

COMP5048 Assignment 2

Group 29

New York City Airbnb

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1. Introduction: Data and Tasks

Our team chose to focus on how property owners could use the dataset

Tasks: Help owners on AirBnB in New York City:

1. Understand the market and competition
2. Identify the right price point for their listing
3. Make the property as appealing as possible

2. Design & Approaches: Analysis

Understand Competitive Landscape

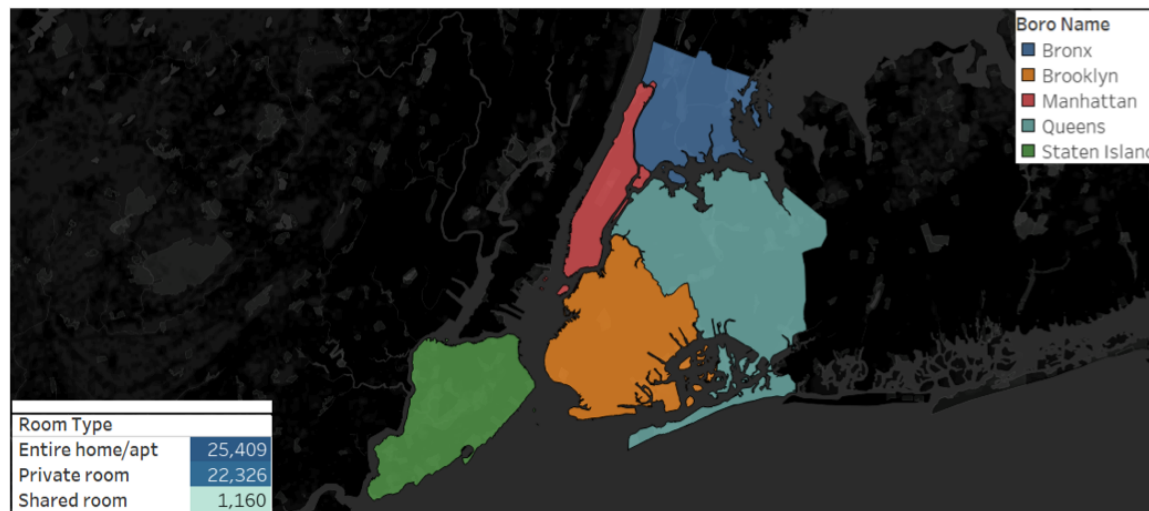
- Distribution of properties across location, type and price
- Most prolific owners and where they invest
- Average rental price and property values to identify hot and cold regions
- Market network analysis

Property Marketing

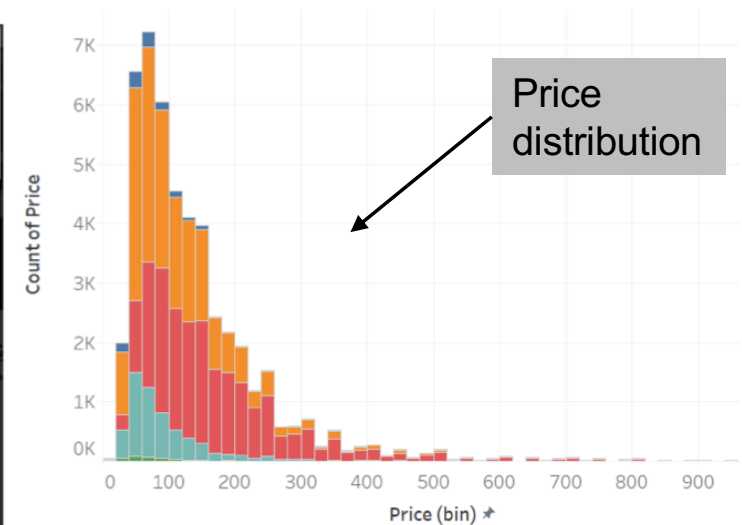
- Frequency of words in listing names, and the average value of each word
- How listings fared in terms of review rate
- Average rental price and property values to identify hot and cold regions
- Develop metrics to assist Owner in optimising property's strategic advantage

2. Visualisation: Expected Return on Investment

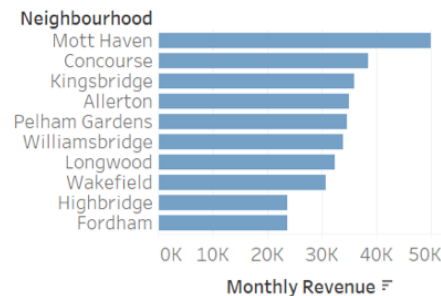
NYC Neighbourhood Overview



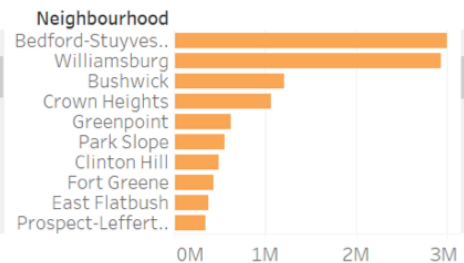
Price Distribution of All



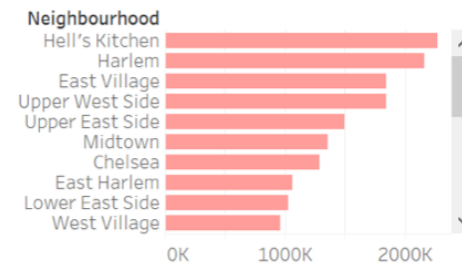
Avg. Profit for Bronx



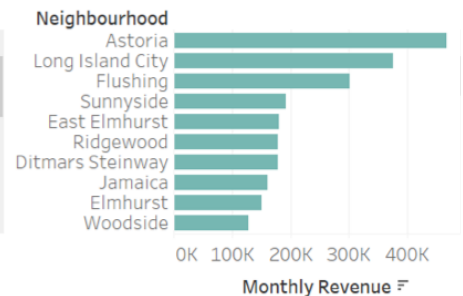
Avg. Profit for Brooklyn



Avg. Profit for Manhattan



Avg. Profit for Queens



Neighbourhoods ranked by average profit

2. Visualisation: The Most Prolific Owners

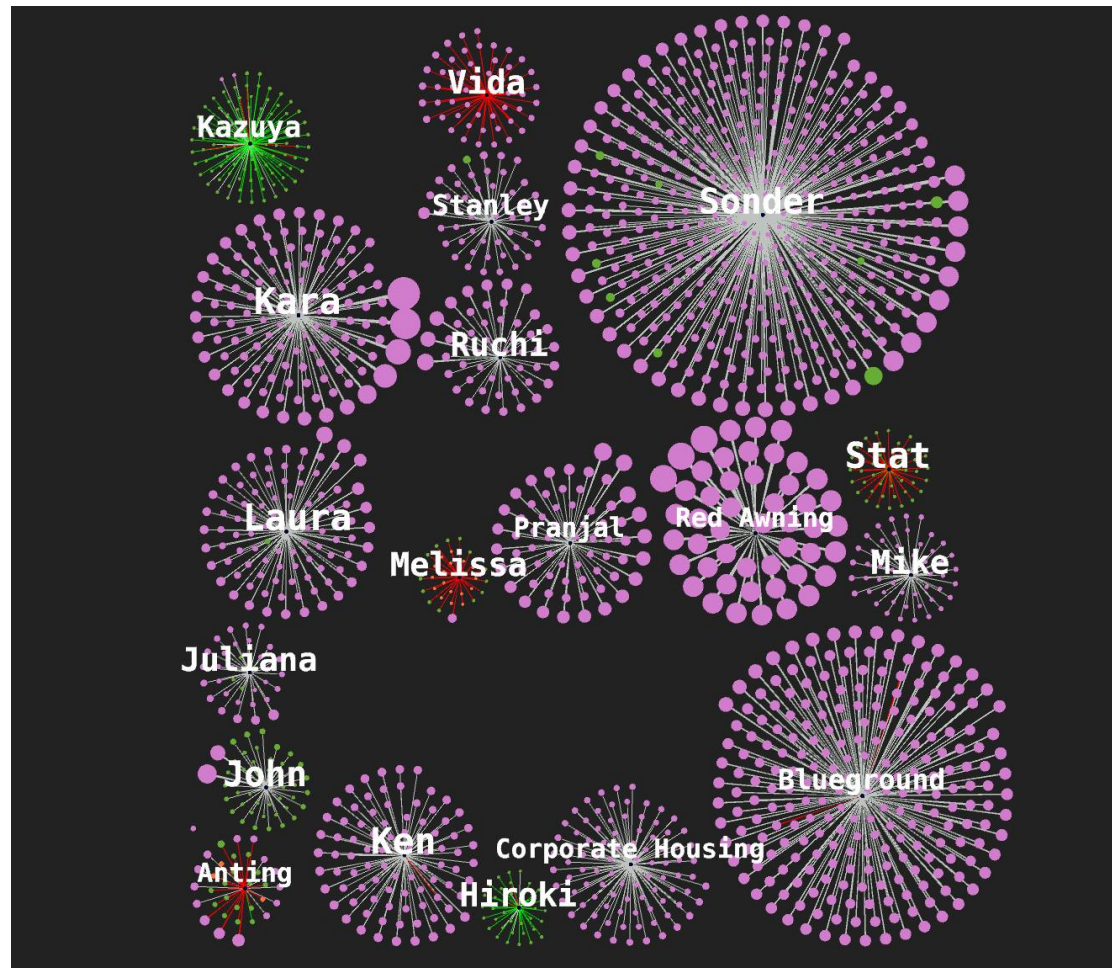
Observations

Of top 20 hosts, many are corporate entities

Most large owners in Manhattan – other areas underdeveloped

Network Possibly scale free

Corporate entities are undercutting individual owners



Nodes

Properties & Owners
Size is Price

Colour is Room Type

Edges

Connect property with owner

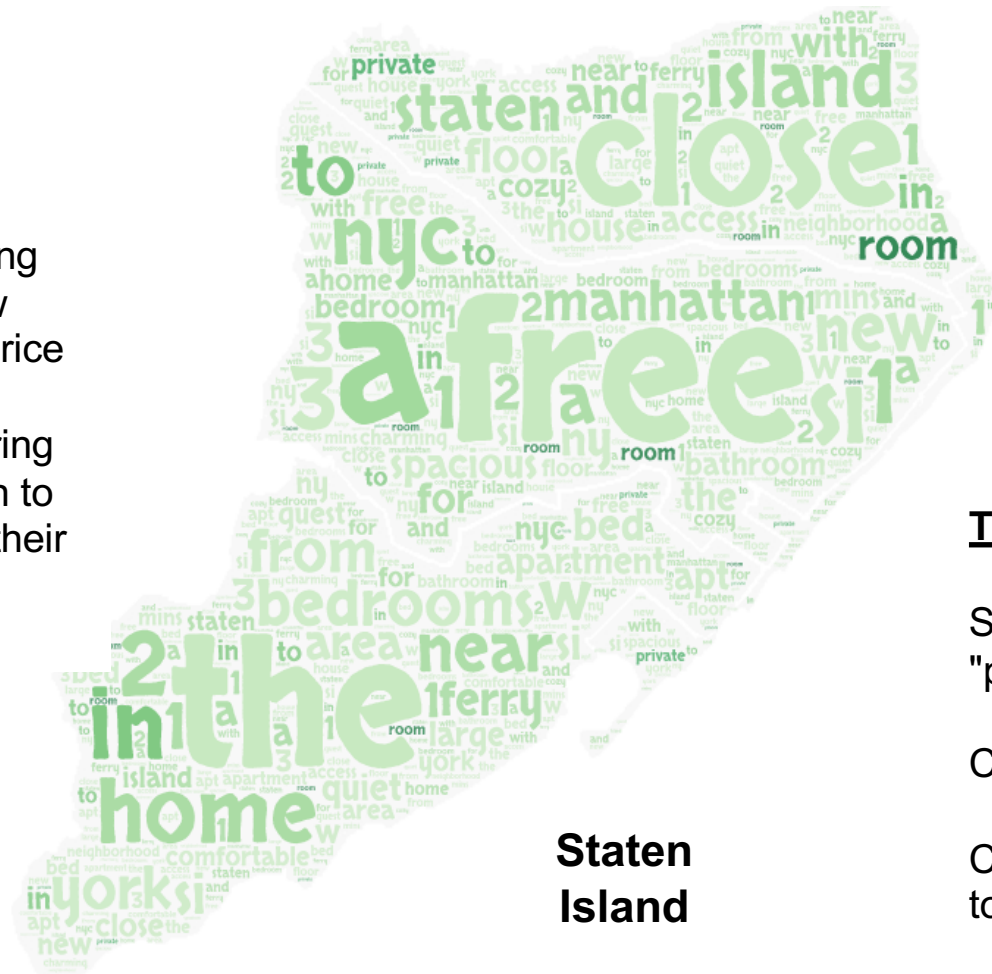
Colour is neighbourhood group

2. Visualisation: Word Cloud

Purpose

Help owners craft listing descriptions that allow them to set a higher price

Assist owners in tailoring their listing description to the specific needs of their market



Technical Details

Size of word is proportional to "price" of listing

Colour indicates room type

Colour gradient is proportional to the frequency

3. Implementation

Tool	Implementation
Python	(1) Initial data analysis (2) To generate pricing and frequency information for each word
Tableau	(1) Initial word mapping (2) Development of Owner dynamic dashboard (3) Consolidate all analysis and visualisation into one tool
WordArt	To generate hex colour codes and produce the maps in the shape of Boroughs
Tulip	Import .graphgml and implement layout
Gephi	Import excel data and establish nodes and edges for network graph
D3	Investigating application for web integration and interaction
Excel	(1) Vlookup function for defining edges and nodes (2) Neighborhood profit analysis and calculation

4. Evaluation

Criteria	Score (1-Poor, 2-Needs Work, 3-Excellent)
Our system works together to provide a comprehensive understanding of the Airbnb market for use by the owner	2
Each visualisation serves a purpose	3
Tools are inclusive of the whole dataset, so every owner has information at their fingertips	2
A useful tool for actual Airbnb Owners has been created	2
Visualisation provide genuine insights	3
Use tools to make predictions about future state of the Airbnb market	2

5. Progress Results

Milestones	
Project Proposal	✓
Presentation Slides	✓
Task #1: Understand Market and Competition	
Owner analysis: Types, locations, and categories	✓
Develop Network Graph of Most Successful NYC Hosts	✓
Examine the current house rents in NYC and how Airbnb properties compare	✓
Task #2: Identify the Right Price Point For Listing	
Baseline Owner dynamic dashboard	✓
Calculated average occupancy rate for each listing for profitability analysis	✓
Task #3: Provide Property Marketing Services	
Extract lists of most frequently used words and calculate the associated price of each	✓
Display the most popular words in each borough by room type	✓

6. Planning

Milestones	
Presentation	<input type="checkbox"/>
Final Report	<input type="checkbox"/>
Task #1: Understand Market and Competition	
Coordinate colour coding for a visualizations	<input type="checkbox"/>
Conduct usability study to obtain feedback	<input type="checkbox"/>
Task #2: Identify the Right Price Point For Listing	
Optimise and publish Owner dynamic dashboard	<input type="checkbox"/>
Combine property profitability data with real estate market data to assist Owner decision making	<input type="checkbox"/>
Task #3: Provide Property Marketing Services	
Find connections between lists, and make recommendations on what words to include	<input type="checkbox"/>
Make a recommendation on the level of service provided to guests	<input type="checkbox"/>
Dynamically select the most relevant chart to display to the user	<input type="checkbox"/>