Explore Your Own Data!

Now that you have completed Python Bootcamp (congratulations!), use the skills you have learned to work through the following tasks to look at the dataset you are using this summer (or a similar one).

It's a good idea to have the lesson notebooks from the previous two weeks readily available for reference. Since you will be working in your own notebook, we encourage you to write out your thoughts in the notebook as you go through the tasks, as well as use the blank spaces on this paper to jot down any thoughts. Remember to comment your code, so you can understand what you did a few weeks from now.

1. **Find/Pick your dataset:**
    - **a.** Do you have a dataset in mind that you would like to analyze this summer? What do you hope to achieve by analyzing this dataset?
    - b. You should have already received a dataset from your mentor but please let us know if you have not received one. We can help you find one, or you can use one of the previous datasets we've used in the Python Bootcamp.

2. **Create a jupyter notebook and do the following:**
    - a. **Import some packages.** You might need some or all of the following: numpy, pandas, xarray, matplotlib, cartopy, datetime, etc. (think about what packages would be helpful for you). Remember that you can always import more packages later on.
    - b. **Load in your dataset.** Remember the multiple techniques we've learned on how to open files. Should you use Pandas (Day 4) or Xarray (Day 5, 6)?

3. **Look at your data:**
    a. What are some of the variables in your dataset? Can you describe these variables – What do they mean? What are the units?
    b. What are the dimensions of the variables within your dataset (try np.shape(variable))? What is the spatial resolution (latitude, longitude)? What is the temporal resolution (hourly? daily? monthly?).

4. **Brainstorm Goals & Strategies:**
    a. Talk with others around you and brainstorm ideas about how you can use your dataset to meet your research goals. Think about your project description and how the variables in your dataset relate to it.

5. **Choose a variable of interest and make a plot:**
    a. Think about what a good plot could be to describe your data. Do you want to show a time series? Or maybe a spatial/contour plot? Or a histogram? Think about what information you are trying to get and decide which plot type would work best to do that
    b. Remember to label all axes, colorbars, and give your plot a title to make it clear what the plot shows

6. **Analyze your plot:**
    a. What does this plot show you? Can you describe any insights gained from reading this plot?

7. **Continue Exploring!**
    a. Can you make other plots to explore the data more?
        i. You could look at a different variable, look at the same variable in a different way, etc.
        ii. Can you compare two variables in your dataset against each other? Would that give you additional information? Maybe make a scatter plot?