

# **Airbnb Case Study-Methodology**

## **Introduction:**

This case study is about finding important insights based on various attributes in dataset to increase their revenue.

## **Problem:**

For the past few months, Airbnb has seen a major decline in revenue due to the lockdown imposed during the pandemic. Now that the restrictions have started lifting and people have started to travel more. Hence, Airbnb wants to make sure that it is fully prepared for this change.

## **Objective:**

The main objective of this case study is to understand the customer preferences, get a better understanding of Airbnb listings with respect to various parameters and give insights to improve their business.

## **Whom we have represented in presentations:**

### **Presentation – I**

Data Analysis Managers: These people manage the data analysts directly for processes and their technical expertise is basic.

Lead Data Analyst: The lead data analyst looks after the entire team of data and business analysts and is technically sound.

## **Presentation – II**

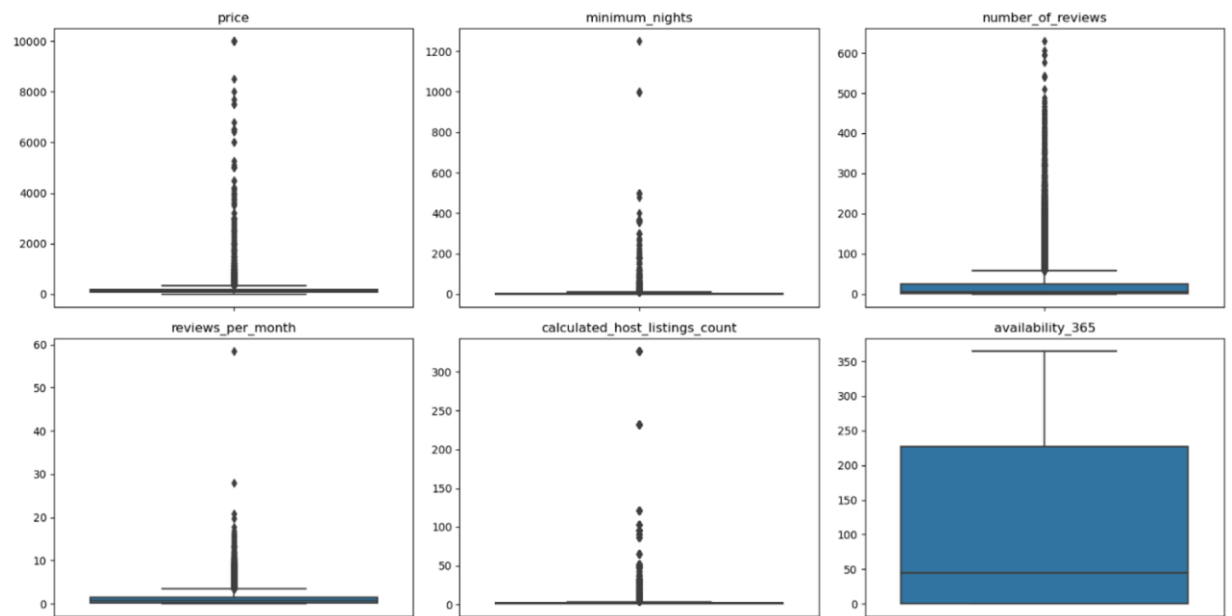
Head of Acquisitions and Operations, NYC: This head looks after all the property and host acquisitions and operations. Acquisition of the best properties, price negotiation, and negotiating the services the properties offer falls under the purview of this role.

Head of User Experience, NYC: The head of user experience looks after the customer preferences and also handles the properties listed on the website and the Airbnb app. Basically, the head of user experience tries to optimize the order of property listing in certain Neighborhoods and cities in order to get every property the optimal amount of traction.

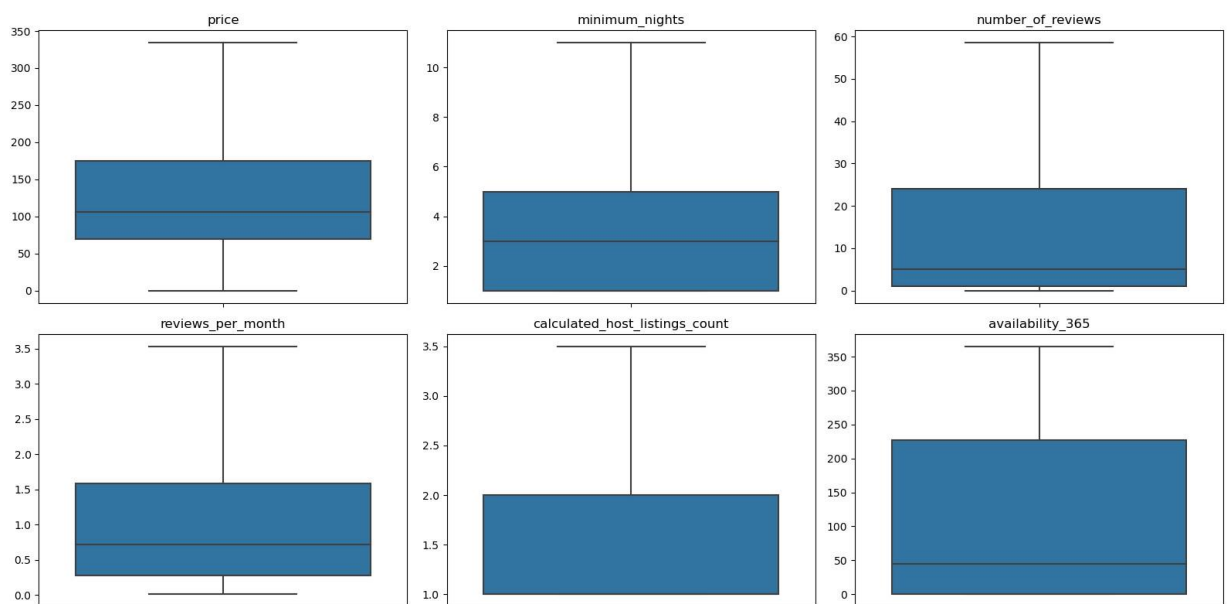
## **Methodology:**

### **Data Understanding and Preparation:**

- First, we have understood the data of the dataset in python.
- Then we have handled the missing values using median. Identified equal number of null values in both last\_review, and reviews\_per\_month of around 20.55%. Also, identifies in name and host\_name.
- Then separated the columns of dataset into categorical and numerical data types.
- Then we have imputed the categorical column with mode and numerical column with median
- Then we have checked if there are any outliers in 6 continuous columns and treated the using capping method.



The above graph shows outliers in the dataset.



The above graph is after removing outliers in the dataset.

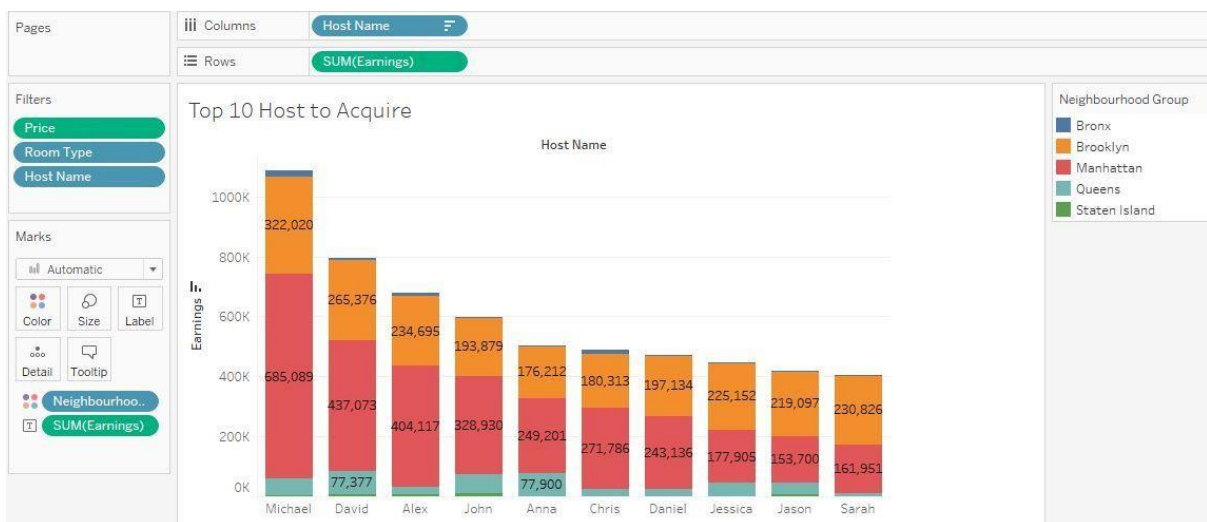
## Data Visualization:

The visualization part we have did in tableau for various attributes to increase the revenue of Airbnb such as-

1. Which type of hosts to acquire more and where?
2. The categorization of customers based on their preferences.

- What are the Neighborhoods they need to target?
  - What is the pricing ranges preferred by customers?
  - The various kinds of properties that exist w.r.t. customer preferences.
  - Adjustments in the existing properties to make it more customer oriented.
3. What are the most popular localities and properties in New York currently?
  4. How to get unpopular properties more traction? And so on...

### Top 10 hosts w.r.t earnings and Neighborhood group:



The graph depicts the top 10 hosts who are earning more. We have observed a single host (Michael) having a greater number of properties overall and has more earnings. This is because Manhattan has the highest influx of tourists and financial enthusiasts visiting city all year around and he has highest revenue from Manhattan.

## Created a calculated field for earnings:

Earnings

×

[Price] \* [Number Of Reviews]

▶

The calculation is valid.

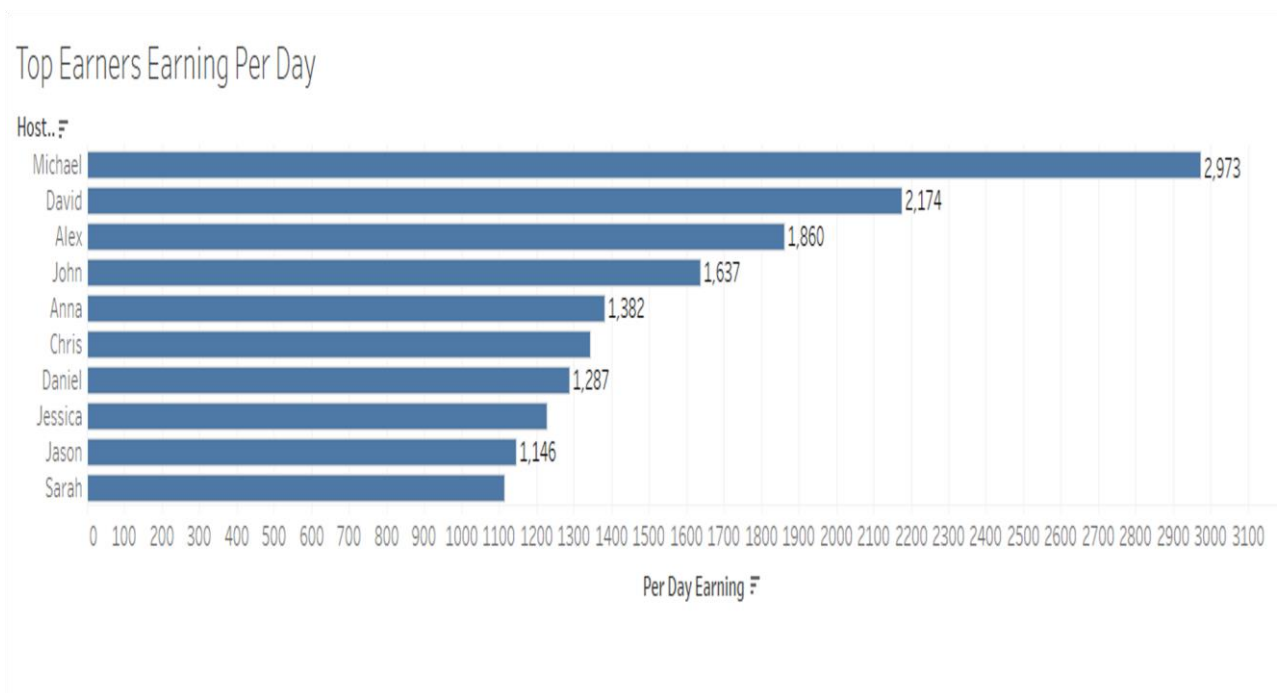
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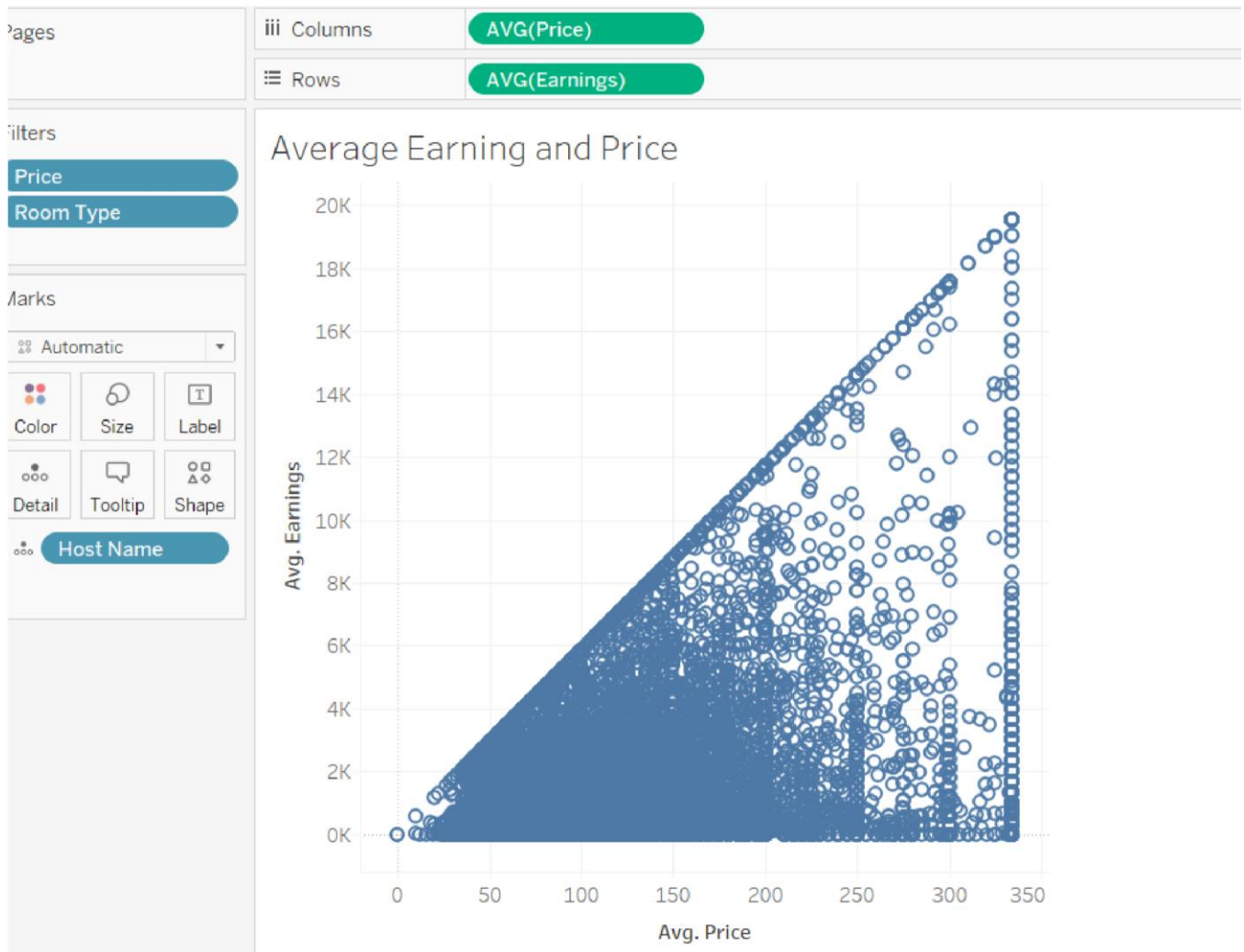
OK

## Top earnings per day:

Michael is earning more in a single day as he has a greater number of properties in popular locality.

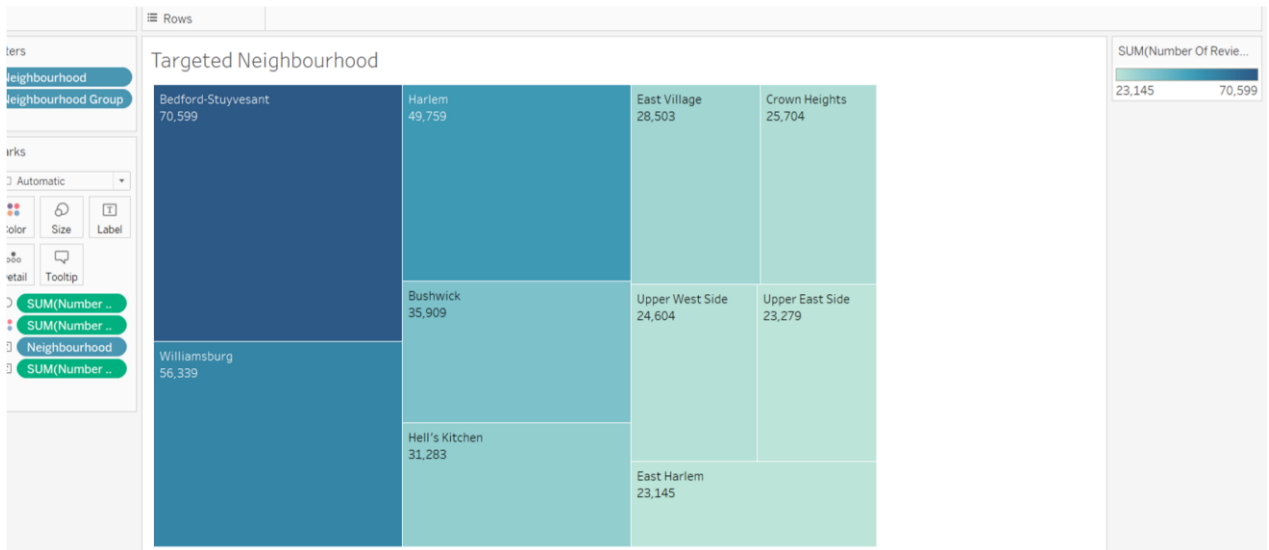


## Average earning and price:



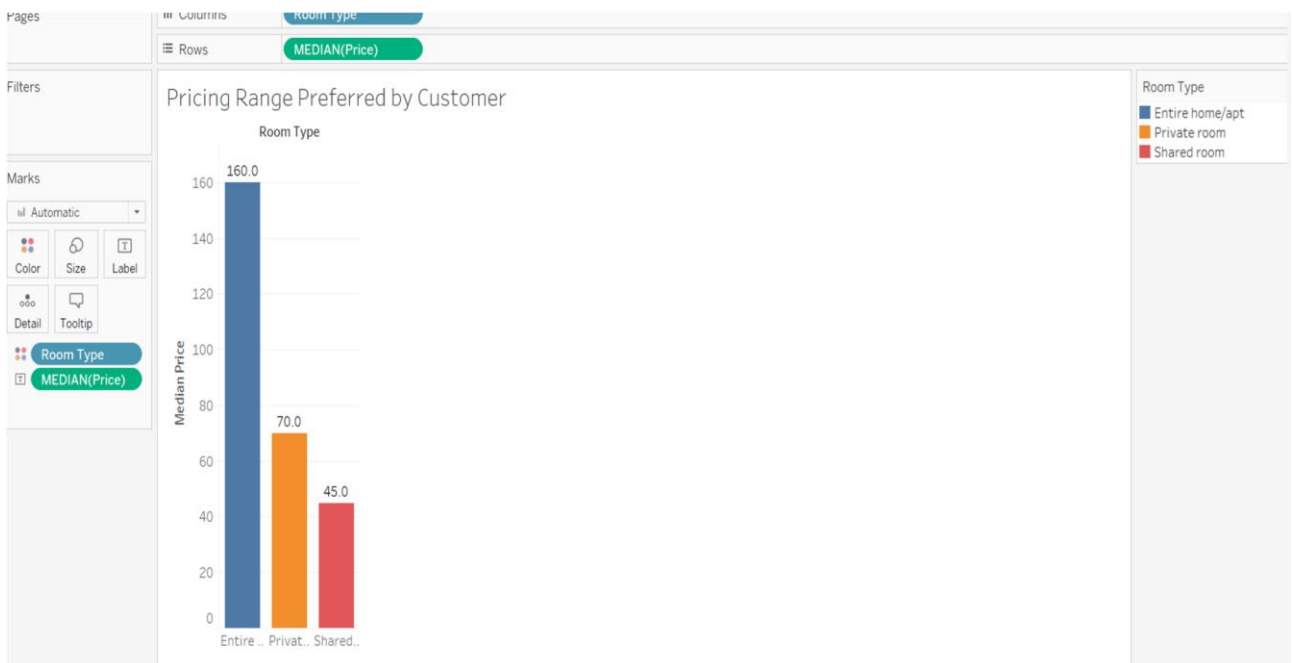
According to this graph, the majority of individuals would have spent between \$40 and \$250. A typical host makes between \$6000 and \$7000 per year. The hosts who charge 170 or more as the standard fee make around 10,000.

## Targeted Neighborhood:



This are the most targeted Neighborhoods by customers. This may be mostly visited as they are near to beach and the facilities are best in this locality.

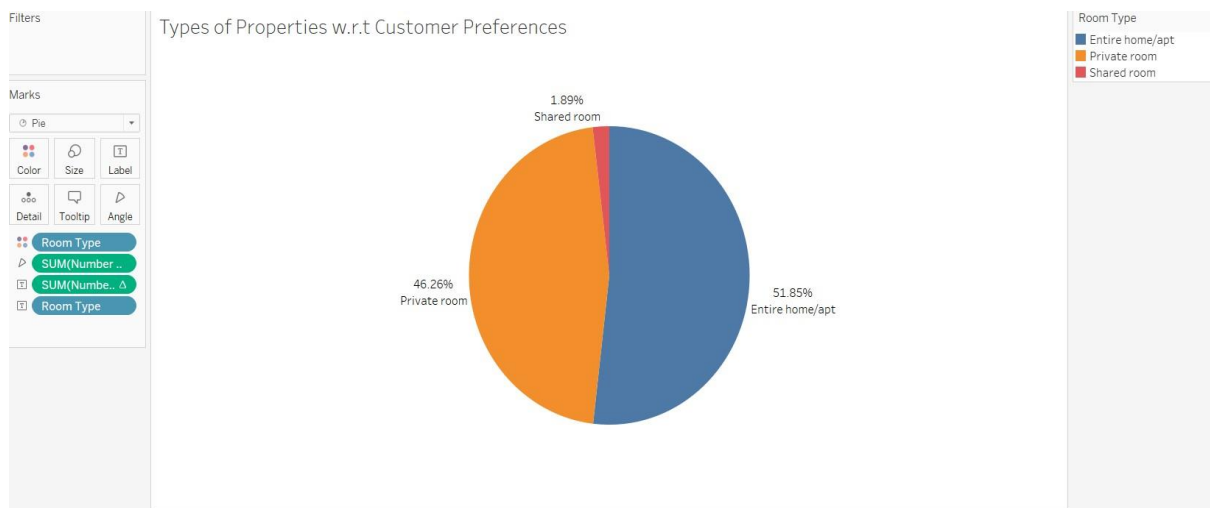
## Pricing range preferred by customer on basis of room type:



On basis of room type, the customers prefer entire home mostly. The pricing range is 160 for entire home, then private room 70 and least is shared room 45.

## Types of properties preferred by customers:

The customers mainly prefer entire home (51.85%) and then private room (46.26%). So, the airbnb can increase this type of rooms more and provide discounts to attract customers more. Shared rooms are preferred less by the customers.



## Type of room type preferred by customer's w.r.t Neighborhood group:

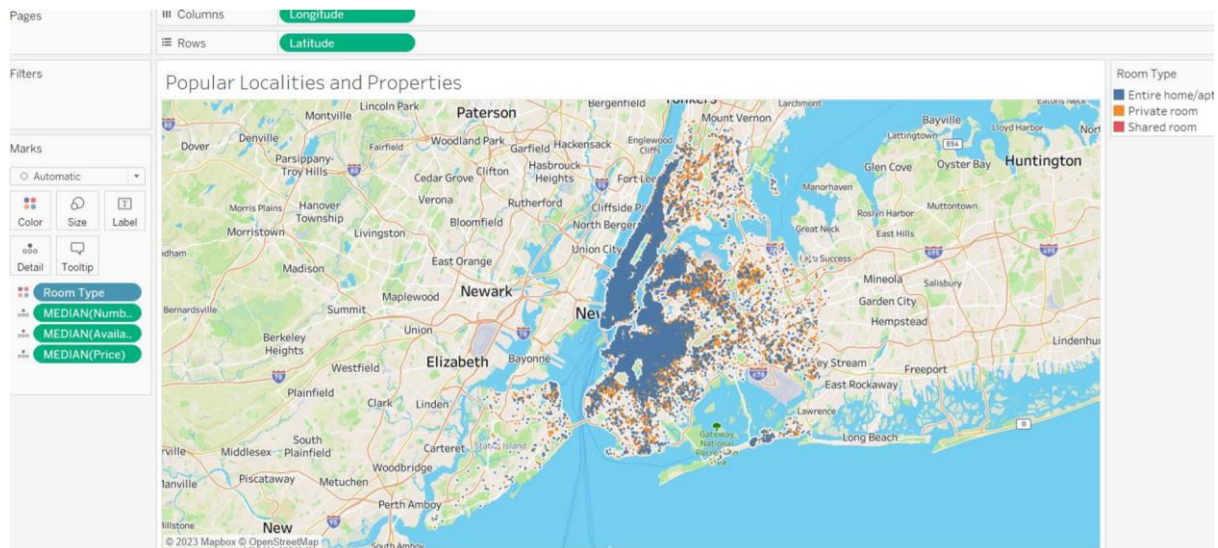


This graph shows that in Manhattan, Brooklyn, Staten Island entire home is preferred by customers whereas in Bronx and Queens private rooms are preferred.

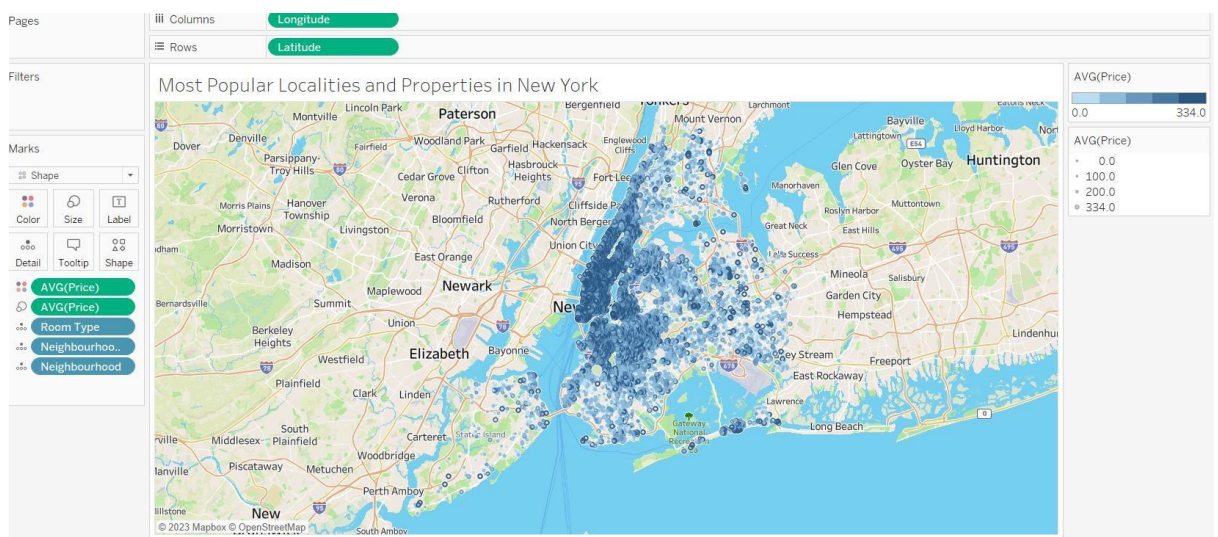


## Popular localities and properties:

This map shows that Manhattan, Brooklyn, are popular than Queens, Bronx and Staten islands for entire home. They are shown as darker side in the map.



## Most popular properties w.r.t room type, Neighborhood and group:

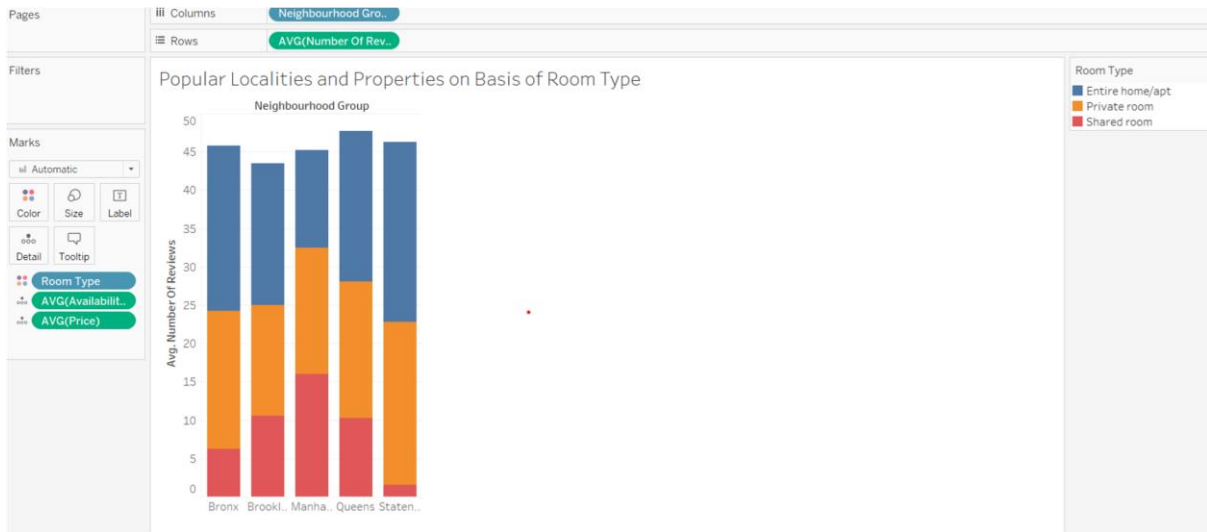


According to the map Manhattan, Brooklyn, Queens are popular than Bronx and Staten islands for entire home. They are shown as darker side in the map.

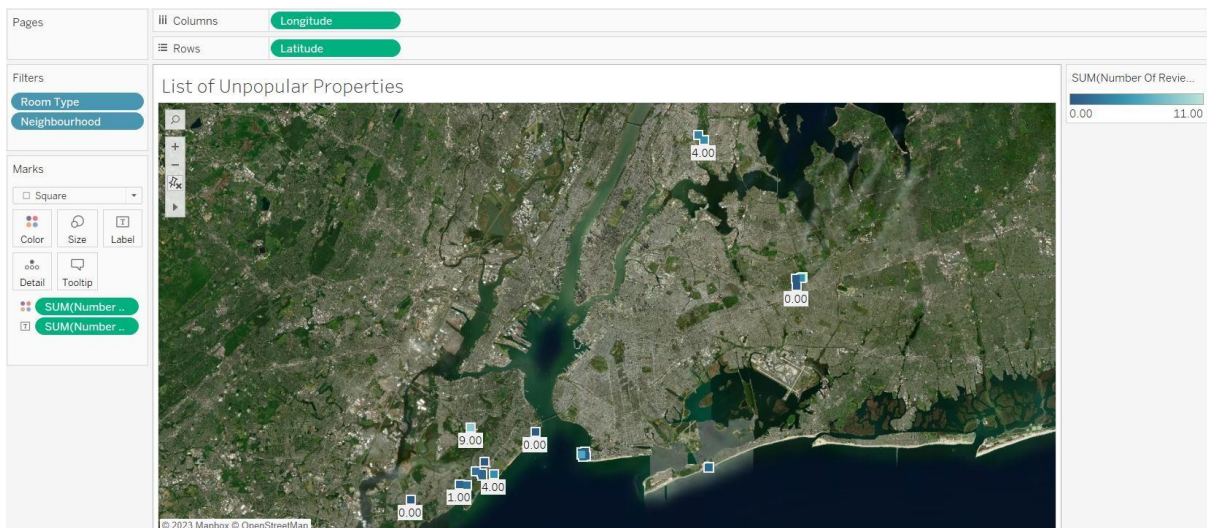
## Popular localities and properties on basis of room type:

This graph, show which room type are preferred by customers in different Neighborhood based on number of reviews and price.

Only in Manhattan, shared room is preferred more as it is industrial area and it hub. So, the employees prefer it more.



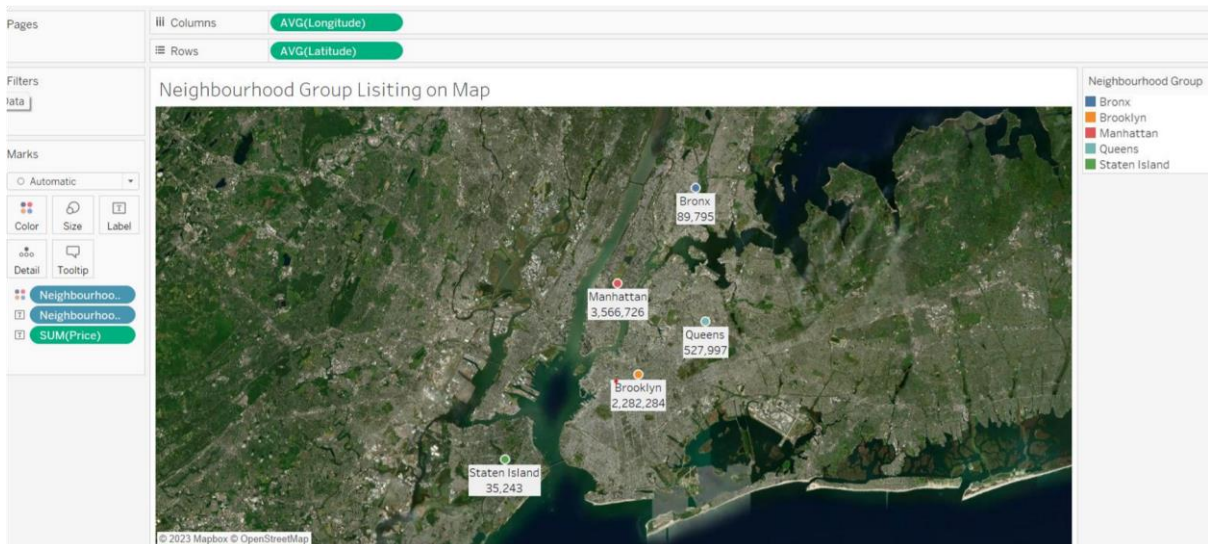
## List of Unpopular Properties:



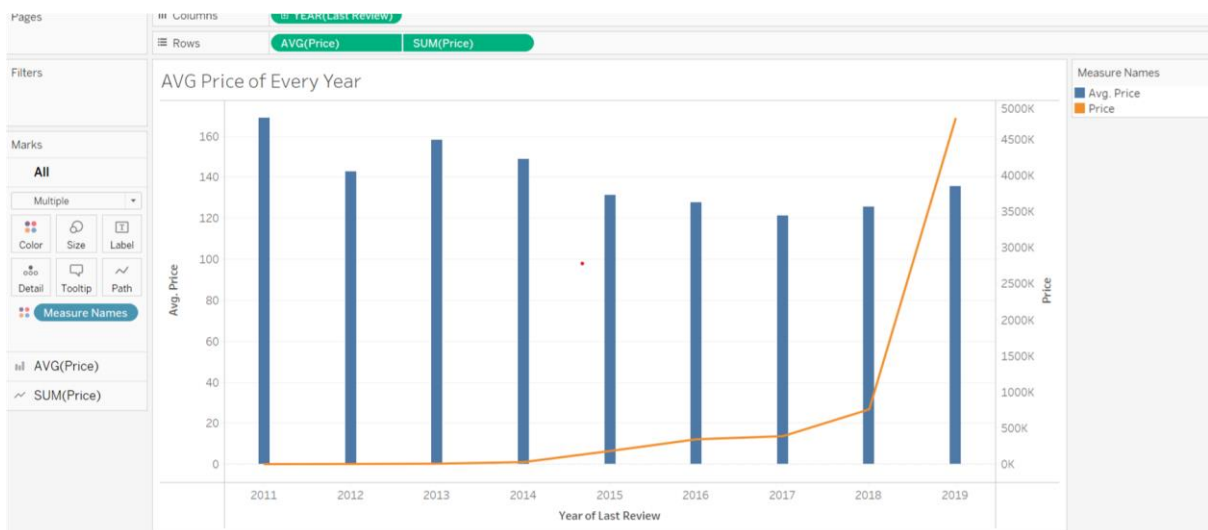
This map shows the top 10 unpopular properties as they are far from city and didn't have any tourist spots.

## Neighborhood group listing:

The map shows that Manhattan is higher and affordable for high class people for its tourist spots. Then Brooklyn is preferred by customers.



## Average price of every year:

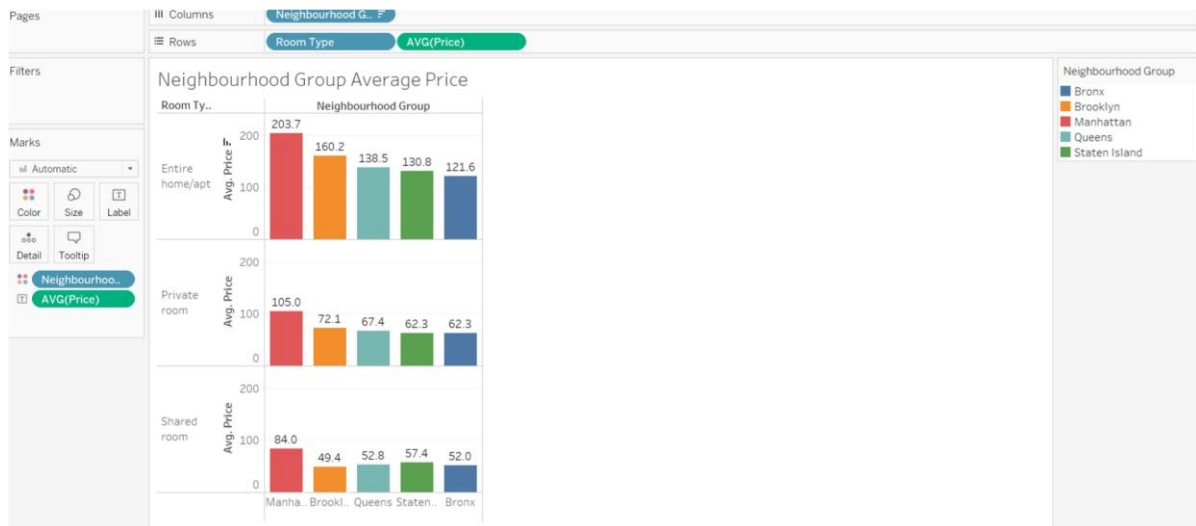


This graph is combination of both line and bar chart last review of year and sum and average of price. It shows that average was fallen after 2011. The total price is gradually increasing from 2011-18 and in 2019 it is increased by more than 400% then previous year.

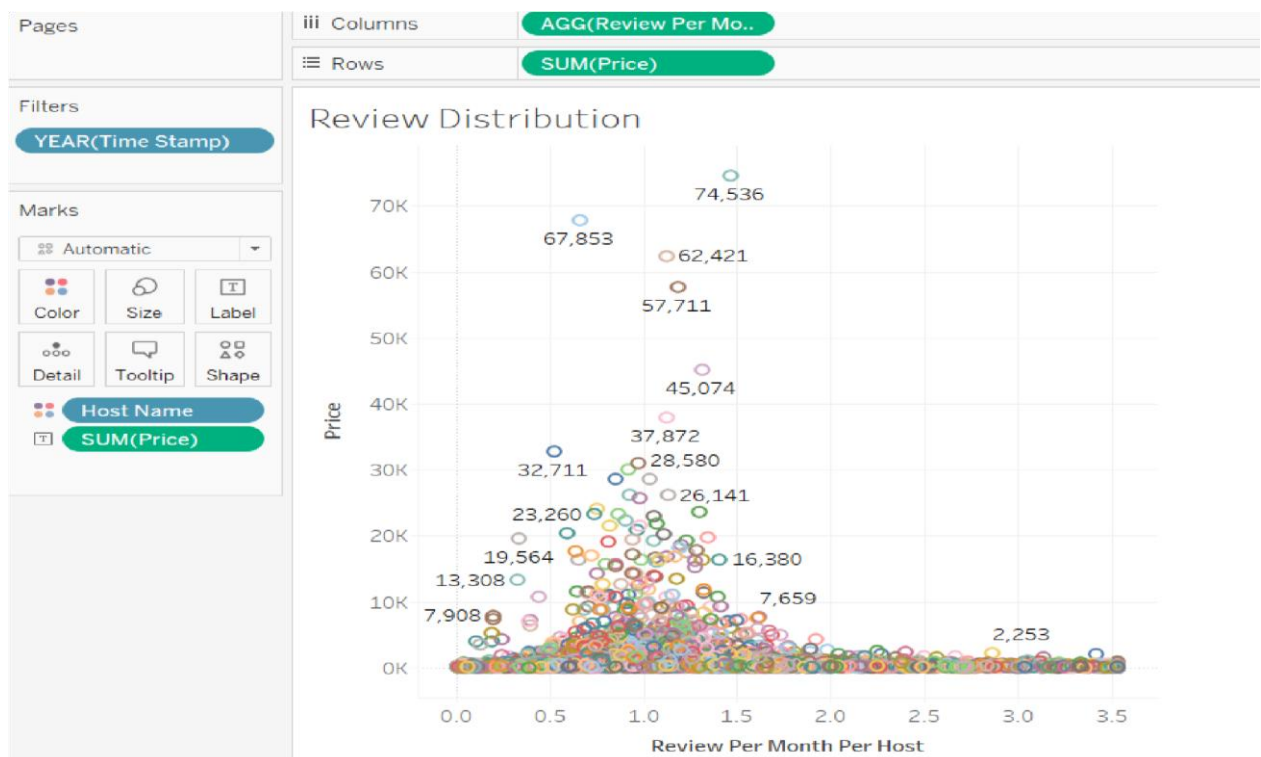


## Neighborhood group average price:

In this graph, Manhattan is preferred in all room types. And Bronx is least preferred mostly by customers in entire home and private rooms. In all the Neighborhoods other than Manhattan they have to make new marketing strategies to increase their revenue.



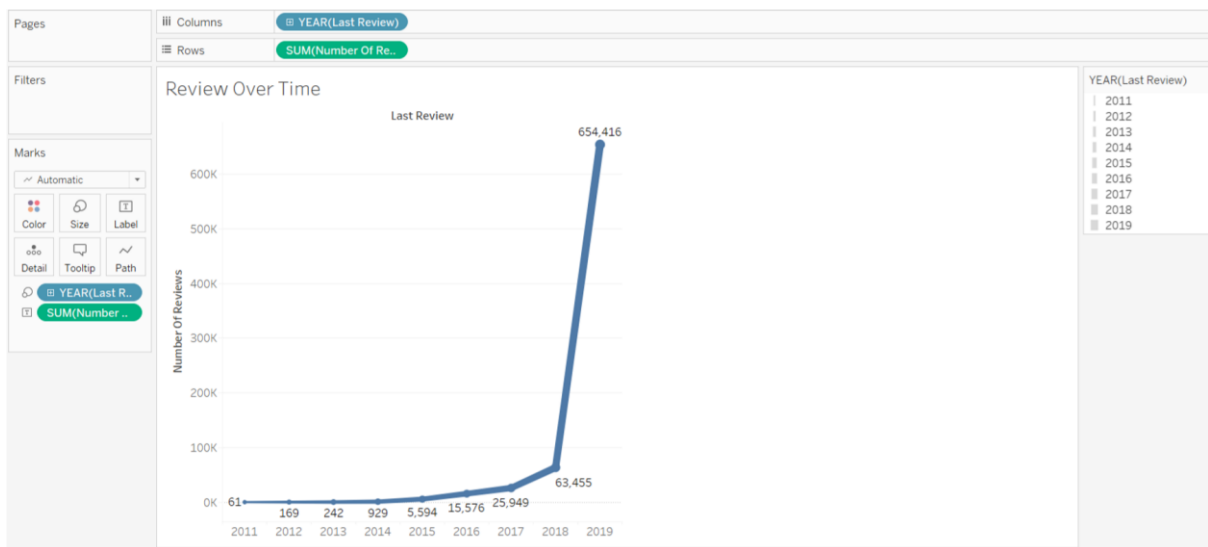
## Review Distribution:



In this graph, we can see that average review per month per host is 1.2 and the highest rating is 3.5.

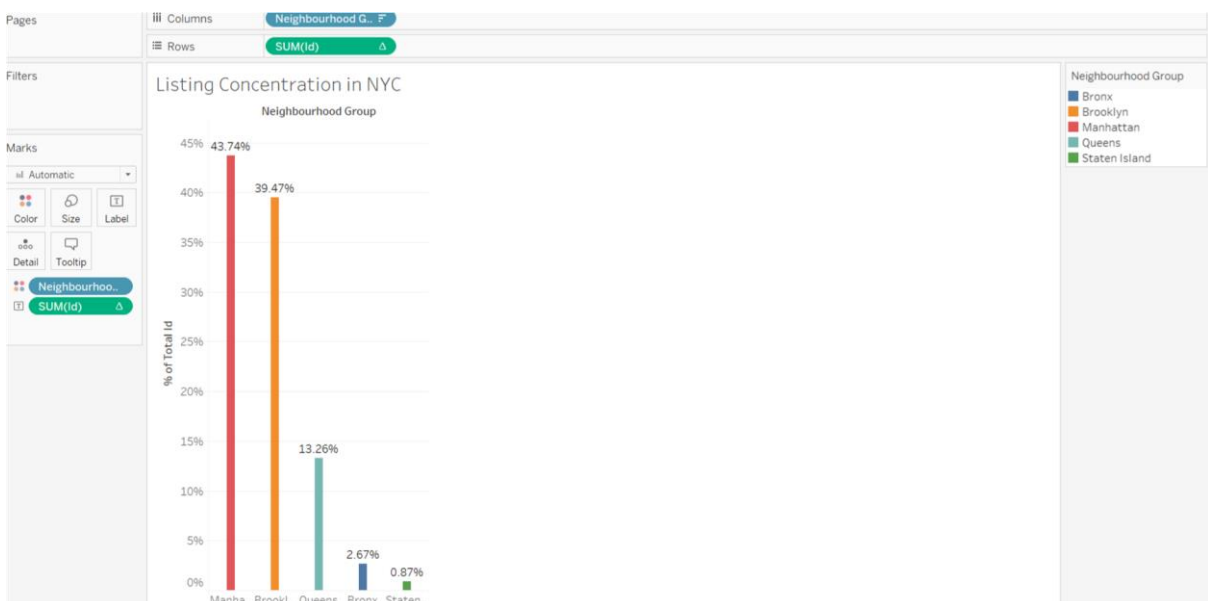
3.5 is highest rating because we have treated whiskers as median.

## Review over time:



The number of reviews are less in 2011 and it is increasing over the years. In the 2019, the reviews are more it is due to the increased technology usage by customers.

## Listing Concentration in New York:



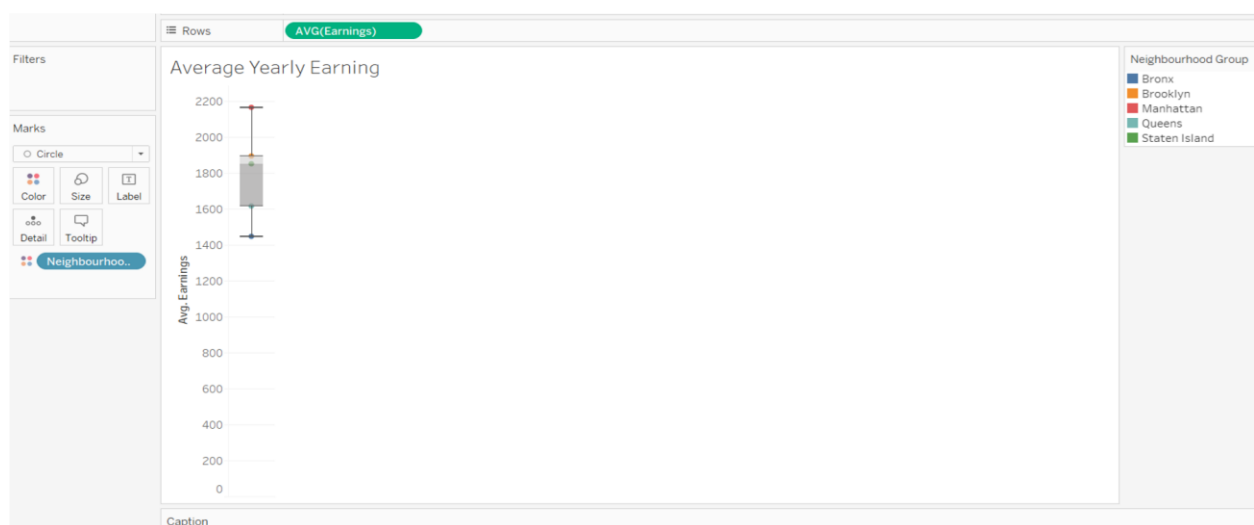
The Airbnb has good presence in Manhattan, Brooklyn, and Queens. Listings are maximum in Manhattan (43.4%), Brooklyn (39.4%) as they have highest population density and tourism spots.

## Availability w.r.t Neighborhood and price:



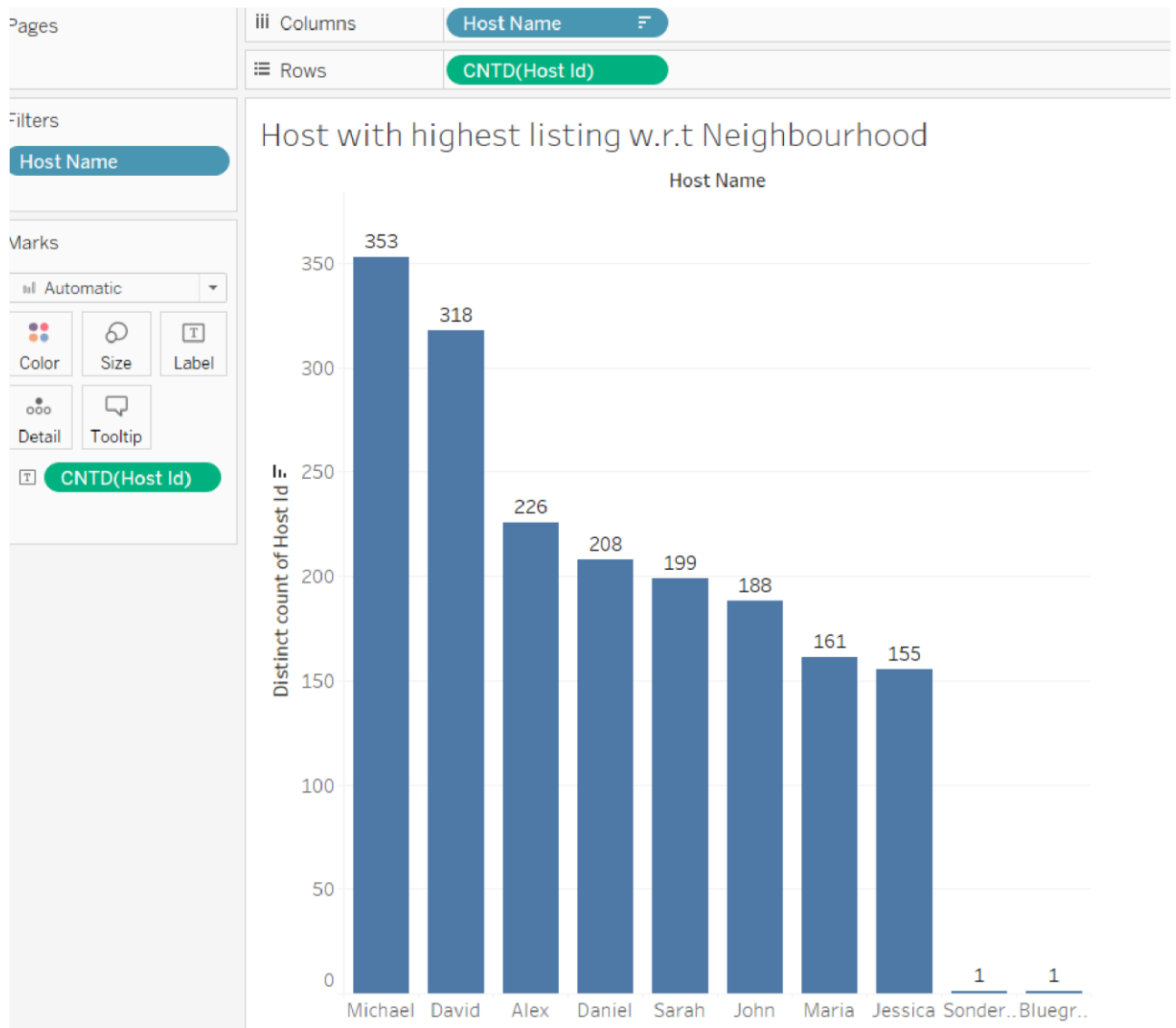
This graph shows the availability of the property w.r.t price. Midtown has the average highest availability 365 with average price 220.

## Average Yearly Earning:



This graph shows the yearly earning in each neighborhood group.

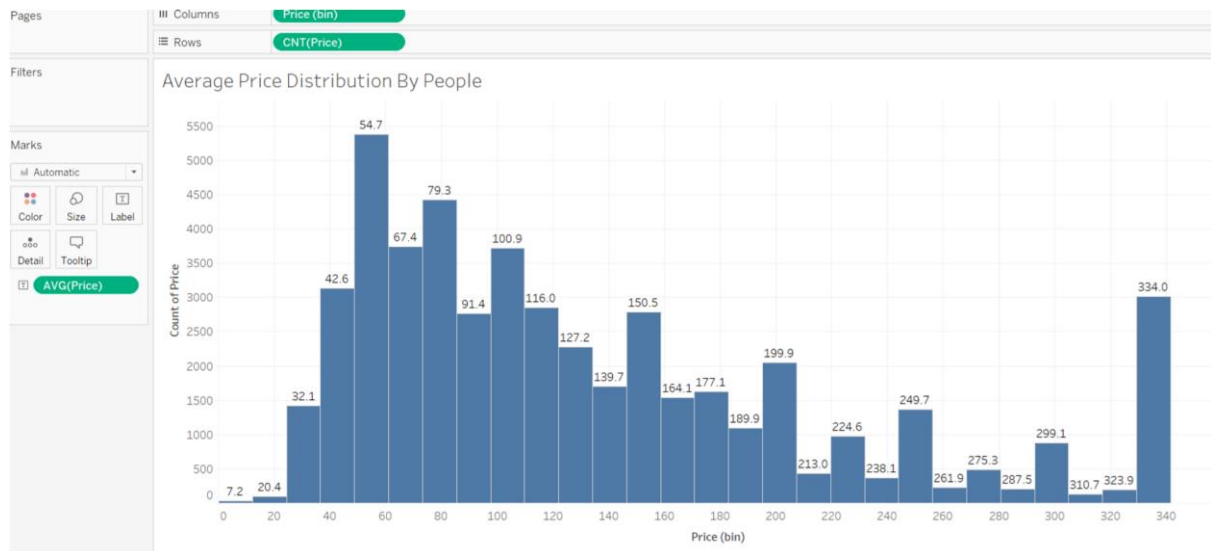
## Host with highest listing in the Neighborhood:



The graph shows Michael, David, Alex has more than 40% properties in New York and they earn more than others.

## Average price distribution by people:

This graph shows the average price range preferred by customers. Most people prefer between \$40 - \$160 prices.



## Price preferred by customer on basis of room type and neighborhood:



In this graph, it shows that Manhattan and Brooklyn have upper hand in both entire home and private room.



### List of top and least 10 Neighborhood w.r.t average per night price:

From below graphs, we can see Midtown is charging more price than others at a price of 95\$ for a night.

And Grant City is least charging 17\$ for a single night.

#### List of Top 10 Neighbourhood w.r.t AVG Per Night Price

Neighbourho..	Avg. Per Night Price	Avg. Price
Breezy Point	213.3	213.3
Neponsit	134.7	269.3
Jamaica Estates	116.9	157.7
Flatiron District	111.9	233.7
Belle Harbor	109.7	169.5
Shore Acres	109.5	152.7
NoHo	109.3	243.2
Grymes Hill	108.1	159.1
Mill Basin	105.1	179.8
Tribeca	101.0	260.5

#### List of Bottom 10 Neighbourhood w.r.t AVG Per Night Price

Neighbourhood	Av..	Avg. ...
Grant City	17.10	57.67
Hunts Point	17.43	50.50
Rossville	25.00	75.00
Richmondton	26.00	78.00
Bull's Head	26.18	47.33
Westerleigh	27.17	71.50
Concord	27.44	58.19
Bay Terrace, Staten ..	27.50	102.50
Castle Hill	27.83	63.00
Howland Hook	29.17	100.00

- Then we have created a listing chart to show average availability 365, earnings, minimum nights, number of review and price w.r.t host name.
- Then we have created dashboards and stories to get clear idea of the attributes and to give insights, suggestions to improve the business.
- Then made the presentation and added recommendations.

## **Adjustments in the existing properties to make it more customer-oriented:**

- With the exception of Manhattan and Brooklyn, every other city needs to alter its marketing plan to boost sales.
- Most customers prefer to invest their money in the \$40 to \$160 range. Try a fresh marketing tactic to draw customers, such as offering deals and reductions.
- Every unpopular locality needs to alter their current plan in order to increase revenue, such as by creating a tourism draw, changing their infrastructure, starting recreation and sports clubs in the properties.
- Increase the customer's purchasing ability, etc.
- Bookings from clients may rise if there are more coastal purchases and new construction.

## **Recommendations:**

- Airbnb can concentrate on promoting shared rooms with targeted discounts to increase bookings.
- New acquisitions can be explored to acquire 'private rooms' in Manhattan and Brooklyn and 'entire homes' in Bronx and Queens.
- Manhattan & Brooklyn have higher number of bookings compared to the others; these areas can be further targeted. Also, weekly or bi-weekly rentals can also be acquired as these can be used customers stranded in NYC for quarantine purposes.
- In line with the earlier recommendation, we observe that 'private rooms' of Manhattan & Brooklyn and 'entire homes' in Bronx and Queens fall in the favorable price range.

- Brooklyn has an average price of \$113. As there are already many listings available in Manhattan, Brooklyn can be considered for expansion.
- Increasing acquisitions and new properties in coastal regions can increase customer bookings.
- Promotion of shared rooms with discounts can increase bookings.

## **Inference after analyzing the data:**

- We saw that people like to visit the center of New York from where they can see the beauty of the city.
- Number of listings of shared rooms are limited but their average price is placed less and availability is high.
- Number of reviews and reviews per month are more at less price than the higher price as there is less chance of people going for a high price room.
- Manhattan and Brooklyn are very costly Neighborhood groups and are most visited.
- Minimum number of nights to stay reduces with increase in price.
- Focus on prime locations like Manhattan and Brooklyn where people show interest.