Statistics

[Enter name of student here]

[Enter name of institution here]

**Answer to Problem**

           There are three columns in this problem, two of them show qualitative data, while one shows quantitative data. For qualitative data sets, we will use mode as a measure of central tendency. A mode is a data point that occurs the most number of times in a data set (Runnenburg, 1978). In wind direction, Southwest has occurred four times and is the mode for data. Data provided under pavement variable has two modes because dry and wet are recorded three times each. This kind of data is called bi-modal data.

           There is only one numeric set of data in a given question, which includes temperature. The most appropriate measure of central tendency to use with this variable is arithmetic mean (Zawojewski & Shaughnessy, 2000). This measure will help us to compare the daily values to a single numerical value. We can calculate the average by adding all the values and dividing the sum by a number of values. The average temperature value for eight cities will come out at 91. This data has strong central tendency because values lie very close to the mean value (S.Manikandan, 2011).

**Chapter Assessment**

           Measures of central tendency are used to find central value in any given set of data. However, this does not mean that we can analyze two sets of data based on central values. All the values tend to move towards center of the data and extent to which this movement happens is measured by measures of central tendency. The first measure of central tendency is arithmetic mean, which can be separately calculated for population and sample. There are certain properties of arithmetic mean, which make it the strongest type of average. The major property is that sum of deviations from mean is zero and sum of squared deviations from mean is minimum. Mean is affected by extreme values and data having such values should not be analyzed using mean.

           Median is the central value of the data that divides it into two equal halves. Mode is the most repeated value in any set of data. All these measures help us to determine the central value of the data, but they do not let us know about the variability in any set of data.

For analyzing variability, standard deviation or variance are the major measures. Although mean is always in the center of a data set, but there is a possibility that the curve representing data has a tail on left or right side. This tilt is depicted with help of skewness. Data can be positively or negatively skewed depending on which side has a long tail. Another relevant measure is kurtosis that helps to ascertain the flatness of the data curve (A.Ayadi, Cao, Lazrak, & Wang, 2019). All these measures add meaning to data analysis (Jondeau, Zhang, & Zhu, 2019). Range is the difference between maximum and minimum values of a data set. Mean deviation is the absolute value of difference between data values and the respective mean.

Grouped data is formed by assigning individual values to designated groups. Mean for grouped data is calculated in three steps. Frequencies are multiplied by midpoints, and resulting column is summed. This sum is divided by total of frequency to get the mean value of data. Grouped data gives more meaningful values to be interpreted.

The major ethical issue that can arise while handling statistics is data manipulation. Any employee from a company can alter the data to show results which are better than original results. This may be done to increase commission for himself. The solution to this problem lies in applying appropriate data security measures and authorizing only one person to handle data.

# **References**

A.Ayadi, M., Cao, X., Lazrak, S., & Wang, Y. (2019). Do idiosyncratic skewness and kurtosis really matter? *The North American Journal of Economics and Finance*.

Jondeau, E., Zhang, Q., & Zhu, X. (2019). Average skewness matters. *Journal of Financial Economics*, 29-47.

Runnenburg, J. (1978). Mean,Median,Mode. *Statistica Neerlandica*.

S.Manikandan. (2011). Measures of central tendency: Median and mode. *Journal of Pharmacology and Pharmacotherapeutics*, 214-215.

Zawojewski, J. S., & Shaughnessy, J. (2000). Mean and median: Are they really so easy? *Mathematics Teaching in the Middle School*, 436-440.