Data Visualization and Programming Project

Purpose: In the REU you will be gathering data, sharing findings, and working with your mentor to pursue science and engineering tasks. The purpose of this project is to have you meet with other folks in the program and work together on a dataset of your choice to explore, analyze, and visualize this dataset.

This project is open ended but the goals for you are three-fold:
- Practice working with your new team interactively online
- Meet other people in the REU program (be sure to introduce each other)
- Practice sharing updates about work that is *in progress* to your colleagues
- +1 bonus goal, have fun!

Tomorrow morning (Friday) each team will have ~8-10 minutes to present their team's progress. You can use Google Slides, Powerpoint, Videos, Graphics, Jupyter Notebooks, etc to present your work.

Logistics & Resources: We will have the Zoom link (https://berkeley.zoom.us/j/96194520304?pwd=U3QyZXpHempYZyt2dnpXcElqdlZrQT09) ongoing with breakout rooms set up for each team which you can use as you wish. A member of the teaching team will be in the main room until 5pm Pacific to answer any questions you have - either invite them to your room or return to the main room to ask questions. Make sure to take breaks as you need to! Note that we will come back for a whole group session in the main zoom room at 3:10 PM Pacific to discuss how to prepare for your project presentation tomorrow.

Each team can use their breakout room (screen sharing will be enabled), and you can also use the "Share" feature on JupyterHub to collaboratively code. We recommend you use Google Slides or Jupyter Notebooks for your presentation for ease of collaboration.

All programming materials (including visualization slides) can be accessed on the hub (http://hub.jupytearth.org/) through the shared folder. You can also access materials through Google Drive (https://drive.google.com/drive/folders/1TUyAjshzbb56qpejpXiIPOZQ4tOJqF8l), and through coming into the Zoom room for interactive questions with the REU Teaching Team. We will also monitor the #bootcamp Slack channel, so feel free to post questions there as well.

Picking Your Dataset(s): You can use any planetary/space/Earth dataset you wish for this project. We do have some recommendations for you to get started however on datasets that we know of that are accessible. To help guide your pick, try to come up with a question or interest area that you would like to explore. We recommend you pick a dataset you are unfamiliar with for this project.

After you pick a dataset and question please come by the Zoom room and chat over your plan to get feedback.

We suggest presentations to include these slides to get you off the ground running:

- What question/area did we want to explore?
- What did we do to explore this? Where is our data from? Who made it?
- What visualizations did we make to explore/explain what we found?
- What are our next steps and what did we find challenging/rewarding in pursuing this project?

Currently Accessible Datasets:

- Space Weather: OMNI Dataset [see visualization lab and more details within]
- Solar Image Data: Solar Data Observatory image data [see visualization lab and more details within and https://sdo.gsfc.nasa.gov/data/aiahmi/]
- Ice Dynamics: github.com/clasp423/data_vis_statistics_geosciences/tree/master/Lab%205 and https://nsidc.org/data
- Juno Magnetic Field Data (Jupiter...the planet): https://github.com/clasp423/data_vis_statistics_geosciences/blob/master/Lab%203/ for more information and https://pds-ppi.igpp.ucla.edu/search/view/?f=yes&id=pds://PPI/JNO-J-3-FGM-CAL-V1.0
- MAVEN (Mars) Data: https://lasp.colorado.edu/maven/sdc/public/ - contact Tony / Abby for more ideas
- Climate Data/Temperature Indicators: https://github.com/clasp423/data_vis_statistics_geosciences/tree/master/Lab%201
- Parker Solar Probe Magnetic Field Data - contact Sam to get started accessing the data with heliopy

We are available on Zoom for any questions regarding these datasets or your programming / visualization / presentation needs.

A final note: All the github links include material we are extremely familiar with, so be sure to explore *other visualization and analysis* than demonstrated, but feel free to use the data included in the CLaSP 423 labs as it's publicly available.