

BAA2054: Group Assignment

# Unveiling Airbnb Market Dynamics, A Comprehensive Data Analysis

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# Objectives



## Objectives

- Provide actionable insights
- Help optimise performance and maintain competitive edge



## Methodologies

- **Microsoft Excel** for initial data exploration and analysis.
- **R** for conducting complex statistical analysis and machine learning.
- **Power BI** for creating interactive dashboards that provide a comprehensive overview of the data and insights.

## Four Pivotal Strategies Identified

- Boosting Host Responsiveness
- Leveraging Reviews
- Adapting to Trends and Seasonality
- Optimising Rental Pricing

# Correlation Analysis

## 1st Correlation Matrix

	host_response_rate	number_of_reviews	review_scores_rating
host_response_rate	1		
number_of_reviews		1	
review_scores_rating	0.046643441	-0.023412674	1

**Host Response Rate and Number of Reviews:** The correlation is 0.072, which is very weak

**Number of Reviews and Review Scores:** Interestingly, there's a slight negative correlation of -0.023

**Host Response Rate and Review Scores:** The correlation here is 0.047, which is positive relationship

## 2nd Correlation Matrix

	Rental_Price	accommodates	bathrooms	bedrooms	beds
Rental_Price	1				
accommodates	0.519323253	1			
bathrooms	0.459058717	0.50546024	1		
bedrooms	0.494379282	0.709201255	0.589764909	1	
beds	0.432998122	0.810220803	0.525655346	0.709162408	1

**Rental Price and Accommodation Capacity:** There's a moderate positive correlation of 0.52

**Rental Price and Amenities:** Bathrooms (0.46), bedrooms (0.49), and beds (0.43) all show moderate to strong positive correlations with rental price

# Regression Analysis

## Analyse Effectiveness of Host Response Rate on Review Score Ratings

"Analyzing the Effect of Host Responses Rate on Airbnb Review Score Ratings"

### SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.986742624
R Square	0.973661006
Adjusted R Square	0.97364751
Standard Error	15.37872315
Observations	74095

### ANOVA

	df	SS	MS	F	Significance F
Regression	1	647786953.2	647786953.2	2738997.521	0
Residual	74094	17523610.79	236.5051258		
Total	74095	665310564			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	92.34887062	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
host response rate	2.250553922	0.05835206	1654.991698	0	96.45780576	96.68655	96.45781	96.68655

### R Square

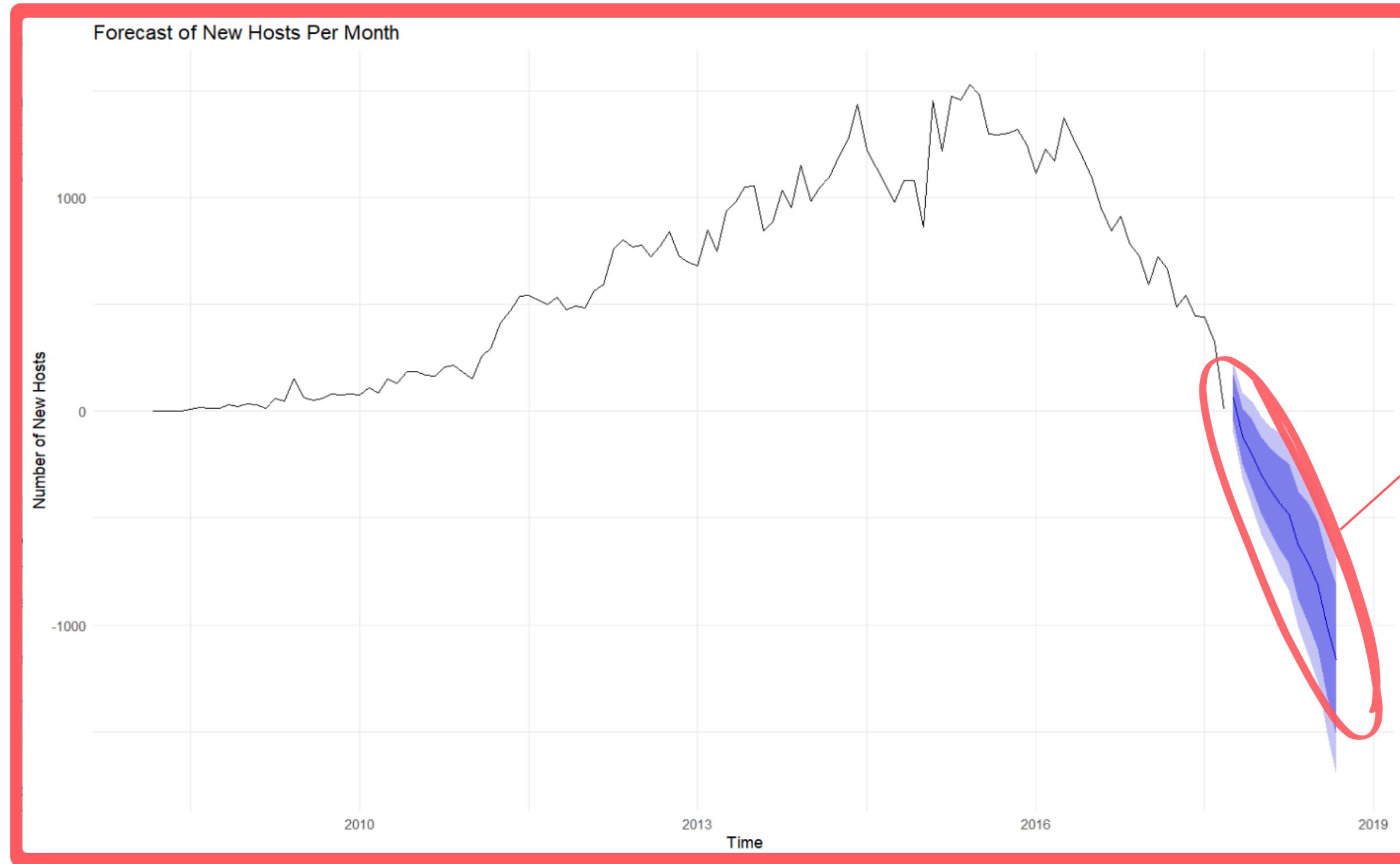
- Positive correlation between independent variables and dependent variables

### Significance F

- Statistics model are high & statistically significance
- A strong evidence to reject null

# Time-Series Forecast

## Host Onboarding Trend Analysis



Forecast Result :  
Sharp Decline Might  
Occur

# Decision Tree Analysis

## Develop Data-Driven Pricing Strategies, Enhancing Revenue and Competitiveness

### Key Insights:

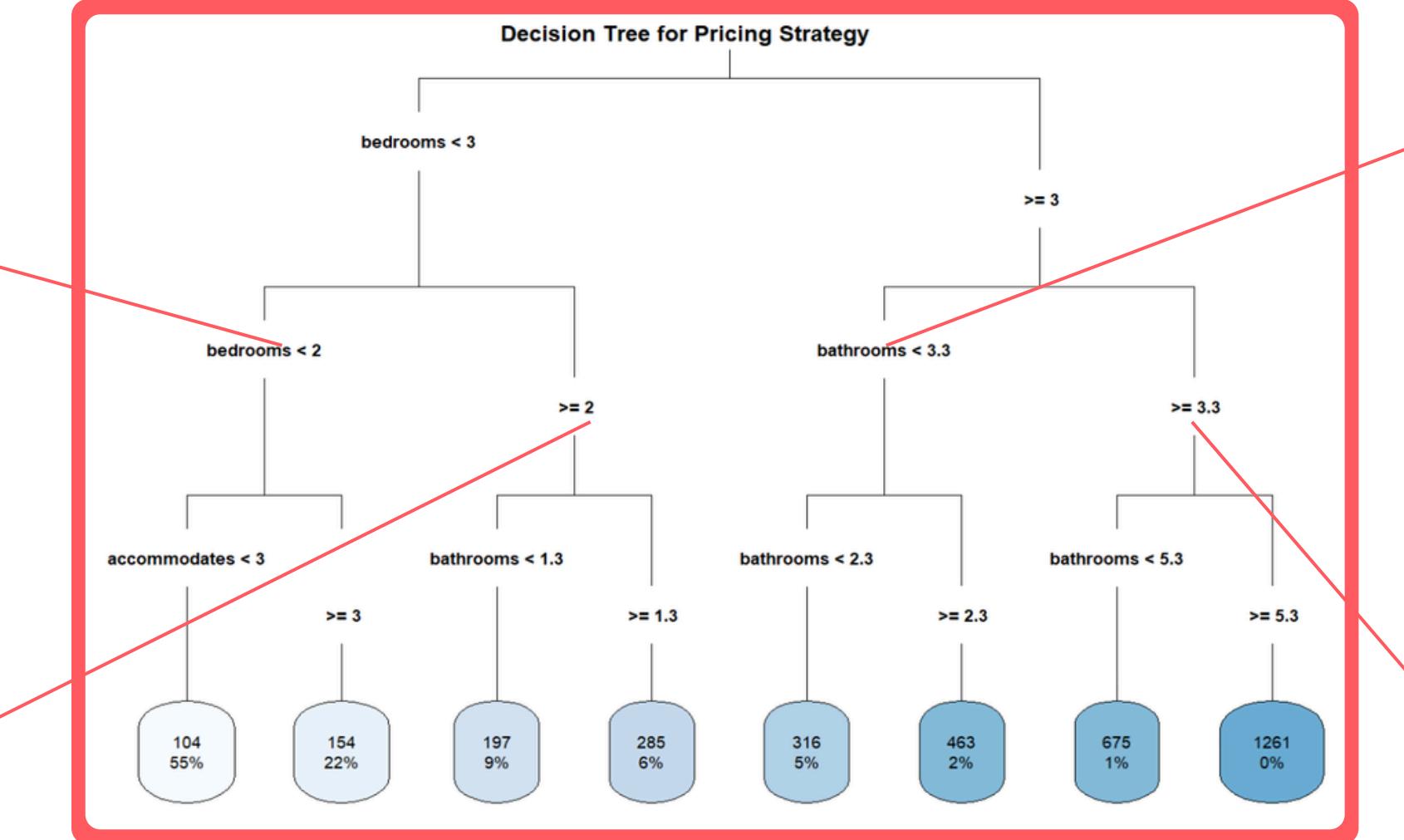
- Most Significant Factor: The number of bedrooms is the most influential factor in determining rental prices
- Split Categories: Properties are categorized into those with  $< 3$  bedrooms and those with  $\geq 3$  bedrooms

### Fewer than 2 Bedrooms:

- Accommodates  $< 3$ : 104 dollars (55%)—smaller properties with limited accommodation have lower pricing
- Accommodates  $\geq 3$ : 154 dollars (22%)—fewer properties with fewer bedrooms can accommodate more people.

### 2 or More Bedrooms:

- Bathrooms  $< 1.3$ : 197 dollars (9%)—fewer bathrooms significantly impact pricing
- Bathrooms  $\geq 1.3$ : 285 dollars (6%)—more bathrooms slightly increase pricing



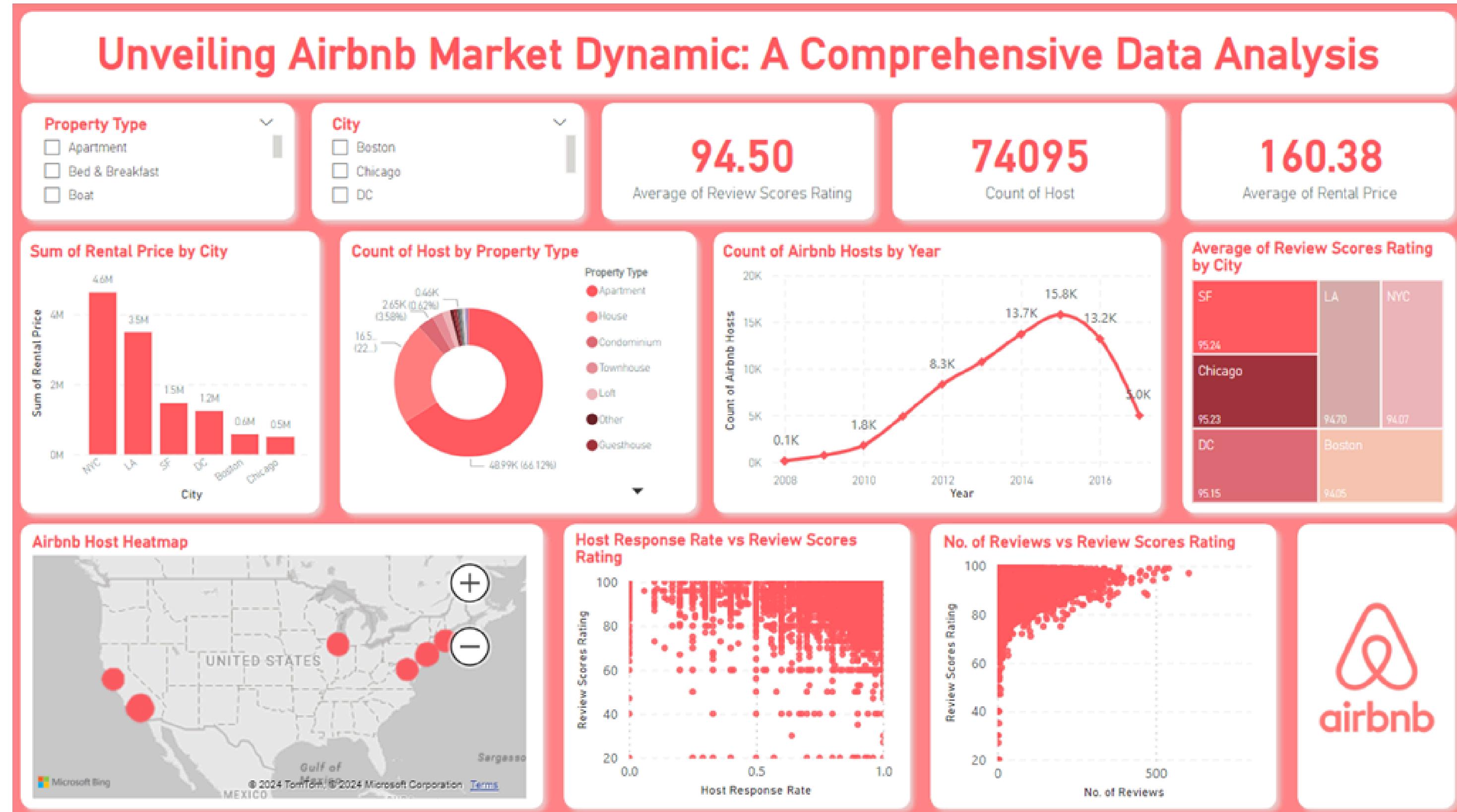
### Fewer than 3.3 bathrooms:

- Bathrooms  $< 2.3$ : 316 dollars (5%)—even for larger properties, bathroom count is critical
- Bathrooms  $\geq 2.3$ : 463 dollars (2%)—higher bathroom count can command higher prices

### 3.3 or more Bathrooms

- Bathrooms  $< 5.3$ : 675 dollars (1%)—niche market with specific pricing dynamics
- Bathrooms  $\geq 5.3$ : 1261 dollars (0%)—extremely rare properties with unique high-end pricing strategies

# Power BI Dashboards



# Conclusion

## Pre and Post-Business Process Engineering

Issues: Resource allocation, inconsistent pricing, limited data analytics.  
Solutions: Implement robust data analytics, standardize pricing, optimize availability

## Model Significance

Insights of Hosts: Improve responsiveness, leverage review, adapt to trends  
Benefits: Enhanced guest experience, increased bookings, competitive advantage

## Reflection and Recommendations

Reflection: Defined objective, explored data using Power BI, faced and overcame data quality and technical challenges  
Recommendation: Expand data sources, enhance techniques and improve communication



A photograph of a white cabin with a dark shingled roof, heavily covered in snow. Bare trees stand behind the cabin, also laden with snow. A wooden deck is visible on the left, and a stack of firewood sits near the base of the cabin. The overall atmosphere is cozy and wintry.

# Thank You!