

# Storytelling Case Study: Airbnb, NYC Case Study IIIT-B

## Methodology Document PPT 1:

In the case study we have used Jupiter notebook to perform initial analysis of the data and Tableau for data analysis and visualization.

**Initial Analysis using Jupiter Notebook:** Data Set Used: AB\_NYC\_2019.csv

**Number of Rows:** 48895

**Number of Columns:** 16

```
# Import the necessary libraries
import warnings
warnings.filterwarnings("ignore")
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

```
# Data conversion and Understanding
airbnb = pd.read_csv("AB_NYC_2019.csv")
airbnb.head(5)
```

	id	name	host_id	host_name	neighbourhood_group	neighbourhood	latitude	longitude	room_type	price	minimum_nights	number_of_reviews
0	2539	Clean & quiet apt home by the park	2787	John	Brooklyn	Kensington	40.64749	-73.97237	Private room	149	1	
1	2595	Skylit Midtown Castle	2845	Jennifer	Manhattan	Midtown	40.75362	-73.98377	Entire home/apt	225	1	
2	3647	THE VILLAGE OF HARLEM....NEW YORK!	4632	Elisabeth	Manhattan	Harlem	40.80902	-73.94190	Private room	150	3	
3	3831	Cozy Entire Floor of Brownstone	4869	LisaRoxanne	Brooklyn	Clinton Hill	40.68514	-73.95976	Entire home/apt	89	1	
4	5022	Entire Apt. Spacious Studio/Loft by central park	7192	Laura	Manhattan	East Harlem	40.79851	-73.94399	Entire home/apt	80	10	

```
# Check the rows and columns of the dataset
airbnb.shape
```

```
(48895, 16)
```

- The dataset contains 48895 rows and 16 columns
- Now we have to check whether there are any missing values in the dataset

```
# Calculating the missing values in the dataset
airbnb.isnull().sum()
```

```
id                0
name             16
host_id          0
host_name        21
neighbourhood_group 0
neighbourhood     0
latitude          0
longitude         0
room_type        0
price            0
minimum_nights   0
number_of_reviews 0
last_review      10052
reviews_per_month 10052
calculated_host_listings_count 0
availability_365  0
dtype: int64
```

```
# Now we have the missing values, there are certain columns that are not efficient to the dataset
airbnb.drop(['id', 'name', 'last_review'], axis = 1, inplace = True)
```

```
# View whether the columns are dropped
airbnb.head(5)
```

	id	name	host_id	host_name	neighbourhood_group	neighbourhood	latitude	longitude	room_type	price	minimum_nights	number_of_revie
0	2539	Clean & quiet apt home by the park	2787	John	Brooklyn	Kensington	40.64749	-73.97237	Private room	149	1	
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- We removed the columns like Id, Name, Last Review which was not giving much information.

```
# Now reviews_per_month contains more missing values which should be replaced with 0 respectively  
airbnb.fillna({'reviews_per_month':0},inplace=True)
```

```
airbnb.reviews_per_month.isnull().sum()
```

0

```
# There are no missing values present in reviews_per_month column  
# Now to check the unique values of other columns'  
airbnb.room_type.unique()
```

```
array(['Private room', 'Entire home/apt', 'Shared room'], dtype=object)
```

```
len(airbnb.room_type.unique())
```

3

```
airbnb.neighbourhood_group.unique()
```

```
array(['Brooklyn', 'Manhattan', 'Queens', 'Staten Island', 'Bronx'],  
      dtype=object)
```

```
len(airbnb.neighbourhood_group.unique())
```

5

```
len(airbnb.neighbourhood.unique())
```

221

---

## Step 2: Data Wrangling:

- Checked the Duplicate rows in our dataset and no duplicate data was found.
- Checked the Null Values in our dataset. Columns like name, host-name, last review and review-per-month have null values.
- We've dropped the column name as missing values are less and dropping it won't have significant impact on analysis.
- Checked the formatting in our dataset.
- Identified and review outliers.

## Data Analysis and Visualizations using Tableau:

We have used tableau to visualize the data for the assignment. Below are the detailed steps used for each visualization.

### 1) Top 10 Host:

- We identified the top 10 Host Ids, Host Name with count of Host Ids using the tree map.



### 2) Preferred Room type with respect to Neighbourhood group:

- We created a pie chart for understanding the percentage of room type preferred w r t neighbourhood group
- We added Room Type to the colours Marks card to highlight the different Room Type in different colours and count of Host Id to the size

### 3) For Variance of price with Neighbourhood Groups:

- We used a box and whisker's plot with Neighbourhood Groups in Columns and Price in Rows.
- We changed the Price from a Sum Measure to the median measure.

#### 4) Average price of Neighbourhood groups:

- We created a bubble chart with Neighbourhood Groups in Columns and Price column in Rows.
- We added the Neighbourhood Groups to the colors Marks card to highlight the different neighbourhood Groups in different colors. Also Put Avg price in Label.

#### 5) Customer Booking w r t minimum nights:

- We created the bin for Minimum nights as shown below.



- The bins were used to display the distribution of minimum nights based on the number of ids booked for each neighbourhood group.

#### 6) Popular Neighborhoods:

- We took neighbourhood in rows and sum of reviews in column and took neighbourhood groups in colour.
- We used filter to show Top 20 neighbours as per the sum of reviews.

#### 7) Neighbourhood vs Availability:

- We created a dual axis chart using bar chart for availability 365 and line chart for price for top 10 neighbourhood group sorted by price.

## **Methodology Document PPT 2:**

### **1) Room type with respect to Neighbourhood group:**

- We created a pie chart for understanding the percentage of room type preferred w.r.t neighbourhood group
- We added Room Type to the colours Marks card to highlight the different Room Type in different colours and count of Host Id to the size

### **2) Customer Booking with respect to minimum nights:**

- We created the bin for Minimum nights as shown below.



- The bins were used to display the distribution of minimum nights based on the number of ids booked for each neighbourhood group.

### **3) Neighbourhood vs Availability:**

- We created a dual axis chart using bar chart for availability 365 and line chart for price for top 10 neighbourhood group sorted by price.

### **4) Price range preferred by Customers:**

- We have taken pricing preference based on volume of bookings done in a price range and no of Ids to create a bar chart. We have created bin for Price column with interval of \$20.

### **5) Understanding Price variation w.r.t Room Type & Neighbourhood:**

- We created Highlights Table chat by taking Room Type in rows & Neighbourhood Group in column.
- We took the average price in colour Marks card to highlight the different Room Type in different colours.

**6) Price variation w r t Geography:**

- We used Geo location chart to plot neighbourhood, neighbourhood Group in map to show case the variation of prices across.

**7) Popular Neighborhoods:**

- We took neighbourhood in rows and sum of reviews in column and took neighbourhood groups in colour.
- We used filter to show Top 20 neighbours as per the sum of reviews.

**8) Tools used:**

- Data cleaning and preparation: Jupyter notebook – Python
- Visualization and analysis: Tableau
- Data Storytelling: Microsoft PPT