
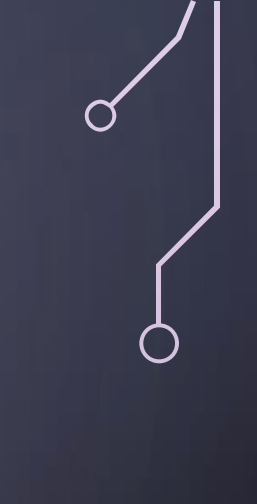
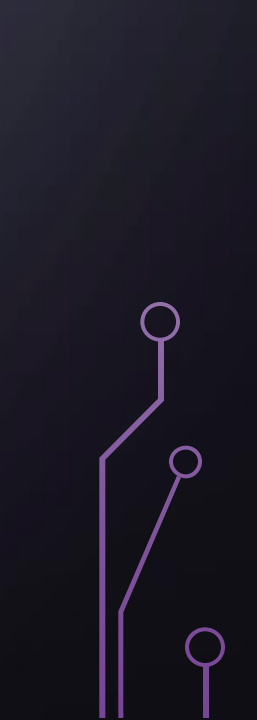


A decorative graphic on the left side of the slide, consisting of white lines and small circles that resemble a circuit board or a stylized tree structure, extending from the top to the bottom.

# AIRBNB STORYTELLING CASE STUDY


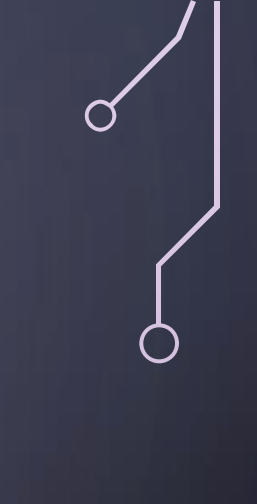
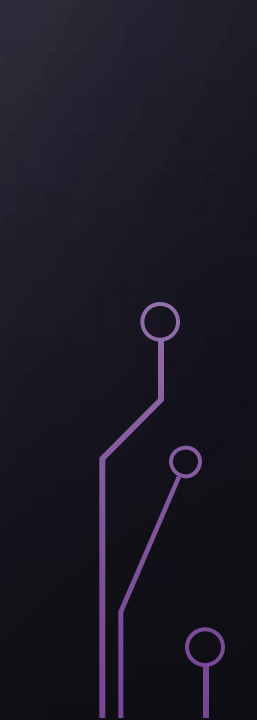


# AGENDA

- Objective
  - Background
  - Key findings
  - Recommendations
  - Appendix
    - Data methodology
    - Data model Assumptions
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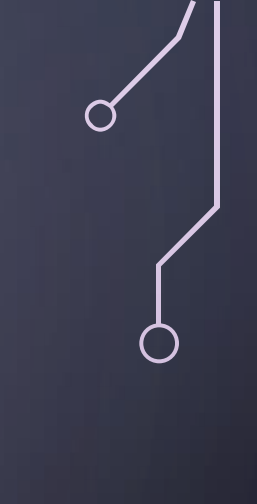
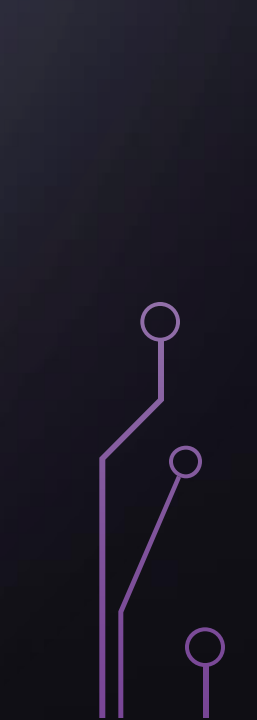


# OBJECTIVE

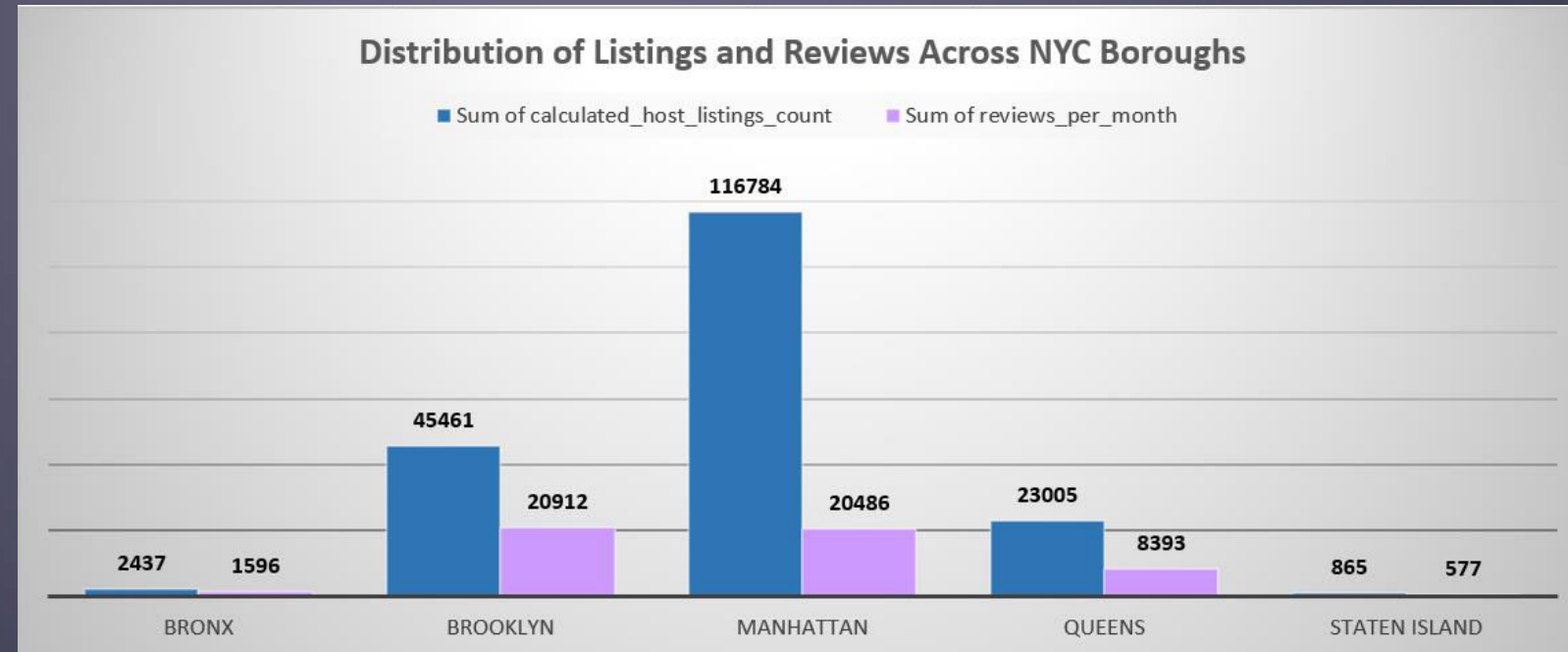
- Analyze Airbnb's listing data and identify which types of hosts to acquire and target specific areas for expansion.
  - Identify trends in Airbnb listing performance across NYC's boroughs
  - Provide recommendations for improving revenue generation based on insights derived from data analysis.
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# BACKGROUND

- Airbnb has seen a significant decline in revenue over the past few months. There is a need to better understand how listings vary in performance across different boroughs and neighborhoods of NYC.
  - Leaders want to understand trends in customer preferences, host acquisitions, and property performance.
  - Insights are needed to increase bookings and ensure an optimal mix of listings.
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## IMPACT ON MARKET THROUGH LISTINGS AND ENGAGEMENT



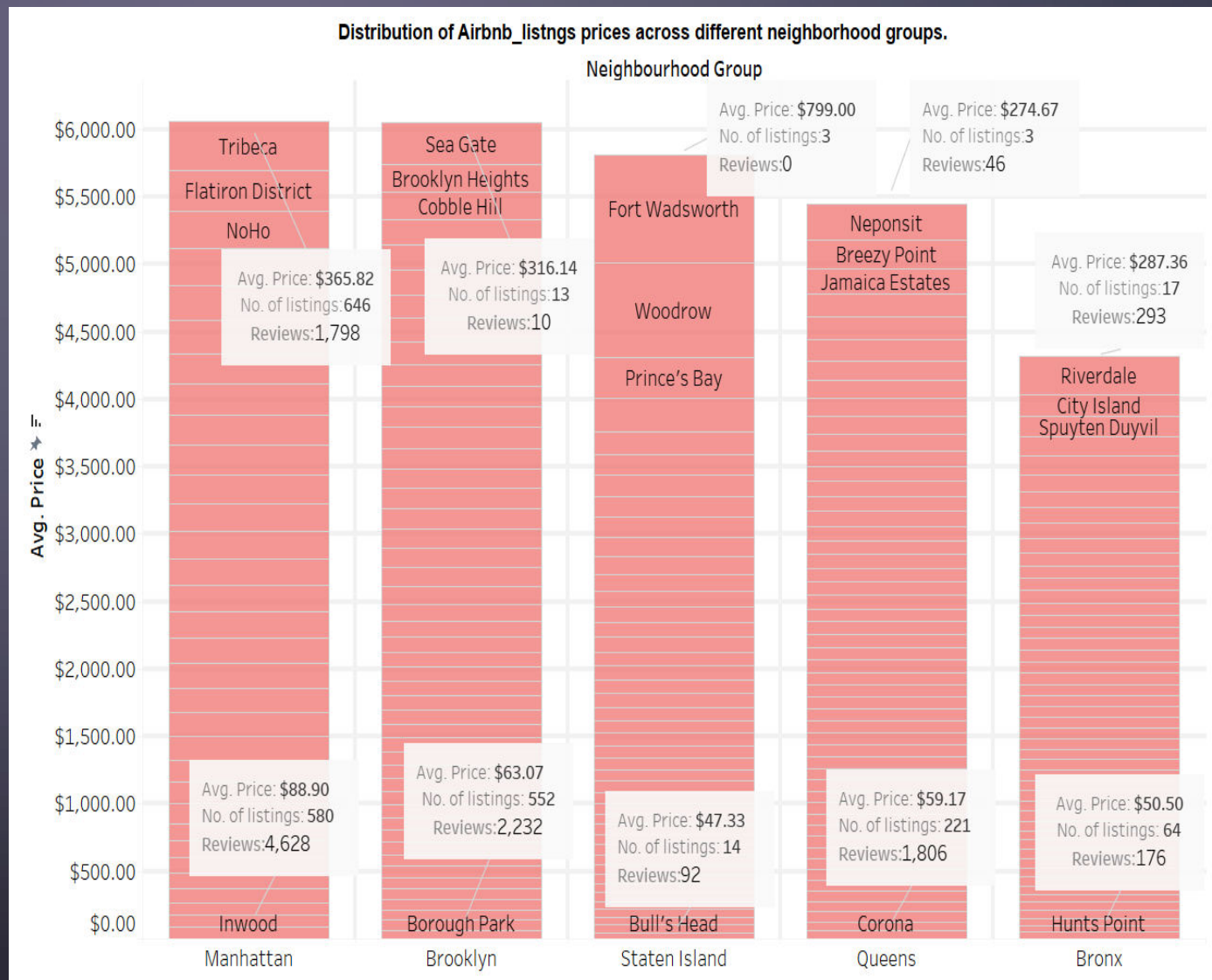
- Manhattan has a **strong market presence** but Brooklyn has **higher customer engagement**.
- With 23,005 listings and 8,393 reviews per month, **Queens** demonstrates a good balance, suggesting a **stable market**.
- Customer Engagement for Staten Island is **not significantly worse** than the Bronx, even though it has a **smaller market presence**.

## MIN TO MAX AVERAGE PRICE DISTRIBUTION ACROSS NEIGHBORHOODS

- Budget-friendly** areas such as Inwood (Manhattan), Borough Park (Brooklyn), and Corona (Queens) shows significant customer engagement.

- Manhattan has extreme neighborhood pricing variations, from high priced (Tribeca) to more affordable (Inwood), with solid listing and customer presence throughout.

- Bronx has a **dynamic range** of property pricing, showing moderate customer presence in both premium (Riverdale) and budget listings (Hunts Point) areas.



## TOP-PERFORMING LISTINGS OF EACH NEIGHBOURHOOD GROUPS WITH HIGHEST REVIEWS

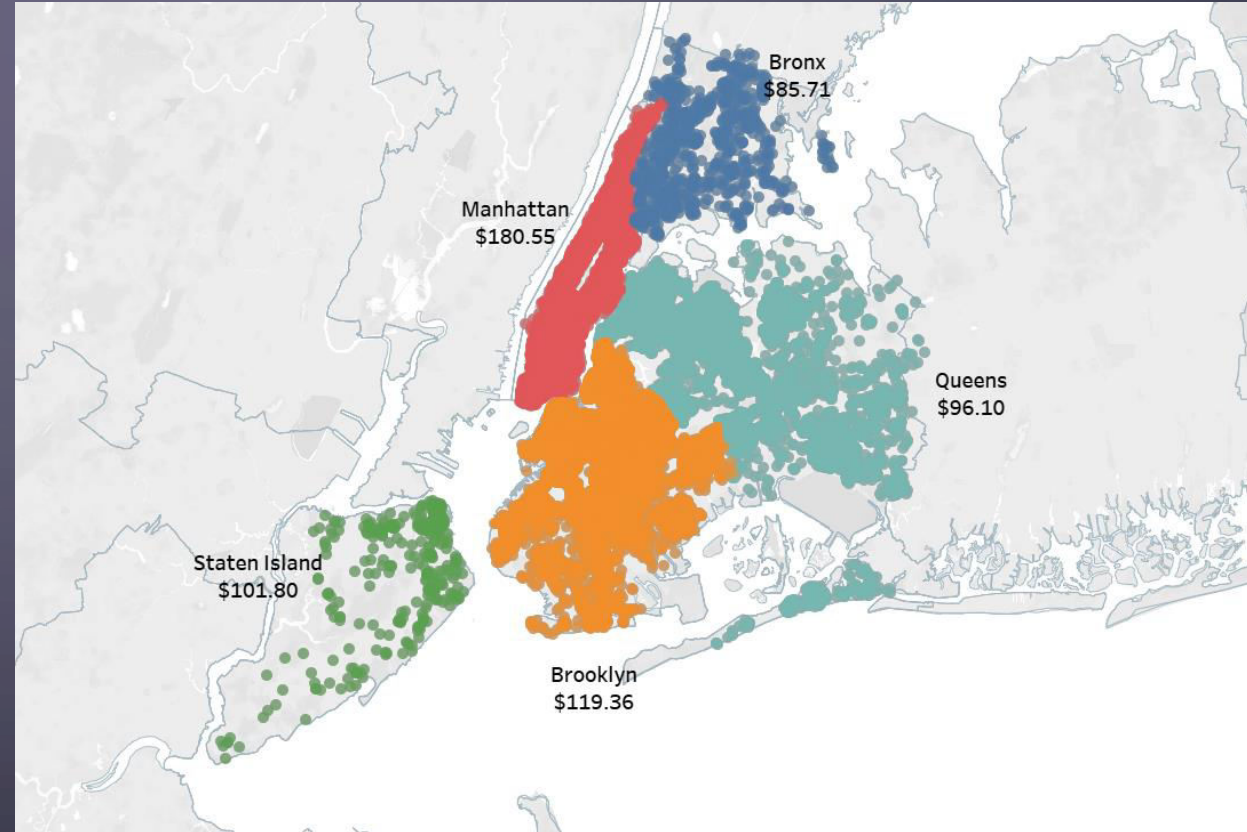


- In Bronx and Staten Island, specific hosts have **multiple top-performing listings** in the different neighborhoods indicating their dominance in these neighborhood groups.
- Hosts with properties in neighborhoods like Prospect Heights (Brooklyn) and Hell's Kitchen (Manhattan) dominate the market, reflecting **strong booking trends**.
- In Brooklyn, Manhattan and Queens, the highest-reviewed listings are concentrated in just a few neighborhoods i.e. Bedford-Stuyvesant, Hell's Kitchen and East Elmhurst, highlighting **key areas of high demand** within these boroughs.



## PRICE AND LISTINGS ANALYSIS ACROSS NYC BOROUGHES

- **Manhattan leads** with the highest prices and maximum presence all over the location.
- Brooklyn and Queens with larger geographic area shows **balanced pricing** and substantial listings suggesting a stable market.
- Despite its large area, Staten Island's **few listings** demand higher prices but generate fewer reviews.





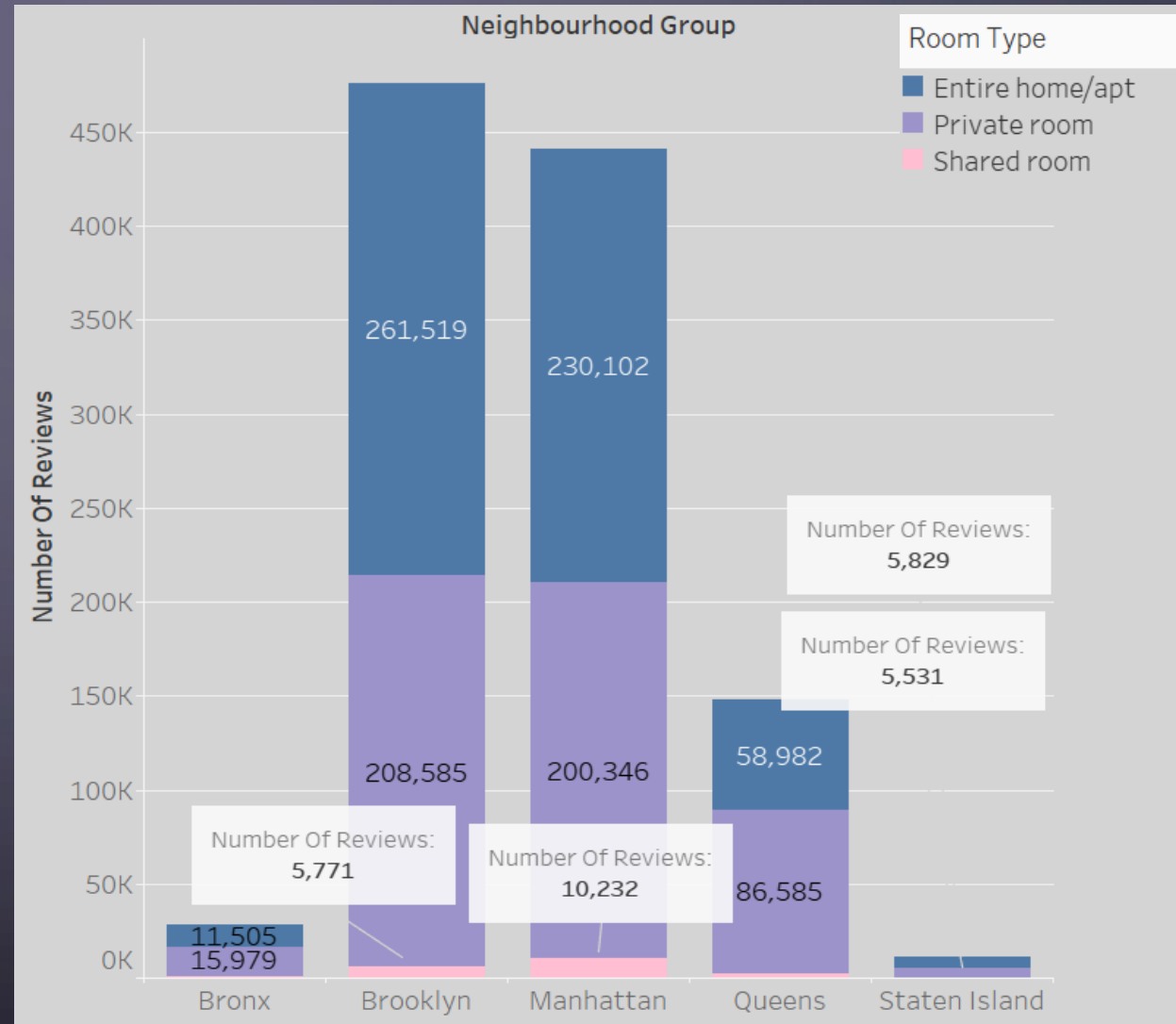
## TOP 10 TRENDING NEIGHBORHOODS FOR AIRBNB LISTINGS

- While neighborhoods like Bedford-Stuyvesant and Williamsburg excel in review counts, others like Hell's Kitchen exhibit a high number of listings with lower review counts.
- Harlem has the **most engagement among Manhattan neighborhoods**, suggesting strong interest area.
- Neighborhoods like East Village, Crown Heights, East Harlem, Upper West Side with fewer listings but high reviews, indicate **strong demand**.

Bedford-Stuyvesant Brooklyn Total Reviews:107,881 Num_Of_Listings:9,687	Harlem Manhattan Total Reviews:72,803 Num_Of_Listings:5,814	East Village Manhattan Total Reviews:42,494	Crown Heights Brooklyn Total Reviews:35,909
	Bushwick Brooklyn Total Reviews:51,189 Num_Of_Listings:6,377	East Harlem Manhattan Total Reviews:35,555	Upper West Side Manhattan Total Reviews:35,017
Williamsburg Brooklyn Total Reviews:82,851 Num_Of_Listings:5,596	Hell's Kitchen Manhattan Total Reviews:48,683 Num_Of_Listings:17,943	Upper East Side Manhattan Total Reviews:31,170 Num_Of_Listings:12,000	

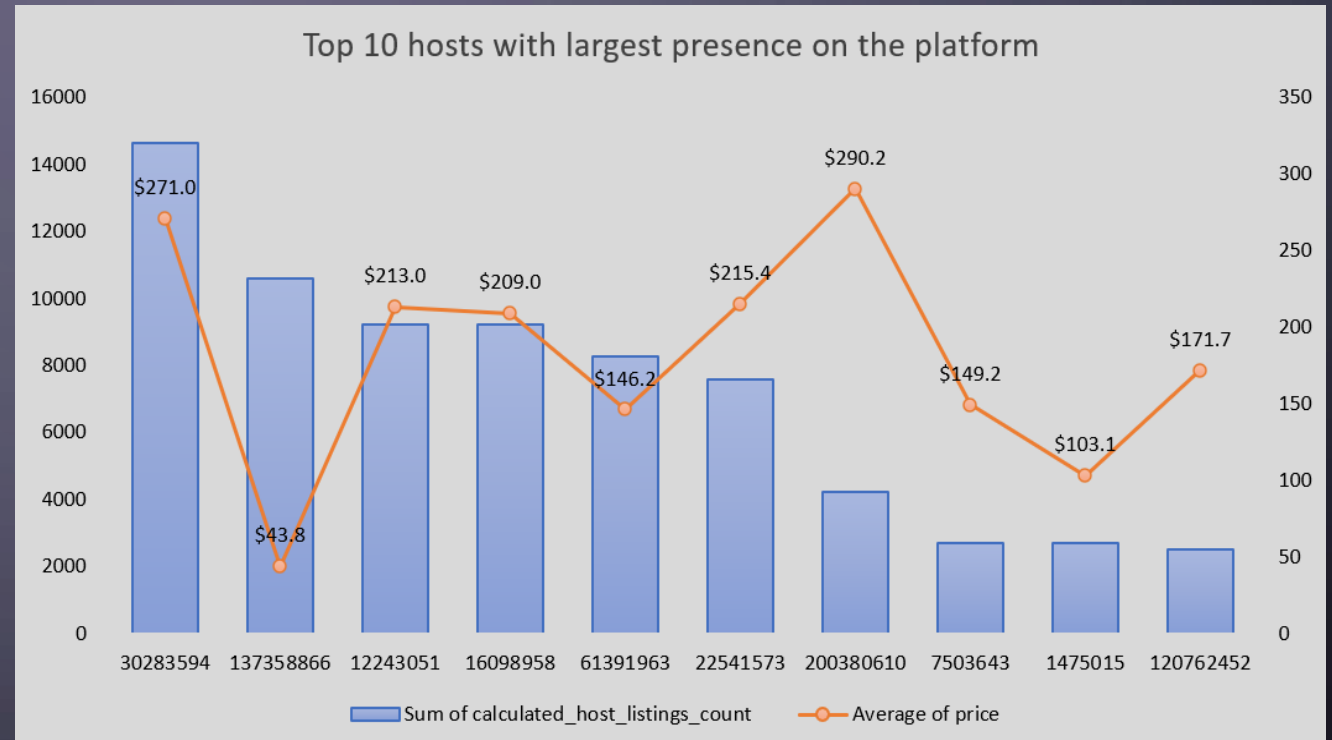
## ANALYSIS OF THE MOST PREFERRED ROOM TYPES

- With over 200K reviews each for **Private rooms** and **Entire homes/apt**, Brooklyn and Manhattan continue to dominate, showcasing the **popularity** of these room types in high-demand areas.
- Both Queens and the Bronx show a **unique trend**, private rooms dominate over entire home/apt.
- Shared rooms in Manhattan and Brooklyn, though fewer still attract more reviews than in other locations.



## ANALYZING TOP HOSTS' PRICING STRATEGY

- Host ID 30283594 dominates the market, while most top hosts managing over 8,000 listings have maintained their pricing in the \$140-\$200 range, indicating a trend towards **mid-tier pricing among high-volume hosts**.
- Host ID 137358866 offers the lowest average price among top hosts at \$43.8, contrasting significantly with Host ID 200380610, who has set a premium rate of \$290.2, indicating potential differences in **property quality**.
- Hosts such as 1475015 and 7503643, with consistent average prices around \$100-\$150, demonstrate **stability**.



# RECOMMENDATIONS

- Prioritize acquiring properties in high-demand, high-price neighborhoods like Tribeca and Brooklyn Heights to maximize revenue.
- Develop a marketing strategy for budget-friendly neighborhoods to boost bookings and increase overall occupancy.
- Focus on acquiring more properties in Staten Island to balance demand and reduce prices, attracting more bookings. Highlight and promote Staten Island properties to increase visibility and bookings, leveraging year-round availability.
- Given the high demand for private rooms in Queens and the Bronx, hosts should focus on improving and marketing these listings to attract more bookings.
- Enhance the appeal of shared rooms by upgrading amenities and ensuring clean, safe and comfortable conditions to attract more customers.
- Improve property listings in East Village to take advantage of the strong demand shown by reviews, and consider adding special features or experiences to attract more customers.
- Implement data-driven pricing strategies for hosts with many listings but low prices to increase occupancy and align supply with the right customer segment for each neighborhood.
- Study the strategies of high-value hosts to understand their strategies, pricing models.
- Given the concentration of high reviews in neighborhoods like Hell's Kitchen (Manhattan) and East Elmhurst (Queens), Airbnb should consider acquiring hosts in these areas.
- Focus marketing efforts on neighborhoods with higher average prices but fewer listings, such as Fort Wadsworth or Neponsit.

# APPENDIX: DATA METHODOLOGY

- Data description:
- Data wrangling:
  - Checking duplicate entries

```
# check for duplicates
airbnb.duplicated().sum()

0
```

- Handling the missing values by imputing and removing rows with less than 5% of missing values.

```
# filling the missing values for reviews_per_month with 0
airbnb['reviews_per_month'].fillna(0, inplace = True)

# drop the 'last_review' column
airbnb.drop('last_review', axis=1, inplace=True)

# drop rows with missing values in the 'name' column
airbnb = airbnb[~airbnb['name'].isnull()]

# check missing values
round((airbnb.isnull().sum()/len(airbnb)*100).sort_values(ascending = False), 2)

name                0.0
host_id             0.0
neighbourhood_group 0.0
neighbourhood        0.0
latitude            0.0
longitude           0.0
room_type           0.0
price              0.0
minimum_nights      0.0
number_of_reviews   0.0
reviews_per_month   0.0
calculated_host_listings_count 0.0
availability_365    0.0
dtype: float64
```

Column	Description
id	listing ID
name	name of the listing
host_id	host ID
host_name	name of the host
neighbourhood_group	location
neighbourhood	area
latitude	latitude coordinates
longitude	longitude coordinates
room_type	listing space type
price	
minimum_nights	amount of nights minimum
number_of_reviews	number of reviews
last_review	latest review
reviews_per_month	number of reviews per month
calculated_host_listings_count	amount of listing per host
availability_365	number of days when listing is available for booking

# APPENDIX: DATA METHODOLOGY

- Identifying and handling outlier: Capping values above the 99th percentile

```
# capping the outliers at 99th percentile
num_cols = ['price', 'minimum_nights', 'number_of_reviews', 'reviews_per_month', 'calculated_host_listings_count',
            'availability_365']

for col in num_cols:
    percentile_99 = airbnb[col].quantile(0.99)
    airbnb[col] = np.where(airbnb[col] > percentile_99, percentile_99, airbnb[col])
```

- Creating Calculated Fields:

- To calculate average price across the neighbourhood groups to see aggregate

avg\_price\_by\_NG

```
{ FIXED [Neighbourhood Group] : AVG([Price]) }
```

- Binning minimum nights

- Supporting Tools:

- Python
- Excel
- Tableau


Custom Bins for Min

```
IF [Minimum Nights] <= 5 THEN "1-5"
ELSEIF [Minimum Nights] <= 10 THEN "6-10"
ELSEIF [Minimum Nights] <= 15 THEN "11-15"
ELSEIF [Minimum Nights] <= 20 THEN "16-20"
ELSEIF [Minimum Nights] <= 25 THEN "21-25"
ELSEIF [Minimum Nights] <= 30 THEN "26-30"
ELSEIF [Minimum Nights] <= 35 THEN "31-35"
ELSE "35+"
END
```





# APPENDIX: DATA ASSUMPTIONS

- We assumed that a higher number of reviews reflects the popularity and demand for a listing, suggesting higher occupancy rates.
  - We assumed that hosts' pricing and availability strategies are consistent over time.
  - We assumed that higher pricing generally correlates with higher quality.
  - We assumed that historical data on reviews and occupancy would be indicative of future trends.
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