PivotTables
WV Mining Problem

Topics

- Create a PivotTable
- Group PivotTable data
- Create a PivotChart and PivotTable
- Update the PivotTable data

Background Information

This project includes information on coal mining in West Virginia from 1999 to 2019.

Instructions

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. **mining_pppvt_wvmp.xlsx** – Information on coal mining in West Virginia [1], [2].

Sheet: *Coal Mined*		
Column Name	**Type**	**Description**
County	Text	Name of the West Virginia county.
Region	Text	Region where the county is located.
1999	Number	Tons of coal mined in the county in 1999.
2004	Number	Tons of coal mined in the county in 2004.
2009	Number	Tons of coal mined in the county in 2009.
2014	Number	Tons of coal mined in the county in 2014.
2019	Number	Tons of coal mined in the county in 2019.
Pctg of Total Mined	Percentage	Percentage of all coal mined in 2019 that was mined in the county.
2019 Top 10 County	Text	Indication if the county ranked in the top 10 for coal mined in 2019.
1999+ Top 10 County	Text	Indication if the county ranked in the top 10 for coal mined any time 1999 or later.

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Sheet: *Prices*		
Column Name	**Type**	**Description**
County	Text	Name of the West Virginia county.
Region	Text	Region where the county is located.
1999	Currency	Per-ton price of coal sold in 1999.
2004	Currency	Per-ton price of coal sold in 2004.
2009	Currency	Per-ton price of coal sold in 2009.
2014	Currency	Per-ton price of coal sold in 2014.
2019	Currency	Per-ton price of coal sold in 2019.
Average Price	Currency	Average of coal prices during the period 1999-2019.
Inflation-Adjusted 1999	Currency	Empty column.
2019 Rank	Number	Rank of coal prices in 2014.
2019 Rank Class	Text	Indication of the county's coal prices are in the top, middle, or bottom third.
Coal Pricing	Text	Relative indication of coal prices in 2019.

Sheet: *Total Values*		
Column Name	**Type**	**Description**
County	Text	Name of the West Virginia county.
Region	Text	Region where the county is located.
1999	Currency	Total value of coal mined in 1999.
2004	Currency	Total value of coal mined in 2004.
2009	Currency	Total value of coal mined in 2009.
2014	Currency	Total value of coal mined in 2014.
2019	Currency	Total value of coal mined in 2019.
Coal Pricing	Text	Empty column.
2014-2019 Change	Text	Indication if the total value increased between 2014 and 2019.
Sparkline	Sparkline	Empty column.
County (Region)	Text	Empty column.

Sheet: *Forecasts*		
Column Name	**Type**	**Description**
Region	Text	Region where the county is located.
1999 Tons	Number	Tons of coal mined in the region in 1999.
2004 Tons	Number	Tons of coal mined in the region in 2004.
2009 Tons	Number	Tons of coal mined in the region in 2009.
2014 Tons	Number	Tons of coal mined in the region in 2014.
2019 Tons	Number	Tons of coal mined in the region in 2019.
2024 Tons	Number	Forecasted tons of coal mined in the region in 2024.
2024 Price	Currency	Forecasted per-ton price of coal in 2024, assuming 2.5% inflation from 2019.
2024 Total Coal Value	Currency	Forecasted total value of coal mined in 2024.

Sheet: *Analysis Questions*		
Column Name	**Type**	**Description**
Question Number	Text	Question being answered.
Response	Text	Response to the analysis question prompt.

2. Open the **mining_pppvt_wvmp.xlsx** workbook in Microsoft Excel.

Create a PivotTable

3. We wish to create a PivotTable to better understand the coal mining data.

    a. Create a new PivotTable based on the data in cells **A3** through **J58** of the *Coal Mined* sheet. Place the PivotTable on a new sheet named *Coal Mined PivotTable*.

    b. On the PivotTable, do the following:

        i. Add the 1999+ top 10 county indicator as a **Filters** field.

        ii. Add the region and then the county as **Rows** fields.

        iii. Add the 1999, 2004, 2009, 2014, and 2019 data as **Values** fields.

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

        i. There is nothing to do for this step. Please proceed to the next step.

        ii. Summarize the 1999, 2004, 2009, 2014, and 2019 values by summing them.

        iii. There is nothing to do for this step. Please proceed to the next step.

Group PivotTable data

4. We want to create another PivotTable to understand relative production between counties.

   a. Create a new PivotTable based on the data in cells **A3** through **J58** of the *Coal Mined* sheet. Place the PivotTable on a new sheet named *2019 Coal Mined PivotTable*.

   b. On the PivotTable, do the following:

      i. Add the 2019 data as a ***Rows*** field.

      ii. Add the county as a ***Values*** field.

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

      i. Group the 2019 data into sets of 2,000,000 starting at 0.

      ii. Summarize the counties by counting them.

      iii. There is nothing to do for this step. Please proceed to the next step.

Create a PivotChart and PivotTable

5. To better understand the total values data, we wish to create a PivotChart with an associated PivotTable.

   a. Create a new PivotChart and PivotTable based on the data in cells **A3** through **K58** of the *Total Values* sheet. Place the PivotTable on a new sheet named *Total Values PivotTable* and move the PivotChart to a new sheet named *Total Values PivotChart*.

   b. On the PivotTable, do the following:

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

      ii. Add the 1999, 2009, and 2019 data as ***Values*** fields.

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

      i. There is nothing to do for this step. Please proceed to the next step.

      ii. Summarize the 1999, 2009, and 2019 values by summing them.

      iii. Format the cells as indicated below:

         (1) **1999**, **2009**, and **2019** columns: currency with no decimal places

   d. We need to perform some formatting on the PivotChart.

      i. Ensure the chart is a 2-D clustered column chart.

      ii. Specify appropriate chart and axis titles.

Update the PivotTable data

6. We will now update the coal mined PivotTable after making some changes to the source data.

    a. On the *Coal Mined* sheet, enter text in the cell as indicated below:

        i. **C5**: 150000

    b. Refresh the *Coal Mined PivotTable* sheet PivotTable.

    c. Undo your change. On the *Coal Mined* sheet, enter text in the cell as indicated below:

        i. **C5**: 0

    d. Refresh the *Coal Mined PivotTable* sheet PivotTable.

7. Starting in row **2** of the *Analysis Questions* sheet, answer the analysis question below. Respond to one question per row.

    c. Between 1950 and 2010, coal mine employment in West Virginia fell from 113,861 to 14,507 yet the amount of coal produced went up. How can this be the case?

Grading Rubric

This assignment is worth 8 points. It will be graded by your instructor using this rubric:

Standard	Meets Requirements (8 points)	Does Not Meet Requirements (0 points)
Student made reasonable effort in correctly completing assignment.	Assignment is at least 70% complete and correct, or student contacted instructor for help on incorrect or incomplete items.	Assignment is less than 70% complete and correct, and student did not contact instructor for assistance on incorrect or incomplete items.

This rubric will be used for peer evaluation of this assignment:

Standard	Excellent	Satisfactory	Needs Improvement
Assignment is correct and complete.	Assignment is at least 90% complete and correct.	Assignment is 70%-89% complete and correct.	Assignment is less than 70% complete and correct.

The analysis question in Step 7c will be evaluated using this rubric:

Standard	Meets Requirements	Does Not Meet Requirements
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] "Historical & Statistical Data," *West Virginia Office of Miners' Health, Safety and Training*, May 18, 2021. Available: *https://minesafety.wv.gov/historical-statistical-data/*.

[2] "Annual Coal Report: Table 30," *Energy Information Administration*, Oct. 05, 2020. Available: *http://www.eia.gov/coal/annual/*.