APPLIED BUSINESS ANALYTICS

2024-25, Spring Semester

Exercises to Practice – Week 2

1. **(Conceptual Question)** Does it make sense to construct a histogram for the state of residence of randomly selected individuals in a sample? Explain why or why not.

2. **(Conceptual Question)** Suppose that the histogram of a given income distribution is positively skewed. What does this fact imply about the relationship between the mean and median of this distribution?

3. **(Conceptual Question)** Explain why the standard deviation would likely not be a reliable measure of variability for a distribution of data that includes at least one extreme outlier.

4. The Wall Street Journal CEO Compensation Study analysed CEO pay from many U.S. companies with fiscal year 2008 revenue of at least $5 billion that filed their proxy statements between October 2008 and March 2009. The data are in the file **CEO.csv**. The file contains the following information:

	Description
Company Name	
Company Type	To which activity sector does the company belong?
Executive Name	Name of CEO as it appears in the company proxy statement.
Salary 2008	Base salary earned in fiscal 2008.
Bonus 2008	Annual bonus earned in fiscal 2008.

   a. Create **boxplots** to gain a clearer understanding of the distributions of annual base salaries and bonuses earned by the surveyed CEOs in fiscal 2008. How would you characterize these charts?

   b. Find the annual salary **below which 75% of all** given CEO salaries fall.

   c. Find the annual bonus **above which 55% of all** given CEO bonuses fall.

   d. Determine the **range of the middle 50%** of all given total direct compensation figures. For the 50% of the executives that do not fall into this middle 50% range, is there more variability in total direct compensation to the right than to the left? Explain.

5. The file **Stock.csv** contains monthly closing price, adjusted for dividends and stock splits, of American Express stock for several years.
   a. **Add a new variable** to the dataset: "return." Each "return" represents the percentage change in the adjusted closing price from one month to the next.

   b. Do monthly stock returns appear to be **skewed or symmetric**? On **average,** do they tend to be positive, negative, or zero?