Assignments

A1. Units

   In the library, find a journal reporting research results in biology. Open the journal to an article, and list the first defined physical or biological quantity you encounter (if you must move to the next article, then so be it). State the Journal name, volume, and page number. For this quantity, provide complete details for each of the 5 components of the quantity: name, symbol, typical value, units, and procedural statement.

For each of the **next 3** quantities in the journal, complete the following checklist:

     Journal name, volume, and page number _____

     name of quantity in words.   Present ? _____

     symbol   Present in article ? _____

     number of values   N = _____ or cannot be determined ____

     procedural statement   Present ? _____

             Reproducible by another investigator ? _____

     type of measurement scale (nominal, ordinal, interval, ratio)   _____

             if ratio scale: units = _____

                                                                    (4 due in all)

A2 = Lab 2b.   Equations. In the literature, find an equation composed of at least 4 different symbols. Complete steps 1-6 in Lab 2, for your equation. Be sure to list the full reference for the equation.

A3. Hypothesis testing.   Find, in the literature, two mean values with associated standard deviations and sample size.

1. Report the 6 values with citation of source.

2. Compute the t-statistic using the appropriate formula from Ch7.3. State which formula you used and why. Use the generic recipe for decision making with statistics (Ch7.3, Table 7.1a) to declare a decision about the two means.

3. Use the generic recipe for hypothesis testing to declare a decision about whether the two variances differ significantly (see Ch7.3 for example)..

A4. Confidence intervals.   For the same data used in A3, compute the confidence limits for each mean. Report all 6 values (means, sd, n), the source of the numbers, and both confidence limits.
Use the generic recipe for confidence limits (Ch7.5, Table 7.5a).

     Hint: Use Minitab MTB>Invcdf command to obtain critical t-values.

Assignments

A5 = Lab 7b. GLM. ANOVA.   In a journal article, find data presented in at least three categories.   Undertake an analysis. Present your results using the following simplified format. Be sure to list the full reference for the source of data.

A. Write the model, state name of test, state H_A/H_o pair.
B. State statistic for hypothesis testing (present the ANOVA table for F-statistic).
C. Show residuals vs fitted values, and comment on whether the model is acceptable.
D. State whether residuals are normal, with one graph (only) for evidence.
E. Reject or accept H_o, reporting statistic, n, and p-value.
F. Declare decision verbally.

A6 = Lab 8b. GLM.   In the literature find data that can be analyzed relative to two explanatory variables, of which at least one is a categorical variable.   Undertake an analysis. Present your results using the simplified format in assignment A5. Be sure to list the full reference for the source of data.

A7. Correlation. Find, in the literature, a data set appropriate for correlation. Enter the data into a spreadsheet or statistical package. Compute the mean and variance for each variable. Compute the correlation coefficient. State the source of the data, why correlation is approprite, then display the data (label each column), each mean and variance, and the correlation coefficient. Use the generic recipe for decision making with statistics (Ch 7.2, Table 7.1a) to declare a decision about the correlation coefficient, relative to the null model (show all steps).