# Tutorial 1: Questions

January 17, 2018

## Review of Key Terms

- unimodal, bimodal
- symmetric, right-skew/positive skew, left-skew/negative skew,
- range, fourth spread (IQR), mild/extreme outliers
- trimmed mean

## Question 1.3.33, Page 34

Consider the following dataset of home sale amounts in 1000s of $:

| | | | | |
|---|---|---|---|---|
| 590 | 815 | 575 | 608 | 350 |
| 1285 | 408 | 540 | 555 | 679 |

(a) Calculate and interpret the sample mean and median.

(b) Suppose the 6th observation had been 985 rather than 1285. How would the mean and median change?

(c) Calculate a 20% trimmed mean by first trimming the two smallest and two largest observations.

(d) Calculate a 15% trimmed mean.

## Question 1.S.78, Page 50

Consider a sample $x_1, x_2, ..., x_n$ and suppose that the values of $\overline{x}$, $s^2$, and $s$ have been calculated.

(a) Let $y_i = x_i - \overline{x}$ for $i = 1, 2, ..., n$. How do the values of $s^2$ and $s$ for the $y_i$s compare to the corresponding values for the $x_i$s? Explain.

(b) Let $z_i = (x_i - \overline{x})/s$ for $i = 1, 2, ..., n$. What are the values of the sample variance and sample standard deviation for the $z_i$s?

Bonus: Show that the sample variance, $s^2$, can be calculated using either

$$\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \overline{x})^2 \quad \text{or} \quad \frac{1}{n-1}\left(\sum_{i=1}^{n} {x_i}^2 - n\overline{x}^2\right).$$