

**HOMEWORK 1**  
**ELEMENTARY STATISTICS & INFERENCE (STAT:1020; BOGNAR)**

Do your homework on notebook paper. You will submit using the Gradescope application.

1. Textbook 1.23 (a), (b)
2. Textbook 1.25
3. Textbook 1.28
4. Textbook 1.32 (a), (b), (c), (d)
5. A researcher determined the weight (in pounds) of 9 first-grade children. The data is listed below.

41, 52, 41, 46, 48, 56, 44, 51, 68

- (a) Determine the 5–number summary.
  - (b) Compute the inter-quartile range (IQR).
  - (c) Draw a histogram with 6 bins. *Make each bin 5 units wide; let the first bin be [40, 45).*
  - (d) Describe the *shape* of the distribution in terms of skewness/symmetry.
  - (e) Draw a boxplot.
  - (f) Draw a stem-and-leaf plot. *To create enough stems, split the 40's stem into two pieces:  $4^l$  will be the stem for 40 through 44 and  $4^h$  will be the stem for 45 through 49. Split the other stems similarly.*
  - (g) Compare the shape of the histogram to the stem-and-leaf plot.
6. Consider the following stem-and-leaf plot (note: the largest number in the dataset is 122).

```
stem | leaves
  8  | 2299
  9  | 12477
 10  |
 11  |
 12  | 2
```

- (a) Does the dataset contain any outliers? If so, which data point(s) is an outlier?
- (b) Determine the 5–number summary.
- (c) Compute the range and interquartile range (IQR).
- (d) Construct a boxplot for this dataset.
- (e) For this dataset, should centrality be described using the sample mean  $\bar{x}$  or sample median  $Q_2$ ? Why?
- (f) Is this dataset skewed to the left, skewed to the right, or symmetric?
- (g) Based upon your answer in (6f), do you expect the sample mean  $\bar{x}$  to be greater than or less than the sample median  $Q_2$ ? Why?
- (h) Verify your intuition in part (6g): compute the sample mean  $\bar{x}$  and compare to the sample median  $Q_2$ .