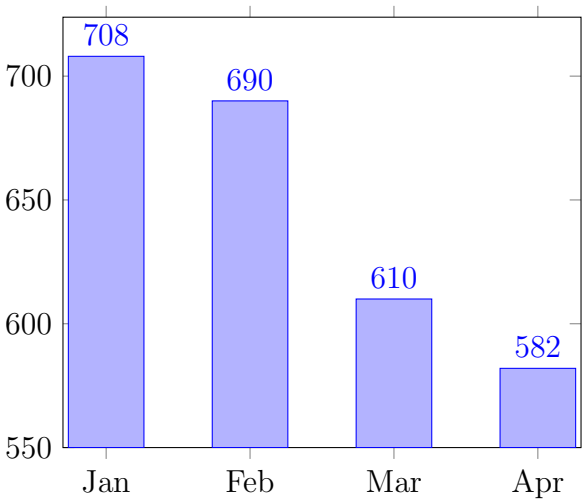
How Can Data Be Misrepresented?

Qualitative Data

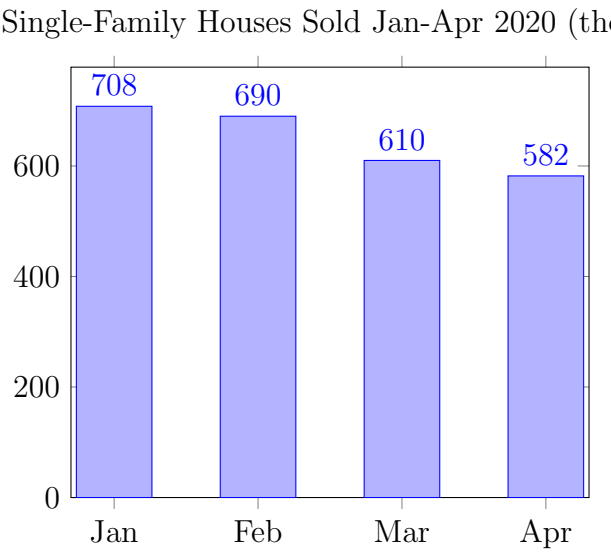
It is not uncommon for data to be used to misinform or mislead. We'll explore some ways graphs can be used to misrepresent data and some ways to identify when that happens.

Example 1.1. The seasonally adjusted annual rate for new single-family houses sold in the United States (in thousands) between January 2020 and April 2020 is shown in the bar graph below.



Discuss why this bar graph might be misleading.

Example 1.2. The same data from the previous example is graphed again below.



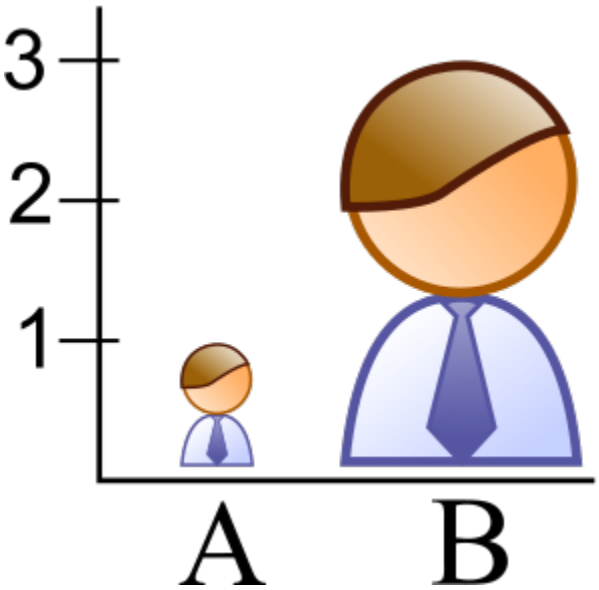
What is different about this graph than the previous one? In what ways might it be a better representation of the data?

Common Ways to Mislead Using Graphs

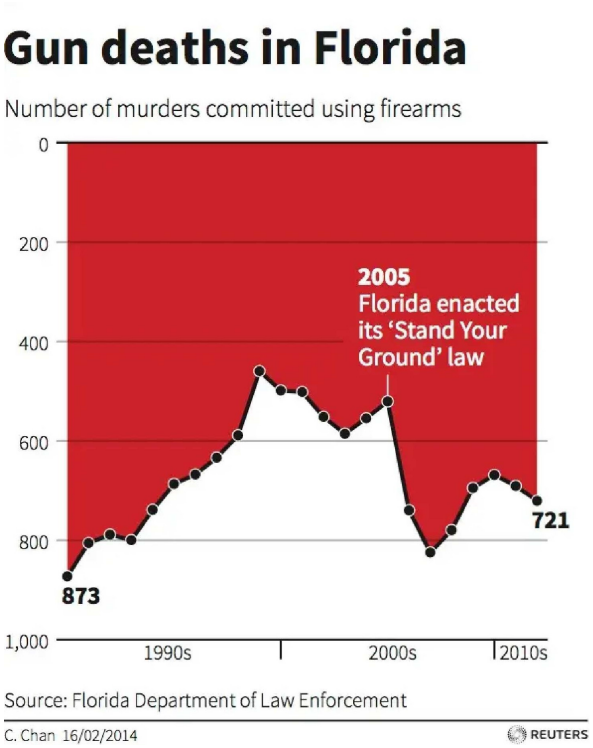
- Adjusting $y-$axis
- Using the wrong graphic
- Poor scaling or labeling
- Cherry picking

Example 1.3. Why would a pie chart be inappropriate for displaying the new home sales data?

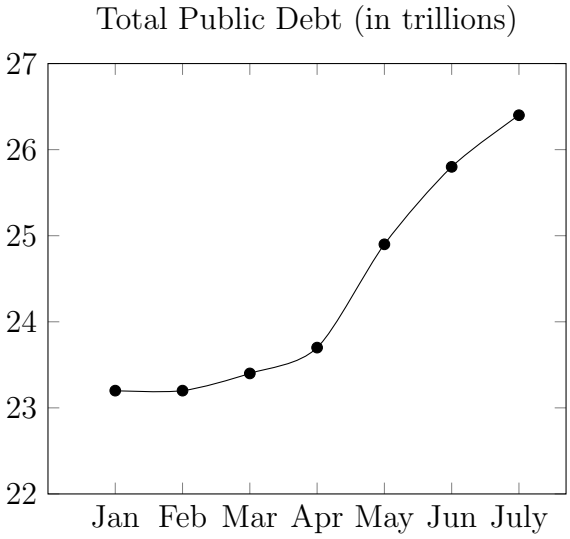
Example 1.4. Describe why the graph below might be considered misleading.



Example 1.5. Discuss your thoughts about the graphic below with one or two people near you. What do you notice? What do you believe is missing?



Example 1.6. The graph below shows the total amount of debt (in trillions) held by the US government between January and July 2020.



Do you think that the graph gives an accurate picture of the rise of national debt? Why or why not?