



Maximizing Profit for Airbnb Hosts

An analysis of Airbnb properties in Hawai`i

By :

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Main Research Question

What factors contribute to the value of an Airbnb rental in the state of Hawai'i?

Hypotheses:

- Rentals will increase in value as number of featured amenities increases
- Rentals will increase in value as number of host reviews increases
- Value will decrease as rental age increases
- Factors will differ across islands



How Airbnb works:


- It is an online market that allows private citizens to rent their property under a short term lease.
- Airbnb takes 3% commission of every booking from hosts, and between 6% and 12% from guests
- Guests like it because it offers cheaper accommodations
- Hosts like it because it gives them an opportunity to earn extra cash with little cost to them.

Hawai'i and Airbnb

- The relationship between locals and Airbnb is strained
- Main Issues :
 - **Taxes** : Full time vacation rentals decreases the number of property owning residents, and brings in more non-residents that do not work for the state. The state claims that they could have collected upwards of \$64M in taxes in 2018.
 - **Overcrowding**: As the number of rentals increases tourism grows, multiple people share rentals at a time
 - **Displacement**: As tourism grows property values go up. The median household income is \$77,765, Median property value is \$795,000, Hawai'i has the 5th highest poverty rate in the country.
- This year, Hawai'i tried a bill that would require Airbnb to collect lodging taxes
- Requires vacation rental operators to register with the state Department of Taxation



Importance

- It is important for Airbnb and hosts to adapt to changes to their environment to maximize their profit
 - It may be important for those living in a state where cost of living is high, and median income is low.
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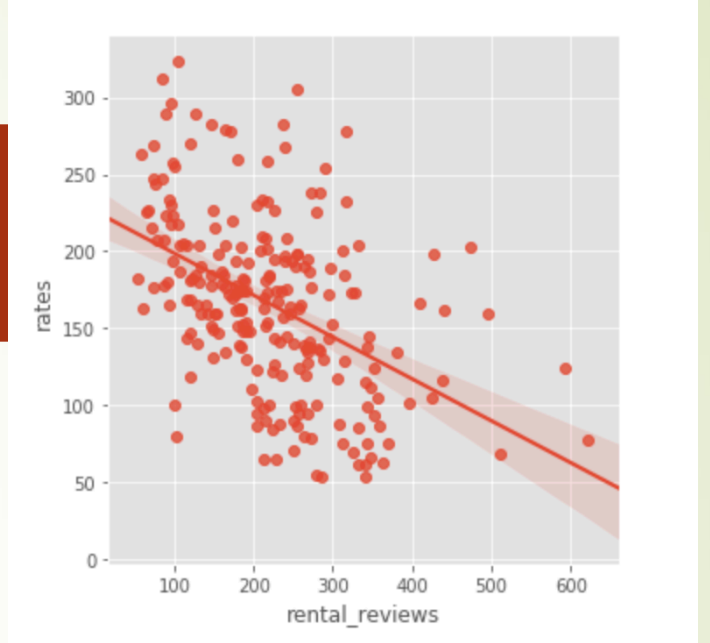
Analysis

- Used Selenium for scraping
- This analysis focuses on unique features of each property
- Variables of Interest:
 - Featured Amenities
 - Rental Age
 - Host reviews
 - Island Location
 - Rental Rate/night
- Due to the unavailability of 'nightly rate,' a property's value is measured by 'host reviews.'



All Islands: Rates vs Number of Rental Reviews

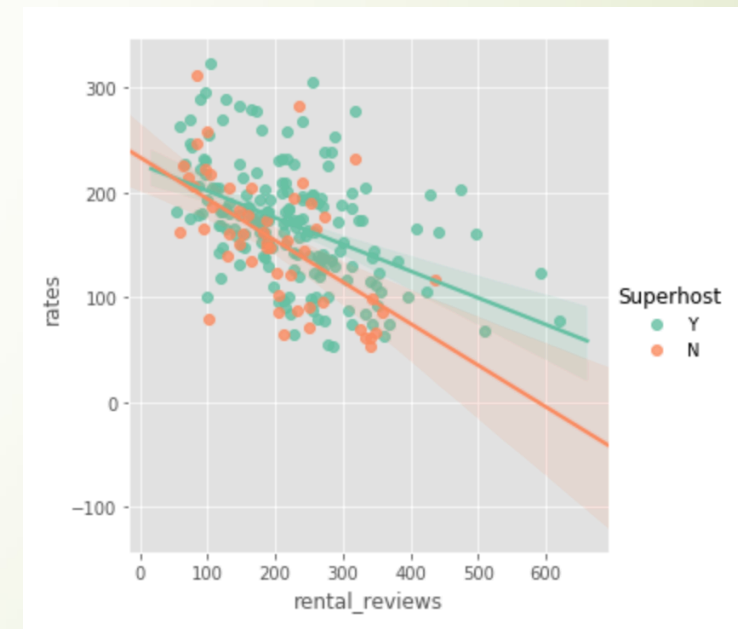
- Plot 1 illustrates the relationship between
 - Number of Rental Reviews(x) and Number of Rates (y)
 - This plot shows a possible negative relationship between the two after two outliers removed.



Number of Rental Reviews

Plot 1

- Plot 2 illustrates the relationship between
 - Number of Rental Reviews (x) and Rates (y) for super-hosts and regular hosts who live in Hawai'i and those who do not
 - This plot shows a possible negative relationship between the two for super-hosts and hosts that live in Hawai'i



Plot 2

Number of Featured Amenities

Correlation by Island

- Correlation analysis demonstrates that linear relationships differ across islands
- Strong correlations between nightly rate and featured amenities, rental age, and rental reviews are observed for each island.
- The strongest observed for the Big Island, Kauai, and Molokai is between rate and featured amenities
- For Maui and Oahu, the correlation between rate and rental reviews was the strongest

		feat_amenities	rates	host_reviews	rental_age	rental_reviews
location						
Big Island	feat_amenities	1.000000	0.549457	-0.408565	0.267625	-0.440200
	rates	0.549457	1.000000	-0.055686	0.258418	-0.308854
	host_reviews	-0.408565	-0.055686	1.000000	0.248217	0.374267
	rental_age	0.267625	0.258418	0.248217	1.000000	-0.179370
	rental_reviews	-0.440200	-0.308854	0.374267	-0.179370	1.000000
Kauai	feat_amenities	1.000000	0.684326	-0.181959	-0.066998	-0.520975
	rates	0.684326	1.000000	0.137934	-0.152395	-0.419561
	host_reviews	-0.181959	0.137934	1.000000	0.184087	0.277598
	rental_age	-0.066998	-0.152395	0.184087	1.000000	0.222281
	rental_reviews	-0.520975	-0.419561	0.277598	0.222281	1.000000
Maui	feat_amenities	1.000000	0.066689	-0.537392	-0.047578	-0.147942
	rates	0.066689	1.000000	0.065702	0.037594	-0.296969
	host_reviews	-0.537392	0.065702	1.000000	0.075966	0.218869
	rental_age	-0.047578	0.037594	0.075966	1.000000	0.189090
	rental_reviews	-0.147942	-0.296969	0.218869	0.189090	1.000000
Molokai	feat_amenities	1.000000	-0.433555	0.518848	0.431881	0.598464
	rates	-0.433555	1.000000	-0.547720	-0.614663	-0.118518
	host_reviews	0.518848	-0.547720	1.000000	0.735639	0.635921
	rental_age	0.431881	-0.614663	0.735639	1.000000	0.325113
	rental_reviews	0.598464	-0.118518	0.635921	0.325113	1.000000
Oahu	feat_amenities	1.000000	0.218546	0.066376	-0.305667	-0.197169
	rates	0.218546	1.000000	-0.242350	-0.098229	-0.371880
	host_reviews	0.066376	-0.242350	1.000000	0.343757	0.312083
	rental_age	-0.305667	-0.098229	0.343757	1.000000	0.315123
	rental_reviews	-0.197169	-0.371880	0.312083	0.315123	1.000000

Linear Regression

- To analyze the relationship between rates and the factors that show a strong correlation simple linear regressions were performed, then a multi-linear regression including all factors
- **Simple linear regression results:**
 - rate vs. rental reviews: the relationship was significant showing a -7.947 decrease in rate for every 1 unit increase in rental reviews ($p = < 0.0001$)
 - rate vs. featured amenities: the relationship was significant showing a 0.6633 increase in rate for every addition of an amenity ($p = < 0.0001$)
 - rate vs. rental age: the relationship between rate and rental age was not significant with a p value of 0.161
- **Multiple Linear Regression results:**
- The model included rental reviews, featured amenities, and rental age
 - The results for the multiple linear regression shows significant relationship between
 - Rate vs .Number of Rental Reviews ($p < 0.0001$)
 - Rate vs. Number of Featured Amenities ($p < 0.001$)



Conclusions

- Rate shares a significant relationship with number of rental reviews ($p < 0.0001$) and number of featured amenities ($p > 0.001$) after conducting a MLR, controlling for rental age.
- The analysis shows that decreasing your rental rate will increase the number of reviews, which, could result in more credibility as a rental, higher total ratings, and a higher value rating. All of these things could contribute to more profit for a host in Hawaii
- More in-depth analyses should be conducted to see which amenities, specifically, increase the rate of a rental
- An analysis between islands should be conducted as well