



# SPRINT 3

# AIRBNB PRICE PREDICTION

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# Problem Statement

## Challenges Faced by Hosts:

- Difficulty determining the best area for investment.
- Struggles with pricing and understanding occupancy rates.
- Newcomers often make suboptimal decisions leading to low profitability



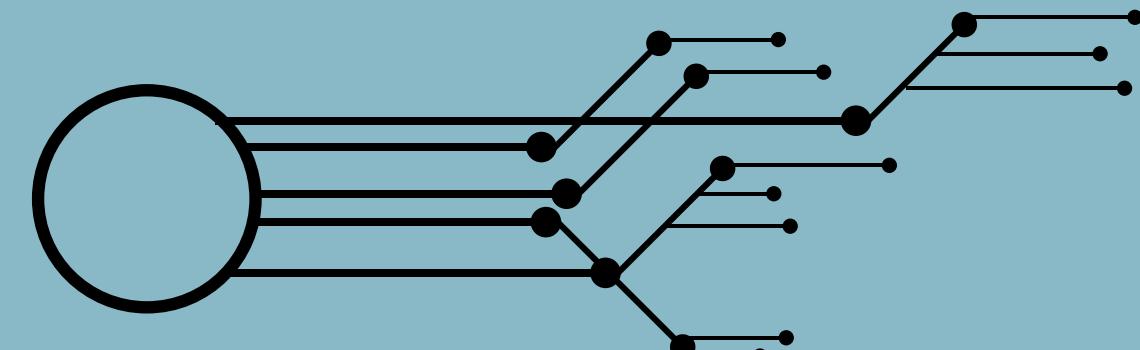
# Solution

- Develop machine-learning models for Airbnb hosts.
- Extensive dataset analysis



# Impact

- Boost in Profitability
- Higher guest satisfaction.
- Anticipation of more positive reviews, which further benefits hosts.

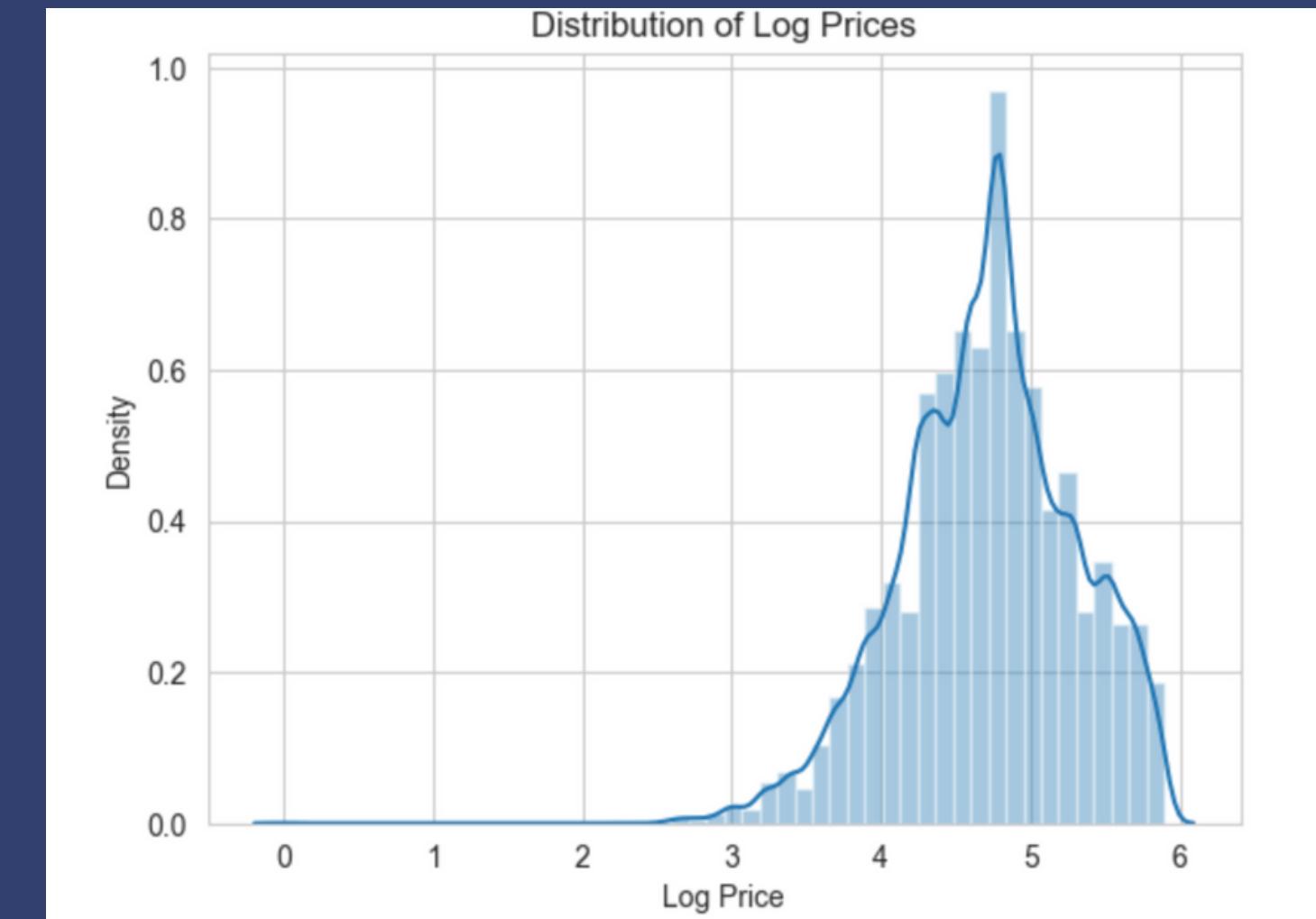
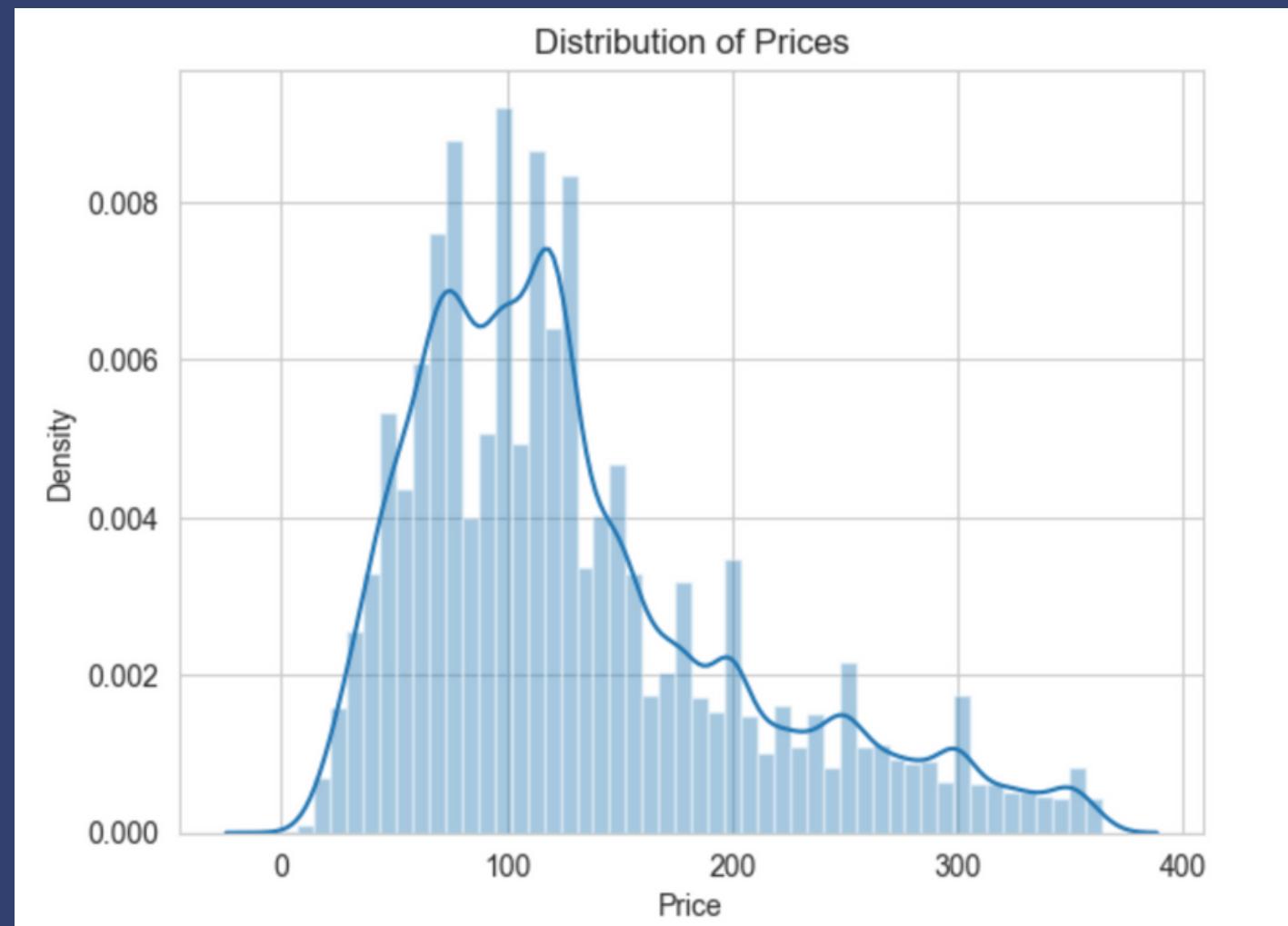


# Models

- Linear Regression
- XG Boost Regression
- Random Forest Regression
- Ridge/Lasso
- Sequential Neural Net

# Target Column Transformation

Model Used: Random Forest Regressor



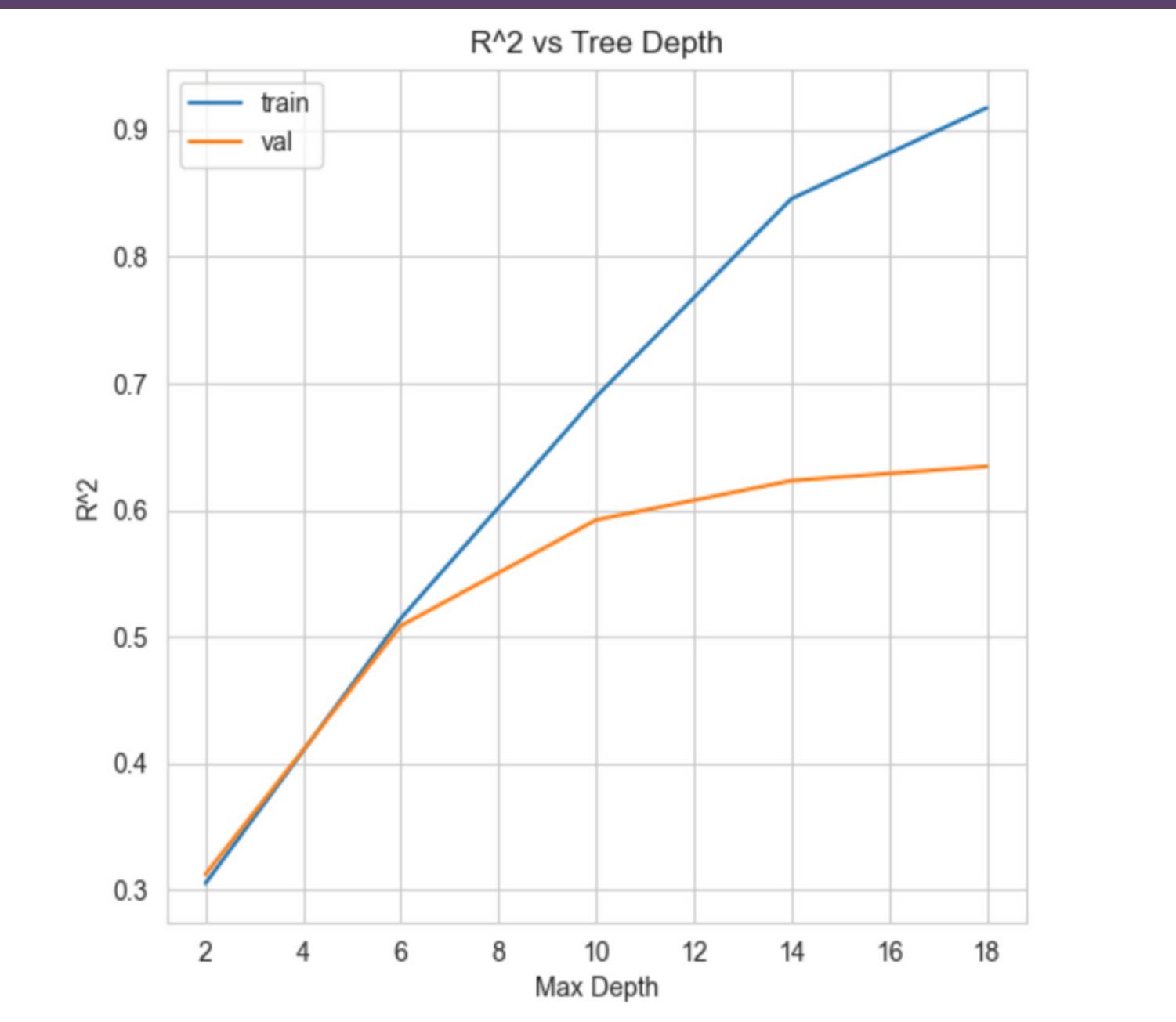
Metric	Train Set	Test Set
R2	0.59	0.55

Metric	Train Set	Test Set
R2	0.62	0.60

# Modelling

## Model: Random Forest Regressor

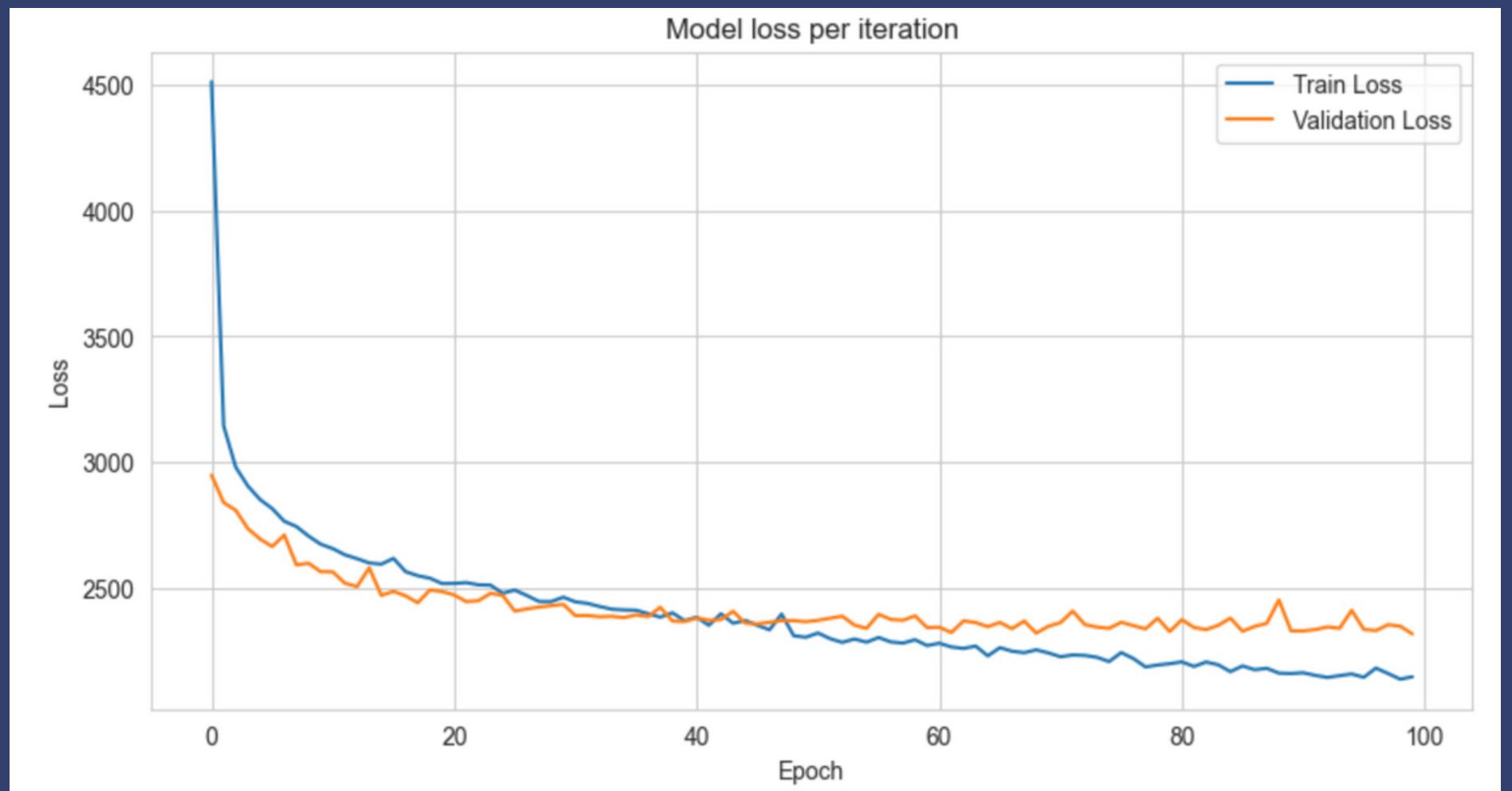
- Max Depth: 8



Metric	Train Set	Test Set
R2	0.59	0.55

# Modelling

## Model: Neural Net



- **Dense:** 128, 64, 32
- **Activation:** Relu
- **Optimizer:** Adam
- **Loss:** MSE
- **Epochs:** 100

R2	RMSE	MAE
0.58	48	33

# Model Evaluation (Test Set)

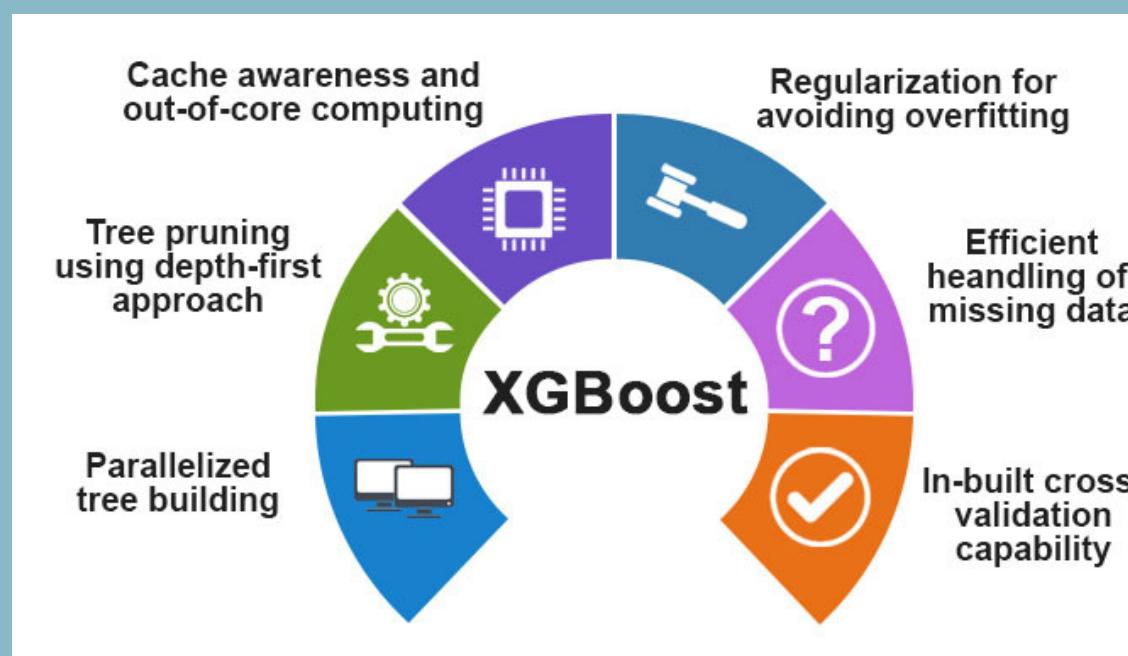
Model	R2	RMSE	MAE	MAPE
Linear Reg	0.40	57.23	42.43	32
XG Boost	0.61	46.23	30.21	23.31
Random Forest	0.60	47.21	32.21	24.32
Neural Net	0.58	48.31	33.34	25.73

# Best Performing Model

- XG Boost Regression

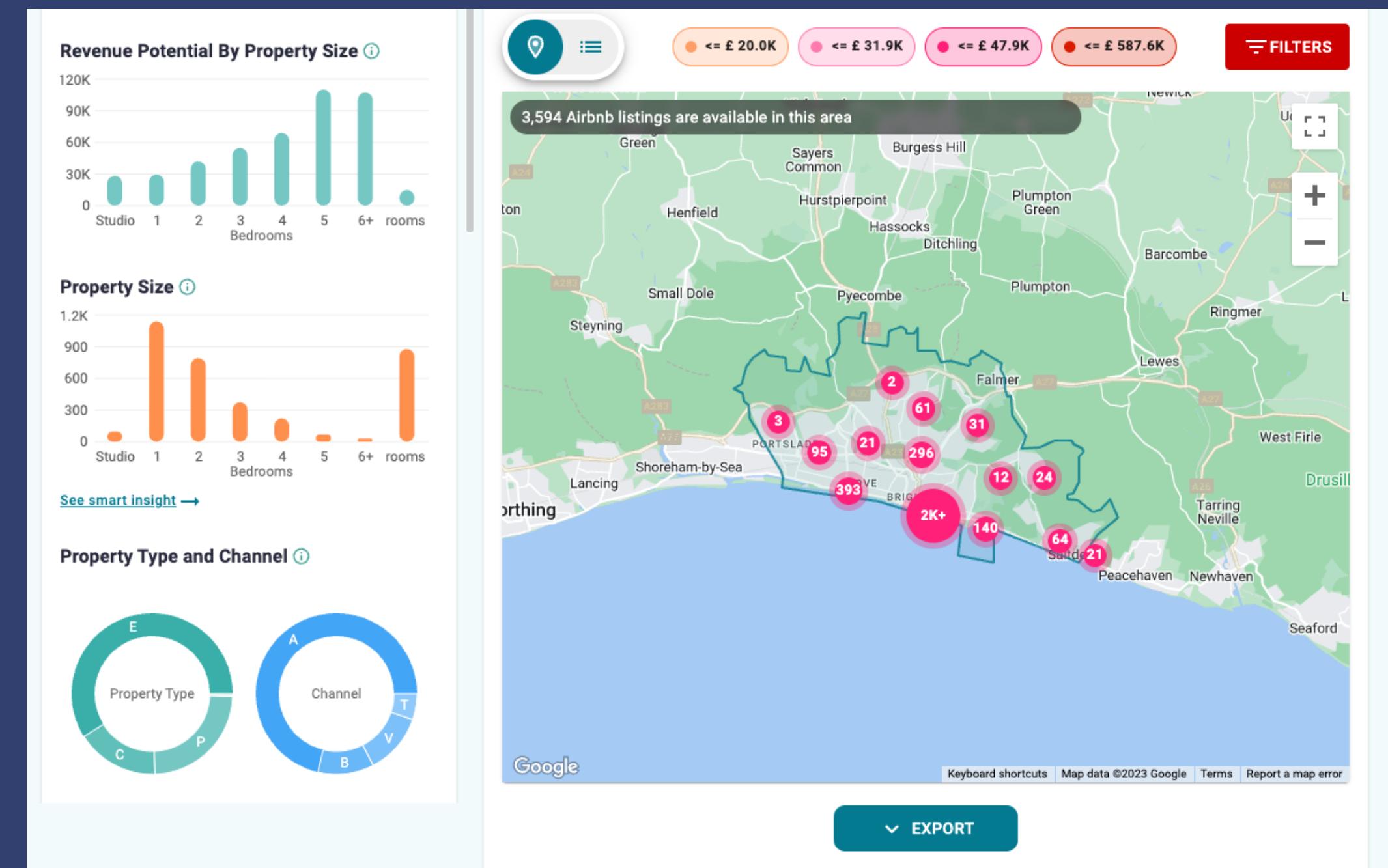
## GridSearchCV

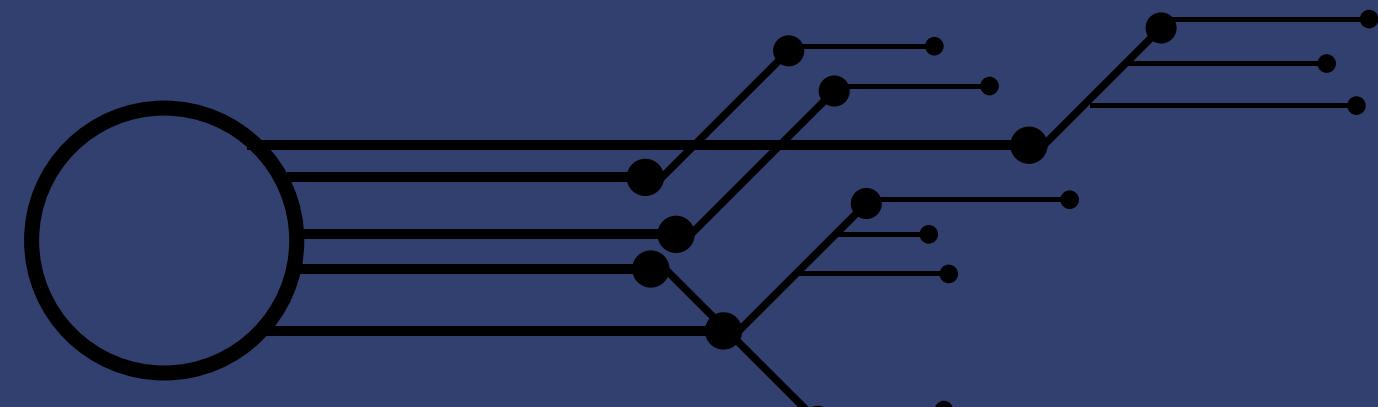
- **colsample\_bytree:** 1
- **learning\_rate:** 0.1
- **max\_depth:** 5
- **n\_estimators:** 200
- **subsample:** 0.7



# WHATS NEXT!

- **StreamLit:** Making an interactive Web application





# Q and A

## ASK AWAY!