Confidence Interval Worksheet (Answer Key)

KEY TERMS

- **Confidence Level:** *measures the capture rate of how often the estimation method is successful*
  - 95% confidence level is commonly used (1.96 margin of error)
- **Margin of Error:** *tells how far from the population value the estimate can be*
  - Notation: m
  - m = z*SE
    - z* = the multiplier that is chosen to achieve the desired confidence level
    - SE = standard error
- **Confidence Interval:** *provides a range of reasonable values in which we expect the population parameter to fall*
  - Confidence interval structure: $\hat{p} \pm m$

Illowsky, B., & Dean, S. (2018). Introductory statistics
Gould, R., & Ryan, C. N. (2015). Introductory statistics: Exploring the world through data. Pearson.

During June 2020, 2,395 salinity measurements were taken in the Mokauea loko i‘a. A sample of 100 of these measurements was taken and found that 66% of the sample contained measurements that were less than 22.5 PSU. The distribution of this sample is Normal.

With the above information, fill in the following:

- **N =** 2,395
- **n =** 100
- **p =** 0.66
- **$\hat{p}$ =** 0.66

Find the standard error. Round your answer to the nearest thousandth; HOWEVER, keep your calculated in your calculator for the next problem.

$$SE = \sqrt{(\hat{p}(1-\hat{p}))/n}$$

SE ≈ 0.047

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

Find the margin of error at a 95% confidence level. Use the standard deviation kept in your calculator. Round your answer to the nearest thousandth.

m = 0.093

Find the confidence intervals. Interpret your answer using percentages.

Lower interval: 0.567

Upper interval: 0.753

Interpretation: We are 95% confident that the percentage of salinity measurements in the Mokauea loko iʻa that are less than 22.5 PSU is between 56.7% and 75.3%.