Capstone Project – 1

E.D.A ON Airbnb booking

by-

Team zlearners :-

Akshit Singh
Mishra Om

Agenda

- ➔ Look at the Problem statements
- ➔ Study the Airbnb dataset
- ➔ Handling the null values
- ➔ Look at the correlation among variables
- ➔ Coordinates of various listings
- ➔ Popular neighbourhoods and room types
- ➔ Analysis summary

Problem Statement

- What can we learn about different hosts and areas?
- What is the availability of room types for different neighbourhood groups?
- What is the minimum number of nights people stay in different places?
- What is the average price for different neighbourhood groups?
- What is the relationship between price and the number of reviews?
- Which neighbourhood group has got the most reviews?
- Which hosts are the busiest and why?
- Is there any noticeable difference in traffic among different areas?

Data Summary

- There are around 49,000 observations with various types of field in our Dataset.
- List of columns:-

id	room_type
name	price
host_id	minimum_nights
host_name	number_of_reviews
neighbourhood_group	last_reviews
neighbourhood	review_per_month
latitude	calculated_host_listings_count
longitude	availability_365

Studying the columns of the dataset

- Dataset contains 6 columns of categorical data.
- There are 10 columns of numeric data.
- last_review and reviews_per_month contains approximately 10 thousand null values.

```
# studying the missing values of columns
airbnb_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48895 entries, 0 to 48894
Data columns (total 16 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   id                              48895 non-null  int64
 1   name                            48879 non-null  object
 2   host_id                         48895 non-null  int64
 3   host_name                       48874 non-null  object
 4   neighbourhood_group             48895 non-null  object
 5   neighbourhood                   48895 non-null  object
 6   latitude                        48895 non-null  float64
 7   longitude                       48895 non-null  float64
 8   room_type                       48895 non-null  object
 9   price                           48895 non-null  int64
 10  minimum_nights                  48895 non-null  int64
 11  number_of_reviews               48895 non-null  int64
 12  last_review                     38843 non-null  object
 13  reviews_per_month               38843 non-null  float64
 14  calculated_host_listings_count  48895 non-null  int64
 15  availability_365                48895 non-null  int64
dtypes: float64(3), int64(7), object(6)
memory usage: 6.0+ MB
```

Handling the null values

- Used the fillna() method to fill the null values in the dataset.
- Filled the reviews_per_month column with 0.
- Filled the rest of the columns with ‘not_present’.

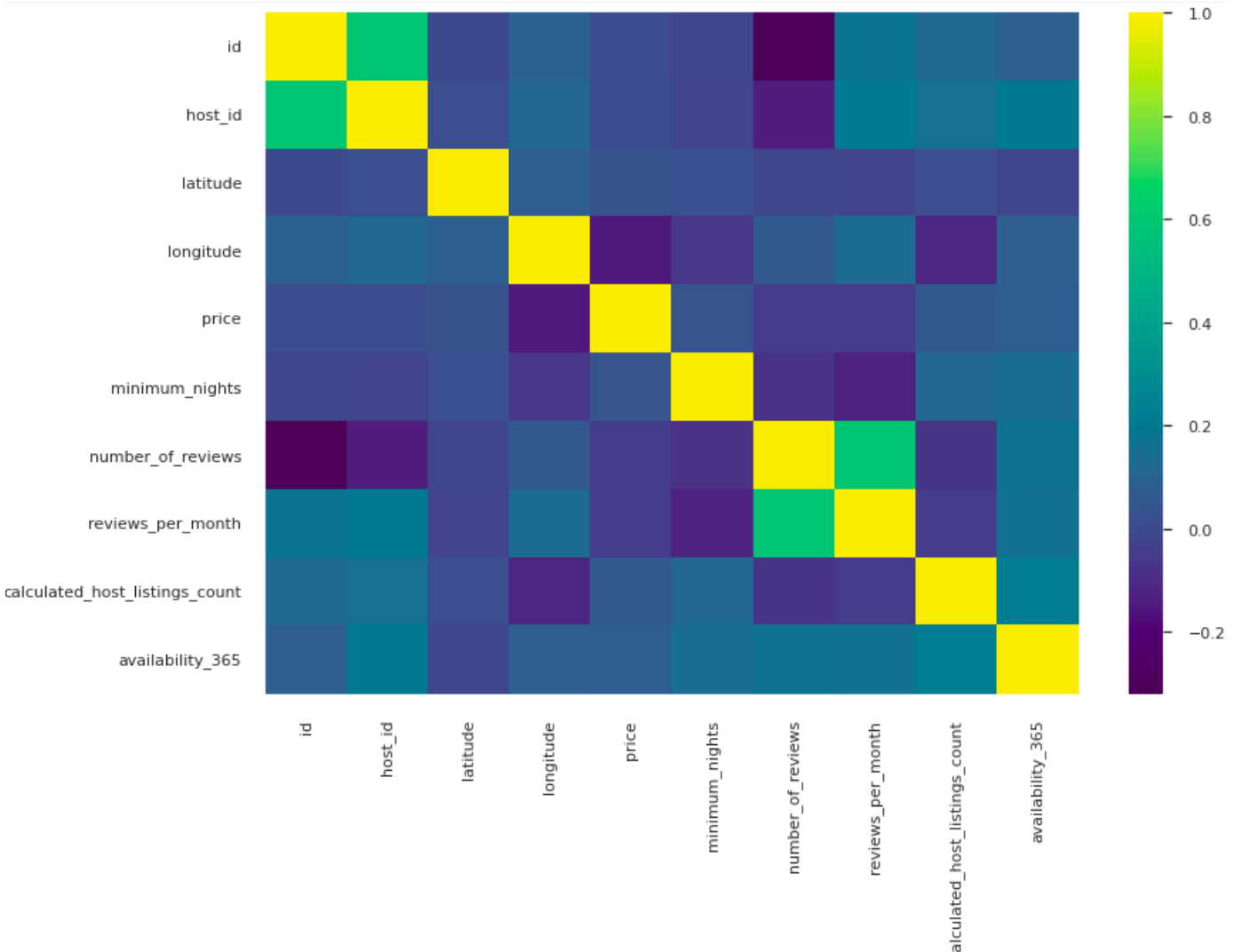
```
# Handling the null values
airbnb_df['reviews_per_month'].fillna(0, inplace = True)
airbnb_df.fillna('not_present', inplace = True)
```

```
# Now checking if any null values are present in our dataset
count_of_null_values = airbnb_df.isnull().sum()
count_of_null_values
```

```
id                                0
name                              0
host_id                           0
host_name                         0
neighbourhood_group               0
neighbourhood                     0
latitude                          0
longitude                         0
room_type                         0
price                             0
minimum_nights                    0
number_of_reviews                 0
last_review                       0
reviews_per_month                 0
calculated_host_listings_count    0
availability_365                  0
dtype: int64
```

Heatmap

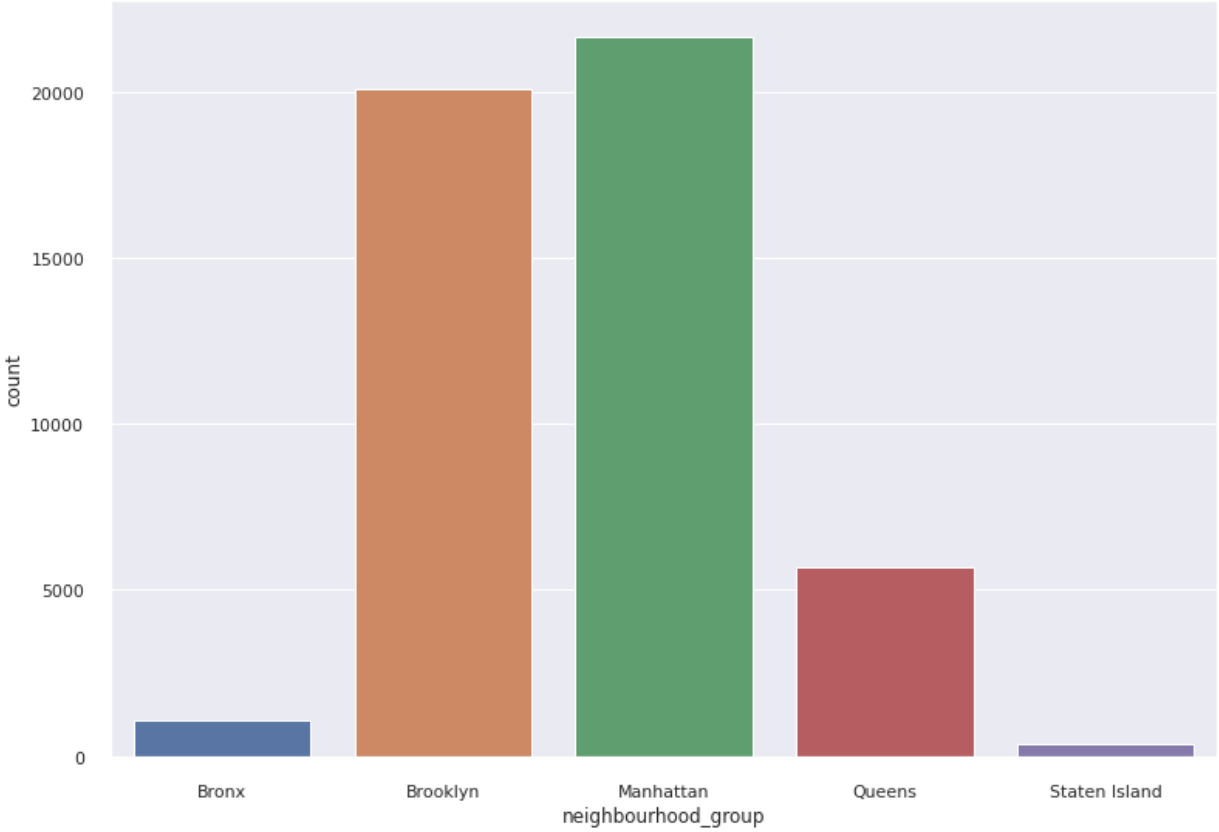
- The review_per_month and number_of_review have a good correlation.
- There are not many strong correlations.



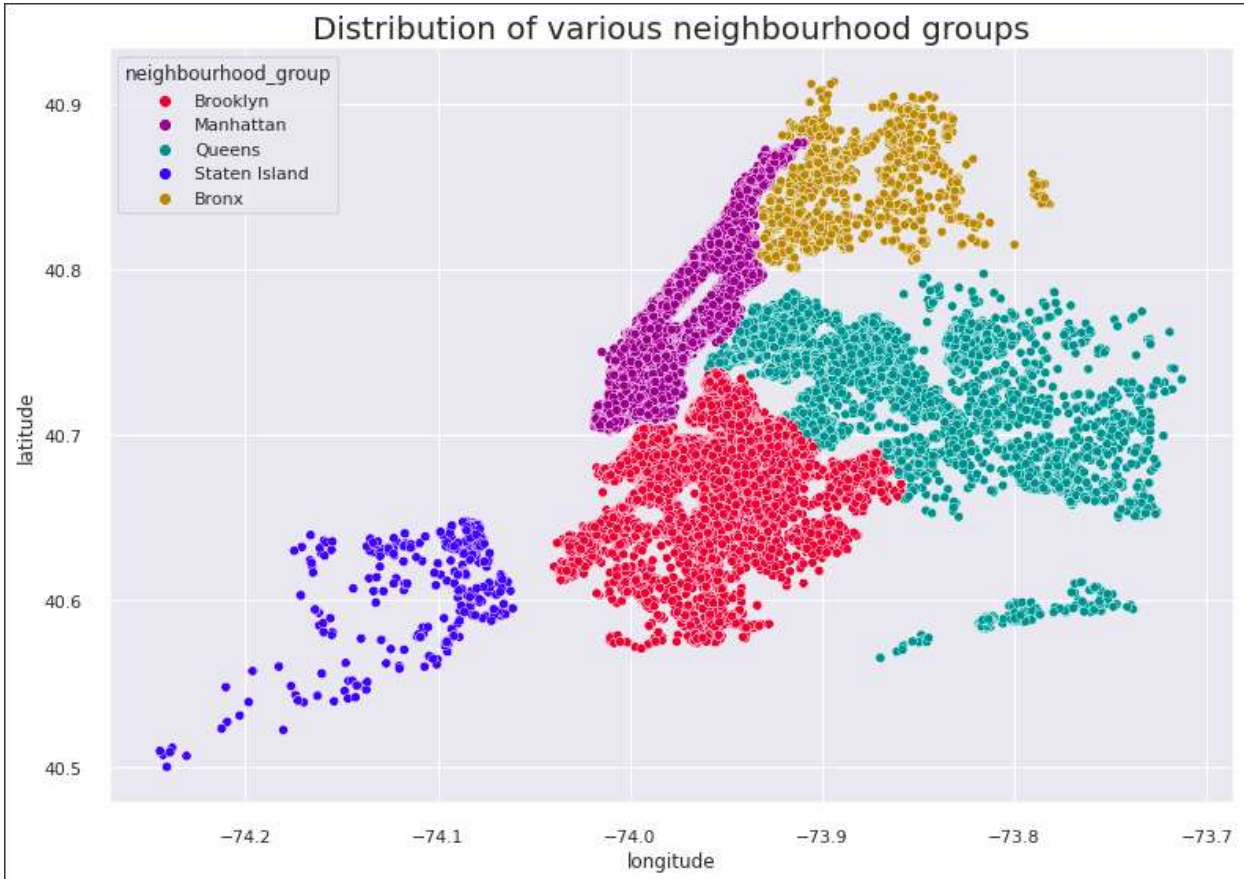
Airbnb listings in different neighbourhood groups

- Manhattan has the most no. of Airbnb listings.
- Staten Island has the least no. of Airbnb listings.

neighbourhood_group	count
Bronx	1091
Brooklyn	20104
Manhattan	21661
Queens	5666
Staten Island	373



Coordinates of rooms in different neighbourhood groups

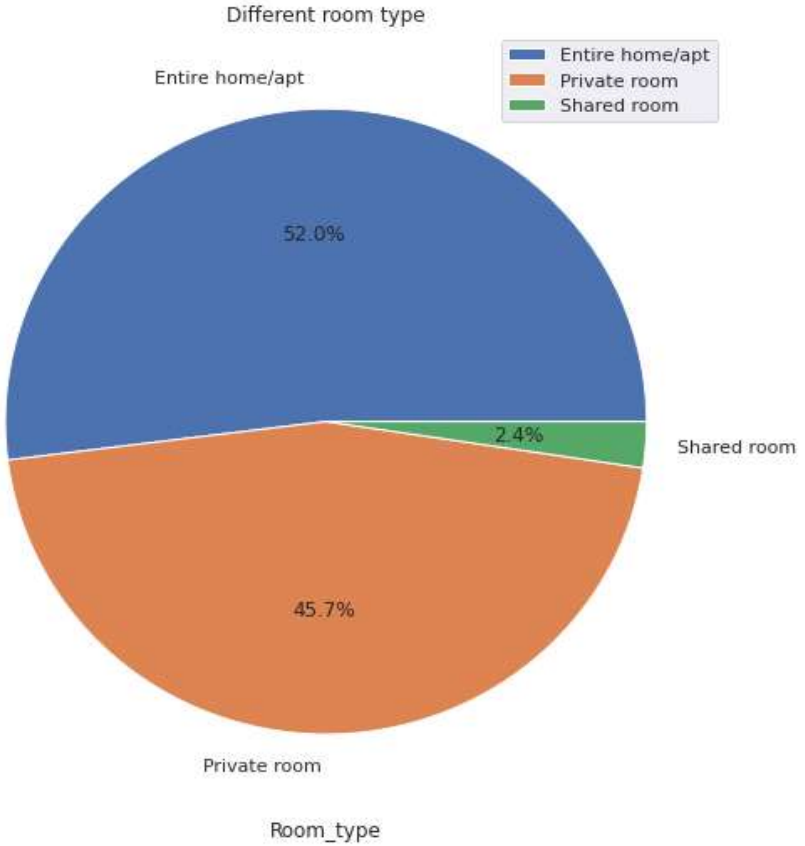


- ➔ Staten Island has the least number of rooms.
- ➔ Manhattan and Brooklyn have a fairly good amount of listings.
- ➔ Listings of Queens are widely spread.

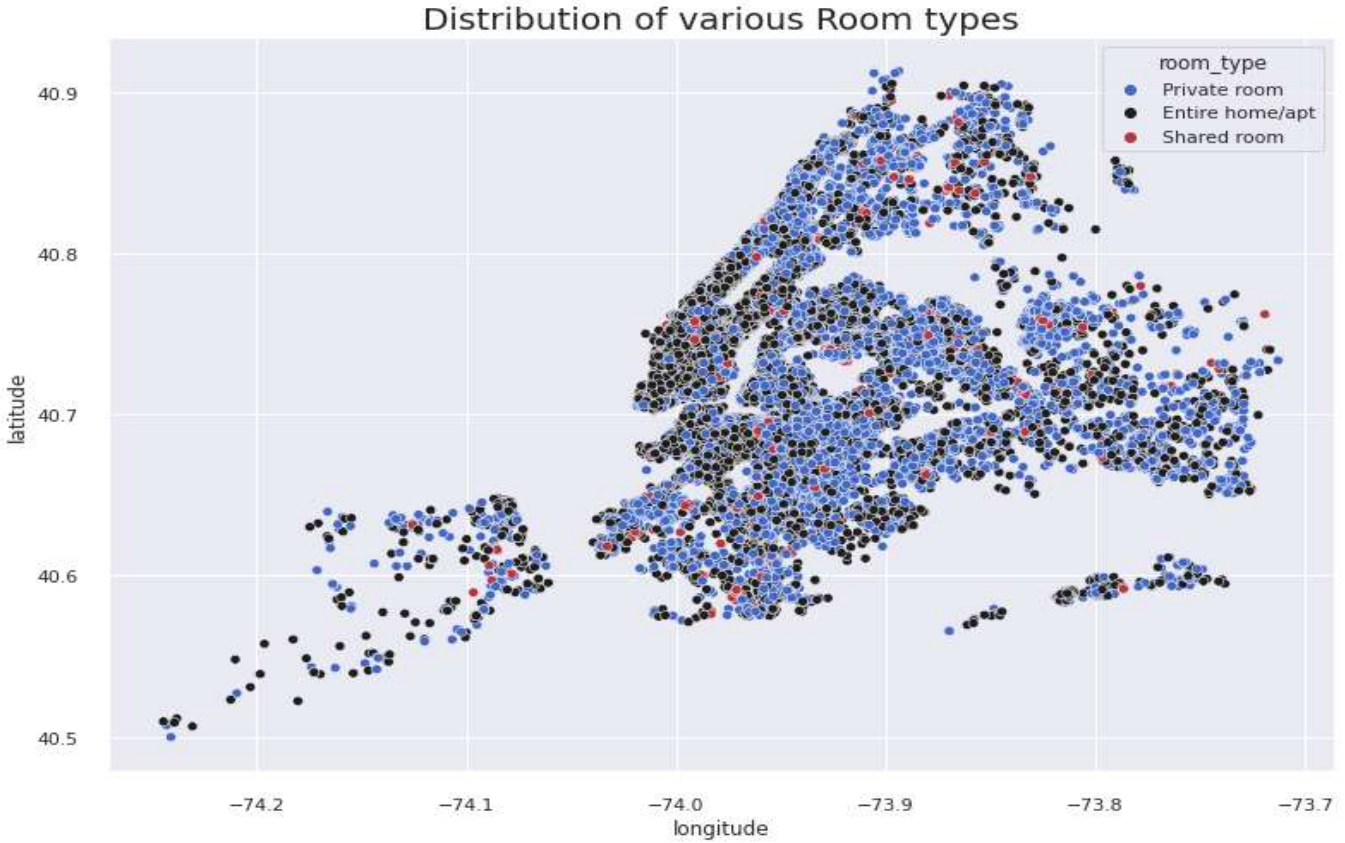
Distribution of Room types

- ➔ Shared room has the least number of listings.
- ➔ Entire Home/apt has the highest number of listings.
- ➔ Private room has a decent no. of listings.

room_type	count
Entire home/apt	25409
Private room	22326
Shared room	1160



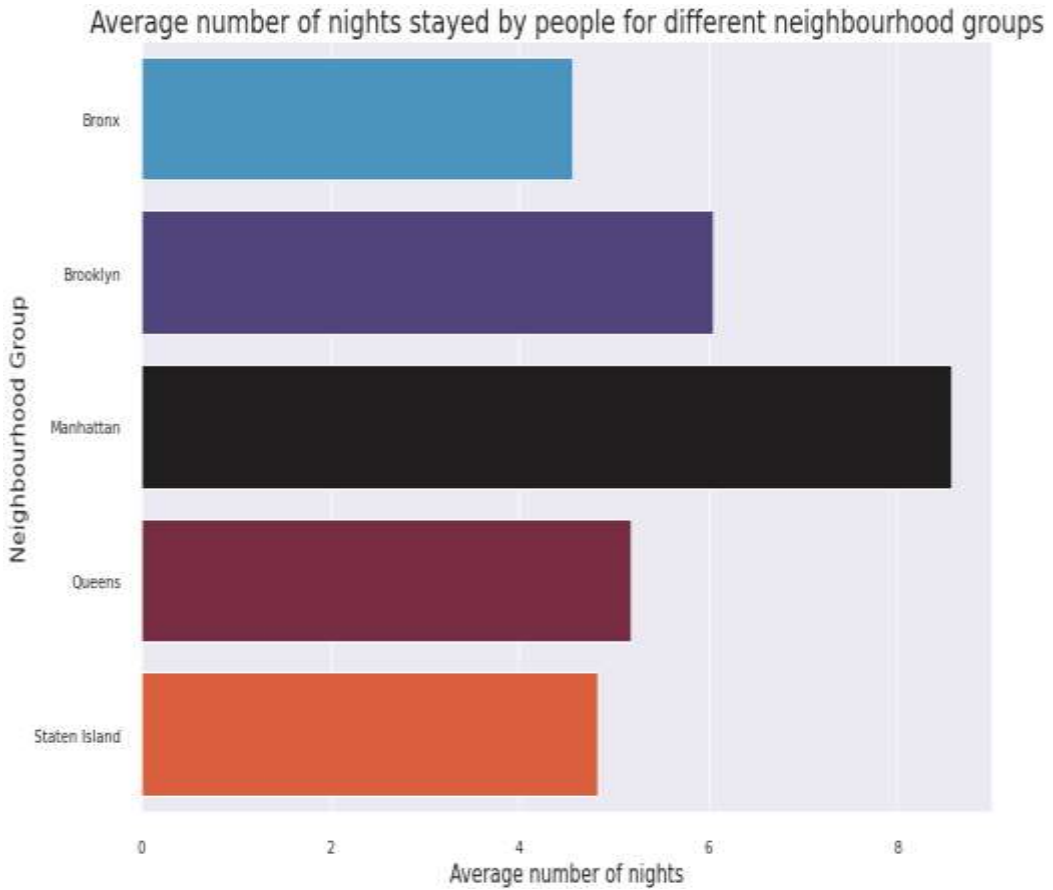
Coordinates of various rooms for different room types



- ➔ Shared rooms are least in number.
- ➔ Entire home/apt and Private Rooms have a good amount of listings.

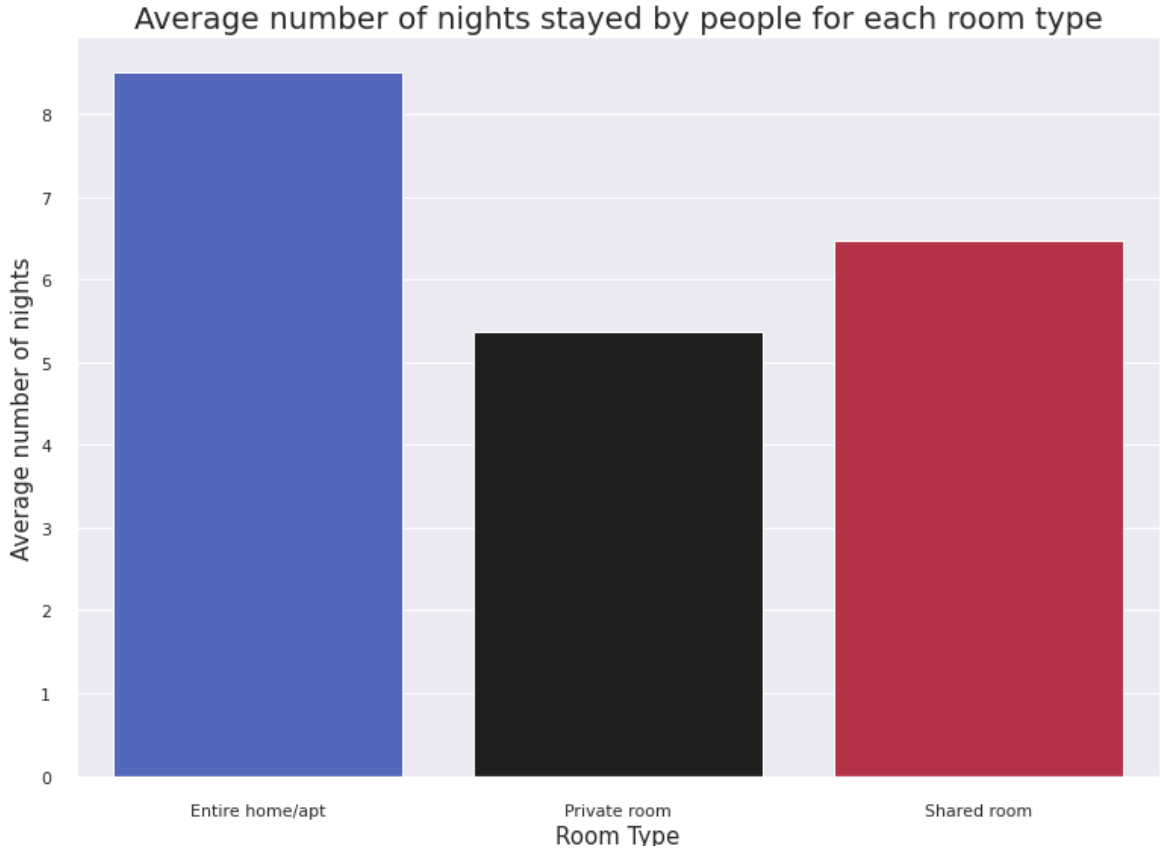
What can we learn about different hosts and areas?

- People stayed for more nights (on an average of 8-9 nights) in Manhattan.
- People have stayed roughly the same number of nights in Bronx and Staten Island.



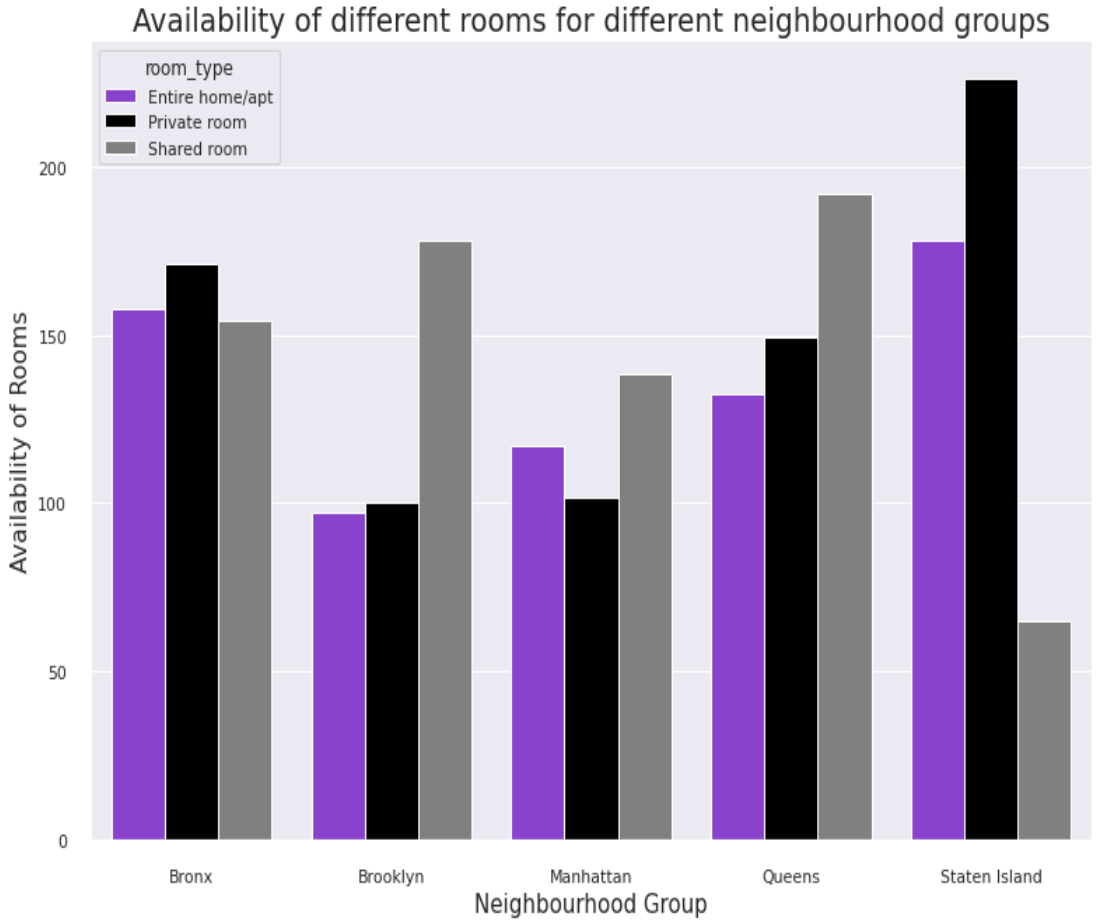
Minimum number of nights people live in different room types

➔ People typically prefer to stay longer in an entire home/apartment which is around 8-9 nights followed by shared rooms.



Availability of room types for different neighbourhood groups

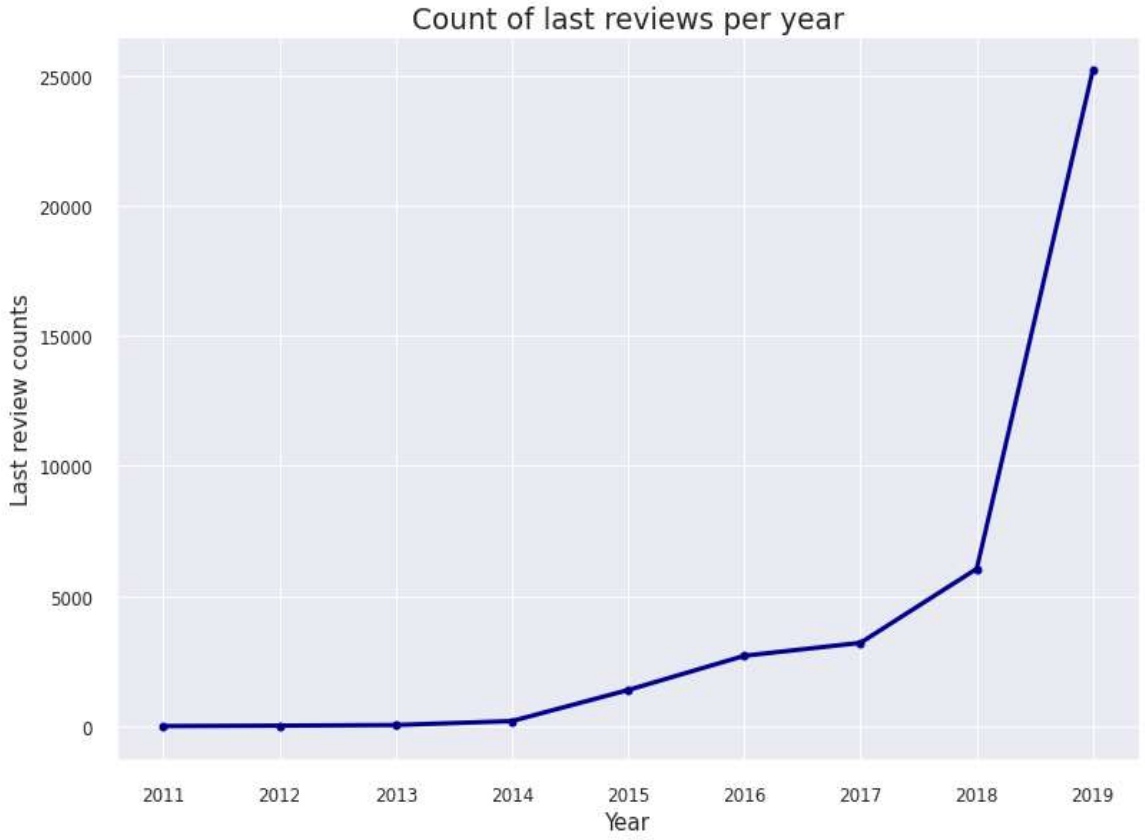
- Staten Island has the highest availability of private rooms and entire home/apt.
- For Brooklyn, the availability of rooms is opposite to that of Staten Island.
- For Bronx and Manhattan the availability for all room types is roughly the same.



Count of last reviews per year

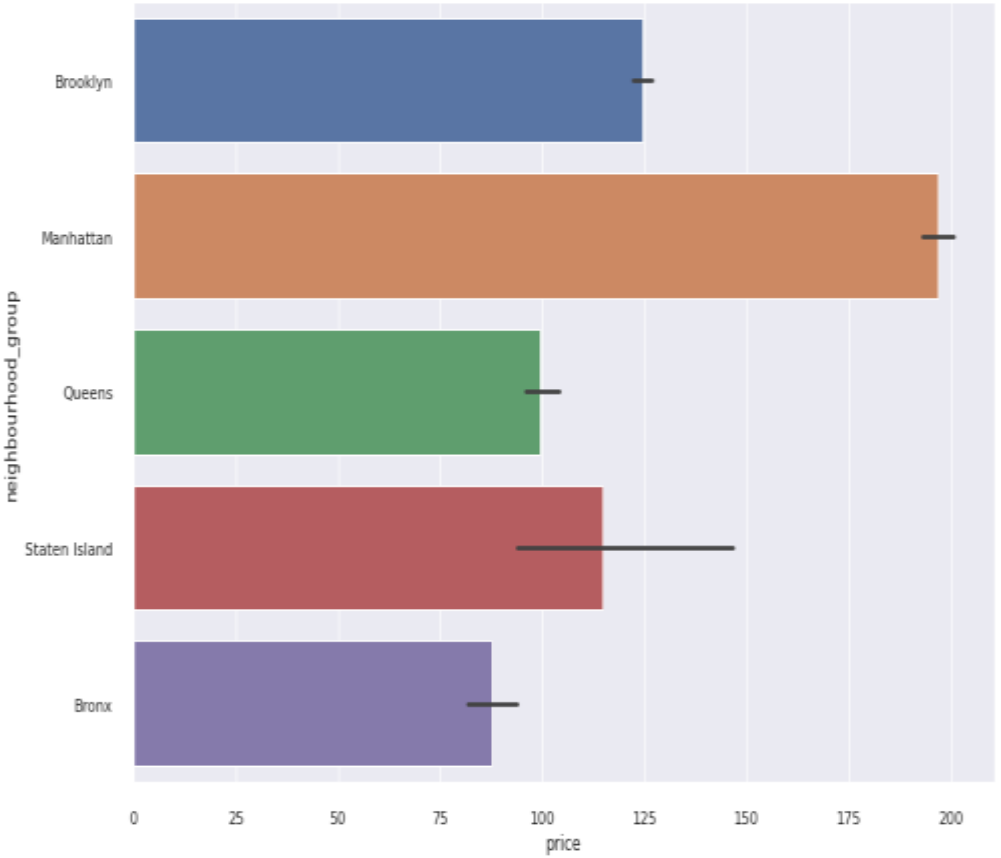
- Most people last reviewed in the year 2019
- Around 6,000 people last reviewed in 2018.

2019	25209
2018	6050
2017	3205
2016	2707
2015	1393
2014	199
2013	48
2012	25
2011	7



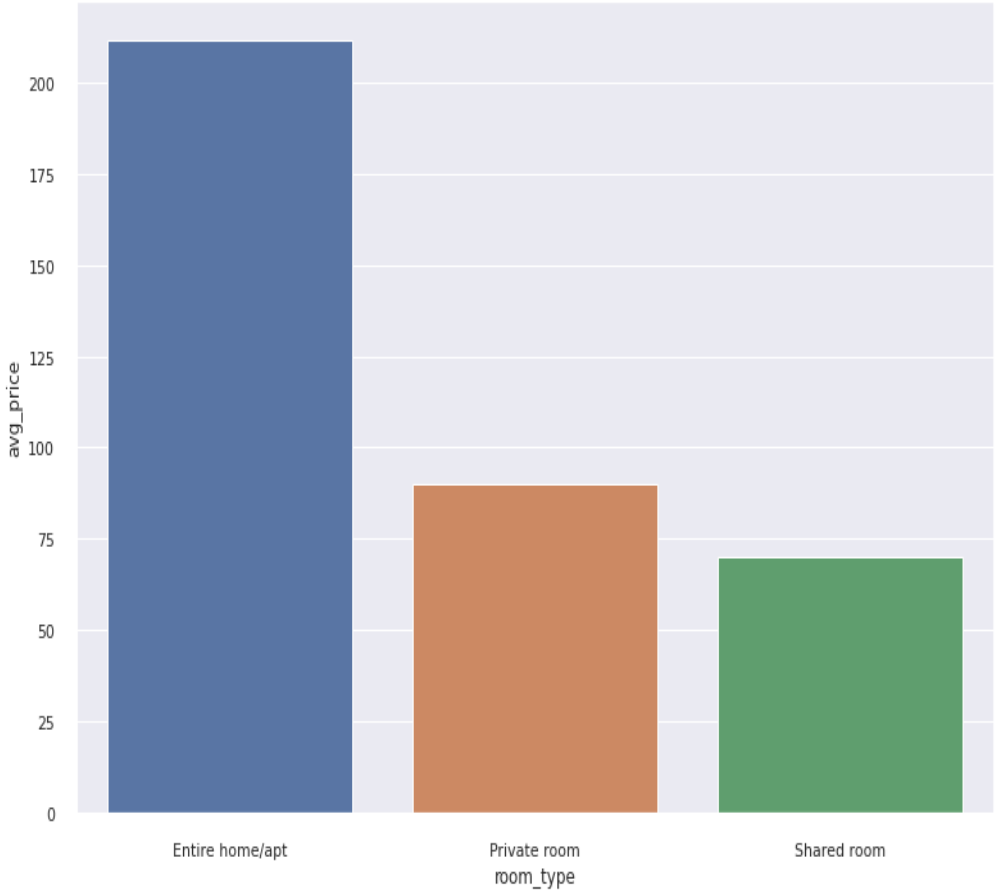
What is the average price of Airbnb with respect to different neighbourhood group ?

- Manhattan has the highest average price among all areas.
- Brooklyn has the second highest average price.
- Bronx has the lowest average price among all areas.



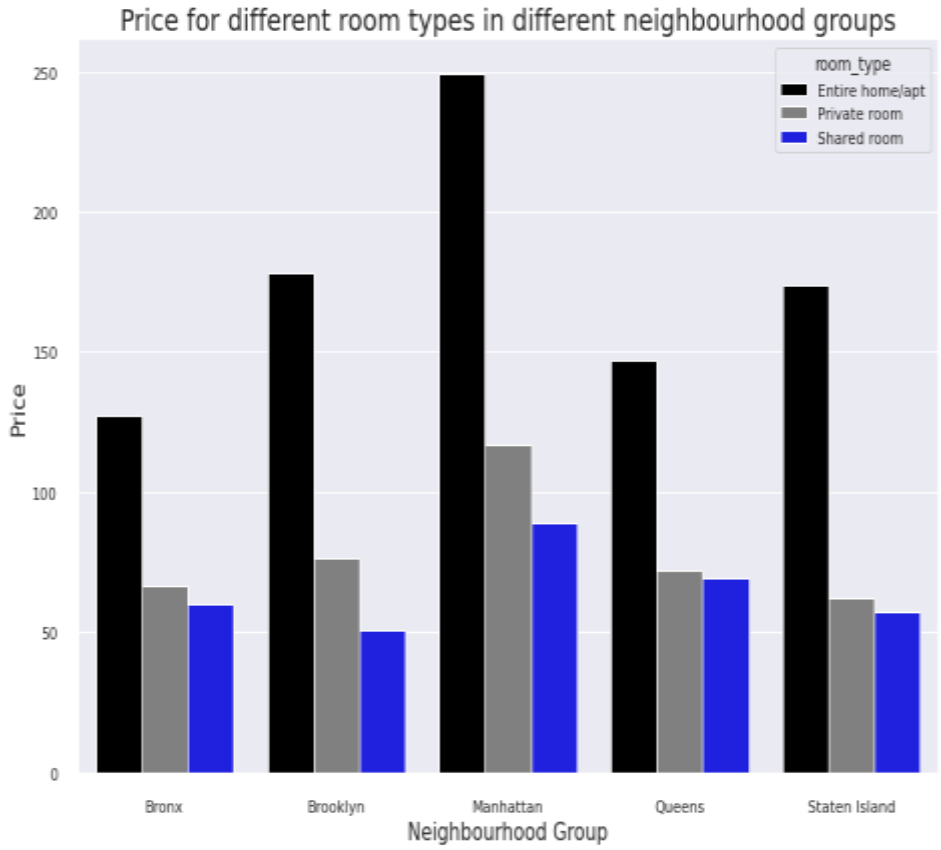
What is the average price for each room type?

- For the Entire home/apt the avg. rate is approx. $ 211.
- For the Private room the avg. rate is approx. $ 89.
- For the Shared room the avg. rate is approx. $ 70.



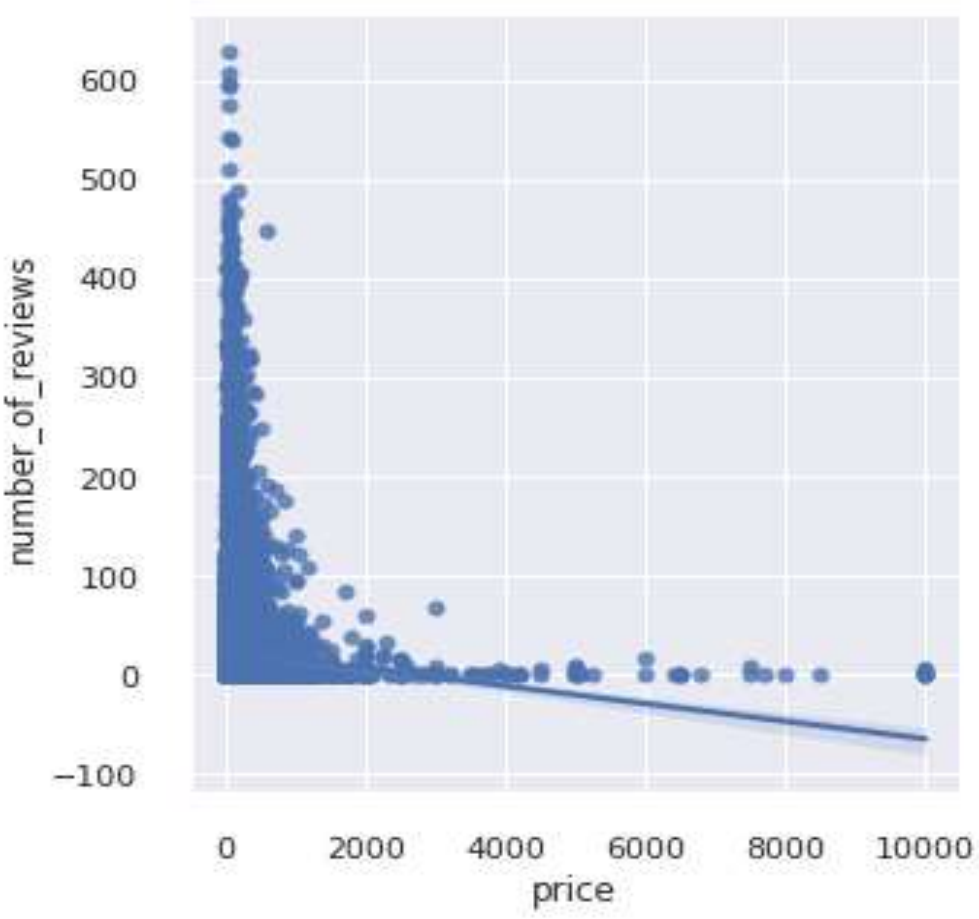
Average price of different room types for each neighbourhood group

- Manhattan has the highest rate for Entire room/apt and Private rooms with respect to other locations.
- Staten Island and Queens have the approx. same rates for the private room and shared room.
- Brooklyn has the lowest rate for shared rooms compared to others.



Relationship between price v/s numbers of reviews ?

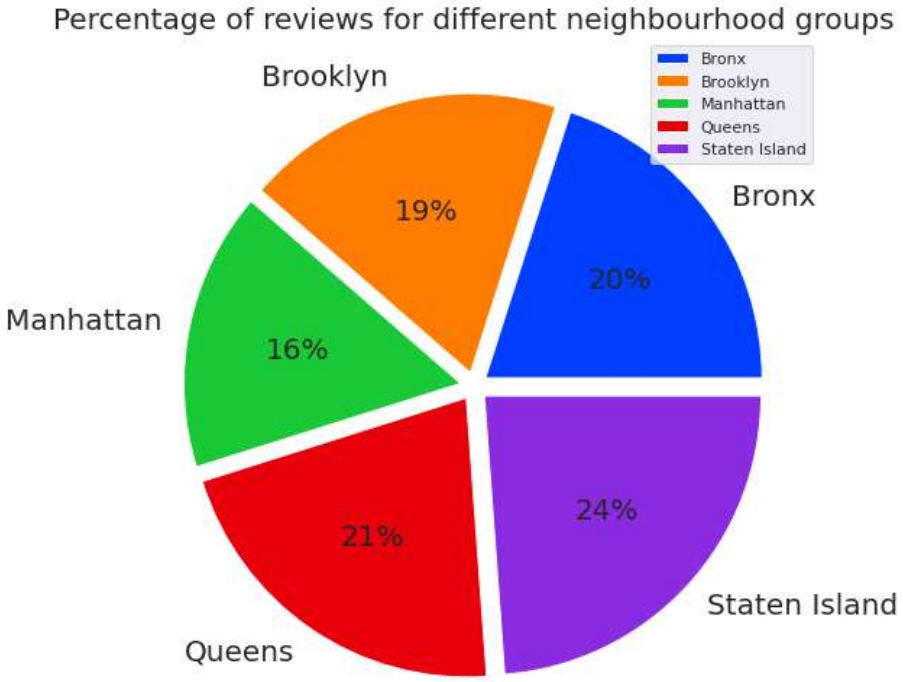
- By looking at the graph we can conclude that people mostly prefer to stay where the price is minimum.



Which neighbourhood group has got the most reviews on average?

- ➔ Staten island has the most numbers of reviews.
- ➔ Manhattan has the least number of reviews.

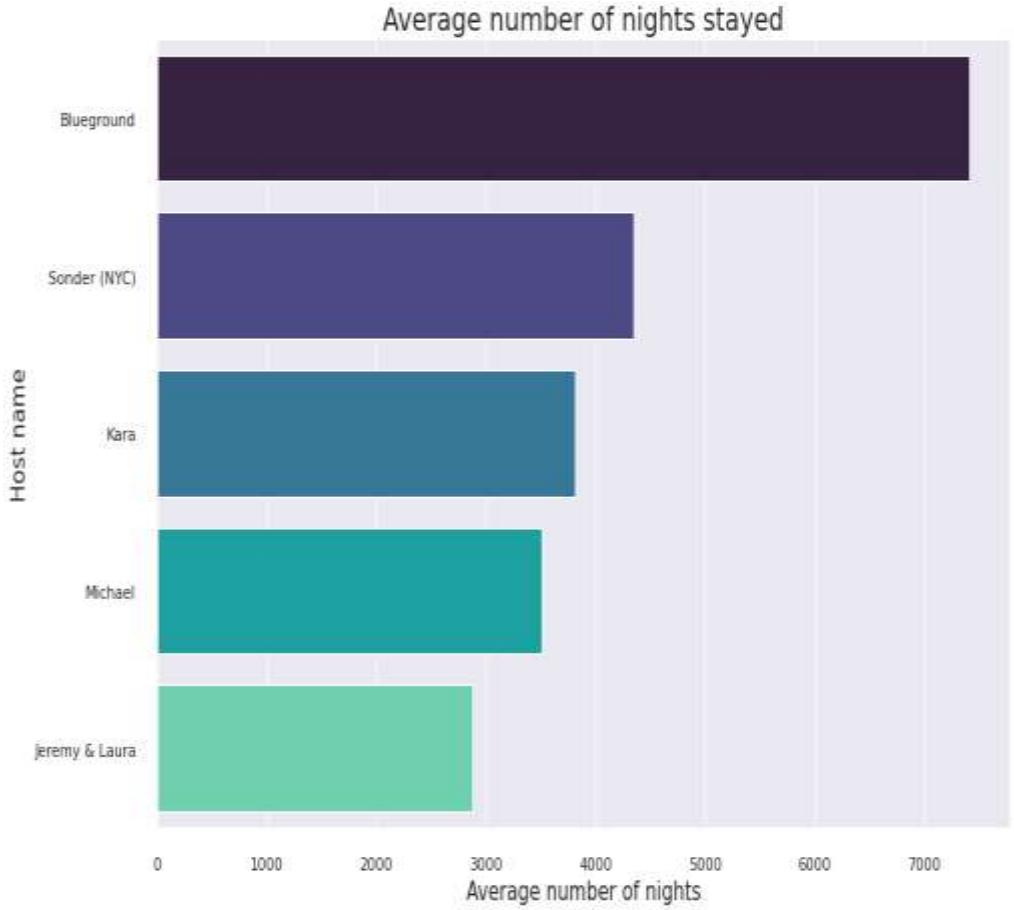
	neighbourhood_group	Reviews
0	Bronx	26.004583
1	Brooklyn	24.202845
2	Manhattan	20.985596
3	Queens	27.700318
4	Staten Island	30.941019



Which hosts are the busiest and why?

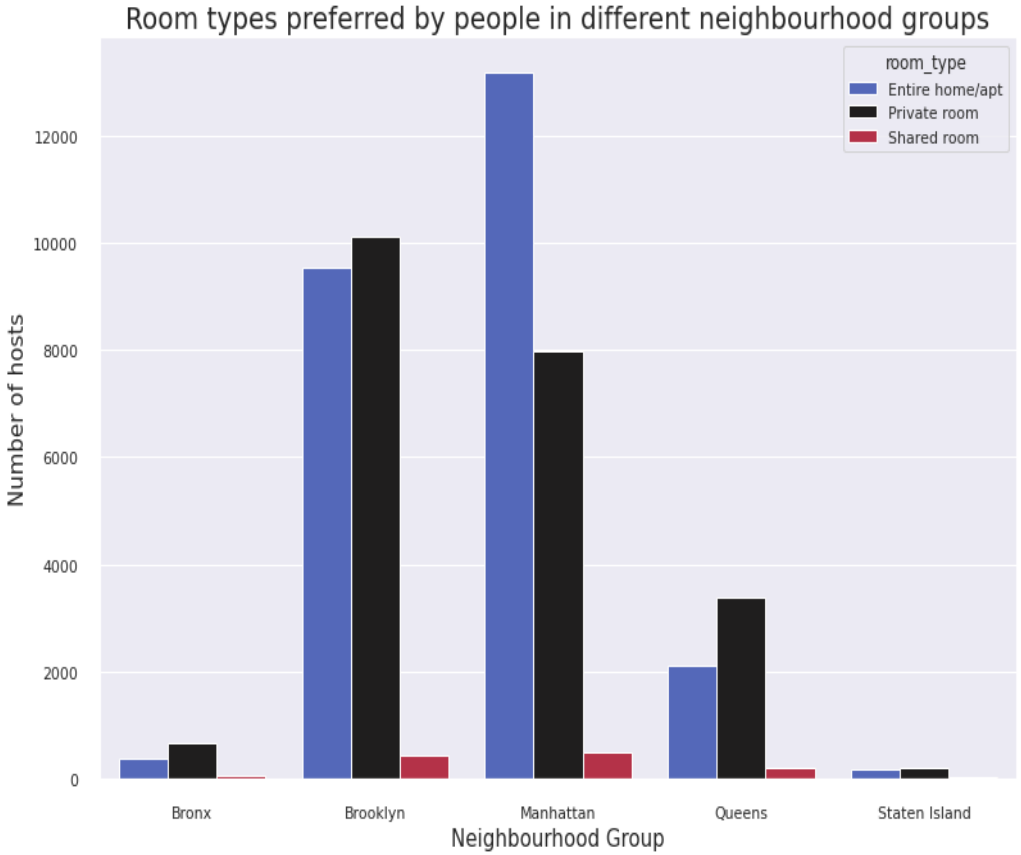
- For Blueground, people have stayed the most number of nights i.e. over 7000 in Manhattan as it is one of the most expensive place to live in.

	host_name	neighbourhood_group	total_no_of_nights_stayed
1834	Blueground	Manhattan	7410
13221	Sonder (NYC)	Manhattan	4353
7275	Kara	Manhattan	3814
9742	Michael	Manhattan	3510
6540	Jeremy & Laura	Manhattan	2880



Is there any noticeable difference of traffic among different areas & what could be the reason for it?

- ➔ Entire home/apartment is mostly preferred by people in Manhattan.
- ➔ In Queens, people prefer private rooms
- ➔ For Bronx, Brooklyn and Staten Island, the overall preference for entire home/apt and private room is same.
- ➔ Shared rooms are least preferred by the people.



Analysis summary

- People stay more nights in Manhattan in comparison to other places though it is one of the most expensive places to live.
- Although the average price in Manhattan is the highest, people prefer to stay in those rooms whose price is low.
- Among the 3 room types entire homes/apartments are in high demand.
- People who like to stay in the entire home or apartment tend to stay longer.
- Manhattan has the most number of listings followed by Brooklyn. Staten Island has the least number of listings.
- Staten Island has the highest availability of rooms to other places.
- In Staten Island, people stay for less number of nights which shows travellers visit this place.