Learning Goals

- Identify and explain key features used to describe a distribution: center, spread, and shape.
- Distinguish between symmetric, left-skewed, and right-skewed distributions using visual and numerical cues.
- Calculate and interpret quartiles, percentiles, and the interquartile range (IQR).
- Compute and interpret measures of spread such as range, variance, and standard deviation.
- Describe how skew affects the relationship between the mean and median.
- Summarize and communicate the overall distribution of a dataset using numerical summaries and visual displays.

Key Terms

Define each term in your own words and include a short example when possible.

- Symmetric Distribution:
- Quartile Analysis:
- Trimmed Mean:
- Weighted Mean:
- Inter-Quartile Range:
- Z-Score:
- Skew:
- Kurtosis:
- Outlier:

Key Concepts

1. If we have a positively (right) skewed distribution, how are the mean, median, and mode related?

2. If we have a positively skewed distribution (meaning outliers might be present on the right), how will the trimmed mean compare to the mean?

3. If the left-half of a dataset is spread out over 10 values, and the right-half of a dataset is spread out over 20 values, how does the symmetry of the dataset look?

4. When is it more appropriate to use the median instead of the mean to describe the center of a dataset?

5. How does the interquartile range (IQR) differ from the total range of a dataset?

6. If two datasets have the same mean but different spreads, how would their histograms look different?

7. How does skew affect the interpretation of variability and outliers?

8. How can a boxplot help us visually identify skewness or outliers in a dataset?