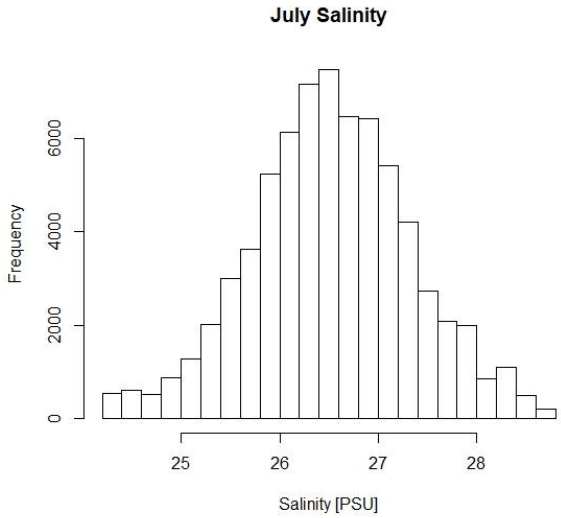
Summarizing Symmetric Distributions Worksheet

KEY TERMS

- **Mean**: *a number that measures the central tendency of the data; a common name for mean is "average"*
  - Notation: $\bar{x}$ for sample mean and μ for population mean
  - $\bar{x} = sum\ of\ all\ values\ in\ sample \div number\ of\ values\ in\ the\ sample$
- **Standard Deviation:** *a number that is equal to the square root of the variance and measures how far data values are from their mean*
  - Notation: s for sample standard deviation and σ for population standard deviation.
  - $s = \sqrt{(\sum(x - \bar{x})^2) \div (n - 1)}$

Illowsky, B., & Dean, S. (2018). Introductory statistics.



Here is a histogram of salinity data from the Mokauea loko iʻa from July 2019. This data has been cleaned where duplicates and outliers have been removed.
Salinity is a critical parameter that needs to be understood to perform restoration efforts to the Mokaeua loko iʻa. Help us to understand July 2019's salinity levels by completing the exercises below.

What is the shape of this histogram?

Given the shape of this histogram, complete the exercises below.

EXERCISE 1: Mean

Here is a random sample of 20 data points (rounded to the nearest tenth) from the July 2019 salinity data. Calculate the mean of this sample. Do not round your answer.

26.4, 26.0, 25.9, 24.6, 25.9, 26.2, 26.0, 27.0, 25.4, 25.5,
25.6, 26.3, 25.0, 27.2, 28.2, 27.9, 27.3, 26.9, 26.4, 27.4

The above data is real data collected from research at Mokauea loko iʻa.
Additional Mokauea loko iʻa data can be explored here: http://grogdata.soest.hawaii.edu/

EXERCISE 2: Standard Deviation

Using the same sample in Exercise 1, find the standard deviation of the sample. Use the table below to help complete your computation. Round $(x - \bar{x})^2$ and your final answer to the nearest hundredth.

x	$(x - \bar{x})$	$(x - \bar{x})^2$
26.4		
26.0		
25.9		
24.6		
25.9		
26.2		
26.0		
27.0		
25.4		
25.5		
25.6		
26.3		
25.0		
27.2		
28.2		
27.9		
27.3		
26.9		
26.4		
27.4		