

Homework 4: Data Plotting

Overview

This homework assignment is intended to get you more familiar with the practical applications of data science with MATLAB and Python. You will be writing an analysis script that can import a data file from the HOBO, Thetis, and Lowell instruments, parse said file, then plot the data with appropriate title, labels and axes scales.

For extra credit: You may do this assignment in both languages

Requirements

To fulfill this project, you must successfully program a script that utilizes several different functions and plots to display real time series data from our instruments! Each function should have a practical name, be easy to read and understand, and work. You should also comment appropriately throughout the program such that someone else could understand what is occurring.

You will need a function for each instrument that will import the time series data given a file path, start index, end index, and any additional arguments you need. Then, you will need to create a figure for each time series and plot the data with an appropriate title, labels, and axes scales.

GRADUATE STUDENTS: You will take this a step forward and have an additional subplot that windows the data into a view of *significant* interest. Make sure that the timestamps for all three series align. In your submission, briefly discuss why you windowed this period and what you believe it means.

Submission

You will submit the following to the Canvas assignment box:

1. A summary document with tables, figures, and any other relevant information from your analysis
2. A well-documented code file OR
3. An organized zipped archive of well-documented code source files.
Make sure the main script is named properly.

Note that any submitted code needs to be able to be executed without any errors. Any additional libraries need to be able to be installed using a package manager like pip.

Documents that contain the figures and printouts with the code, such as Jupyter notebooks, will also be accepted in lieu of the other submission items.

The main script should be named in the following format: `h[#]_[ASSIGNMENT NAME]_[LAST NAME].[EXTENSION]`, for example, `h4_data_plots_duffy.ipynb`

Grading

You will be graded on the following criteria:

Criterion	Points
Efficacy	60
Code Neatness	20
Output Neatness	20
Multilingual (EC)	20

Extra Credit

If you are willing to dig in a little bit more, this project has an opportunity to earn extra credit points at the discretion of the instructor. You may do this assignment in both Python and MATLAB. Being able to work with multiple programming languages is an extremely useful skill. Python and MATLAB are also close enough in syntax that the code should not have to change much between them.