1. **Problem**

   Please make a frequency table and a dot plot from the following (unsorted) data.

 | | | | | | |
   |----|----|----|----|----|----|
   | 57 | 52 | 58 | 54 | 58 | 55 |
   | 55 | 51 | 52 | 57 | 52 | 52 |
   | 57 | 55 | 52 | 58 | 53 | 55 |
   | 55 | 58 | 52 | 53 | 57 | 55 |

2. **Problem**

A continuous random variable was measured 100 times. The resulting frequency distribution is shown below.

class	frequency
15–15.5	14
15.5–16	29
16–16.5	20
16.5–17	14
17–17.5	12
17.5–18	6
18–18.5	2
18.5–19	1
19–19.5	2

(a) Describe the overall shape of the distribution. (symmetric mound, skew left, skew right, uniform, or bimodal)

(b) Estimate the range of the distribution (range = max-min).

(c) What percent of the measurements are less than 18?

(d) What percent of the measurements are less than 15.5?

(e) What percent of the measurements are between 15.5 and 18?

(f) What percent of the measurements are within 0.25 of 16.25? In other words, what percent of measurements satisfy $|x - 16.25| \leq 0.25$?

(g) Of the measurements less than 18, what percent are less than 15.5?

(h) Estimate the value of the 77th percentile. In other words, determine a value such that 77% of the measurements are less than or equal to it.

3. **Problem**
   A continuous random variable was measured 500 times. The resulting histogram is shown below.

Histogram of data
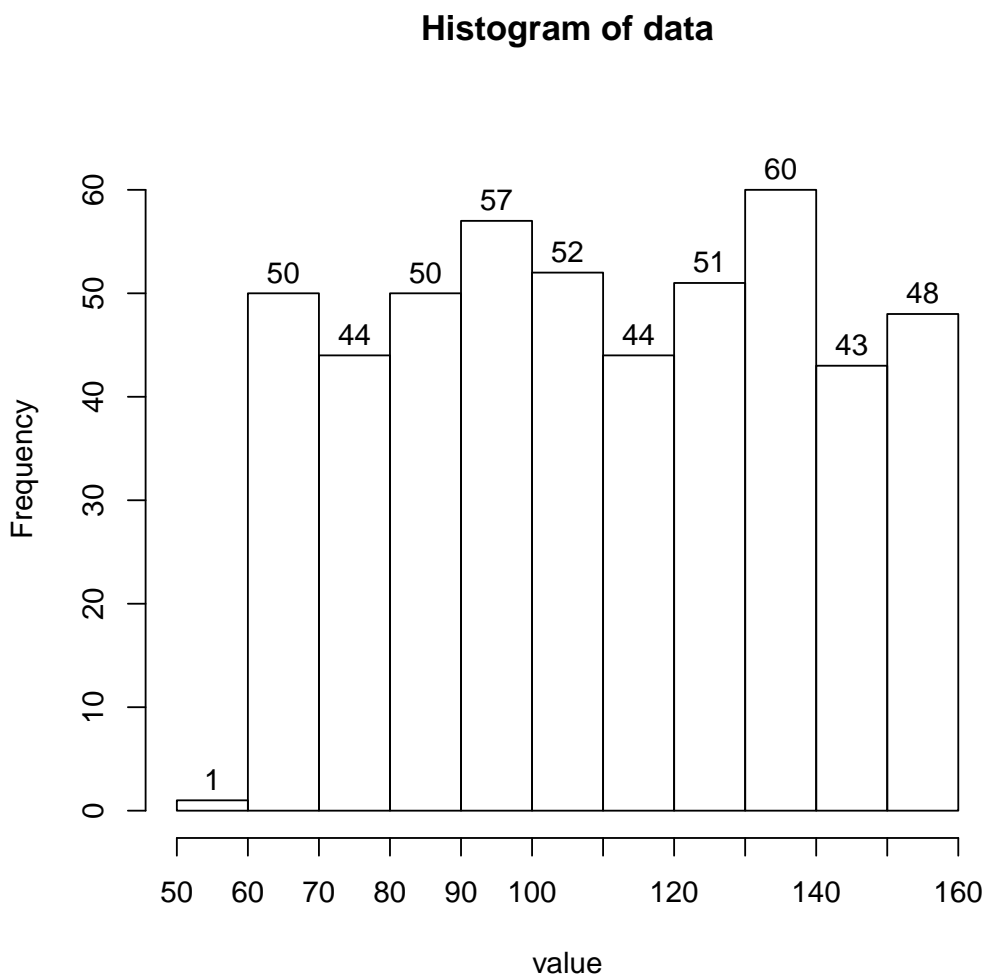
.image

(a) Describe the overall shape of the distribution. (symmetric mound, skew left, skew right, uniform, or bimodal)

(b) Estimate the range of the distribution (range = max-min).

(c) What percent of the measurements are greater than 70?

(d) What percent of the measurements are greater than 110?

(e) What percent of the measurements are between 70 and 110?

(f) What percent of the measurements are within 5 from 115? In other words, what percent of measurements satisfy $|x - 115| \leq 5$?

(g) Of the measurements greater than 70, what percent are greater than 110?

(h) Estimate the value of the 69.8th percentile. In other words, determine a value such that 69.8% of the measurements are less than or equal to it.

4. **Problem**

A continuous random variable X was measured 40 times. The sorted measurements are shown below.

80.04	80.14	80.18	80.19	80.19	80.19	80.2	80.37	80.57	80.57
80.59	80.65	80.67	80.71	81.17	81.2	81.22	81.26	81.39	81.42
81.56	81.63	81.64	81.8	81.81	82.37	82.45	82.46	82.58	83
83.45	83.47	83.5	83.88	84.64	84.83	85.42	86.99	86.99	88.13

The total of the measurements is 3285.52.

(a) Determine the percentile rank of the measurement 83. In other words, determine what percent of data are less than or equal to 83.

(b) Determine the measurement corresponding to a percentile rank of 0.125. In other words, determine x such that 12.5% of the data are less than or equal to x.

(c) Determine the mean of the measurements.

(d) Determine the median of the measurements.

5. **Problem**

Three random variables (F, G, and H) were measured 1000 times each. The resulting histograms show the three distributions.

Random Variable F

Random Variable G

Random Variable H
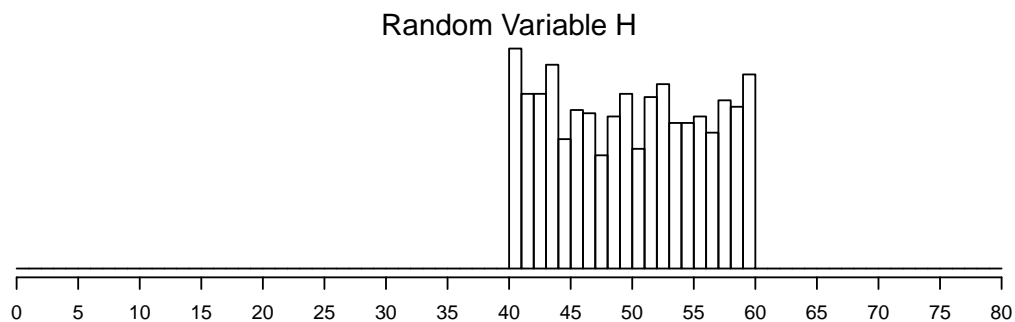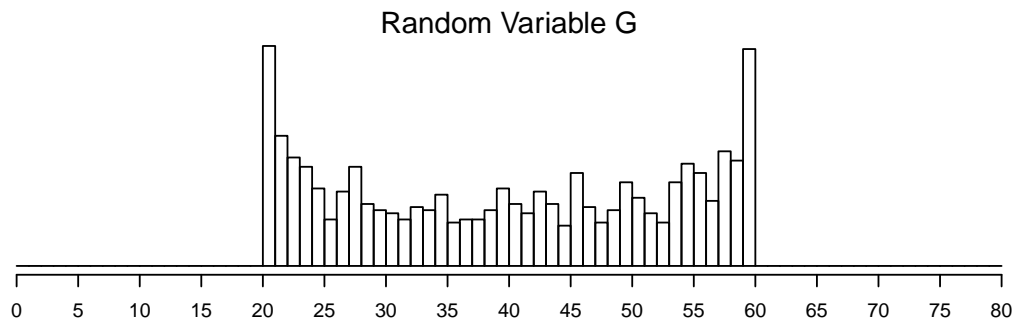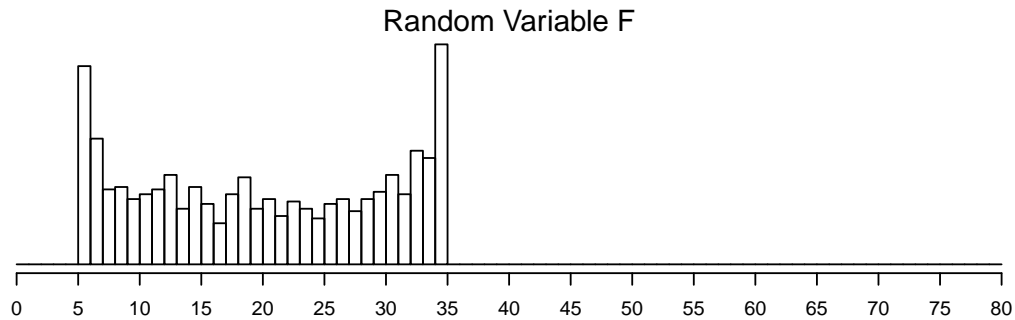
(a) Which distribution has the highest mean? (F, G, or H)

(b) Which distribution has the lowest mean? (F, G, or H)

(c) Which distribution has the largest standard deviation? (F, G, or H)

(d) Which distribution has the smallest standard deviation? (F, G, or H)

6. **Problem**
   From a very large population, a small sample of measurements was taken.

$$\overline{83 \quad 79 \quad 71 \quad 75 \quad 72}$$

Please calculate the (Bessel corrected) sample standard deviation using the following formula:

$$s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$$

7. **Problem**
   From a very large population, a small sample of measurements was taken.

163	150	150	138	147

   Please calculate the average absolute deviation using the following formula:

   $$\text{AAD} = \frac{\sum |x - \bar{x}|}{n}$$