# Lab 02: Data Visualization, Measures of Centrality, Measures of Spread.

As always, indicate your answers using a different color font or shading to clearly separate your answers from the questions. When you are finished, save the file as "lab01\_FIRST\_LAST" using **your** first name and **your** last name, and then upload the file as a Word Document or .pdf on Canvas.

Start by opening the data\_800m.csv datafile in Jamovi. These data resemble real data taken from a study of two sets of high-level athletes (collegiate Nordic Skiers and Soccer players) and similarly aged Controls who were engaged in recreational sports.

## Question 1.

1A. Insert a **histogram** showing the distribution of 800m run times as a function of group:

1B. Insert a **boxplot or violin plot** showing the distribution of VO2 max values as a function of group. Enable individual data points in your figure and turn “jitter” on so that overlapping points are visible:

1C. Insert a **table of descriptive statistics** for each group. Be sure to include **only** the sample size (N), the mean, the standard deviation, and skewness for **both** 800m run times and the VO2 max test.

1D. Finally, insert a **scatterplot** showing 800m run time (on the y-axis) as a function of VO2 max (on the x-axis) and group (as the color of the individual data points).

Question 2

2A. In your own words, provide a definition for a **dependent variable** in either an experimental or observational study:

2B. In your own words, provide a definition for an **independent variable** in either an experimental or observational study:

Question 3

Use data either from your own discipline or from one of the datasets from the course (see the zipped “data” folder and the “Data Dictionary” under Module 02) to answer the following questions below:

3A. Insert a **histogram** showing the distribution of a dependent variable from this study:

3B. If your independent variable is categorical, insert a **boxplot or violin plot** showing the distribution of the dependent variable as a function of the independent variable. Alternatively, if your independent variable is continuous, insert a scatterplot showing the distribution of the dependent variable as a function of the independent variable.

3C. Insert a **table of descriptive statistics** for all of the important numeric variables in your study. Be sure to include **only** the sample size (N), the mean, the standard deviation, and skewness.

3D. Note that we haven’t discussed **skewness** in class. Using the internet and/or available textbooks, look up the definition of skewness. In your own words, provide a definition of skewness.

3E. Based on the histogram you made in 3A and your definition of skewness in 3D, do you think that your primary dependent variable is skewed?

3F. Finally, **provide a brief description** of these data, the study, and your qualitative interpretation of the results. In **250 words or less**, explain the primary motivation, the pattern of data, and if the pattern of the data supports your hypotheses.