Visualising the Airbnb Scenario in New York

Introduction

Airbnb is a global online marketplace that has revolutionized the way people find and book accommodations. By connecting travellers with hosts offering unique spaces, Airbnb has transformed the traditional hospitality industry. The platform allows individuals to rent out their homes, apartments, or even single rooms, providing travellers with diverse lodging options ranging from luxurious penthouses to cosy, budget-friendly stays.

This project aims to visualize the Airbnb house-letting scenario in New York City, to guide homeowners in the region that want to list their properties on the website. This report will discuss how the price and popularity of listings are impacted by reviews, location, property size etc. To provide a reference point for the visualisations, I have based all of them on the fictional case of Julie. Julie is the homeowner of a property in Queens. She wants to list this 2-bed/1-bath unit on Airbnb, but is uncertain about whether she should take on an expansion project, and turn this into a 3-bed/2-bath unit before creating the listing. The renovation cost would be $15,000. The visualisations in this project are directed towards helping Julie make an informed decision, but the parameters of the visualisations can be changed by other homeowners and directed towards their specific use.

Description of data

The public dataset used in this project contains details of over 41,000 listings on Airbnb in New York City. Each listing had details about the host, location, room type, number of bedrooms and bathrooms, price and reviews. There were a few listings in the dataset for which the price was not recorded. These listings were deleted for this analysis.

Visualisations

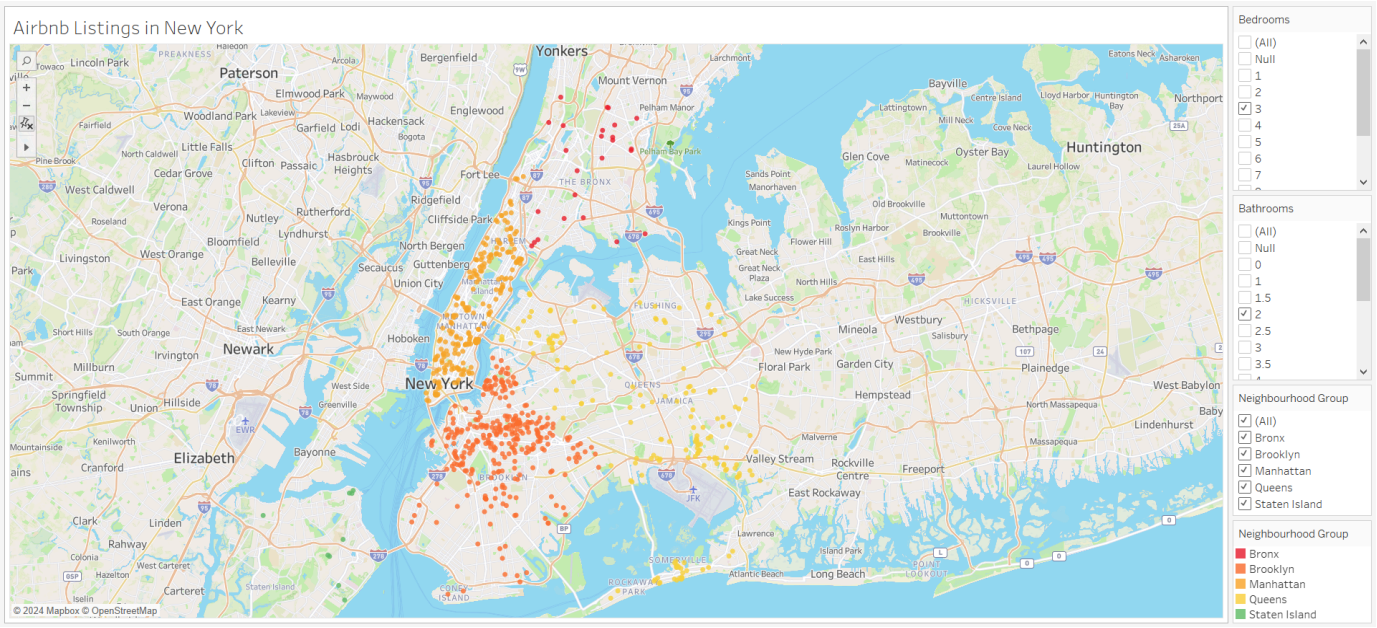

Fig 1: Mapping the listings in NYC

This first visualisation in the dashboard aims to set the scene and present the count of Airbnb listings over a map of New York City. The listings have been categorized by colour, based on the neighbourhood they belong to.

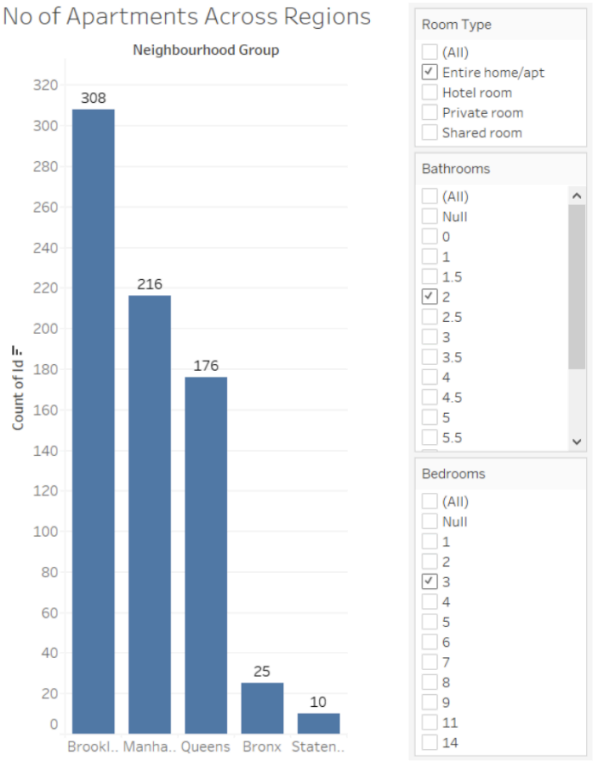

Fig 2: Number of apartments by Region

The visualisation above is to give prospective Airbnb hosts a sense of the competition in each neighbourhood, in terms of the number of listings. The bar graph visualises the number of listings of entire homes that have 3 beds and 2 baths. At 308 listings, Brooklyn has by far the highest number of listings of this specification. On the other hand, Staten Island has the lowest number of listings, presenting an opportunity for homeowners in this region who are considering listing their properties. On the Tableau dashboard, the filters can be changed by future prospective Airbnb hosts according to their needs.

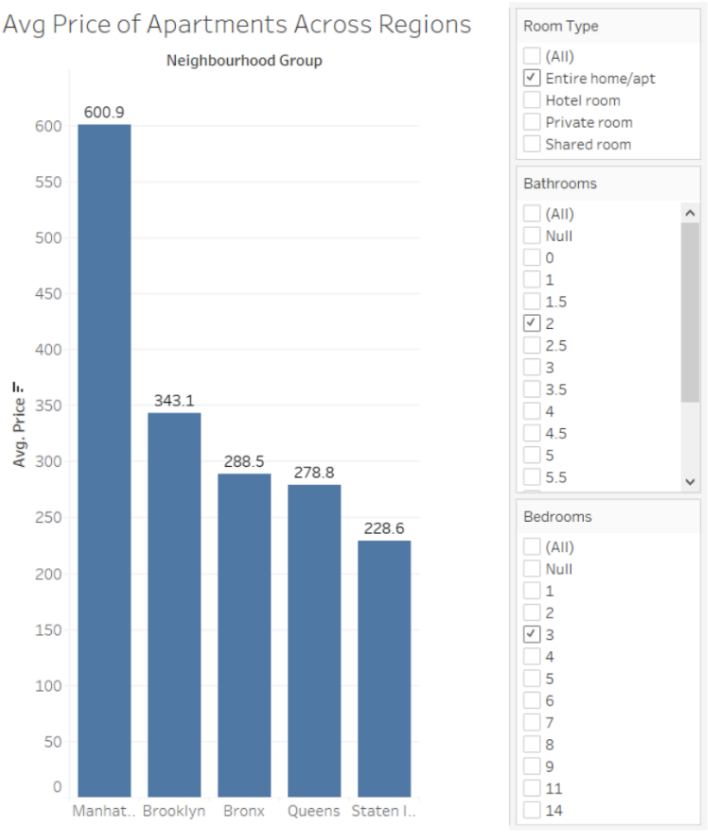

Fig 3: Average Price of Listings by Region

The bar graph above visualises the differences in the price of Airbnb listings by region. Again, the visualisation above shows prices of entire homes that have 3 beds and 2 baths. At $600.9 per night, Manhattan has the costliest listings in this category. The average price of listings in Staten Island might indicate that this area is less desirable for tourists.

Break Even Period Across Neighbourhoods

Neighbourhood Group	Avg. Revenue per Night	Avg. Break Even Period (Days)	Investment Amount
Bronx	280	119	15,000
Brooklyn	333	122	15,000
Manhattan	583	83	15,000
Queens	270	133	15,000
Staten Island	222	146	15,000

Occupancy Rate
50

Investment Amount
15,000

Fig 4: Break-Even Period for Home Improvement Projects

This table is intended to be used by homeowners who, like Julie, are considering projects to improve their listings. Based on the break-even period in days, they make an informed decision on whether or not the improvement project makes financial sense. In Julie's case, the investment amount is $15,000, and this amount will take roughly 4 and a half months to break even. Other prospective users can alter the investment amount and projected occupancy rate as per their scenario.

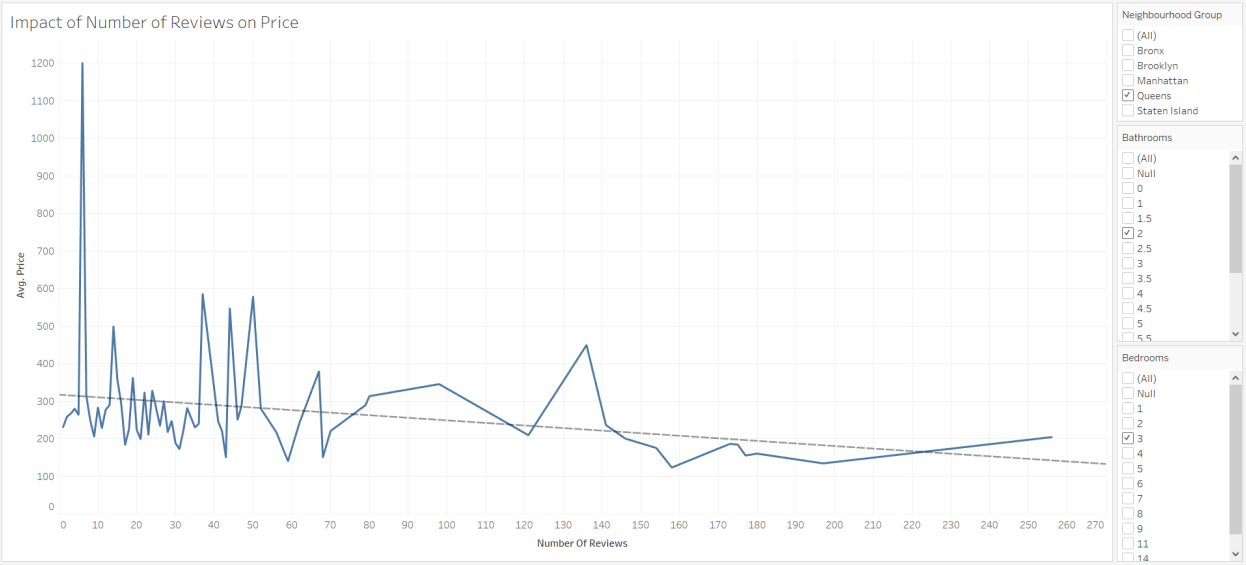

Fig 5: Impact of Number of Reviews on Price

Another potential determinant I wanted to explore was the effect of the number of reviews on price, as Airbnb hosts usually nudge their guests into writing reviews. This effect is shown in the line graph above. For 3-bed/2-bath units in Queens, there is a weak negative correlation between the number of reviews and the average price. The R-Square value is 0.067, which suggests that the number of reviews can explain 6.7% of the variation in prices. The negative effect is contrary to the logic that more reviews indicate a more popular listing which can be priced higher. The effects of the reviews would be more conclusive if there were distinct data for positive and negative reviews.

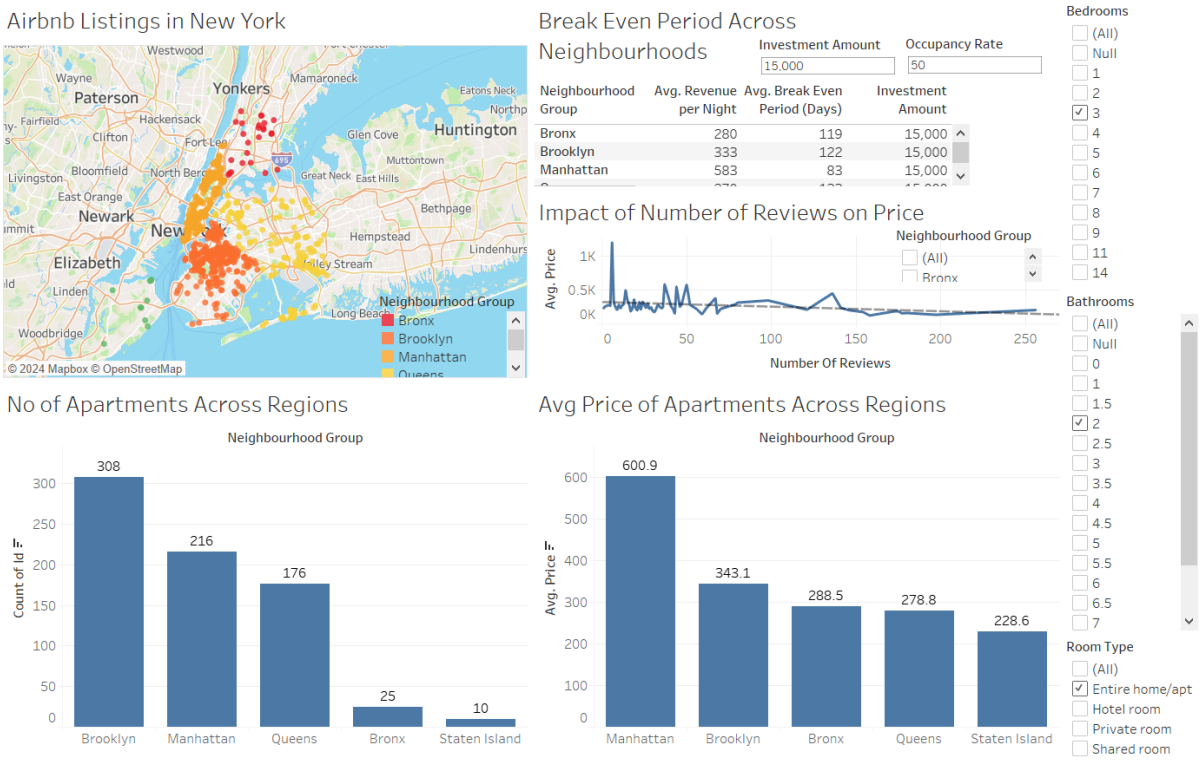

Fig 6: Compiled Dashboard

The last tab in the packaged workbook presented all the visualisations in a single compiled dashboard. In this dashboard, all the filters (number of bedrooms/bathrooms, room type, neighbourhood) can be adjusted, and the changes in the metrics of all visualisations can be seen. This makes it convenient for the user to gauge the house-letting scenario in New York for different parameters and specifications.

Key Takeaways

In this project, through a series of visualizations, we explored various aspects of the Airbnb market, including listing distribution, regional competition, pricing trends, and the financial implications of property improvements. While this report uses a fictional case study to illustrate these insights, the interactive nature of the visualizations allows for adjustments to fit individual scenarios.

By analyzing the dataset, we can better understand how factors such as location, property size, and the number of reviews impact listing prices and popularity. The visualizations are designed to assist homeowners in making informed decisions about listing their properties and considering potential renovations.