

Analysis of short-term rentals in NYC

By: The Amazing Analyst at Pillow Palooza

Summary

This report aims to analyze the short-term rentals data in New York City and provides recommendations to below stakeholders on optimizing their business strategy in order to maximize revenue and occupancy rates for Pillow Palooza's rental properties.

- CEO
- VP of Data
- Head of Marketing
- Head of Finance

Context

As a start-up in offering short-term rentals for travelers, Pillow Palooza has seen a significant increase in demand for rental properties in New York City. Management wants to better understand the market in order to optimize the company's business strategy so as to get the best returns for our rental assets.

We have collected data from various sources (both internal and public) on rental listings in New York City to gain insight into the market. The plan is to analyze this data using internal resources in order to provide insights and recommendations to those teams that are responsible for leading growth and success in the NYC market:

- **CEO:** The insights gained from this initiative helps to determine which neighborhoods and property types we should invest in and how to set competitive pricing of the rental assets.
- **VP of Data:** Recommendations from this project can help the team to identify trends and patterns for use in forecasting of future rentals demand in different neighborhoods.
- **Head of Marketing:** Knowledge and insights gained from the project should help the marketing team to design targeted campaigns aimed at potential guests based on their preferences by neighborhoods and property types.

- **Head of Finance:** Recommendations from the project enable the finance team to identify which neighborhoods and property types generate the highest revenue and to determine how to price rentals to maximize profitability.

Results

We use tools like SQL and Tableau to help with our analytic works performed against the short-term rental datasets. The following findings summarized our analysis.

- 1) The most popular neighborhoods by number of listings

Borough	Number of listings
Brooklyn	10460
Manhattan	10322
Queens	3456
Bronx	697
Staten Island	267

The combined total of the top three neighborhoods have 96% of the market share in terms of number of listings.

- 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?

Borough	Room Type	Average Rental Price
Bronx	entire home/apt	121
	private room	56
	shared room	33
Brooklyn	entire home/apt	170
	private room	73

	shared room	39
Manhattan	entire home/apt	238
	private room	106
	shared room	73
Queens	entire home/apt	141
	private room	64
	shared room	41
Staten Island	entire home/apt	117
	private room	56
	shared room	22

The average rental price differed significantly by neighborhood and property type. For instance, the average price for an entire home/apt unit in the Manhattan area is around \$238 whereas a shared room in Staten Island only costs about \$22.

- 3) What are the most commonly rented property types on Airbnb in New York City, and how does this vary by neighborhoods?

Borough	Room Type	Number of Listings
Bronx	entire home/apt	8
	private room	19
	shared room	2
Brooklyn	entire home/apt	725
	private room	696
	shared room	16
Manhattan	entire home/apt	821
	private room	495
	shared room	17

Queens	entire home/apt	103
	private room	167
	shared room	5
Staten Island	entire home/apt	7
	private room	6

Across all neighborhoods, the most commonly rented property types are entire home/apt and private room. The combined share of both types has closed to 98.7% of total listings. In addition, rental listings vary greatly by neighborhoods. With popular borough like Manhattan has over 800 listings whilst less common neighborhoods like Staten Island only have single digit number of listings.

4) The most common room type in NYC Airbnb listings.

Room Type	Total Counts
Entire home/apt	13266
Private room	11356
Shared room	587

As the total counts indicated, the most common room types are Entire home/apt and Private room.

5) The average price of a listing by room type.

Room Type	Average Price
Entire home/apt	197
Private room	82
Shared room	54

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

Borough	Room Type	Number of Listings
Bronx	entire home/apt	261
	private room	403
	shared room	33
Brooklyn	entire home/apt	5367
	private room	4906
	shared room	187
Manhattan	entire home/apt	6170
	private room	3901
	shared room	251
Queens	entire home/apt	1335
	private room	2009
	shared room	112
Staten Island	entire home/apt	133
	private room	132
	shared room	2

As the numbers indicated, the three most popular boroughs have the majority of listings in the market.

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

Room Type	Number of Listings
Entire home/apt	395
Private room	19

Shared room	1
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8) What is the distribution of listing prices by neighborhood?

Borough	Price Differences	Average Price
Brooklyn	7490	122
Manhattan	5090	184
Queens	2590	93
Bronx	650	79
Staten Island	287	86

Brooklyn has the biggest price differences (the difference between the highest price and the lowest price of listings in a borough) among all boroughs.

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

Borough	Revenue
Manhattan	393420567
Brooklyn	279130240
Queens	58404083
Bronx	9324180
Staten Island	3443919

Out of the three most popular neighborhoods, Manhattan generates the most revenue.

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

Borough	Average Price per Month
Manhattan	5597
Brooklyn	3710
Queens	2823
Bronx	2617
Staten Island	2410

Manhattan has the highest average price of \$5597 per month.

11) Do the estimated book days correlate with the price of an Airbnb listing in New York City?

These two variables have a negative correlation of -0.0796. However, the value is small to negligible, we can say these two variables have no correlation.

12) 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
Entire home/apt	180
Private room	85
Shared room	59

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

There are 3119 hosts that have more than one listing. The maximum number of listings by a single host name is 327.

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

Host	Highest Price per Month
Sally	109895
Kathy	45625
Michael	36500
John	30386
Gabriel	30386

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

Borough	Highest Variance in Prices
Brooklyn	7490
Manhattan	5090
Queens	2590
Bronx	650
Staten Island	287

Of the three most popular neighborhoods, Brooklyn and Manhattan have the highest variance (the difference between highest and lowest prices) in listing prices.

16) 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.

Borough	Average Price per Month
Manhattan	5256
Brooklyn	3221
Queens	2639
Staten Island	1939
Bronx	1905

Recommendation

We should concentrate the company's resources and investment in the top three neighborhoods: Manhattan, Brooklyn, and Queens. These boroughs generate 99+% of the revenues of the whole short-term rentals market in New York City. In comparison with other competitors that have bigger budgets and more manpower, Pillow should focus its efforts in areas that have the highest potential returns.

In addition, 99+% of property listings are located in these three boroughs. Logistically speaking, having the majority of hosts concentrated in areas that are accessible by easy transportation, provides an opportunity for the Pillow teams to recruit and engage new and potential hosts in person. Face-to-face contacts could be an edge over other much bigger and established players with impersonal services.

We should start a campaign to enlist the most popular hosts in the top three boroughs to promote Pillow Palooza's property assets. The top ten hosts analysis indicates the number of reviews and range of prices vary significantly across different boroughs. For example, the price ranges from \$45 to \$460 in Queens while in Manhattan the price goes between \$399 and \$1200. The scope is wide to develop tailor-made pricing strategies for each neighborhood or specific hosts. It offers us flexibility and nimbleness over the more entrenched competitors.

We should offer two room types only: Entire home/apt and Private room. Through the room types analysis, we found the demand for Shared room type is between 0% and 4.4% across all neighborhoods. The volume and profit margin for this room type does not offer much revenue upside. Pillow Palooza is better off to focus its marketing and financial resources in developing effective strategies on those two mentioned room types.

References

Scripts to generate the data and tables in the Results section [SQL](#)

Link to Tableau [Pillow Palooza Story](#)