Exercise I- Descriptive Statistics

1. The following data represent the scores of 40 students on a college qualification test

   162 171 138 145 144 126 145 162 174 178
   167 98 161 152 182 136 165 137 133 143
   184 166 115 115 95 190 119 144 176 135
   194 147 160 158 178 162 131 106 157 154

   a) Make a stem-and-leaf display
   b) Calculate the sample mean
   c) Find the median.
   d) Find first quartile, and third quartile
   e) Calculate interquartile range

2. A zoologist collected wild lizards. Thirty lizards from the genus *Phrynosoma* were placed on a treadmill and their speed measured. The recorded speed (meters/second) is the fastest time to run a half meter.

   1.28 1.36 1.24 2.47 1.94 2.52 2.67 1.29
   1.56 2.66 2.17 1.57 2.10 2.54 1.63 2.11
   2.57 1.72 0.76 1.02 1.78 0.50 1.49 1.57
   1.04 1.92 1.55 1.78 1.70 1.20

   a) Construct a frequency distribution using the class intervals 0.45–0.90, 0.90–1.35, and so on, with the endpoint convention that the left endpoint is included and the right endpoint is excluded. Calculate the relative frequencies.
   b) Make a histogram.
   c) Find the sample median, first quartile, and third quartile.
   d) Find the sample 90th percentile.

3. Loss of calcium is a serious problem for older women. To investigate the amount of loss, a researcher measured the initial amount of bone mineral content in the radius bone of the dominant hand of elderly women and then the amount remaining after one year. The differences, representing the loss of bone mineral content, are given in the following table

   8 7 13 3 6
   4 8 6 3 4
   0 1 11 7 1
   8 6 12 13 10
   9 11 3 2 9
   7 1 16 3 2
   10 2 15 5 8
   17 8 2 5 5

a) Calculate $\bar{x}$ and s

b) Does the sample mean or the median give a better indication of the amount of mineral loss?

c) Find the proportion of the observations that are in the intervals $\bar{x} \pm s$, $\bar{x} \pm 2s$, $\bar{x} \pm 3s$.

d) Compare the results of part (c) with the empirical guidelines.