Title: The Secondary Frontier

Basic Info:

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Link to Repo: https://github.com/divpatel10/CPSC-4030-Final-Project

Link to Github Page: https://divpatel10.github.io/CPSC-4030-Final-Project/

Background and Motivation:

We chose this topic because we all are passionate about Space Exploration and with an increase in the desire to explore space thanks to companies such as SpaceX, Blue Origin, Virgin Galactic, Rocket Lab Electron have fueled up the space race in the private Space exploration industry which is still in its early stages.

Looking back at previous missions can give better insights towards how things have progressed at NASA. There are often various costs associated with space missions and looking at the data from previous missions can shine light on how cost effective space exploration has become since the end of the Apollo Missions.

Project Objectives:

With this project we look to examine how operational costs, timelines, and mission specifications can shape a space faring mission. Naturally, the questions one must ask in order to examine previous missions include asking what combination of logistical constraints result in a more favourable outcome? How much does the overall budget influence other factors of the mission? Does a more constrained timeline lead to a better or worse outcome? Some of the benefits that we could foresee is if we are able to find a very cost effective means of launch, operations, and research to other planets then we could see many more explorations leading to new research and data being found.

We hope to learn more about how planet destinations, research, advancement in technology has affected NASA ability to make cost effective missions.

Data:

https://docs.google.com/spreadsheets/d/1QW8MaPWa2YXDik52h4M0LN4SVc_tINoFEwashbaOjgE/edit#gid=1577405277

The data from the above link is collected from The Planetary Society's website which collected the data from the following sources:

- Planetary Science "Actuals", 1998-2001. Callahan, Jason. "Budgeting for Exploration: History and Political Economy in Space Science 1959-2010" Presented at the AAS 45th Meeting of the Division for Planetary Sciences, Denver, Colorado. October 7, 2013.

All other data compiled from original NASA budget estimates and reporting documents provided to Congress from 1961 to now.

- https://www.planetary.org/space-policy/every-nasa-budget-request

Data Processing:

- The dataset provided by The Planetary Society requires little to no clean up. The data has been well organized in terms of mission types, years, and Timeline of the mission.
- The current plan is to derive data for about 45 missions. All of these missions have attributes such as timeline, costs, Launch vehicle used, and outcome of the mission. Each mission also contains a range of 5 - 10 costs associated with them.
- Processed data will be stored in JSON objects and csv files.

Must Have Features:

- Mission Dates
- Mission Timeline (From start to finish)
- Destination of each mission
- Costs associated with each missions adjusted for inflation
- Type of Mission (Flyby, Satellite, Rover)

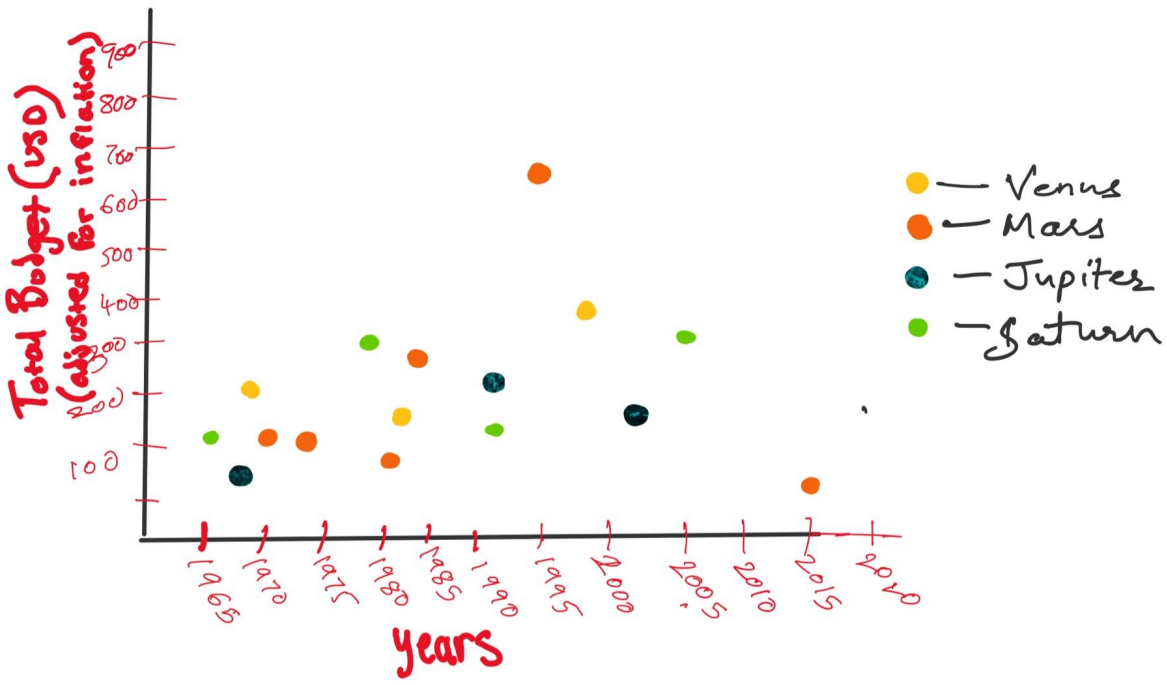
Optional Features:

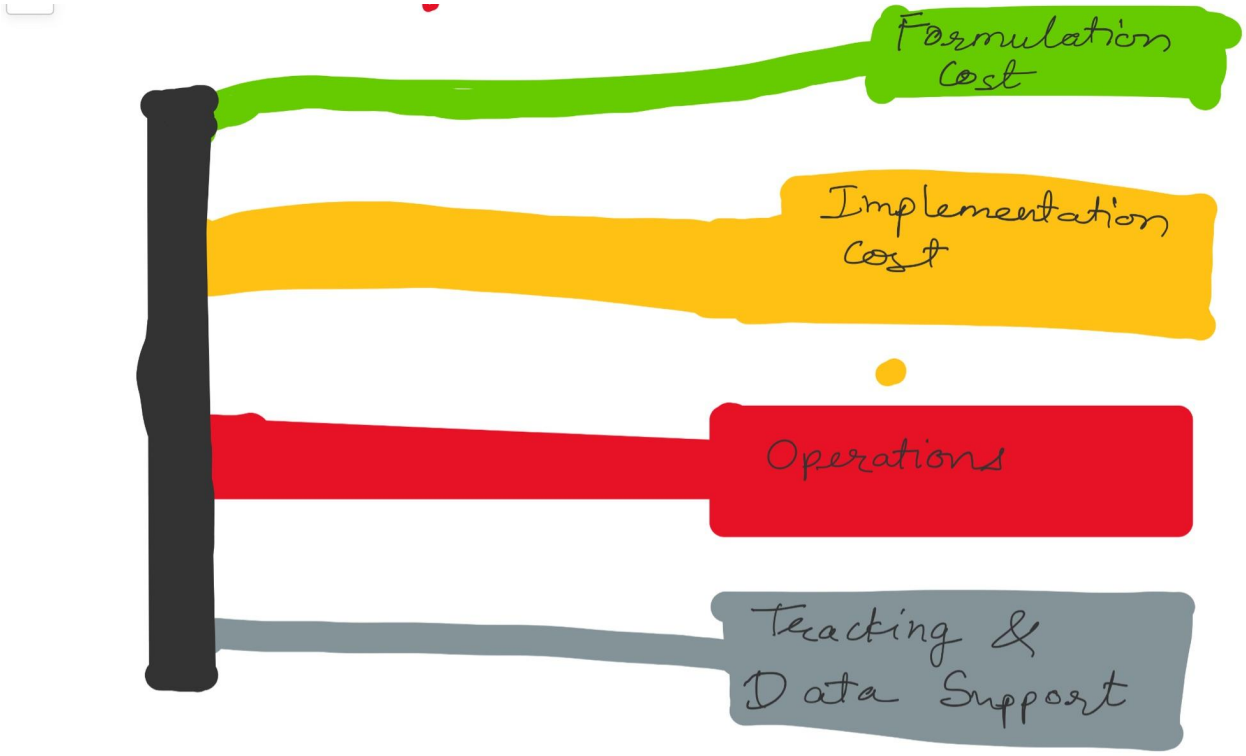
- NASA Budget Allocation for a given year
- Cost associated with a given mission without adjustment for inflation
- Fundings by Destination of the mission

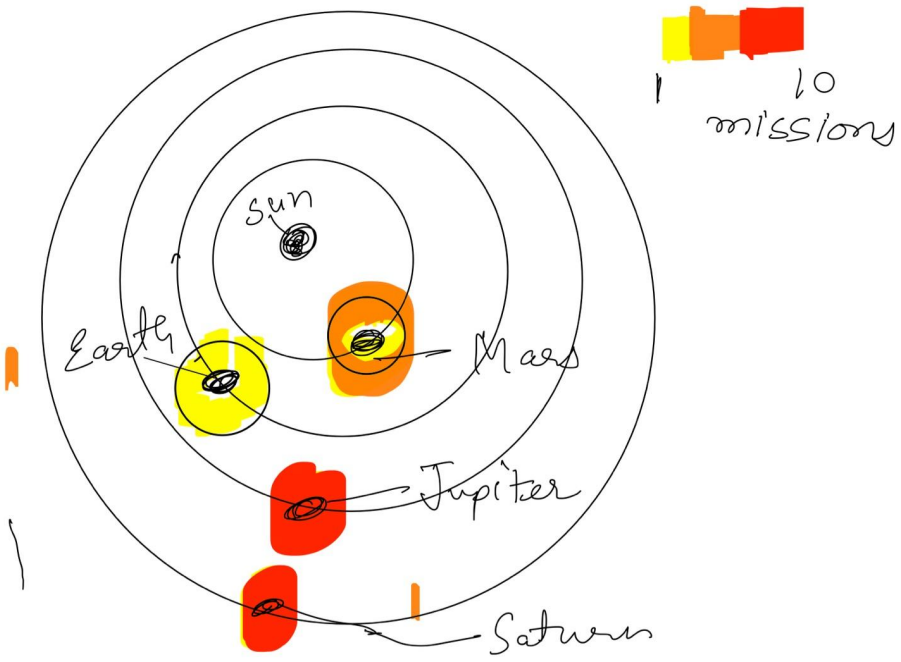
Project Schedule

- We plan to meet at least twice a week, with at least one hour each meeting to work towards the project.
- Tentative Schedule:
    - Mondays - 5:00 pm to 6:30pm
    - Wednesdays 5:00 pm to 6:30 pm
    - Fridays - Optional/as needed 5:00 pm to 6:30 pm
- Deadlines:
    - Project Prototype due November 7th
    - Peer Evaluation due November 14th
    - Oral Presentation due November 30th / December 2nd
    - Final Delivery due December 5th
    - Peer Assessment due December 5th

Vizualization Ideas:




Formulation Cost
Implementation Cost
Operations
Tracking & Data Support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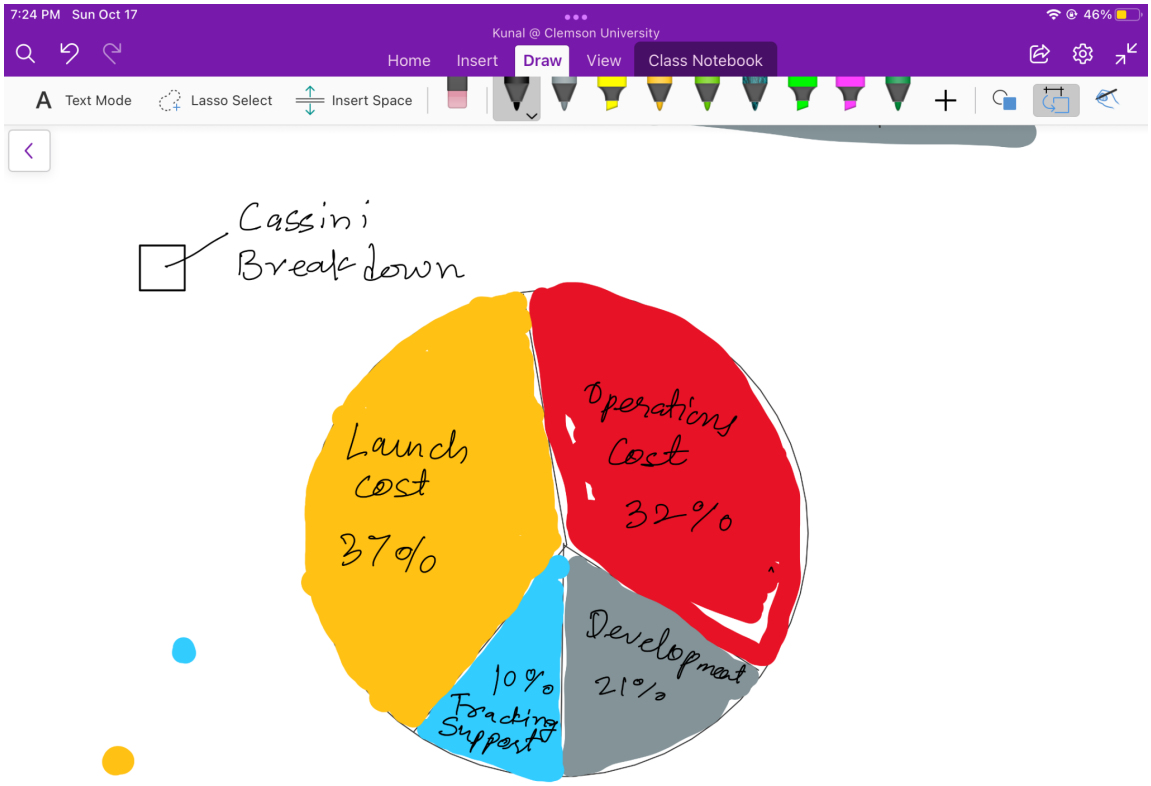
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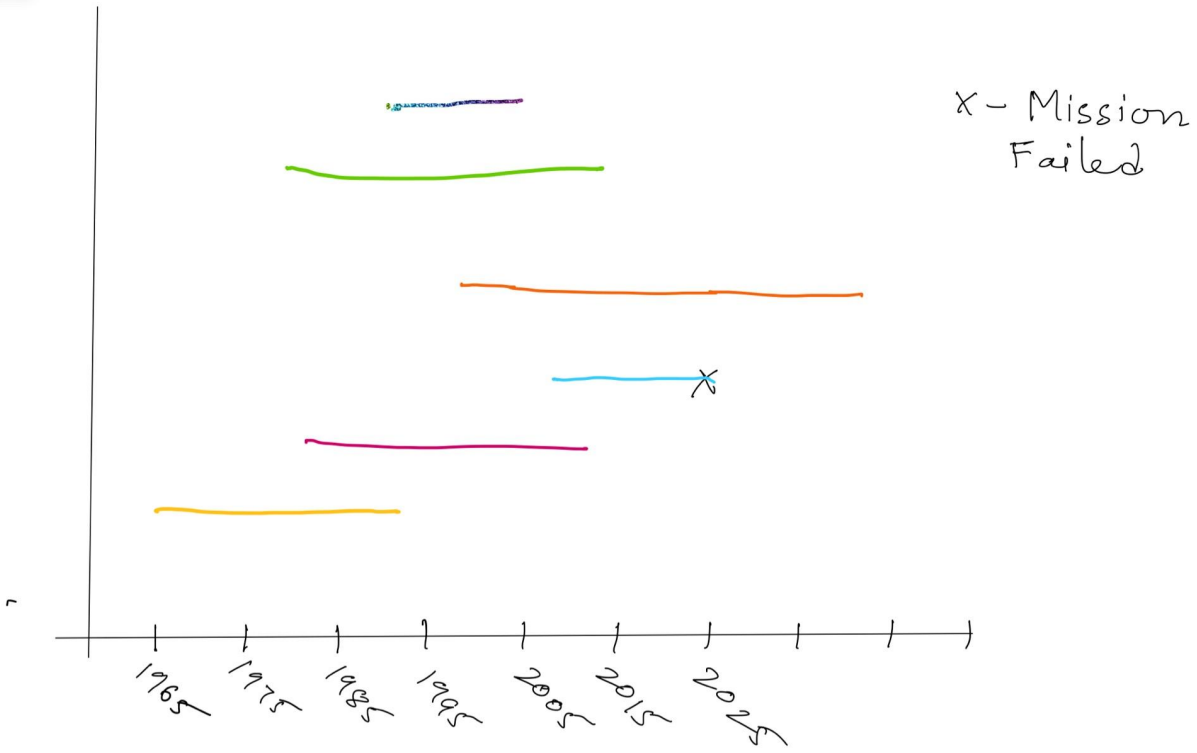
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