



# Homework #2 Help

## Grain Exports Problem

### Background Information

Agricultural exports are vital to America's economy and the balance of payments between the U.S. and other countries. It is important for the government to have a clear, consistent export policy which responds to the changing needs of the international market.



Non-U.S. production of grains has been growing rapidly over the past two decades. Production of corn alone has increased from 11 billion bushels in 1990 to an estimated 20.9 billion bushels for 2013. These rapid changes can have a significant impact on the agricultural sector of the American economy.

### Problem Statement

In this assignment, students will analyze statistics from the U.S. Department of Agriculture to determine the impact of grain supply on exports and on the national economy.

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### 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. **supply.csv** – Total supply by grain type in the U.S. between 2005 and 2015 [1], [2].

Column Name	Type	Description
<b>Grain Type</b>	Text	Type of grain.
<b>2005</b>	Number	Bushels of grain available in the U.S. in 2005.
<b>2007</b>	Number	Bushels of grain available in the U.S. in 2007.
<b>2009</b>	Number	Bushels of grain available in the U.S. in 2009.
<b>2011</b>	Number	Bushels of grain available in the U.S. in 2011.
<b>2013</b>	Number	Bushels of grain available in the U.S. in 2013.
<b>2015</b>	Number	Bushels of grain available in the U.S. in 2015.



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- b. **exports.csv** – Amount of grain exported from the U.S. between 2005 and 2015 [1], [2].

Column Name	Type	Description
<b>Grain Type</b>	Text	Type of grain.
<b>2005</b>	Number	Bushels of grain exported from the U.S. in 2005.
<b>2007</b>	Number	Bushels of grain exported from the U.S. in 2007.
<b>2009</b>	Number	Bushels of grain exported from the U.S. in 2009.
<b>2011</b>	Number	Bushels of grain exported from the U.S. in 2011.
<b>2013</b>	Number	Bushels of grain exported from the U.S. in 2013.
<b>2015</b>	Number	Bushels of grain exported from the U.S. in 2015.

- Create a new Microsoft Excel workbook named **lastname\_firstname\_hh2\_gep.xlsx**.
- We must adjust the sheets in our workbook.
  - Rename *Sheet1* to *Supply*.
  - Add a new sheet named *Exports*.
  - Add a new sheet named *Export Rates*.
  - Add a new sheet named *Analysis Questions*.
- Import the following items into the workbook:
  - supply.csv** file – Import starting in cell **A3** of the *Supply* sheet. The file is comma-delimited. Its first row contains headers.
  - exports.csv** file – Import starting in cell **A3** of the *Exports* sheet. The file is comma-delimited. Its first row contains headers.
- We wish to apply formatting to the *Supply* sheet.
  - We must setup a table to store data on grain supply.
    - If a table does not already exist in cells **A3** through **G10**, 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.
    - If a table already exists in cells **A3** through **G10**, format the table using a style of your choice other than the default table style.
  - We need to add additional table columns to store statistics and a sparkline.



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- i. Insert four new table columns to the right of existing column **G**.
  - c. Enter text in the cells as indicated below:
    - i. **A1**: Total Supply (in Bushels)
    - ii. **H3**: Minimum Value
    - iii. **I3**: Maximum Value
    - iv. **J3**: Supply 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 **I10**: number with no decimal places, use 1000 separator
  - g. AutoFit the width of columns **A** through **K**.
  - h. Apply *Green-Yellow-Red* color scale conditional formatting to cells **B4** through **G10**.
6. We also wish to apply formatting to the *Exports* sheet.
  - a. We must setup a table to store data on exports.
    - i. If a table does not already exist in cells **A3** through **G10**, 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 **G10**, 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**: Exports (in Bushels)
  - 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 **G10**: 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 *Export Rates* sheet.
  - a. Enter text in the below cells as indicated:



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- i. **A1**: Export Rates
  - ii. **A3**: Grain Type
  - iii. **B3**: 2005
  - iv. **C3**: 2007
  - v. **D3**: 2009
  - vi. **E3**: 2011
  - vii. **F3**: 2013
  - viii. **G3**: 2015
  - ix. **A4**: Barley
  - x. **A5**: Corn
  - xi. **A6**: Oats
  - xii. **A7**: Rice
  - xiii. **A8**: Sorghum
  - xiv. **A9**: Soybeans
  - xv. **A10**: Wheat
- b. Merge (but not center) cells **A1** through **G1**.
  - c. Apply the *Title* cell style to cell **A1**.
  - d. Format cells **A3** through **G10** as a table using a style of your choice. The table has headers.
8. On the *Export Rates* sheet, we wish to calculate export statistics.
- a. In column **B**, write a formula to calculate for each grain type the percentage of grain that was exported. Reference the values on the *Supply* and *Exports* sheets in your formula.
- You can calculate the export rate using the formula:
- $$\frac{[Exports\ for\ Year\ and\ Grain\ Type]}{[Supply\ for\ Year\ and\ Grain\ Type]}$$
- b. In columns **C** through **G**, duplicate your export rate formula from column **B**.
9. We must apply additional formatting to the *Export Rates* sheet.
- a. Format the cells as indicated below:
    - i. **B4** through **G10**: percentage with 1 decimal place
  - b. AutoFit the width of columns **A** through **G**.



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10. On the *Supply* sheet, we wish to calculate supply statistics.
- In column **H**, write a formula to calculate the minimum supply of each grain type.
  - In column **I**, write a formula to calculate the maximum supply of each grain type.
  - In column **J**, write a formula to determine if the grain type's 2015 supply was more than its 2005 supply. If it was, display *Increasing*; otherwise, display *Not Increasing*.

11. We wish to add a sparkline to the *Supply* 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 export rate for each year and grain type.
- Create a 2-D line chart based on cells **A3** through **G10** of the *Export Rates* sheet. Move the chart to a new sheet named *Export Rates 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 a trendline based on the export rate of corn. Use the trendline type that best fits the data and project the values forward 5 periods (through the year 2025). 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.
- Enter text in the cells as indicated below:
    - A1:** Question Number
    - B1:** Response
  - Bold the contents of row **1**.
  - AutoFit the width of column **A**. Set the width of column **B** to 100 (8.39").
  - Set the height for rows **2** through **5** to 110 (1.53").
  - Change the vertical alignment setting for columns **A** and **B** so that text is displayed at the top of each row.
  - 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.



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- Which trendline type did you use on *Export Rates Chart*? Why did you choose this type of trendline?
- Corn makes up the largest share of the U.S. grain supply. Why do you think this might be?
- The supply of corn can vary by hundreds of millions of bushels from year to year. Why might there be this great variance?
- Why are agricultural exports important to the economy?
- In recent years, the US has imported about twice as much barley as it has exported. Why might there be both imports and exports of the same grain?

## 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. Department of Agriculture [3].



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### References

- [1] "Feed Grains: Yearbook Tables." Available: <http://www.ers.usda.gov/data-products/feed-grains-database/feed-grains-yearbook-tables.aspx>.
- [2] "Agricultural Baseline Database," USDA ERS. Available: <https://www.ers.usda.gov/data-products/agricultural-baseline-database/>.
- [3] U.S. Department of Agriculture, *Wheat harvest on the Palouse, Idaho, USA*. 2004. Available: [https://commons.wikimedia.org/wiki/File:Wheat\\_harvest.jpg](https://commons.wikimedia.org/wiki/File:Wheat_harvest.jpg).