

Session 3: Post Class Test Solutions

1. c. When the data is negatively skewed, i.e., when large outliers are more likely to be much lower than the average. The big negative outliers will pull down the average, but the median will remain unaffected.
2.
 - a. When neither the highest nor the lowest values are extreme outliers, i.e., there are other observations close to these.
 - b. When either the highest or the lowest value is an extreme outlier, the range fails as a measure of dispersion, since it does not reflect most of the sample data.
 - c. Using the range between the first decile and the ninth decile, or the first and third quartile, may give a more comprehensive measure of true dispersion.
3.
 - a. Variance/standard deviation have the most informative value when a distribution is symmetric and does not have extreme outliers (fat tails). There is a reason why they are so often linked to the normal distribution.
 - b. As data distributions become skewed and have fatter tails, variance/standard deviation becomes a less informative measure of dispersion.
 - c. Use data transformations (take the natural log, square root etc.) to reduce asymmetry and fat tails. If that does not work, report the skewness and kurtosis with the standard deviation.
4. b. Data has a lower bound but has no upper bounds. Since this data can have only extreme positive outliers, the data is likely (though not guaranteed) to be positively skewed.
5. False. While variance and kurtosis often go together, you can have cases where they do not.