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Case study

Airbnb host Seattle Jan – Dec 2016

Question

Customer's question:

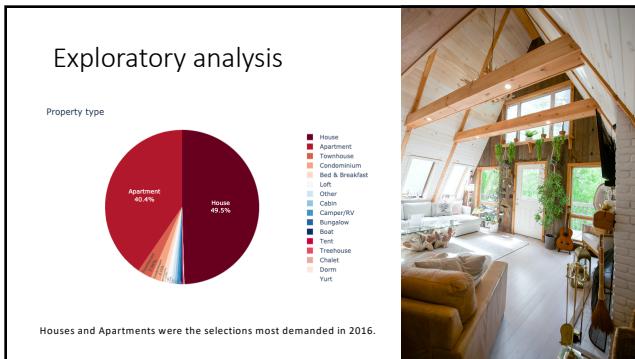
- Does the cleaning fee affect the monthly availability?
- Do the booking prices change per location?
- Do the booking prices change throughout the year?

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Data

 • Booking price • Cleaning fee	 • Availability • Property type • Accommodates <ul style="list-style-type: none"> • Room type • Number of bathrooms • Number of bedrooms 	 • Latitude • Longitude • Zip code
 • Date	 • Review score rating • Review score cleanliness	

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Exploratory analysis

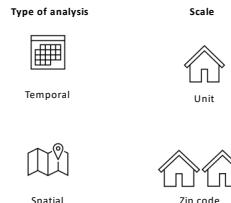


- The average booking price per day is \$107.47
- The average cleaning fee per day is \$29.11



Exploratory analysis

→ BOOKING PRICE + AVAILABILITY



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Exploratory analysis

→ BOOKING PRICE



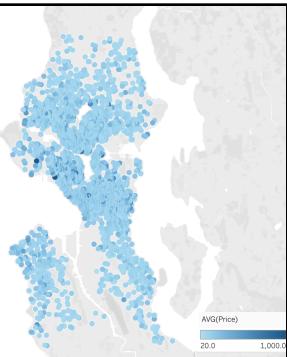
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Exploratory analysis

→ BOOKING PRICE



- Booking prices range from \$20 - \$1000 per day
- Prices seem relatively even across the area



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Exploratory analysis

→ BOOKING PRICE

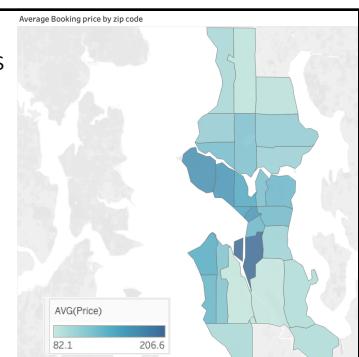


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Exploratory analysis

→ BOOKING PRICE

- Highest average booking price was \$207
- Zip code: 98134



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Exploratory analysis

→ AVAILABILITY

- Number of available units remains relatively constant over the year

Weekly Availability

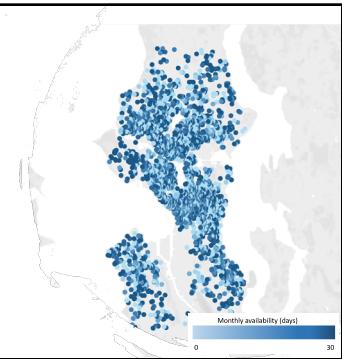


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Exploratory analysis

→ AVAILABILITY

- Availability = not booked (available for booking)
- No significant spatial pattern

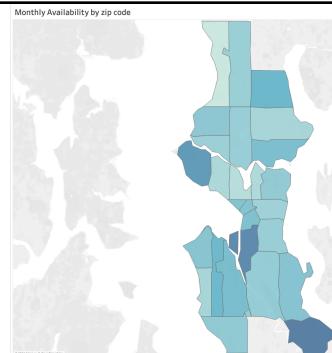


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Exploratory analysis

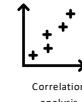
→ AVAILABILITY

- Availability = not booked (available for booking)
- No significant spatial pattern
- Zip code: 98134



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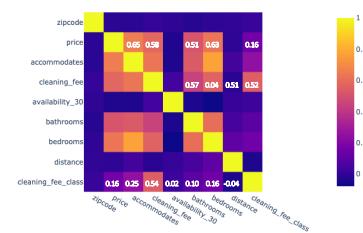
Exploratory analysis



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Exploratory analysis

Heatmap



Insights:

- No correlation between cleaning fee classification and the monthly availability
- Cleaning fee classification doesn't have a strong relationship with any other features

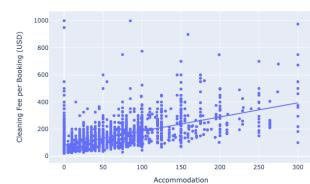
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Exploratory analysis

Price vs Accommodation



Cleaning fee vs Accommodation



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Summary

- Most of the Airbnb units in Seattle are houses and apartments
- The booking price per day doesn't depend on the location.
- Adding a cleaning fee to the booking does not affect the customer's decision to book an Airbnb.



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Prediction model

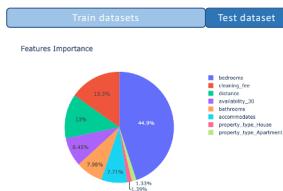
- Build and train five different models.
- The accuracy score will be the evaluation method for the models.
- The score should not below 0.60.
- The model will predict Airbnb prices.



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Feature Selection & Data Split

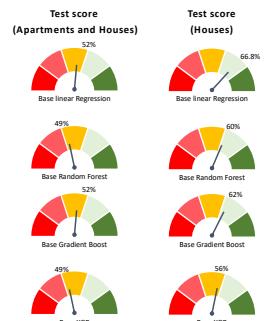
- Models:**
- Linear Regression
 - Random Forest
 - Gradient Boost
 - Extreme Gradient Boost



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Models Result

- The prediction model doesn't perform well with Apartment and House prices.
- The prediction model has better performance with the house's prices.



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Models tuning

Model	Test Score
Base Linear Regression	0.604
Base Random Forest	0.5837
Base Gradient Boost	0.5971
Base XGB	0.5664
Tune Model	Test Score
Tune Linear Regression	0.604
Tune Random Forest	0.6141
Tune Gradient Boost	0.6322
Tune XGB	0.6286

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