Analysis of Short-Term Rental Market in New York City

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Summary

This report presents the findings and recommendations from an analysis of the short-term rental market in New York City. The study aims to provide insights to Pillow Palooza, a start-up focused on optimizing its business strategy in the rapidly growing market. The analysis includes an examination of popular neighborhoods, rental prices, property types, and other key factors impacting revenue and occupancy rates. The report concludes with a recommendation on whether to proceed with the current business approach or suggest iterating on the strategy.

Context

The short-term rental market in New York City has experienced significant growth, creating opportunities for businesses like Pillow Palooza to disrupt the traditional real estate market. Pillow Palooza aims to maximize revenue and occupancy rates for their short-term rental properties. To achieve this, a comprehensive analysis of the market was conducted using data collected from various sources, including Airbnb listings. The dataset was cleaned and prepared for analysis, and a technological framework was established using Python, PostgreSQL, and Tableau.

The analysis focused on addressing key questions such as identifying popular neighborhoods, understanding rental prices by neighborhood and property type, and examining the distribution of property types across different neighborhoods. By delving into these aspects, the goal was to provide actionable insights and recommendations to Pillow Palooza's team, enabling them to make informed decisions and optimize their business strategy.

The results and recommendations detailed in this report are based on the findings derived from the analysis.

The Dataset

Pillow Palooza stores its data in a relational database. We will be using the following datasets:

1. **Prices**
   - listing_id - the listing ID
   - price - price in dollar
   - borough - Name of the borough
   - neighborhood - Name of the neighborhood
   - price_per_mont - price per month in dollars
   - price_range - range of listing prices
   - latitude - latitude coordinates
   - longitude - longitude coordidantes
2. **Reviews**
   - listing_id - the listing ID
   - host_name - name of the host
   - last_review - date of the last review
   - number_of_reviews - number of reviews

- reviews_per_month - number of reviews per month
- minimum_nights - number of minimum nights stayed
- 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

3. **Room_types**
   - listing_id - the listing ID
   - description - the description of the listing
   - room_type - listing space type

Results

The analysis of the short-term rental market in New York City has yielded insightful findings. The following key results provide a comprehensive understanding of the market dynamics and performance:

- **Main KIPs:**

Total Listings	Average Price	Occupancy Rate	Total Revenue	Average Revenue
25,184	$4,315	59.89%	$743M	$30K

  - Total Listings: The dataset comprises a total of 25,184 listings, indicating a significant number of short-term rental options available in New York City.
  - Average Price: The average price of the listed properties is calculated to be $4,315.
  - Occupancy Rate: The occupancy rate is an essential metric that indicates the percentage of time the listed properties are occupied. In this analysis, the occupancy rate is determined to be 59.89%, highlighting the demand and utilization of short-term rentals in New York City.
  - Total Revenue: The total revenue generated from the listed properties is an impressive $743,369,052. This significant revenue figure demonstrates the financial potential of the short-term rental market in New York City.
  - Average Revenue: The monthly average revenue per listing is calculated to be $30,000. This figure provides an estimate of the average monthly income that hosts can expect to earn from their short-term rental properties.

- **Occupancy rate by borough and room type in New York City:**

Occupancy Rate by Borough and Room type

	Staten Island	Bronx	Brooklyn	Manhattan	Queens	Grand Total
entire home/apt	47.06% (N=133)	49.51% (N=260)	63.56% (N=5,365)	61.64% (N=6,169)	54.11% (N=1,335)	61.27% (N=13,262)
private room	33.64% (N=132)	47.44% (N=403)	60.57% (N=4,899)	62.10% (N=3,895)	52.44% (N=2,008)	58.87% (N=11,337)
shared room	89.59% (N=2)	51.71% (N=33)	48.70% (N=187)	51.18% (N=251)	38.69% (N=112)	48.16% (N=585)
Grand Total	40.74% (N=267)	48.41% (N=696)	61.89% (N=10,451)	61.56% (N=10,315)	52.64% (N=3,455)	59.89% (N=25,184)

- o Manhattan has the highest average occupancy rate among all boroughs, standing at 61.56%. This suggests that short-term rental properties in Manhattan are in high demand and frequently booked by travelers.
- o Brooklyn follows closely with an average occupancy rate of 61.89%, indicating a strong demand for accommodations in this borough as well.
- o Queens has a slightly lower average occupancy rate of 52.64%, suggesting a comparatively moderate demand for short-term rentals in this borough.
- o The Bronx and Staten Island have lower average occupancy rates of 48.21% and 40.74%, respectively. This indicates a relatively lower demand for short-term rental properties in these boroughs.
- o Entire home/apartment listings have the highest average occupancy rate at 61.27%, indicating that travelers often prefer having an entire place to themselves during their stay.
- o Private rooms have a slightly lower average occupancy rate of 58.87%, suggesting that some travelers are willing to share common areas but prefer a private sleeping space.
- o Shared rooms have the lowest average occupancy rate at 48.16%, indicating a lower demand for this room type where guests share the same sleeping space.
- o Manhattan and Brooklyn consistently have higher occupancy rates across all room types, highlighting the popularity and demand for short-term rentals in these boroughs.
- o Staten Island stands out with a notably lower occupancy rate across all room types compared to other boroughs.
- o Shared rooms tend to have the lowest occupancy rates across all boroughs, indicating a lesser preference for this type of accommodation among travelers.
- o Private rooms generally have slightly higher occupancy rates compared to entire home/apartments in most boroughs.

- **Pareto analysis of Total Revenue by Borough, Price Range, and Room type:**

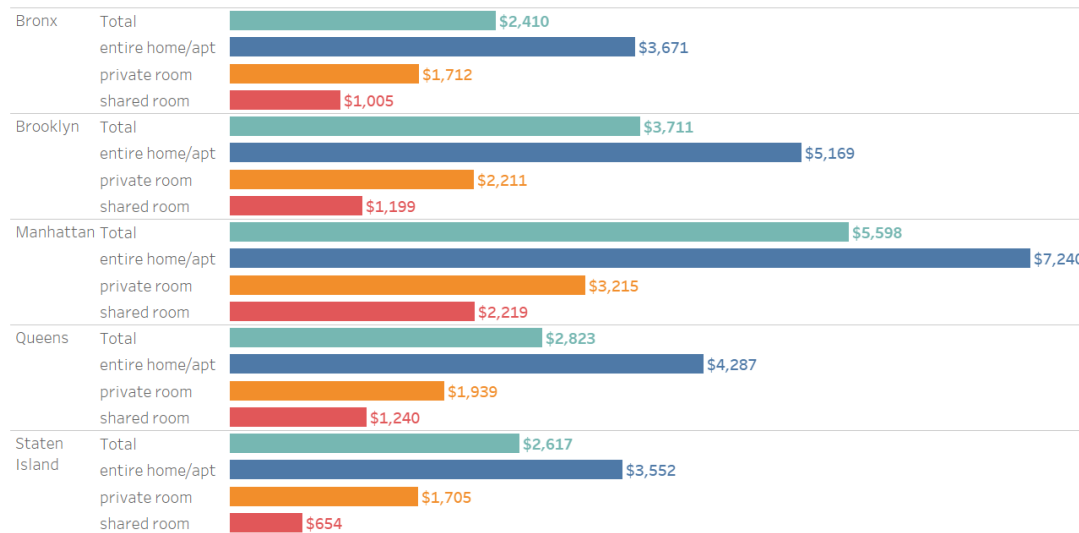Pareto analysis of Total Revenue by Borough, Price Range, and Room type
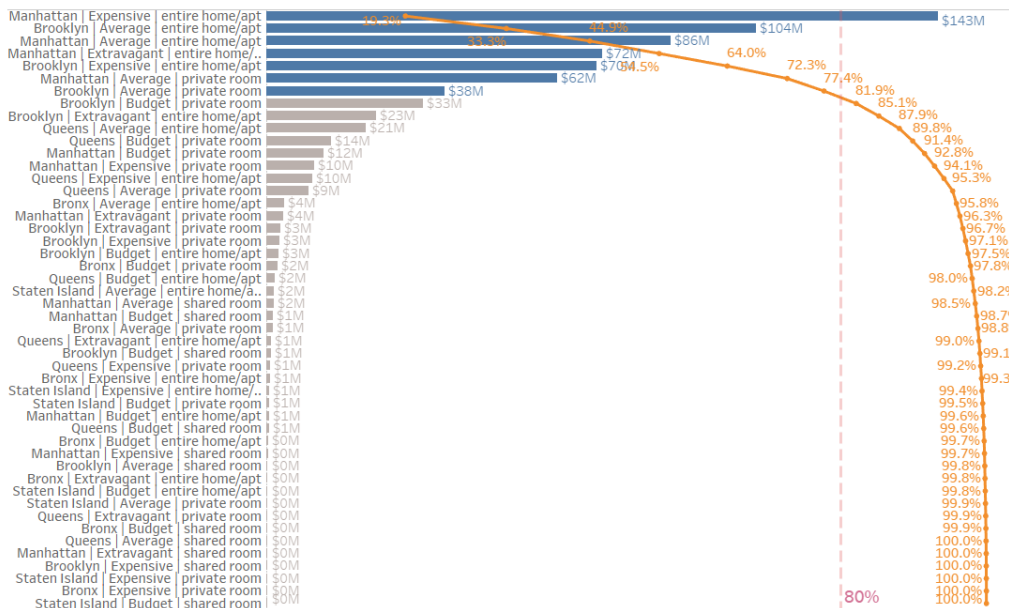
The Pareto analysis conducted on the short-term rental market in New York City reveals an interesting insight regarding the revenue distribution among different segments. The analysis indicates that a significant portion, approximately 80%, of the total revenue is generated by the "entire home/apartment" listings falling under the expensive and average price categories and located mainly in Manhattan. This finding highlights the importance of these segments in driving the financial success of Pillow Palooza's business in the New York City market.

By focusing on the entire home/apartment listings with higher price ranges, Pillow Palooza can tap into the lucrative market segment that contributes significantly to the company's revenue. This information can guide strategic decision-making and resource allocation, directing efforts toward optimizing the performance and occupancy rates of these high-value listings.

- **Average monthly prices for different room types across various boroughs in New York City:**

Average Monthly Price by Borough and Room type

Borough	Room type	Price
Bronx	Total	$2,410
	entire home/apt	$3,671
	private room	$1,712
	shared room	$1,005
Brooklyn	Total	$3,711
	entire home/apt	$5,169
	private room	$2,211
	shared room	$1,199
Manhattan	Total	$5,598
	entire home/apt	$7,240
	private room	$3,215
	shared room	$2,219
Queens	Total	$2,823
	entire home/apt	$4,287
	private room	$1,939
	shared room	$1,240
Staten Island	Total	$2,617
	entire home/apt	$3,552
	private room	$1,705
	shared room	$654

The analysis reveals that Manhattan has the highest average monthly prices across all room types. The "entire home/apartment" listings in Manhattan command the highest average monthly price of $7,240, followed by Brooklyn with an average of $5,169. These figures indicate that Manhattan and Brooklyn are the boroughs where short-term rental prices are relatively higher compared to the other boroughs.
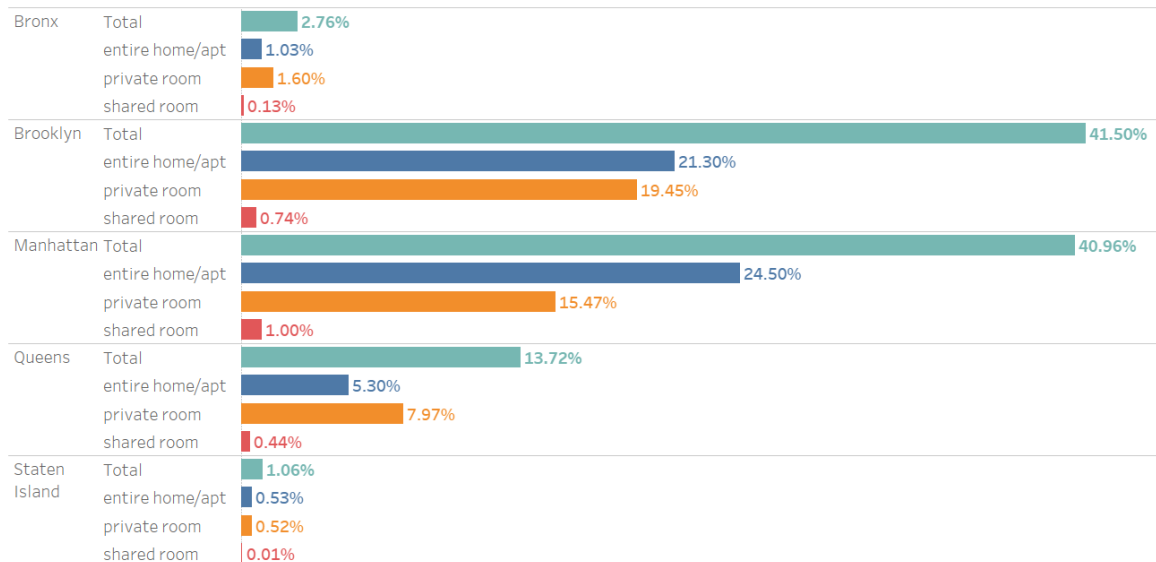
On the other hand, the Bronx and Staten Island have the lowest average monthly prices for all room types. The "entire home/apartment" listings in the Bronx have an average monthly price of $3,671, while Staten Island has the lowest average price at $3,552. These lower prices suggest that the Bronx and Staten Island may be more affordable options for short-term rentals compared to Manhattan and Brooklyn.

In terms of room types, the "entire home/apartment" listings consistently have higher average monthly prices across all boroughs. This implies that guests are willing to pay a premium for the privacy and exclusivity provided by having an entire home/apartment to themselves. The "private room" listings have lower average monthly prices, followed by the "shared room" listings, which are generally the most budget-friendly option.

These insights can help Pillow Palooza make informed decisions regarding pricing strategies and target markets. By understanding the price dynamics across different boroughs and room types, the company can adjust their pricing strategy to maximize revenue and occupancy rates. Additionally, this information can guide marketing efforts, allowing Pillow Palooza to effectively position their offerings based on the preferences and affordability of potential guests in each borough.

- **Distribution of listings by borough and room type in New York City**

Distribution of Listings by Borough and Room type *(% of total)*

Borough	Room type	%
Bronx	Total	2.76%
	entire home/apt	1.03%
	private room	1.60%
	shared room	0.13%
Brooklyn	Total	41.50%
	entire home/apt	21.30%
	private room	19.45%
	shared room	0.74%
Manhattan	Total	40.96%
	entire home/apt	24.50%
	private room	15.47%
	shared room	1.00%
Queens	Total	13.72%
	entire home/apt	5.30%
	private room	7.97%
	shared room	0.44%
Staten Island	Total	1.06%
	entire home/apt	0.53%
	private room	0.52%
	shared room	0.01%

The analysis shows that Brooklyn has the highest number of listings overall, accounting for 41.50% of the total listings. It is followed by Manhattan, which comprises 40.96% of the total listings. These two boroughs together represent a significant portion of the short-term rental market in the city. When looking at the distribution by room type, the majority of listings in all boroughs are "entire home/apartment" listings. Manhattan has the highest proportion of "entire home/apartment" listings at 24.50% of the total listings, followed closely by Brooklyn at 21.30%. This suggests that there is a high demand for entire homes or apartments among travelers in these boroughs.

The "private room" listings make up a significant portion of the total listings as well, with Brooklyn having the highest proportion at 19.45% and Manhattan at 15.47%. These types of listings offer a more affordable and shared accommodation option for guests.

In contrast, the "shared room" listings constitute a smaller percentage of the total listings across all boroughs, with the highest proportion found in Brooklyn at 0.74% and the lowest in Staten Island at 0.008%.

Understanding the distribution of listings by borough and room type helps Pillow Palooza identify the most popular accommodation types in each borough. This information can guide their investment decisions and marketing strategies, allowing them to focus on areas and room types that have higher demand and potential for maximizing occupancy rates and revenue.

Recommendation

Based on the analysis of the available data on the short-term rental market in New York City, along with the acknowledged limitations, the following recommendations are provided for Pillow Palooza to optimize their business strategy:

1. Focus on Expensive and Average Price Categories: The Pareto analysis reveals that the "entire home/apartment" listings falling under the expensive and average price categories contribute significantly to the total revenue. Pillow Palooza should prioritize these segments and allocate resources accordingly to maximize revenue.
2. Target Manhattan and Brooklyn: Manhattan and Brooklyn consistently demonstrate higher occupancy rates across all room types. These boroughs have a strong demand for short-term rentals and offer potential for higher revenue. Pillow Palooza should concentrate their efforts on these areas to capitalize on the lucrative market.
3. Optimize Entire Home/Apartment Listings: The analysis indicates that entire home/apartment listings have the highest occupancy rates, highlighting their popularity among travelers. Pillow Palooza should focus on improving the performance and attractiveness of these listings to meet the demand. This may involve enhancing amenities, ensuring cleanliness, and providing a seamless guest experience.
4. Consider Pricing Strategies: Although the dataset does not provide information on the average length of stay, Pillow Palooza should continue to monitor market trends and competition to adjust

their pricing strategies accordingly. Charging a premium for entire home/apartment listings in Manhattan and Brooklyn can help maximize revenue, while offering competitive rates for private rooms and shared rooms can attract budget-conscious travelers.

5. Expand Presence in Brooklyn: With the highest number of listings and a significant market share, Brooklyn presents an opportunity for Pillow Palooza to expand their presence. They should consider acquiring or partnering with property owners in Brooklyn to increase their inventory and cater to the demand in this borough.

6. Enhance Marketing Efforts: Tailoring marketing strategies to target specific segments and locations is crucial. Pillow Palooza should leverage digital marketing channels, social media, and partnerships with local businesses to increase brand visibility and attract potential guests. Additionally, they should consider gathering more data on seasonal trends and historical demand to identify any potential patterns that could influence business decisions.

7. Continuous Monitoring, Data Collection, and Analysis: As acknowledged, the dataset provided has limitations and certain questions cannot be fully answered due to the lack of necessary data points or historical data. To overcome these limitations, Pillow Palooza should actively seek opportunities to collect additional relevant data. This may involve implementing systems to capture information on the average length of stay, gathering data on seasonal trends, and accessing historical demand patterns. By expanding their data collection efforts, Pillow Palooza can gain deeper insights into customer behavior, market dynamics, and business performance. Regular monitoring and analysis of the available data, along with the acquired additional data, will enable Pillow Palooza to refine their business strategy, make informed decisions, and stay competitive in the evolving short-term rental market of New York City.

In conclusion, Pillow Palooza can utilize the available data and acknowledged limitations to make informed decisions and optimize their short-term rental business in New York City. By focusing on high-revenue segments, targeting popular boroughs, implementing effective pricing and marketing strategies, and continuously monitoring market trends, Pillow Palooza can enhance their occupancy rates, revenue, and overall success in the competitive market.

Appendix

1. Code used for analysis - NYC Rental Insights.ipynb

2. Link to Tableau dashboard –
https://public.tableau.com/app/profile/manuk.mikayelyan/viz/NYCRentalInsights/Dashboard1