



Beating the Airbnb Market in Berlin



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Metis Project #3



Background

GOAL

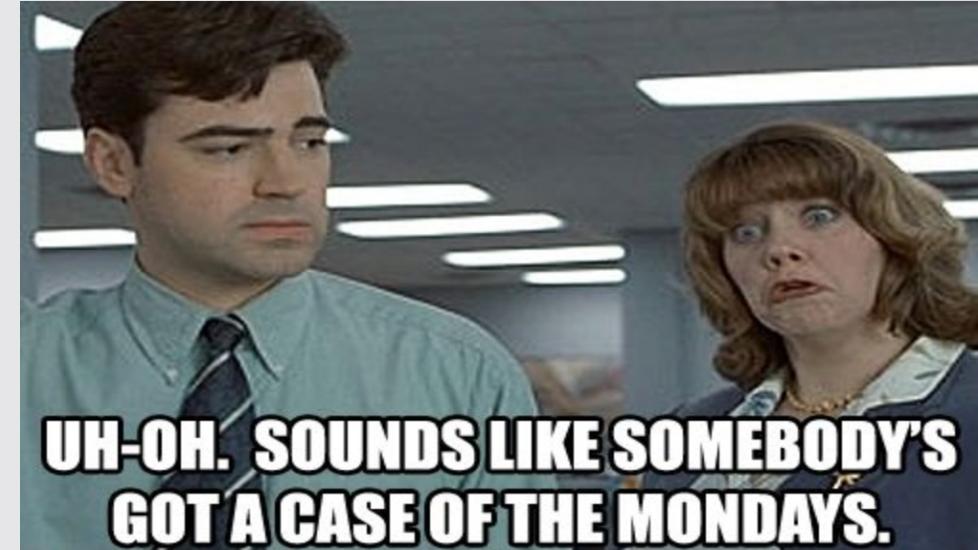
Determine what factors influence whether a home is beating the Airbnb rental market.

PURPOSE

- **Real Estate Investor** - What type of home will generate higher cash flow
- **Current Renter** - Are there things you can do with your listing to increase your monthly cash flow

DATA

Historical Airbnb rental history from over 20,000 homes in Berlin (09/2018-09/2019)



The Real Goal

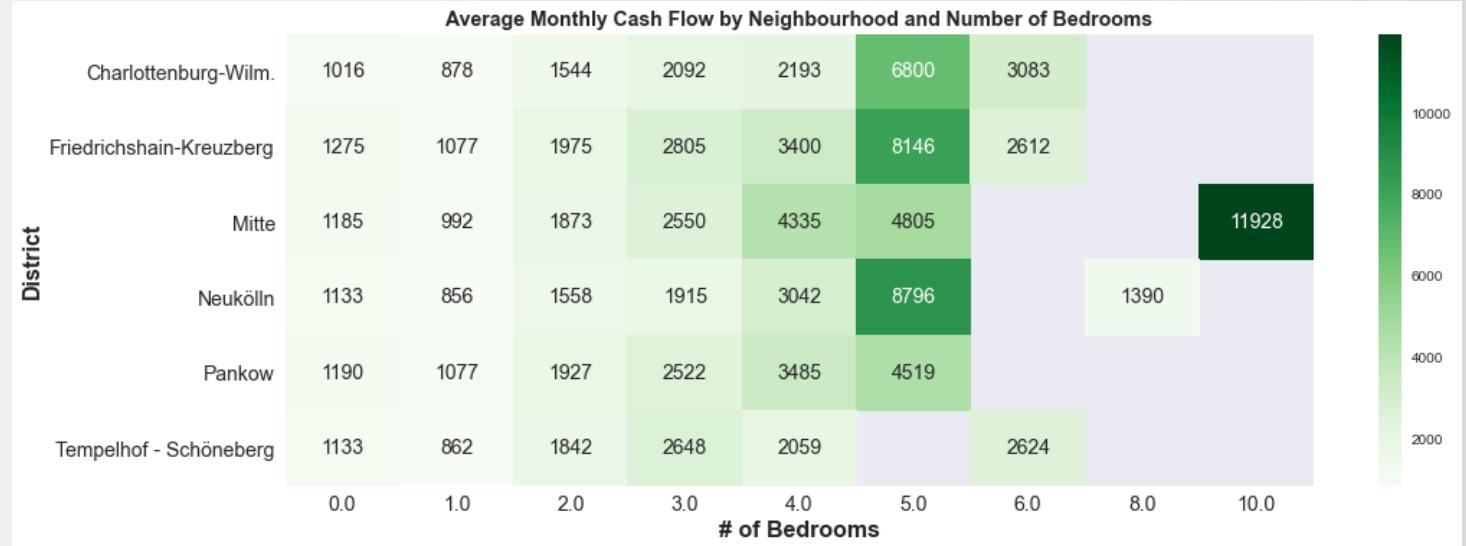




EDA

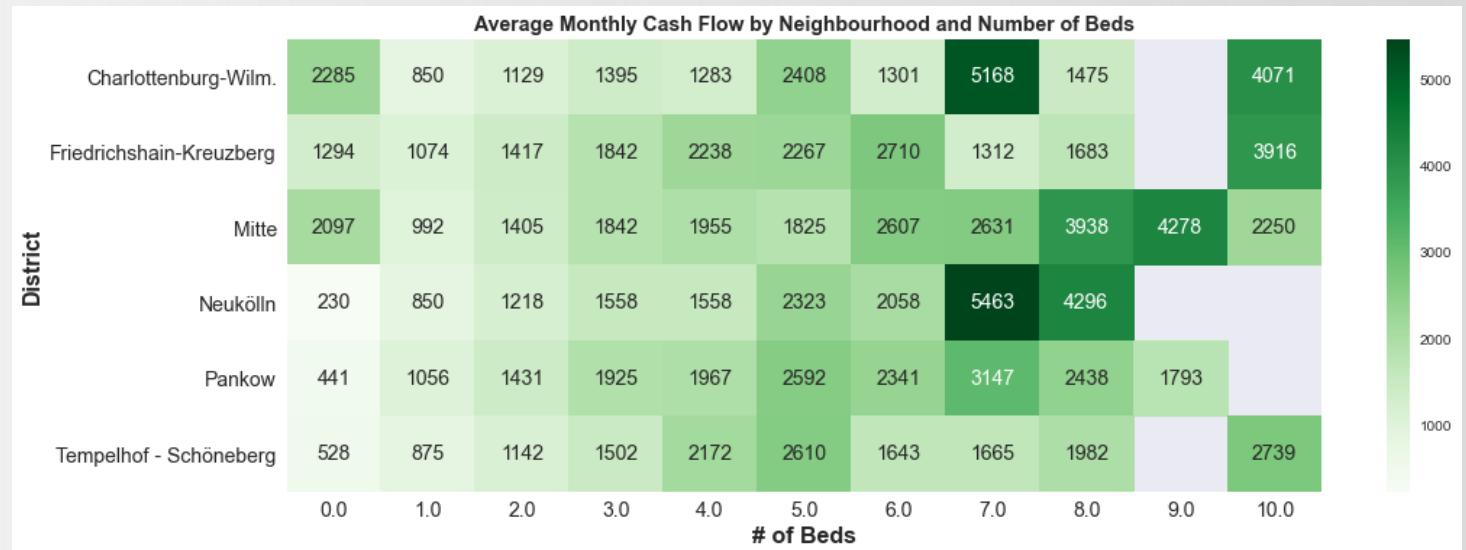
This makes sense! 😊

In almost every neighborhood, the more bedrooms, the higher the average cash flow



This plot has anomalies! 😥

Some places with more beds have lower cash-flows





Features

Target: Monthly Cash Flow above the Median Cash Flow of a home in a Neighborhood

Engineered Features

- Distance from City Center
- Approximate rental size
- Length of rental Descriptions

SPACE: Our two-room apartment measures **60 square meters**. The biggest part of the apartment is the living room with an **open kitchen**. Both flooded with sun almost all day. Additionally one person can **sleep on the comfy couch** in the living room. The location of our apartment is a dream and is one of the best in Berlin: 5 minutes to Rosenthaler Platz, 2 minutes to the wall memorial and **countless restaurants, bars, cafes** in the neighbourhood.

Given Features

Numerical

- # of accommodations
- # of beds, rooms, bathrooms

Categorical

- Superhost?
- Cancellation Policy
- Bed Type
- Host Response Time
- Amenities Offered

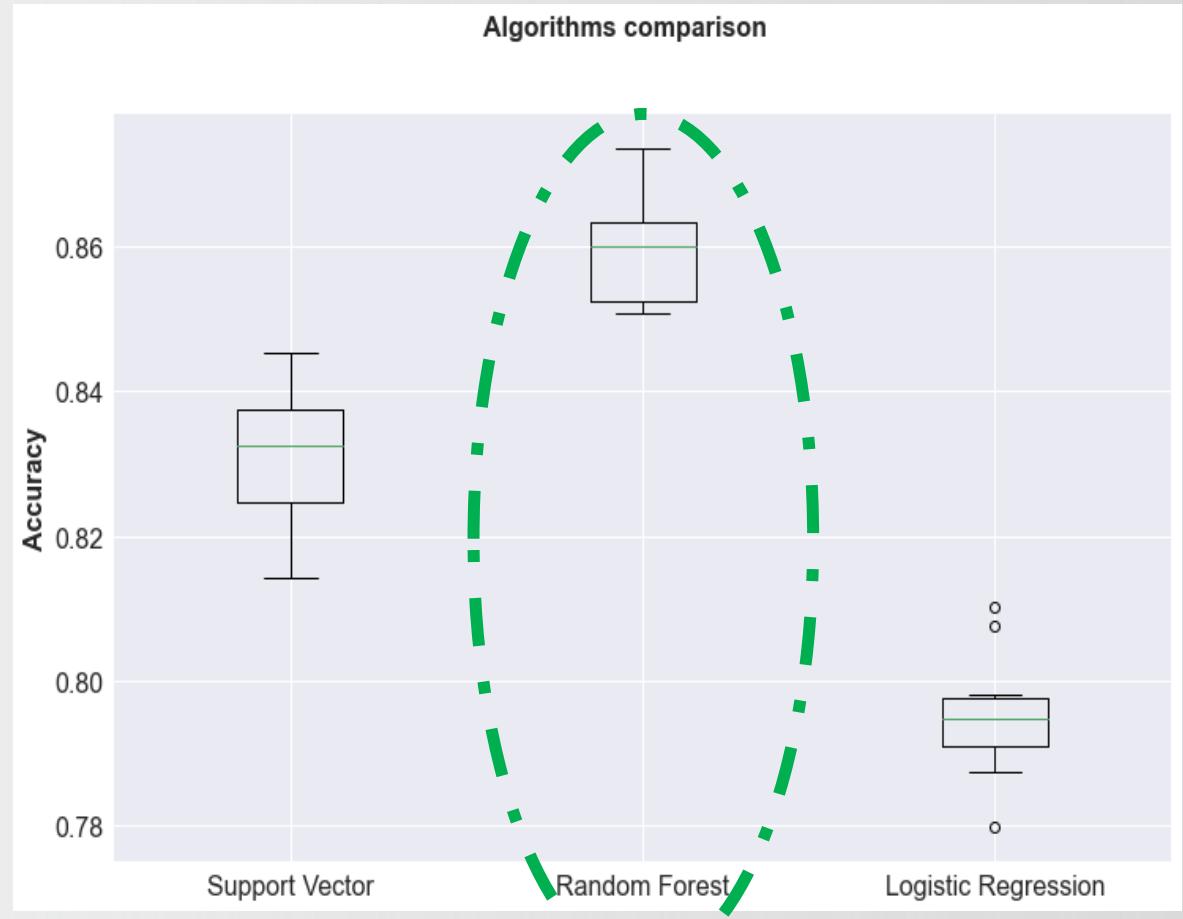


Modeling

Using a 10-fold Cross Validation to review the following models:

- Support Vector Classifier
- Random Forest
- Logistic Regression

Random Forest had consistently higher accuracy and less variation across all KFolds

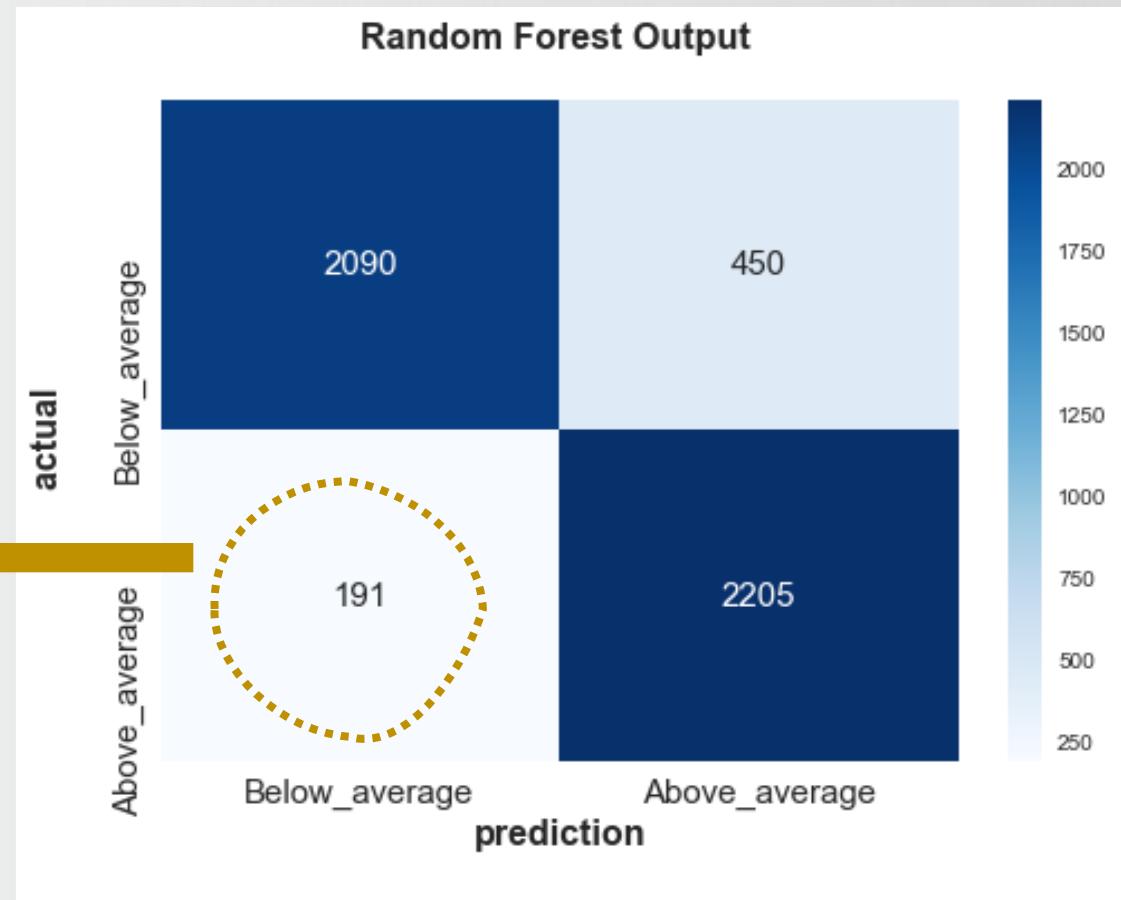




Model Performance Metrics

Outcome	Precision	Recall
Below Average	91%	82%
Above Average	83%	92%

Missed Opportunity





Findings



Factors For Real Estate Investor

Number of bedrooms and bathrooms

Size

Distance to city center

"AirBnB happened because Brian Chesky couldn't pay rent"

Factors For Current Renter

Unsurprising	<ul style="list-style-type: none">- Number of people that can be accommodated- Number of amenities- High Ratings a lot of them!
Surprising	<ul style="list-style-type: none">- Bed Type plays a negligible role- Flexible Cancellation Policy plays a negligible role- Simply having more amenities listed or a more detailed descriptions increases probability of higher cash flow



Additional Info

Modeling Inputs

Factors you cannot control

Number of bathrooms
1 - +

Number of bedrooms
2 - +

Distance to City Center(km)
2 - +

Things you have control over

How many people does it accommodate
5 - +

How much are you charging
100 - +

How long is your description
100 - +

Getting the most out of your Airbnb

Effect of Accommodation Bedrooms on Monthly Cash Flow

price

accommodates

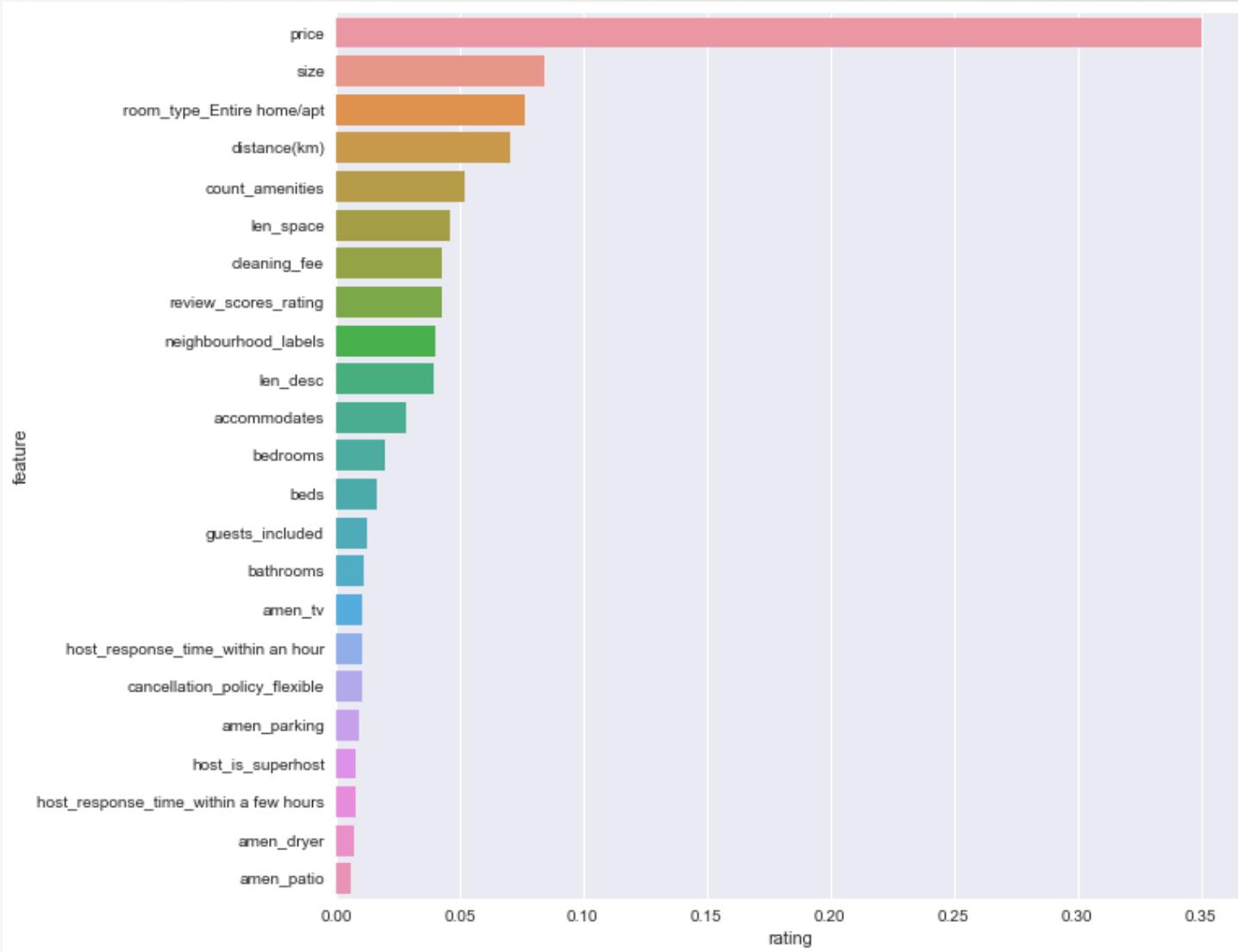
0 3000 6000 9000 12000 15000

id	type	beds	bed_type	amenities	minimum_nights	maximum_nights
6877	apt	1	Real Bed	{TV,"Cable TV",Interne...	3	112
11708	room	2	Real Bed	{Wifi,"Air conditionin...	2	112
17794	room	1	Real Bed	{Internet,Wifi,Kitchen...	1	2
19471	room	1	Real Bed	{TV,Wifi,Kitchen,Heati...	3	2
3394	room	2	Real Bed	{TV,Internet,Wifi,Kitch...	2	112

You have a 86.7% probability of beating the market!!



Additional Info





Moving Forward

- Text Mining!!!
 - Mine the Descriptions
 - Mine the review comments
 - Mine information about the Host
- Analyze Pictures