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Data 101

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<p style="text-align:center">AirBnB in NYC</p>

About Me

My name is Christopher, I am currently a senior majoring in Economics and minoring in Business Administration. Over the past year or so, I gained an interest in data analytics and uncovering useful information in a world full of data. For a brief period, I was also a real estate agent, so I have a good understanding of the home buying process and understand the benefits that come with owning real estate. I chose this dataset on AirBnB not only because of my interest in real estate but also because people will always need a place to stay whether it is to own, rent, or even just for the night.

Background and Its Importance

AirBnB has become a major disruptor in the hospitality industry. Guests and hosts have used Airbnb since 2008 and it has provided a new way to connect hospitality services and rental services to customers in different locations across the globe. This new flexibility for customers as well as real estate owners has given a new challenge to hotels who struggle to keep up with AirBnB.

This data was obtained from Kaggle, however the dataset comes from AirBnB. The dataset shows the listings and metrics in the New York City area for 2019 that includes over

48,800 observations. This data is important to know since more people are switching from using hotels to homes, apartments, or rooms as they provide benefits that hotels cannot offer. Not only can users find more affordable prices, but they also have more options to choose when picking a location to rent. This can also be interesting for people who are considering becoming landlords in New York City as there may be an opportunity waiting to be seized in the market.

Analysis

When looking through the data it was found that out of all the boroughs in New York City, the two boroughs with the most listings on AirBnB were Manhattan and Brooklyn with 21,661 and 20,104 listings respectively. These two boroughs alone represented over 80% of AirBnB's listings in NYC for this dataset.
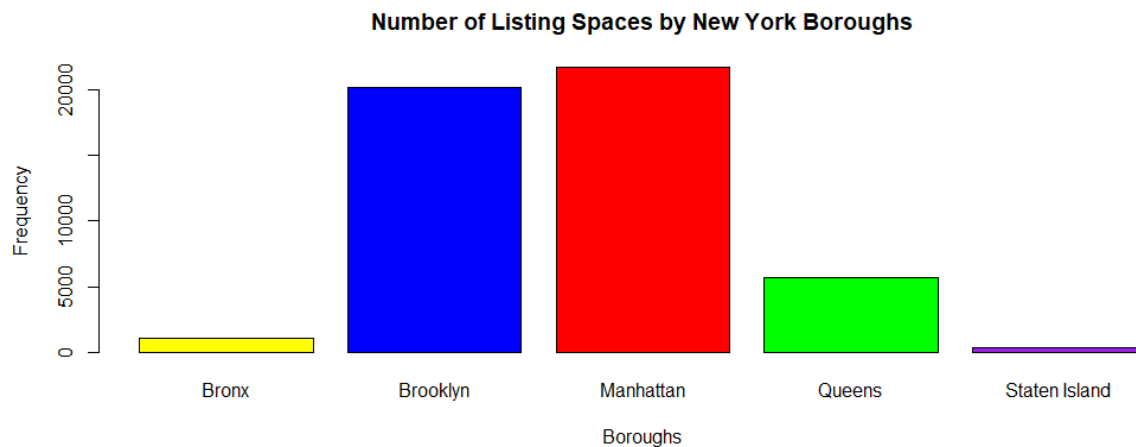
I decided to look further into the two boroughs and found the average prices for each room type. I was surprised to find out that Manhattan homes were about $70 more expensive to rent than Brooklyn homes. Homes were also found to be on average more than twice the price of private rooms.

```
> tapply(manhattan_neighborhoods$price, manhattan_neighborhoods$room_type, mean)
Entire home/apt     Private room     Shared room
    249.23911          116.77662        88.97708
```

Figure 1: Average price of Room Type in Manhattan

```
> tapply(brooklyn_neighborhoods$price, brooklyn_neighborhoods$room_type, mean)
Entire home/apt     Private room     Shared room
    178.32754           76.50010        50.52785
```

Figure 2: Average price of Room Type in Brooklyn

It appears that the prices of homes and apartments for rent in Manhattan are higher than that of Brooklyn. However, to make sure this assumption has some validity and did not just occur by chance, I looked at the p-value. I began by subsetting the data to only look at prices of homes/apartments in both Manhattan and Brooklyn. I followed this by finding the standard deviation of both boroughs which was obtained by finding the variance and number of observations for each borough. Lastly, I used the Two-Sample z-test formula to compare the two mean prices of homes/apartments.

Null hypothesis: The mean prices of Homes/Apartments in Manhattan are the same price as in Brooklyn.

Alternative hypothesis: The mean prices of Homes/Apartments in Manhattan are higher than in Brooklyn.

The **z-score** was **19.15458** which gave a **p-value** of **0**.

Result:

Since the p-value of 0, is smaller than our significance level of 0.05 we reject the null hypothesis. There is significant evidence that prices of homes/apartments in Manhattan are higher than that of Brooklyn.

Final Thoughts:

From the results found, we can see that anyone who is considering using AirBnB's services in NYC should expect to pay a higher price in Manhattan. This could be useful for those who may want to visit as they could save money by staying in Brooklyn. In addition to this, from my experience as a real estate agent, this does seem to make sense as location is oftentimes the main factor in the value of a home. Manhattan may have more points of interest than the other boroughs, museums like the MET or places like Central Park or Wall Street are in Manhattan. Landlords or future landlords may want to consider renting in Manhattan out of all boroughs since the prices seem to be higher. This will warrant further research as there could be an opportunity for future investors in real estate.

Source of dataset:

https://www.kaggle.com/dgomonov/new-york-city-airbnb-open-data