Milestone 3
Due Monday, April 25 at EOD (end of day)

Learning Objectives:
I.   **What characters do I type next?** *How do I interact with data in Python and then display this data?* This lab will focus on using the powerful NumPy, SciPy and matplotlib libraries to be able to mathematically manipulate data and display it using plots.

II. **How do I plan a project and execute my plan?** *How do I integrate Git into my workflow for version control?* This lab will provide the opportunity to practice using Git within a Unix environment to track changes and communicate about them with an external server. *How do I get all the way from raw data to plots?* This lab will provide the opportunity to practice mapping out a data flow and writing code from scratch that fulfills it.

Part 1: Try Coding Up Part of a Project, Redux

In Milestone 1, we asked you to pick a tentative project topic and spend some time coding the basic building blocks of the project. We're asking you to do that again so that you have a better idea of how long things will take now that you have NumPy, SciPy, and matplotlib at your disposal. **Pick a tentative topic (it can be the same one) and spend an hour starting to write the building blocks.** Take note of how far you get; you can use this to estimate whether the project will be a reasonable scope for this class. Save your code inside your Project repository, and push it to GitHub after you're done with Part 2.

Part 2: Write a Project Proposal and Data Flow

It's time to decide on a topic so that you can get started. Write your proposal in a text file inside your final project repository and push it to GitHub when you're done.

Your proposal should give you and us a good idea of what you'll be doing for the next six weeks. It should have four parts:
- **What does your project accomplish?** Explain what you want your program to do and why. Say also possible reductions/extensions of your project, in case part of it takes more/less time than expected.
- **What inputs will it accept?** Explain how the program will interact with the user and with any data it needs. In what format will the data be initially? What commands or options does the user need to provide? In what Python data structures will you store data and user input?
- **What manipulations will the program perform on the data?** Explain how you'll manipulate the data and user input. Explain how you'll use scientific Python functionality that you've learned towards the manipulations.
- **What outputs will the program produce?** Explain how the program will give output to the user: plots, statistics, more data, etc. Don't go into too much depth on this part; we'll spend more time later on making readable, useful output.

We're looking for 100–300 words. The more specific you are, the better we'll be able to help you.