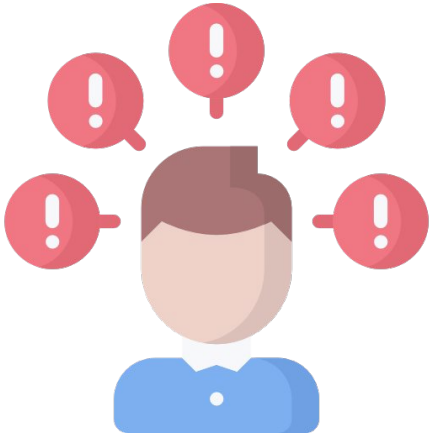
City Wise AI

A modern tool for urban planning

Problem

North American Major Cities

- Skyrocketing Property Prices
- Low Vacancy Rates
- Vacation Rental Platforms Impact Affordability



Solution

City Wise AI: A modern tool for Urban Planning

- Assess profitability of vacation rental listings
- Tax based on assessed profitability
- Shape and control market based on areas or types of listings

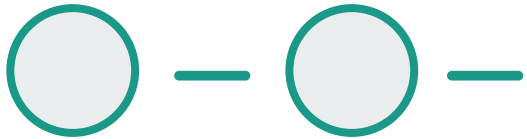
Vision

- Help municipalities make effective vacation rental policy
- Help improve housing affordability.

Hypothesis

The goal is to build the price prediction model using available data in order to manage, regulate and assess taxes on vacation rental listings.

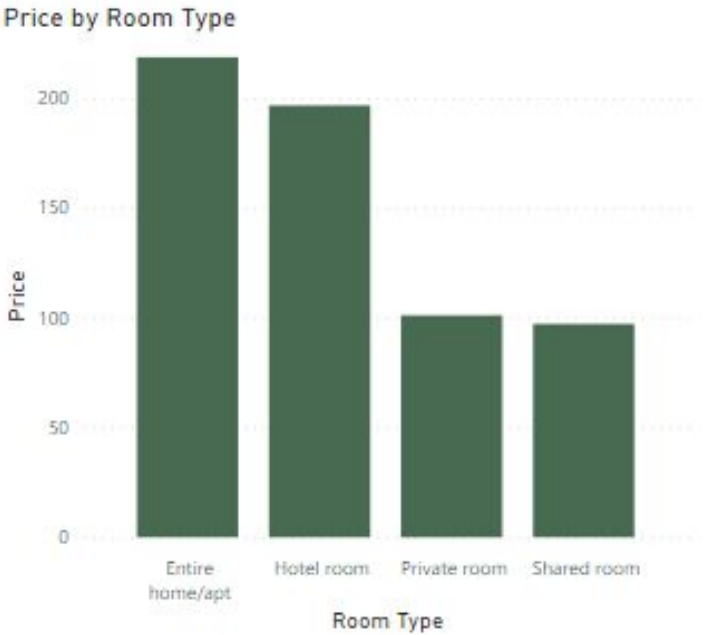
Methodology

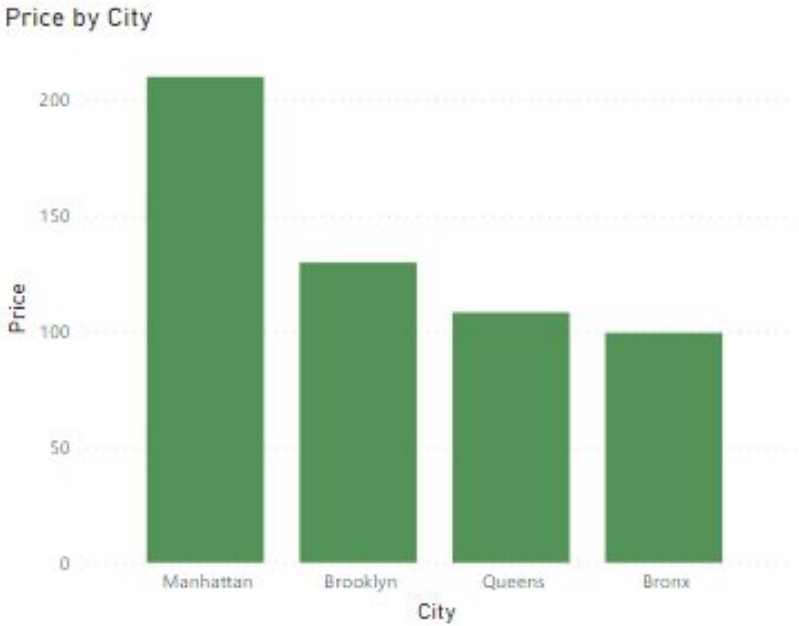


Business Understanding

Data Exploration

Data Exploration





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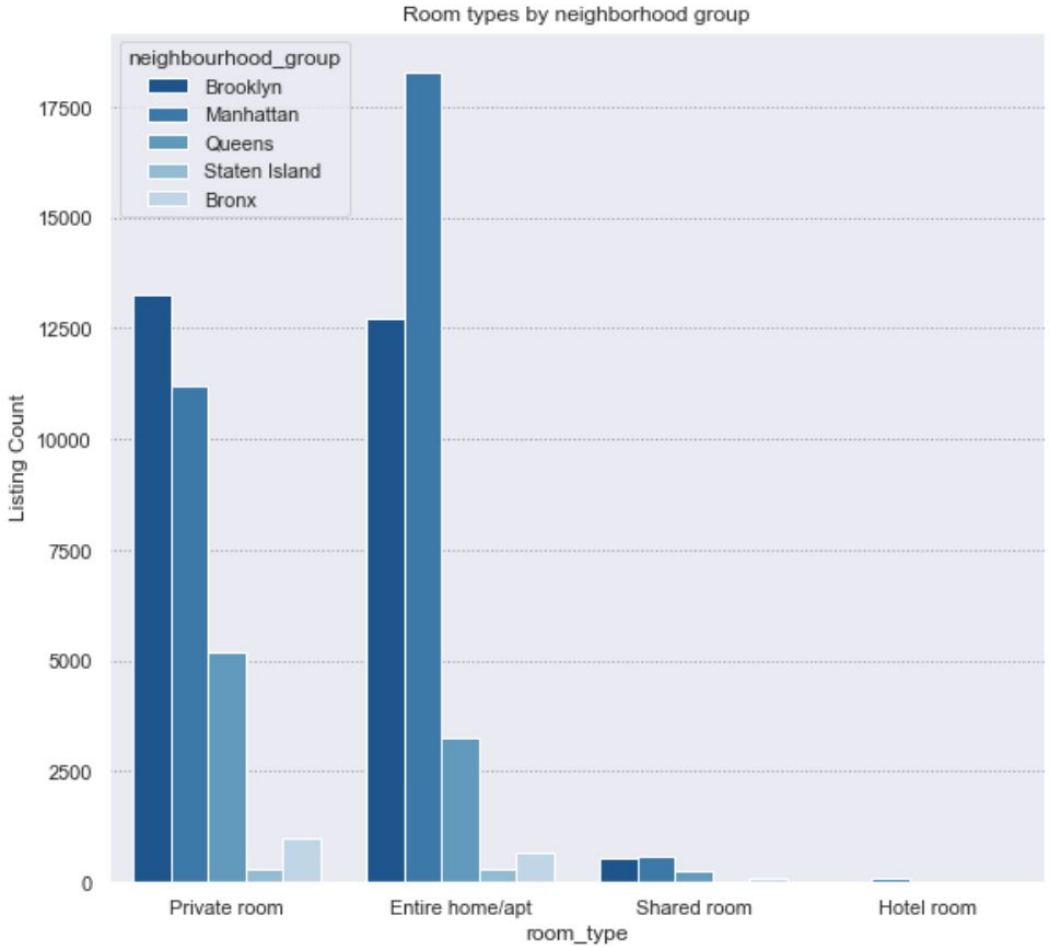

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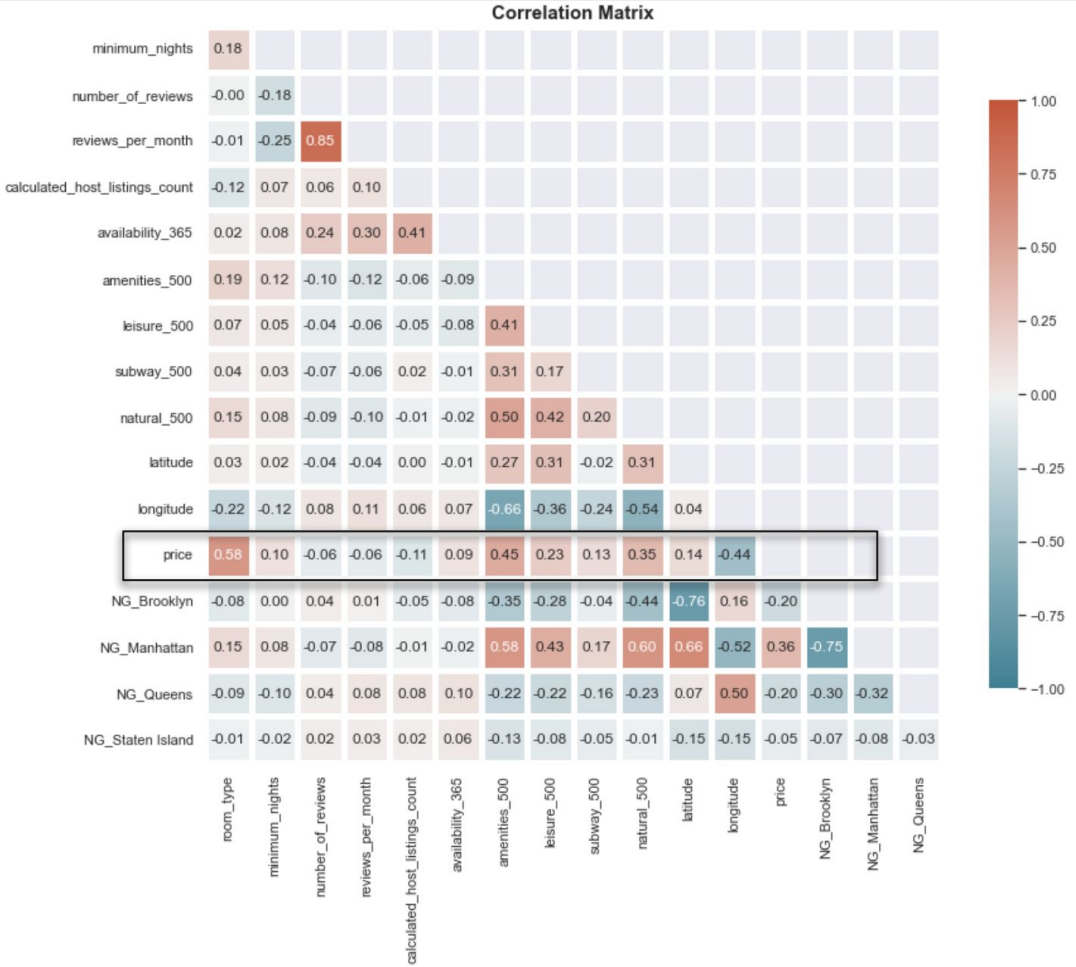
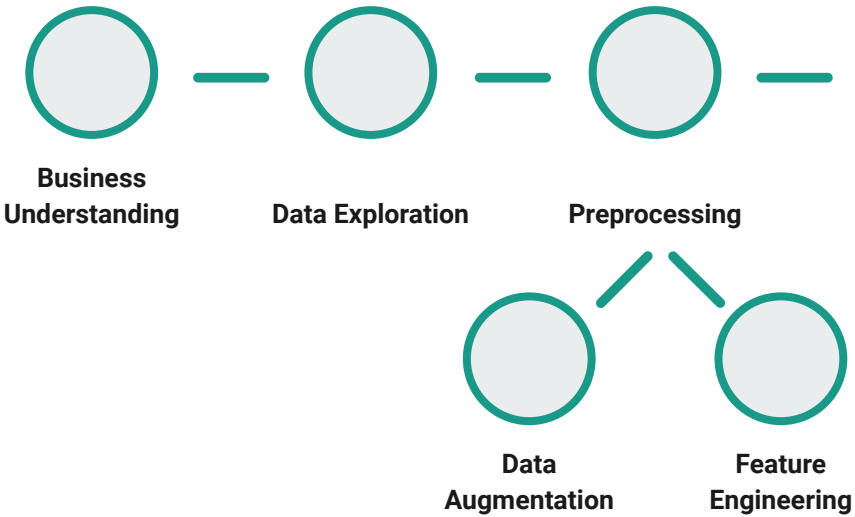


Methodology



Data Augmentation

Latitude	Longitude	Room Type	…
…	…	…	…
…	…	…	…
	…	…	…

Data Augmentation

Latitude	Longitude
…	…
…	…
	…

tag_leisure = {'leisure':['park','water-park','amusement-park','theme-park','zoo','stadium']}

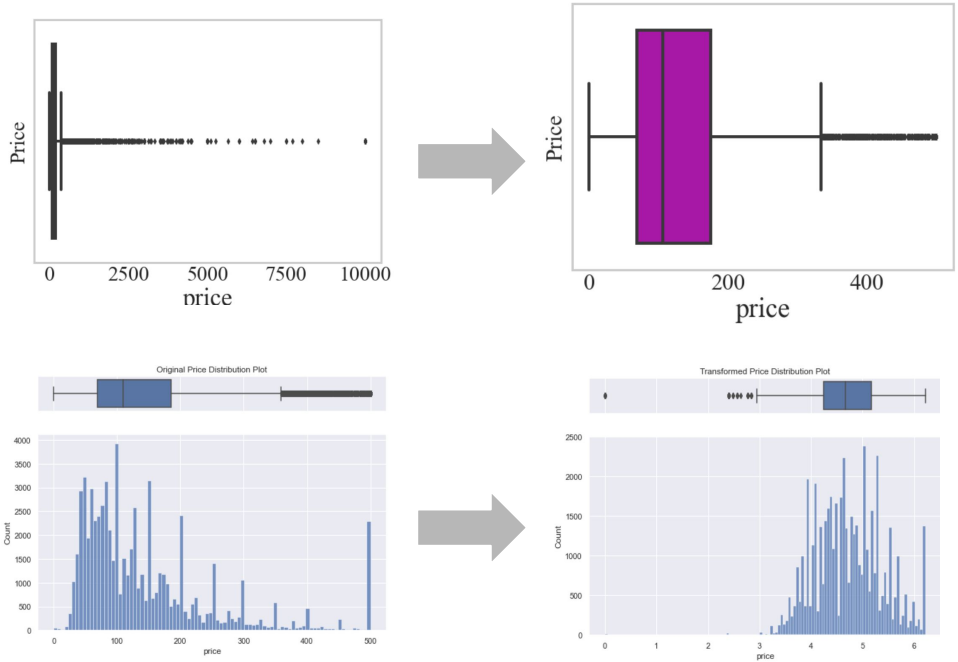
tag_subway = {'building': ['train_station']}

tag_natural = {'natural': ['beach', 'park', 'water']}

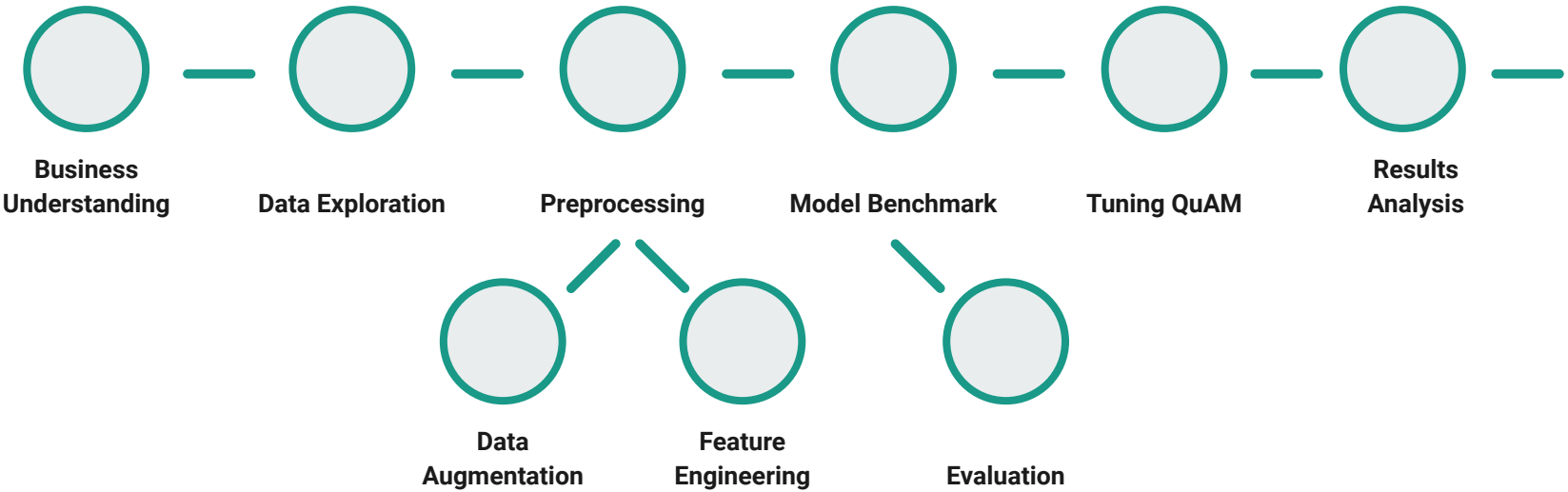
tag_amenities = {'amenity': ['restaurant', 'pub', 'hotel'],
'building': ['hotel','transportation','airport'],'store':'mall', 'tourism': 'hotel'}

Feature Engineering

- Categorical Variables Encoding
- Log Transformation
- Handling Outliers



Methodology



Model Evaluation

Models evaluated with CV (k= 10)

Regressor	R2	Adjusted R2	MAE	MSE	RMSE	Time
Dummy	0	0	70.876	11200.80	105.817	0.2020
KNN	0.416	.415	47.996	6086.697	78.000	12.593
RF	0.481	0.479	44.169	5414.429	73.562	235.749
XGB	0.482	0.480	44.183	5407.25	73.511	10.238

count	67745.000000
mean	145.072684
std	108.645872
min	0.000000
25%	69.000000
50%	110.000000
75%	185.000000
max	500.000000

Model Evaluation

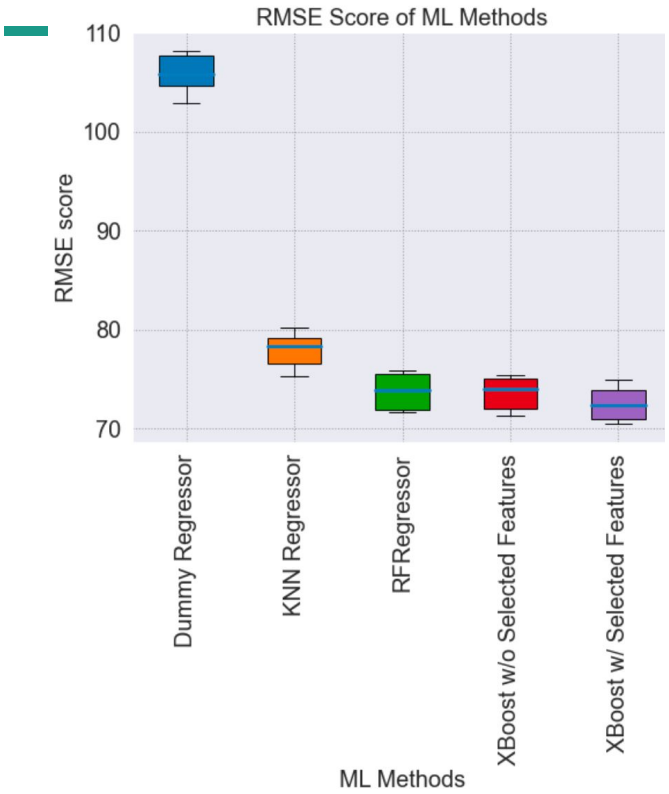
Hyper-parameter Tuning : Optimization done with a TPE (Tree-structured Parzen Estimator) parameter sampler

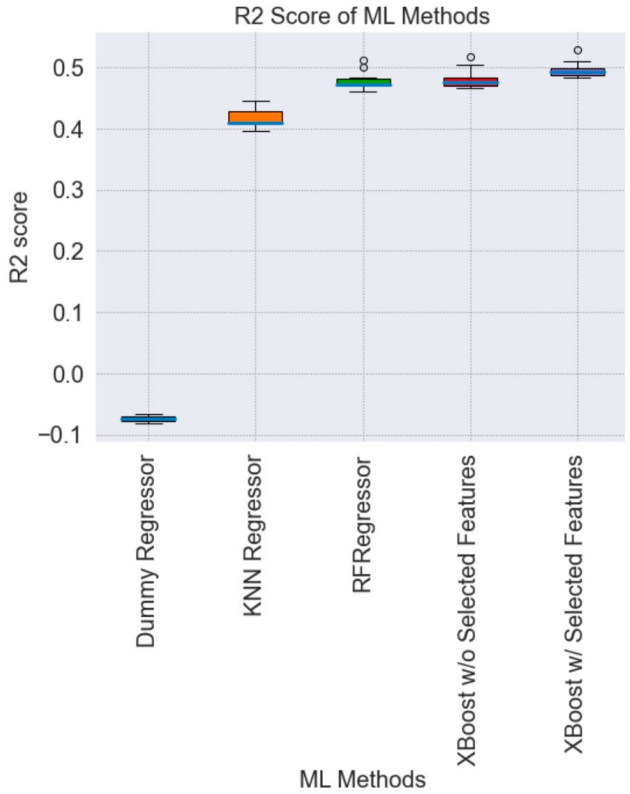
Recursive Feature Elimination + Hyperparameter Tuning

Gradient Boosting Quantile Models for price intervals.

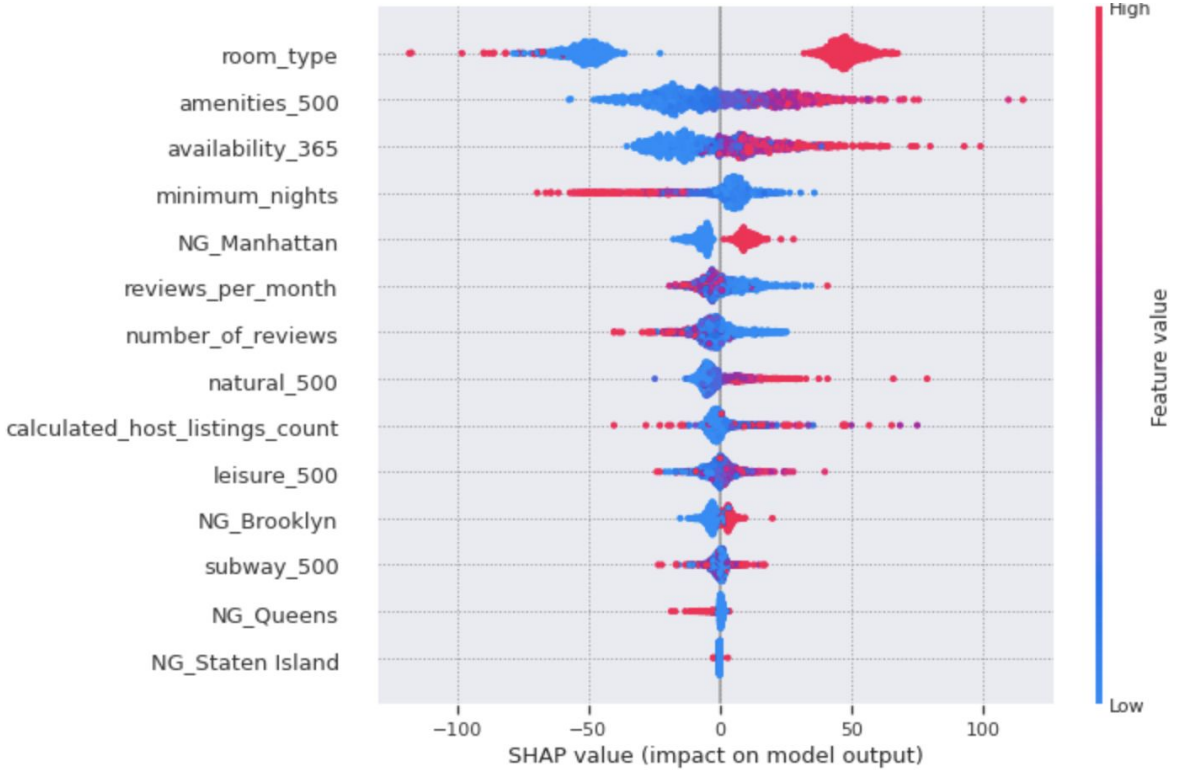
Regressor	R2	Adjusted R2	MAE	MSE	RMSE	Time
Dummy	0	0	70.876	11200.80	105.817	0.2020
KNN	0.416	.415	47.996	6086.697	78.000	12.593
RF	0.481	0.479	44.169	5414.429	73.562	235.749
XGB	0.482	0.480	44.183	5407.25	73.511	10.238
XGB w/selected	0.498	0.490	43.288	5400.10	72.273	8.367

Model Evaluation

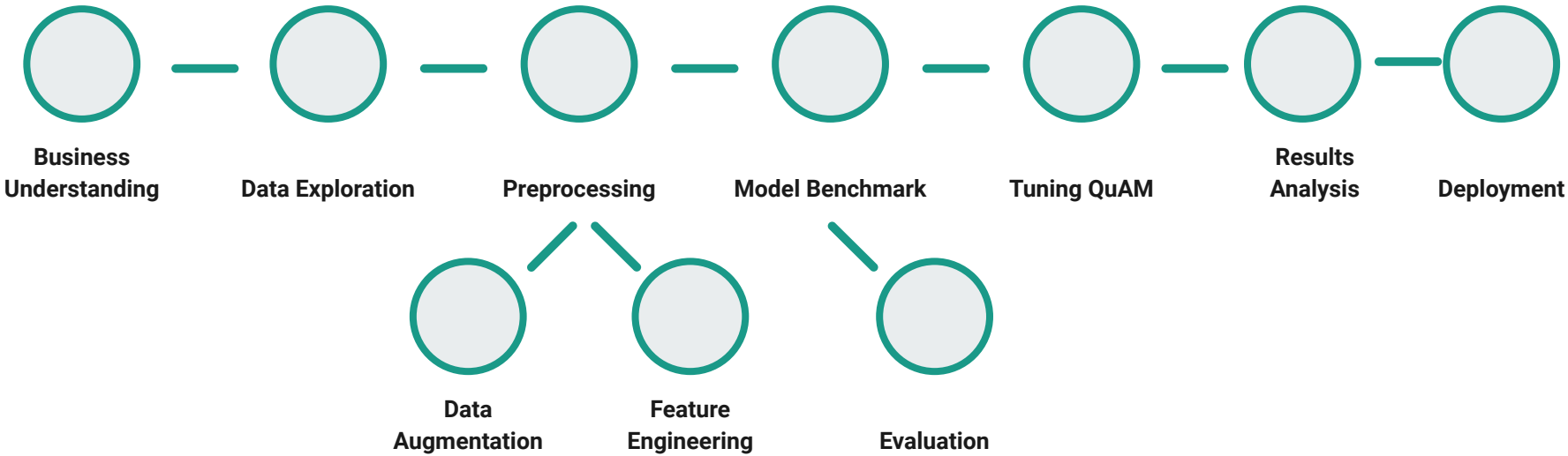




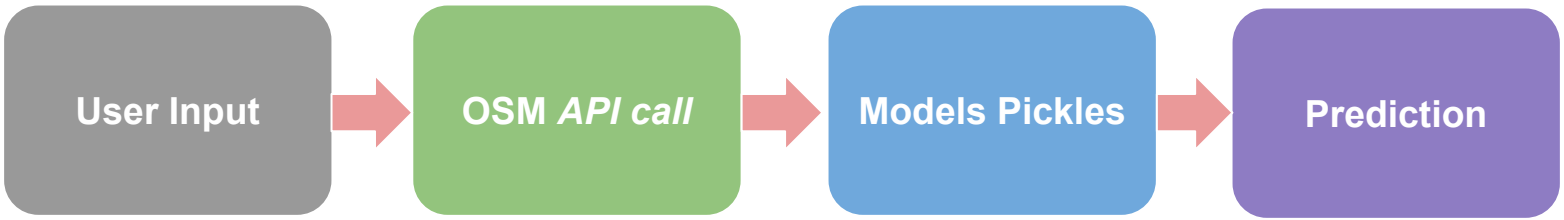
Results Interpretation & Feature Impact



Methodology

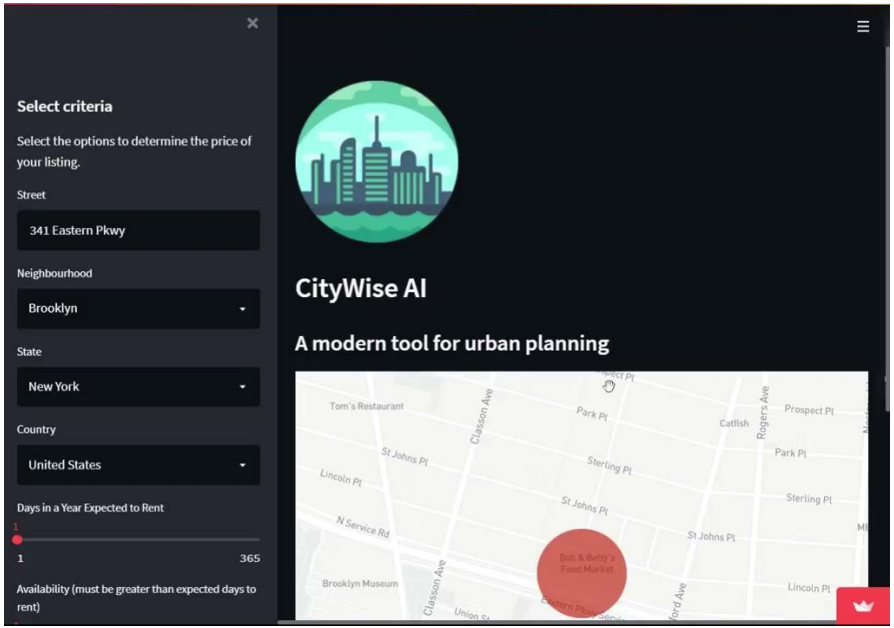


Model Pipeline



Demo

- View Recorded Demo Here
- Try Live Demo Here



Business Model & Market Opportunity

- Vacation rental market size $81.1 billion USD in 2022
- CAGR of 7.28%
- North American major cities spend $42.9 billion USD on taxation and urban planning
- Total Addressable Market: $850 million USD

Competition

	Taxation & Zoning	Profitability	Analytics
City Wise AI	✔	✔	
Airdna		✔	✔
Alltherooms		✔	✔
Transparent		✔	✔

Roadmap

Q1 2022	Q2 - Q4 2022	Q1 - Q2 2023	Q3 2023
Proof of Concept	**Iterate**	**MVP**	**Go to Market**

• Build prototype QuAM
• Reverse engineer MLPL (Machine Learning Process Lifecycle)
	• Obtain additional data
	  ○ Cities
	  ○ Amenities
	• Iterate QuAM
	• Iterate App
		• Complete Minimum Viable Product
		• Launch with early partners
			• North American launch.

Team

Maviya Shaikh
Software Developer

Daniela Gomez
Data Science

Melika Torabgar
AI in Medicine

Heeba Parvez
Computing Science and Mathematics

Jason Gravelle
Entrepreneur

Ask

Access to better vacation rental datasets

- Allow us to create a more accurate tool
- Data for other cities

Introductions to municipal planners

- To gain a better understanding of municipal policy objectives