	284	$11,380,098
2014	WVU	Doctoral	14,332	14,998	$125,296,733
2018	WVU	Doctoral	12,909	13,998	$114,714,761
2022	WVU	Doctoral	11,277	13,511	$119,285,972
2014	WVU Tech	Baccalaureate	976	298	$8,400,448
2018	WVU Tech	Baccalaureate	1,496	256	$7,717,964
2022	WVU Tech	Baccalaureate	1,295	219	$8,320,240

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.

    a. Create a query to view information on each college. List the college name, year, in-state students, out-of-state students, and appropriations.

        Sort by college name and then by year, both in ascending order.

        HINT: This query will show 36 records and 5 fields.

    b. We wish to calculate the appropriations per in-state student for each college. Create a query listing the college name, year, in-state students, and appropriations. Also, include a field to calculate to calculate the appropriation per in-state student.

        You can calculate the appropriation per in-state student using the formula:
        $$\frac{[AnnualStatistics.Appropriations]}{[AnnualStatistics.InStateStudents]}$$

        Format the calculated field as currency with 2 decimal places. Sort by the appropriations per in-state student in descending order.

        HINT: This query will show 36 records and 5 fields.

    c. Create a query to view 2022 appropriations. List the college name and appropriations.

        Only display records for the year 2022. Do not show the year in the results.

        HINT: This query will show 12 records and 2 fields.

    d. We wish to calculate the average enrollment and appropriations for each college. Create a query listing, for each college name, the average of in-state students, average of out-of-state students, and average of appropriations.

        Format the average of in-state students and average of out-of-state students both as standard-type numbers with no decimal places. Format the average of appropriations as currency with no decimal places.

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

e.   Create a query to display information on the Carnegie classifications. List, for each classification name, the count of its annual statistics records.

Your results must include all classifications, even if they have no colleges.

Format the count of annual statistics records as a standard-type number with no decimal places.

HINT: This query will show 8 records and 2 fields.

6.   Using the Form Wizard, create a form with subform. The main form should display the college name. The subform must display a datasheet with all *AnnualStatistics* table fields.

Name the main form *CollegeData* and the subform *CollegeDataSubform*.

7.   Using the Report Wizard, create a report to show the results of the *Query5A* query. Display all fields from the query.

View by college and sort by year in ascending order. Use a stepped layout and landscape page orientation. Name the report *CollegeSummary*.

Ensure the full widths of all columns are visible on the report.

8.   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.

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

a.   Amongst the colleges, the appropriations per in-state student varied in 2022 from a low of $3,244 at West Virginia State University to a high of $34,072 at the West Virginia School of Osteopathic Medicine. Aside from political considerations, why might there be such a large variation in the appropriations per in-state student?

b.   For West Virginia University, the percentage of in-state students declined from 48.9% in 2014 to 45.5% in 2022. Why do you think this is the case?

c.   The appropriations listed in the provided dataset only include direct legislative appropriations to the individual colleges. Name at least one other type of money West Virginia colleges receive from the state government.

d. Starting in 2015, WVU Tech was relocated from its long-time home in Montgomery to a new location approximately 30 miles away in Beckley. WVU President Gordon Gee said he expected that moving to a larger, more accessible city would help grow enrollment to 5,000 students by 2020 [4]. Do you believe the move was successful?

e. Looking at enrollment figures and taking into account population and locations (shown in the below map), do you think that some of the public colleges should be closed, consolidated, or moved? Explain your reasoning.

West Virginia 4-Year Public Colleges with 2020 County Population
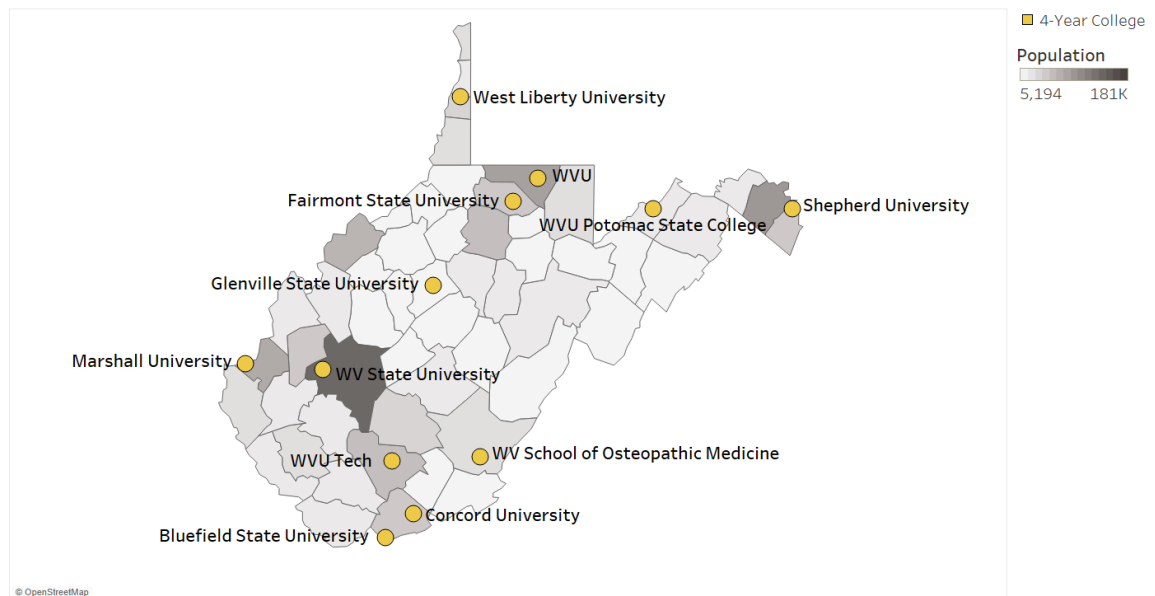
10. Run the Compact and Repair Database utility on your database. Ignore any errors you receive when running the utility.

Grading Rubric

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

Steps 2a-b	5 points total	Step 6	4 points
Steps 3a-b	5 points total	Step 7	4 points
Step 4a	6 points	Step 8a	3 points
Step 4b	4 points	Steps 9a-e (pick 3 of 5)	3 points each
Steps 5a-e	4 points each		

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The analysis questions in Steps 9a-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 West Virginia Higher Education Policy Commission [5]. The population data in the Step 9e map appears courtesy of the U.S. Census Bureau [6].

References

[1] "Resources: Public Data File," *Carnegie Classification of Institutions of Higher Education*. Available: *https://carnegieclassifications.acenet.edu/resource/*. Accessed: Oct. 27, 2023.

[2] "Approved Budgets," *West Virginia State Budget Office*. Available: *http://www.budget.wv.gov/approvedbudget/Pages/default.aspx*. Accessed: Oct. 27, 2023.

[3] "Enrollment by Selected Characteristics," *West Virginia Higher Education Policy Commission*. Available: *https://www.wvhepc.edu/resources/data-and-publication-center/data-center-enrollment/*. Accessed: Oct. 27, 2023.

[4] S. Wiles, "WVU Tech moving to Beckley; BOG unanimously backs plan," *WV MetroNews*, Sep. 01, 2015. Available: *https://wvmetronews.com/2015/09/01/wvu-tech-moving-to-beckley-wvu-bog-unanimously-backs-plan/*.

[5] *West Virginia Higher Education Policy Commission logo*. 2020. Available: *https://www.wvhepc.edu/wp-content/uploads/2020/11/cropped-WVHEPC_Main_Logo_COLOR-e1605738324377.png*.

[6] "U.S. Census Bureau QuickFacts: West Virginia," Apr. 01, 2020. Available: *https://www.census.gov/quickfacts/fact/table/WV/PST045221*.