**BL 1110 Lab 1b: Analyzing and Graphing Data (15 pts)**

Due the week of 09/13 (submit on Canvas)

**Learning Objectives:**

In this part of lab, you will learn basic statistical techniques to summarize, analyze, and present data from scientific experiments. You will be required to use these techniques throughout the semester. By the end of the lab you should be able to:

* Input and organize data in Excel spreadsheets
* Understand the importance of replicates and variation among individuals
* Calculate means and standard deviations in Excel
* Create line and bar graphs and correctly label these figures
* Interpret data with figures and statistics (mean and standard deviations)

**Instructions for lab 1b assignment to submit on Canvas:**

Note: all MTU students can freely download Microsoft Office Suite, which contains MS Word, Excel, and PowerPoint.

1. Choose one weather variable (temperature, precipitation, etc.) that you would like to graph from two different places other than Houghton, MI ([climate-charts.com](https://www.climate-charts.com/)).
   1. Come up with a question about the weather variables and places you chose. For example, I chose to graph the maximum temperatures in Houghton and in Fairbanks, AK. My question was are the maximum temperatures higher in Houghton or in Fairbanks?
2. Create and label a line and bar graph in Excel of the weather data vs. time from the two places that you chose **(10 pts)**. You can play around with the chart features (font, colors, etc.) and choose a format that you like, however, make sure it is easy to read and interpret. You must include a figure/table header (title must be included in the header), correctly labeled axes, and a legend if necessary. Please refer to the lab 1b slides for instructions on proper formatting.
3. Answer the following questions **(5 pts total)**:
   1. What was your question? i.e. why did you choose to graph the data for the places that you did? **(1 pt)**
   2. How do your graphs show the data differently? **(1 pt)**
   3. What are the means and standard deviations of the data that you compared? **(1 pt)**
   4. Were you able to answer your original question based on these data? Briefly explain how. **(2 pts)**
4. Upload a Word document with the appropriate graphs and answers to questions 3a-d to Canvas by the due date. You will need to copy and paste graphs from Excel into Word. Ask your instructor for help if you are not familiar with how to do this.