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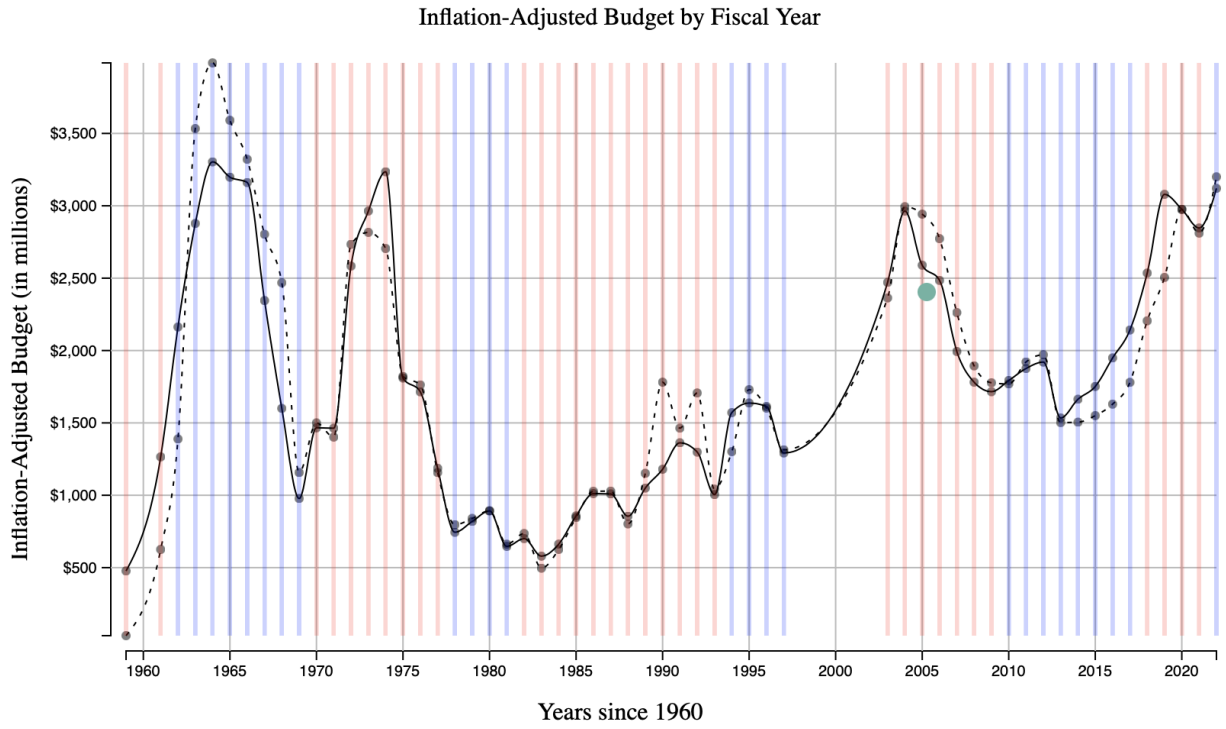
CS/INFO 3300
Prof. Jeff Rzeszotarski

P1 Final Report

Final Visualization



Visualization Story

The annual process of creating NASA's budget begins with a detailed budget proposal from the White House, known as the President's Budget Request (PBR), typically submitted in February. This proposal is the result of negotiations within NASA and with the White House, reflecting the President's priorities and policy direction. While the PBR does not have the force of law, it shapes the funding debate in Congress. Congressional committees then craft legislation to fund NASA, deciding whether to accept or modify the President's proposals. This legislation must be passed and signed into law before the start of the fiscal year on October 1, or NASA loses its spending authority, affecting its operations and obligations. The visualization we created plots the fiscal years from 1959 to 2022 against budget in millions of USD adjusted for inflation to

2022 USD. The dotted line represents the requested amount and the solid line represents the actual received amount, and the blue and red bars in the background of the plot represent the political affiliation.

Description of Data

We used the Planetary Science Budget Dataset created by the Planetary Society, who has listed this dataset as a Google sheet on their website to use. They have consolidated annual spending records for each NASA planetary science mission and have incorporated inflation adjustments to ensure accurate comparisons between historical and contemporary planetary explorations.

In budget_data, we can see the fiscal year, the amount requested, the actual amount received, and the political affiliation of Congress for the corresponding year. In budget_history_inflation_adj, we can see the fiscal year, the amount requested, the approved enacted budget, actual expenditures, and % of US discretionary expenditures allocated to the organization. In funding_by_destination_decades, we can see the decade covered by the budget allocations, specific destination columns–such as Mercury, Venus, Mars, etc.–with the related budget allocations, and the total budget allocated for the planetary missions and activities for each decade.

The planetary_science_budget_history holds data from budget_data and budget_history_inflation_adj, so we can see the fiscal year, budget request, political affiliation of Congress, Deep Space Networks costs (accounted for from 2002 to 2007), enacted budget, actual expenditures, and % of US discretionary expenditures allocated to NASA's planetary science budget. All dollar amounts in this dataset are represented in millions of USD. The original dataset had red and blue colored table cells to represent political affiliation, but we revamped this and created a "congress" attribute that can be either "D" or "R".

Design Rationale

When designing our data visualization, we considered many factors and features so that our visual was a seamless, clean, and concise representation of our chosen dataset. We employed various design elements and data cleaning techniques, and our primary goal was to provide a visual that allows viewers to easily discern trends of planetary exploration budget history. We utilized line and point marks. For the line mark, we used a dotted line for the requested budget and a solid line for the final budget to differentiate between budget phases. For individual instances, we used point marks.

The vertical Y-axis shows the budget amount in millions of USD, and the horizontal X-axis represents distinct fiscal years to ensure a clear timeline. To highlight the influence of political affiliation, we chose to use transparency vertical bars in the background of the plot with each bar being either red or blue to represent Congress' political affiliation for the corresponding year (ex. red colored bar for 1990 represents a Republican-controlled Congress for that year). These bars are slightly transparent to make sure the budget lines are the foreground of the visual, and this allows viewers to develop an easy understanding of political influence on planetary budget. We have also included grid lines to help viewers read visualization easily, and we cleaned the data to remove empty entries and used tools to make smoother, natural curves in the plot lines and allow for a clean, concise, and seamless visual.

Team Contributions

Joseph Agaba: Contributed to development of D3 visualization, particularly Congresses political affiliation during the years of this data set. This was represented in the visualization colored vertical bars. Helped with design rationale, organization, and team delegation throughout the project.

Amad Kabir: Helped with the development of the D3 visualization, finding the dataset, and data cleansing. Also helped with organizational efforts, and made the Git repo.

Vishok Jonnalagada: Contributed to the D3 visualization code, added plot title and labels as well as some work on data cleansing for the visualization. Also helped with design rationale and organization in the project.

Neeharika Kotimreddy: Helped clean up D3 visualization and debug errors in data.py and index.html, wrote majority of P1 report including visualization story, description of data, and part of design rationale, assisted in team organization effort