



Homework #2 Help

Gross Regional Product Problem

Background Information

Similar to the Gross Domestic Product, the measure of economic output of a country, the Gross Regional Product (GRP) is the value of all goods and services produced within a specific region. The United States Census Bureau defines four statistical regions, including Northeast, Mideast, South, and West.



The GRPs tell us about the geographic distribution of U.S. economic activity and growth. The estimates of GRP per capita are especially significant when comparing one region to another. As the data presented in this assignment shows, it provides a consistent framework for analyzing the performance and change of the individual region.

Problem Statement

In this assignment, students will analyze statistics from the U.S. Census Bureau and U.S. Department of Commerce to determine the impact of population and GRP on the regional economy.

Instructions

IMPORTANT: This is not the actual Homework for your section. You will not receive any credit for completing this project.

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. **population.csv** – Population for different regions of U.S. between 1970 and 2020 [1].

Column Name	Type	Description
Region	Text	Name of region.
1970	Number	Population of the region in 1970.
1980	Number	Population of the region in 1980.
1990	Number	Population of the region in 1990.
2000	Number	Population of the region in 2000.
2010	Number	Population of the region in 2010.
2020	Number	Population of the region in 2020.



Homework #2 Help

Gross Regional Product Problem

- b. **grp.csv** – Gross Regional Product for different regions of U.S. between 1970 and 2020 [2], [3].

Column Name	Type	Description
Region	Text	Name of region.
1970	Currency	Inflation-adjusted gross regional product for 1970.
1980	Currency	Inflation-adjusted gross regional product for 1980.
1990	Currency	Inflation-adjusted gross regional product for 1990.
2000	Currency	Inflation-adjusted gross regional product for 2000.
2010	Currency	Inflation-adjusted gross regional product for 2010.
2020	Currency	Inflation-adjusted gross regional product for 2020.

2. Create a new Microsoft Excel workbook named **hwhelp2_grpp_lastname_firstname.xlsx**.
3. We must adjust the sheets in our workbook.
 - a. Rename *Sheet1* to *GRP*.
 - b. Add a new sheet named *Population*.
 - c. Add a new sheet named *GRP per Capita*.
 - d. Add a new sheet named *Analysis Questions*.
4. Import the following items into the workbook:
 - a. **grp.csv** file – Import starting in cell **A3** of the *GRP* sheet. The file is comma-delimited. Its first row contains headers.
 - b. **population.csv** file – Import starting in cell **A3** of the *Population* sheet. The file is comma-delimited. Its first row contains headers.
5. We wish to apply formatting to the *GRP* sheet.
 - a. We must setup a table to store data on gross regional products.
 - i. If a table does not already exist in cells **A3** through **G7**, create one using a style of your choice. The table has headers and will overlap external data ranges. If prompted, convert the selection to a table and remove all external connections.
 - ii. If a table already exists in cells **A3** through **G7**, format the table using a style of your choice other than the default table style.
 - b. We need to add additional table columns to store statistics and a sparkline.



Homework #2 Help

Gross Regional Product Problem

- i. Insert four new table columns to the right of existing column **G**.
 - c. Enter text in the cells as indicated below:
 - i. **A1**: Inflation-Adjusted Gross Regional Product
 - ii. **H3**: Minimum Value
 - iii. **I3**: Maximum Value
 - iv. **J3**: 5x Increasing
 - v. **K3**: Sparkline
 - d. Merge-and-center cells **A1** through **K1**.
 - e. Apply the *Title* cell style to cell **A1**.
 - f. Format the cells as indicated below:
 - i. **B4** through **I7**: currency with no decimal places
 - g. AutoFit the width of columns **A** through **K**.
 - h. Apply *Green-Yellow-Red* color scale conditional formatting to cells **B4** through **G7**.
6. We also wish to apply formatting to the *Population* sheet.
 - a. We must setup a table to store data on population.
 - i. If a table does not already exist in cells **A3** through **G7**, create one using a style of your choice. The table has headers and will overlap external data ranges. If prompted, convert the selection to a table and remove all external connections.
 - ii. If a table already exists in cells **A3** through **G7**, format the table using a style of your choice other than the default table style.
 - b. Enter text in the cells as indicated below:
 - i. **A1**: Regional Population Statistics
 - c. Merge-and-center cells **A1** through **G1**.
 - d. Apply the *Title* cell style to cell **A1**.
 - e. Format the cells as indicated below:
 - i. **B4** through **G7**: number with no decimal places, use 1000 separator
 - f. AutoFit the width of columns **A** through **G**.
7. We must also apply formatting to the *GRP per Capita* sheet.
 - a. Enter text in the below cells as indicated:
 - i. **A1**: Inflation-Adjusted GRP per Capita



Homework #2 Help

Gross Regional Product Problem

- ii. **A3**: Region
 - iii. **B3**: 1970
 - iv. **C3**: 1980
 - v. **D3**: 1980
 - vi. **E3**: 2000
 - vii. **F3**: 2010
 - viii. **G3**: 2020
 - ix. **A4**: Midwest
 - x. **A5**: Northeast
 - xi. **A6**: South
 - xii. **A7**: West
- b. Merge (but not center) cells **A1** through **G1**.
 - c. Apply the *Title* cell style to cell **A1**.
 - d. Format cells **A3** through **G7** as a table using a style of your choice. The table has headers.
8. On the *GRP per Capita* sheet, we wish to calculate GRP statistics.
- a. In column **B**, write a formula to calculate for each region the GRP per Capita. Reference the values on the *GRP* and *Population* sheets in your formula.
- You can calculate the export rate using the formula:
- $$\frac{[GRP \text{ for Year and Region}]}{[Population \text{ for Year and Region}]}$$
- b. In columns **C** through **G**, duplicate your export rate formula from column **B**.
9. We must apply additional formatting to the *GRP per Capita* sheet.
- a. Format the cells as indicated below:
 - i. **B4** through **G7**: currency with no decimal places
 - b. AutoFit the width of columns **A** through **G**.
10. On the *GRP* sheet, we wish to calculate GRP statistics.
- a. In column **H**, write a formula to calculate the minimum GRP of each region.



Homework #2 Help

Gross Regional Product Problem

- b. In column **I**, write a formula to calculate the maximum GRP of each region.
 - c. In column **J**, write a formula to determine if the region's 2020 GRP was at least 5 times its 1970 GRP. If it was, display *Yes*; otherwise, display *No*.
11. We wish to add a sparkline to the *GRP* sheet to compare data.

In column **K**, insert a line-type sparkline based on the values in columns **B** through **G**.

12. We wish to create a chart to plot the GRP per capita for each year and region.
- a. Create a 2-D line chart based on cells **A3** through **G7** of the *GRP per Capita* sheet. Move the chart to a new sheet named *GRP per Capita 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 GRP per capita of the West region. Use the trendline type that best fits the data and project the values forward 5 periods (through the year 2070). Display the ***R-squared*** value on the chart.

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

13. We need to set up the *Analysis Questions* sheet so that it can store responses to the analysis questions.
- a. Enter text in the cells as indicated below:
 - i. **A1:** Question Number
 - ii. **B1:** Response
 - b. Bold the contents of row **1**.
 - c. AutoFit the width of column **A**. Set the width of column **B** to 100 (8.39").
 - d. Set the height for rows **2** through **5** to 110 (1.53").
 - e. Change the vertical alignment setting for columns **A** and **B** so that text is displayed at the top of each row.
 - f. Turn on text wrapping for column **B**.
14. Starting in row **2** of the *Analysis Questions* sheet, answer four of the five analysis questions below. Respond to one question per row.
- a. Which trendline type did you use on *GRP per Capita Chart*? Why did you choose this type of trendline?
 - b. Do you believe that your GRP per capita projection for 2070 is accurate? Why or why not?



Homework #2 Help

Gross Regional Product Problem

- c. Between 1970 and 2020, the West enjoyed the greatest GRP increase of any region. Why do you think this might be?
- d. Why is it useful to measure the GRP on a per-capita basis rather than in total?
- e. The GRP data used in this assignment has been adjusted for inflation. Why might we want to do this?

Grading Rubric

This is a practice assignment and is worth no points. A comparable Homework would be worth 50 points and graded using this rubric, with partial credit awarded as appropriate:

Steps 3a-d	1.5 points total	Steps 9a-b	1.5 points total
Step 4	3 points	Steps 10a-c	4.5 points total
Steps 5a-g	3.5 points total	Step 11	3 points
Step 5h	2.5 points	Step 12a	4 points
Steps 6a-f	3 points total	Step 12b	3 points
Steps 7a-d	3 points total	Steps 13a-f	3 points total
Steps 8a-b	4.5 points total	Steps 14a-e (pick 4 of 5)	2.5 points each

The analysis questions in Steps 14a-e can be evaluated using this rubric:

Standard	Meets Requirements (1.25 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. Census Bureau [4].

References

- [1] "Population and Housing Unit Estimates Tables," *US Census Bureau*. Available: <http://www.census.gov/programs-surveys/popest/data/tables.html>. Accessed: Dec. 20, 2016.
- [2] "SAGDP9N Real GDP by State," U.S. Bureau of Economic Analysis, Mar. 2021. Available:



Homework #2 Help

Gross Regional Product Problem

<https://www.bea.gov/itable/iTable.cfm?ReqID=70&step=1#reqid=70&step=1&isuri=1>.

[3] "CPI Inflation Calculator," U.S. Bureau of Labor Statistics. Available:

https://www.bls.gov/data/inflation_calculator.htm.

[4] "Census Regions and Division of the United States," *Wikipedia*. Available:

https://en.wikipedia.org/wiki/File:Census_Regions_and_Division_of_the_United_States.svg. Accessed: Dec. 20, 2016.