



# Airbnb in Music City

*An analysis on the relationship  
between Airbnb's presence and the  
boom in home prices in Nashville*

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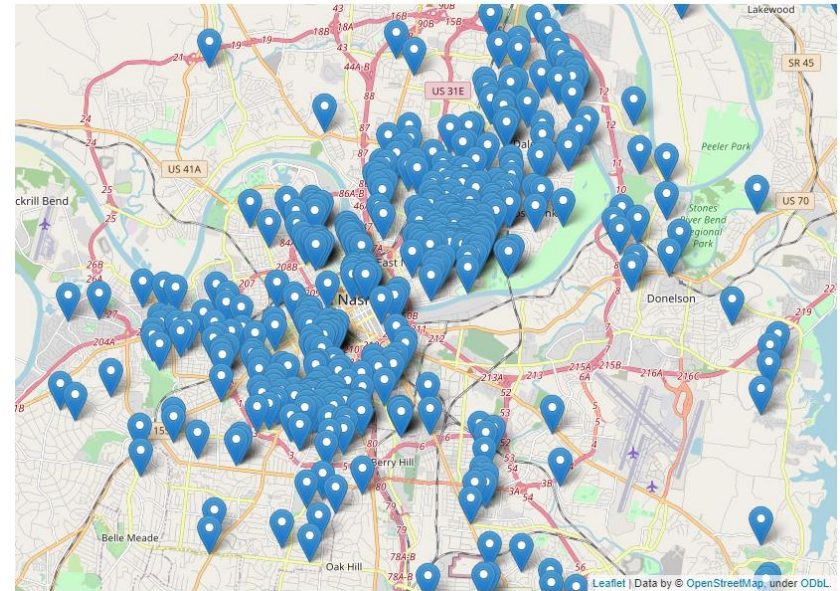
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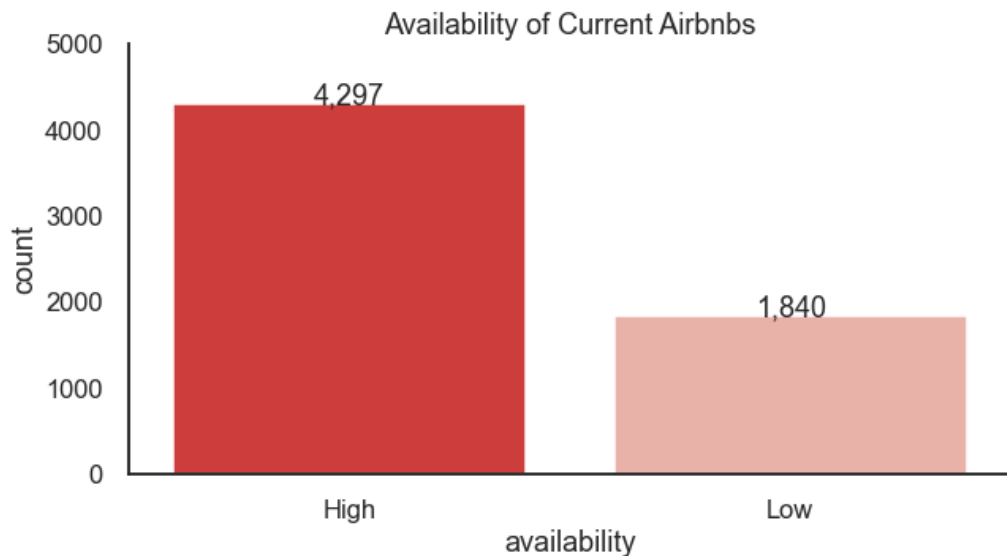
# BUSINESS PROBLEM

- Extreme growth in Nashville
- 6,000+ Airbnbs
- Majority non-owner occupied

## *Representation of Current Airbnbs in Nashville*



# BUSINESS VALUE



- Help the city of Nashville with policy
- Help residents of Nashville understand the trends

# METHODOLOGY



- Inside Airbnb and Zillow Data
- 2015 - Feb 2021
- **Regression:** Is there a significant relationship between home values and Airbnbs?
- **Time Series:** Can we predict future home values?
- **Classification:** Can we predict if an Airbnb will be non-owner occupied?

# RESULTS

01

## Regression

R2: 0.98

Train RMSE: 3,864

Test RMSE: 2,838

02

## Time Series

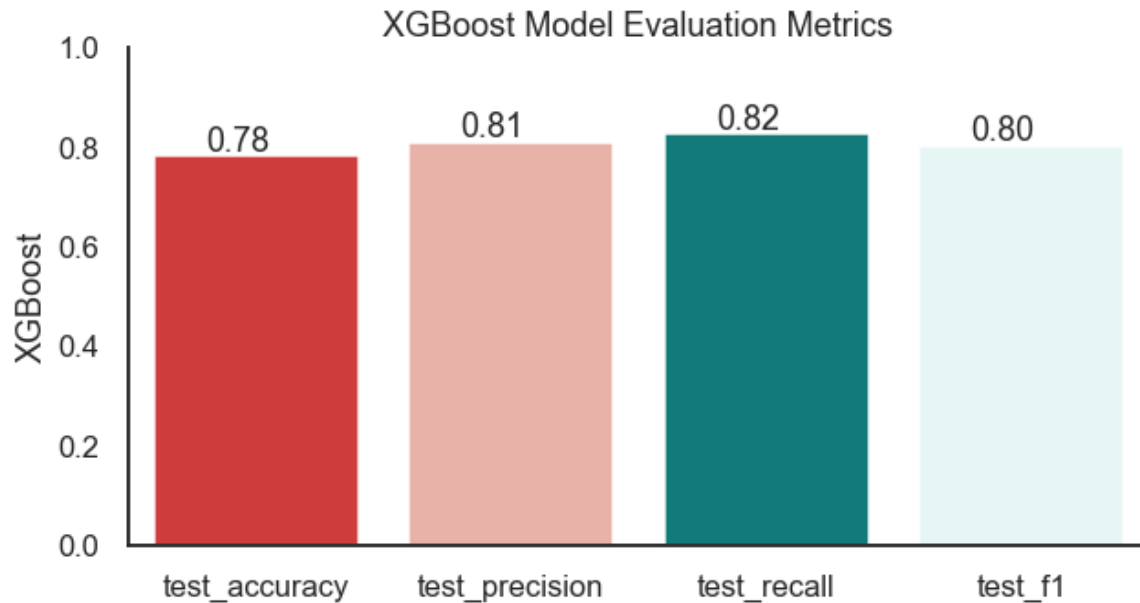
Dynamic Model

RMSE: 19,970

03

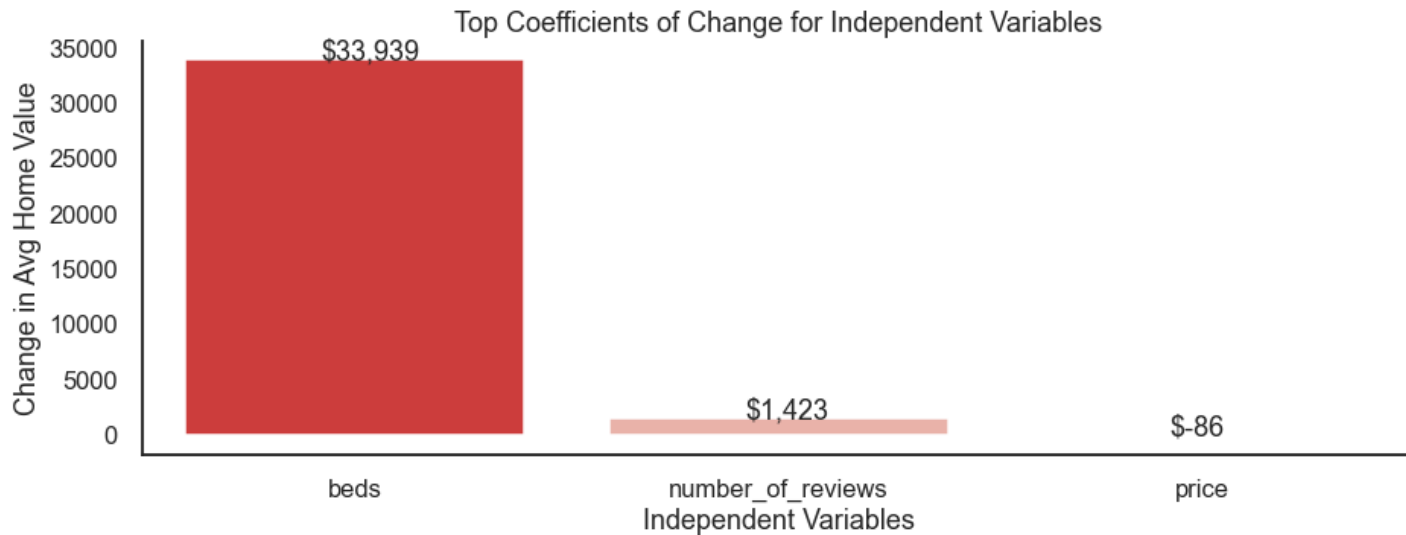
## Classification

XG Boost Model



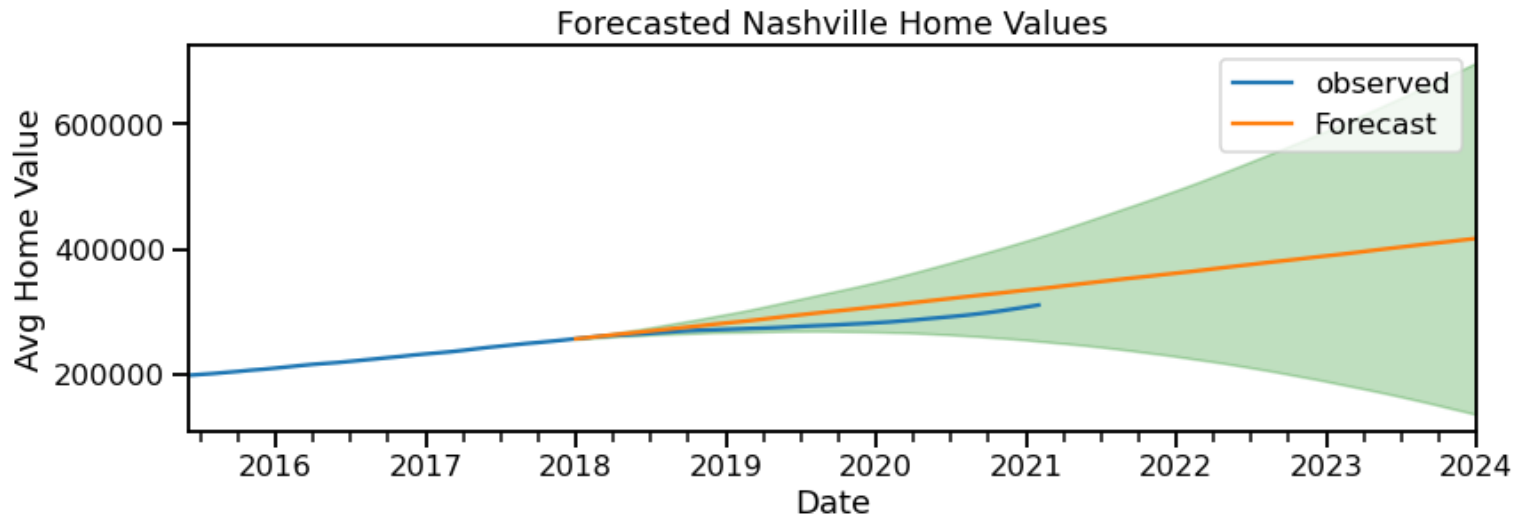
# RECOMMENDATION 1

Limit the number of beds in an Airbnb.



# RECOMMENDATION 2

Use time series model to make decision to buy a house.





# RECOMMENDATION 3

Use classification model to approve or reject Airbnb permits.

### Model Predictions - Will a New Airbnb Be Highly Available?

Using the XGBoost model will help the city determine whether a property will be non-owner occupied. Non owner-occupied units will have their applications rejected.

Permit Application Decision

Property Type:  
House

Room Type:  
Private room

Neighborhood:  
Downtown

Is Instant Bookable:  
Yes

Price: 150

Accommodates: 4

Bathrooms: 2

Beds: 2

REJECT AIRBNB APPLICATION

# FUTURE WORK

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Neighborhoods



Demographics



Deep Learning

# THANKS

Do you have any questions?

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