Predicting Prices for Airbnb Accommodations

Capstone Project

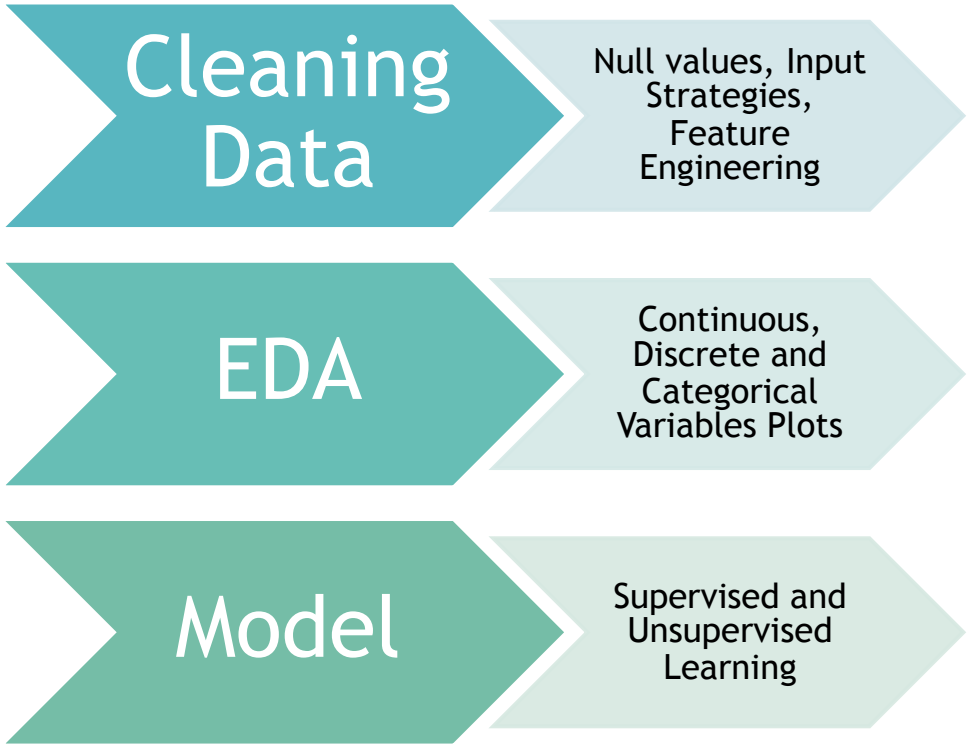
Problem Statement

- About: Renting accommodation's site
- Audience: primary and secondary
- Metrics: Regression Problem - RMSE

About Data

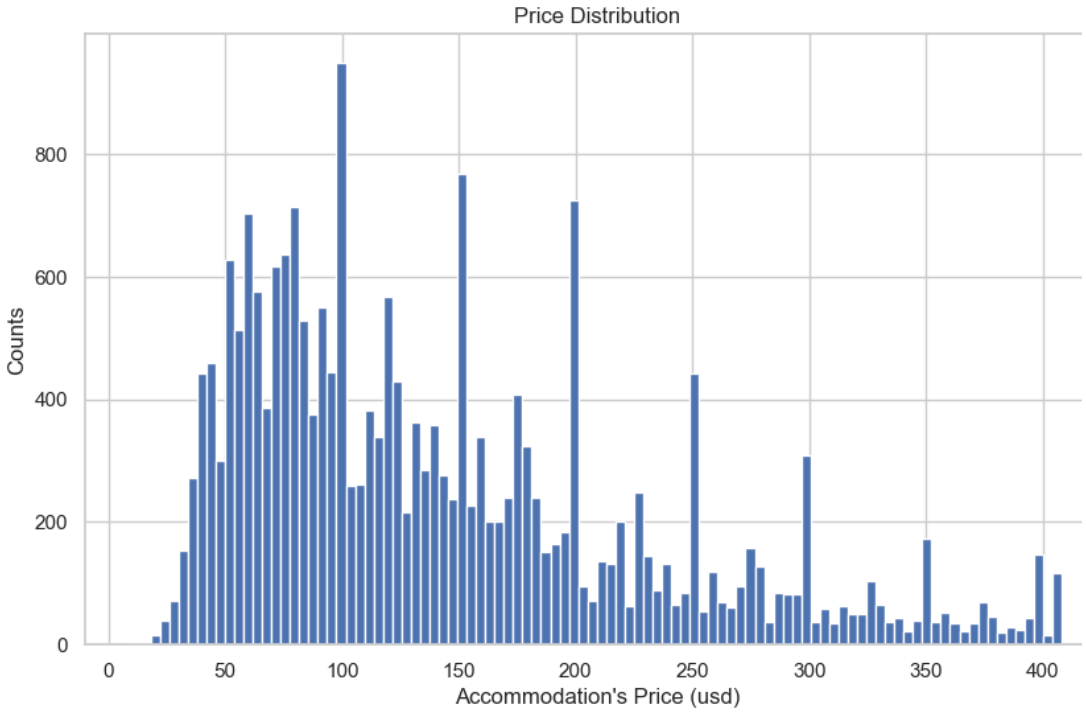
- **Datasets:**
  - Listing accommodations New York City;
    - 38,000 x 75
  - Neighborhoods price;
    - ~180 neighborhoods
- **Cleaning Process:**
  - Null values, Input Strategies, Regex, Feature Engineering, handle outliers;
    - 25,000 x 23

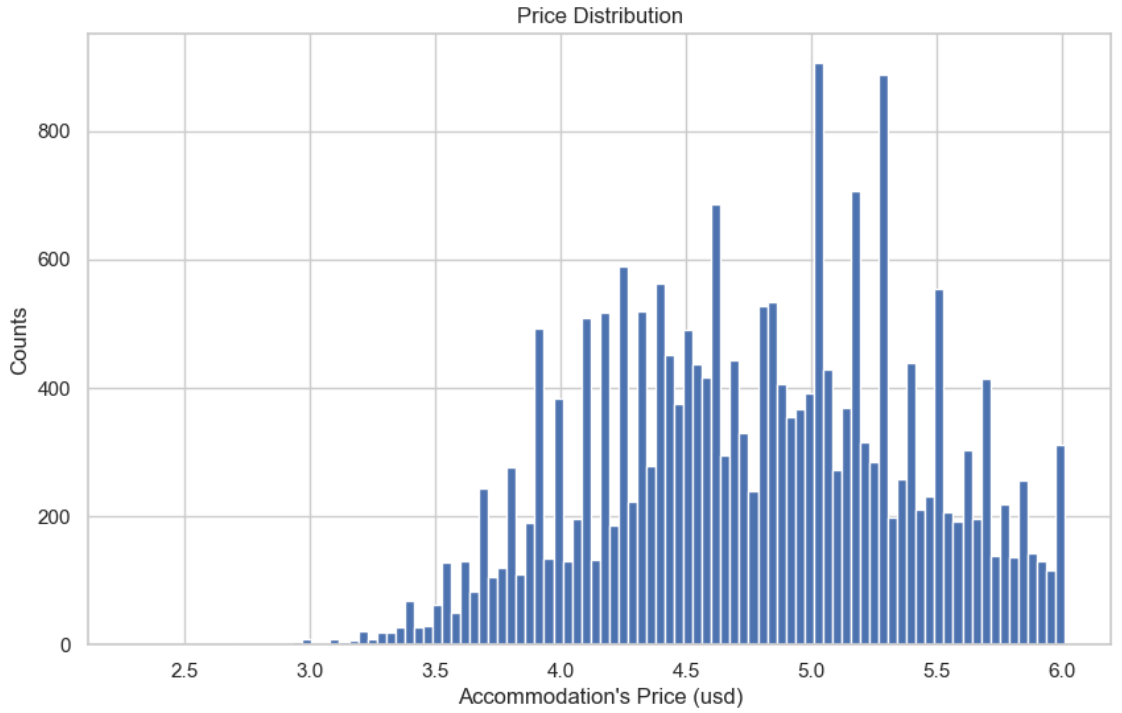
Data Science Workflow



Exploratory Data Analysis

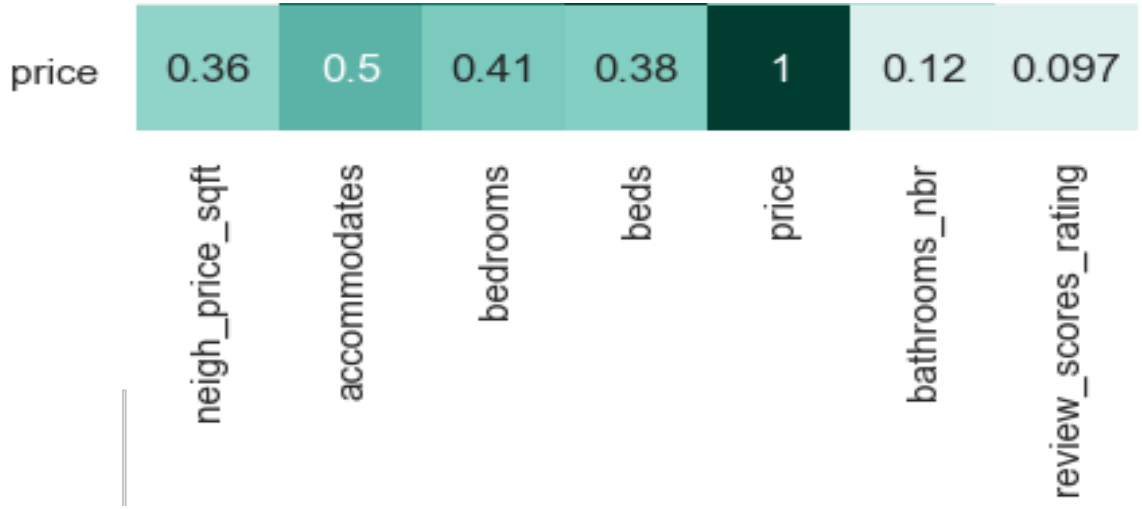
- **Distributions:**
  - skewness /log transformation





Exploratory Data Analysis

- Correlations with the target;
  - latitude/longitude x neighborhood;

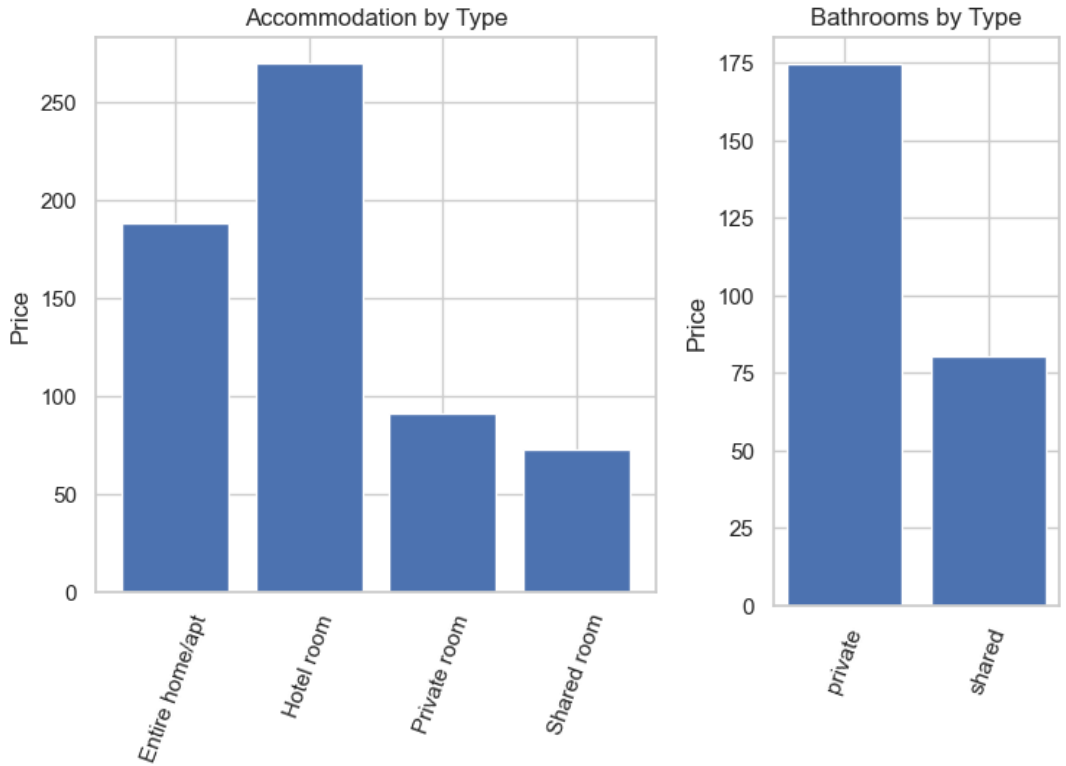


Exploratory Data Analysis

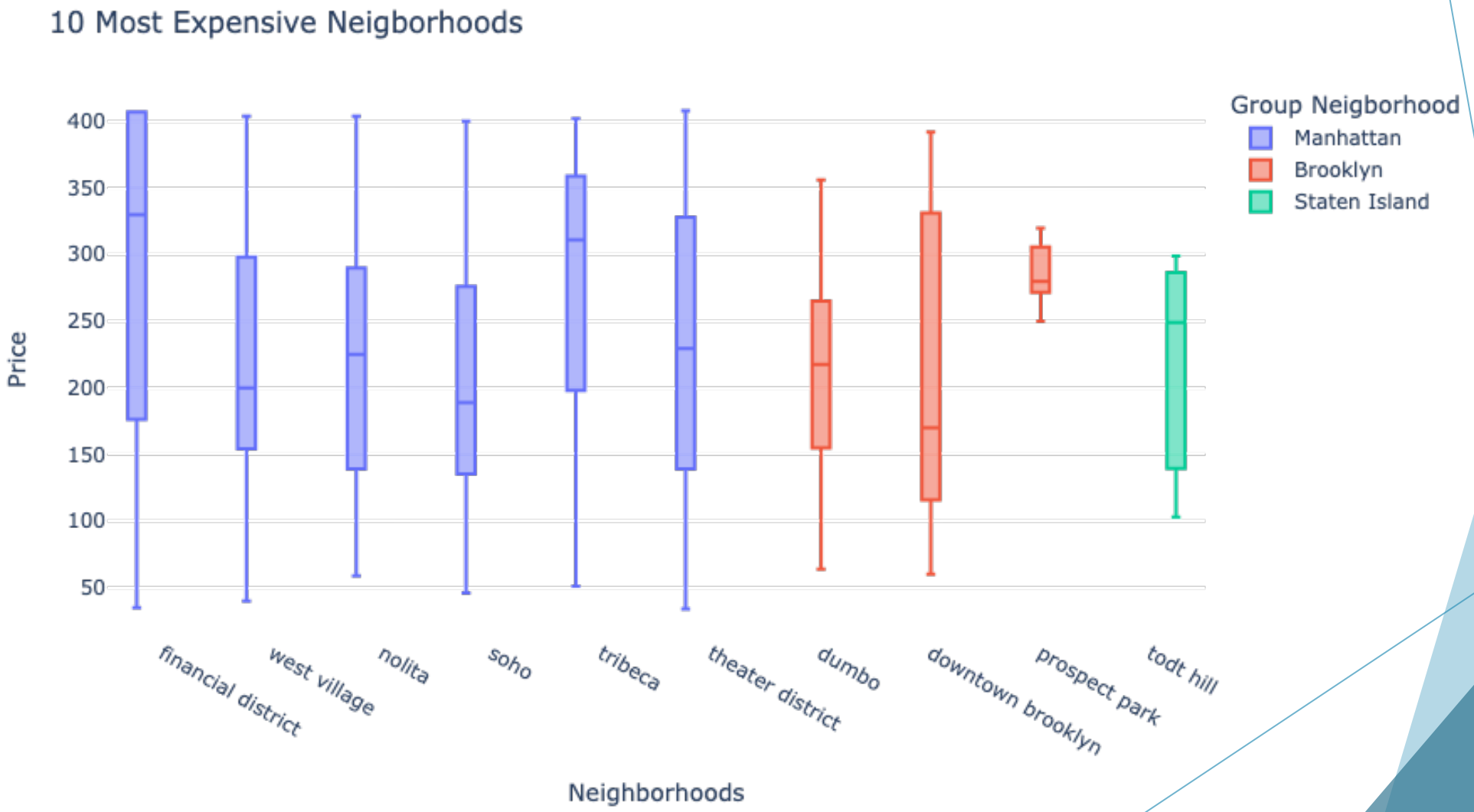
- latitude/longitude variables;

Exploratory Data Analysis

- Boxplot for categorical variables



Exploratory Data Analysis



Models Evaluation

- **Tranformers:**
  - One Hot Encoded;
  - Scalling;
- **Models:**
  - Supervised: Linear Regression / KNN
  - Unsupervised: Decision Trees / RainForest / Neural Networks
- **Techniques:**
  - Regularization
  - Gridsearch

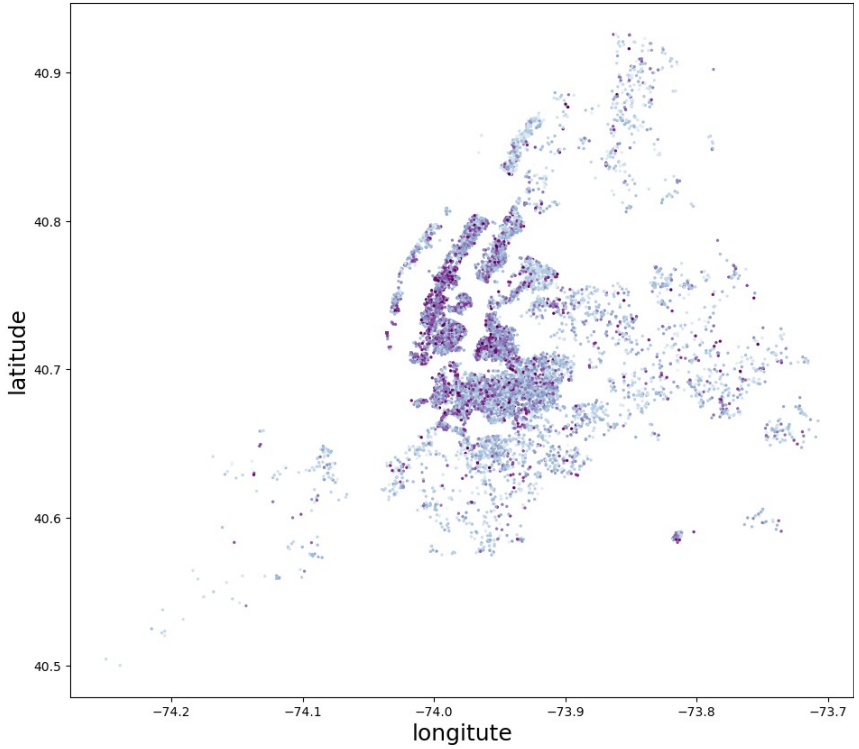
Models Evaluation

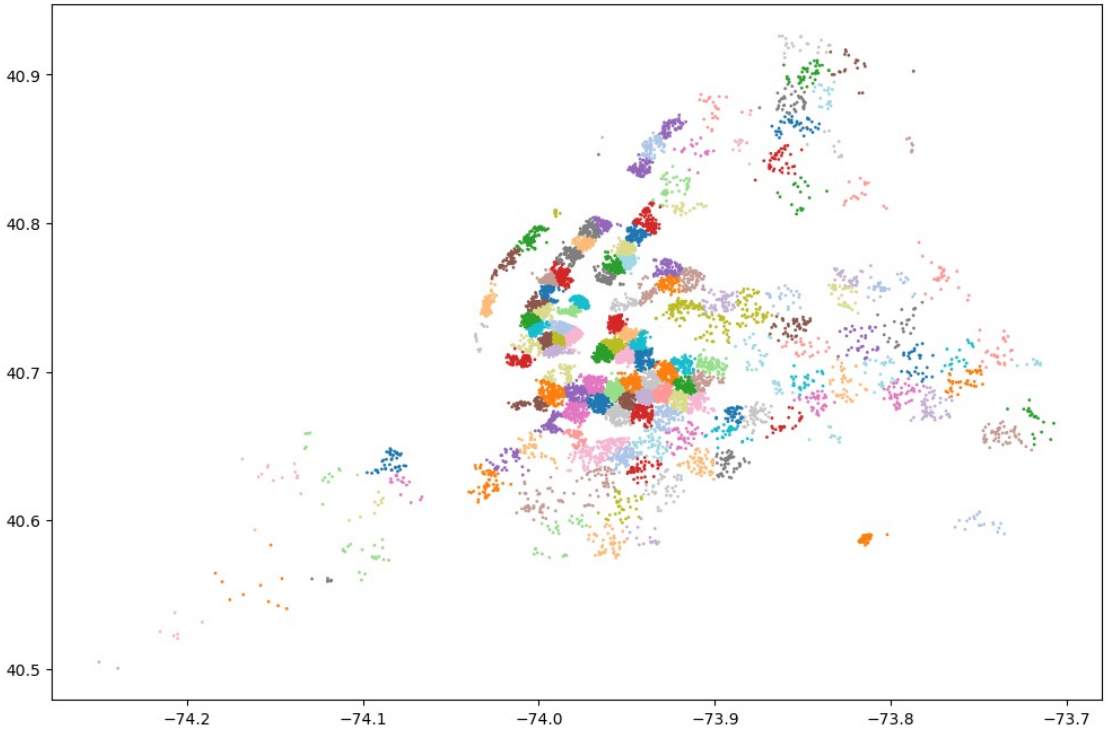
- Benchmark's Model:

Model	Train Score	Test Score	Diff.	RMSE
Random Forest	0.8866	0.6818	20.48%	150.465
K-NNeighbor	0.7198	0.6619	5.79%	150.487
Stacked Model ElasticNet	0.6526	0.5790	7.36%	126.150

Transfer Learning

- **Transfer Learning using KMeans**
  - k = 150, using silhouette score;





Conclusions and Recommendations

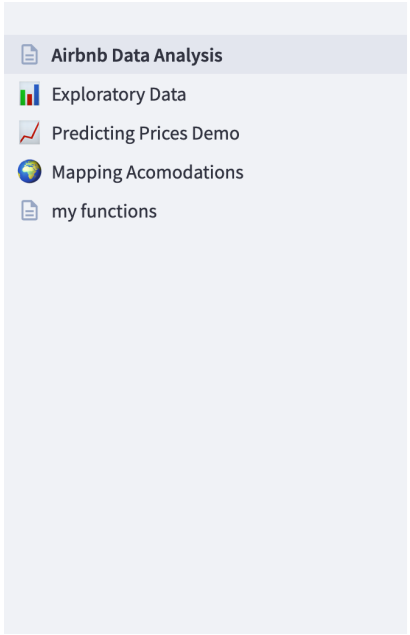
- **Conclusions:**
  - feature engineering 'amenities_count' and 'description_listing_count' ;
  - latitude/longitude or cluster with transfer learning to replace the neighborhood;
  - some variables are more important than others in determining the accommodation' prices
    - (the neighborhood feature carries more weight to the target than the number of beds or baths)

Conclusions and Recommendations

- **Recommendations:**
  - Between 5 groups of neighborhood Manthan has so far the higher If you living in Manhattan
  - more efficient increase the capacity of accommodate people than necessarily adding a room;
- **Future works:**
  - Try to work in a different way with the ‘amenities’ variable and try to get some information from it.

Airbnb App

- App to explorer Airbnb Listing Data and Predicting Prices:
  - Airbnb Explorer App



_ Data Analysis on Airbnb Listings _

Sunrise by the mountains

Thank You!