

NYC Short-Term Rental Insights for Pillow Palooza

By

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1. About Project

1.1 Project Background

Pillow Palooza is a start-up focused on disrupting the traditional real estate market by offering short-term rental options for travelers. The company has seen a significant increase in demand for short-term rentals in New York City, but wants to better understand the market in order to optimize their business strategy.

Pillow Palooza has collected data from various sources on Airbnb listings in New York City to gain insight into the market. The company has planned to analyze this data using its internal teams, in order to provide recommendations on how to maximize revenue and occupancy rates for their short-term rental properties.

1.2 Introduction

As a Data Analyst for Pillow Palooza, a real estate start-up, we have been tasked with conducting an in-depth analysis of the short-term rental market in New York City. The goal was to provide valuable insights and recommendations to the stakeholders. To accomplish this, we have designed and executed a comprehensive project that involved collecting **Airbnb listing data 2019** from various sources, cleaning and organizing it, and conducting a thorough analysis.

The analysis was focused on uncovering key trends in popular neighborhoods, rental prices, property types, length of stay, and demand over time. By analyzing this data, we can gain a deeper understanding of the market dynamics and identify opportunities for Pillow Palooza to make informed business decisions.

The insights generated from this analysis have the potential to provide crucial information for Pillow Palooza. For instance, by identifying which neighborhoods were most sought after by short-term renters, we can determine where to focus our investments. Additionally, understanding the preferences for different property types will allow us to tailor our offerings to meet the demand effectively. Furthermore, by analyzing rental prices and trends over time, we can develop a competitive pricing strategy that attracts customers while maximizing profitability.

Ultimately, the aim of this project is to equip Pillow Palooza with the knowledge necessary to make strategic decisions that will drive growth and success in the highly competitive short-term rental

market in New York City. By leveraging data-driven insights, we can position Pillow Palooza as a key player in the industry, capturing market share and delivering exceptional value to both property owners and renters.

After collaborating with my team, we have developed a set of guiding questions to steer our analysis and ensured we have extracted meaningful insights from the data.

1. What are the most popular neighborhoods for short-term rentals in New York City?
2. What is the average rental price for short-term rentals in New York City, and how does it vary by neighborhood and property type?
3. What are the most commonly rented property types on Airbnb in New York City, and how does this vary by neighborhood?
4. What is the average length of stay for short-term rentals in New York City, and how does this vary by neighborhood and property type?
5. How has demand for short-term rentals in New York City changed over time, and are there any seasonal trends that could impact business decisions?

2. Project Logistics

The project has been divided into three parts:

1. Data Wrangling and Cleaning – using Python
2. Data Analysis and Insights Generation – using SQL
3. Presenting your findings for Business Impact – using Tableau/Python

2.1 Step 1 - Data Wrangling and Cleaning – using Python

Thoroughly cleaning and preparing the data is of utmost importance as it guarantees the reliability and accuracy of the information. This initial step served as the building block for subsequent analysis, allowing to uncover meaningful trends in the NYC Airbnb market. By ensuring the dataset was cleaned and well-prepared, we could proceed with analyzing listing prices across different boroughs and comparing them to the private rental market. The results of this analysis have been presented in a suitable format, ready to be utilized in the next step.

It was required to create a list that outlined the specific actions that have taken during each stage of the data cleaning process. This list has included all necessary steps, such as identifying missing or duplicate data, dealing with inconsistencies, and addressing any anomalies in the dataset.

The following steps were done to clean the dataset using Jupiter Notebook,

- Importing the data
- Cleaning the price column
- Removing Outliers
- Comparing costs to the private rental market

- Cleaning the room_type column
- Working with TimeFrames
- Joining the DataFrames
- Analyzing listing prices by NYC borough
- Price range by borough
- Export the datasets that have cleaned

2.2 Step 2 - Data Insights with SQL

The cleaned datasets were exported and created the schema for to use as a further analysis, additionally the data engineering team have included extra columns (from public data sources) in order to enhanced the analysis.

When working with the public dataset, we have encountered situations where some of the five business questions which have been asked to answer cannot be fully addressed using the provided dataset. Pillow Palooza faced a limitation in accessing Airbnb's internal data as they operate as a competitor. While they did not have access to specific details of each booking or reservation data, they could utilize publicly available information. This included data such as the number of reviews, the availability of nights, and other relevant metrics that would still provide valuable insights for the analysis. Despite the absence of internal data, Pillow Palooza can leverage the available public data to gain valuable information about the market.

When considering of the above 5 business questions, the following 3 questions can be answered by combining and correlating the available data columns,

- 1- What are the most popular neighborhoods for short-term rentals in New York City?
- 2- What is the average rental price for short-term rentals in New York City, and how does it vary by neighborhood and property type?
- 3- What are the most commonly rented property types on Airbnb in New York City, and how does this vary by neighborhood?

Questions that could not be fully answered due to the partial information we had. We may not have access to the necessary data points or historical data to provide accurate insights.

- 4- What is the average length of stay for short-term rentals in New York City, and how does this vary by neighborhood and property type?

The provided dataset has not included data on the length of stay

- 5- How has demand for short-term rentals in New York City changed over time, and are there any seasonal trends that could impact business decisions?

The provided dataset has not allowed us to answer this question with full certainty. What insights can we provide to answer these questions partially?

The description of each table and its columns,

Prices

listing_id	the listing ID
price	price in dollar
borough	Name of the borough
neighborhood	Name of the neighborhood
price_per_month	price per month in dollars
latitude	latitude coordinates
longitude	longitude coordinates

Table 1 - Prices

Reviews

listing_id	the listing ID
host_name	name of the host
last_review	date of the last review
minimum_nights	Minimum night rented
number_of_reviews	number of reviews
reviews_per_month	number of reviews per month
calculated_host_listings_count	amount of listing per host
availability_365	number of days when listing is available for booking in the next 365 days
booked_days_365	Amount of booked days in the next 365 days

Table 2 - Reviews

Room_Types

listing_id	the listing ID
description	the description of the listing
room_type	listing space type

Table 3 – Room_Types

To analyze the data and derive recommendations, we formulated a set of questions and employed SQL as the primary tool for addressing them. By utilizing SQL, we were able to query the dataset and extract relevant information that allowed us to draw insights and provide actionable recommendations. The structured nature of SQL facilitated efficient data retrieval, aggregation, filtering, and manipulation, enabling us to perform complex analyses and generate meaningful outcomes. Through the use of SQL, we were able to address the predefined questions effectively and derive valuable insights to inform our recommendations.

2.3 Step-3 Presenting your findings for Business Impact – using Tableau/Python

To effectively visualize our findings, we utilized a combination of Tableau and Python.

3. Analysis, Insights and Recommendations

Several questions were created to answer the main business questions.

1). What is the most common room type in NYC Airbnb listings?

When it comes to property types, the most commonly listed room type was "Entire home/apt," with a staggering 13,266 listings. This room type may offer guests the luxury of having an entire space to themselves, providing privacy and ample room for families, groups of friends, or individuals who prefer more independence. It is often favored for its flexibility and the higher rental income it can generate for hosts.

Following closely behind was the "Private room" category, with 11,356 listings. This option allowed guests to enjoy a private space within a host's property while still having access to shared amenities. It can be an attractive choice for solo travelers or those seeking a more budget-friendly accommodation option.

In contrast, the "Shared room" category lagged behind with only 587 listings. Shared rooms typically involve guests sharing the same living space with others, which can be appealing to budget-conscious travelers or those looking for a communal experience.

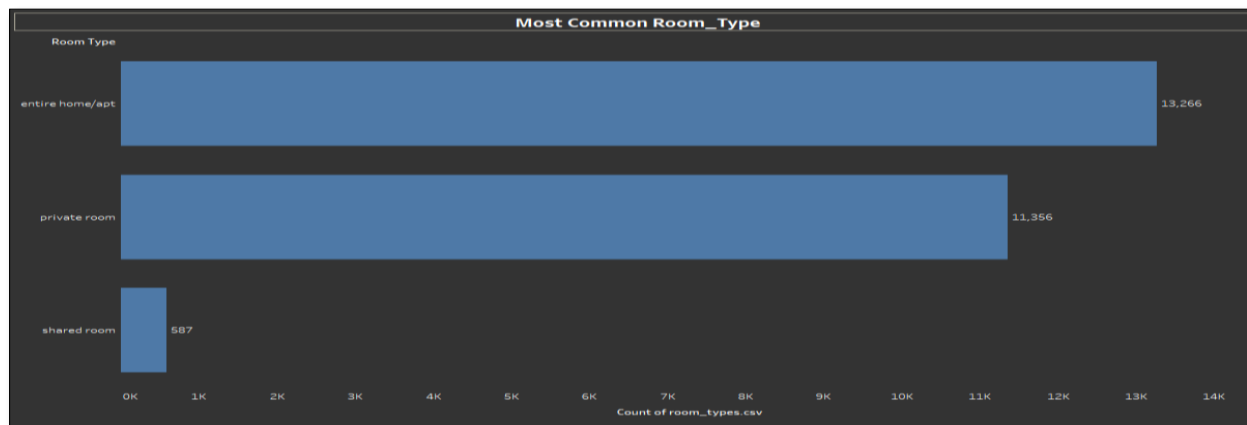


Figure 1 – Most Common Room Type

Understanding the distribution of different room types in the short-term rental market can be useful for targeting specific types of listings for marketing or promotion purposes.

2). How many listings of each room type are in each borough?

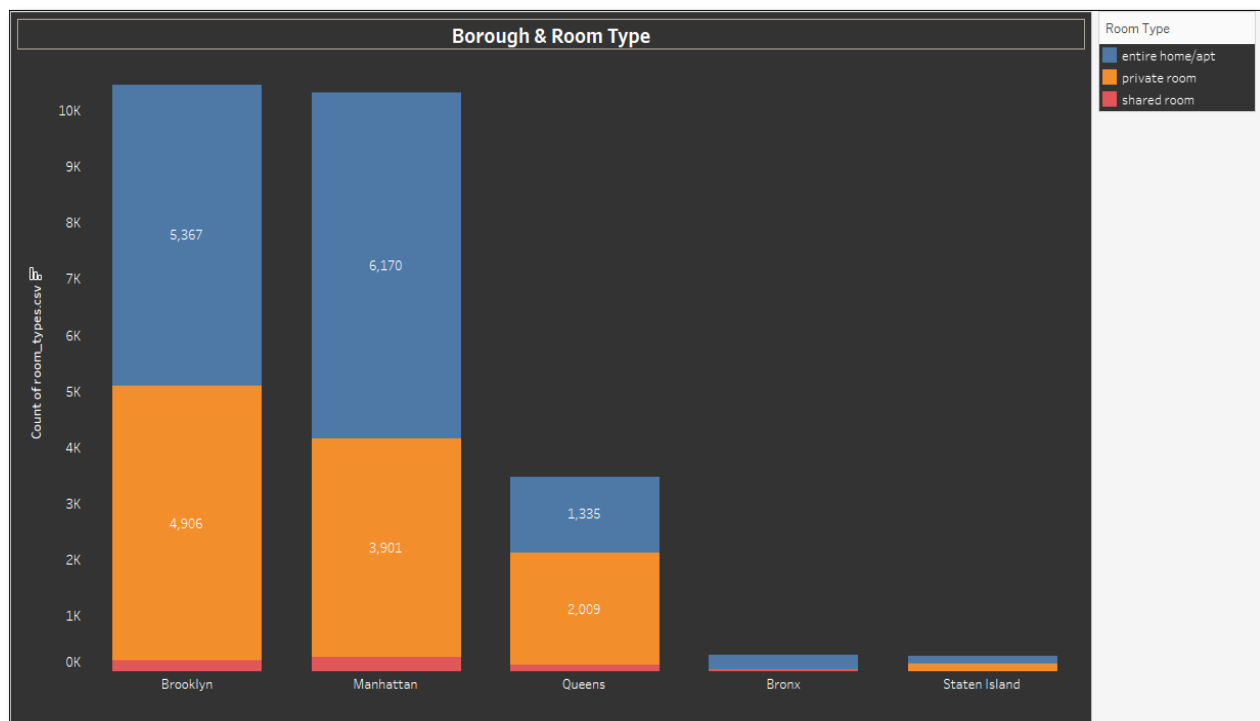


Figure 2 – Borough & Room Type

Popular Borough: The analysis revealed that boroughs such as Manhattan, Brooklyn, and Queens had the highest concentration of short term rentals.

These areas present the most promising opportunities for Pillow Palooza to focus its marketing efforts and expand its presence.

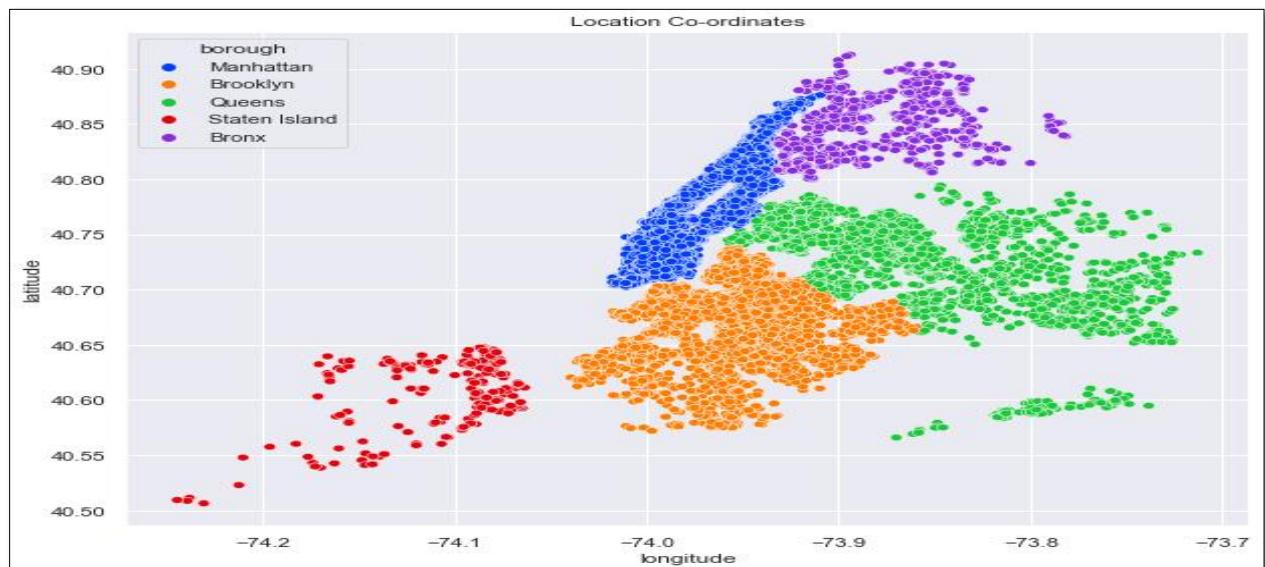


Figure 3 – Location Co-ordinates



Figure 4 – Distribution of type of rooms across NYC

Upon further examining the graphs, it becomes apparent that Brooklyn and Manhattan exhibit the highest prevalence of property types, while the availability of room types in the Bronx and Staten Island is comparatively lower.

Therefore, this type of information could be useful for targeted advertising, by knowing which room types are most prevalent in the area, the marketing department of Pillow Palooza can tailor advertising efforts to attract guests looking for those specific accommodations. For example, if "Entire home/apt" listings dominate the market, we can focus our marketing on the advantages of having an entire space to oneself, emphasizing privacy, amenities, and the flexibility it offers.

Another important fact is that understanding the room type distribution can help differentiate the listing from the competition. If the market is saturated with "Entire home/apt" listings, you could consider offering a unique experience within that category, such as themed decor, personalized amenities, or additional services to make the listing stand out.

This is also opportunity to identify potential gaps in the market. If there is a low number of listings in a particular room type in each borough such as shared rooms, it may indicate an untapped

opportunity. We could consider diversifying the offerings by adding that room type to cater to guests looking for something different.

In summary, analyzing the distribution of room types can inform company's marketing and promotional strategies, allowing to target specific listings, create customized promotions, differentiate your offerings, identify market gaps, and tailor your messages to attract your desired guest demographic.

3). What is the average rental price of a listing by room type?

Average rental prices: By examining the dataset, we have identified that the average rental prices vary significantly across different boroughs, neighborhoods and property types.

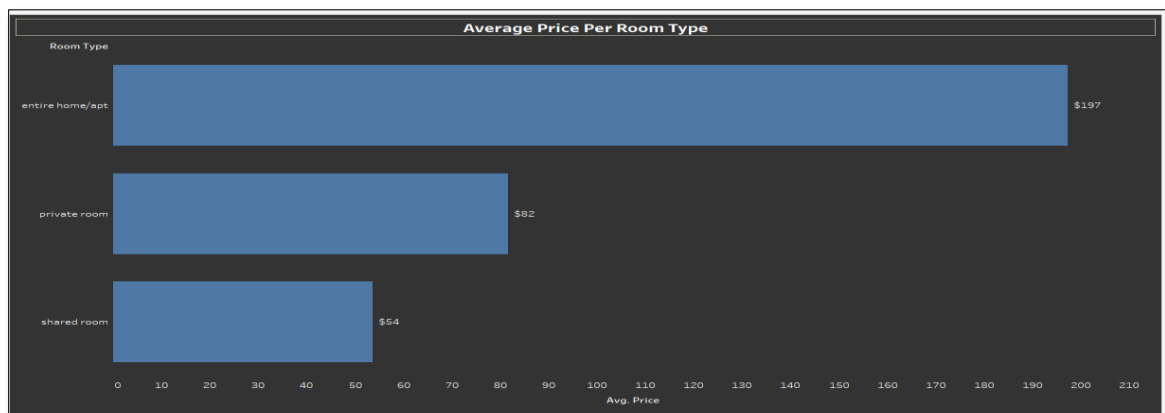


Figure 5 – Average Price Per Room Type

The average rental price for an entire home or apartment was \$197

The average rental price for a private room was \$82

The average rental price for a shared room was \$54

The information about the average prices for different room types in short-term rentals is valuable for Pillow Palooza to understanding the price ranges and identifying any significant differences between them.

Understanding price range: By knowing the average prices, we can gain insights into the typical cost associated with each room type. This allows to establish a price range within which most listings in each category fall. For example, the range for "Entire home/apt" listings may vary from lower-priced options around \$70 to more luxurious accommodations priced at several hundred dollars per night such as \$805. Similarly, "Private room" listings typically fall within a range of

around \$30 to \$200 per night, while "Shared room" listings tend to have the most economical range, usually below \$100 per night.

Identifying significant differences: Comparing the average prices across different room types helps identify any notable discrepancies. In this case, there are substantial differences between the prices of "Entire home/apt," "Private room," and "Shared room" listings. "Entire home/apt" is the most expensive option, with an average price of \$197, indicating that guests can expect to pay more for the privacy and exclusive use of an entire space. On the other hand, "Private room" has a significantly lower average price of \$82, providing guests with a more budget-friendly option that still offers a dedicated private space. "Shared room" listings have the lowest average price of \$54, making them the most economical choice for travelers willing to share living spaces.

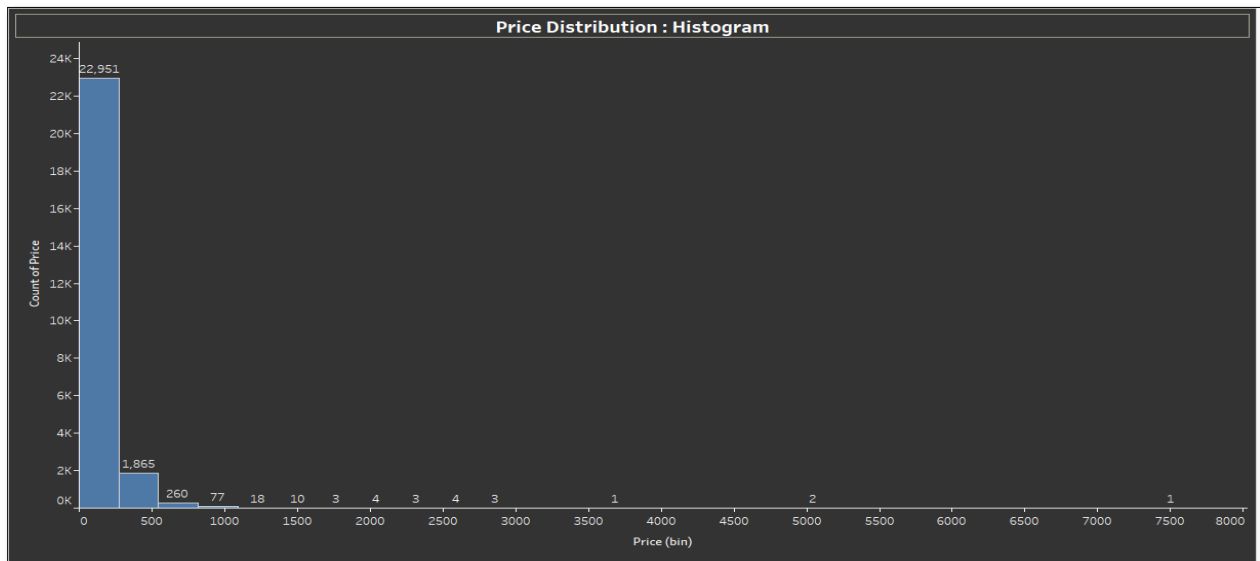


Figure 6 – Price Distribution: Histogram

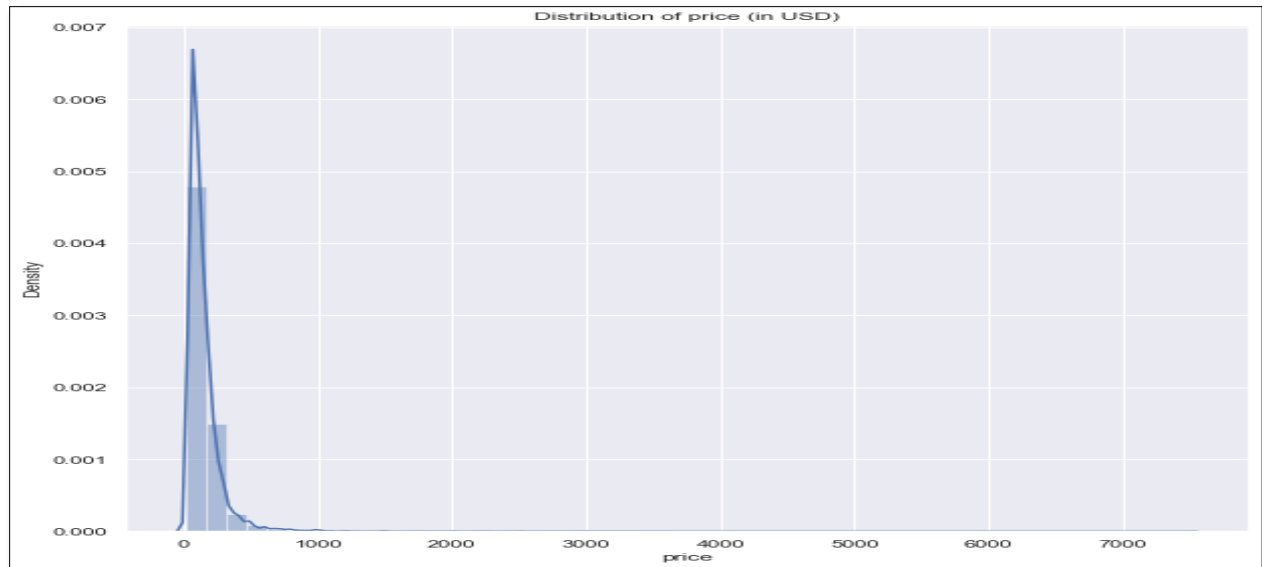


Figure 6 – Distribution of Price (in USD)

The distribution of price was right skewed with the property prices less than \$1000. We also had properties with \$5000 and \$7500. Let's check the summary statistics for prices.

```
count    25202.000000
mean      141.817316
std       147.350650
min        10.000000
25%        69.000000
50%       105.000000
75%       175.000000
max       7500.000000
```

From the summary statistics, we understood that the average value of the property was \$141.82 while the median value was \$105.00. The maximum property value was \$7500.00. It can be observed that only one property was listed that price.

The histogram plot for price between 0-1000 USD was more interpretable and as it's mentioned the distribution was skewed towards right. We had more properties in the price range of 0-250 USD. Pillow Palooza should consider this rental prices distributions when they planning prices for their properties.

4). Which Borough & Neighborhood has the highest average rental price?

4.1 Borough Wise

Manhattan boasted the highest average rental price of \$184.00, making it the most expensive borough. Following closely was Brooklyn with an average rental price of \$121.97. Queens follows

with an average rental price of \$92.81, while Staten Island and the Bronx had average rental prices of \$86.04 and \$79.24, respectively.

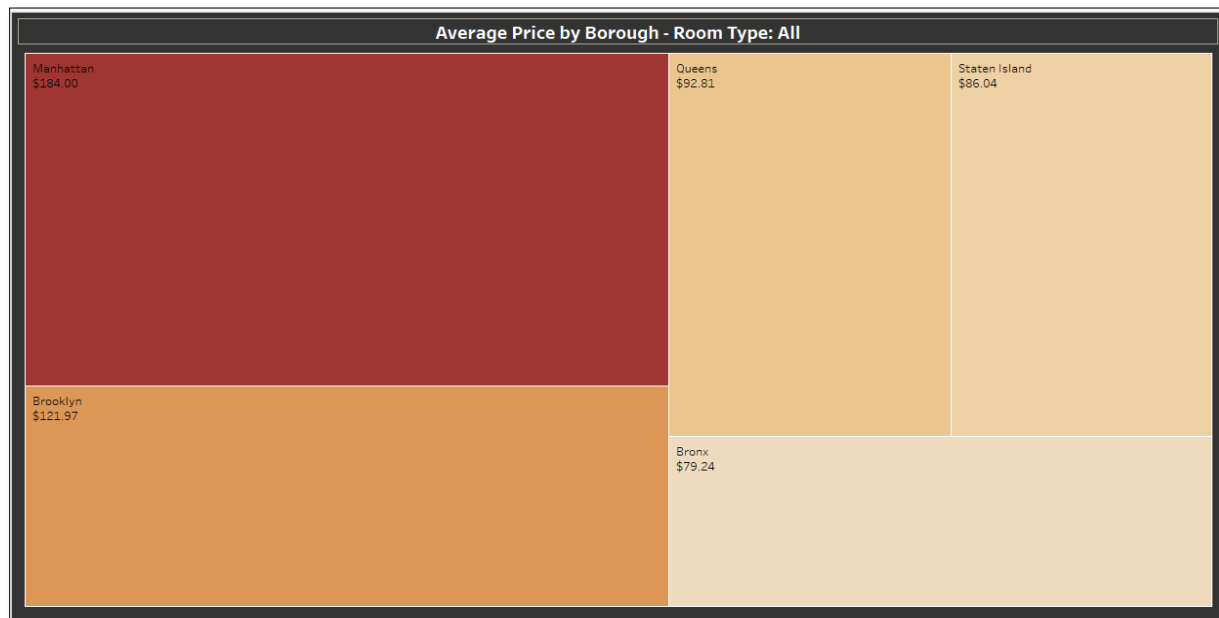


Figure 7 – Average Price by Borough – Room Type

Manhattan: With an average price of \$184.00, Manhattan stands out as the most expensive borough. This is in line with its reputation as a high-end and affluent area in New York City. The high average price can be attributed to factors such as prime real estate locations, luxurious amenities, and a vibrant urban lifestyle.

Brooklyn: Although not as pricey as Manhattan, Brooklyn still commands a relatively high average price of \$121.97. Over the years, Brooklyn has experienced significant gentrification and has become increasingly popular among young professionals and families seeking a mix of city living and a more relaxed atmosphere. The borough offers a diverse range of neighborhoods and a thriving cultural scene.

Queens: Queens had an average price of \$92.81, making it more affordable compared to Manhattan and Brooklyn. It is known for its diverse population, suburban-like neighborhoods, and a relatively lower cost of living. Queens offers a balance between urban amenities and a more spacious living environment, attracting residents seeking affordability and convenience.

Staten Island: Staten Island had an average price of \$86.04. It was the second least expensive among the five boroughs, offering a more suburban lifestyle with quieter neighborhoods and a

slower pace of life. Staten Island is connected to the rest of the city by ferry and bridges, providing residents with a retreat from the bustling urban environment at a more affordable cost.

The Bronx: With an average price of \$79.24, the Bronx was also relatively affordable compared to the other boroughs. It is known for its strong sense of community, diverse cultural heritage, and ample green spaces. The Bronx has experienced revitalization efforts in recent years, attracting residents who value affordability and a rich cultural experience.

These insights reflect the general trends in the real estate market and the varying characteristics and appeal of each borough within New York City.

5). What is the average rental price of a listing by room type?

In addition to analyzing the average listing prices in different borough, it can also be valuable to understand how the prices have varied according to the room type. This information can be particularly useful for targeting specific types of guests and understanding the pricing dynamics within the market.

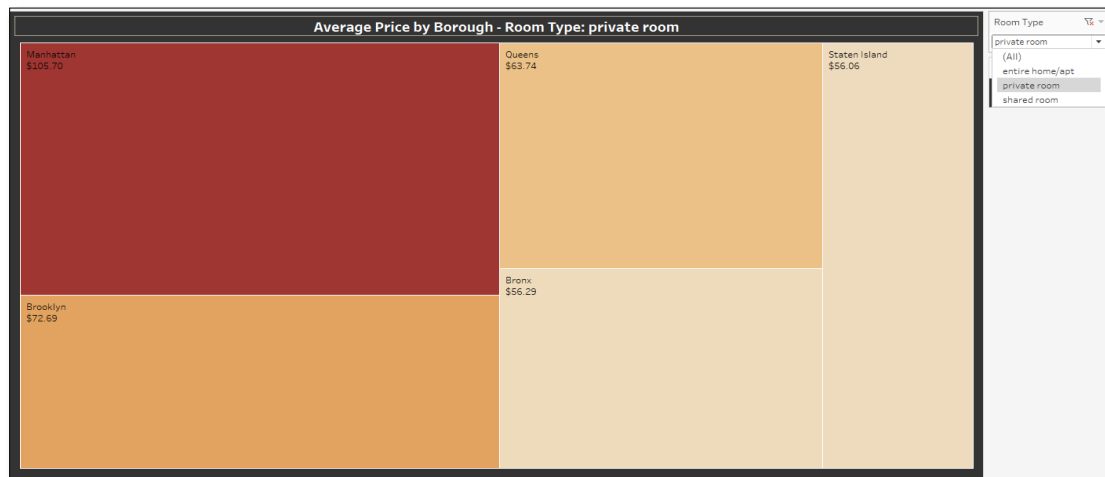


Figure 7 – Average Price by Borough – Room Type: private room

By examining the prices according to room types, such as private rooms, shared rooms, or entire homes/apartments, property owners or hosts can gain insights into the pricing preferences of different guest segments. This allows them to tailor their offerings and marketing strategies to target specific types of guests who are willing to pay a premium for certain room types.

Understanding the pricing variations across different room types helps hosts determine which types of accommodations yield higher returns and appeal to their target audience. For example, if private rooms in a particular neighborhood command significantly higher prices compared to shared rooms

or entire homes, hosts can focus on marketing private rooms to individuals or couples seeking a more intimate and exclusive experience.

Conversely, if entire homes/apartments are priced at a premium, hosts can target families or larger groups who prefer the privacy and convenience of having an entire space to themselves.

By incorporating room type pricing analysis into their strategies, hosts can optimize their offerings, enhance guest satisfaction, and maximize their revenue potential by catering to the specific needs and preferences of different guest segments.

6). What is the distribution of listing prices by Borough and Room Type?

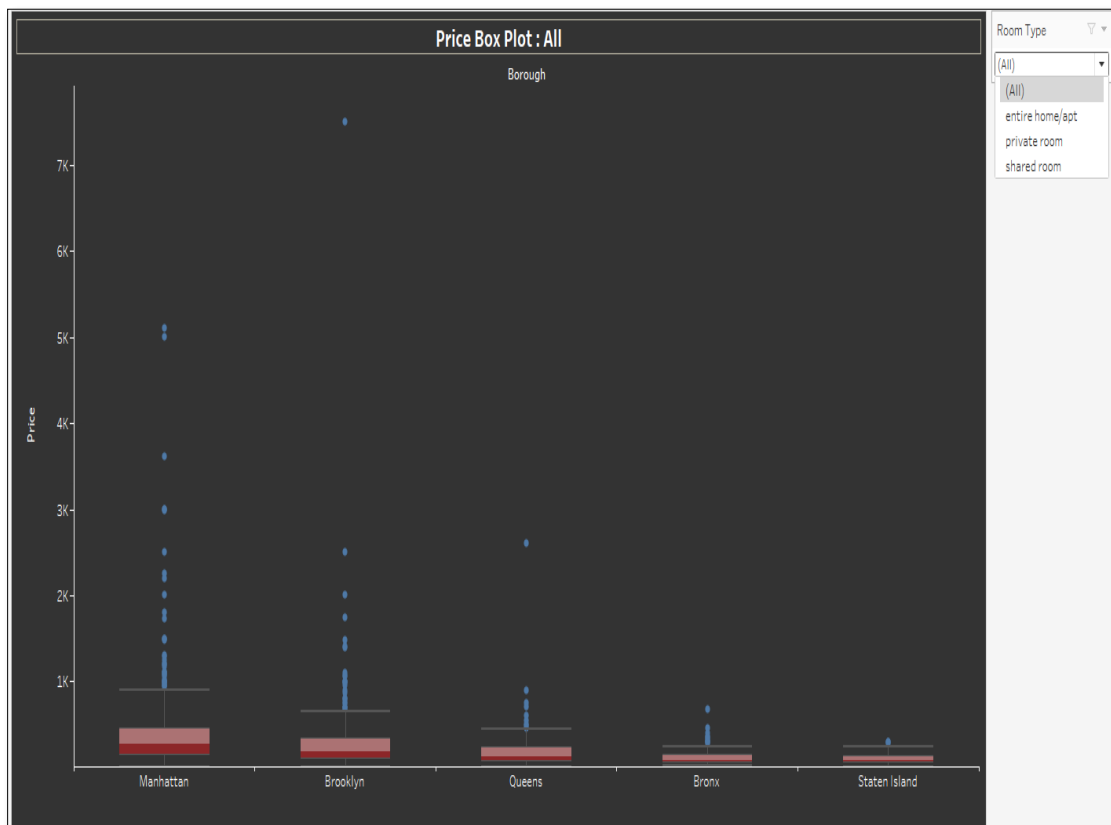


Figure 8 – Price Box Plot : All

	borough	min	max	mean
0	Bronx	20.0	670.0	79.241033
1	Brooklyn	10.0	7500.0	121.974665
2	Manhattan	10.0	5100.0	184.000678
3	Queens	10.0	2600.0	92.813947
4	Staten Island	13.0	300.0	86.044944

Figure 9 – Price Distribution_1

	borough	median	mean
0	Manhattan	149.0	184.00
1	Brooklyn	95.0	121.97
2	Staten Island	71.0	86.04
3	Queens	70.0	92.81
4	Bronx	65.0	79.24

Figure 10 – Price Distribution_2

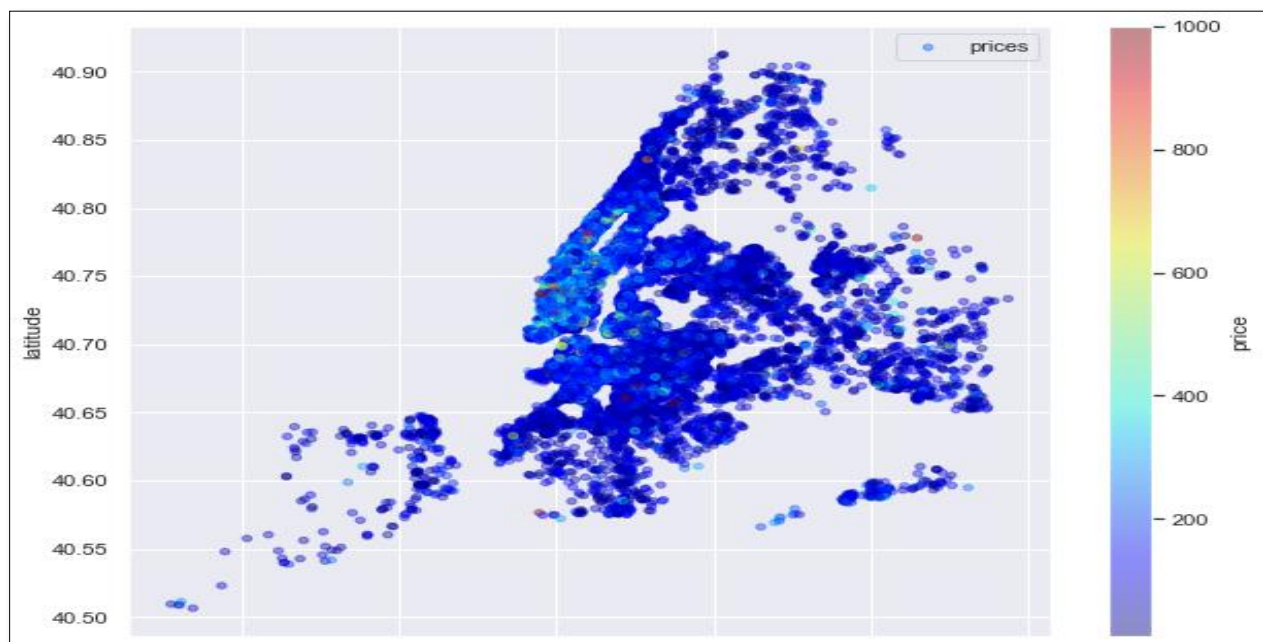


Figure 11 – Price Distribution_3

Manhattan had the highest median price of \$149.00, indicating that half of the properties in Manhattan had a price below this value. The mean price of \$184.00 was slightly higher than the median, suggesting the presence of some properties with relatively higher prices that contributed to the overall average.

Brooklyn had a median price of \$95.00, which was lower than Manhattan. This suggests that half of the properties in Brooklyn had a price below \$95.0. The mean price of \$121.97 was higher than the median, indicating that there might be some properties with relatively higher prices that impact the average.

Queens had a median price of \$70.00, which is similar to Staten Island. This means that half of the properties in Queens had a price below \$70.00. The mean price of \$92.81 suggests that there might be some properties with relatively higher prices that contribute to the average.

Staten Island had a median price of \$71.00, indicating that half of the properties had a price below \$71.00. The mean price of \$86.04 was slightly higher than the median, suggesting the presence of some properties with higher prices that influence the overall average.

The Bronx had the lowest median price of \$65.00, indicating that half of the properties in the Bronx had a price below this value. The mean price of \$79.24 was slightly higher than the median, suggesting the presence of some properties with higher prices that impact the overall average.

It can be observed that most areas prices below 200 USD, Manhattan and Brooklyn had the most diverse price range. Overall, Manhattan had the highest average and median prices among the boroughs, indicating a higher price range and a more expensive real estate market. Brooklyn followed with relatively lower prices but still above the median prices of Staten Island, Queens, and the Bronx, with the latter having the lowest prices among the five boroughs. In the Bronx and Staten Island were zero listings in above 1000 USD. Only few prices were above 250USD, which proof of in these areas the average price mostly below 200 USD.

Based on the statistical analysis and insights gained, we can establish the price ranges for each borough and room type. These ranges should reflect the typical rental prices within each category while accounting for variations and outliers.

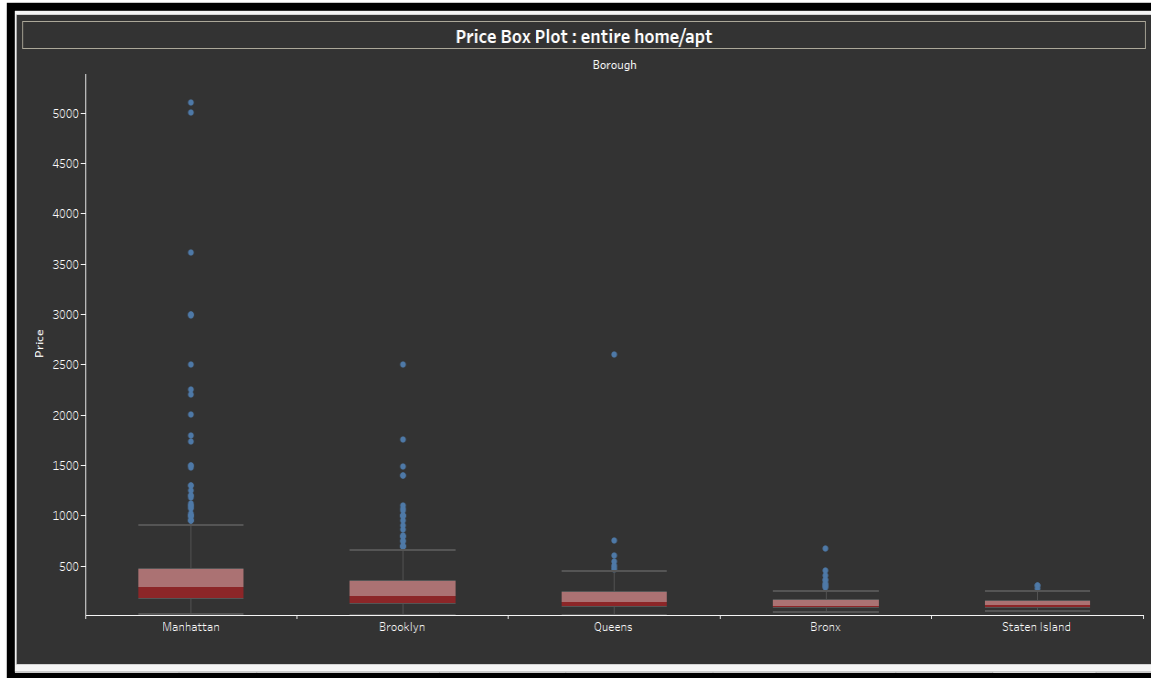


Figure 12 – Price Box Plot: entire home/apt

When considering the price ranges for specific property types, this box plot is useful for gain insights.

	borough	room_type	min	max	mean	median
0	Bronx	entire home/apt	35.0	670.0	120.517241	100.0
1	Bronx	private room	23.0	187.0	56.292804	50.0
2	Bronx	shared room	20.0	60.0	33.030303	28.0
3	Brooklyn	entire home/apt	10.0	2500.0	169.903671	145.0
4	Brooklyn	private room	10.0	7500.0	72.688545	65.0
5	Brooklyn	shared room	18.0	250.0	39.422460	35.0
6	Manhattan	entire home/apt	16.0	5100.0	238.024473	195.0
7	Manhattan	private room	10.0	1500.0	105.698795	90.0
8	Manhattan	shared room	25.0	800.0	72.960159	65.0
9	Queens	entire home/apt	10.0	2600.0	140.931086	120.0
10	Queens	private room	22.0	900.0	63.741165	58.0
11	Queens	shared room	15.0	120.0	40.767857	35.0
12	Staten Island	entire home/apt	49.0	300.0	116.774436	100.0
13	Staten Island	private room	20.0	235.0	56.060606	50.0
14	Staten Island	shared room	13.0	30.0	21.500000	21.5

Figure 12.1 – Price Statistics

For entire home/apt

Most areas prices were below 300 USD, Manhattan and Brooklyn had the most diverse price range, with prices mostly below 300 USD but several above 1000USD. Queens was the third most expensive area for entire homes and apartments. In the Bronx and Staten Island were zero listings

in above 1000 USD. Only few prices were above 300USD in Bronx, which proof of in these areas the average price mostly below 100 USD.

For Private rooms

Most areas prices below 250 USD, Brooklyn had the most diverse price range, with prices mostly below 250 USD but there were two properties above 1000USD. Manhattan and Queens also had relatively few diverse price ranges. Manhattan Private rooms rental prices varied from 10 – 1500 USD. Furthermore, Queens privates' rooms varied from 22 – 900 USD. Bronx and Staten Island's prices were below 250 USD.

For Shared rooms

For Manhattan price rage was 25 – 800 USD, Brooklyn was 18 – 250 USD, Queens was 15 – 120 USD, Bronx was 20 – 60 USD, Staten Island 13 – 30 USD.

6.1 Neighborhood Wise

The below chart provides a visual representation of the neighborhoods with the highest average rental prices in each borough.

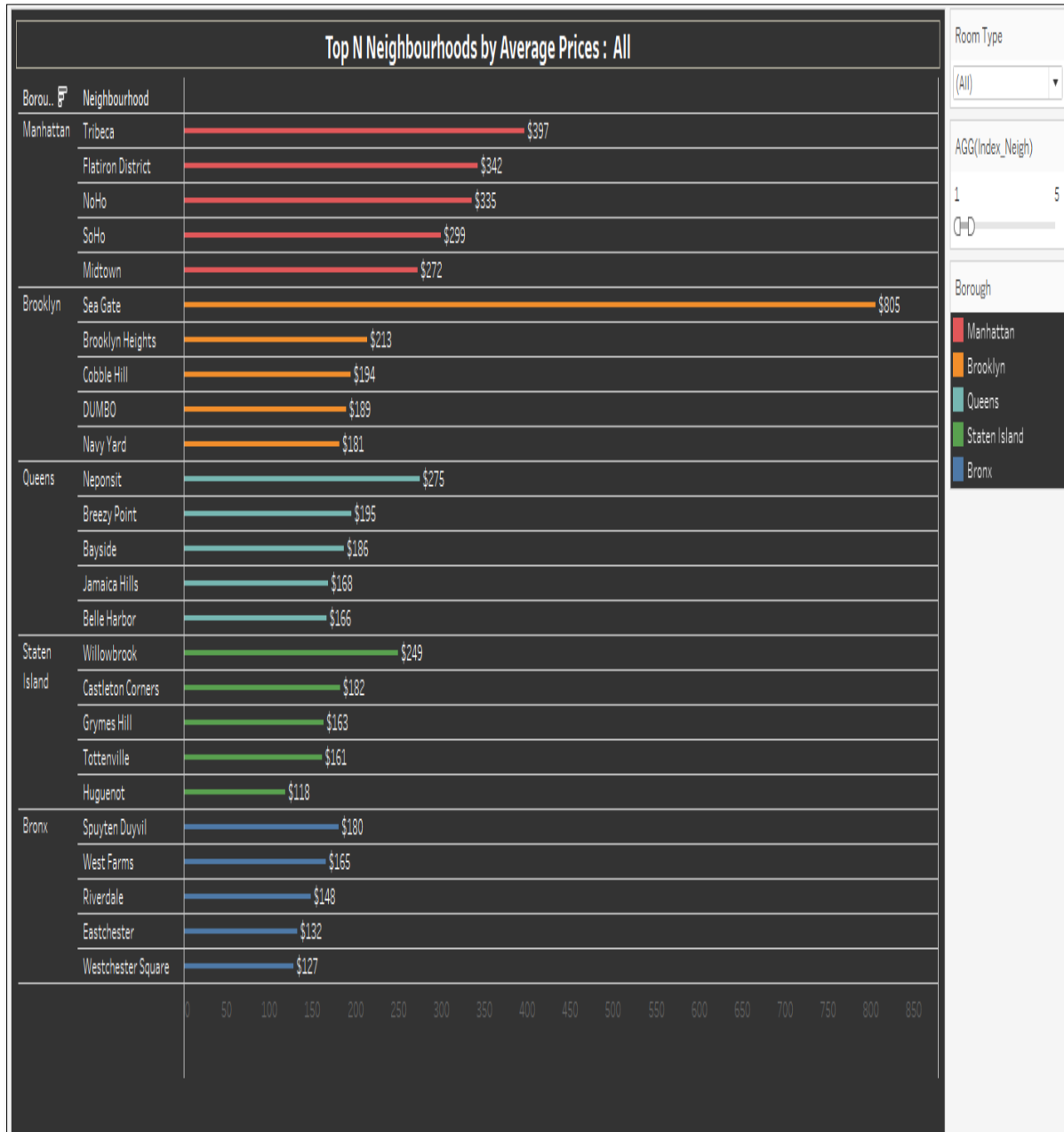


Figure 13 – Top N Neighborhoods by Average Rental Prices: All

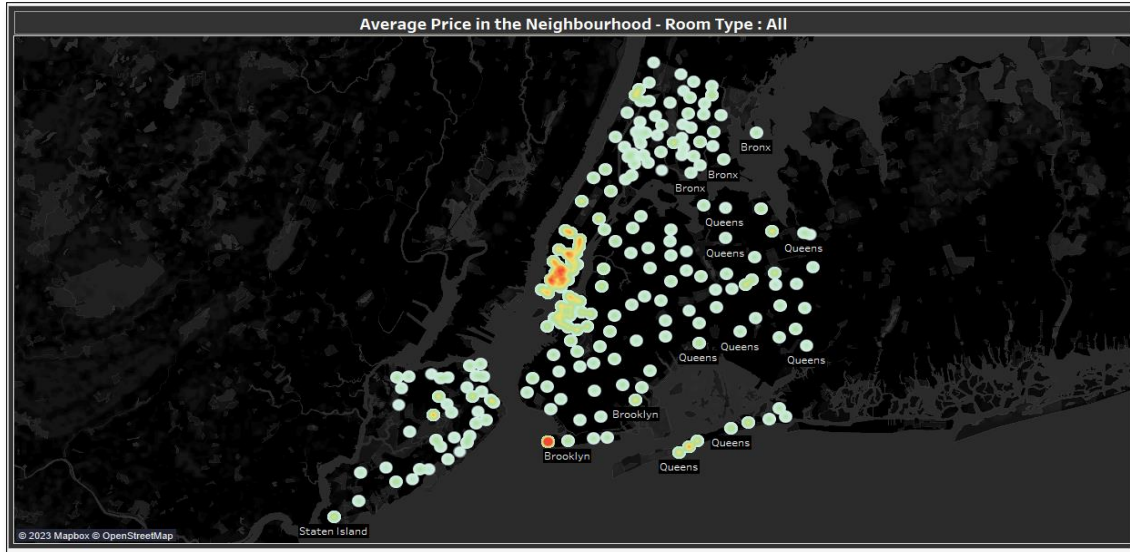


Figure 14 – Average Price in the Neighborhood – Room Type: All

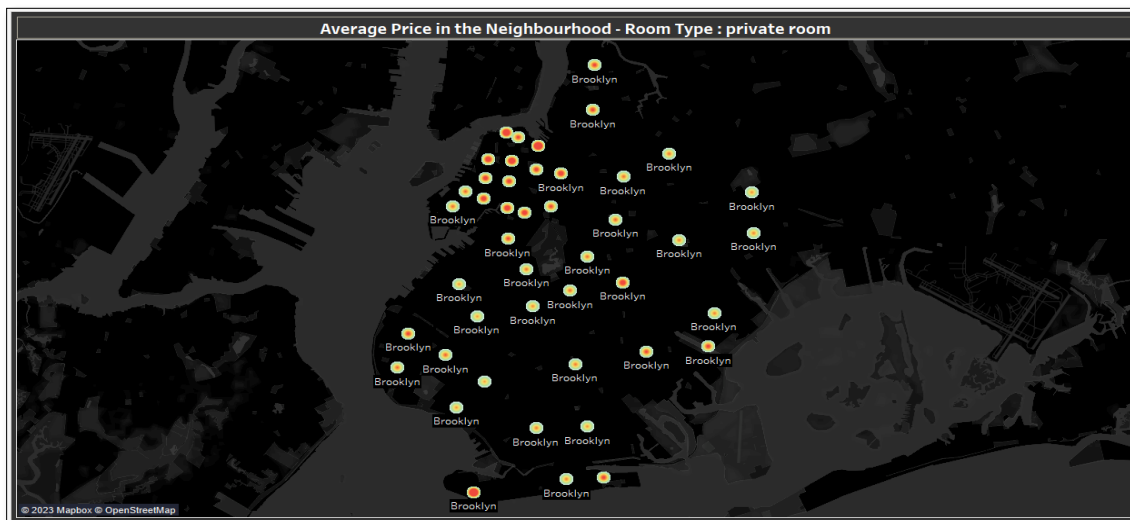


Figure 15 – Average Price in the Neighborhood – Room Type: private room

The bar chart and maps are showcasing the neighborhoods with the highest average rental prices (Top 5 or Top N) in each borough, offers valuable insights into the real estate market and can provide several key takeaways for Pillow Palooza:

Neighborhoods with High Affluence: The neighborhoods at the top of each borough's list indicate areas that generally command higher prices. These neighborhoods are often associated with affluence, luxury amenities, desirable locations, or other factors that contribute to their premium

status. Identifying these neighborhoods can be helpful for investors, homebuyers, or developers looking for upscale properties or areas with potential for high returns on investment.

Price Variations Within Boroughs: The chart allows for a comparison of the average prices between neighborhoods within the same borough. It highlights the price variations within a borough, indicating that some neighborhoods may have higher price ranges compared to others. This information can guide prospective buyers or renters in making decisions about where to focus their property search based on their budget or desired investment level.

Targeting Specific Demographics: Analyzing the neighborhoods with higher average prices can provide insights into the target demographic or market segment that is willing to pay a premium for properties in those areas. It may indicate the presence of specific amenities, cultural attractions, or lifestyle preferences that attract affluent residents or visitors. This information can be useful for businesses or service providers looking to cater to a specific clientele or market their offerings effectively.

Investment Opportunities: The chart can also reveal potential investment opportunities. Identifying neighborhoods with high average prices that are not yet at their peak or are experiencing upward trends may indicate areas of future growth or emerging hotspots. Investors or developers may consider such neighborhoods as potential targets for long-term investments or property development.

Understanding Market Dynamics: The chart provides a snapshot of the current market dynamics within each borough. It highlights the neighborhoods that are driving the average prices and may indicate the overall health of the real estate market in those areas. It can be useful for real estate professionals, analysts, or policymakers in assessing market trends, supply and demand dynamics, and making informed decisions about housing policies or development strategies.

By carefully analyzing the chart and considering the insights mentioned above, individuals and organizations can gain a better understanding of the real estate landscape, identify opportunities, and make informed decisions regarding buying, selling, investing, or targeting specific neighborhoods or market segments.

7). Which borough has the highest average price per month?

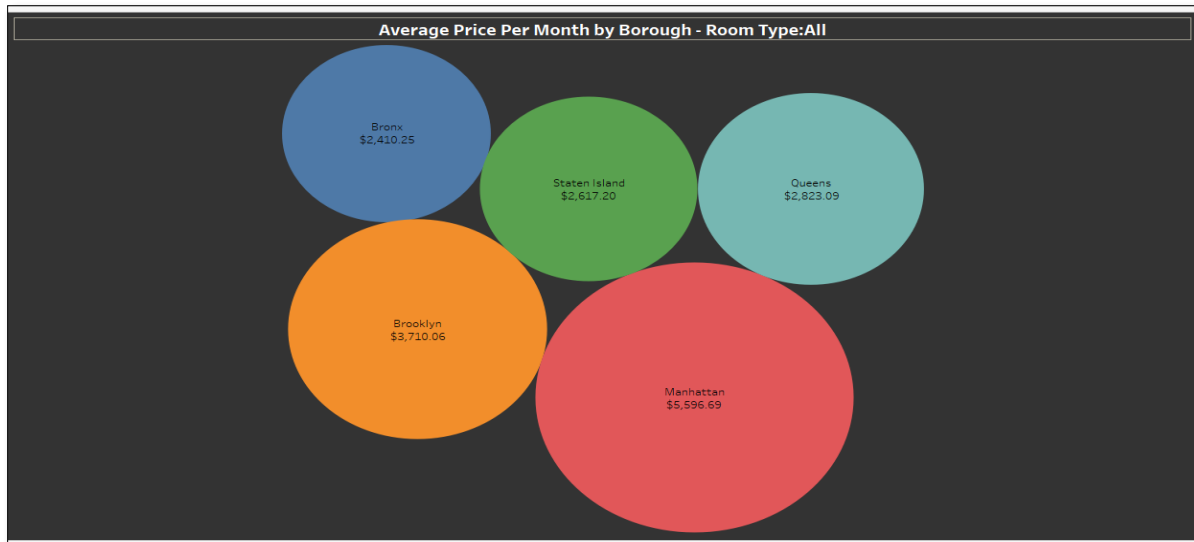


Figure 16 – Average Price Per Month by Borough – Room Type

Manhattan had the highest average price per month among the listed boroughs, with an average price of \$5,596.69.

Manhattan had the highest average price per month, indicating a higher cost of living and potentially a wealthier demographic. Brooklyn had the second-highest average price per month. It is a diverse and vibrant borough known for its cultural scene. Queens, although having a lower average price per month compared to Manhattan and Brooklyn, still offers a considerable market. It is the most ethnically diverse borough and has a mix of residential and commercial areas. Staten Island and the Bronx had lower average prices per month compared to Manhattan, Brooklyn, and Queens. These boroughs may present opportunities for businesses targeting middle-income or budget-conscious demographics. Local businesses, service-based industries, and community-focused initiatives could be viable options in these areas.

The information about the average prices per month for different boroughs can be useful in identifying the most expensive borough for listings in New York City. By knowing which borough has the highest average price, Pillow Palooza can focus their attention on that area when targeting certain types of guests who are willing to pay a premium for their accommodations.

For example, if you have a high-end, luxury listing, targeting Manhattan could be a strategic choice since it has the highest average price per month. This borough tends to attract affluent travelers who are willing to pay a premium for luxury accommodations and access to upscale amenities.

On the other hand, if you have a budget-friendly or more affordable listing, you might consider targeting boroughs like Staten Island or the Bronx, where the average prices per month are lower. These boroughs could attract budget-conscious travelers or those who are seeking more affordable options.

Understanding the pricing dynamics across different boroughs can help tailor the marketing efforts, set competitive prices, and attract the right kind of guests for our Pillow Palooza listings. However, it's essential to conduct further market research, assess demand, and consider other factors like location, amenities, and competition to optimize the Pillow Palooza business strategy effectively.

8). How many listings in each room type category have a price of over \$500 per night?

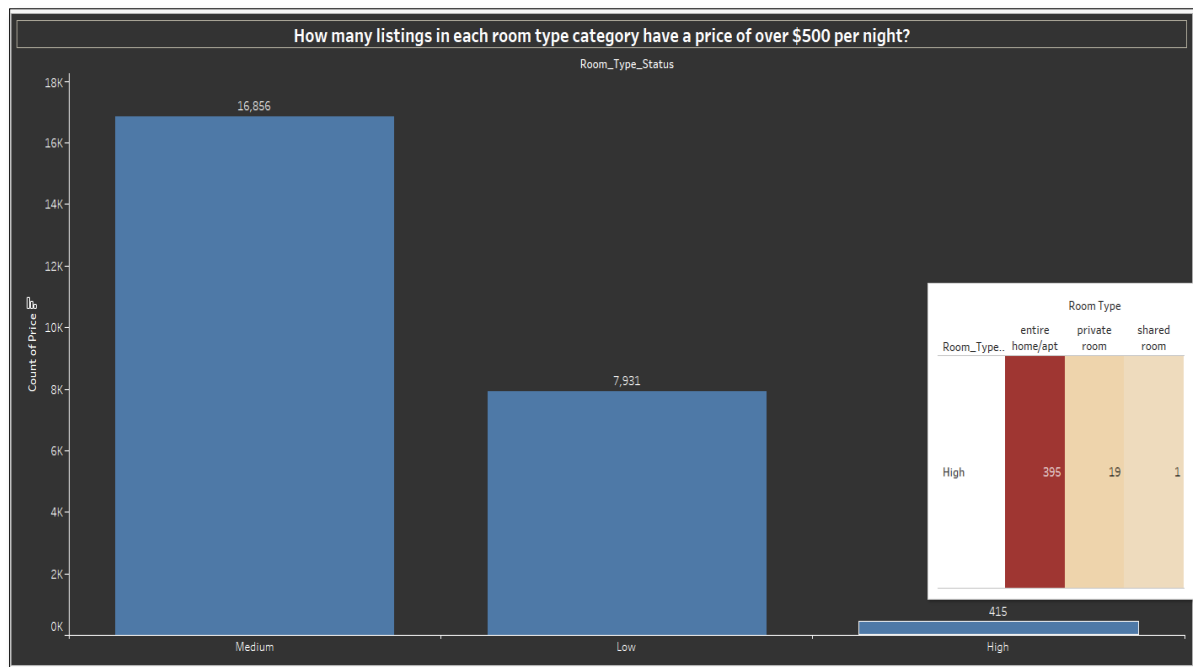


Figure 17 – How many listings in each room type category have a price of over \$500 per night

From this information, we can observe that the majority of higher-end Airbnb listings were in the "entire home/apt" category, followed by the "private room" category. The "shared room" category

had the fewest listings in the higher price range, which is expected as shared accommodations are generally more budget-friendly.

It has been noticed that very few people preferred to stay in high-end accommodations.

Target Audience: Understanding the preferences and behaviors of our target audience is crucial. If the data suggests that there is limited demand for high-end accommodations, it may be more effective to focus on other segments of the market. This could involve targeting budget-conscious travelers, families, or specific niche markets with different accommodation preferences.

Pricing Strategy: If the demand for high-end accommodations is low, it might be necessary to reassess the pricing strategy. It may be challenging to sustain higher prices in a market with limited demand. Adjusting the pricing structure to cater to a broader range of customers or offering competitive rates could be a more viable option.

Market Differentiation: Consider differentiating your offerings in the market. If high-end accommodations have limited demand, it might be advantageous to explore alternative strategies. This could involve focusing on unique selling points such as exceptional customer service, immersive experiences, specialized amenities, or targeting specific niche markets that value luxury accommodations.

Diversification: Diversifying the portfolio of accommodations can be a smart business decision. By offering a range of options, including budget-friendly or mid-range accommodations, you can attract a wider customer base. This approach allows you to cater to different preferences and capture market segments that may not be interested in high-end accommodations.

Marketing and Promotion: When marketing high-end accommodations, it's important to understand the target audience and their motivations. Highlighting the unique features, exclusivity, and luxury aspects of the accommodations can help attract the right clientele. However, it may also be necessary to invest in marketing efforts to raise awareness and generate demand for high-end offerings.

Ultimately, business decisions related to investing and marketing in the hospitality industry should be based on a thorough analysis of market trends, customer preferences, and financial considerations. While it's important to take note of the lower demand for high-end accommodations, it doesn't necessarily mean that investing or marketing in this segment is unprofitable. The key is to adapt strategies to align with market realities and customer needs.

9). What is the average price per month for listings in each neighborhood?

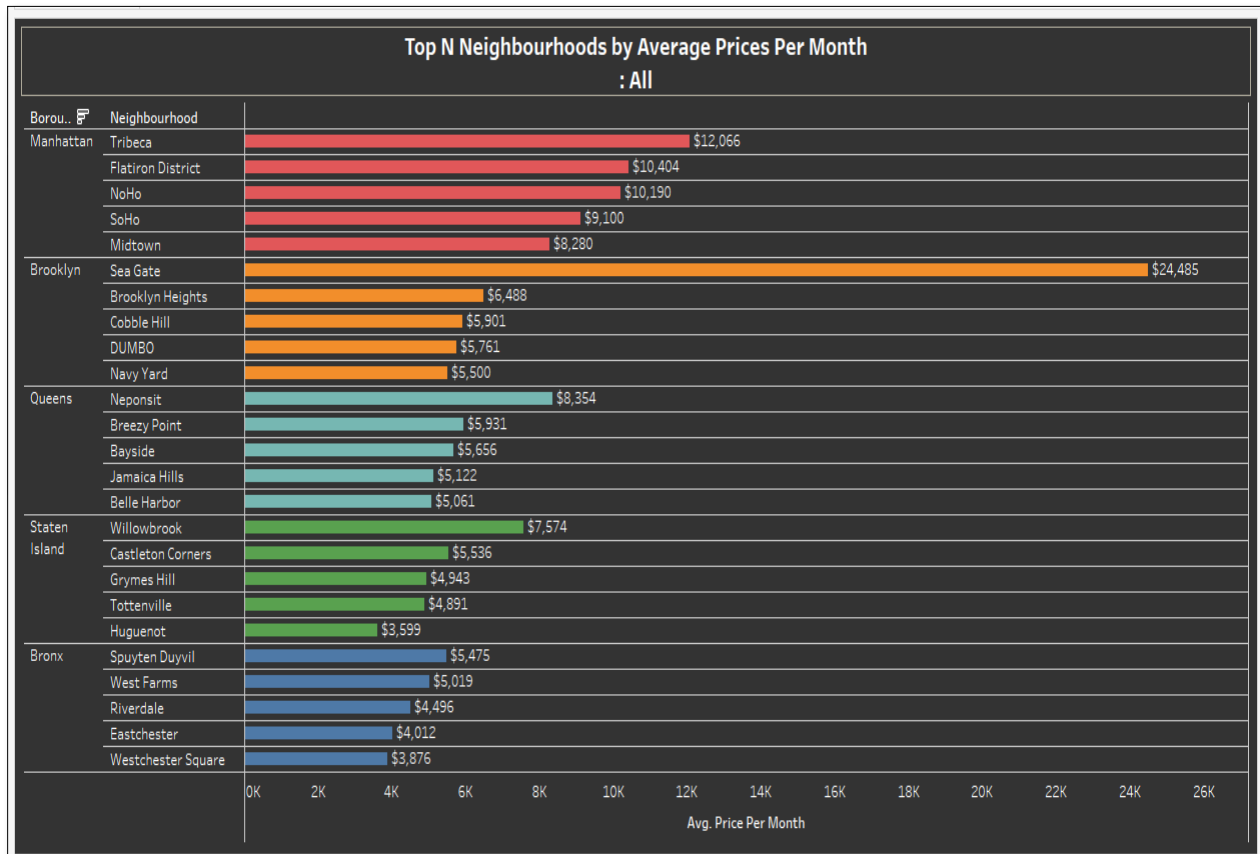


Figure 18 – Top N Neighborhoods by Average Prices Per Month: All

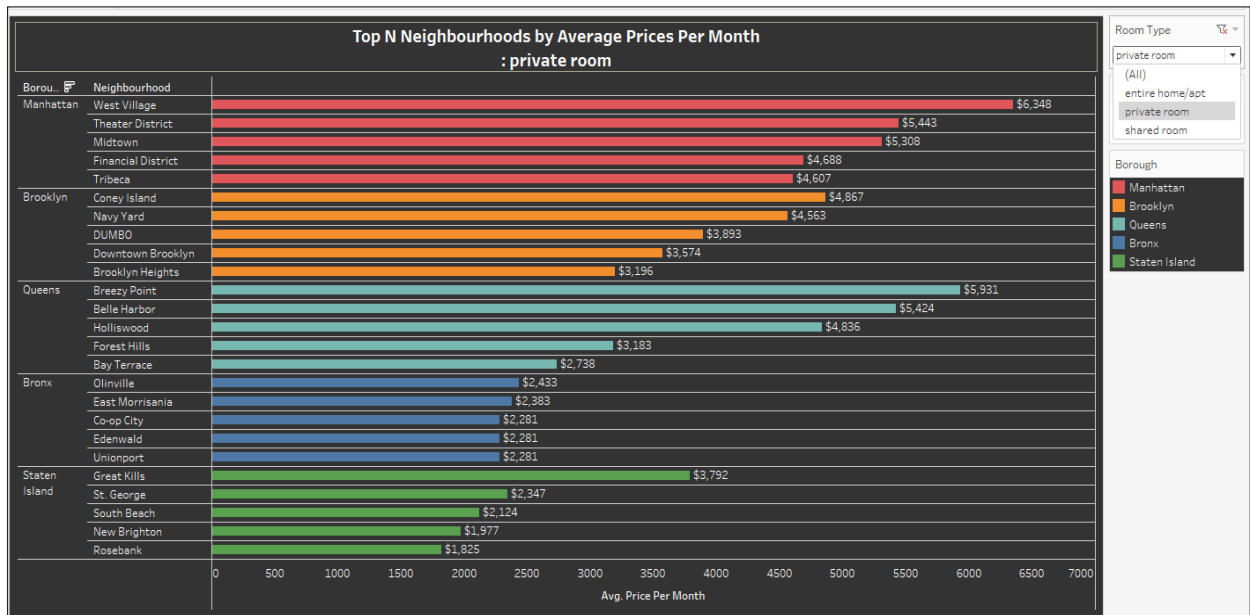


Figure 19 – Top N Neighborhoods by Average Prices Per Month: private room

These averages provide insights into the price ranges (Price per Month) for listings in different neighborhoods in NYC. From the provided data, Sea Gate has the highest average price per month, followed by Tribeca, Flatiron District, NoHo and SoHo. On the other hand, Randall Manor has the lowest average price per month among the listed neighborhoods.

These insights again can be useful for identifying the most popular neighborhoods for NYC listings and understanding the pricing dynamics within those areas. It can also help target specific types of guests based on their budget and preferences. Keep in mind that these averages are based on the provided data, we were missing a lot of data here, and for a more comprehensive analysis, it would be beneficial to have a larger dataset encompassing a broader range of neighborhoods in NYC.

10). What is the estimated amount of revenue generated by hosts in each borough?

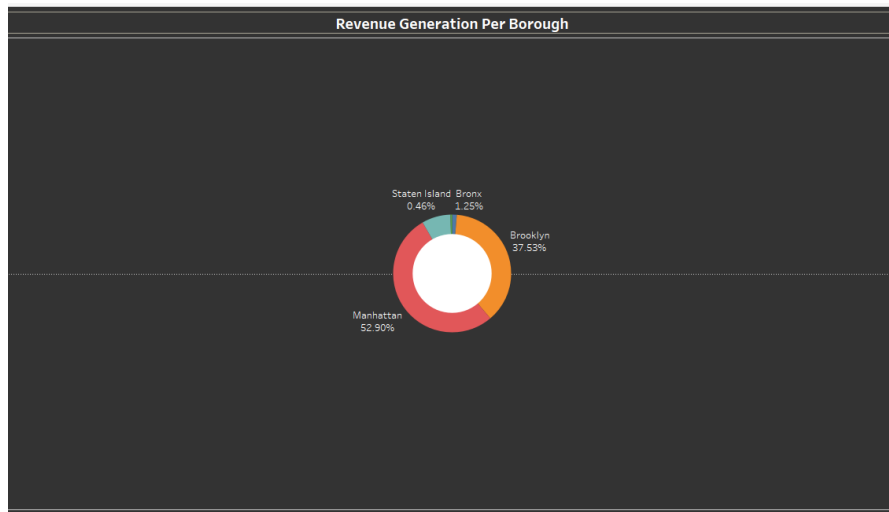


Figure 20 – Revenue Generation Per Borough

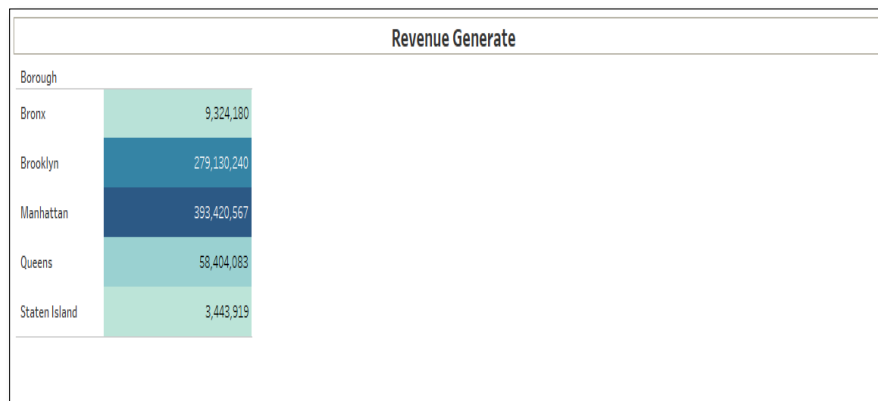


Figure 21 – Revenue Generation

Manhattan: With 52.90% of the estimated revenue, Manhattan had the highest revenue potential for host/company among the boroughs. Its popularity as a tourist destination, business hub, and cultural center contributes to its higher revenue share. Hosts in Manhattan have a significant opportunity to generate income through short-term rentals.

Brooklyn: Brooklyn followed Manhattan with a substantial 37.53% of the estimated revenue. It is a trendy borough with diverse neighborhoods, attracting tourists looking for a more authentic and local experience. Hosts in Brooklyn can leverage its vibrant atmosphere and proximity to Manhattan to generate substantial revenue.

Queens: Queens captured 7.85% of the estimated revenue, indicating a smaller but still significant opportunity for hosts. Queens is home to two major airports, which can attract transient visitors in need of accommodations. Hosts in Queens can benefit from the borough's accessibility, cultural attractions, and events such as the U.S. Open tennis tournament.

Bronx: The Bronx had a relatively modest share of 1.25% of the estimated revenue. While it may not have had as high revenue potential as Manhattan or Brooklyn, hosts in the Bronx can still capitalize on its attractions, such as the Bronx Zoo and Yankee Stadium. They can target visitors interested in specific events or attractions in the borough.

Staten Island: With only 0.46% of the estimated revenue, Staten Island had the lowest revenue potential among the boroughs. It is primarily a residential borough with fewer tourist attractions. Hosts in Staten Island may find it more challenging to generate substantial income compared to other boroughs, but they can still cater to visitors seeking a quieter and more suburban experience.

Recommendations:

Hosts in Manhattan and Brooklyn and management in Pillow Palooza should focus on optimizing their listings and providing exceptional guest experiences. These boroughs have the highest revenue potential, but the competition can also be fierce. Offering unique amenities, competitive pricing, and outstanding hospitality can help hosts stand out and attract more bookings.

Hosts/Pillow Palooza in Queens and the Bronx should target specific niches or audiences to maximize their revenue potential. They can highlight nearby attractions, events, or specific interests in their listings to appeal to visitors who prefer those areas or activities. Collaborating with local businesses or offering customized experiences can also help attract guests.

While the revenue potential in Staten Island is relatively low, hosts can still position themselves as an alternative to the hustle and bustle of other boroughs. Emphasizing the tranquility, scenic beauty, and local charm of Staten Island can help hosts attract guests seeking a more laid-back experience. It's important for hosts to keep local regulations and guidelines in mind when operating short-term rentals in New York City. Compliance with applicable laws ensures a smooth and legal operation of their hosting businesses.

12). How many listings have no reviews? Total Reviews by Month

As it can be observed, there was a sharp increase in reviews from May (86,486) to June (619,907) with a sharp decrease by July (243,262). This could be due to the summer season coming up in the year and the influx of tourists staying in New York through the summer. Since the dataset ends on July, we are unable to see how the trend is for the end of the year. The data was only available from January 2019 to July 2019, from this we could only get limited insights.

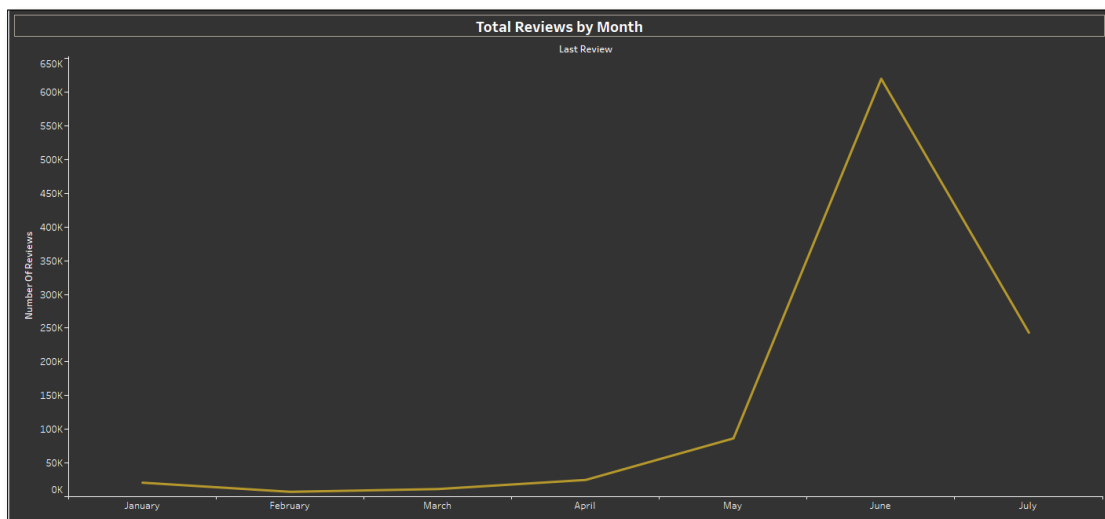


Figure 22 – Total Reviews by Month

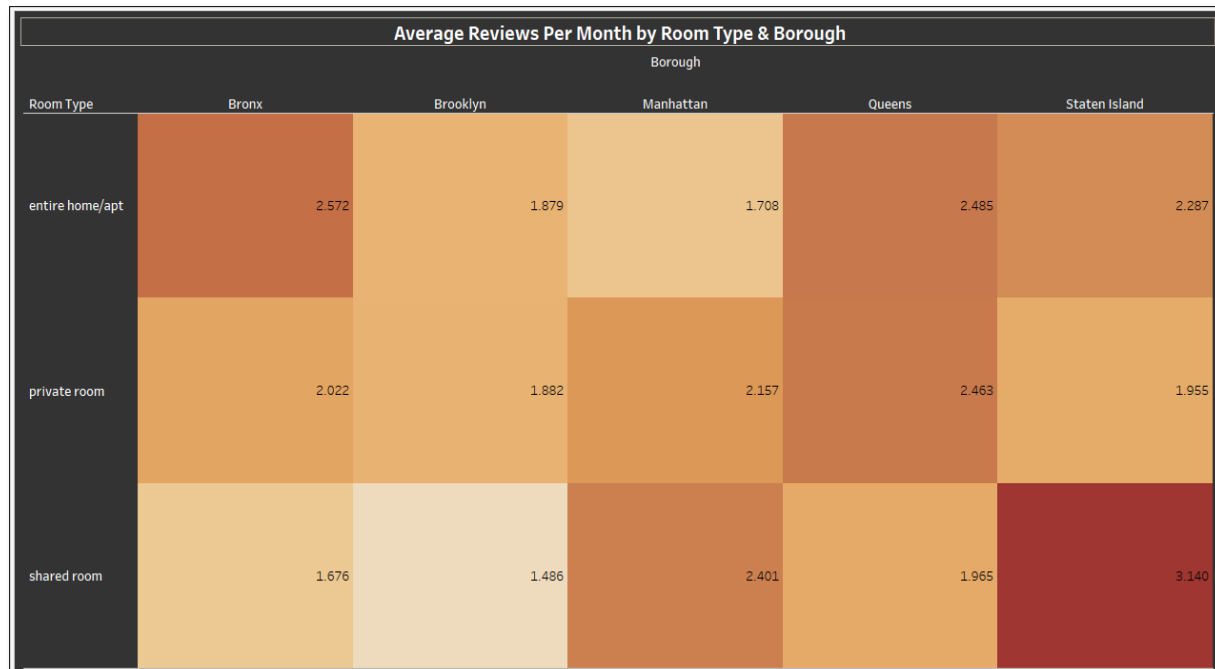


Figure 23 – Average Reviews Per Month by Room Type & Borough

It appears that Staten Island had the highest average reviews per month of 3.140 for shared rooms, followed by the Bronx for entire home/apartment listings (2.572), and then Queens for entire home/apartment listings for 2.485 as well. Brooklyn had the lowest average reviews per month for shared rooms, values of 1.485.

However, it's important to note that the number of bookings and listing counts can vary for each borough and room type. And, as I mentioned several time, we were missing lot of data which can be highly affect to the insights and conclusions.

In terms of business recommendations, here are a few suggestions:

Improve and Maintain Quality: Regardless of the borough or room type, it's essential to focus on providing high-quality accommodations and services. Ensure the cleanliness, comfort, and amenities of the listings are up to par. Promptly address any customer concerns or issues to maintain positive reviews.

Pricing Strategy: Analyze the market demand and adjust the pricing strategy accordingly. If a particular borough or room type is in higher demand, consider adjusting the rates to maximize profitability. Similarly, if a certain room type has low demand, you may need to offer competitive pricing or promotions to attract more guests.

Targeted Marketing: Understand the target audience and tailor marketing efforts to reach them effectively. Utilize online platforms, social media, and local advertising to promote our listings in the respective boroughs. Highlight the unique features and attractions of each borough to attract potential guests.

Enhance Listing Visibility: Optimize our listings with accurate and appealing descriptions, high-quality photos, and competitive amenities. Utilize keywords relevant to each borough and room type to improve the search ranking on booking platforms. Respond promptly to guest inquiries and provide detailed information to increase conversion rates.

Guest Experience and Reviews: Focus on creating a positive guest experience to encourage positive reviews and repeat bookings. Provide clear instructions for check-in, offer helpful local tips, and ensure excellent communication throughout the guest's stay. Actively request feedback from guests and address any issues promptly.

13). Total Bookings by Month and Borough Vs Room Type

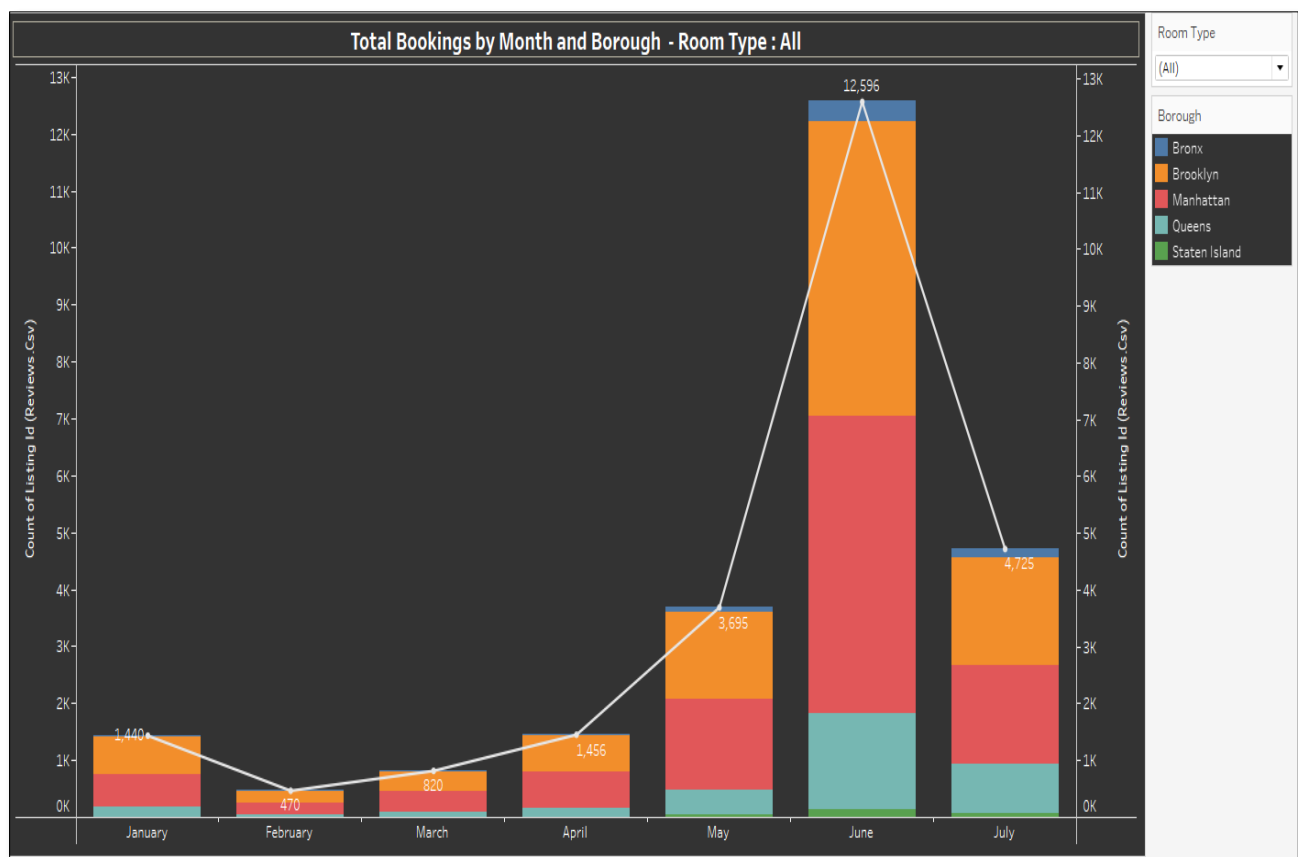


Figure 24 – Total Bookings by Month and Borough: Room Type: All

In June 2019, which falls during the summer season, there was a total of 12,596 bookings made. This indicates a significant level of activity and demand during that period.

Among the boroughs, Manhattan had the highest number of bookings, with a total of 5,212 listings. Following closely behind was Brooklyn, with a count of 5,190 bookings. These two boroughs stood out as the most popular choices among guests in June month and January to July period.

On the other hand, Staten Island had the lowest number of bookings, with only 128 listings. Similarly, the Bronx had a relatively lower number of bookings compared to Manhattan and Brooklyn, with a total of 366 listings in June month.

Additionally, most of the guests were preferred entire home and apartments for their short-stays during this period.

These statistics highlight the preferences and popularity of different boroughs among guests during the summer season. Manhattan and Brooklyn emerged as the top choices for accommodation, potentially due to their vibrant attractions, convenient locations, and diverse offerings. Meanwhile, Staten Island and the Bronx had comparatively fewer bookings, suggesting they may be perceived as less preferred options among travelers during this time.

Understanding these booking patterns can be beneficial for Pillow Palooza's property owners, marketers, and investors as they can tailor their strategies to align with the demand and preferences of guests during specific seasons and in different boroughs.

14). Exploratory Data Analysis Correlation

How do the estimated booked-days (or availability_365) correlate with the price of an Airbnb listing in New York City?

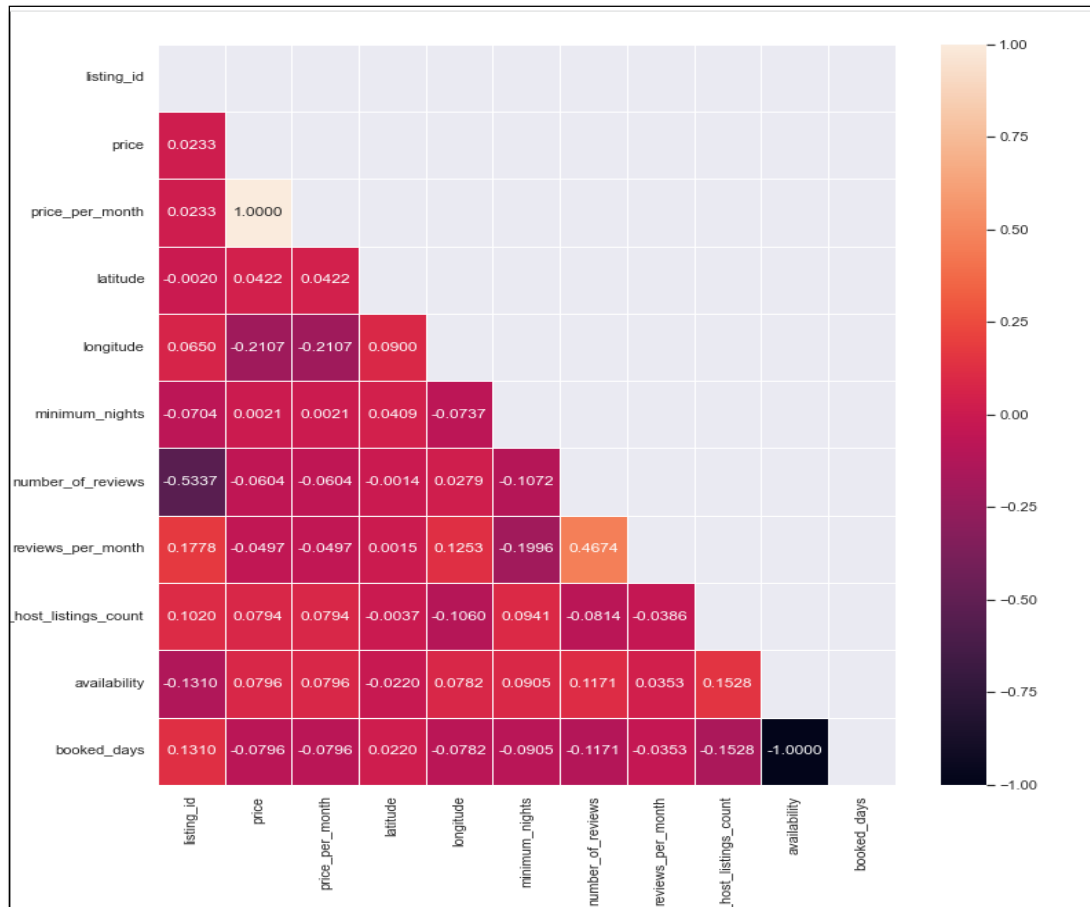


Figure 25 – Correlation Map

The high correlation value of 0.4674 between the number of reviews and reviews per month suggests a positive relationship between these two variables in the dataset.

The insight derived from this correlation can be that properties with a higher number of reviews tend to receive more reviews per month. In other words, properties that have accumulated a significant number of reviews over time are more likely to continue receiving a higher number of reviews on a monthly basis.

This insight can be valuable for understanding guest behavior and engagement on the Airbnb platform and get insights for our company, Pillow Palooza. It implies that properties with a strong track record of positive reviews tend to attract a steady stream of guests, resulting in a higher number of reviews per month.

From a marketing or investment perspective, this insight can help property owners or investors focus on strategies to generate more initial reviews and maintain positive guest experiences. By actively encouraging guests to leave reviews and ensuring a high level of customer satisfaction,

property owners can increase their chances of receiving a higher number of reviews on an ongoing basis. This, in turn, can contribute to attracting more guests and improving the overall visibility and reputation of the property.

The low correlation value of 0.0796 between `availability_365` and `price` indicates a weak relationship between these two variables in the dataset.

The insight derived from this correlation is that there is no significant association between the availability of a property throughout the year (`availability_365`) and its price. In other words, the availability of a property for a higher number of days in a year does not necessarily imply that the price of the property will be higher.

This insight suggests that the pricing of properties on the Airbnb platform is not primarily determined by their availability throughout the year. Other factors such as location, amenities, size, demand, and competition likely have a more significant impact on determining the price of a property.

From a marketing or investment perspective, this insight implies that property owners and investors should consider various factors beyond availability when determining the pricing strategy for their listings. They should focus on factors that are more influential in the market, such as the features and uniqueness of the property, comparable prices in the area, and overall market demand.

According to the heatmap, which shows a low correlation between price and the available factors, it suggests that setting pricing strategies for a listing should consider a comprehensive analysis of multiple factors beyond the variables examined in the dataset. While the specific factors influencing the price may not be clearly evident from the correlation heatmap alone, it is important to consider additional aspects such as location, property size, amenities, seasonal demand, market trends, and competition in order to develop effective pricing strategies. Conducting market research, analyzing similar listings in the area, and monitoring customer preferences can provide valuable insights for setting competitive and optimal prices. Additionally, regularly reviewing and adjusting prices based on real-time market conditions and feedback from guests can help optimize pricing strategies for maximizing revenue and maintaining a competitive position in the market.

15). Correlation Between Borough vs Room Type: `Availability_365`

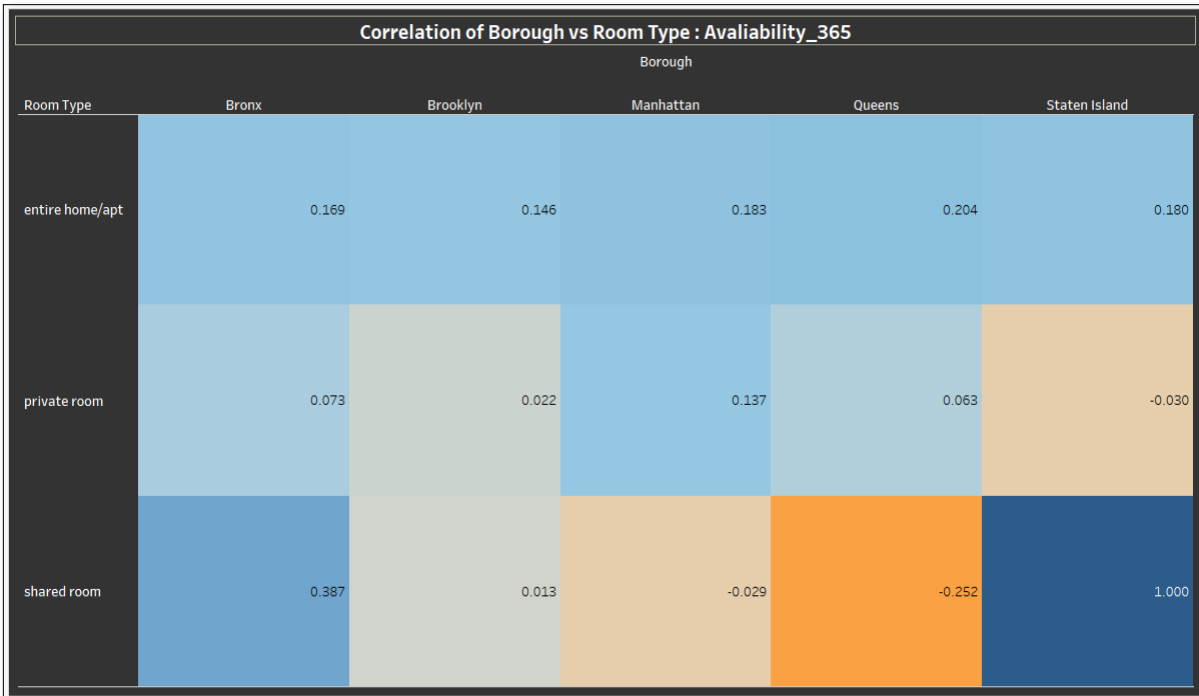


Figure 26 – Correlation of Borough vs Room Type: Avariability_365

Based on the analysis of correlations between room types and borough availability, it has been observed that there is a strong positive correlation of 1 between shared rooms and availability in Staten Island.

The insight derived from the correlation analysis between room types and borough availability is that there is a high demand for shared rooms in Staten Island. This information can help businesses in the hospitality industry make informed decisions regarding their offerings and operations.

Based on this insight, we can consider allocating more resources and marketing efforts towards promoting and accommodating shared rooms in Staten Island. This could involve increasing the number of shared rooms available, enhancing their features and amenities, and targeting advertising campaigns specifically towards individuals seeking shared accommodations in that borough.

Additionally, Pillow Palooza can use this information to optimize company's pricing strategies. Since there is a high correlation between shared rooms and availability in Staten Island, we can potentially adjust the pricing of shared rooms in that area to maximize their revenue and occupancy rates.

Furthermore, this insight can guide businesses in their expansion plans or investment decisions. If we are looking to open new locations or invest in property developments, investors can consider

focusing on Staten Island to meet the demand for shared accommodations and capitalize on the high availability in that borough.

Overall, understanding the correlation between room types and borough availability allows company to tailor their offerings, marketing efforts, pricing strategies, and expansion plans to cater to the specific demands and opportunities presented by shared rooms in Staten Island.

16). What is the average price per room type for listings that have at least 100 reviews and are available more than 200 days a year?

Room Type	Average Price per room
Entire home/apartment	\$ 179.54
Private Room	\$ 85.41
Shared Room	\$ 59.19

Table 4 - average price per room (at least 100 reviews and are available more than 200 days a year)

These figures represent the average prices for each room type among listings that meet the specified criteria. These insights can be valuable for several purposes, including:

Pricing Strategy: Hosts or property managers can use this information to determine competitive prices for their listings based on the average prices in the market. They can adjust their rates accordingly to attract more guests or maximize revenue.

Investment Decisions: Individuals or businesses looking to invest in short-term rentals can analyze the average prices per room type to assess the potential profitability of different types of properties.

Marketing and Promotion: This data can help in crafting marketing strategies and promotions, targeting specific room types based on their average prices to attract potential guests.

Revenue Management: Understanding the average prices per room type can assist in optimizing revenue management strategies by adjusting rates dynamically based on demand, seasonality, and other factors.

Guest Expectations: Guests can use this information to set their budget and make informed decisions when booking accommodations, ensuring they are getting fair prices for the type of room they desire.

It's important to note that these average prices are specific to the dataset provided (listings with at least 100 reviews and available more than 200 days a year). Prices can vary significantly depending on factors such as location, amenities, size, and overall quality of the listing. Market dynamics and trends can also influence pricing, so it's essential to consider these factors when making business decisions and recommendations.

17). How many hosts have more than one listing, and what's the maximum number of listings by a single host name?

There were **2929 hosts** had more than one listings, and the maximum number of listings by a single host name was **215**

The fact that 2,929 hosts had more than one listing suggests a significant number of hosts were managing multiple properties on the platform. This insight indicates a diverse and competitive marketplace with a range of options for guests to choose from.

Moreover, the maximum number of listings by a single host being 215 highlights the presence of hosts who had a substantial inventory of properties. These hosts likely had a high level of experience and expertise in managing multiple listings, and they may have had established efficient operational processes to handle a large volume of bookings and guests.

From a business perspective, these insights can have several implications:

Competition: With numerous hosts having multiple listings, the competition within the platform can be intense. Hosts need to differentiate their properties, offer unique experiences, and provide excellent customer service to attract guests.

Host Performance: Hosts managing multiple listings successfully may serve as role models for other hosts. Their strategies, operational efficiency, and ability to maintain a high number of listings could provide valuable insights and best practices for other hosts to improve their own performance.

Guest Options: Guests benefit from a wide range of options when choosing accommodations. With a large number of hosts having multiple listings, guests have access to diverse properties, locations, and amenities, enabling them to find accommodations that meet their specific preferences and requirements.

Host Professionalization: The presence of hosts with a substantial number of listings indicates the professionalization of the short-term rental industry. These hosts may treat hosting as a business and invest in creating a consistent and high-quality guest experience across their properties.

Overall, the presence of hosts with multiple listings demonstrates the dynamic and competitive nature of the short-term rental market. It provides opportunities for hosts to scale their operations and for guests to find a variety of accommodations, while also highlighting the need for hosts to stay innovative and provide exceptional service to stand out in the marketplace.

18). Determine the top 5 hosts who have the highest price_per_month for their listings, considering only hosts who have at least 10 listings.

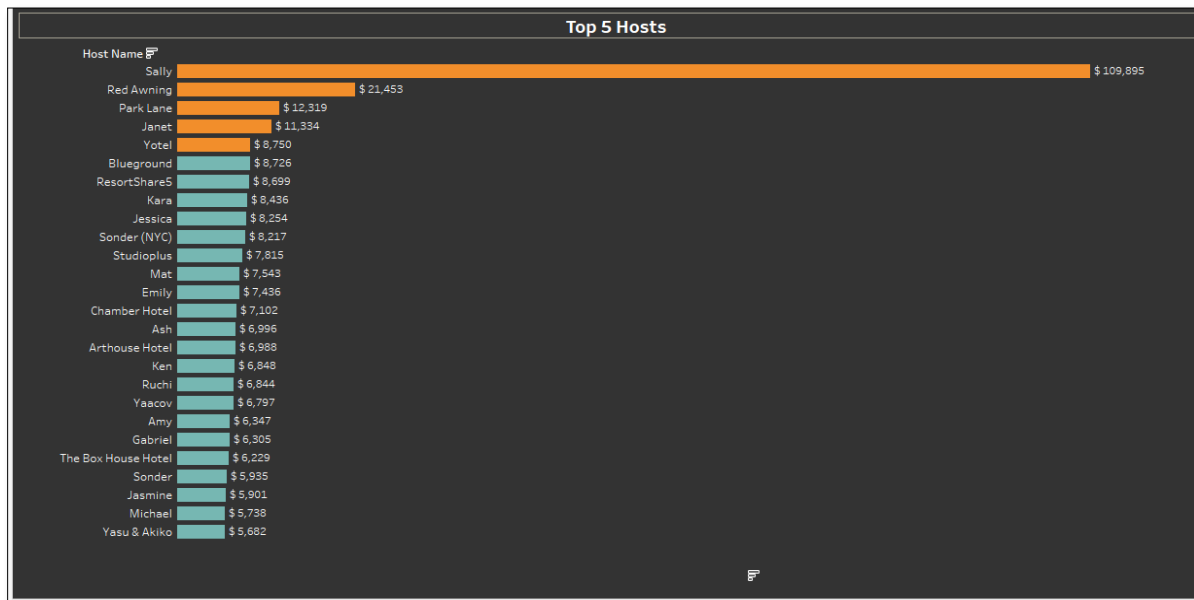


Figure 27 – Top 5 Hosts

Top 5 hosts were Sally, Red Awning, Park Lane, Janet, and Yotel

The objective is to contacting these high performing hosts in order to get more reviews for Pillow Palooza. We could start a campaign to contact the most popular host to persuade them to promote our company.

There are additional insights as well,

Pricing Strategy: Analyzing the hosts with the highest price_per_month can provide insights into the potential for higher pricing in certain markets or for specific types of properties. Pillow

Palooza's hosts can evaluate their own pricing strategy and consider adjusting their rates if they believe they can offer comparable or superior value.

Competitive Analysis: Identifying the top hosts with the highest price_per_month can help understand the competition in the market. By analyzing the offerings and services of these hosts, Pillow Palooza can identify areas where they can differentiate themselves and potentially command higher prices.

Value Proposition: Hosts with the highest price_per_month may offer unique features, amenities, or exceptional guest experiences that justify their premium pricing. Pillow Palooza can assess their own value proposition and consider enhancing their offerings to command higher rates.

Market Positioning: Understanding the price ranges and positioning of hosts can assist in determining where a host's properties fit within the market. Company can use this information to position their listings accordingly, targeting specific customer segments or niches.

Revenue Optimization: By evaluating the price_per_month of hosts with the highest rates, company can explore opportunities to optimize their revenue. This analysis can help Pillow Palooza to identify the potential for increasing rates during peak seasons or high-demand periods, maximizing their revenue potential.

Investment Decisions: Investors of Pillow Palooza, who will be interested in entering the short-term rental market can use this information to assess the potential profitability of acquiring or managing multiple listings. They can evaluate the expected revenue from properties in different price ranges and make informed investment decisions.

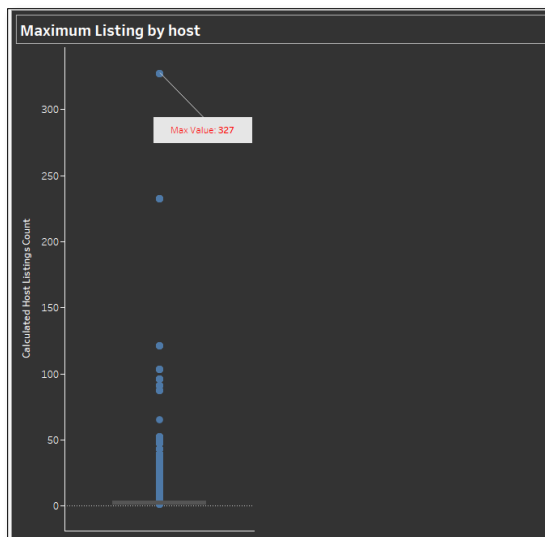


Figure 27.1 – Maximum Listing by host

Maximum Listing by host analysis: we understood that the maximum number of listing by a single host was **327**. Therefore, we checked the details for this host,

```
Maximum Listing by host From our earlier analysis , we understood that the maximum number of listing by a single host is 327.Lets check the details for this host.

In [51]: max_host=Airbnb_Analysis[Airbnb_Analysis.calculated_host_listings_count==327]

In [52]: print(f'Name of host:{list(max_host.host_name.unique())}')
print(f'boroughs listed:{list(max_host.borough.unique())}')
print(f'Neighbourhoods listed:{list(max_host.neighbourhood.unique())}')
print(f'Room type listed:{list(max_host.room_type.unique())}')
print(f'Maximum price listed:{max(max_host.price)} USD Located in neighbourhood {max_host[max_host.price==max(max_host.price)].neighbourhood}')
print(f'Minimum price listed:{min(max_host.price)} USD Located in neighbourhood {max_host[max_host.price==min(max_host.price)].neighbourhood}')

Name of host:['Sonden (NYC)']
boroughs listed:['Manhattan']
Neighbourhoods listed:['Financial District', 'Murray Hill', 'Hell's Kitchen', 'Theater District', 'Upper East Side']
Room type listed:['entire home/apt', 'private room']
Maximum price listed:616.0 USD Located in neighbourhood ['Financial District']
Minimum price listed:100.0 USD Located in neighbourhood ['Financial District']
```

Figure 27.2 – Maximum Listing by host details

Objective is contact Host and get more reviews

19). Find the neighborhood(s) that have the highest variance in listing prices.

	neighbourhood	price
171	Sea Gate	924800.00
10	Bayside	230283.44
59	East Flatbush	173518.92
175	SoHo	122866.07
194	Tribeca	98547.14
...
196	Unionport	150.00
68	Eltingville	98.00
100	Hunts Point	94.02
153	Port Richmond	32.70
139	New Dorp Beach	8.00

Figure 28 – Highest variance in listing prices

To determine the neighborhood(s) with the highest variance in listing prices, we need access to the entire dataset containing the listing prices for each neighborhood. However, based on the limited information provided, we can observe some insights:

Price Range: The listing prices vary significantly across different neighborhoods. The highest price variance observed was in Sea Gate at \$924,800, while the lowest prices was in neighborhoods like New Dorp Beach at \$8.00.

Potential Variance: While we cannot determine the highest variance without the complete dataset, it's likely that neighborhoods with a wide range of listing prices would have a higher potential for variance. Neighborhoods like Sea Gate with high-priced listings may have a higher likelihood of experiencing price variability among different properties.

Market Dynamics: Neighborhoods such as SoHo, Tribeca, and East Flatbush had relatively higher listing price variances compared to neighborhoods like Unionport, Eltingville, and Hunts Point. This discrepancy may suggest differences in demand, desirability, or property characteristics among neighborhoods, which can contribute to price variance.

To obtain accurate insights about the neighborhood(s) with the highest variance in listing prices, it is necessary to analyze the complete datasets without any missing values, and calculate the variance or other statistical measures of price distribution within each neighborhood.

20). Calculate the average price_per_month for each neighborhood, taking into account only listings where the host has a minimum_nights value that is higher than the average minimum_nights value across all listings?

	neighbourhood	price_per_month
7	Bayside	11949.95
140	Tribeca	11791.53
56	Flatiron District	10172.69
127	SoHo	9549.23
104	NoHo	9374.04
...
148	West Brighton	1216.67
26	Clason Point	1216.67
3	Bath Beach	1003.75
66	Grant City	912.50
144	Van Nest	646.35

Figure 28 – Price_per_month (condition)

Minimum Nights Consideration: The analysis takes into account only listings where the host had a minimum_nights value higher than the average across all listings. This filter ensures that the average price_per_month calculation focuses on hosts who require longer stays. This could imply that hosts with higher minimum nights values may cater more to long-term guests or offer properties suitable for extended stays.

It's important to note that these insights are based on the limited information provided and several missing columns and values, so may not capture the complete picture. Further analysis and exploration of the complete dataset, including additional factors such as detailed property types, amenities, and location-specific dynamics, would provide a more comprehensive understanding of price variations and neighborhood characteristics.

21). Relation between Borough and Availability

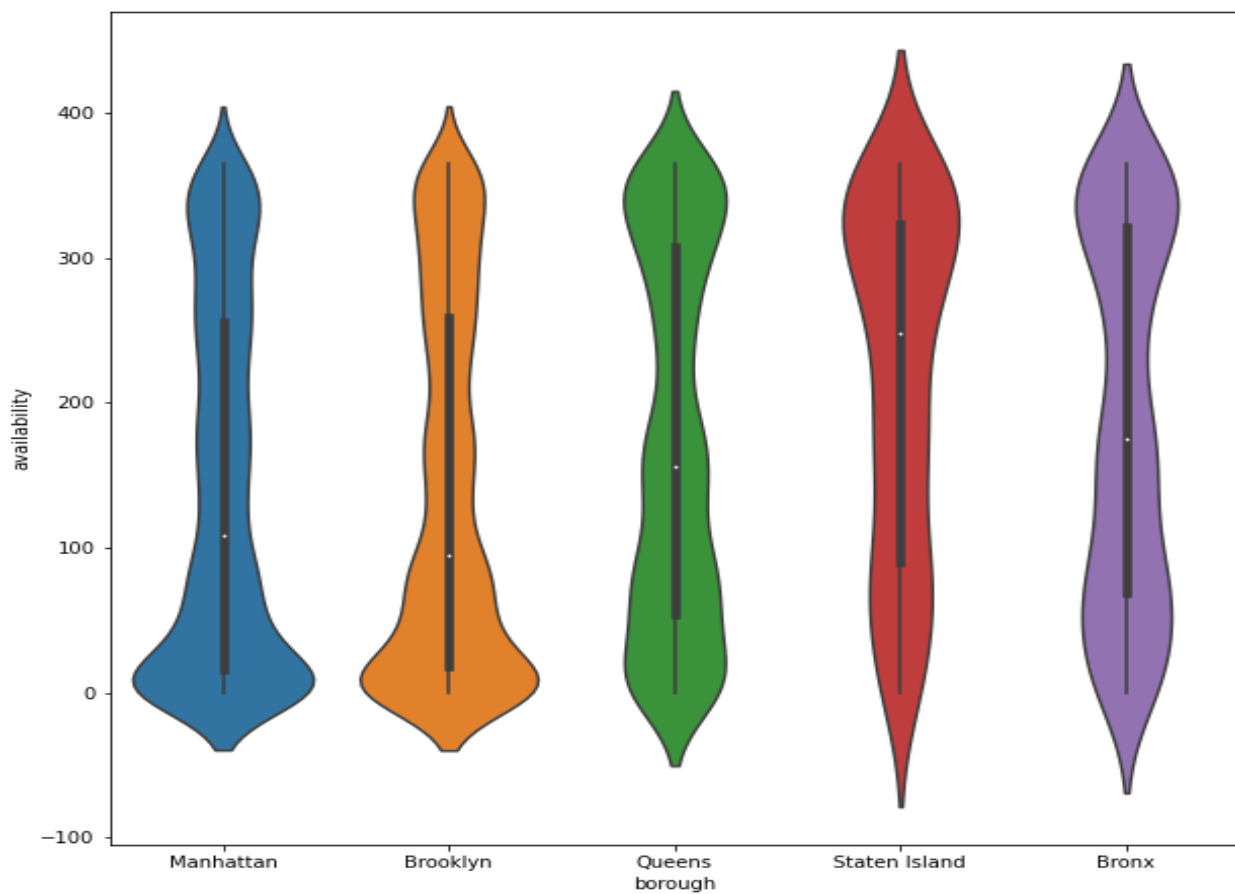
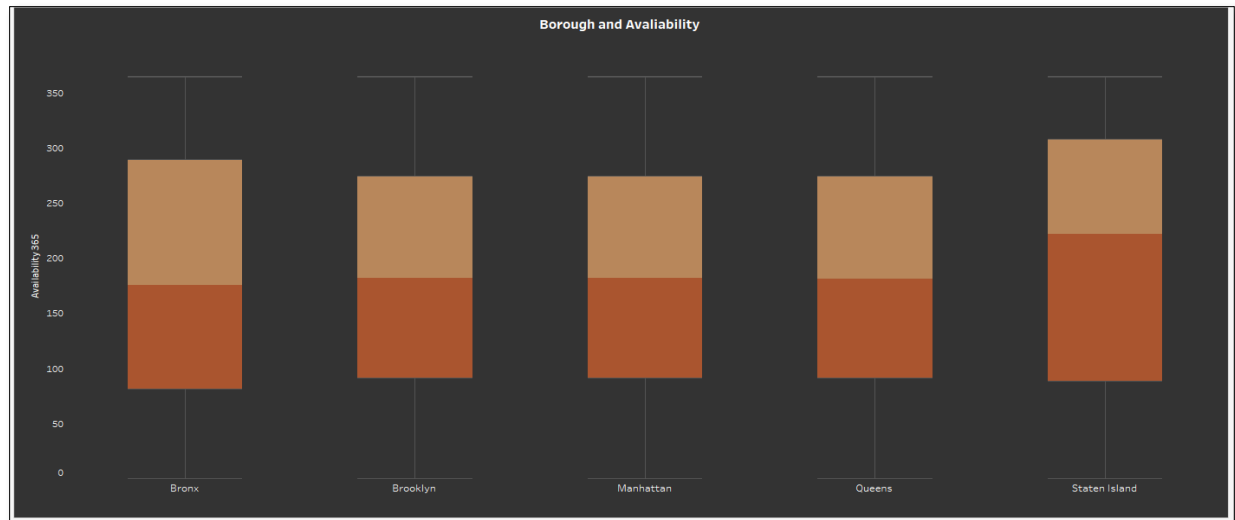


Figure 29 – Violin Plot for Borough and Availability

Violin Plot shows that Staten Island had the highest mean availability value around 200-300 days compared to others

Availability Range: The violin plot indicates that properties in Staten Island, on average, had a higher availability throughout the year compared to other neighborhoods. The concentration of the plot around the 200-300 days' mark suggests that a significant number of listings in Staten Island were available for a substantial portion of the year.

Supply and Demand: The higher mean availability in Staten Island implies that there is a relatively larger supply of available properties in this neighborhood. This could be due to various factors such as a higher number of short-term rental properties, lower demand, or a larger inventory of listings in general.

Seasonality and Occupancy: Analyzing availability patterns can provide insights into seasonality and occupancy rates in Staten Island. If the peak availability falls within the 200-300 day range, it may suggest that demand for accommodations in Staten Island experiences certain seasonal fluctuations, with a higher availability of listings during certain periods.

Market Dynamics: The higher mean availability could be influenced by factors specific to Staten Island, such as its location, attractions, or demographics. Understanding the reasons behind this availability trend can help hosts, property managers, and investors make informed decisions about pricing, marketing, and property management strategies in the area.

Competitive Advantage: If Staten Island has higher availability compared to other neighborhoods, it could present an opportunity for hosts and property managers to attract guests looking for longer-term stays. It may be a unique selling point that can be leveraged in marketing efforts to differentiate their listings and appeal to a specific target audience.

This is an exciting opportunity to invest in Staten Island by leveraging targeted marketing and promotion strategies. By adopting a focused approach, Pillow Palooza can aim to capture the attention of potential customers and maximize its presence in the market.

22). Prices Vs Minimum Nights Vs Number of Reviews

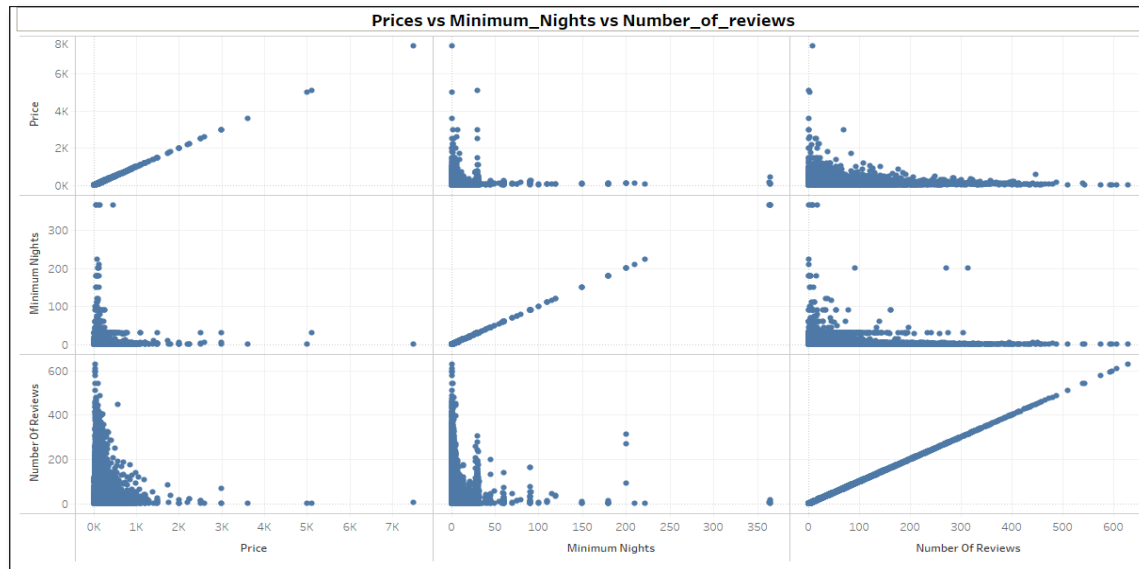


Figure 30 – Prices Vs Minimum Nights Vs Number of Reviews

There was no relationship between the price and the Minimum Nights and Price and Number of Reviews. There are various options to choose when it comes to number of minimum nights and the price charged. There were properties where the minimum nights' requirement was higher but the price was less. The number of reviews were higher for those properties in the price range 0-400 USD. The maximum number of reviews was approximately 600 as the price for the property decreases.

23). Prices Vs Availability: Manhattan Private Rooms/ Prices Vs Availability: Brooklyn Private Rooms

When observing the data, we observed that demand for private rooms in Brooklyn was higher (4906 listings) than the Manhattan Private Rooms (3901 listings). To analysis this we have plot the prices vs availability scatter plots for each Borough.

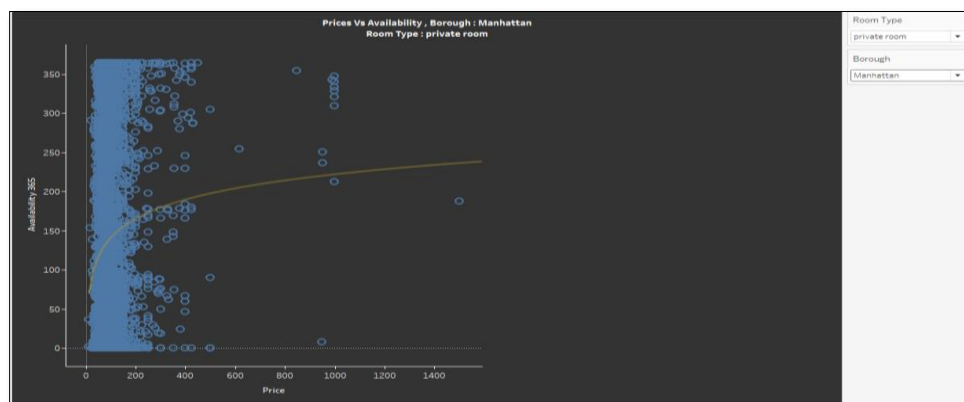


Figure 31 – Prices Vs Availability: Manhattan Private Rooms

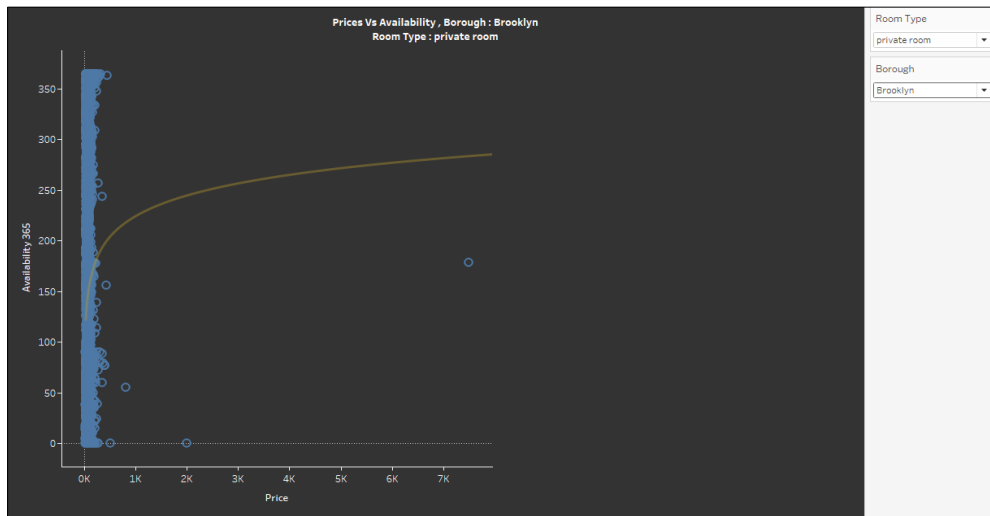


Figure 32 – Prices Vs Availability: Brooklyn Private Rooms

Based on the scatter plots of Prices vs Availability for Manhattan Private Rooms and Brooklyn Private Rooms, we can interpret the following insights:

Price Distribution: In Manhattan, the majority of the data points were distributed within the price range of 10 to 200 USD. On the other hand, in Brooklyn, most of the data points are scattered within the lower price range of 10 to 120 USD. This suggests that private rooms in Manhattan tend to have higher prices overall compared to Brooklyn.

Availability Distribution: Both Manhattan and Brooklyn show a similar scatter of data points across the availability axis, indicating a relatively similar distribution of availability for private rooms in both areas.

Price Disparity: The wider spread of prices in Manhattan (10 to 200 USD) compared to Brooklyn (10 to 120 USD) indicates a higher price disparity among private rooms in Manhattan. This suggests that in Manhattan, there is a wider range of options available, catering to various budget levels, while in Brooklyn, the options are relatively more concentrated within the lower price range.

Affordability: Based on the price ranges observed in the scatter plots, private rooms in Brooklyn appear to be more affordable on average compared to Manhattan. This affordability factor may attract budget-conscious individuals or travelers who prefer lower-cost accommodations.

The affordability of private rooms in Brooklyn with affordable prices compared to Manhattan suggests that there may be an increased demand for such accommodations in Brooklyn. This insight

into the pricing dynamics can be highly valuable for Pillow Palooza when formulating their competitive pricing strategy for private rooms.

By recognizing that Brooklyn offers more affordable options within the lower price range (0 to 120 USD), Pillow Palooza can capitalize on this market advantage. They can strategically position their pricing to attract budget-conscious individuals and travelers who are seeking cost-effective accommodations. This could include offering competitive rates, discounts, or promotional offers specifically targeting those interested in private rooms in Brooklyn.

Understanding the price disparity between Manhattan and Brooklyn can also guide Pillow Palooza in differentiating their offerings. They can emphasize the value proposition of their private rooms in Manhattan, highlighting the wider range of options available at various price points (1 to 200 USD). This could appeal to customers who are willing to spend more for additional amenities, convenience, or a premium experience.

Overall, leveraging the insights gained from the scatter plots, Pillow Palooza can tailor their pricing strategy to meet the specific demands and preferences of customers looking for private rooms. By recognizing the affordability factor in Brooklyn and the wider range of options in Manhattan, they can position themselves competitively in the market and attract a diverse customer base.

4. Key Insights and Conclusions for Management of Pillow Palooza

1. When considering investments in the short-term rental market, the Manhattan and Brooklyn boroughs show the most potential for favorable returns because they are the most popular neighborhoods for short-term rentals in New York City with high revenue generations.
 - 1.2 These areas demonstrate the greatest potential for Pillow Palooza to concentrate its marketing efforts and enhance its market reach. By strategically targeting these regions, Pillow Palooza can seize the most promising opportunities to expand its presence and capture a larger customer base. By allocating resources and implementing tailored marketing strategies in these specific areas, Pillow Palooza can effectively position itself as a preferred choice for customers' short-term rentals. This focused approach will enable Pillow Palooza to maximize its marketing impact and achieve significant growth in these promising markets.
2. When analyzing the higher average availability in Staten Island, it becomes evident that this neighborhood offers a relatively larger supply of available properties. This availability

trend presents a valuable opportunity for Pillow Palooza investors to explore new property investment prospects in Staten Island. Additionally, it enables hosts, property managers, and investors associated with Pillow Palooza to make well-informed decisions regarding pricing, marketing, and property management strategies in the area. By leveraging this data, Pillow Palooza can maximize profitability and generate significant revenues.

3. Additionally, the potential neighborhoods should be the Top 5 neighborhoods for each borough
4. The affordability of private rooms in Brooklyn compared to Manhattan suggests that there may be an increased demand for such accommodations in Brooklyn. This insight into the pricing dynamics can be highly valuable for Pillow Palooza when formulating their competitive pricing strategy for private rooms.
- 4.1 Pillow Palooza can leverage Brooklyn's affordability advantage in the lower price range (0 to 120 USD) to attract budget-conscious individuals and travelers. By strategically pricing their private rooms and offering competitive rates, discounts, or targeted promotions, Pillow Palooza can capture this market segment effectively.
5. Based on the rental pricing analysis, we have developed a pricing strategy for home/apt rentals, private rooms, and shared rooms in different areas. Here's a suggested approach:

Entire Home/Apartment:

Set the majority of prices below \$300 in most areas.

In Manhattan and Brooklyn, maintain a diverse price range, with prices mostly below \$300 but several listings above \$1000 to cater to higher-end customers.

Queens can be positioned as the third most expensive area, with prices below \$300 but slightly higher than other areas.

In the Bronx and Staten Island, focus on offering more affordable options, as there were no listings above \$1000. Set prices mostly below \$300, with some options even lower to cater to customers looking for budget-friendly rentals.

Private Rooms:

Set prices below \$250 in most areas for private rooms.

Brooklyn should have a diverse price range, with prices mostly below \$250, but with a couple of higher-priced options above \$1000.

Manhattan and Queens can be priced relatively higher, with a range of prices from \$10 to \$1500 for Manhattan and \$22 to \$900 for Queens to accommodate a wider range of customers.

In the Bronx and Staten Island, maintain prices below \$250 to target budget-conscious individuals seeking private rooms.

Shared Rooms:

In Manhattan, set prices between \$25 and \$800 for shared rooms to cater to different budgets and offer a higher-end option.

Brooklyn should have prices ranging from \$18 to \$250, with a focus on affordable shared room options.

Queens can offer shared rooms with prices ranging from \$15 to \$120 to target customers looking for more budget-friendly accommodations.

Set prices for shared rooms in the Bronx between \$20 and \$60, targeting budget-conscious customers.

For Staten Island, offer shared rooms with prices ranging from \$13 to \$30, emphasizing affordability.

Overall, the pricing strategy aims to offer a range of options catering to different budgets and preferences while considering the specific price ranges observed in each area. It's important to regularly monitor the market, competition, and customer feedback to adjust the pricing strategy as needed for optimal results.

6. Top 5 hosts were Sally, Red Awning, Park Lane, Janet, and Yotel
And the maximum number of listing by a single host was **327**, the host name is Sonder
The objective is to contacting these high performing hosts in order to get more reviews for Pillow Palooza. We could start a campaign to contact the most popular host to persuade them to promote our company.

5. Appendix

5.1 - SQL codes

Query Results

3 ROWS

room_type

TEXT

total_number_of_property

INT8

entire home/apt	13266
private room	11356
shared room	587

Idle

PING 170ms

Run query

```
1 --1. What is the most common room type in NYC Airbnb listings?
2 SELECT room_type AS room_type, COUNT(room_type) AS total_number_of_property
3 FROM room_types
4 GROUP BY room_type
5 ORDER BY total_number_of_property DESC;
```

Query Results

3 ROWS

room_type

TEXT

avg_rental_price

NUMERIC

entire home/apt	197.17
private room	81.67
shared room	53.65

Idle

PING 223ms

Run query

```
1 --2. What is the average price of a listing by room type?"shared room"?
2 SELECT rt.room_type AS room_type,
3        ROUND(AVG(price),2) AS avg_rental_price
4 FROM prices AS p
5 LEFT JOIN room_types AS rt
6 USING(listing_id)
7 GROUP BY room_type
8 ORDER BY room_type,avg_rental_price DESC;
```

Query Results

1 ROWS

borough

TEXT

average_price_per_month

NUMERIC

Manhattan	5596.69
-----------	---------

Idle

PING 160ms

Run query

```
1 --3. Which borough has the highest average price per month?
2 SELECT borough AS borough,
3        ROUND(AVG(price_per_month)::numeric,2) AS average_price_per_month
4 FROM prices
5 GROUP BY borough
6 ORDER BY average_price_per_month DESC
7 LIMIT 1;
```

Query Results

15 ROWS

borough

TEXT

room_type

TEXT

number_of_listings

INT8

Bronx	entire home/apt	261
Bronx	private room	403
Bronx	shared room	33
Brooklyn	entire home/apt	5367
Brooklyn	private room	4906
Brooklyn	shared room	187
Manhattan	entire home/apt	6170
Manhattan	private room	3901
Manhattan	shared room	251

Idle

PING 183ms

Run query

```
1 --4. How many listings of each room type are in each borough?
2 SELECT p.borough AS borough,
3        rt.room_type AS room_type,
4        COUNT(rt.listing_id) AS number_of_listings
5 FROM prices AS p
6 LEFT JOIN room_types AS rt
7 USING(listing_id)
8 GROUP BY borough, room_type
9 ORDER BY borough, room_type, number_of_listings DESC;
```

Query Results

3 ROWS

room_type	number_of_listings
TEXT	INT8
shared room	1
entire home/apt	395
private room	19

Idle ●

PING 135ms

Run query

```

1 --5.How many listings in each room type category
2 --have a price greater than $500 per night?
3 SELECT rt.room_type AS room_type,
4       COUNT(rt.listing_id) AS number_of_listings
5 FROM room_types AS rt
6 JOIN prices AS p USING (listing_id)
7 WHERE p.price > 500
8 GROUP BY rt.room_type;
9

```

Query Results

5 ROWS

borough	min_price	max_price	avg_price
TEXT	INT8	INT8	NUMERIC
Queens	10	2600	92.8139467592592593
Brooklyn	10	7500	121.9746653919694073
Staten Island	13	300	86.0449438202247191
Manhattan	10	5100	184.0006781631466770
Bronx	20	670	79.2410329985652798

Idle ●

PING 168ms

Run query

```

1 --6.What is the distribution of listing prices by borough?
2 SELECT p.borough AS borough,
3       MIN(p.price) AS min_price,
4       MAX(p.price) AS max_price,
5       AVG(p.price) AS avg_price
6 FROM prices AS p
7 Group BY borough;
8

```

Query Results

5 ROWS

borough	estimated_total_amount
TEXT	NUMERIC
Manhattan	393420567
Brooklyn	279130240
Queens	58404083
Bronx	9324180
Staten Island	3443919

Idle ●

PING 190ms

Run query

```

1 --7.What is the estimated amount of revenue generated by hosts in each borough?
2 SELECT p.borough AS borough,
3       SUM(p.price * r.booked_days_365) AS estimated_total_amount
4 FROM prices AS p
5 LEFT JOIN reviews AS r
6 USING(listing_id)
7 GROUP BY borough
8 ORDER BY estimated_total_amount DESC;
9

```

Query Results

489 ROWS

neighbourhood	room_type	avg_price_per_month
TEXT	TEXT	NUMERIC
Sea Gate	entire home/apt	24485.42
Tribeca	entire home/apt	13707.58
Bayside	entire home/apt	12133.48
Flatiron District	entire home/apt	11766.18
SoHo	entire home/apt	11674.97
NoHo	entire home/apt	10488.29
Theater District	entire home/apt	9614.37
Midtown	entire home/apt	9459.58
NoIta	entire home/apt	8745.75

Idle ●

PING 130ms

Run query

```

1 --8.What is the average price per month for listings in each neighborhood?
2 SELECT p.neighbourhood AS neighbourhood,
3       rt.room_type AS room_type,
4       ROUND(AVG(p.price_per_month):: numeric,2) AS avg_price_per_month
5 FROM prices AS p
6 LEFT JOIN room_types AS rt
7 USING(listing_id)
8 GROUP BY neighbourhood, room_type
9 ORDER BY room_type,avg_price_per_month DESC;
10

```

Query Results
1 ROWS

number_of_listings
INT8
0

Idle
PING 147ms

Run query

```

1 --9. How many listings have no reviews?
2 SELECT COUNT(r.listing_id) AS number_of_listings
3 FROM reviews AS r
4 WHERE number_of_reviews = 0;
5

```

Query Results
1 ROWS

correlation
FLOAT8
-0.07963883976667008

Idle
PING 171ms

Run query

```

1 --10. How do the estimated book days correlate with the price of
2 --an Airbnb listing in New York City?
3 SELECT CORR(p.price, r.booked_days_365) AS Correlation
4 FROM prices AS p
5 LEFT JOIN reviews AS r
6 USING(listing_id) ;
7

```

Query Results
3 ROWS

room_type	avg_price_p
TEXT	NUMERIC
entire home/apt	179.54
private room	85.41
shared room	59.19

Idle
PING 169ms

Run query

```

1 --1. What is the average price per room type for listings
2 --that have at least 100 reviews and are available more than 200 days a year?
3
4 SELECT rt.room_type AS room_type,
5        ROUND(AVG(price)::numeric,2) AS avg_price_per_room
6 FROM prices AS p
7 LEFT JOIN room_types AS rt
8 USING(listing_id)
9 LEFT JOIN reviews AS r
10 USING(listing_id)
11 WHERE r.number_of_reviews >= 100 AND r.availability_365 > 200
12 GROUP BY room_type
13 ORDER BY avg_price_per_room DESC;
14
15

```

Query Results
1 ROWS

num_hosts_multiple_listings	max_listings_by_single_host
INT8	INT8
2929	215

Idle
PING 253ms

Run query

```

1 --2. How many hosts have more than one listing,
2 --and what's the maximum number of listings by a single host name?
3
4 SELECT COUNT(DISTINCT host_name) AS num_hosts_multiple_listings,
5        MAX(listing_count) AS max_listings_by_single_host
6 FROM
7 (
8   SELECT r.host_name AS host_name, COUNT(listing_id) AS listing_count
9   FROM reviews AS r
10  GROUP BY host_name
11  HAVING COUNT(listing_id) > 1
12  ORDER BY listing_count DESC ) sub ;
13
14

```

Query Results

5 ROWS

host_name	avg_price_per_month
TEXT	NUMERIC
Sally	109895.42
Red Awning	21452.58
Park Lane	12318.75
Janet	11334.01
Yotel	8749.86

Idle ●
PING 149ms

```

1 --3.Determine the top 5 hosts who have the highest price_per_month for their listings,
2 -- considering only hosts who have at least 10 listings.
3 SELECT r.host_name AS host_name,
4       ROUND(AVG(p.price_per_month)::numeric,2) AS avg_price_per_month
5 FROM prices AS p
6 LEFT JOIN reviews AS r
7 USING(listing_id)
8 WHERE r.calculated_host_listings_count >= 10
9 GROUP BY host_name
10 ORDER BY avg_price_per_month DESC
11 LIMIT 5;

```

Run query

Query Results

206 ROWS

neighbourhood	price_variance
TEXT	NUMERIC
Sea Gate	924800.00
Bayside	230283.44
East Flatbush	173518.92
SoHo	122866.07
Tribeca	98547.14
NoHo	85803.19
Midtown	82363.86
NoHo	74693.22
Flatiron District	71319.60

Idle ●
PING 128ms

```

1 --4.Find the neighborhood(s) that have the highest variance in listing prices.
2 SELECT p.neighbourhood AS neighbourhood,
3       ROUND(VARIANCE(p.price)::numeric, 2) AS price_variance
4 FROM prices AS p
5 GROUP BY p.neighbourhood
6 HAVING VARIANCE(p.price) IS NOT NULL
7 ORDER BY price_variance DESC;

```

Run query

Query Results

155 ROWS

neighbourhood	avg_price_per_month
TEXT	NUMERIC
Bayside	11949.95
Tribeca	11791.53
Flatiron District	10172.69
SoHo	9549.23
NoHo	9374.04
Grymes Hill	9125.00
Midtown	8849.85
Gramercy	8004.65
Chelsea	7840.98

Idle ●
PING 163ms

```

1 --5.Calculate the average price_per_month for each neighborhood,
2 --taking into account only listings where the host has a minimum_nights value
3 --that is higher than the average minimum_nights value across all listings.
4
5 SELECT p.neighbourhood AS neighbourhood,
6       ROUND(AVG(p.price_per_month)::numeric,2) AS avg_price_per_month
7 FROM prices AS p
8 LEFT JOIN reviews AS r
9 USING(listing_id)
10 WHERE r.minimum_nights > (SELECT AVG(r.minimum_nights)
11                          FROM reviews AS r)
12 GROUP BY neighbourhood
13 ORDER BY avg_price_per_month DESC;
14

```

Run query

5.2 Link to the **NYC Short-Term Rental Insights for Pillow Palooza Tableau Dashboard**

https://public.tableau.com/views/NYCSHORT-TermRentalInsightsforPillowPalooza/PillowPaloozaDashboard?:language=en-US&:display_count=n&:origin=viz_share_link

5.3 DA 202.2 Project - Airbnb Data Analysis and Insights Generation (python file)

[DA 202.2 Project - Airbnb Data Analysis and Insights Generation .pdf](#)

5.4 DA 202.1 Project - Airbnb Data Wrangling and Cleaning (python file)

[DA 202.1 Project - Airbnb Data Wrangling and Cleaning .pdf](#)