Riding the Rails: A Visualization of the MBTA subway & lightrail ridership patterns

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Introduction:

The Massachusetts Bay Transportation Authority (MBTA) is the primary public transit system that serves the Greater Boston area. This project explores the ridership patterns of the MBTA using the Subway and Light Rail Transit Ridership dataset for 2019-2022, obtained from MassDOT Mobility Dashboard. The ridership dataset contains daily ridership data by station and subway line for the Greater Boston area. The aim of this project is to provide a comprehensive and interactive visualization of the ridership data to understand MBTA subway ridership patterns in Boston. The visualization seeks to explore and answer the question of how ridership varies across different lines, stations, and neighborhoods, and how this changes over time. This project is motivated by the fact that the MBTA is relevant to the daily lives of many Boston residents and visitors, including mysef, who is an international student in Boston. Observing the varying degrees of ridership across different lines and stations piqued my interest in understanding the patterns of ridership across the city.

Methods:

To create the visualizations for this project, various visualization techniques and narrative strategies were employed. The visualizations include a bar chart, a choropleth map, and a bubble map. The bar chart displays the ridership of the five subway lines for the selected year, with the length of the bars representing the ridership. The choropleth map shows the ridership data by neighborhood, with different shades of color representing different levels of ridership. The bubble map displays the subway stations as circles, where the size of the circle represents the ridership, and the color of the circle represents the subway line with the highest ridership at that station.

To enable users to explore the data and draw their own insights, interactive and exploratory visualization elements were incorporated, such as tooltips, dropdown menus, and zooming features. Additionally, various visual encodings were used, such as color, size, and position, to highlight different aspects of the data. Finally, algorithms such as data aggregation and filtering were used to facilitate the analysis and presentation of the ridership data.

Discussion & Future Work:

The visualizations presented in this project provide a clear and informative representation of MBTA subway ridership patterns in Boston. The audience has learned about the varying degrees of ridership across different lines, stations, and neighborhoods, as well as how ridership has changed over time. The system has also enabled new insights, such as identifying the stations and lines with the highest ridership.

In terms of future work, the visualization could be expanded to include other modes of transportation, such as buses, commuter rail, and ferries to give a more comprehensive picture of transportation patterns in the Greater Boston area. Additional variables such as seasonal variation could also be included in the the visualization. Finally, the system could be integrated with real-time data feeds to provide up-to-date information about current ridership patterns and potential disruptions to the subway system.