Worksheet 6B

Range = max value – min value

Quartiles: lower quartile (1st quartile), median (2nd quartile), upper quartile (3rd quartile)

Five-number summary: min value, lower quartile, median, upper quartile, max value

Standard deviation = $\sqrt{\frac{(x_1-\bar{x})^2+(x_2-\bar{x})^2+\ldots+(x_n-\bar{x})^2}{n-1}}$ where $\bar{x}=\frac{x_1+x_2+\cdots+x_n}{n}$

Range rule of thumb: if the dataset has a normal distribution, then standard deviation $\approx$ range/4

1) The table below gives the average sales tax rate in six east coast states and six western states in 2021.

East coast states		Western states	
New York	8.52%	Washington	9.23%
Rhode Island	7.00%	California	8.68%
Massachusetts	6.25%	Arizona	8.40%
Florida	6.00%	Nevada	8.23%
Maryland	6.00%	Utah	7.19%
New Hampshire	0%	Oregon	0%

a) Find the mean, median, and range for each of the two data sets.

b) Give the five-number summary and draw a boxplot for each of the data sets.

c) Find the standard deviation for each of the data sets.

East coast states: mean =

Data	Deviation	Deviation squared

Sum of dev. sq.=
Standard deviation =

West coast states: mean =

Data	Deviation	Deviation squared

Sum of dev. sq.=
Standard deviation =

d) Apply the range rule of thumb to estimate the standard deviation of each of the data sets. How well does the rule work in each case?

2) An auto transmission manufacturer receives ball bearings with a specified diameter of 16.30 millimeters from two different suppliers. Recent shipments from the two suppliers had ball bearings with the following diameters.

Supplier A: 16.25, 16.27, 16.29, 16.31, 16.34, 16.37, 16.41
Supplier B: 16.19, 16.22, 16.28, 16.34, 16.39, 16.42, 16.44

a) Find the mean and standard deviation of each data set.

b) Draw a boxplot for each data set.