# **Key Learning Reflection Assignment**

**Overview:**

To sharpen your ability to speak about data analysis, each student will be asked to prepare and submit a recorded, video reflection. For this reflection, you will identify a single statistical concept or tool that you believe could be applicable in your professional life. Visualize yourself presenting this to your supervisor or other employees.

**Strong responses will address the each of the following:**

1. Explain why you have selected the particular statistical concept or tool for your presentation – how could it be useful in your professional life.
2. Explain why the concept/tool is important and how the statistical concept or tool fits into the bigger picture of the discipline of applied statistics.
3. Using pertinent and accurate technical language, describe the technical details needed to use this concept or tool. This is the “how to” part of the presentation. Illustrate with one or more examples (preferably from your professional life).
4. Discuss the strengths and limitations of the tool/concept.
5. Use visuals to aid the listener.

**Details:**

* Maximum 5 minutes in length
* Counts as a portion of your participation grade
* Due any time before LIVE session for Week 12 – email the link to your zoom presentation to your professor.

**Possible concepts/tools for your presentation (not limited to this list):**

* Population vs sample
* Independent variable vs dependent variable
* Classifying variables – 3 dimensions
* Frequency distributions and graphs of frequency distributions including how to describe them
* The good, the bad and the ugly – examples of graphs that are well done and examples that are poorly done or misleading
* Measures of the middle
* Measures of spread
* Probabilities – joint, marginal and conditional
* The Normal Distribution and the Empirical Rule
* Z Scores
* Outliers
* Sampling distributions
* Sampling error
* Central Limit Theorem
* Point estimates
* Overall strategy of hypothesis testing
* Type I and Type II errors
* Critical values vs p values
* Power and effect size
* t distribution
* One sample test of the population mean when sigma is known (Z test)
* One sample test of the population mean when sigma is unknown (t test)
* Dependent or paired t test of two population means
* Independent t test of two population means
* Confidence intervals – overall approach
* Confidence interval for a single population mean
* Confidence interval for the difference in two population means
* Confidence intervals and hypothesis testing
* One Way ANOVA
* F distribution
* Two Way ANOVA
* Interaction Effect
* Scatter plots
* Correlation coefficients
* Simple Linear Regression – overall approach
* Hypothesis testing in regression – t test and F test
* Multiple Linear Regression – overall approach
* Coefficient of Determination