Title: Mapping the Pulse of New York Real Estate: An Interactive Analysis of Housing Market Trends in NYC

Abstract:
In our group project, we want to explore the New York Housing Market using a dataset that shows how real estate prices vary across New York City. We plan to use different types of charts and maps to make sense of this information.

We'll start with a map that shows average housing prices in each neighborhood. The map will use colors to show which areas are more expensive. Then, we'll look at how housing prices have changed over time with a simple line chart for different areas and types of homes. We also want to see what kinds of homes are most common, so we'll make a bar chart that shows the number of each type of property available. To understand what affects prices, we'll use a heatmap to show the relationship between a home's size, the number of bedrooms and bathrooms, and its price. Lastly, we'll create a waterfall chart to show how different factors contribute to the average price in different neighborhoods.

Our goal is to make it easier for everyone to understand the New York housing market, whether you're looking to buy a home, sell one, or just interested in real estate trends.

Techniques: ggplot2, ggmap, interaction, Shiny, NLP text mining

Data Description:

- **Dataset - New York Housing Market**
  https://www.kaggle.com/datasets/nelgiriyewithana/new-york-housing-market/data
    - This dataset contains housing prices of New York City areas, providing valuable insights into the real estate market in the region. Analyzing this dataset can help us gain significant information about the trends, fluctuations, and key factors influencing property values in New York City.
    - The dataset contains comprehensive information of the broker title, housing type, housing price, number of bedrooms and bathrooms per unit, size of the property, housing address, state of the unit, main address information, administrative area information, locality & sublocality information, street name, long name, and latitude & longitude coordinate of the house.

Visualization:

- **Map**: We would use ggmap and other interactive map packages to illustrate the average housing price amongst different neighborhoods. The map would be color coded, with darkness of shades indicating different price ranges.
- **Line Chart for Price Distribution(Time-Series):** For a more time sensitive analysis, we would like to plot the line chart by different regions and/or types of houses. This analysis allows us to have a better grasp of the trend over years.
- **Bar Charts for Property Type Counts:** Taking down to the property type level, we are also interested in examining the most to least available type on the market. Therefore,

an interactive bar chart would be provided to allow our audience to examine their top choice of property a bit.

- **Heatmap for Correlation Analysis:** Moreover, we are also interested in examining the correlation between size of the house, #of bedrooms, #of bathrooms and its price. This information would be best presented with a heatmap.
- **Waterfall Chart for Performance Analysis:** On top of what we would do for the heatmap, a waterfall chart would also be included by calculating the incremental average price contributions. This analysis could also be made interactive with different neighborhoods in concern.