**Final Project**

**Introduction**

Congratulations! You are nearing the end of the Python DeCal. To wrap up our class, you will be asked to complete one last project. This assignment is a reflection based on the progress you have made in becoming a programmer over the last semester. You will have the option to:

1. Complete a series of revisions to the program you wrote for **either** Project 1 or Project 2 after reflecting on the feedback that was given
2. **OR** Pursue a coding project of your choosing.

We will be assessing the following software design skills:

* Clean Code
* Unit-Testing and Integration Testing
* Utilizing Github

**Logistics**

This project is worth 25% of your grade. We will grade on the completion of the following:

* A LaTeX document outlining your plans for the final project (this will be a homework assignment)
* You must write **at least** two unit tests and one integration test for your project.
* By Wednesday, December 4th, your code must be available in your own repository on GitHub.

In addition, you will be assessed on the following [criteria of clean code](https://docs.google.com/document/d/16f6yBoUJ4VpCR5hcO3Z2NztMhaYq5vJ14x4ufwmCU3A/edit?usp=sharing), which we will go over in class on Wednesday, November 20th.

Regardless of whether you are making revisions to your previous projects or creating a new one from scratch, **your code must work**. If it does not work, you will get a maximum of **80%** on the final project.

**Choose Your Final Project!**

**Option 1: Making Revisions to Project 1 or Project 2**

The focus of this option is software design. The basis of software design is code that is sustainable and readable to other programmers.

As a bonus for doing these revisions, **if your code is fully functioning by the end of this final project, we will return half the points lost in your initial attempt of the project to your original score.** This is your chance to review concepts from this class that you didn’t fully understand before and optimize your code to be efficient, clean, and thought-out.

**Option 2: Creating Your Own Programming Project**

It would be preferred if you implement the project you previously outlined in your proposal, although you may come up with a new idea if you really want. Regardless of what you choose to do, you must come up with an idea that is novel and non-trivial to implement (basically we want something interesting).

The idea is to demonstrate your knowledge of the topics you’ve learned over the course of the semester.

We will be looking not just at what the code does or what you present but also the way that you structured your code (so please add comments) as well as good/bad programming practices you practice.

You are free to use whatever packages you find, but a decent amount of the work that you do has to be original. Your project does not have to be astronomy related; it can be anything you want! This is a very open-ended assignment. We only ask that you put some good effort into writing efficient code to do cool stuff (which is really what a lot of research boils down to anyway). This is your chance to show off your new Python skills and explore topics that interest you!