CSE 564: Group 35

Preliminary Project Proposal

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Visual Analytics of Affordable Housing Development in New York City

Overview

Affordable housing is a critical issue faced by many urban areas, especially in cities like New York. This project presents an interactive visual analytics dashboard that analyzes affordable housing developments across New York City. Drawing on data from the NYC Department of Housing Preservation and Development, the dashboard reveals key insights into the distribution, types, and trends of housing projects over time and across neighborhoods. By combining standard and advanced visualizations, the dashboard can help policymakers, urban planners, and community members better understand patterns in housing availability and support efforts toward more equitable and informed decision-making.

Progress & Dashboard Features

1. Bar Chart: The bar chart visualizes the total number of affordable housing units constructed in each borough of New York City. This makes it easy to identify which boroughs have seen the most significant investment in affordable housing projects.

2. Pie Charts: The pie charts show the percentage distribution of affordable housing projects by construction type, and the other by borough. These charts offer a clear, visual breakdown of how housing developments vary across categories and geographic areas. The interactivity will allow users to click on chart segments to dynamically filter other visualizations, enabling a more connected and insightful exploration of the data.

3. Geo Plot: The interactive map displays housing projects geographically using latitude and longitude coordinates. Each point is colored by borough, while the bubble size represents the total number of units in a development. Users can apply filters by year, construction type, and borough to narrow down their view. Hovering over a project reveals additional details such as unit count, developer name, and construction category, enabling a deeper spatial understanding of affordable housing patterns across the city.

4. **Parallel Coordinates Plot (PCP)**: The Parallel Coordinates Plot (PCP) provides a comprehensive view of the multivariate distribution of affordable housing projects, highlighting key dimensions such as Borough, Construction Type, and various Income Unit categories. Each line in the plot corresponds to a unique housing development, with color coding enhancing visual differentiation. By combining categorical and numerical axes, the plot enables users to detect patterns and relationships across policy and housing unit metrics. Interactive brushing enhances the experience, allowing users to filter the data by selecting specific ranges within any axis. This functionality makes it easier to focus on targeted subsets of the data—

for example, identifying trends between construction types and levels of unit affordability—offering valuable insights for further analysis and policy considerations.

Interactivity

- **Tooltip Integration:** All charts (bar, pie, geo map, parallel coordinates) are equipped with hover tooltips that display contextual information such as borough name, unit counts, construction types, and income levels. These tooltips provide instant insights without requiring user clicks.

- **Pie charts:** When a user clicks on a specific borough in the Borough Distribution pie chart, both the Geo plot and the Bar chart automatically update to reflect data relevant to the selected borough. Similarly, selecting a construction type in the Construction Type pie chart triggers an update in the Geo plot, showing only the projects that match the chosen category. This coordinated filtering allows for a more focused and intuitive exploration of affordable housing data across different dimensions.

- **Dynamic Geo Plot:** This interactive map updates in real-time based on user-selected filters for borough, construction type, and year range. Users can adjust dropdowns and immediately see spatial patterns and project-level variations across NYC.

- **Brushing in Parallel Coordinates Plot:** Users can click and drag along any axis in the PCP to filter a range of values (e.g., select projects with more than 100 low-income units). The chart dims non-matching lines, enabling focused comparison across multiple variables.

- **Reset Button for PCP:** A dedicated reset button allows users to quickly clear their brushed filters and return to the full dataset view — improving usability and analysis flow.

In Progress

- In the dual pie chart, a toggle button would allow users to seamlessly switch between Construction Type Distribution and Borough Distribution within a single pie chart component.
- Integration of Sankey plot to visualize flow from boroughs to income categories and for further analysis to understand how units are distributed across affordability levels.
- Increase interactivity among all the charts.
- Enhancing filtering and brushing across all the visualizations.
- Finalize dashboard styling and export options.

The following screenshots capture the current progress of the dashboard, and the functionalities implemented.

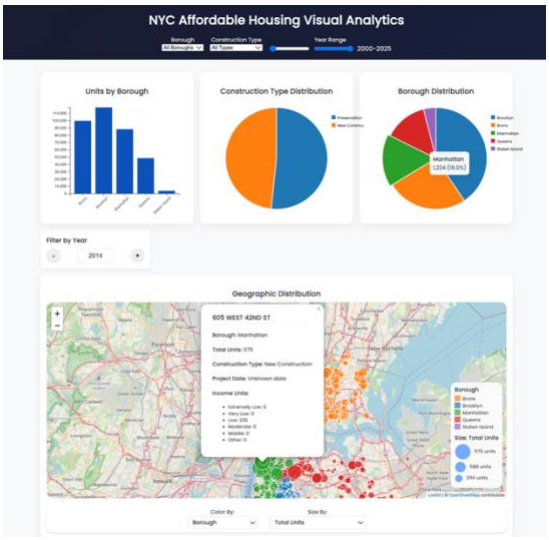

Fig.1: Interactive tooltip and legend

Fig.2: Filtering by year

Fig.3: Basic layout of the dashboard

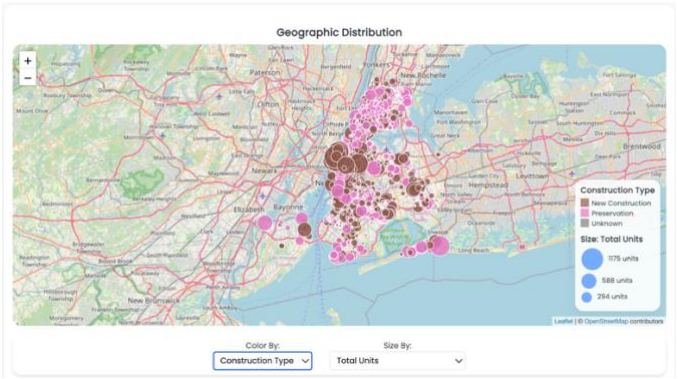

Fig.4: Geo plot filtered by the Construction type

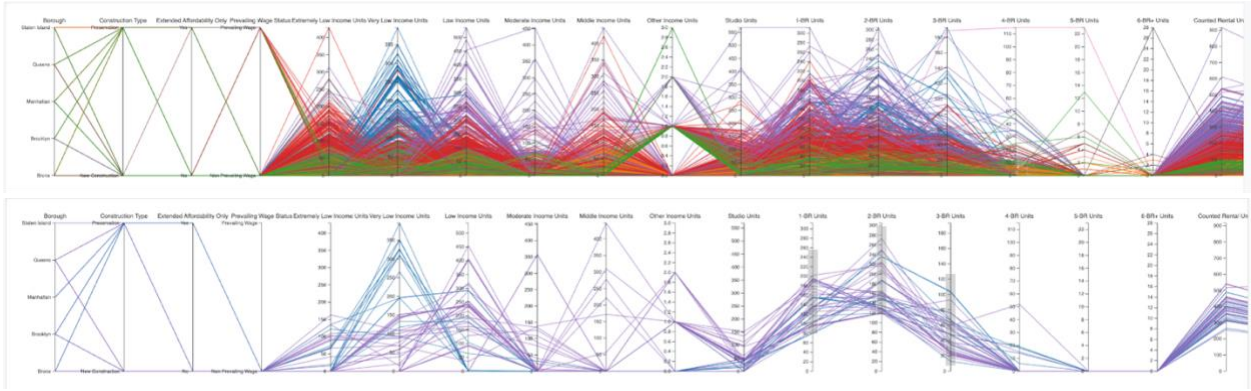

Fig. 5: Parallel Coordinates Plot along with brushing and filtering