Exercise 3B.1

Answer the following questions:

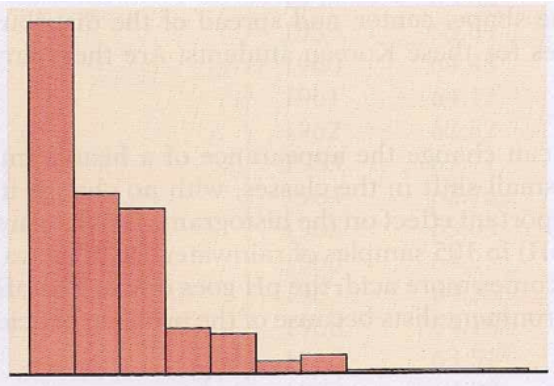
(a) What kind of data is best summarized by a histogram?

ANSWER: discrete and continuous

(b) What kind of data can be summarized by bar charts?

ANSWER: nominal and ordinal

(c) Are the data shown in the histogram below symmetric, right skewed, left skewed, or none of those?



ANSWER: right skewed

(d) For the histogram above, which would we expect to be larger – the mean or the median?

ANSWER: mean, since for right-skewed data the mean $>$ median

Exercise 3B.2

A small sample of undergraduate students was randomly selected from a chemistry course. Their GPAs were recorded and are shown below. Use these data to calculate the requested summary measures.

GPAs: 3.08, 2.5, 3.33, 3.75, 3.1, 2.64

(a) Mean

ANSWER: 3.07

$$\bar{x} = \frac{3.08 + 2.5 + 3.33 + 3.75 + 3.1 + 2.64}{6} = \frac{18.4}{6} = 3.07$$

(b) Median

ANSWER: 3.09

Sort data values: 2.5, 2.64, 3.08, 3.1, 3.33, 3.75

Even number of values (6) so the median is the average of the middle two: $\frac{3.08 + 3.1}{2} = 3.09$

(c) Geometric mean

ANSWER: 3.04

Log-transform (natural log being used here):

{ln(3.08), ln(2.5), ln(3.33), ln(3.75), ln(3.1), ln(2.64)} = {1.125, 0.916, 1.203, 1.322, 1.131, 0.971}

Take (arithmetic) mean of these values: $\frac{1.125 + 0.916 + \cdots + 0.971}{6} = \frac{6.668}{6} = 1.111$

Back-transform: $e^{1.111} = 3.04$