Charts
WV Mining Problem

Topics

- Create and format a column chart
- Create and format a pie chart
- Create and format a line chart
- Use a trendline
- Insert a sparkline

Background Information

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

Instructions

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_ppc_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.

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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_ppc_wvmp.xlsx** workbook in Microsoft Excel.

Create and format a column chart

3. We want to compare the coal prices for each county in 2019. We will create a column chart to view the values side-by-side.

   a. Create a new 2-D clustered column chart based on the non-contiguous cell range of cells **A3** through **A58** and cells **G3** through **G58** of the *Prices* sheet. Position the chart at the bottom of the existing *Prices* sheet. Resize the column so it covers cells **A60** through **L80**.

   Specify appropriate chart and axis titles. Format the vertical (value) axis as currency with no decimal places. Ensure every label is displayed on the horizontal (category) axis.

Create and format a pie chart

4. We wish to visualize each county's share of total coal production in 2019. We will create a pie chart to view the relative values on a single chart.

   a. Create a new pie of pie chart based on the non-contiguous cell range of cells **A3** through **A58** and cells **G3** through **G58** of the *Coal Mined* sheet. Move the chart to a new chart-only sheet named *Coal Mined Chart*.

   Specify an appropriate chart title. Add data labels showing the category name and value. Turn off display of the legend. Display series with percentage values of less than 1% on the secondary pie.

Create and format a line chart

5. We wish to track the amount of coal mined over time. We will create a 2-D line chart to show the coal mined for each year.

    a. Create a line chart based on the non-contiguous cell range of cell **A3**, cells **C3** through **G3**, cell **A59**, and cells **C59** through **G59** of the *Coal Mined* sheet. Move the chart to a new chart-only sheet named *Coal Mined by Year Chart*.

    Ensure the years are shown as labels for the horizontal (category) axis, not plotted as chart data. Specify appropriate chart and axis titles. Add minor gridlines to the vertical (value) axis.

Use a trendline

    b. Add a trendline based on the total amount of coal mined. Use the trendline type that best fits the data and project the values forward 5 periods (through the year 2044). Display the **R-squared** value on the chart.

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

Insert a sparkline

6. We wish to add a sparkline to the *Total Values* sheet to compare coal mine production over time.

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

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

    b. How much coal being mined is predicted for 2044? Is this prediction reasonable?

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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 7b 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/*.