How does San Francisco fit with sharing economy?
Empirical analysis of Airbnb listing rental prices

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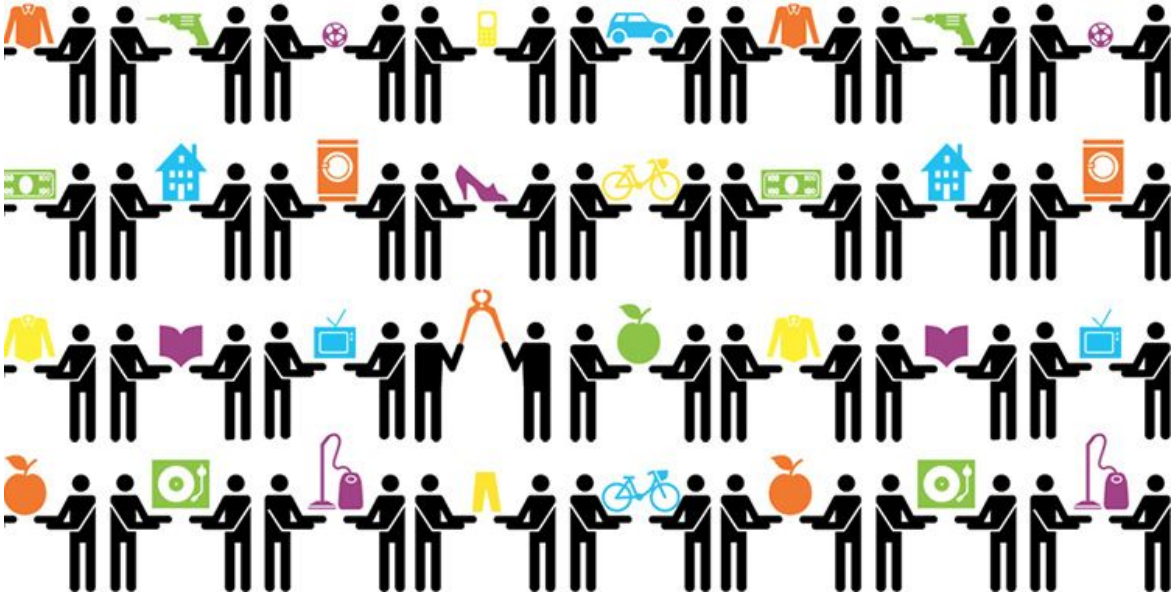
San Francisco

- Tourists
- Bussiness
- Cultural
- Technology
- 2000s

Sharing Economy: What is it?



- Private Ownership
- “Ours”
- peer-to-peer

San Francisco + Sharing Economy

- Early adptoers
- Hub

Sharing Economy: For-profit companies

Peer-to-peer Accomdation: Airbnb

- Founded in 2008 in San Francisco

- 2015 Airbnb Valuation: $20 Billion
- 2019 Airbnb Valuation: $38 Billion

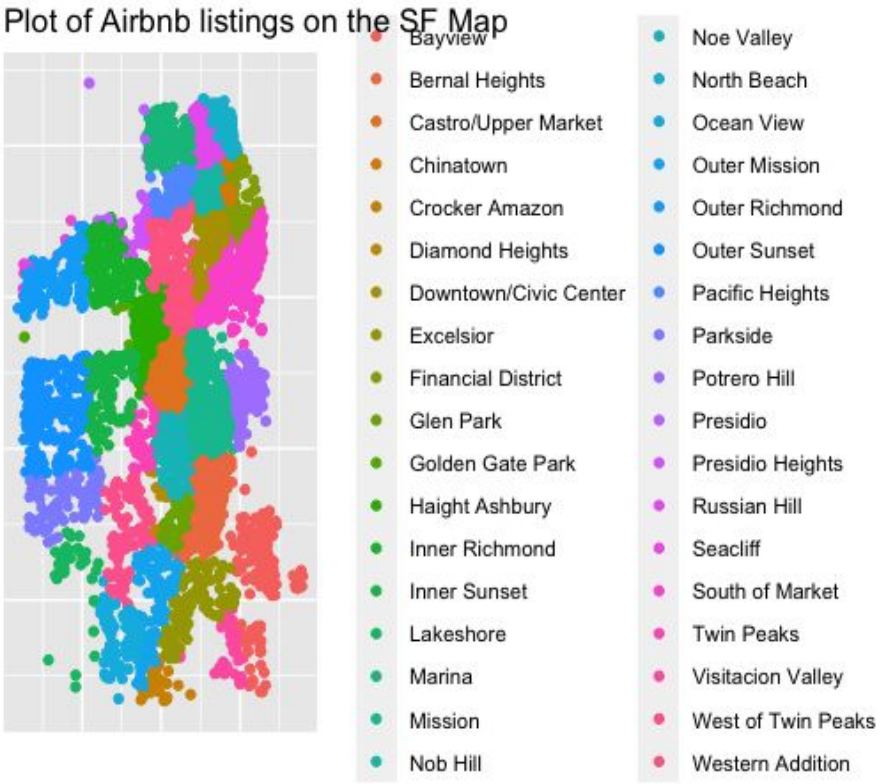
- Huge pressure to traditional hotel bussiness

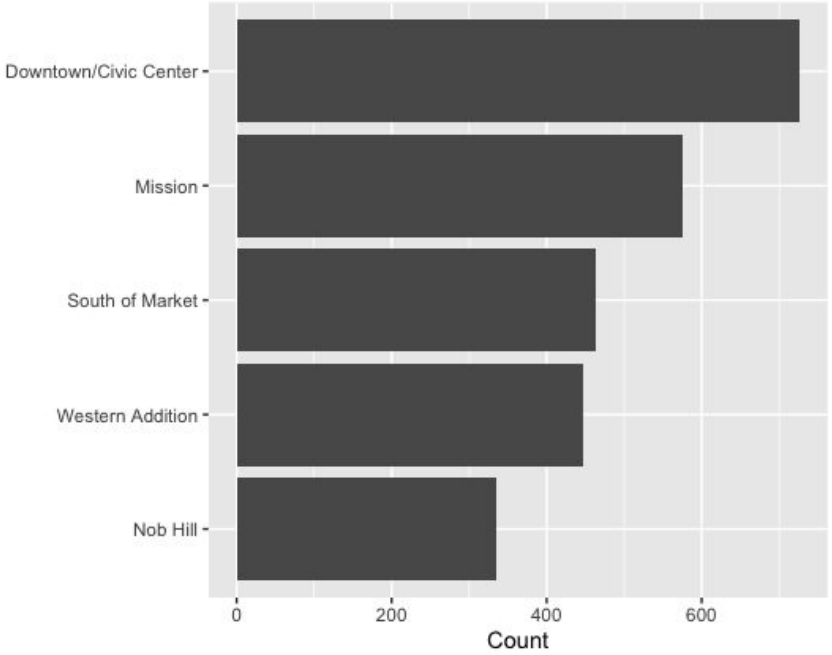
How does sharing economy behave in the SF market? Does traditional commerical power still win?

Visulization

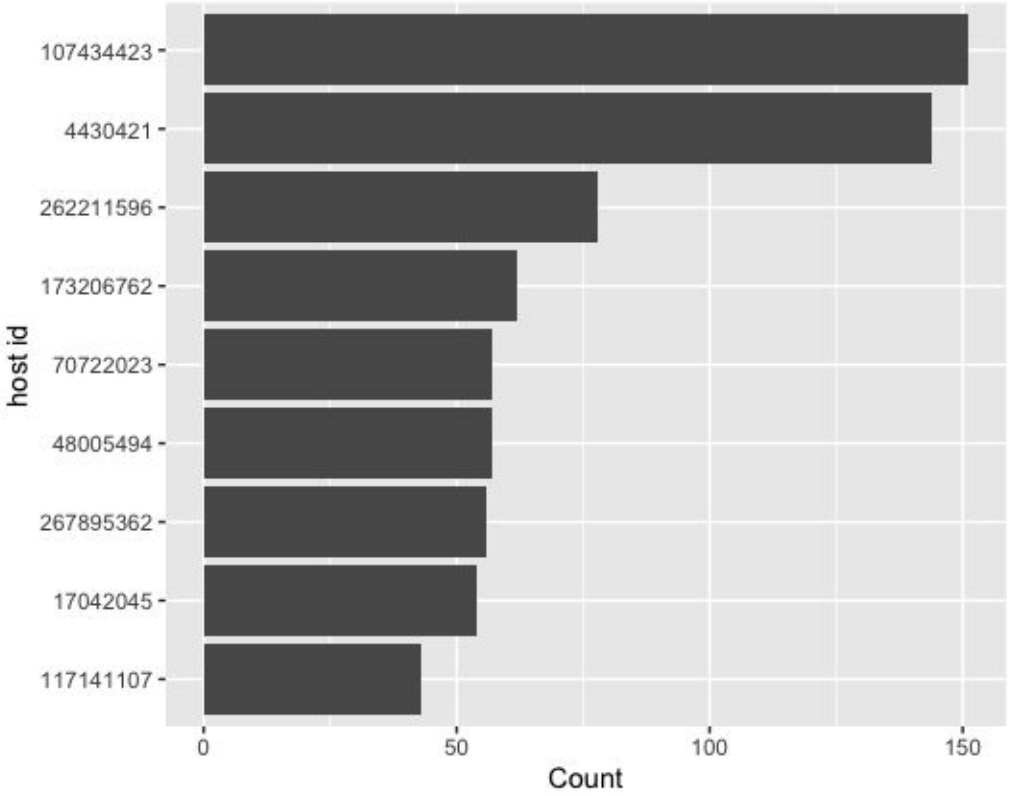
- Data Source: ***Inside Airbnb , Nov, 2021***
- Size of Data: ***6552 listings in San Francisco***
- Size of Variables: ***29 select fetures***

Neighbourhood



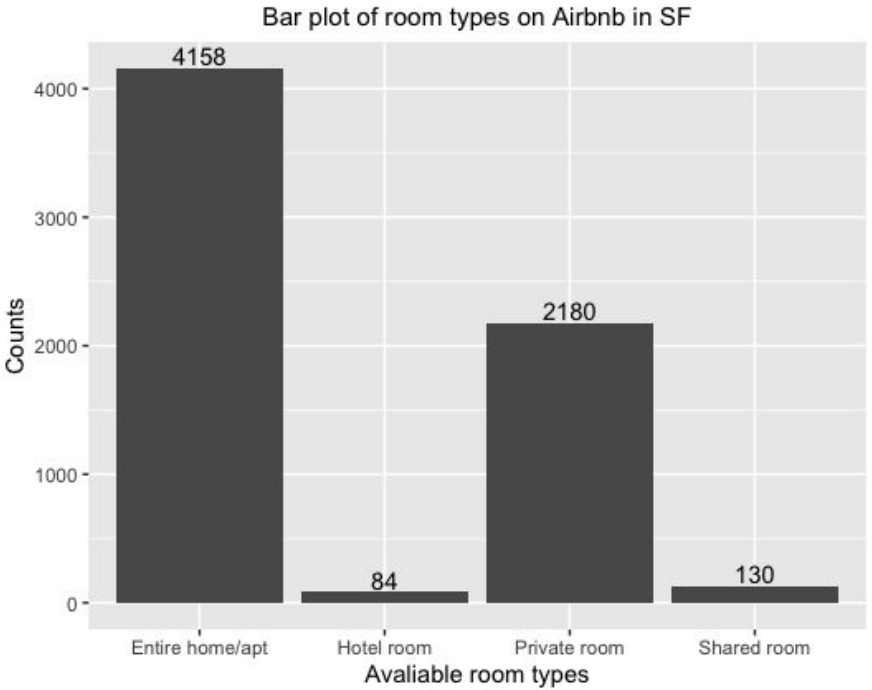


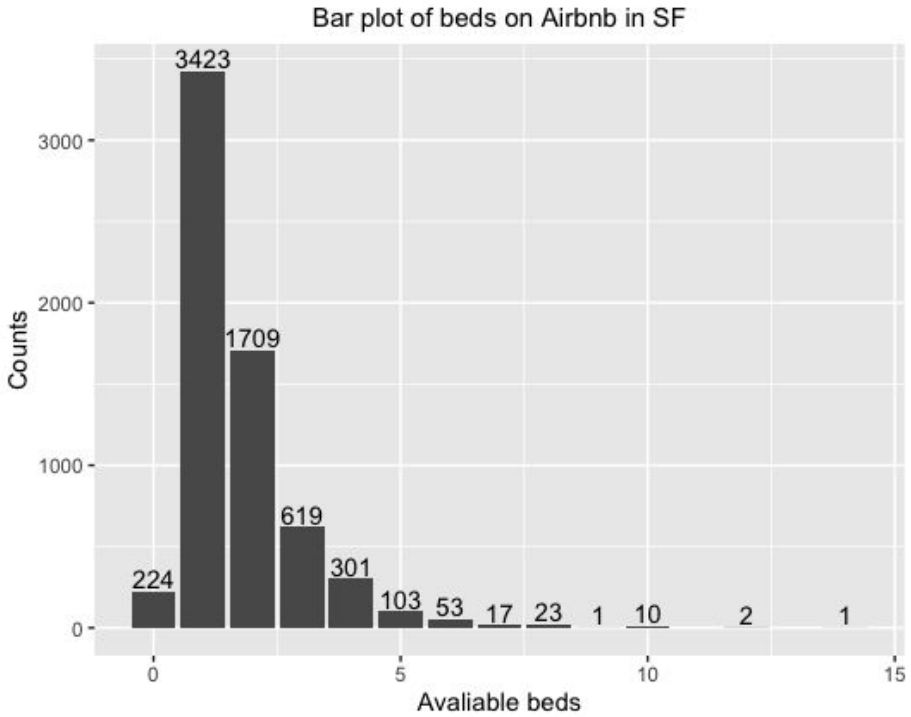
Hosts with multiple listings posted



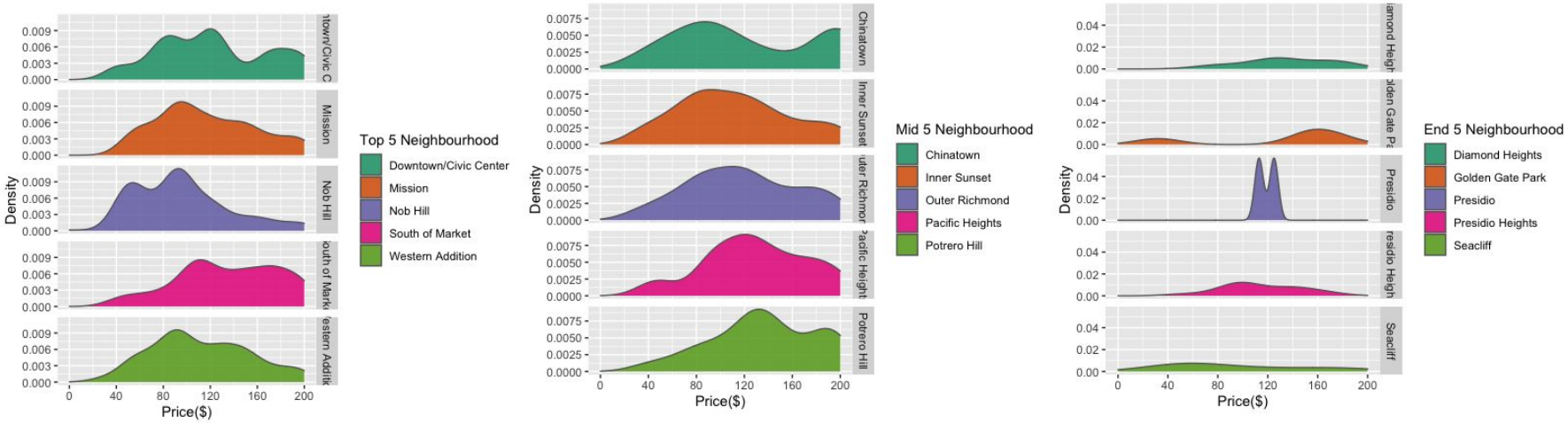
- 3397 hosts have more than 1 listings.
- 64 hosts have more than 10 listings
- 9 hosts have over 40 listings

Room types & Bed numbers



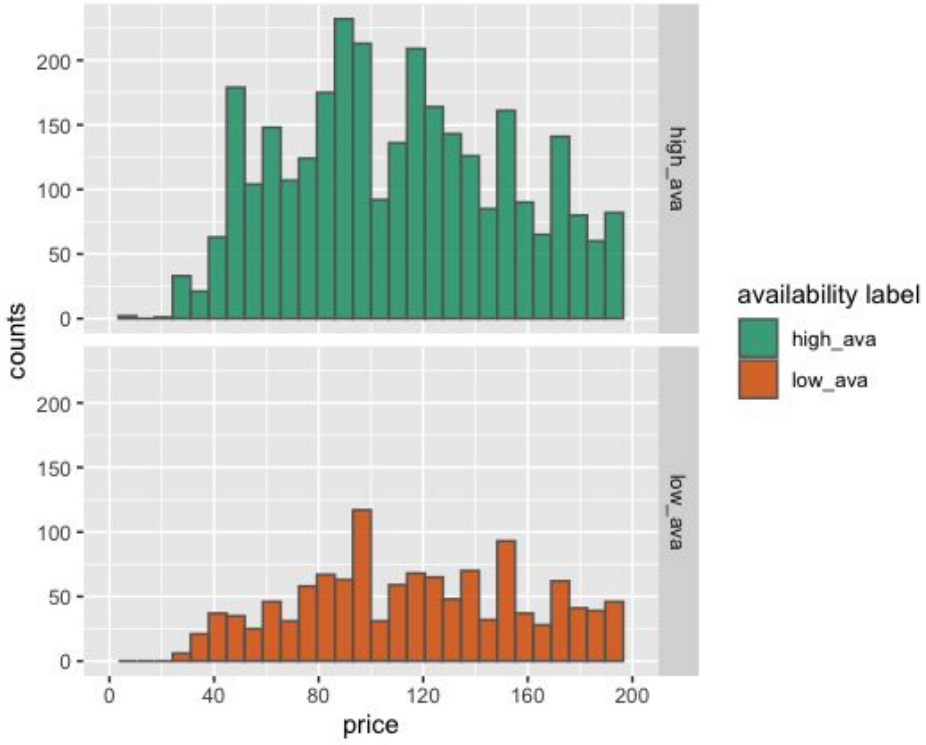


Price and Neighbourhood



Top 5 Neighbourdood: Count the listings for each neighbourhoods and slect the top 5 with most counts.

Price and Avaliability



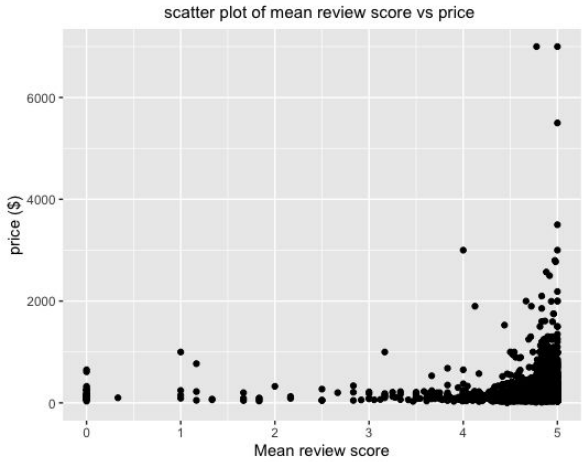
High ava : anuual availiability ≥ 90 days

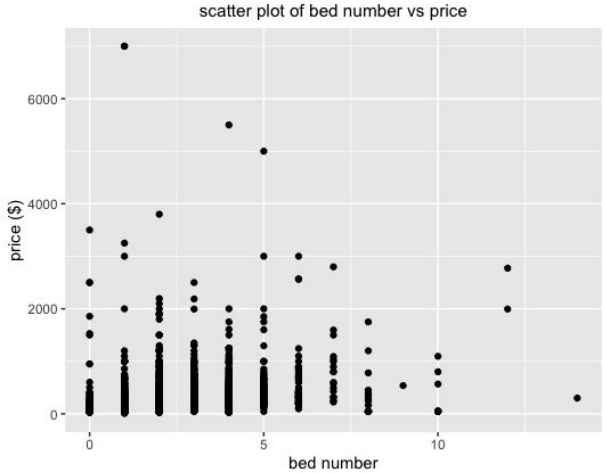
Low ava : anuual availiability < 90 days

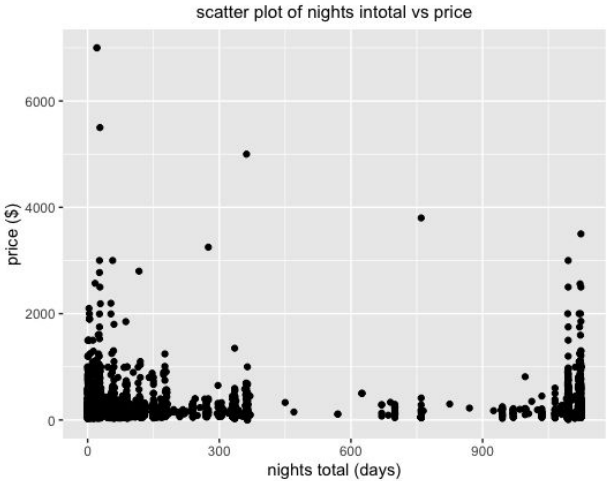
Mean review score
bed number
Nights total

v.s.

Price







Regression: General Linear Model

$$
\begin{aligned}
price = {} & \beta_0 + \beta_1 * Neighbourhood + \beta_2 * Room\ type + \beta_3 * Availability\ label \\
& + \beta_4 * Nights\ total + \beta_5 * Beds + \beta_6 * Mean\ review\ score \\
& + \beta_7 * Nightstotal * Beds + \beta_8 * Nights\ total * Mean\ review\ score \\
& + \beta_9 * Beds * Mean\ review\ score \\
& + \beta_{10} * Beds * Mean\ review\ score * Nights\ total
\end{aligned} \tag{1}
$$

Regression: General Linear Model

β_i Constant Coefficient	Estimate	Std. Error	t value	$Pr(>\|t\|)$
β_0	0.10556	0.23862	0.442	0.65824
β_1	0.08017	0.02602	3.081	0.00208
β_2	0.21163	0.02683	7.887	3.76e-15
β_3	-0.02772	0.02672	-1.038	0.29948
β_4	0.51988	0.24760	2.100	0.03580
β_5	-0.40607	0.12893	-3.150	0.00164
β_6	-0.14825	0.04937	-3.003	0.00269
β_7	-0.37673	0.14635	-2.574	0.01007
β_8	-0.10126	0.05173	-1.958	0.05034
β_9	0.13723	0.02681	5.118	3.21e-07
β_{10}	0.07238	0.03042	2.380	0.01737

RMSE	R^2
0.08327	0.19314

Reject null hypothesis

Regression: General Lienar Model

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\end{aligned}
\tag{1}
$$

Classification: Supervised, Random Froest

		Actual Class		
		Cheap	Expensive	Total
Prediction Class	Cheap	%65.8	%14.6	%80.4
	Expensive	%5.2	%14.4	%19.6
	Total	%70.0	%30.0	%100.0

Accuracy	Kappa
0.80194	0.46858

Target Varaibel: Expensive/ Cheap

Features: neighbourhood, room types, bed, mean review score

Major featuers that relate to price

neighbourhood

room type

bed

mean review score

Major featuers that not relate to price

nights total

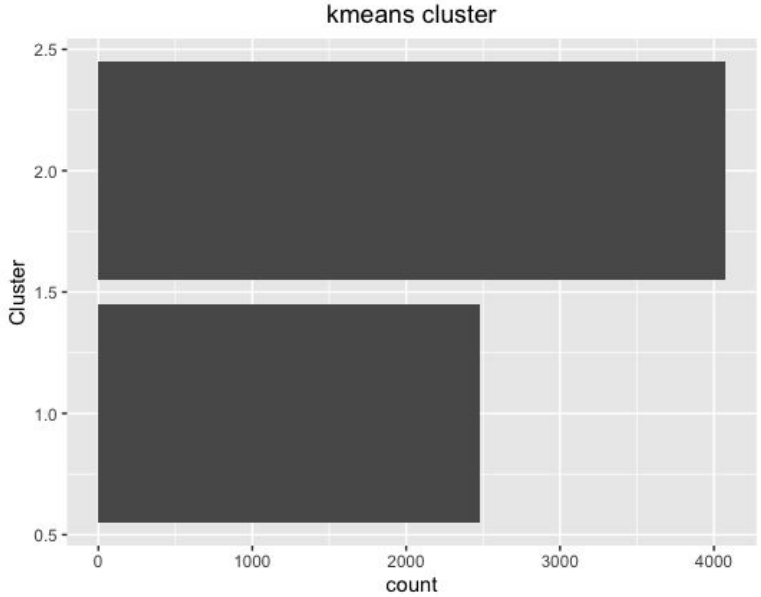
availiability

Classification: Unsupervised, K-means clusering

price

nights total

availiability



cluster name	percent	price	nights total	availability label
Commercial Hosts	36.3%	-0.01767306	1.2736271	0.7445099
Peer Hosts	63.7%	-0.00839774	-0.7816904	0.6327029

Conclusion

The ***commercial power*** takes great proportion in this market over the years.

More than ***1/3*** of the whole market.

The model of ***listing price*** in this market highly ***follows the traditional economy models***. Better neighbourhood, individual room and higher review scores inevitably result to a higher price. The key feature of peer-to-peer accommodation, ***availability*** of the listings, has ***no importance to the price***.

Airbnb's sharing economy ***depends greatly on conventional economy model*** in ***San Francisco.***

Some Thoughts

- Complexity of San Francisco
- Political subcultures: liberal, environmentalists and populists
- Deregulation
- Political, cultural backlash

- Rethink how individuals consume (and produce) services under the challenges from political and public cultures while constructing a new type of economy of their own.