

Programming Lab 8 – Data Analysis  
PHYS 2511 – Prof. Matthew Newby – Spring 2020

Goal:	Use real physical data to plot an interesting trend, or to compare multiple trends.
Requirements:	Find a set of real physical data and generate a figure that illustrates this data, allowing the viewer to come to some conclusion. “Bad” data points should be removed. Your figure must also include a short description and proper sources.
Inputs:	<ul style="list-style-type: none"><li>• Your data.</li></ul>
Outputs:	<ul style="list-style-type: none"><li>• The figure.</li></ul>
Optional:	<ul style="list-style-type: none"><li>• Compare two (or more) data sets through a statistical method.</li><li>• Perform other analyses on your chosen data.</li></ul>

Background:

One of the most important tasks for every scientist is the ability to plot real data in an illustrative way. Figures are key components of teaching, research papers, and grant proposals. Non-scientists use figures to summarize complicated information, communicate needs, and “wow” bosses.

For this assignment you will find publicly available data online (other sources are possible) and generate a plot that shows an interesting physical relation. Example data sets include, but are not limited to:

- Temperature vs. Time (average temperature versus year, temperature by hour, etc.)
- US Federal deficit with time.
- US GDP growth with time.
- World population by year
- Prices of several raw materials (gold, oil, uranium, ...) with time.
- Number of penguins in South Africa per season.

If you are interested in a certain type of data, your instructor can help you find an available source.

**IMPORTANT:** Your source must be a primary (original) source! No second-hand data, please!

In addition to plotting some interesting trend(s), you will need to provide a short write-up describing your figure. This description should only require a short paragraph or two, with less description needed for figures that are better at ‘speaking for themselves.’ Interesting features in the figure should be described. All sources used must be professionally cited.