



Storytelling Case study: Airbnb, NYC Methodology Document

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PROBLEM STATEMENT

Airbnb's revenue has experienced a significant decline in the past few months, mainly due to travel restrictions caused by the Covid-19 pandemic. The most considerable drop occurred in Q2 2020 in New York City. As travel restrictions begin to ease and people start to travel again, Airbnb aims to ensure that it is fully prepared for the change.

OBJECTIVE

- Over the last few months, there has been a significant drop in revenue for Airbnb.
- With the lifting of restrictions, Airbnb wants to ensure it is well-prepared for the changes.
- Identify the next best steps for Airbnb, we need to examine a dataset of various Airbnb listings in New York.
- Our aim is to minimize the economic and commercial impacts of Covid-19 on Airbnb in New York City by improving our strategy.
- When the pandemic struck, we realized that we needed to prioritize our core business of hosting - which is the essence of Airbnb - and understand what makes it unique: everyday people hosting their homes and offering experiences.
- Provide early recommendations for adjustments to existing properties to enhance the customer experience.
- Airbnb's revenue has experienced a significant decline in recent months due to the COVID-19 pandemic and the resulting lockdowns that have imposed travel restrictions, leading to a significant reduction in the company's income.
- Now that the restrictions are being lifted, it is important for the business to be well-prepared to recover from the financial losses incurred during the pandemic.
- To achieve this, an analysis has been conducted on a dataset comprising various Airbnb listings in New York.

DATA ASSUMPTIONS

The data provides evidence that the company was able to achieve its goals and generate profits before the Covid-19 pandemic.

With travel now gradually becoming possible once again, the company can focus on developing more effective marketing and business strategies to increase its profitability.

DATA METHODOLOGY

Tools: Power BI for visualization, Python with some libraries.

1. Preparation and Understanding

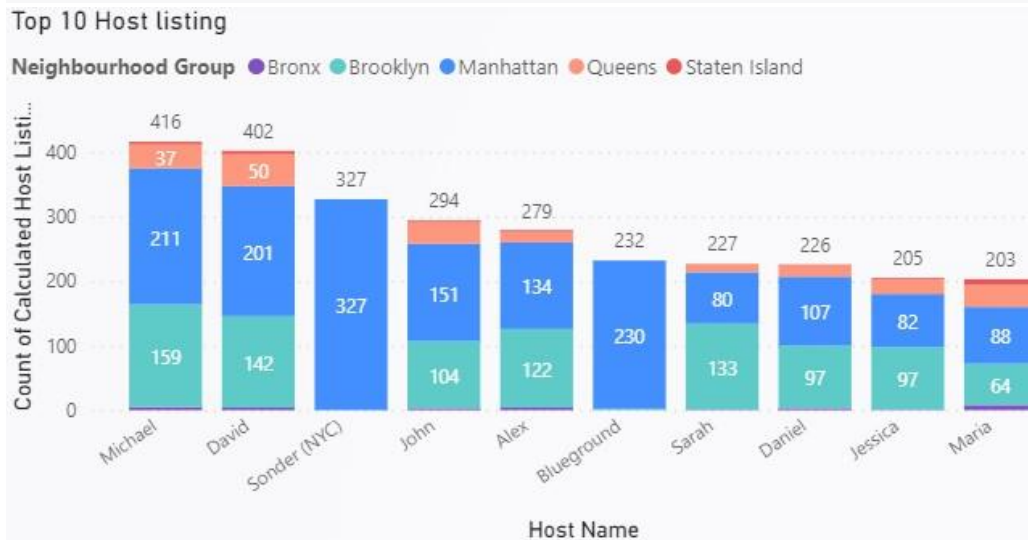
- Libraries imported: numpy as np, pandas as pd, matplotlib.pyplot as plt, matplotlib.image as mpimg, %matplotlib inline and seaborn as sns.
- Dataset loaded, datatype checked, and dimension/size of data frame confirmed.

2. Handling Missing Values and Outliers

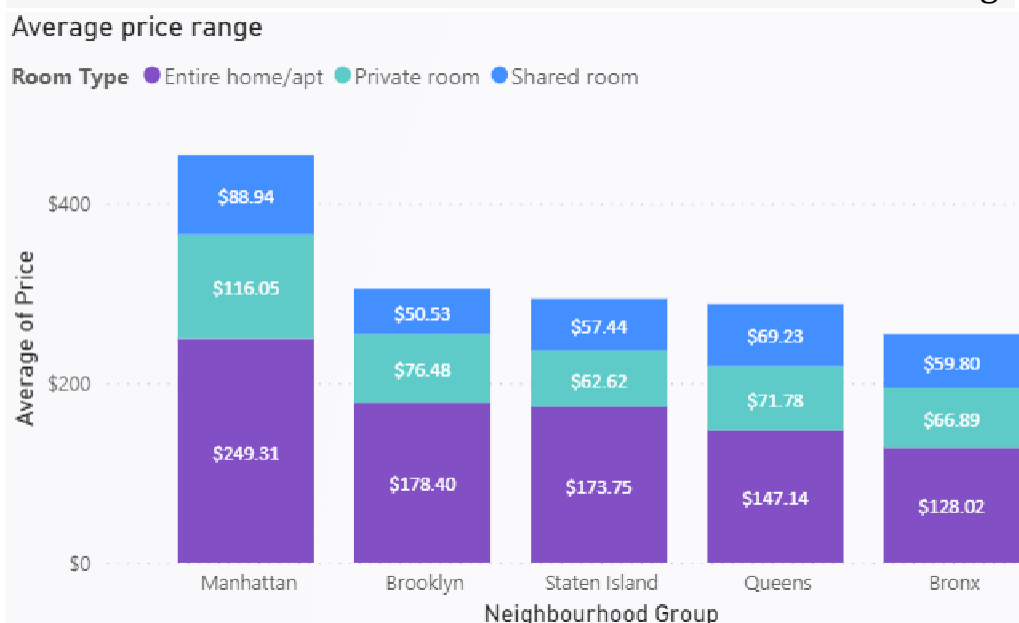
- Missing values and outliers were checked in the data frame.
- Columns "last_review", "reviews_per_month", "host_name", and "name" had missing values, with "last_review" and "reviews_per_month" having NaN values indicating some properties didn't receive reviews.
- Columns "price", "minimum_nights", "number_of_reviews", "reviews_per_month" and "calculated_host_listings_count" had outliers.
- However, no treatment was applied to missing values and outliers.

DATA ANALYSIS

- To explore data, we analyze its statistics, visualize features, and correlations between them, and then explain the process and results.
- When exploring data, we can follow a left-to-right rule to ensure we explore each column individually and learn as much as we can about the dataset, especially when working with datasets with a large number of attributes.
- A barplot was created to display the distribution of the top 10 hosts with the most listings. The first host, Michael on the list had more than 400 listings.



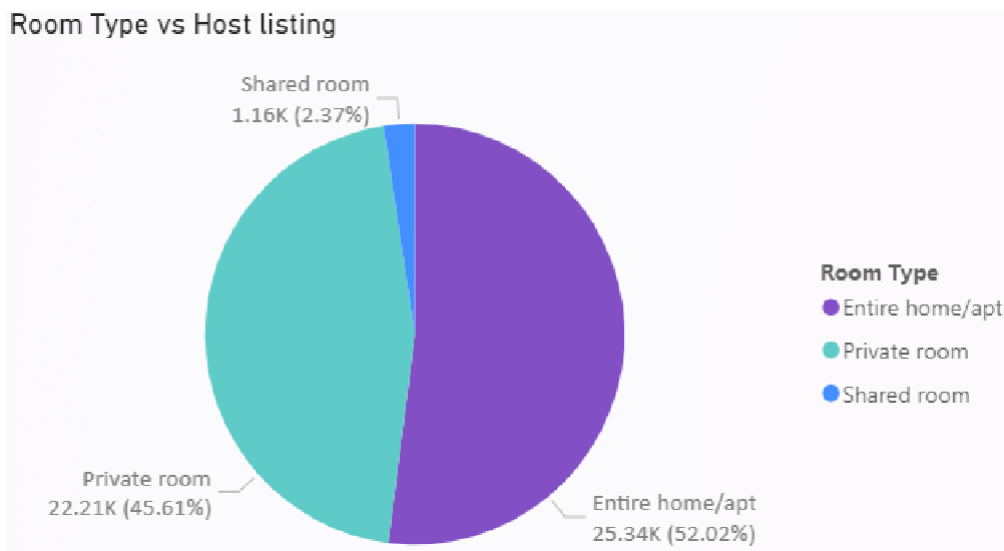
By using a statistical table and a stacked bar chart, we can make several observations about the distribution of prices for listings in different NYC boroughs. Manhattan has the highest range of prices with an average of over \$200 per night, followed by Brooklyn with around \$170 per night. Queens and Staten Island have similar price distributions, while the Bronx is the cheapest. These findings were expected as Manhattan is known to be one of the most expensive places to live, while the Bronx is considered to have lower standards of living.



Bi-Multivariate Analysis using Power BI

The categorization of Room type based on customer preferences

1. The room types Entire home/apartment and Private room account for 52.02% and 45.61% of the listed properties in the given dataset with Shared room as 2.37% only.
2. According to the analysis, it seems like the Hosts prefer to lease out/rent Entire Homes/Apartments in comparison of opting for shared room listings.



Manhattan and Brooklyn have the highest average prices for Entire Home or Apartment in the area, with prices over \$200 and \$170, respectively. On the other hand, Bronx and Queens have the most affordable prices for Entire Home or Apartment, with prices of \$128.02 and \$147.14, respectively.

Neighborhood Group and the property prices in context with room types

- Bronx and Staten Island have the cheapest rental properties. However, Manhattan has the most expensive properties listed, followed by Brooklyn.
- Compared to the other neighborhood groups, the difference in price between whole house/apartment and private room varies from 5 to 10%.
- Costliest listing type in both Manhattan and Brooklyn is for Entire Home or an apartment.



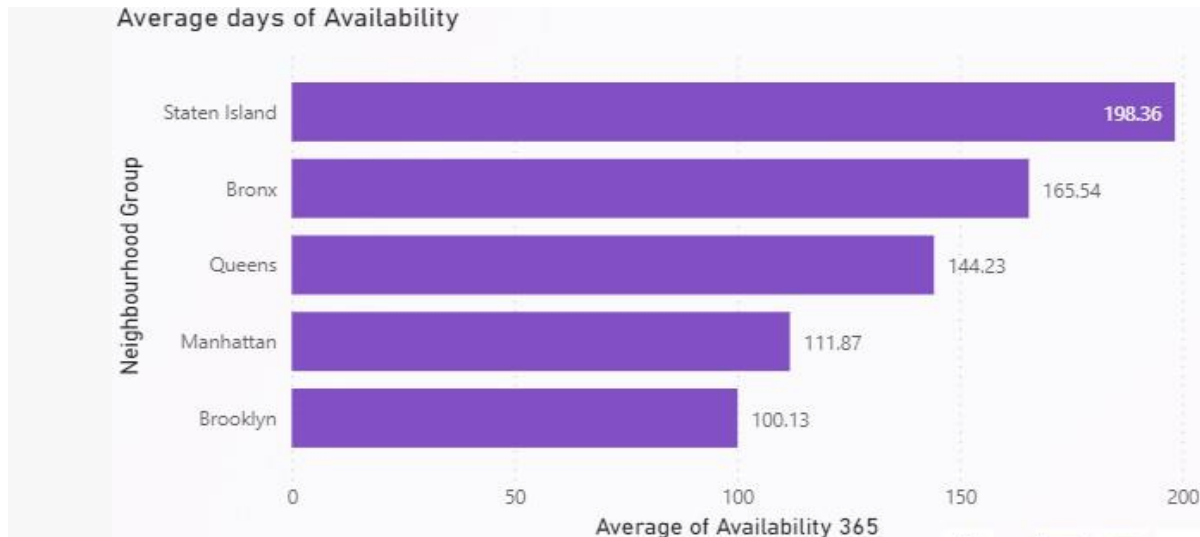
Average Price for Room types

- One can clearly see that being at \$211.91, Entire Home or Apartment is the most expensive kind of Room type available.
- Making Private rooms with an average of \$89.52 a little more affordable.
- However, shared rooms with \$70.10 as an average price remain the least listing of room type expensive.



Average Days of Availability

- With the average of 198(round figure), Staten Island has highest number of availabilities throughout the year.
- Making Brooklyn either most in demand or with least availability on average at a number of 100 days a year.



- Fort Wadsworth and Woodrow, both located in Staten Island, are the two neighborhoods with the highest average property prices.
- Tribeca and Battery Park City, both in Manhattan, are among the top 20 neighborhoods with the highest average property prices, with Manhattan having a total of 12 neighborhoods in the top 20.
- The top 20 neighborhoods with the highest average property prices include only one neighborhood each from Brooklyn, Queens, and the Bronx, namely Sea Gate, Riverdale, and Neponsit, respectively.

