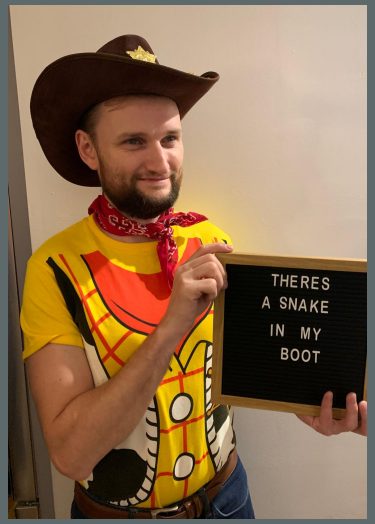
AirBnB: An Analysis of Consumer Surplus in NYC

Nathan Gollogly, Christina Ho

Our Team

Christina Ho



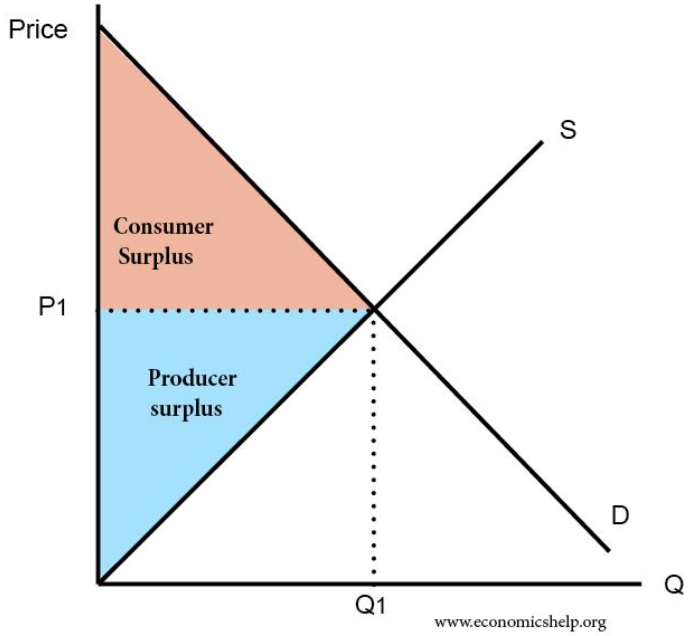
Nathan Gollogly

Measuring the Value of Innovation

- Purpose: Show regulators in $ amount how much ***welfare*** AirBnB generates in NYC market
- Welfare (Consumer Surplus) is a measure of additional benefit consumer receive because they're paying less for something than what they are willing to pay

The Data Driven Approach

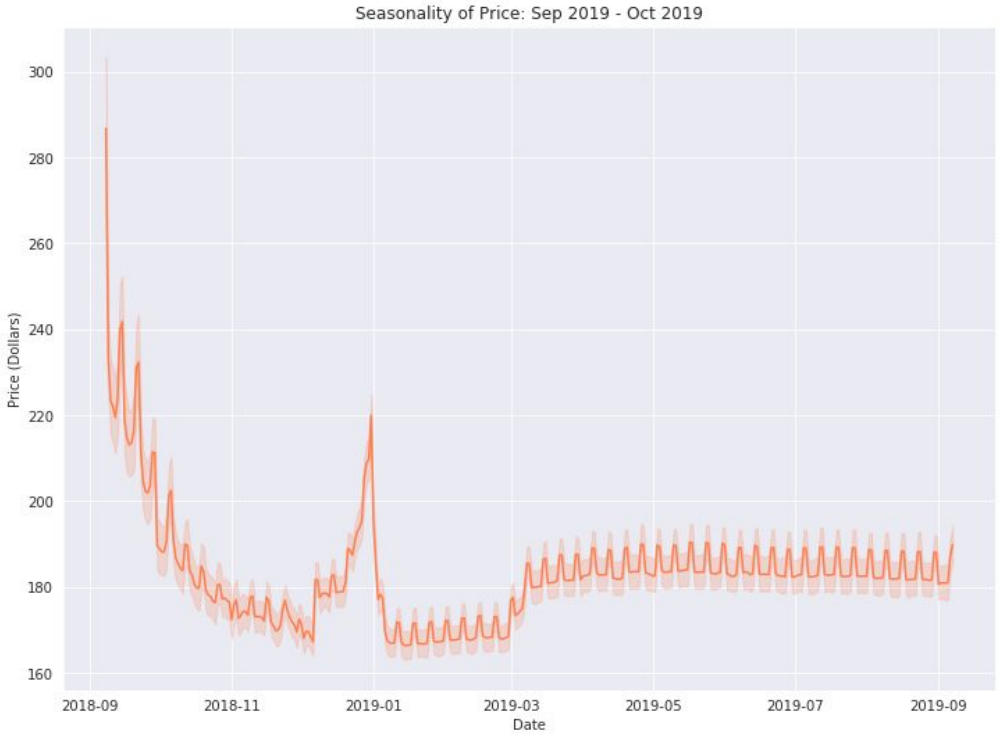
The Consumer Surplus Diagram



Three Critical Variables

1. **Price** consumer pays for rental
2. **Quantity Demanded** (Aggregated) of all listings
3. **Willingness to Pay** for each consumer

Impact of Seasonality on Price



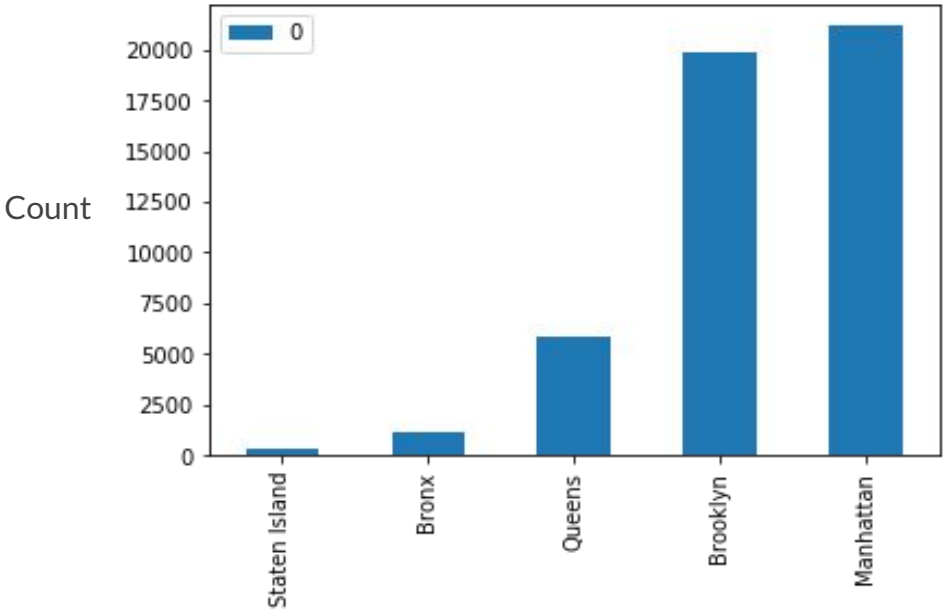
- Seasonality is evident
- High prices seen during weekends and during Christmas and New Years
- Used a seasonality adjustment to calculate our ***demand***

Modeling: K-Modes Clustering

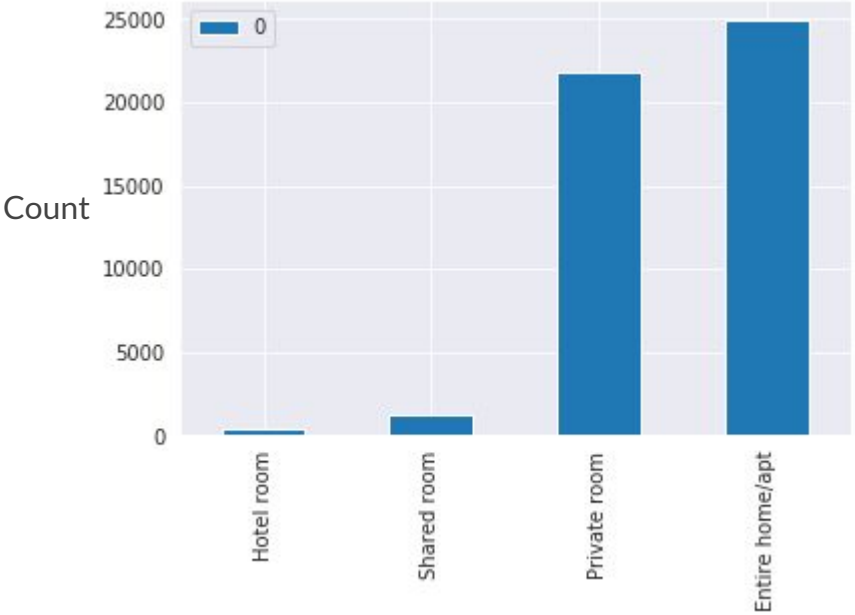
Feature Selection (mixed categorical and binary):

Feature Selection

AirBnB Listings by Borough

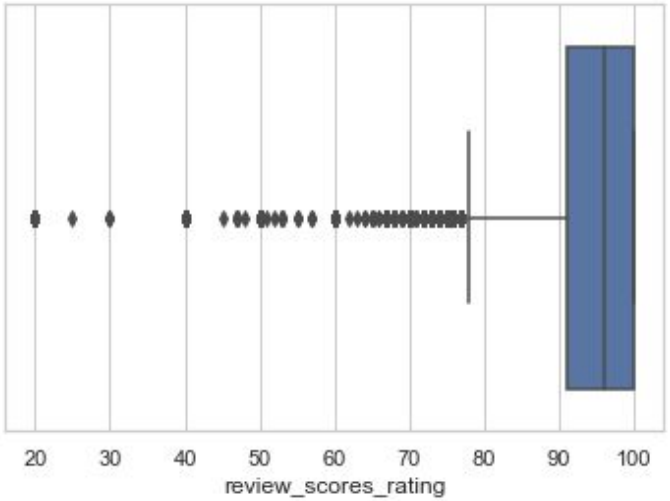


AirBnB Listings by Room Type

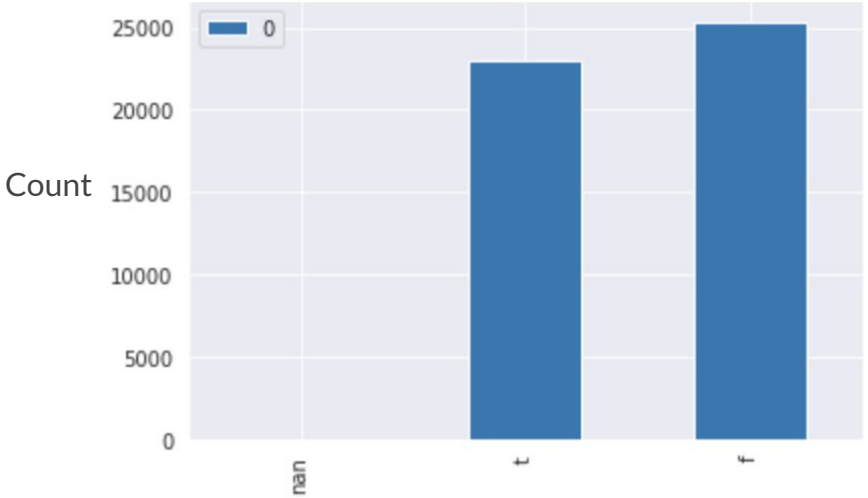


Feature Selection *(Continued)*

Listing Rating Review Distribution

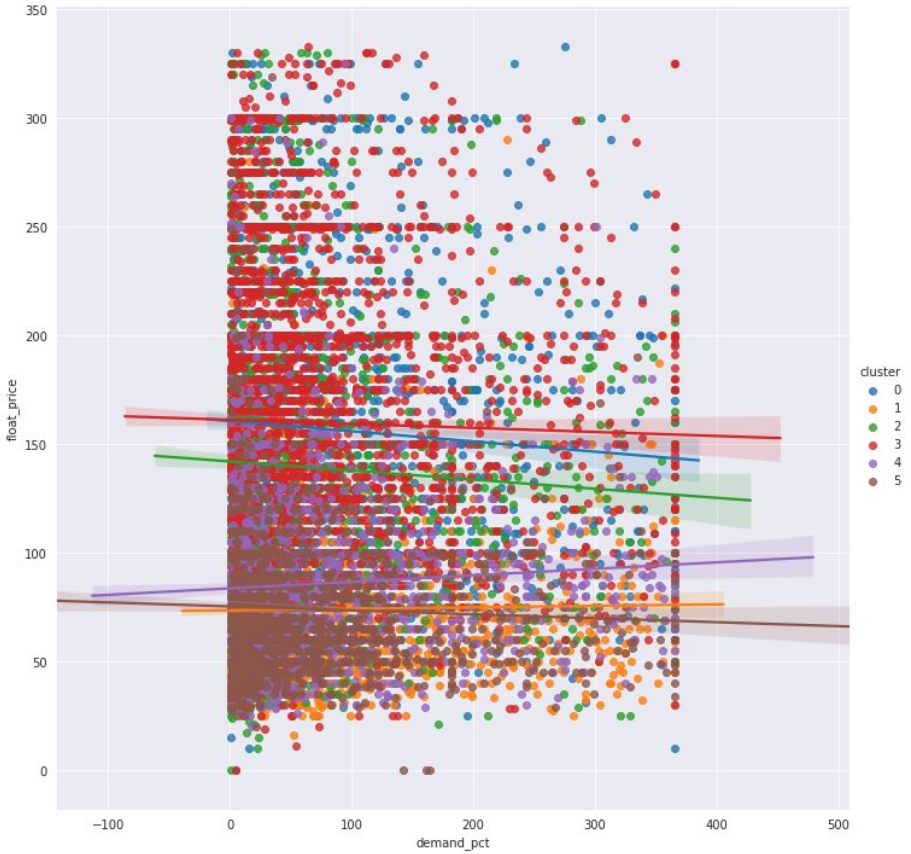


Host Identity Verification (T/F)

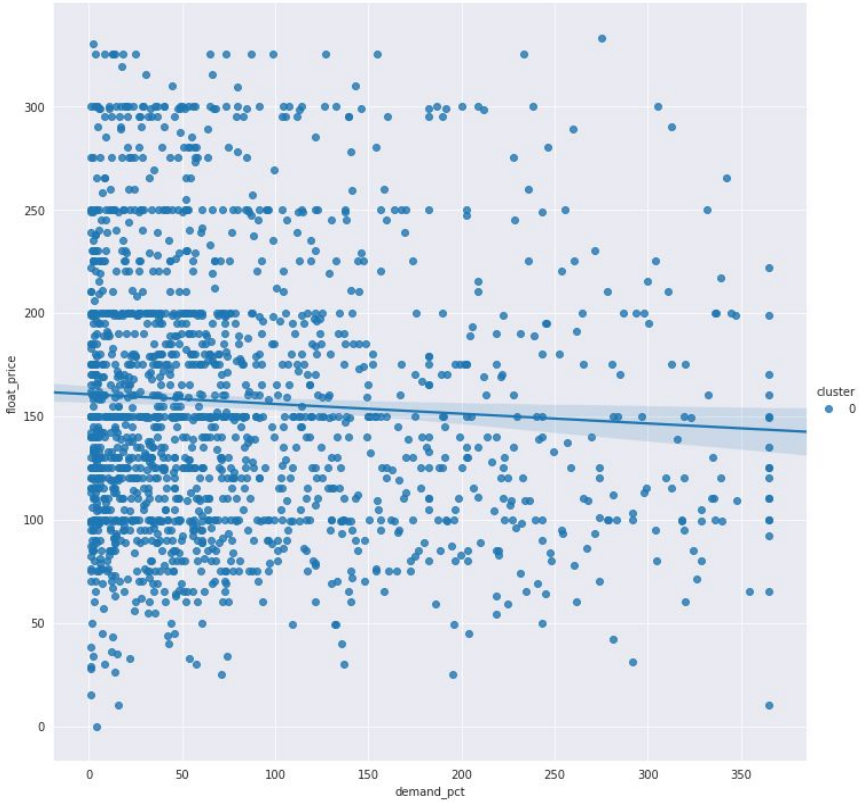


6 Cluster Results

Budget (All Boroughs)	Value Private (All Boroughs)	Premium (All Boroughs)
Budget (Brooklyn)	Value Shared (All Boroughs)	Premium Shared (All Boroughs)



Price vs. Quantity Demanded: All Clusters



Consumer Surplus: $79.20
r-squared = 0.01

Price vs. Quantity Demanded: Best Cluster

Limitations / Future Analysis

- Quantity demanded not directly available in the data, price & quantity demanded highly correlated (inaccurate)
- Using more robust methods for feature selection (Chi Squared Significance Tests) and feature importance (XGBoost)
- Look into multicollinearity of features to drop features that had big correlation with each other
- Potential analysis: estimate effects of regulation

Thank You