# Lab 05: Simple Regression.

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 "lab05\_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\_ALTITUDE.csv datafile in Jamovi. These data resemble real data taken from a study of healthy young adults who had their VO2max tested at baseline (sea level or 0m) and were then tested again at different altitudes. We are primarily interested in the **change in VO2max** (high altitude test minus the baseline test)

## Question 1.

1A. Create a **scatterplot** showing the change in VO2max (in mL/kg/min) on the y-axis as a function of altitude (in meters) at which participants were tested. Be sure to turn on the marginal distributions for both and include a best fit line in your scatterplot. Insert that plot below:

1B. Regress the change in VO2max onto altitude in a simple regression model. In the Regression window in Jamovi, include the F-test for the overall model Fit, and include the 95% confidence intervals for both the slope and the intercept. Insert the tables showing the regression results below:

1C. Provide a one sentence interpretation of the **intercept**. Be sure to interpret both the magnitude of the estimate and its statistical significance.

1D. Provide a one sentence interpretation of the **slope**. Be sure to interpret both the magnitude of the estimate and its statistical significance.

Question 2

2A. Create a new version of the altitude variable that gives the **altitude in kilometers** rather than in meters. Regress the change in VO2max onto altitude in kilometers in a simple regression model. In the Regression window in Jamovi, include the F-test for the overall model Fit, and include the 95% confidence intervals for both the slope and the intercept. Insert the tables showing the regression results below.

2B. Provide one sentence interpretations of the **slope and intercept** when we use kilometers as our measure of altitude. Be sure to interpret both the magnitude of the estimate and its statistical significance.

2C. Create a new version of the **altitude in kilometers variable that is centered on 4km** (i.e., subtract 4km from every value so that 0=km, >0= >4km, and <0= <4km). Regress the change in VO2max onto this centered altitude variable in a simple regression model. In the Regression window in Jamovi, include the F-test for the overall model Fit, and include the 95% confidence intervals for both the slope and the intercept. Insert the tables showing the regression results below.

2D. Provide one sentence interpretations of the **slope and intercept** when we use this new kilometers variable (centered on 4km) as our measure of altitude. Be sure to interpret both the magnitude of the estimate and its statistical significance.

2E. Contrast the tables you get in 1B, 2A, and 2C. Note that you changed the way that altitude is coded in each one. **Briefly explain what stays the same and what changes between these different tables**. In your own words, explain why some things stay the same, but other things change.

Question 3

Finally, use either one of your own datasets or another dataset from the class data folder, the dataset will need to include at least two continuous variables that you can regress onto each other.

3A. Create a **scatterplot** showing your chosen dependent variable on the y-axis as a function of your chosen predictor variable on the x-axis. Include a best fit line in your scatterplot and insert that plot below:

3B. Regress your chosen dependent variable onto your chosen predictor variable in a simple regression model. In the Regression window in Jamovi, include the F-test for the overall model Fit, and include the 95% confidence intervals for both the slope and the intercept. Insert the tables showing the regression results below.

3C. Provide one sentence interpretations of the **slope and intercept** for the regression you conducted in 3B. Be sure to interpret both the magnitude of the estimate and its statistical significance.