DA - 202 - Mastery Project

Pillow Palooza

NYC Short-Term Rental Insights

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Dated: 10th June 2023

INTRODUCTION

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.
Structure

Pillow Palooza has collected data from various sources on Airbnb listings in New York City to gain insight into the market. The company now plans 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.

CONTEXT:

The project will provide insights and recommendations to the Pillow Palloza team, which is responsible for leading growth and success in the short-term rental market in New York City

RESPONSIBILITY:

🏠Our work as a Data Analyst for a real estate start-up (Pillow Palooza). The main objective of your job is to provide insight into the short-term rental market in New York City. In a competitive market, it is your goal to help the start-up identify opportunities for growth and success.

The analysis will aim to uncover key trends in popular neighborhoods, rental prices, property types, length of stay, and demand over time.

The insights gained from the analysis had the potential to provide valuable information to the start-up on how to make informed business decisions. For example, Pillow Palooza could use the insights to identify which neighborhoods to invest in, which property types to focus on, and how to price their rentals to remain competitive in the market.

By providing these insights, the project aimed to help Pillow Palooza make strategic decisions that could lead to growth and success in the short-term rental market in New York City.

After meeting with our team, we wrote some questions to guide us along the analysis:
★ What's the average price of prices data frame after completing the step number 3?
   Note: We ensured that we eliminate any abnormal data points and conduct data cleansing procedures prior to computing the mean price.
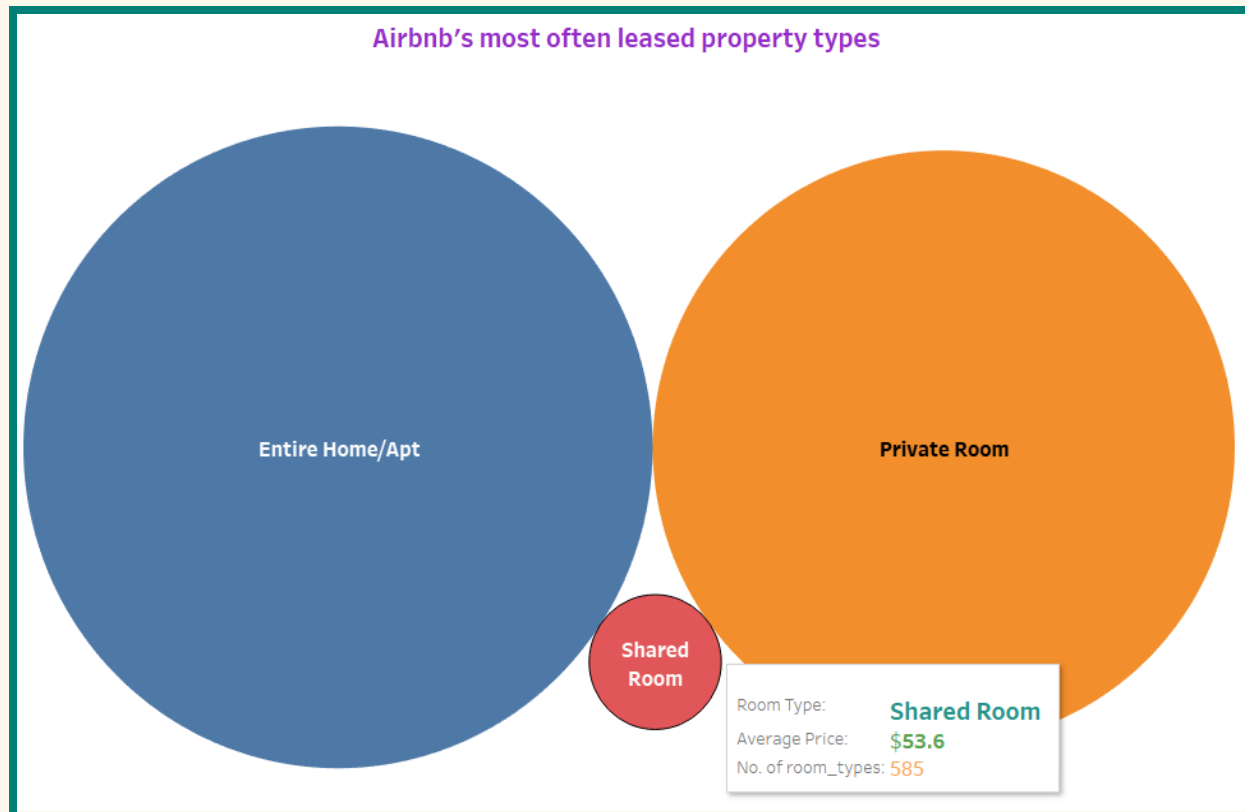

★ What are the most popular neighborhoods for short-term rentals in New York City?
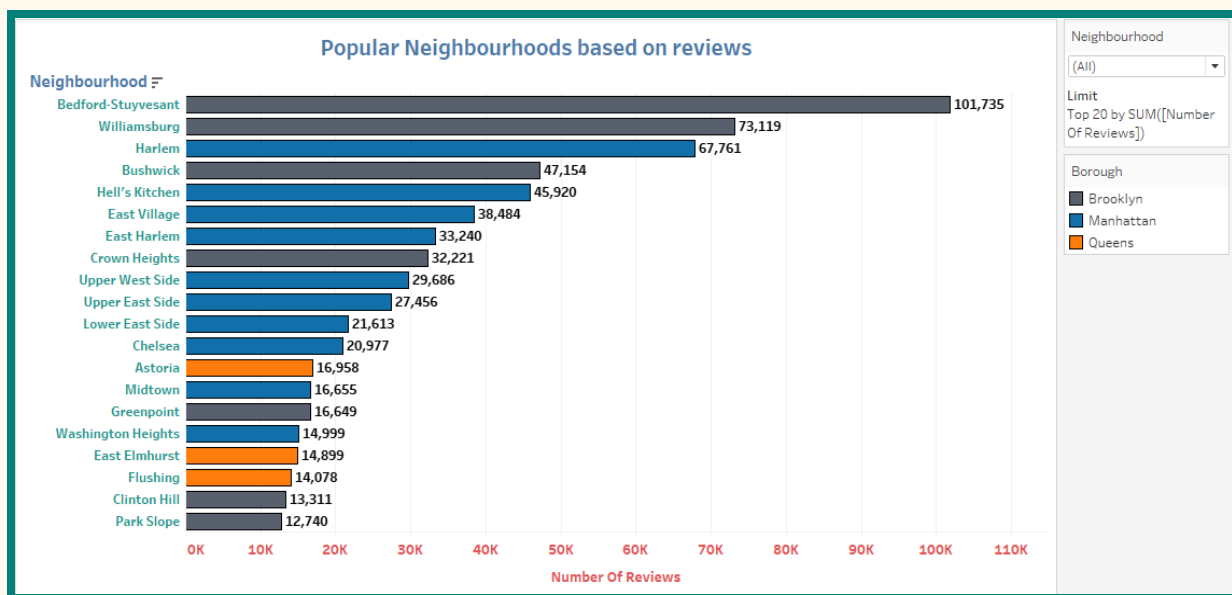
★ **What is the average rental price for short-term rentals in New York City, and how does it vary by neighborhood and property type?**
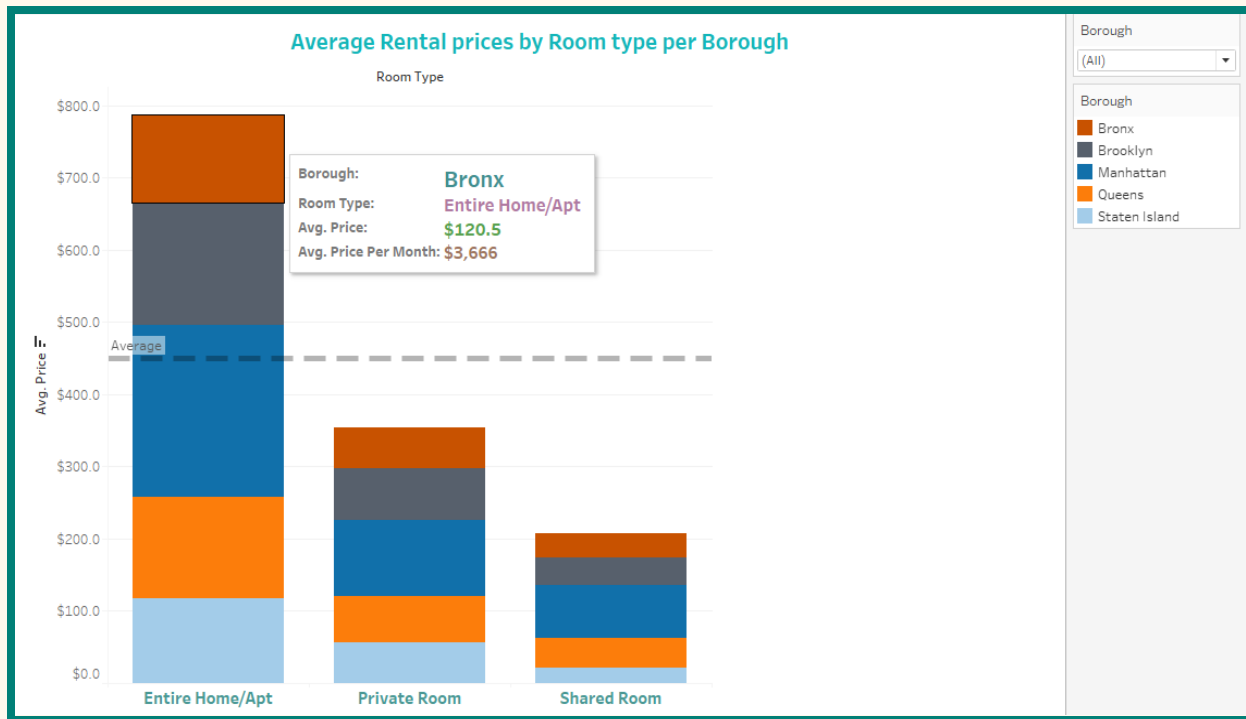
★ **What are the most commonly rented property types on Airbnb in New York City, and how does this vary by neighborhood?**

Airbnb's most often leased property types

Entire Home/Apt

Private Room

Shared Room

Room Type:	Shared Room
Average Price:	$53.6
No. of room_types:	585

★ **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?**

Length of stay by Area & kind of accommodation
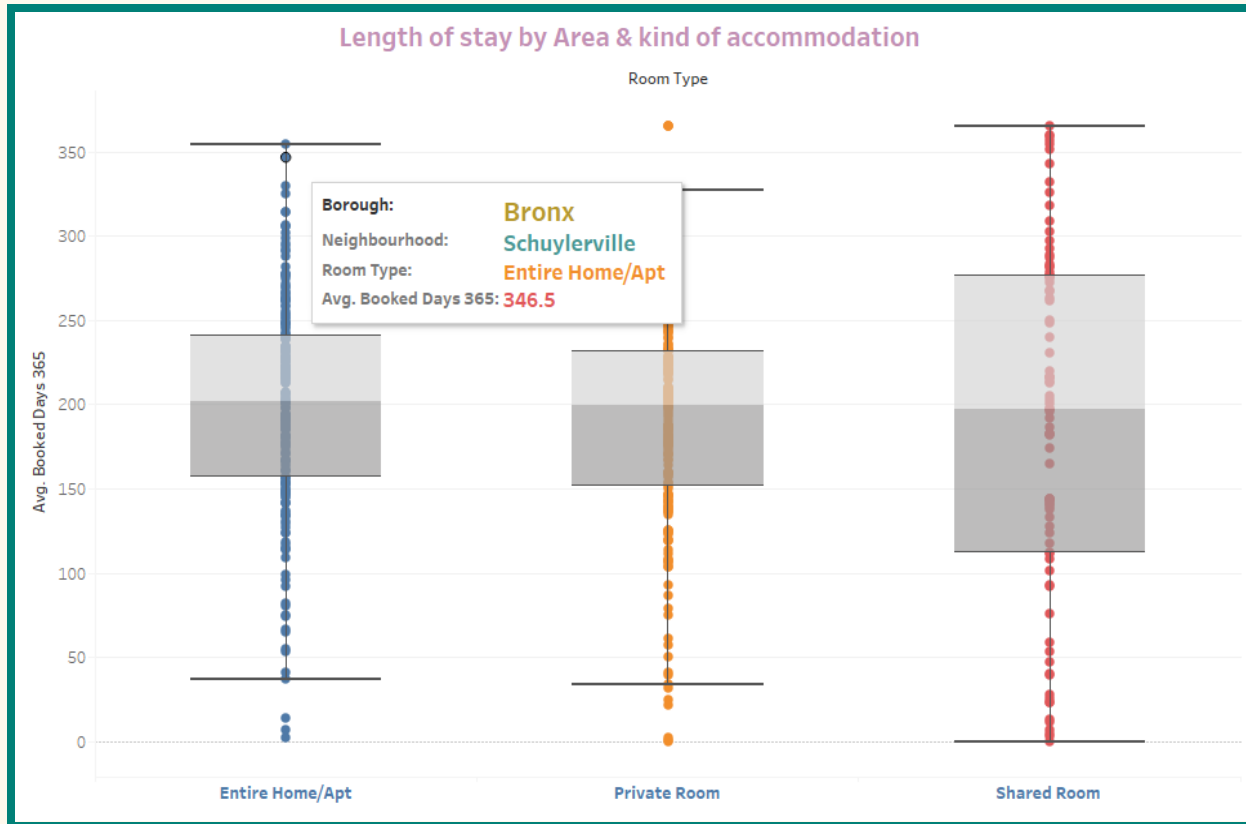
★ How has demand for short-term rentals in New York City changed over time, and are there any seasonal trends that could impact business decisions?

Seasonal fluctuations by room type and changes in demand over time
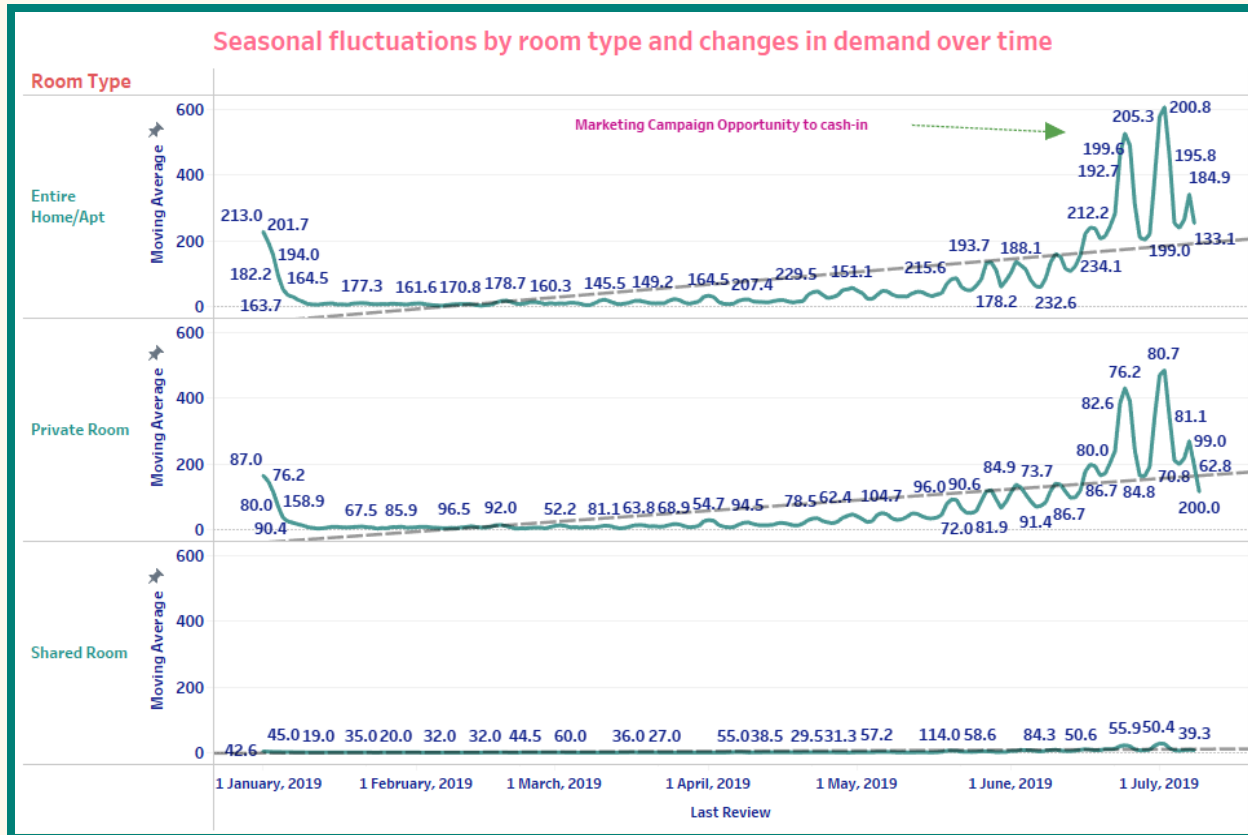
★ Further we did analysis in SQL and Python as well to fetch more inside information for business decision making.

RESULTS:

1. What is the most common room type in NYC Airbnb listings?
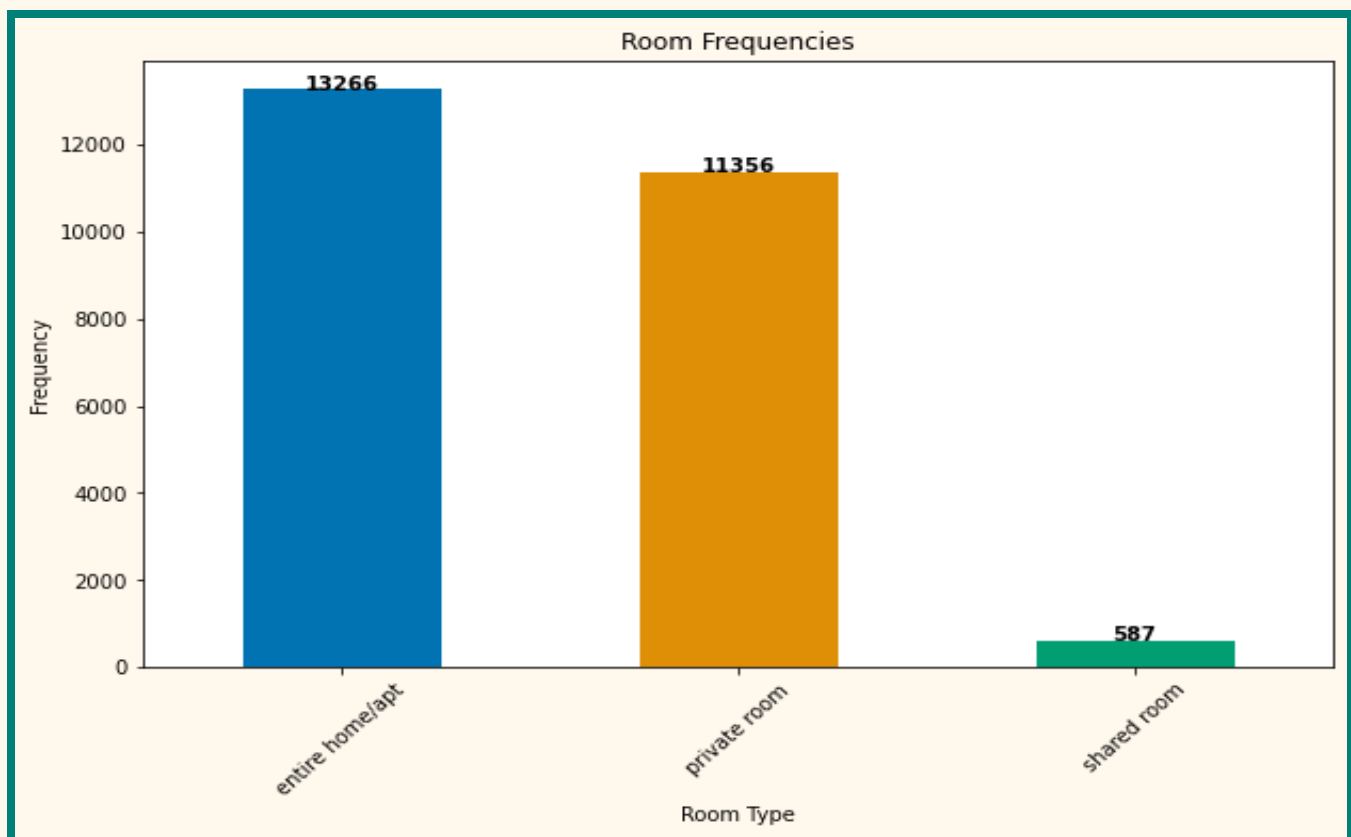
2. **What is the average price of a listing by room type?**

Average Listing Price by Room Type

3. Which borough has the highest average price per month?
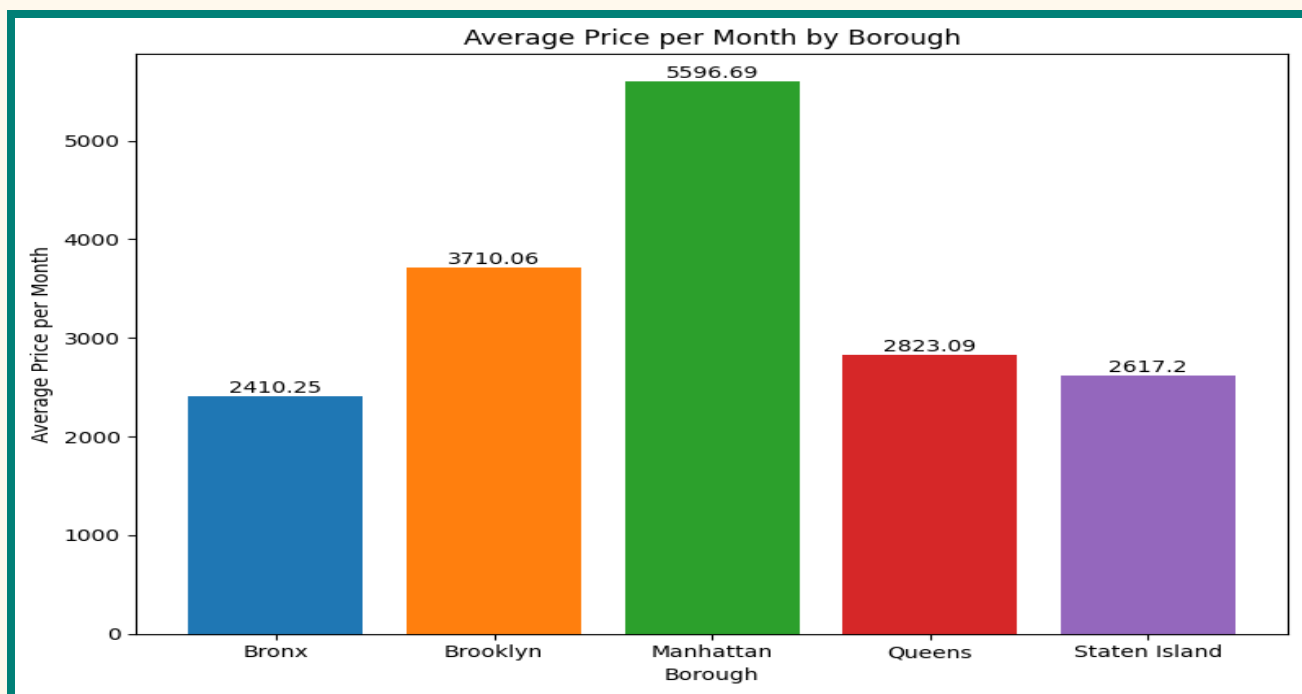
Overall Average price per month and distribution of prices are as below:
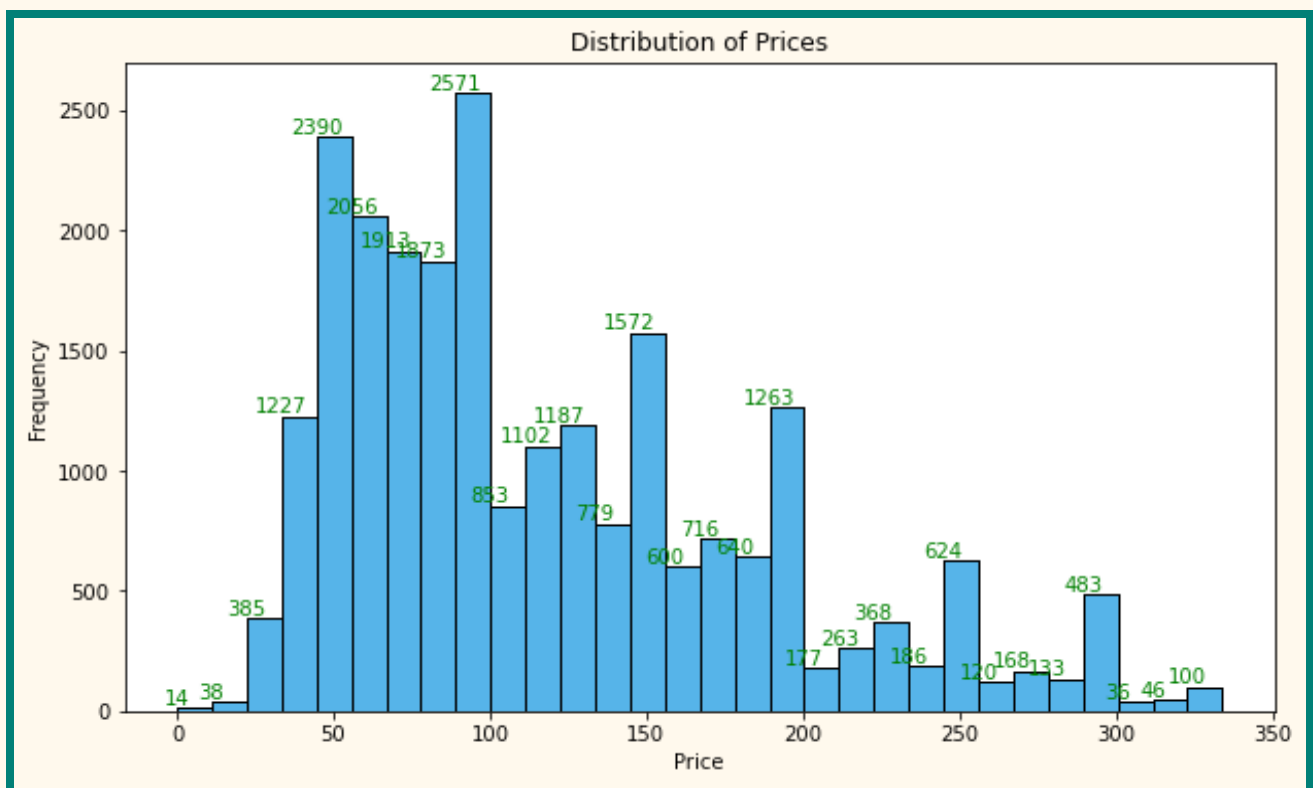
4. How many listings of each room type are in each borough?

emiliano / **DA202_Airbnb_NYC** PRO

TABLES

⊞ prices ⌃

   Unnamed: 0
   listing_id
   price
   borough
   neighbourhood
   price_per_month
   latitude
   longitude

⊞ reviews

⊞ room_types

Query Results
15 ROWS

borough TEXT	room_type TEXT	listing_count NUMERIC
Staten Island	entire home/apt	133
Manhattan	private room	3901
Brooklyn	shared room	187
Staten Island	shared room	2
Manhattan	shared room	251
Brooklyn	entire home/apt	5367
Bronx	private room	403
Brooklyn	private room	4906
Queens	shared room	112
Queens	entire home/apt	1335
Staten Island	private room	132

Listing Count per Borough and Room Type
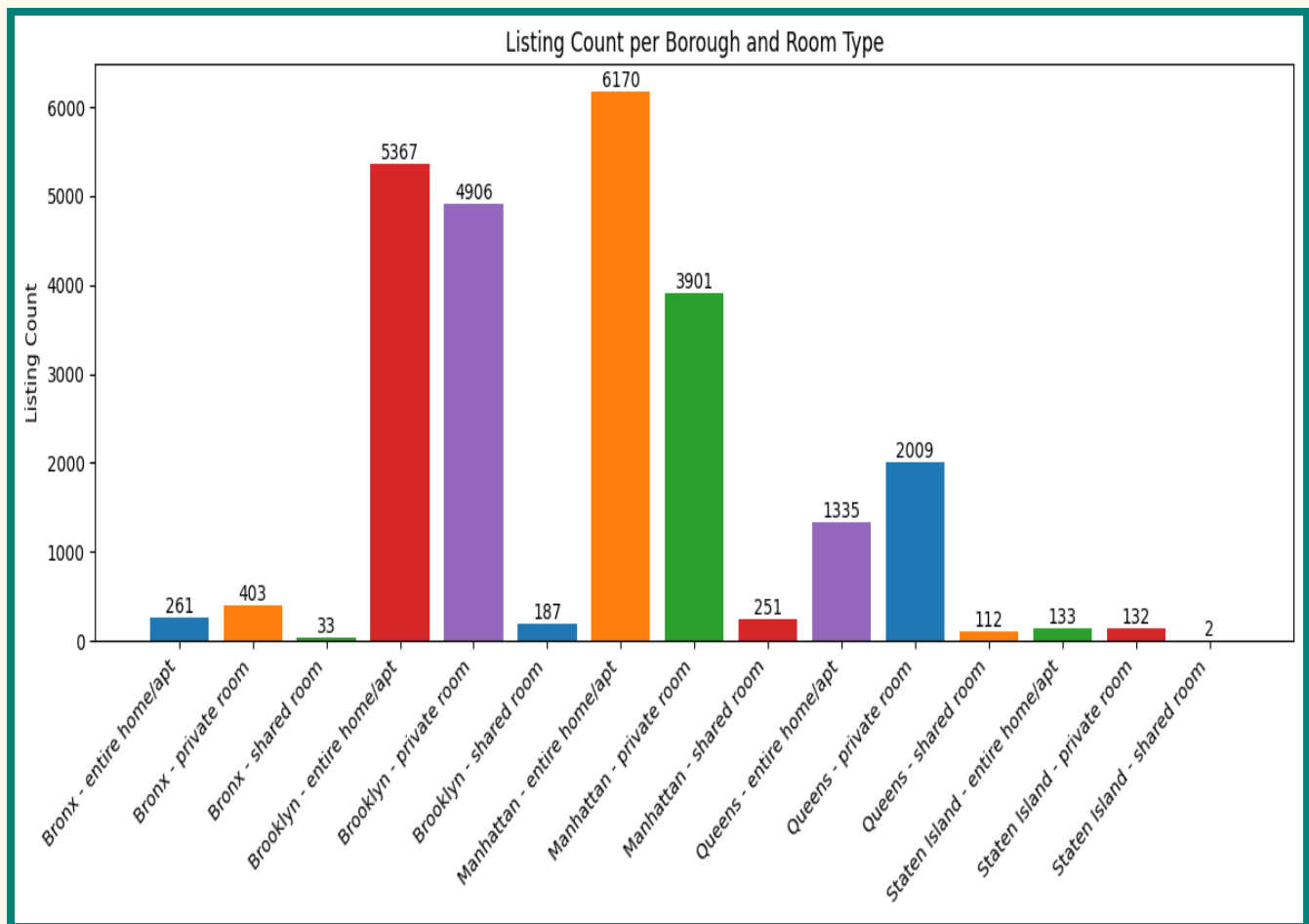
5. How many listings in each room type category have a price of over $500 per night?

room_type TEXT	listing_count INT8
entire home/apt	395
private room	19
shared room	1
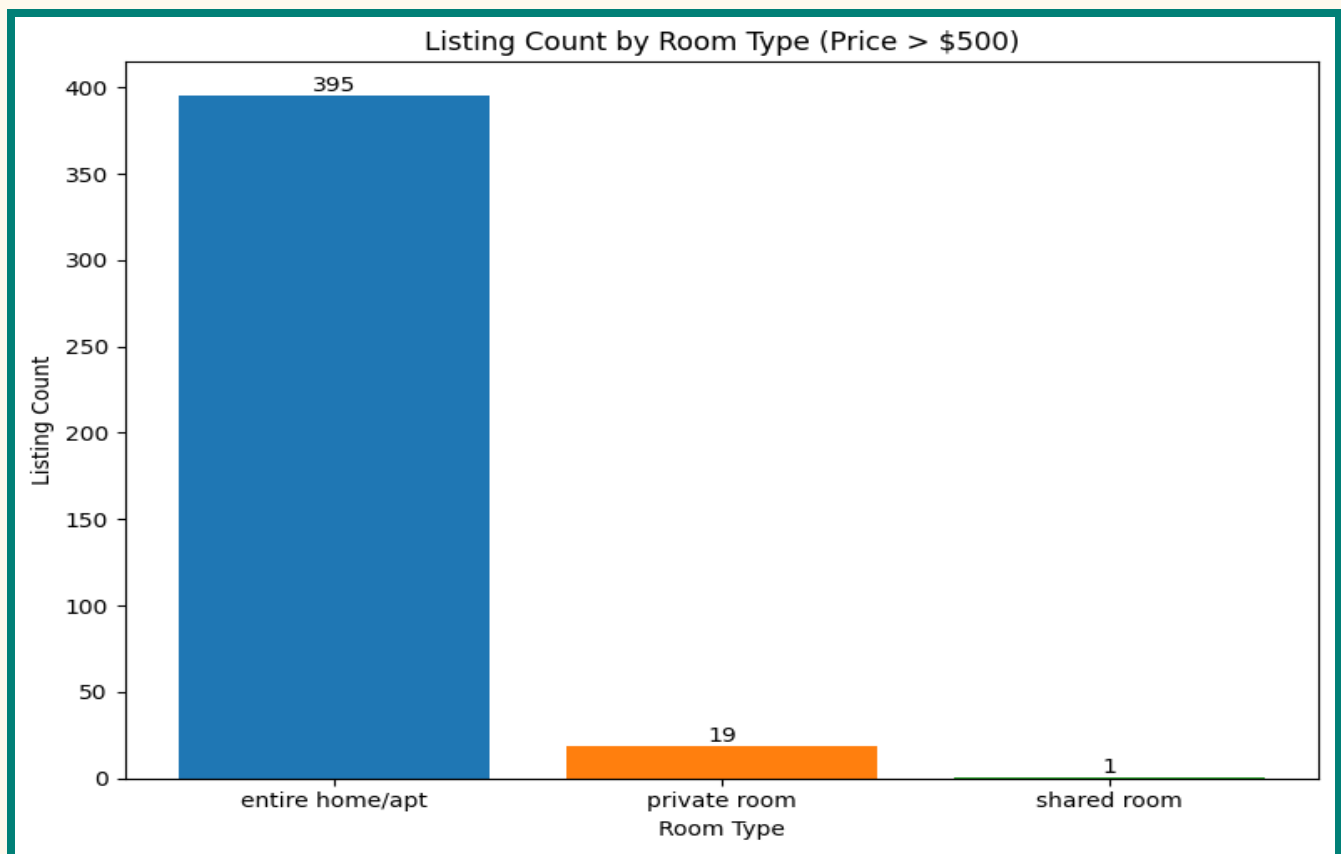
6. What is the distribution of listing prices by borough?

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TABLES

⊞ prices ⌃

    Unnamed: 0

    listing_id

    price

    borough

    neighbourhood

    price_per_month

    latitude

    longitude

⊞ reviews

Query Results
5 ROWS

borough TEXT	min_price INT8	max_price INT8	avg_price NUMERIC
Queens	10	2600	92.81
Brooklyn	10	7500	121.97
Staten Island	13	300	86.04
Manhattan	10	5100	184.00
Bronx	20	670	79.24

Price Distribution by Borough
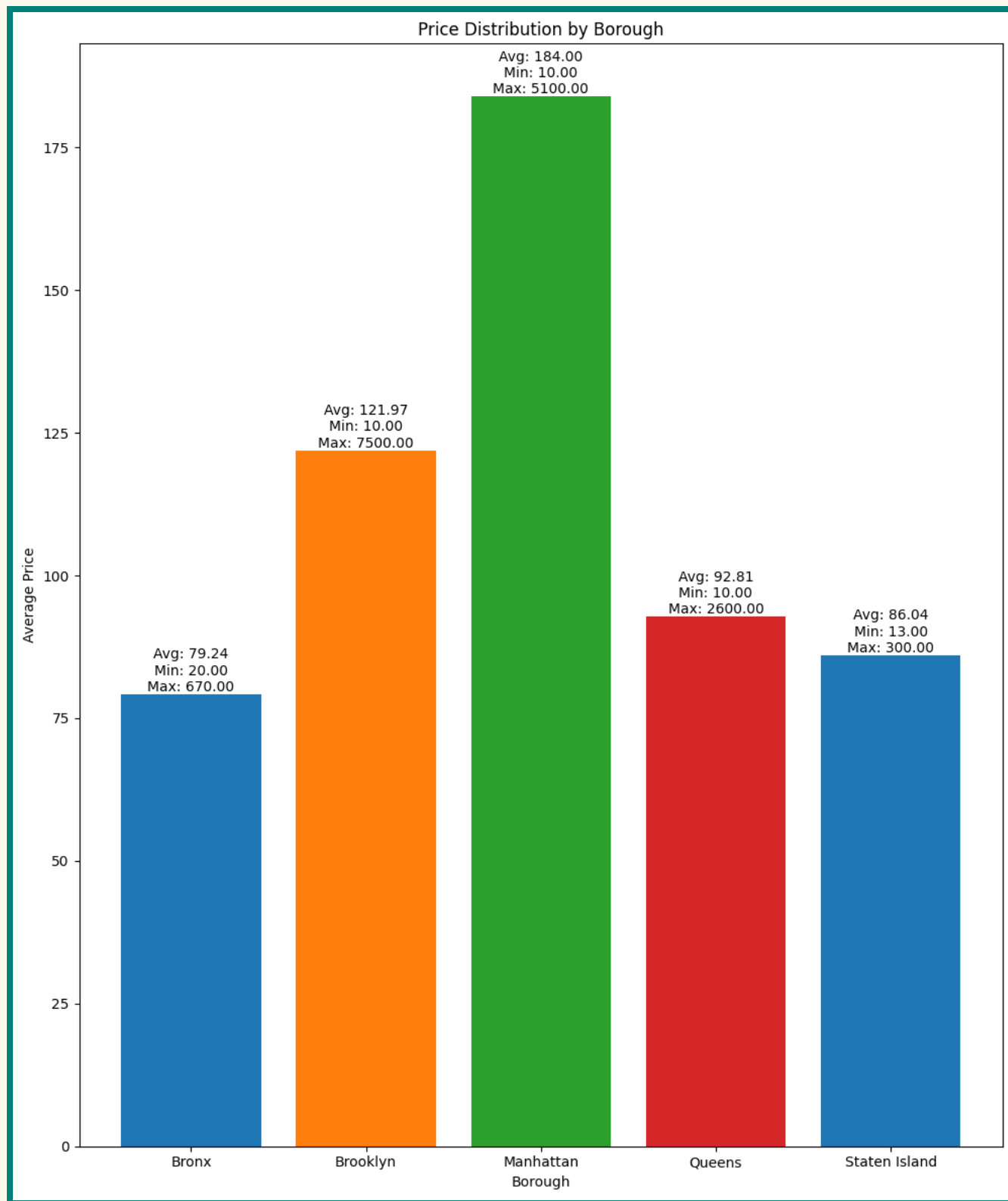
We grouped the boroughs to calculate summary statistics
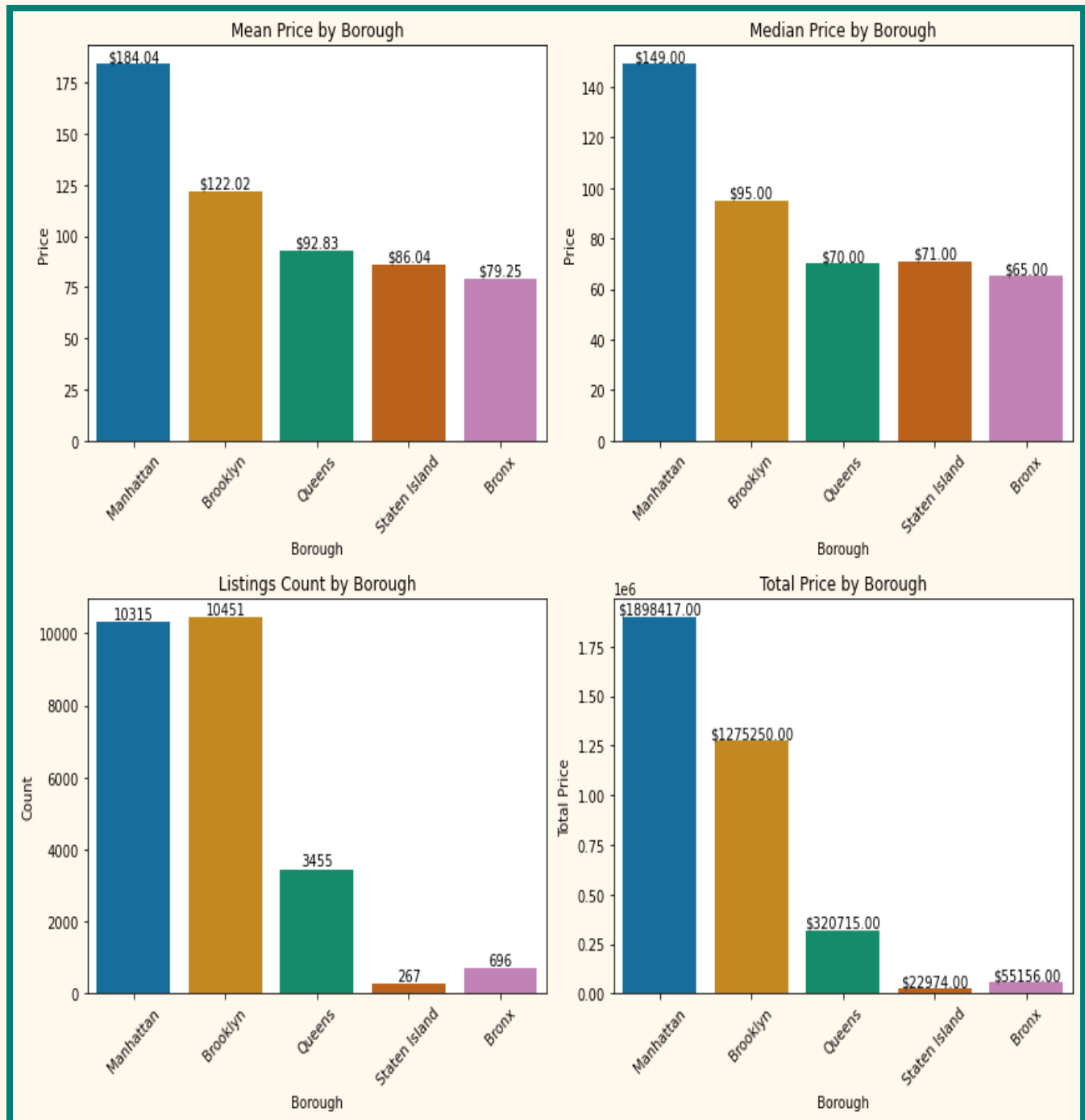
7. What is the estimated amount of revenue generated by hosts in each borough?

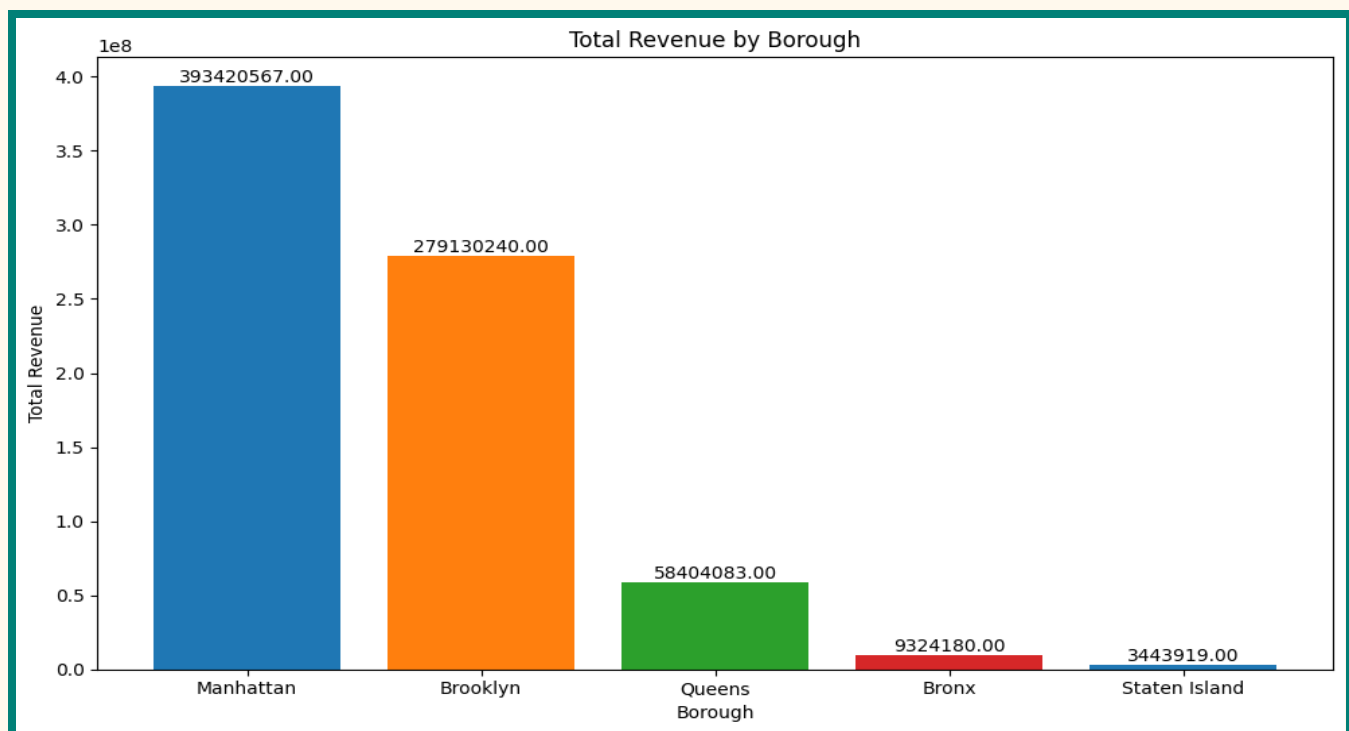emiliano / **DA202_Airbnb_NYC**   PRO

TABLES
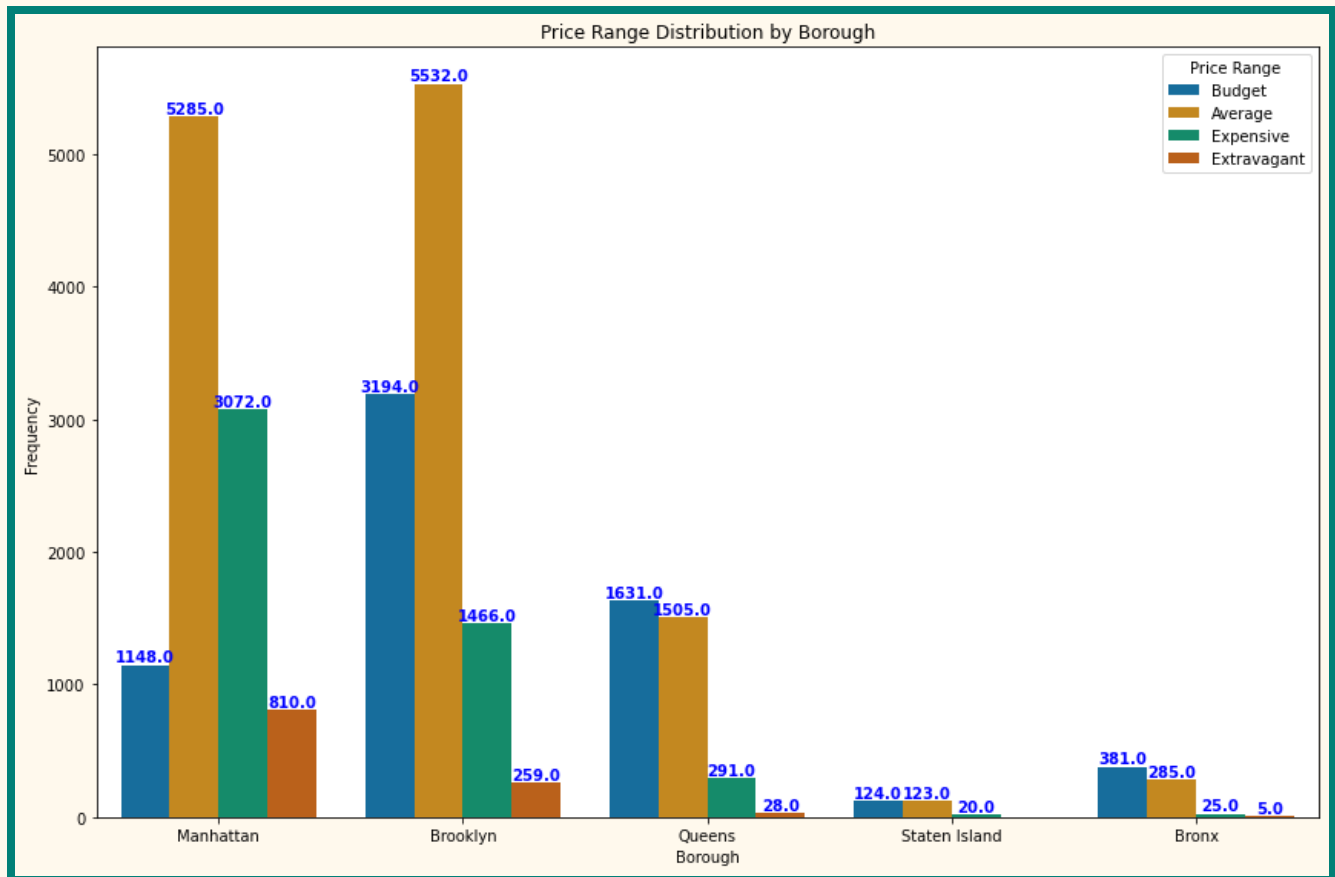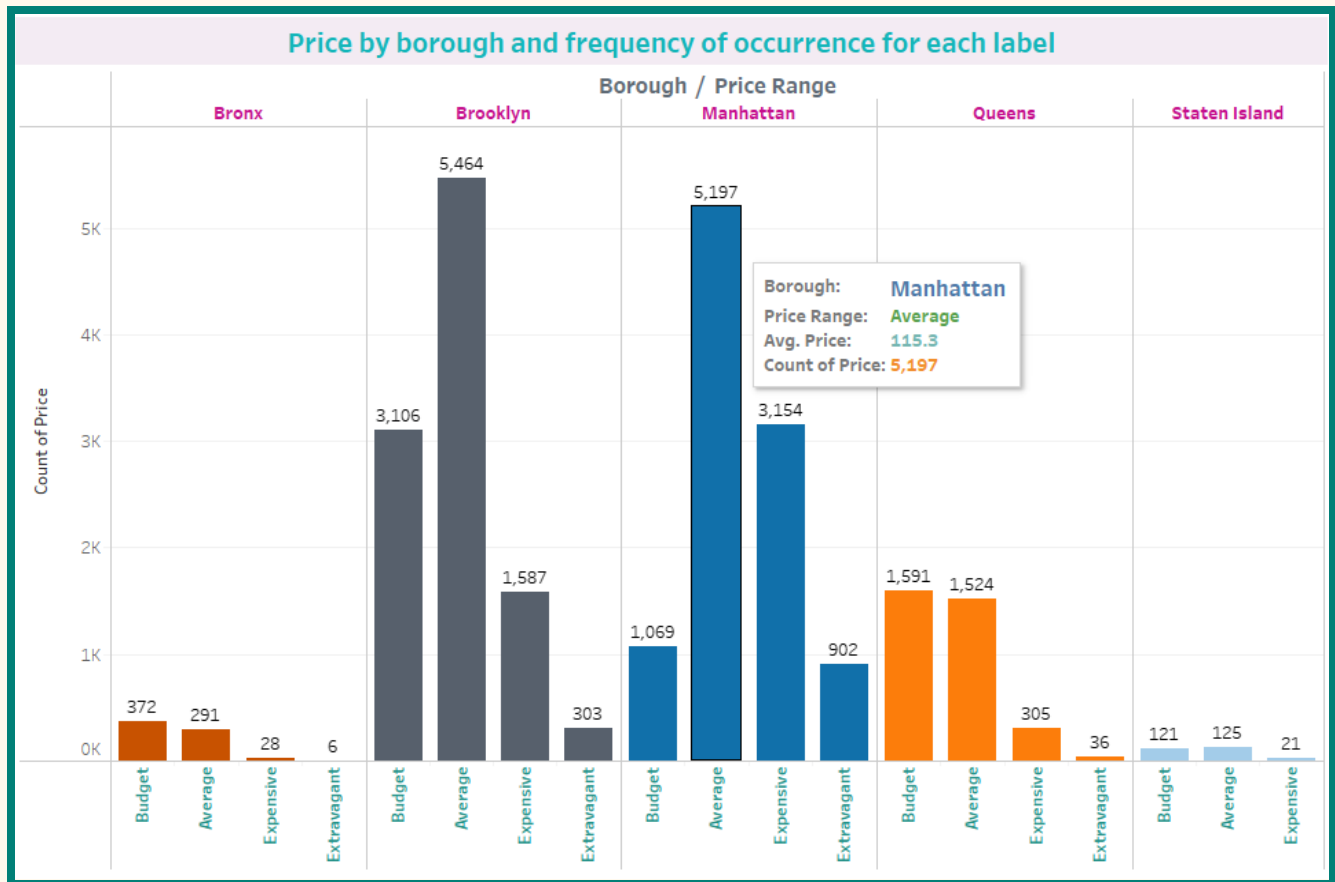
⊞ prices

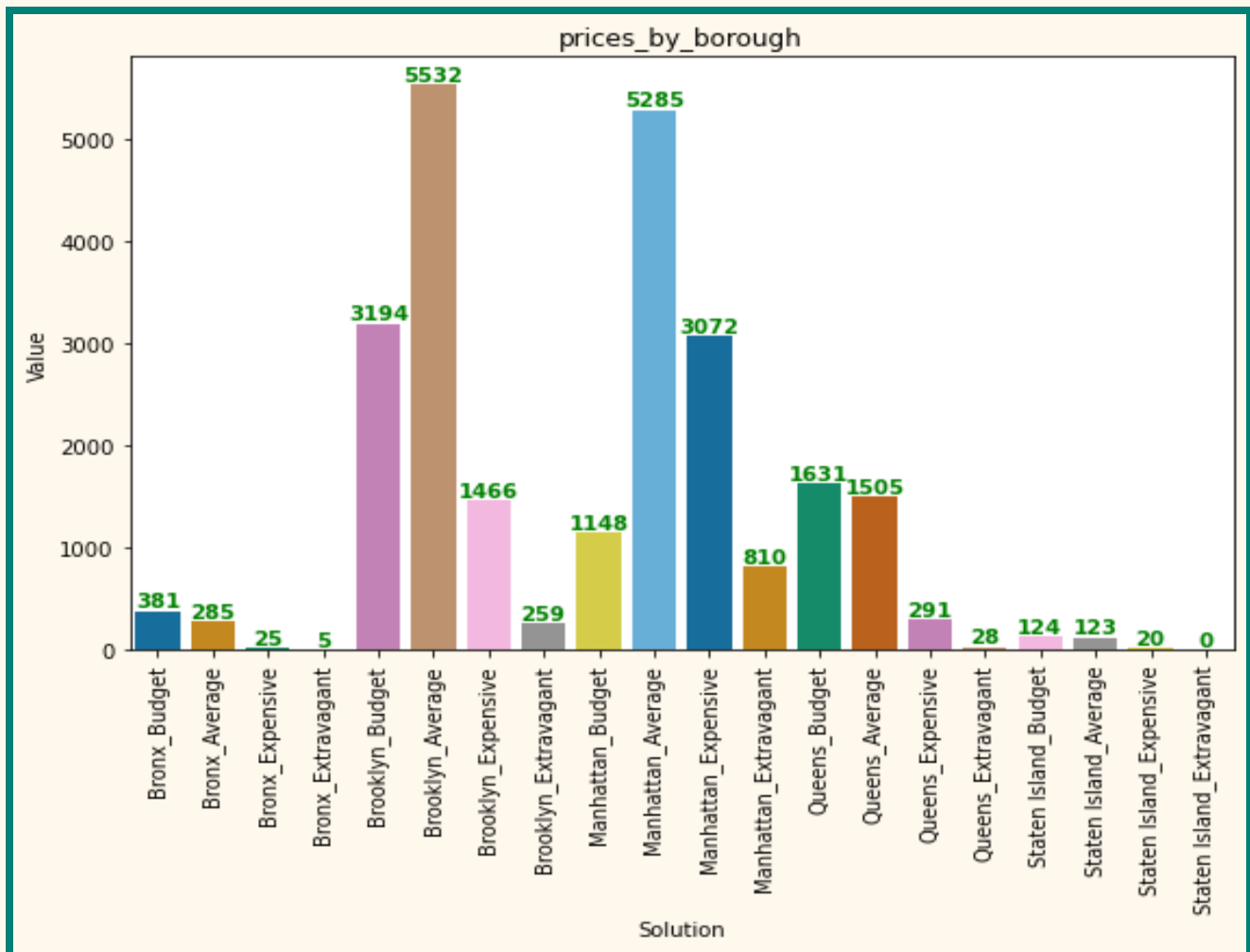⊞ reviews

⊞ room_types

Query Results
5 ROWS

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

Total Revenue by Borough

We defined Price range by borough to understand more information about the data by giving label names = ["Budget", "Average", "Expensive", "Extravagant"] and ranges = [0, 69, 175, 350] to Calculate occurence frequencies for each label, prices by borough.

Price by borough and frequency of occurrence for each label

Borough / Price Range

Bronx | Brooklyn | Manhattan | Queens | Staten Island

Count of Price

Bronx: Budget 372, Average 291, Expensive 28, Extravagant 6
Brooklyn: Budget 3,106, Average 5,464, Expensive 1,587, Extravagant 303
Manhattan: Budget 1,069, Average 5,197, Expensive 3,154, Extravagant 902
Queens: Budget 1,591, Average 1,524, Expensive 305, Extravagant 36
Staten Island: Budget 121, Average 125, Expensive 21

Borough: Manhattan
Price Range: Average
Avg. Price: 115.3
Count of Price: 5,197

prices_by_borough

8. **What is the average price per month for listings in each neighborhood?**

neighbourhood TEXT	room_type TEXT	average_price_per_month FLOAT8
Sea Gate	entire home/apt	24485.4166665
Tribeca	entire home/apt	13707.575000259998
Bayside	entire home/apt	12133.484848090908
Flatiron District	entire home/apt	11766.180555266666
SoHo	entire home/apt	11674.970472393708
NoHo	entire home/apt	10488.290598641026
Theater District	entire home/apt	9614.370370577777
Midtown	entire home/apt	9459.583333126406
Nolita	entire home/apt	8745.754219468354
South Beach	entire home/apt	8364.583333

Top 15 Neighbourhoods by Average Price per Month
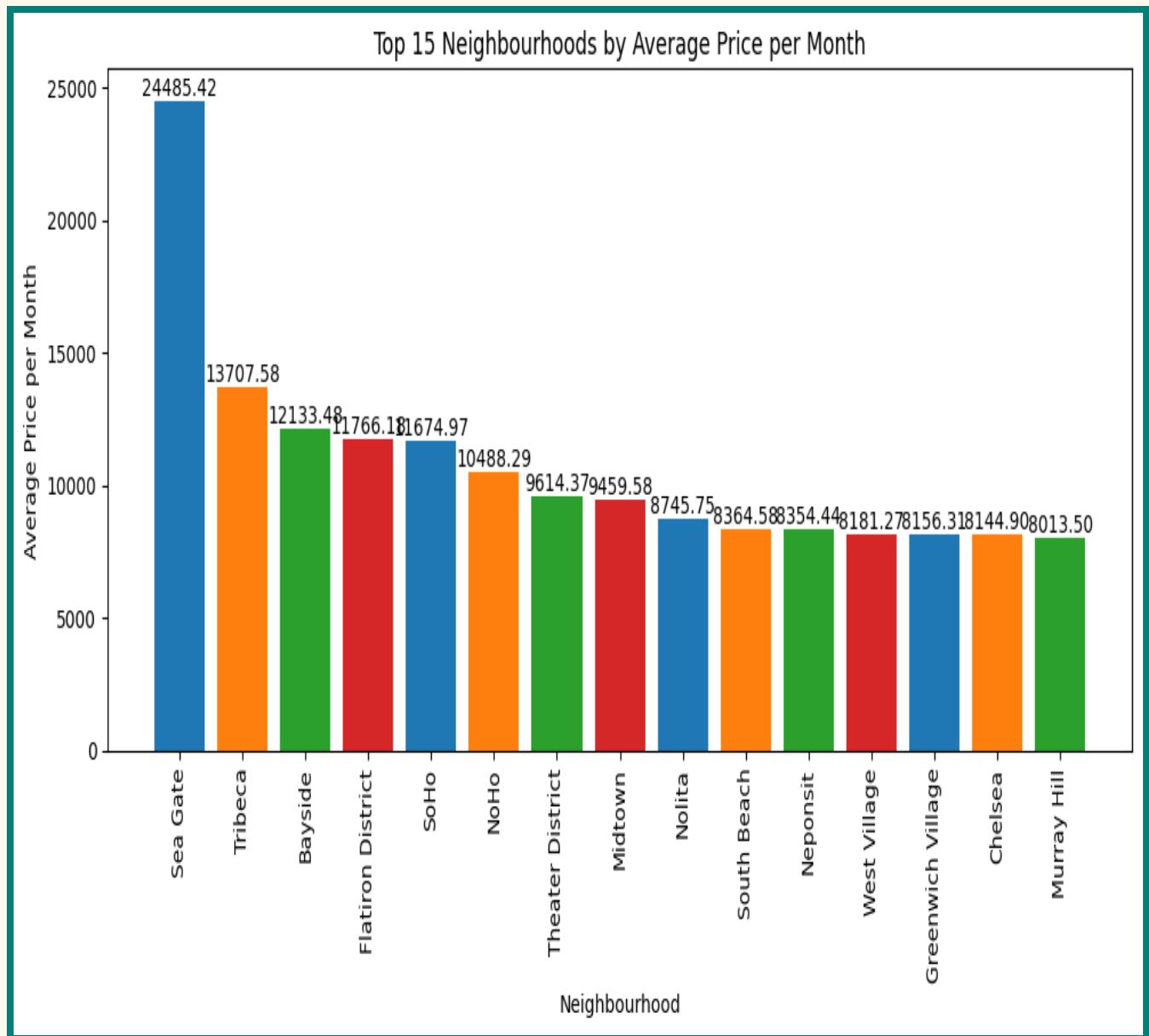
Top neighborhoods in terms of the average price per month over room_type
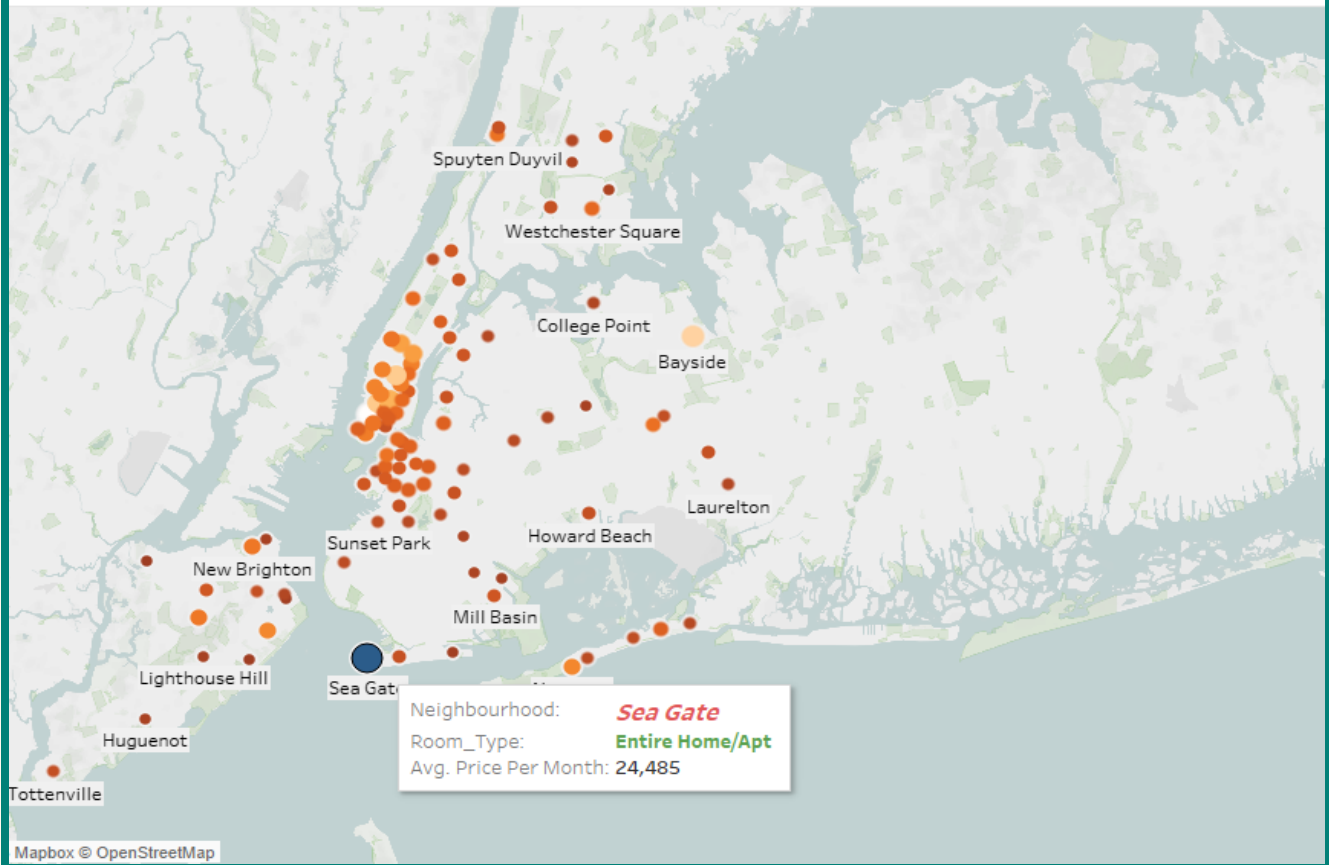
On further exploration we extracted data after filtering the DataFrame to remove outliers.
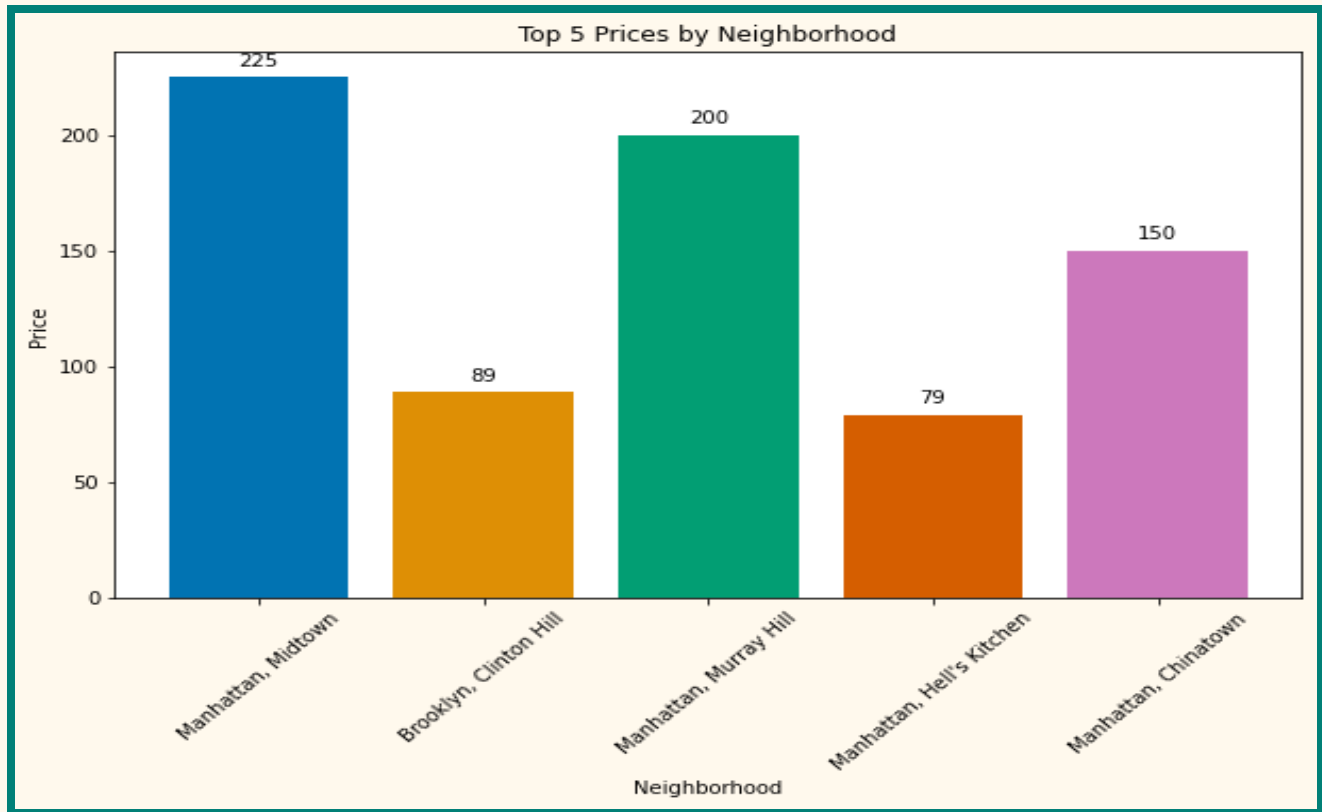
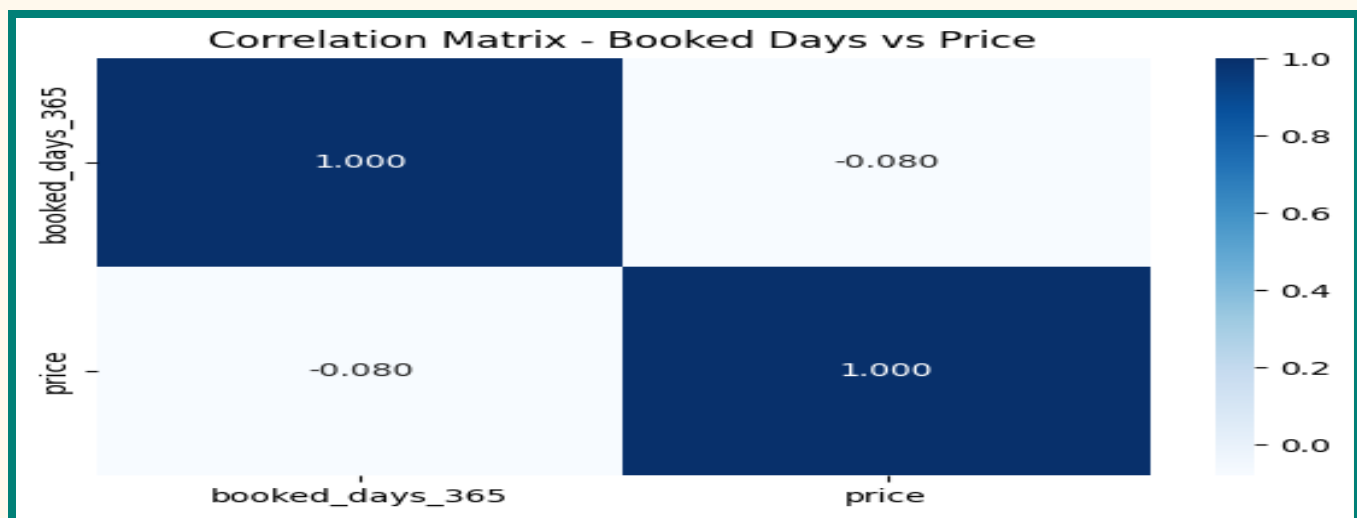**Which led to Calculate the average price per neighborhood**
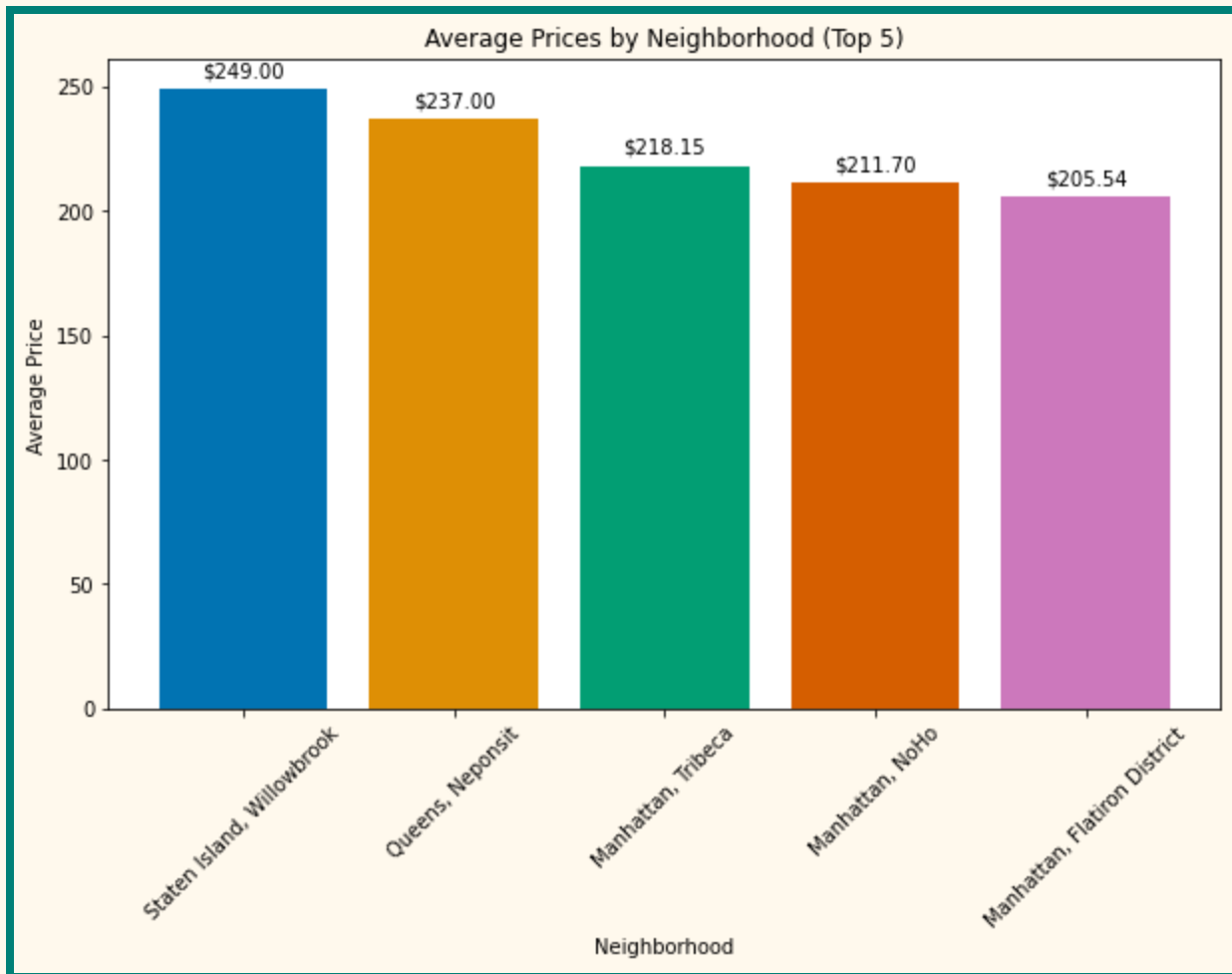
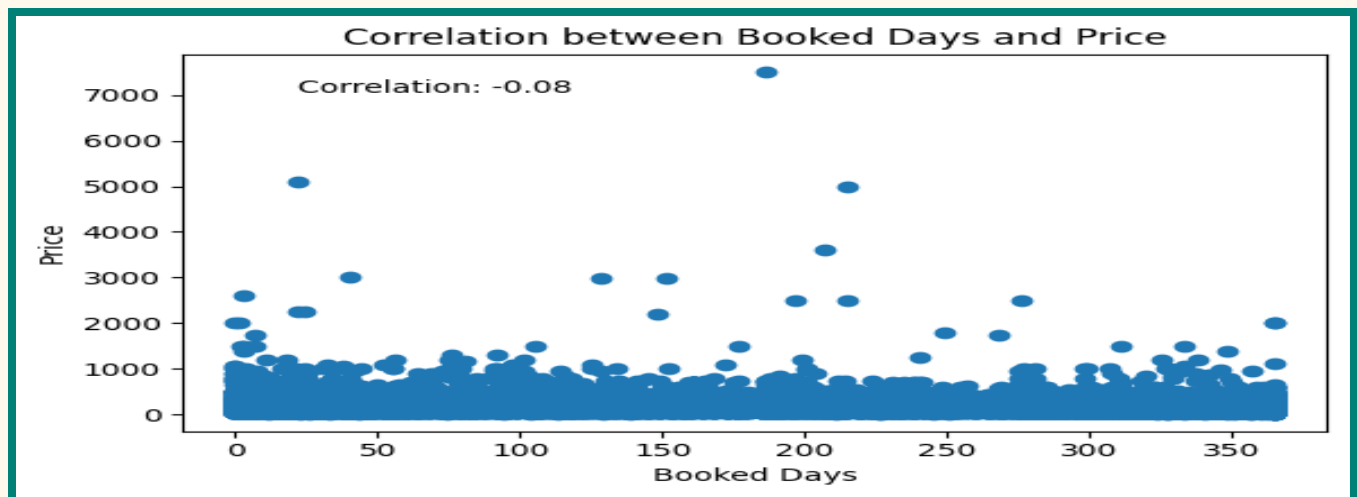**9. How many listings have no reviews?**

10. How do the estimated book days correlate with the price of an Airbnb listing in New York City?
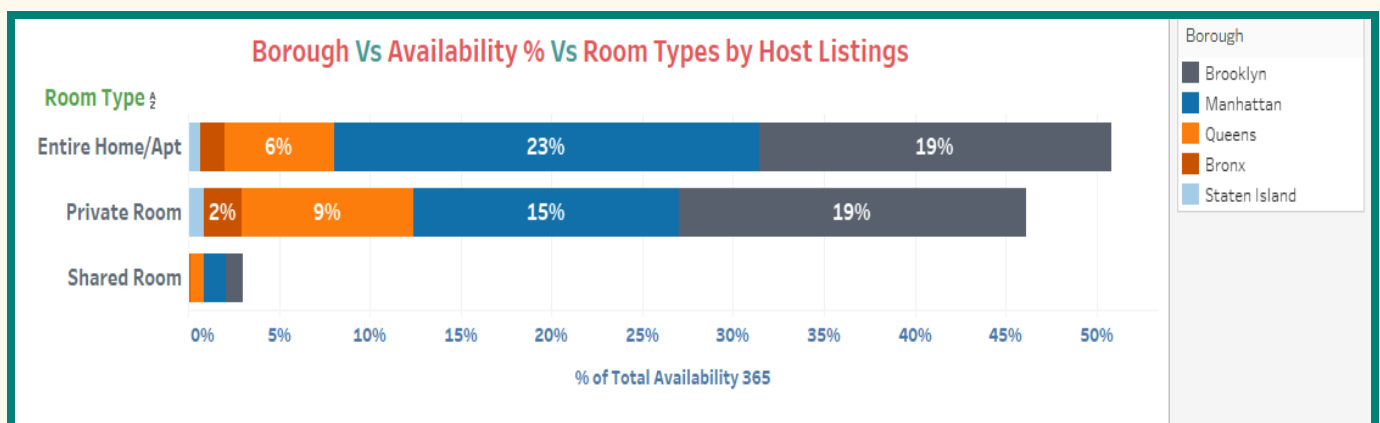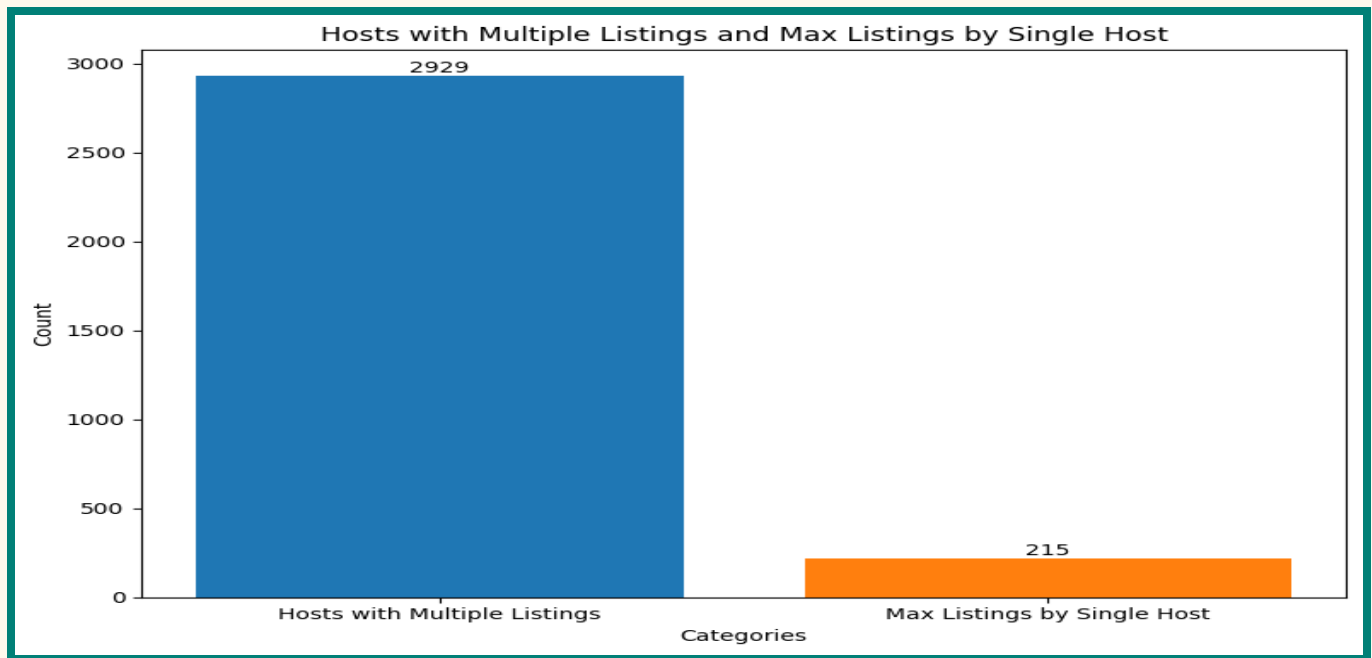
11. What is the average price per room type for listings that have at least **100** reviews and are available more than **200** days a year?

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TABLES	**Query Results**
	3 ROWS

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

TABLES
- prices
- reviews
- room_types

Average Price by Room Type

Room Type	Average Price
entire home/apt	179.54
private room	85.41
shared room	59.19
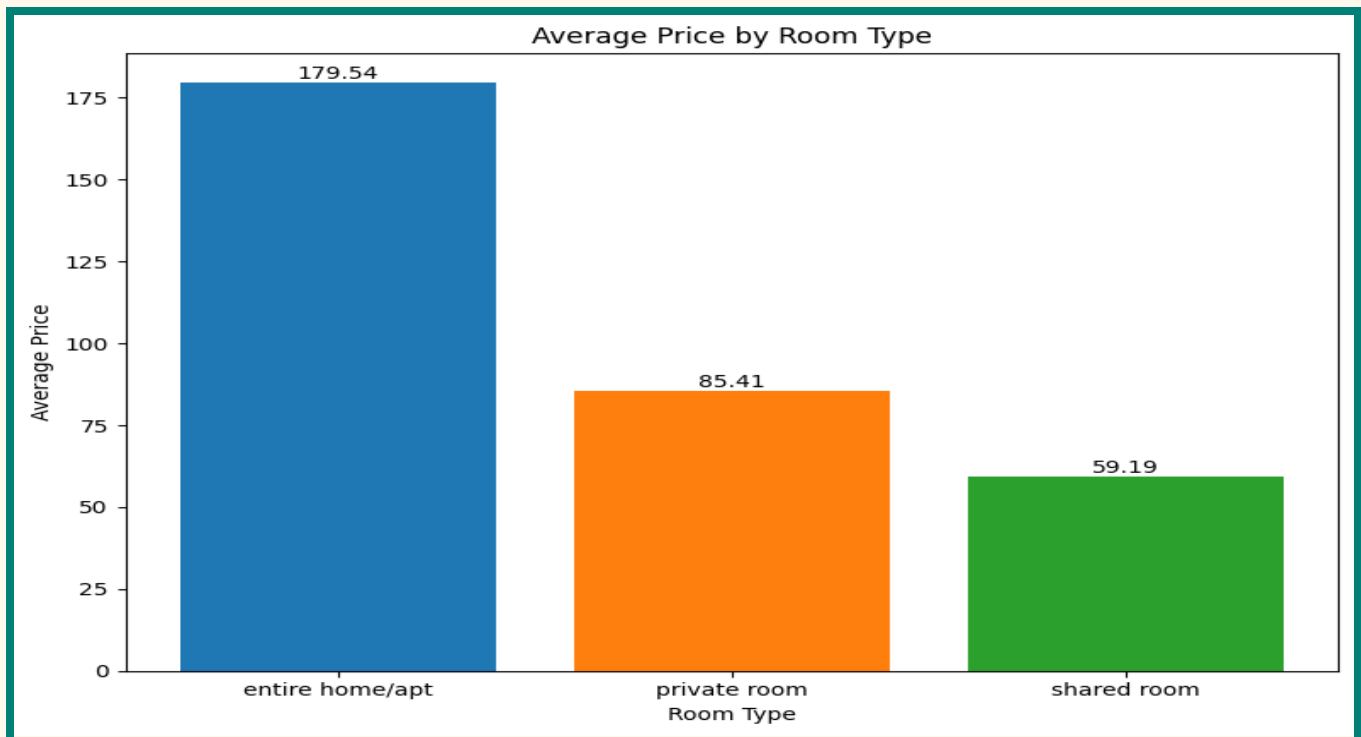
12. How many hosts have more than one listing, and what's the maximum number of listings by a single host name?

Hosts with Multiple Listings and Max Listings by Single Host

Borough Vs Availability % Vs Room Types by Host Listings

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

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

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TABLES

⊞ prices

⊞ reviews

⊞ room_types

Query Results
1 ROWS

neighbourhood TEXT	price_variance NUMERIC
Sea Gate	924800.0

Top Variance Neighborhood

15. 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.

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TABLES

▦ prices

▦ reviews

▦ room_types

Query Results
155 ROWS

neighbourhood TEXT	average_price_per_month NUMERIC
Flatlands	3802.08
Port Morris	3802.08
Kew Gardens Hills	1470.14
Cypress Hills	1502.94
SoHo	9549.23
Columbia St	3315.42
Norwood	2022.71
Lower East Side	4280.82
Glendale	2425.73
Little Italy	3748.16
Bergen Beach	2585.42

Neighbourhoods with Higher Minimum Nights than Average (Price Range: 3800-10000) - Top 15
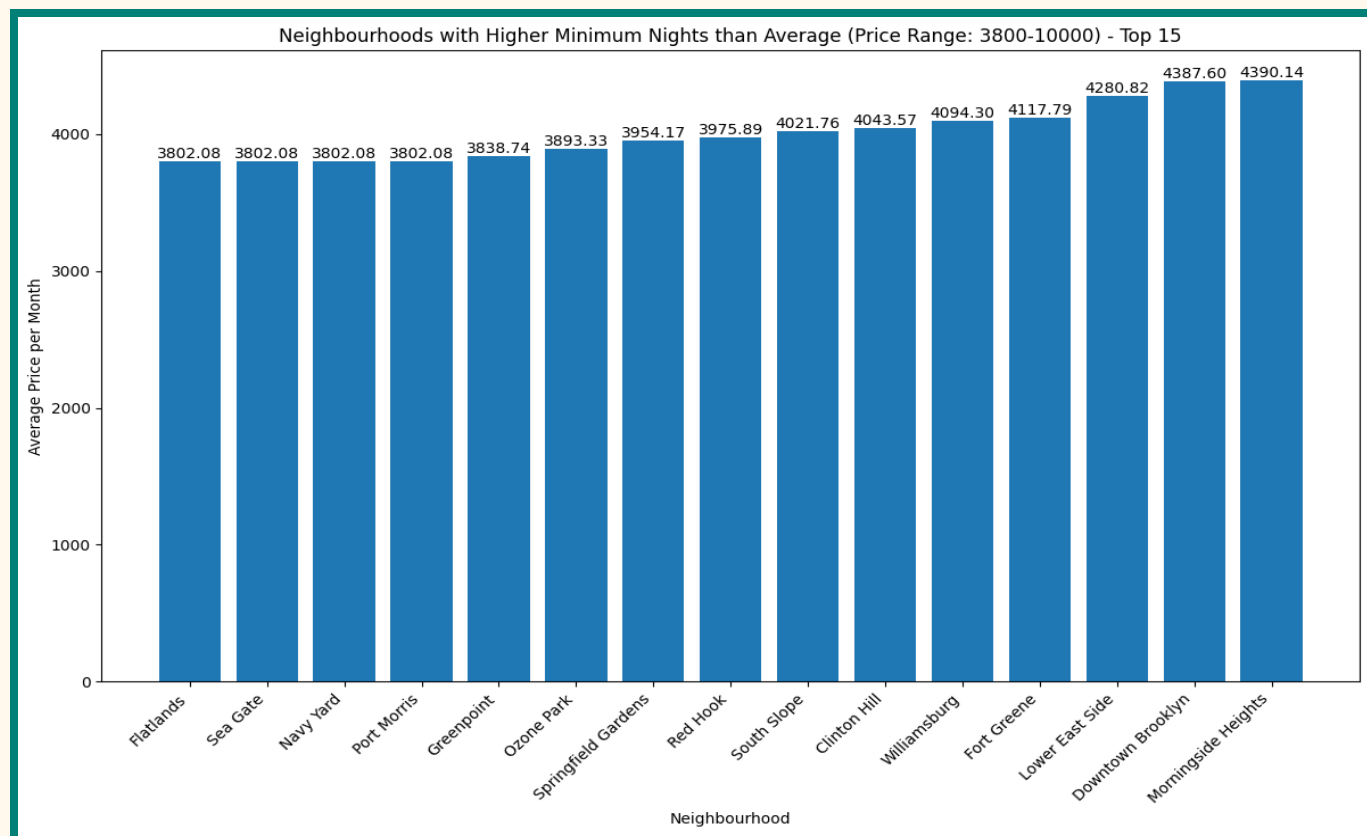
RECOMMENDATION:

- ❖ I see huge potential opportunities for marketing campaign launch during June or July as that's the time when the high season for renting starts. There's a spike around June. We see a steep decrease starting in the beginning of January. The numbers of renting are so low and steady from Feb to round April and May.
- ❖ Entire Property and private property attracts more customers than Shared.
- ❖ Manhattan, Queens & Brooklyn Boroughs should be focused for more customer attracting campaigns. Rest Bouroughs should be given Research-backed promotions.

APPENDIX:

☑ [**Tableau Presentation Link**](#)

☑ Python file of Cleaning attached as Zip

☑ Python file of Analysis attached as Zip

☑ SQL file of Analysis attached as Zip

☑ [**Video Presentation Link**](#)

☑ Presentation File as PDF

☑ Written Report as PDF