NYC Short-Term Rental Analysis (Jan-Jul, 2019)

By Marcia Espinosa

Summary:

Pillow Palooza, a real estate start-up focused on short-term rentals, analyzed the NYC short-term rental market from January to July 2019. The data revealed that Manhattan generated the highest revenue and had a high occupancy rate, making it an ideal focus for expansion. Specific neighborhoods within each borough were identified as revenue generators and should be targeted for property acquisitions. Implementing dynamic pricing strategies to adjust rates based on demand fluctuations was recommended, along with promoting properties in high-demand neighborhoods during peak seasons, like summer. Encouraging positive guest reviews, improving the online booking platform, and staying updated on market trends and competitors. Analyzing a longer time period and considering guest reviews would provide further insights for improving guest satisfaction and provide a more comprehensive understanding of market dynamics.

Context:

NYC Short-Term Rental Insights

Pillow Palooza is a real estate start-up focused on offering short-term rental options. The company has seen a significant increase in demand for short-term rentals in New York City and aims to better understand the market to **optimize its business strategy**.

The purpose of this analysis is to gain valuable insights into the NYC short-term rental market. By understanding market trends and patterns, Pillow Palooza can make well-informed investment decisions, focus on suitable properties, and develop effective pricing strategies to maintain competitiveness. The aim is to provide recommendations on how to **maximize revenue and occupancy rates** for their short-term rental properties.

The team involved in this project includes:

Samantha Patel, the CEO, seeks to make strategic decisions regarding investment in neighborhoods and property types to remain competitive. John Kim, the VP of Data, is interested in leveraging data to drive business decisions and exploring predictive modeling. Emily Chen, the head of marketing, aims to identify popular neighborhoods and property types for targeted marketing campaigns. Michael Lee, the Head of Finance, is interested in optimizing rental pricing and maximizing profitability.

Results:

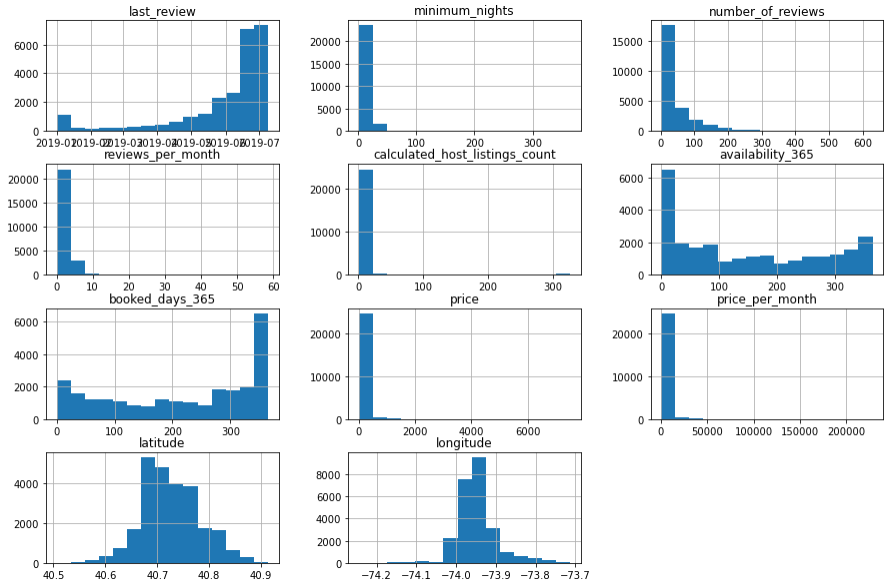
The dataset, obtained from DataCamp, comprises various file types such as .csv, .tsv, and .xlsx. It includes information on key aspects of short-term rentals, including neighborhood, rental prices, room types, and

length of stay. Our analysis process began with data wrangling and cleaning to ensure the accuracy and readiness of the dataset. Python was employed for this purpose (link: **DataCamp Workspace**). Subsequently, additional data, including latitude, longitude, and other relevant variables were incorporated, the data was in **https://bit.io**, the tool used SQL. This allowed for a comprehensive analysis, enabling the identification of trends, patterns, and correlations within the dataset.

➔ The final data were analyzed in Python.

Data Validation: The data consists of 25202 rows and 16 columns. The 'reviews' and 'room_types' tables have 25209 rows, while the 'price' table has 25202 rows. An inner join was performed to merge the tables and eliminate null values, and the index = 'listing_id' was present in all tables. The data was for 189 days, between 2019-01-01 and 2019-07-09.

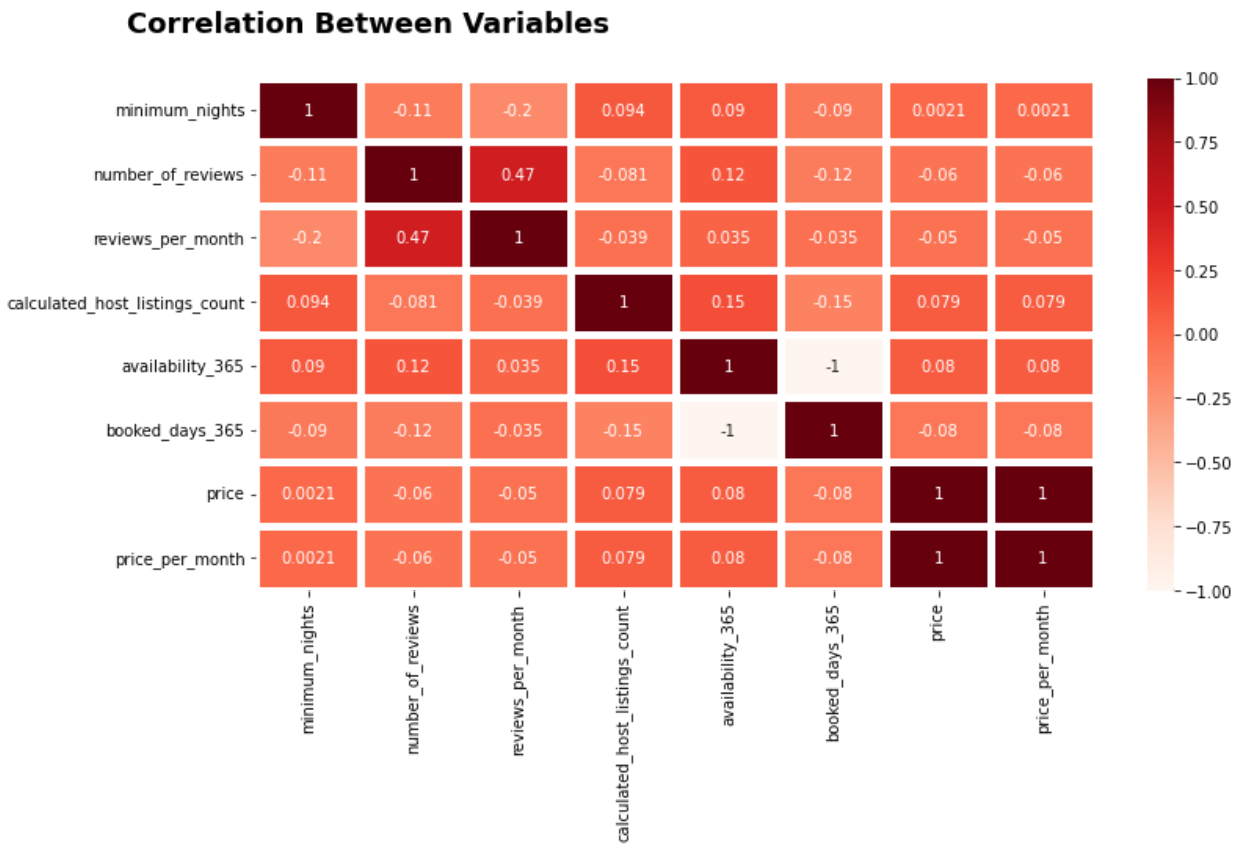
EDA: Distribution Distribution of numeric variables:



- The majority of the data had a right-skewed distribution (positively skewed), indicating that there were fewer values toward the right and more values toward the left. The average is typically greater than the median, and the mode may be the lowest point in the distribution. This suggests that the majority of the data points are concentrated toward the lower values, with a few extreme values towards the higher end.

Summarize statistics of numeric variables:

- In the majority of variables, the standard deviation was relatively high, suggesting that the values in the dataset have high variability.



- Suggests that there is little to no linear relationship between variables; in other words, changes in one variable do not correspond to predictable changes in the other variable in a linear manner.

➔ Tableau:

Finally, we created a dashboard in Tableau to present our findings and insights. The interactive dashboard can be accessed at the following link: **Tableau Dashboard**.

Manhattan emerged as the leading borough, generating $393 million. It had a total of 10,322 listings available for short-term rentals. The average price per night was $184, while the median price per night was $149. In terms of monthly rentals, the median price was $4,532. Analyzing the occupancy rates, the figure of 160% suggests that there is a high demand for short-term rentals in Manhattan. When considering the type of accommodations preferred by guests, private rooms were the choice for 227 bookings, generating $88 million in revenue. Additionally, entire rooms or apartments were booked 224 times, generating $302 million in revenue. Regarding the timing of guest reviews, a significant number of reviews were received during the summer months of May, June, and July, accounting for approximately 65% of the total reviews. This suggests that the summer season attracts a larger number of guests, while the other months have a comparatively smaller number of reviews.

Brooklyn emerges as the second borough generating significant revenue, With a total of 10,460 listings available, Brooklyn generated $279 million in revenue. The average price per night in Brooklyn was $122, while the median price per night stood at $95. When considering monthly rentals, the median price was

$2,890. Similar to Manhattan, the occupancy rate in Brooklyn was high at 162%. This suggests a strong demand for short-term rentals in the borough. When it comes to preferred accommodation types, entire rooms/apt were booked 232 times, resulting in $201 million in revenue. Additionally, private rooms were booked 221 times, generating $77 million in revenue. Reviewing the timing of guest reviews, the majority of them were received during the summer months of May, June, and July, accounting for approximately 64% of the total reviews. Similar to Manhattan, the other months showed a relatively smaller number of reviews.

Queens, the third borough in terms of revenue generation, generated $58 million. There were a total of 3,456 listings available in Queens. The average price per night in Queens was $93, while the median price per night stood at $70. When considering monthly rentals, the median price was $2,129. The occupancy rate in Queens was 111%, indicating a relatively lower occupancy compared to Manhattan and Brooklyn.

When it comes to preferred accommodation types, the entire room/apt was booked 197 times, resulting in $34 million in revenue. Additionally, private rooms were booked 191 times, generating $24 million in revenue. Reviewing the timing of guest reviews, the majority of them were received during the summer months of May, June, and July, aligning with the summer season. Similar to Manhattan and Brooklyn, the other months showed a smaller number of reviews.

The analysis reveals that the **Bronx** generated the least revenue among the boroughs, with a total revenue of $9 million. There were 607 listings available for short-term rentals in the Bronx. The average price per night in the Bronx was $79, while the median price per night stood at $65. When considering monthly rentals, the median price was $1,977. The occupancy rate in the Bronx was 95%, indicating a relatively high occupancy level. In terms of preferred accommodation types, the entire room/apt was booked 181 times, resulting in $5 million in revenue. Additionally, private rooms were booked 173 times, generating $4 million in revenue. Reviewing the timing of guest reviews, the majority of them were received during the summer months of May, June, and July, similar to the other boroughs.

Moving on to **Staten Island**, it generated a revenue of $3 million with a total of 267 listings available for short-term rentals. The average price per night in Staten Island was $86, while the median price per night stood at $71. When considering monthly rentals, the median price was $2,170. The occupancy rate in Staten Island was 69%, indicating a comparatively lower occupancy level than the other boroughs. Regarding preferred accommodation types, the entire room/apt was booked 172 times, resulting in $3 million in revenue. Additionally, private rooms were booked 123 times, generating $1 million in revenue. Reviewing the timing of guest reviews, the majority of them were received during the summer months of June and July.

Recommendation:

Based on the data provided for six months and days of July, Pillow Palooza can consider the following recommendations:

- Focus on Manhattan: this borough has a high occupancy rate and attracts guests looking for both private rooms and entire apartments. By expanding its presence in Manhattan, Pillow Palooza can maximize revenue and occupancy rates.
- There are specific neighborhoods within each borough that generate the most revenue and have high demand. Allocate resources to acquire properties in these popular neighborhoods to attract more guests and increase revenue.
- Dynamic pricing strategies can be implemented to adjust rates based on demand fluctuations for the season.
- Focus on promoting the properties and neighborhoods that are in high demand during the peak seasons, such as summer.
- Encourage positive guest reviews and ratings to build a strong reputation in the short-term rental market. Implement a reliable and user-friendly online booking platform to streamline the reservation process and improve the guest experience.

Continuously monitor the NYC short-term rental market for any shifts in demand, pricing patterns, or regulations. Stay updated on industry trends and competitors to adapt the business strategy accordingly.

Analyzing a longer time period of data would provide a more comprehensive understanding of market dynamics. Additionally, reviewing guest reviews can help identify areas for improvement and address any issues to enhance guest satisfaction.

Appendix:

Code SQL:

https://github.com/marcia-espinosae/Project_in_SQL/tree/c7ad7221051e8c6e44ed83765071c3e1edf2253c/NYC_short_term_rental_in_SQL

Code Python:

https://github.com/marcia-espinosae/Project_in_Python/tree/a04ef1a91a2342146b9537636a3c5171e76afaa0/NYC_short_term_rental_in_python

Tableau Dashboard:

Link: **Tableau Dashboard**