CSE 564: Group 35

Final Project Proposal

Sanjyot Amritkar
Dhruv Rathee

Visual Analytics of Affordable Housing Development in New York City

Overview

Affordable housing remains one of the most pressing urban challenges in modern cities. This project explores affordable housing developments in New York City using an interactive visual analytics dashboard. Using a dataset from the NYC Department of Housing Preservation and Development, we aim to uncover insights into the scale, location, and characteristics of housing developments - ultimately aiding policy makers, planners, and community stakeholders in understanding and improving housing equity.

The project leverages both standard and non-standard visualizations to support storytelling and interactive exploration of housing data across time, geography, and development types.

Data Source

- **Dataset**: Affordable Housing Production by Project (https://data.cityofnewyork.us/Housing-Development/AffordableHousing-Production-by-Project/hq68-rnsi/about_data)
- **Key Features**:
  - Building identifiers: Borough, Neighborhood, Address
  - Geo-coordinates: Latitude, Longitude
  - Time: Construction Year, Completion Year
  - Size & Scope: Units Created, Number of Floors, Building Area
  - Classification: Program Type, Construction Type, Building Category
  - Administrative: Developer, Project ID

Key Visualizations and Their Purpose

Visualization	Description & Analytical Purpose
Bar Charts	Show number of units built by borough, year, and program type. Highlights areas with maximum investment and time trends.
Geo Plot (Map)	Map housing developments using coordinates. Color by program type or borough. Bubble size represents number of units.
Parallel Coordinates Plot	Multivariate view across variables like program type, construction type, borough, and unit count. Reveals patterns across dimensions.
Sankey Diagram	Trace the flow from Program Type → Borough → Construction Type. Visualizes how funds and housing types are distributed.

Scatter Plot Matrix	Explore numeric correlations between Year, Floors, Units, and Building Area. Identify clusters and outliers.
Radar Chart	Compare boroughs based on metrics like avg units per building, avg height, avg area. Helps benchmark performance.
Pie Charts	Display percentage distribution by construction type and borough. Use for simple categorical summaries.
PCA Plot	Apply dimensionality reduction on quantitative features to reveal clusters of buildings with similar development patterns.

Interactivity Design

The dashboard will use a combination of linked filters, dynamic rendering, and interactive tooltips to enhance user engagement and allow tailored analysis.

Filters and Selection Panels

- **Dropdown menus** or **checkbox filters** for:
    - Borough (e.g., Bronx, Manhattan, Brooklyn, Queens, Staten Island)
    - Construction Type (e.g., New Construction, Preservation, Rehab)
    - Year range slider (e.g., 2000–2025)

Interactive Components

- Clicking a borough in a pie chart filters all visualizations to that borough.
- Selecting a program in the sankey diagram dynamically updates the bar chart and map to reflect only buildings using that program.
- Hovering on a point in the geo plot shows a tooltip with:
    - Building name
    - Units produced
    - Developer
    - Program & category
- Linked brushing between PCP and scatterplot matrix to investigate detailed building relationships.

Expected Outcome

The project will deliver a fully interactive dashboard that integrates standard and advanced visualizations-including bar charts, geo-maps, Sankey diagrams, PCP, scatterplot matrices, radar charts, pie charts, and PCA. Users will be able to explore affordable housing trends across boroughs, programs, and time, with filters for construction type, year, and affordability status. The outcome is a comprehensive, intuitive tool that reveals spatial disparities, funding patterns, and development clusters - supporting deeper understanding and data-driven decision-making around housing equity in NYC.