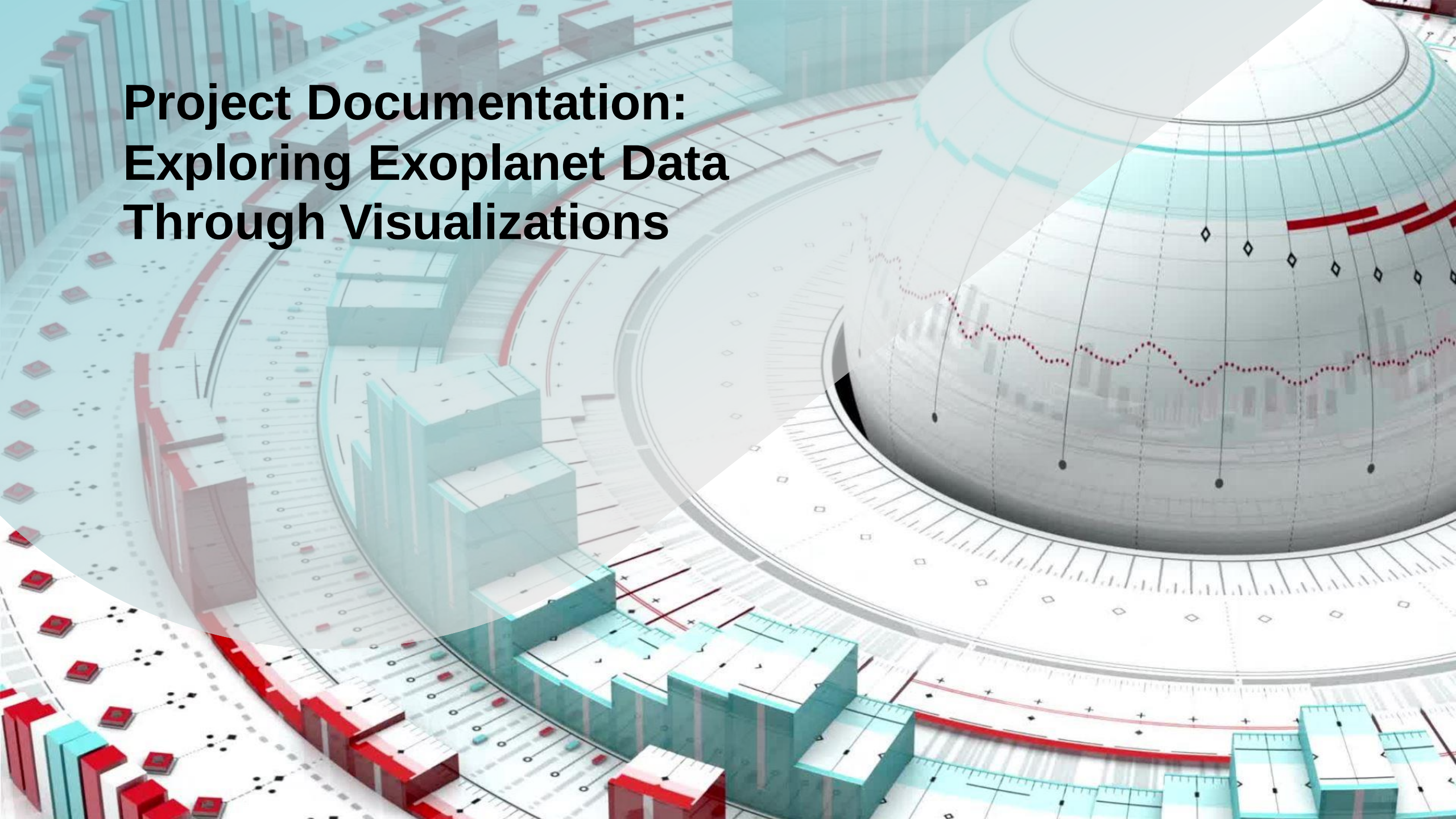
Project Documentation: Exploring Exoplanet Data Through Visualizations



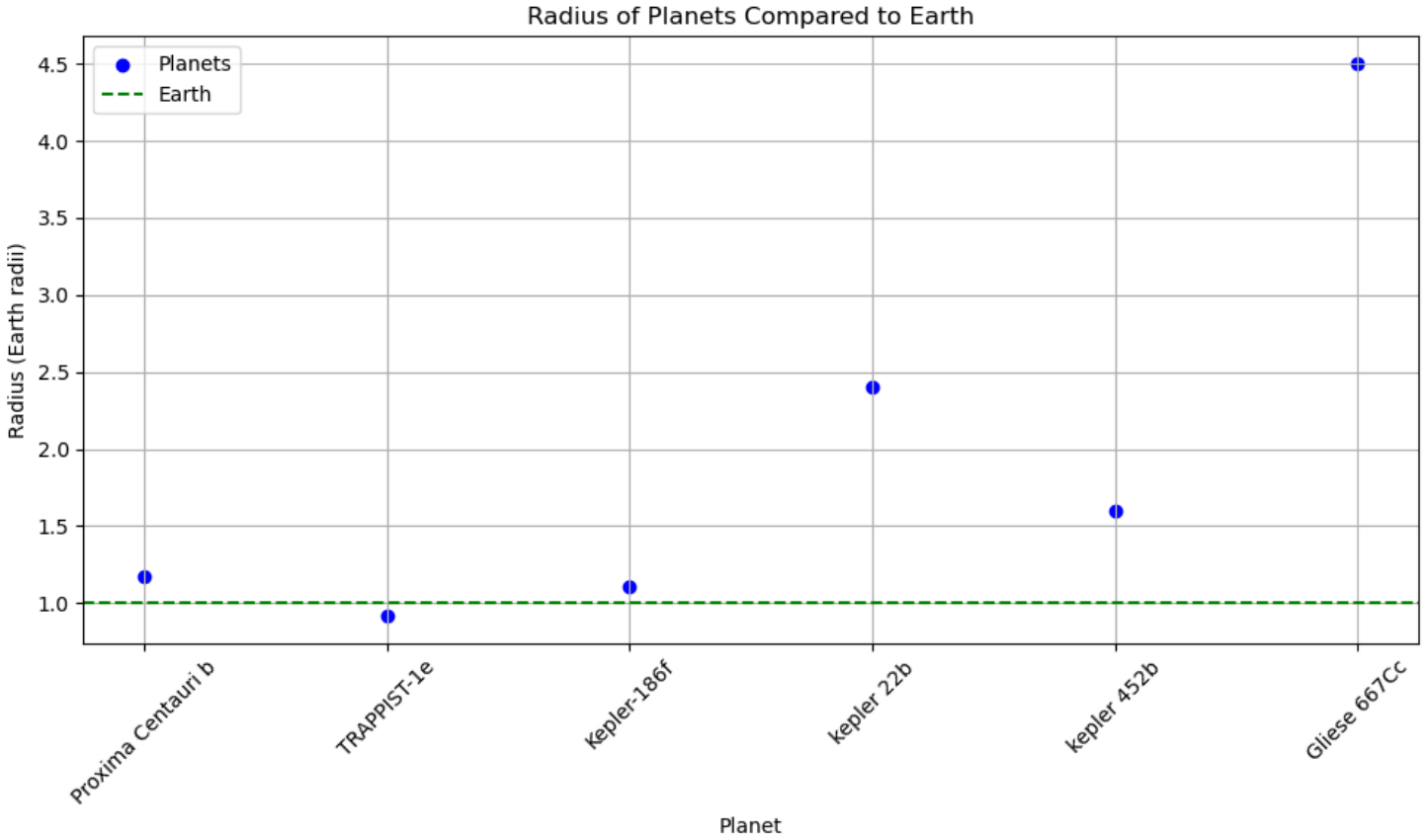
Introduction to exoplanet visulisation

This project aims to provide insights into a large dataset of exoplanets that have been scraped. To achieve this, three distinct visualizations have been created, each presenting the data in a unique way. The visualizations include a table representation of the data, a scatter graph comparing exoplanet radii to that of Earth, and a bar chart depicting the percentage of temperature and orbital days alongside their respective numerical values for each exoplanet.

	planet_name	host_star	orbital_period_days	radius_earth	temperature_fahrenheit	
0	Proxima Centauri b	Proxima Centauri	11.200000	1.170000	39.000000	
1	TRAPPIST-1e	TRAPPIST-1	6.100000	0.920000	37.000000	
2	Kepler-186f	Kepler-186	129.900000	1.110000	56.000000	
3	kepler 22b	kepler 22	290.000000	2.400000	22.220000	
4	kepler 452b	kepler 452	385.000000	1.600000	77.000000	
5	Gliese 667Cc	Gliese 667c	28.000000	4.5		

Tabular Representation

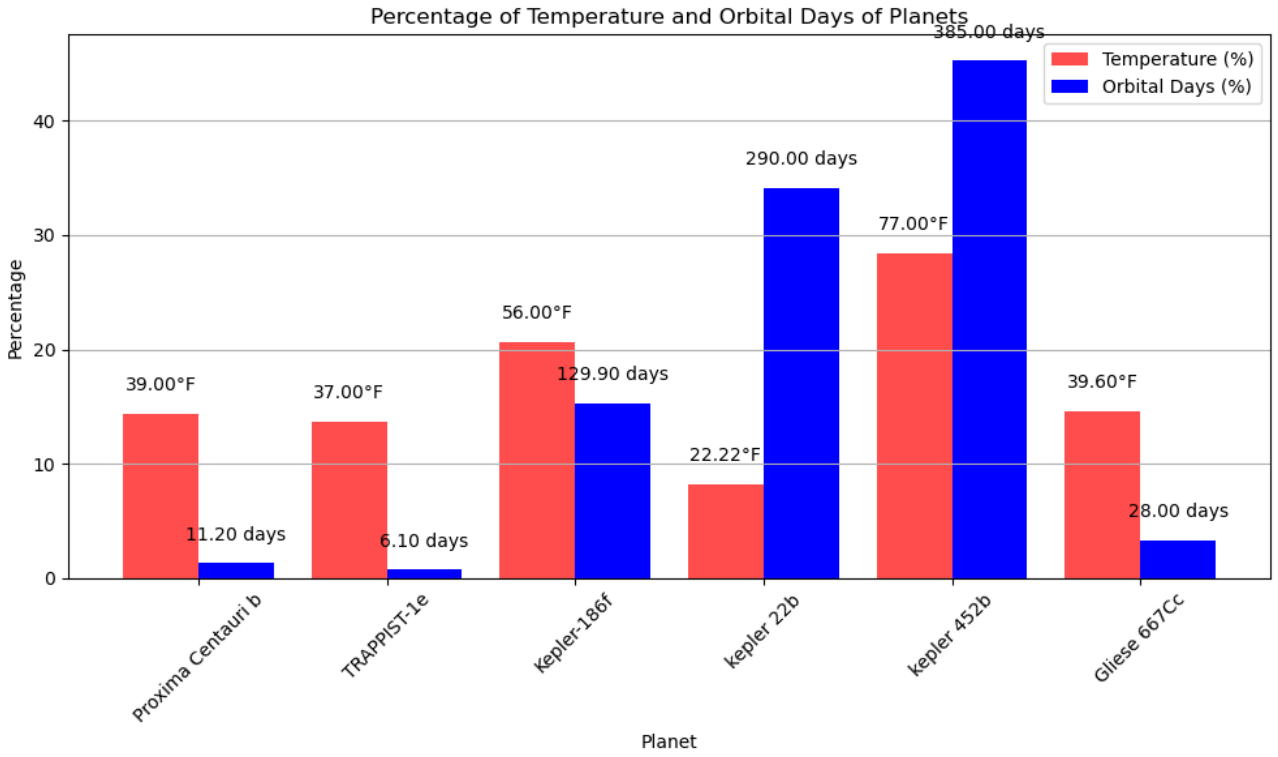
A tabular representation of the dataset was chosen as the initial visualization. This format presents the raw data in a structured manner, allowing users to easily identify and access specific details about each exoplanet. The table format is intuitive and familiar, making it an ideal starting point for users to gain a comprehensive overview of the dataset. By displaying information like planet names, host stars, orbital periods, radii, and temperatures in a table, users can quickly compare and contrast the attributes of different exoplanets.



Scatter Graph: Exoplanet Radii vs. Earth

The scatter graph was chosen to illustrate the relative sizes of exoplanets in comparison to Earth. This visualization leverages the familiarity of Earth's size to help users grasp the exoplanets' dimensions more effectively. By plotting exoplanet radii on the x-axis and Earth's radius on the y-axis, users can visually assess whether an exoplanet is smaller, larger, or comparable in size to our planet. This approach provides an intuitive and tangible understanding of exoplanet sizes, making it easier for users to identify outliers and trends within the dataset.

Bar Chart: Percentage Comparison of Temperature and Orbital Days



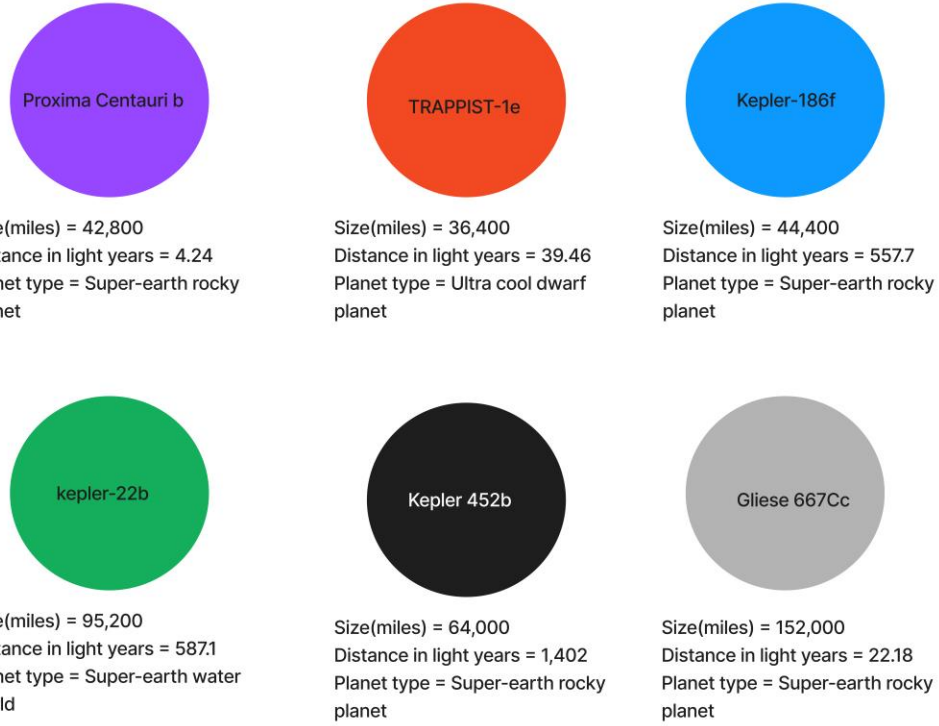
The bar chart was employed to present a comparative view of the temperature and orbital days of exoplanets. This visualization choice provides a succinct comparison by displaying both percentage values and corresponding numerical data in a single chart. Users can quickly identify which exoplanets have higher or lower temperature percentages and orbital day percentages. Additionally, the inclusion of numerical values ensures that users have precise data points to refer to. This format aids in understanding the distribution of these attributes across the exoplanet dataset and facilitates easy identification of exoplanets with extreme values.

Visualizing Exoplanetary Diversity: A Comparative Diagram

Size Representation: Each exoplanet is depicted with a proportional size representation relative to Earth. This visual comparison allows viewers to quickly discern whether an exoplanet is smaller, similar in size, or larger than our home planet. Such a comparison aids in grasping the scale of these celestial bodies, providing context for further analysis.

Distance Scale: The exoplanets' distances from Earth are meticulously marked in light years. This scale showcases the immense cosmic separations between us and these distant worlds. The placement of each exoplanet's distance on the diagram allows viewers to visualize the varying degrees of proximity or remoteness.

Planetary Type Indicators: Each exoplanet is labeled with its specific planetary type, whether rocky, gaseous, oceanic, or another classification. This categorization contributes essential insights into the composition and potential habitability of these exoplanets. The inclusion of these types provides a more comprehensive understanding of the diversity of planetary systems.



Failed ideas

In the exploration of visualization methods, an attempt was made to employ a bubble graph to represent exoplanets discovered through different methods. For instance, the transit method could be visualized with bubble size representing the number of exoplanets discovered through this method. However, due to the dataset's size, which included around 5000 exoplanets, the resulting graph became cluttered and difficult to interpret. As a result, this approach was deemed ineffective for conveying meaningful insights and was ultimately set aside in favor of more focused visualizations.

Exploring Datasets from NASA's Archive

An attempt was made to incorporate a larger dataset of exoplanet information from NASA's archive. Initially, the inclusion of over 5000 exoplanets seemed promising for a more comprehensive analysis. However, the sheer volume of data proved challenging to visualize effectively. In this process, it became apparent that working with such a vast dataset led to cluttered and unintelligible visualizations. To address this, the dataset size was reduced to a more manageable scale, ensuring that the visualizations remained both precise and detailed.