Session 3: Post Class Test

1. The mean and median are both measures of location that describe the central value around which the data in a sample is distributed. The mean is the average of the observations in a sample, and the median represents the 50^{th} percentile of the data. Under which of the following conditions will the average for a sample be less than the median?
    a. When the data is symmetrically distributed
    b. When the data is positively skewed, i.e., when large outliers are more likely to be much higher than the average.
    c. When the data is negatively skewed, i.e., when large outliers are more likely to be much lower than the average.
    d. When the data has fat tails
    e. When the data is bounded
2. The range is the difference between the highest and lowest values in a sample and is used as a measure of dispersion.
    a. When is it a good measure of dispersion?
    b. When is it a misleading measure of dispersion?
    c. What can you do to make it more informative?
3. The variance and standard deviation are computed by summing the squared deviations of individual observations from the mean.
    a. When are variance/standard deviation good measures of dispersion?
    b. When are variance/standard deviation misleading measures of dispersion?
    c. What can you do to make them more informative?
4. The skewness measures how sample observations fall around the average. It is linked to whether there are bounds (either upper or lower) on the data. Under which of the following conditions are you most likely to see positive skewness?
    a. Data has both upper and lower bounds
    b. Data has a lower bound but has no upper bounds
    c. Data has an upper bond but has no lower bonds
    d. Data has no bounds
5. The kurtosis measures the how big outliers in a sample are, on either side of the distribution. Since these outliers also have greater squared distances from the average, higher kurtosis and higher variance always go hand in hand.
    a. True
    b. False