Data Design Project:

Background:

The data analysis skills learned in this course are broadly applicable beyond astronomy. In order to demonstrate your successful development of data analysis skills and your conceptual understanding of the material, this project tasks you with designing your own data-driven project. You may choose any topic so long as it satisfies the following requirements:

- The project must include data to be collected and analyzed with a clear goal in mind. While you do not actually have to collect this data, it must be theoretically possible to collect real data.

- You will have to design a "pipeline" including:
  - The type of data you would collect
  - How you would collect this data
  - How you would organize this data
  - How you would analyze this data
  - The insights you'd like to glean from the data

I recommend choosing a topic you are interested in. For example, if you are interested in environmental conservation, perhaps the project might be related to measuring and mapping the presence of microplastics in the environment.

The following rubric will be used to grade the project:

Item	Grading scale
The student identified a project that could use data to derive insights.	Skill not exhibited (0) – Flawless (10)
The student thoughtfully planned the type of data to be collected and the method(s) for doing so.	Skill not exhibited (0) – Flawless (10)
The student thoughtfully planned an organizational schema for the data.	Skill not exhibited (0) – Flawless (10)
The student thoughtfully designed a method for processing raw data, including handling missing values, deriving new quantities, and ensuring the fidelity of the data.	Skill not exhibited (0) – Flawless (10)
The student clearly identified the goal of their project and any insights they'd like to find in the data.	Skill not exhibited (0) – Flawless (10)
The student clearly engaged with their topic of choice and spent time researching domain knowledge to help in the planning and organization of their project design.	No evidence of engagement or research (0) – Evidence of substantial engagement with the material and research into chosen topic (25)

To ensure the quality of the assignment you are turning in, an additional 25 points is reserved for clarity, effort, participation, and overall presentation of your design. Please turn in a pdf slide deck with 10-20 slides on canvas. Your slide deck should contain some or all of the following:

- Background information and citations
- Study goal and methodology
- Data pipeline flow chart with explanation/motivation
- Data organizational schema with explanations/motivation
- Data analysis/processing ideas
- Optionally, screenshots of sample analysis code written in python can be included.