

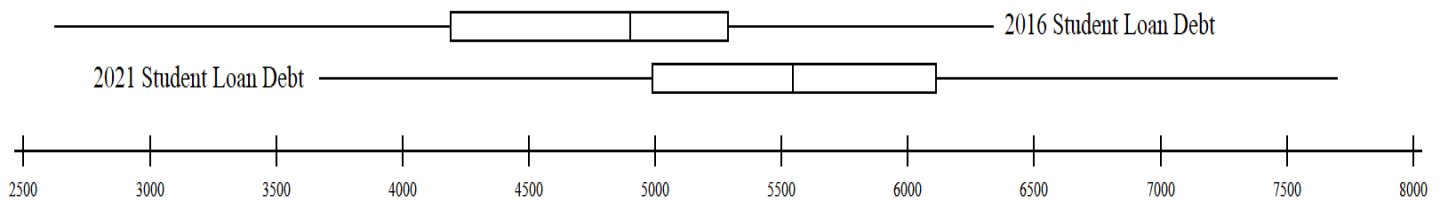
Name:

APPLICATION: Analyzing Debt

Level 1

Comparing Student Loan Debt

The box plots below use the data on state average student loan debt for all 50 US states from 2016 and 2021. Use it to answer the questions that follow.



Source: [CMD Data Bank](#)

1. What was the approximate maximum average student loan debt in 2016?
2. Estimate how much the median student loan debt increased from 2016 to 2021?
3. What is the approximate interquartile range of each set of data? Draw a conclusion about what this means about student loan borrowers in 2016 and 2021.
4. What percentage of states had an average of more than \$5,000 in student loan debt in 2021?
5. How many states are represented by the box portion of each diagram?
6. Fill in the blank: The top 25% of borrowers in 2016 had between \$_____ and \$_____ debt.

Level 2

Comparing Mortgage Debt

Kalina is working for a real estate firm in New Jersey and has been given the task of gathering data about outstanding mortgage balances in two neighborhoods that her firm sells in. She sends out surveys to home owners and receives the following data:

Nicetown	Coolsville
13336	211279
368679	525651
491570	78542
410208	432678
586586	511257
398242	228967
722276	385687
638631	116159
108303	480825
218494	295517
547427	500122
609104	367101
27916	328739
136531	305905
147629	157197
298937	562500

1. Follow the steps to use eGood Calculators' [Box Plot Maker](#) to generate box plots for the data.
 - a. Change the Y-Axis Title to Total Outstanding Mortgage
 - b. Copy and paste Nicetown's data in the Group 1 box
 - i. Double check that there are no blank lines at the end of your data. The calculator will count these as 0. You can also verify by checking the Minimum of your data table.
 - c. Copy and paste Coolsville's data in the Group 2 box
 - i. Double check that there are no blank lines at the end of your data. The calculator will count these as 0. You can also verify by checking the Minimum of your data table.
 - d. Click the Delete Group button to remove the Group 3 box
 - e. Click the Draw button

- 2. What is the interquartile range of each city's data?**

- 3. Explain what the difference in interquartile range between the cities says about the mortgage debt in each city.**

- 4. For each statement, fill in the blank:**
 - a. 50% of survey respondents from Coolsville have an outstanding mortgage less than \$_____

 - b. _____% of Nicetown residents have a mortgage balance greater than \$485,649.

- 5. Kalina needs to summarize this data for her boss. What are some key points that she can pull from the box plots that summarize the mortgage debt situation in each city.**

Level 3

Using Spreadsheets to Build a Box Plot

Elsie works for an auto dealership's finance department. For an annual meeting, she is going to present information about changes to the cost of new and used cars sold in 2022 compared to 2019. She gathered a sample of 50 data points for each category and entered them into [this spreadsheet](#).

1. Use this template to create your own version of spreadsheet and paste a link to the spreadsheet below. Be sure your sharing permissions allow your teacher to view it.
2. Complete the spreadsheet table by inserting formulas to find the minimum, maximum, median, and quartile values for each category using the reference below. Replace START and END with appropriate cell values for each category.

Calculation	Formula
Minimum Value	=MIN(START:END)
Maximum Value	=MAX(START:END)
Median	=MEDIAN(START: END)
Lower Quartile	=QUARTILE(START: END, 1)
Upper Quartile	=QUARTILE(START: END, 3)

3. Create stacked box plots (called candlestick charts in Sheets) for each column of data following the steps below. You can also use the animation as a reference.

Step 1: Click and drag to highlight all 4 rows of data

Step 2: On the top menu bar click Insert > Chart

Step 3: Under the Chart Editor, click Chart Type and change it to Candlestick Chart

Step 4: Uncheck the bottom two options "Switch rows / columns" and "Use row 2 as header"

Step 5: Change the title on the graph to an appropriate title for the data

Make a Box Plot ☆ 📁 ☁

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A2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1		Minimum Value	Lower Quartile	Median	Upper Quartile	Maximum Value									
2	Data A	\$200.00	\$250.00	\$300.00	\$400.00	\$450.00									
3	Data B	\$250.00	\$300.00	\$350.00	\$450.00	\$500.00									
4	Data C	\$300.00	\$450.00	\$475.00	\$500.00	\$550.00									
5	Data D	\$350.00	\$425.00	\$450.00	\$550.00	\$600.00									
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- Elsie needs to make a summary slide for her presentation. Use the box plot and table to write at least three statements that summarize the data. You can compare new cars to used cars in the same year or compare changes from 2019 to 2022.
- Elsie's boss wants her to also include predictions about the price of new and used cars three years from now. What are some reasonable predictions that Elsie could share in her presentation?