



Apartment Rental & Venues Data Analysis of Toronto

Background

- Toronto is the largest city of Canada
 - First city ranked by population
 - 33rd city ranked by area in Canada
- Demands of International students in renting apartment
 - A suitable price
 - A good Environment
 - Venues around apartment
- Giving the best suggestion on renting an apartment based on students needs.

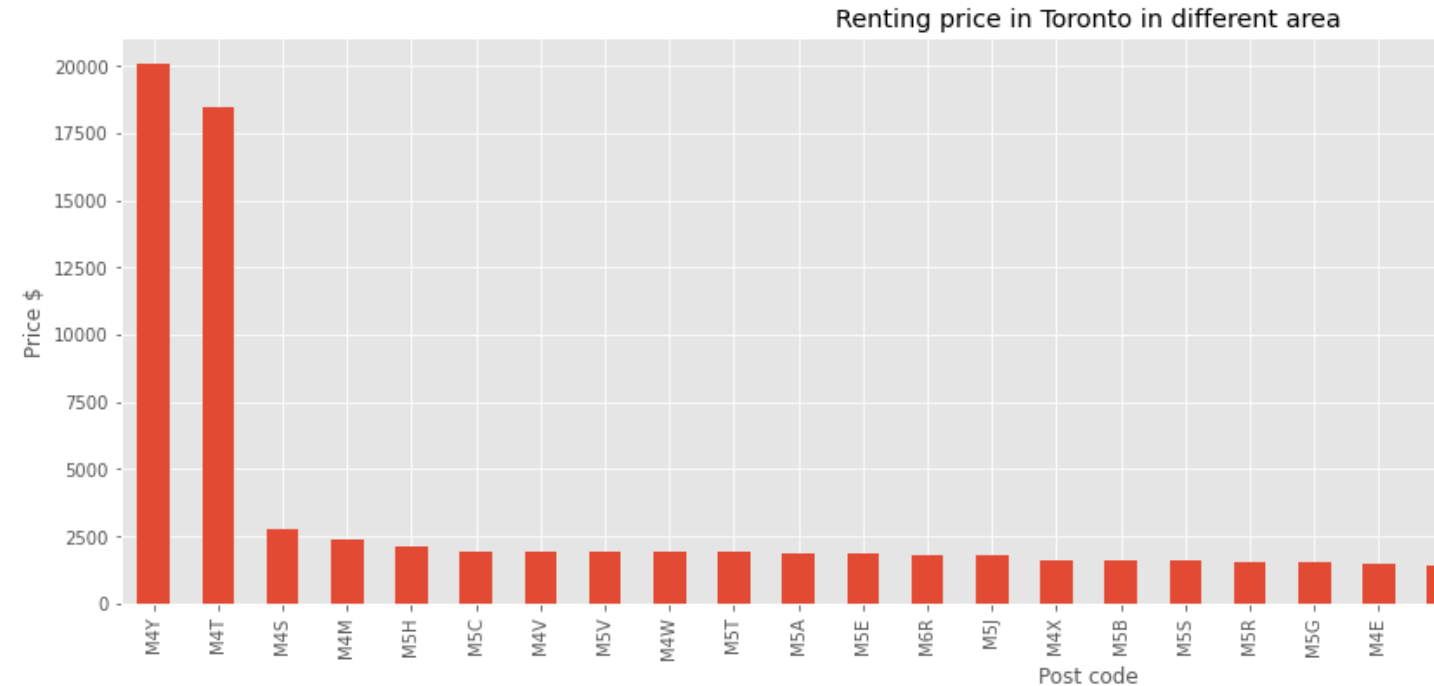
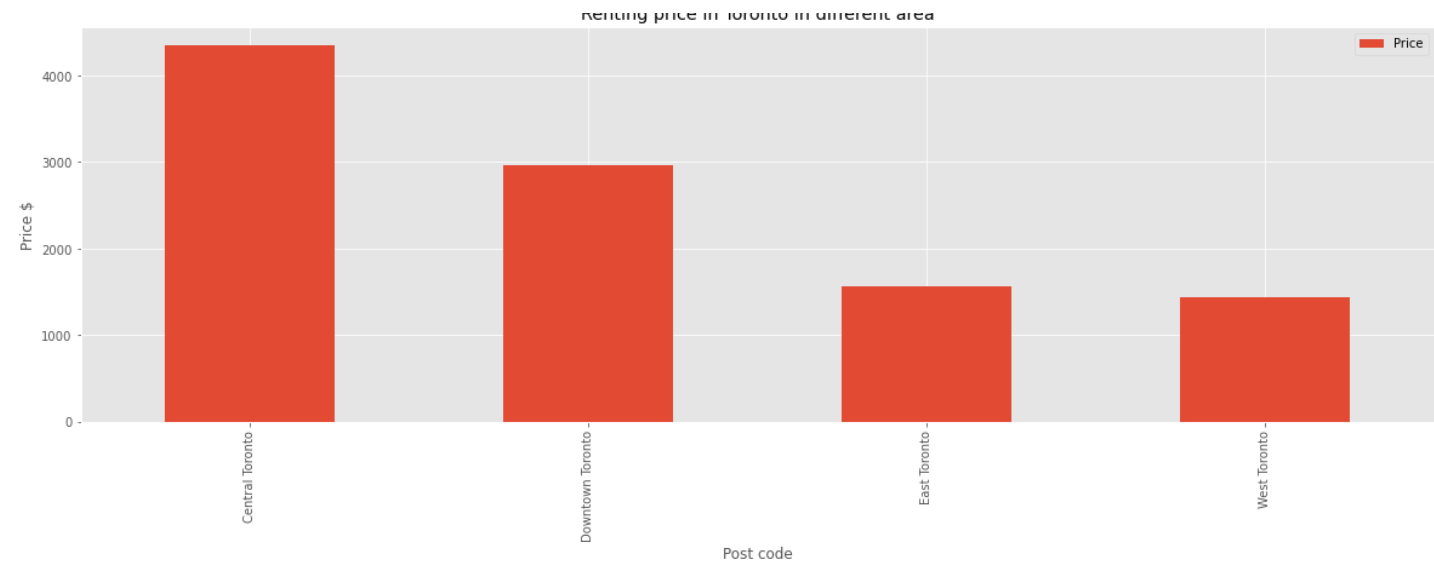


Data

- Toronto Apartment Rental :
Kaggle: <https://www.kaggle.com/rajacsp/toronto-apartment-price>
- Foursquare location data.
- Table of postal codes of Canada.
- Geocoder package or the csv file .
- The cleaned data contains information of apartment' s postal code, Borough, Neighborhoods, latitude, longitude, number of bedroom , number of bathroom, Price, venues around.

Price Vs Different Area In Toronto

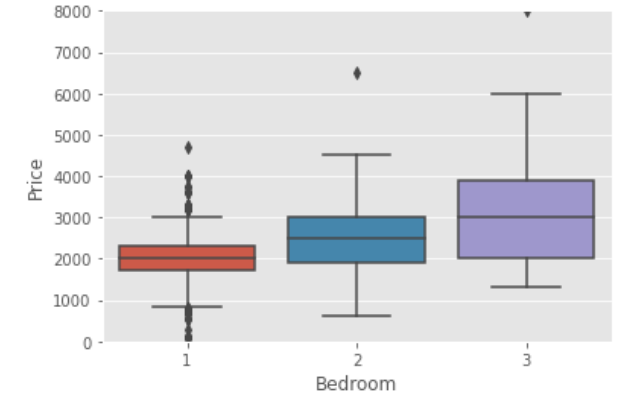
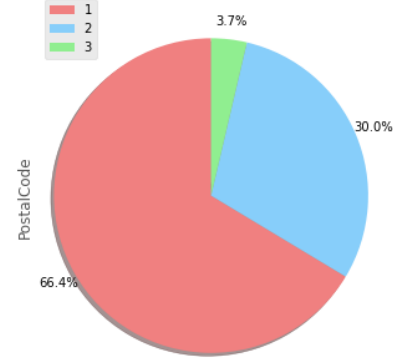
- The bar chart shows the average price (per room) of apartment in different area of Toronto.
- City central has the highest price.
- Except M4Y and M4T, the rental price of other areas have little differences.



Apartment with how many bedrooms is the best choice?

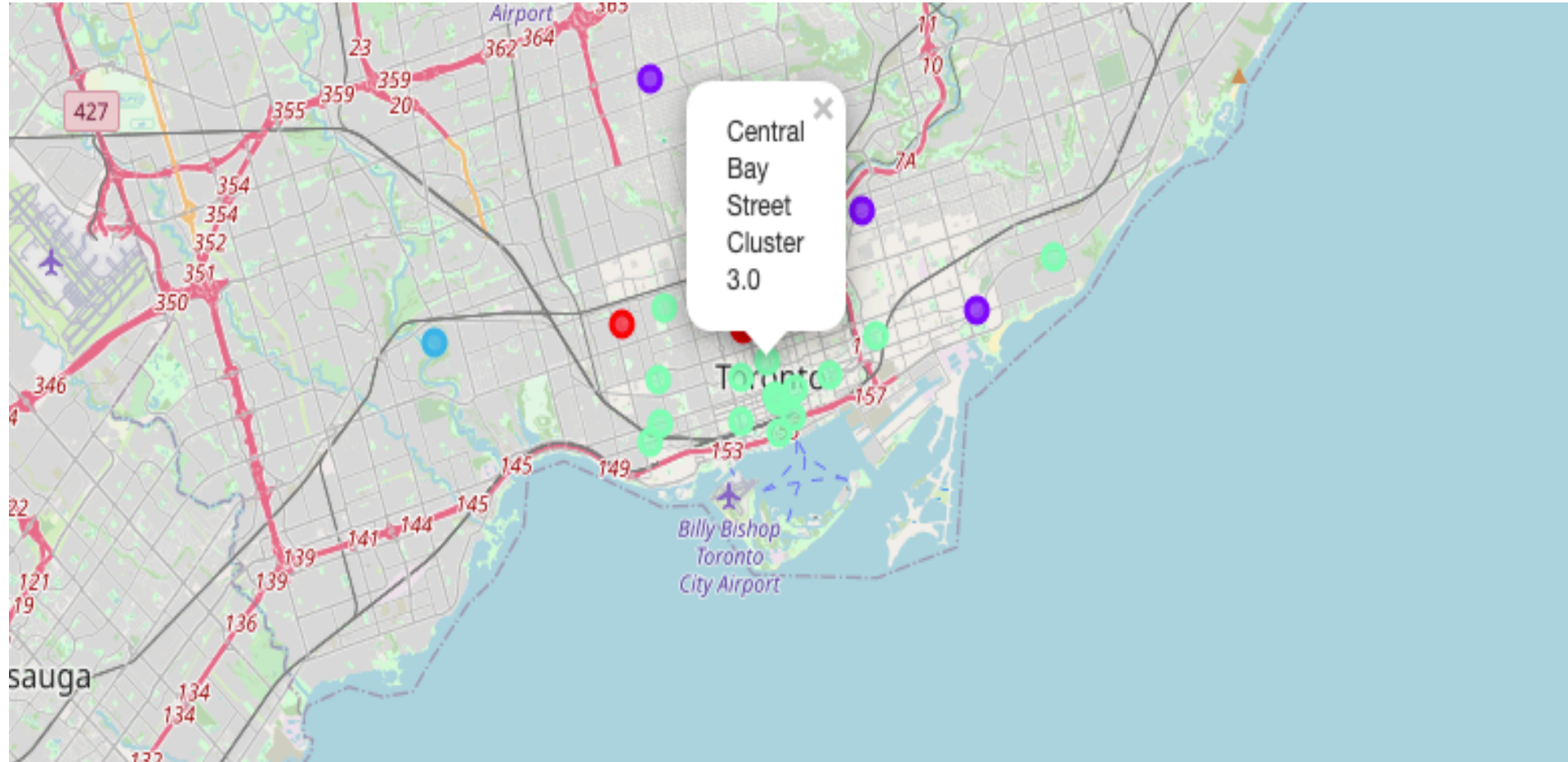
- students who have limited budget can share a two bedrooms apartment with classmates or friends.
- For students who have enough budget can choose one bedroom apartment.

The propability of Apartments with different number of bedrooms



Num of bedroom	50%	75%
One	\$2000	\$2300,
Two	\$2500	\$3000
Three	\$3000	\$4000

Based on Venues around the apartment
Five clusters are obtained



Model:
K-mean

Cluster 0, Quite and healthy Environment

Neighbourhood	Bedroom	Bathroom	Den	Latitude_y	Longitude_y	Price	ClusterLabels
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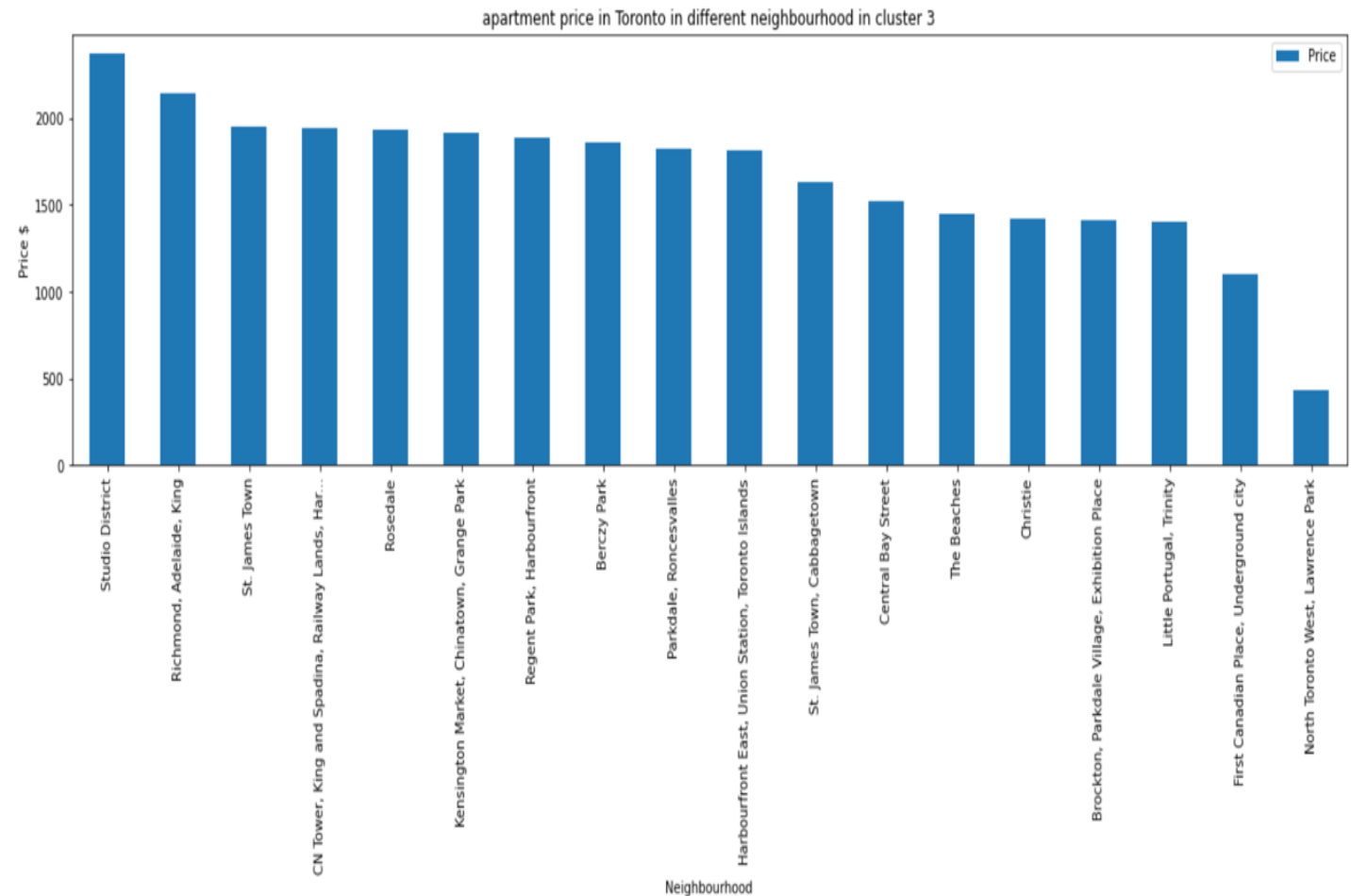
Dufferin, Dovercourt Village	1.187500	1.125000	0.187500	43.664819	-79.434812	1429.894737	0
Summerhill West, Rathnelly, South Hill, Forest...	1.000000	1.000000	0.000000	43.664388	-79.391946	1952.400000	0
University of Toronto, Harbord	1.230769	1.076923	0.384615	43.663759	-79.393333	1581.187500	0

ClusterLabels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Park	Bar	Brazilian Restaurant	Gym	Café	Coffee Shop	Distribution Center	Falafel Restaurant	Event Space	Ethiopian Restaurant
0	Park	Office	Sushi Restaurant	Chinese Restaurant	Café	Coffee Shop	Theater	College Theater	Museum	Art Museum
0	Park	Coffee Shop	College Theater	Sandwich Place	Art Museum	Café	Office	Theater	Dog Run	Dive Bar

The venues in cluster 0 are parks, gyms and several restaurants which is suitable for students who enjoy quite and healthy life

The apartment near University of Toronto is the cheapest, which is really the best choice for students who studied in University of Toronto.

Cluster 3 Urban and Causal life



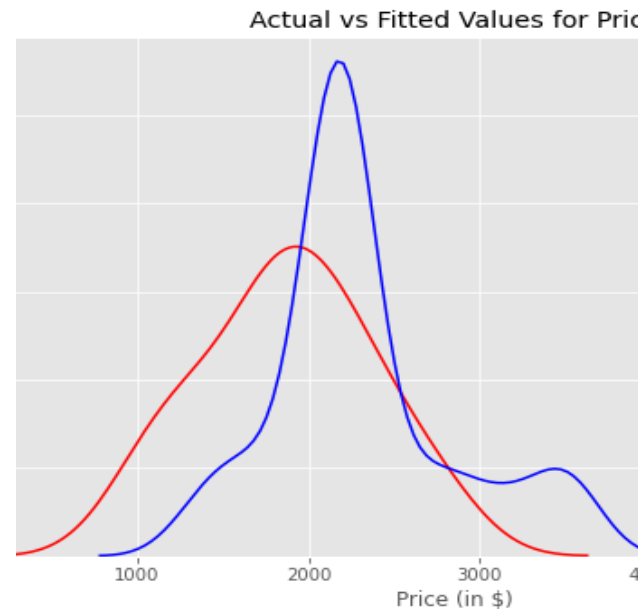
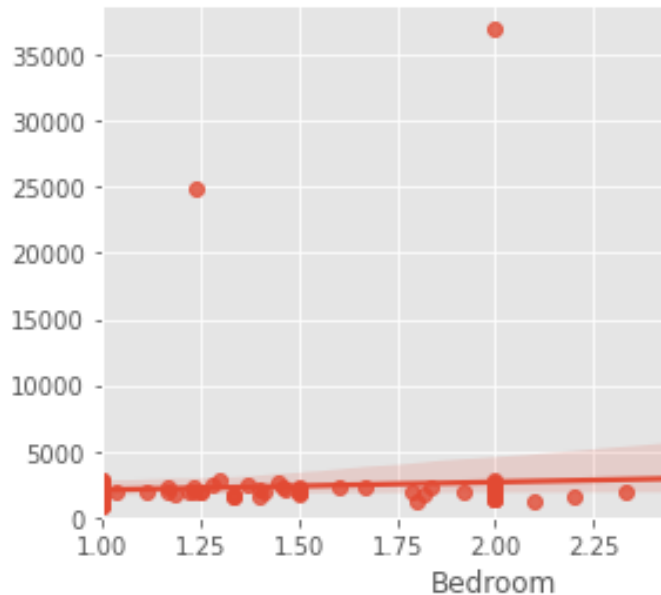
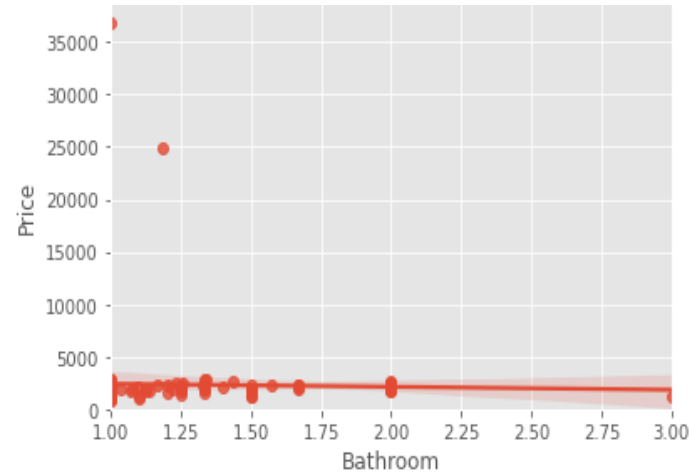
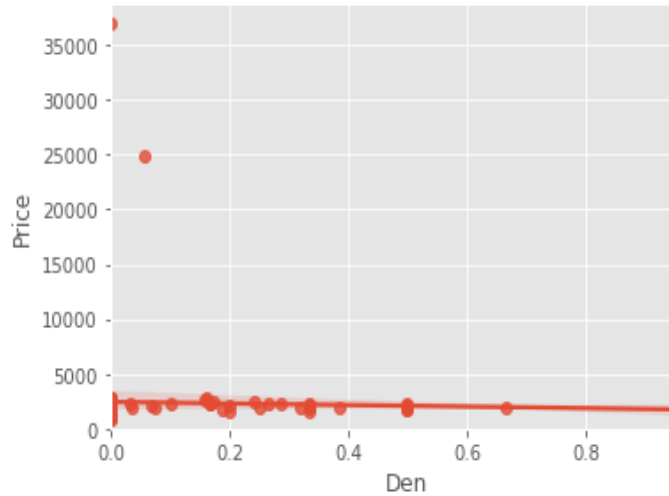
Students who want to enjoy the urban life can pick cluster 3.

The apartment rental price is listed in bar chart.

The venues around are coffee shops, restaurants, bar and shops,

Coffee Shop	17
Restaurant	17
Hotel	17
Italian Restaurant	17
Sporting Goods Shop	17
Japanese Restaurant	17
Beer Bar	17
Café	17
Cocktail Bar	17
Pub	17

Multiple Linear Regression

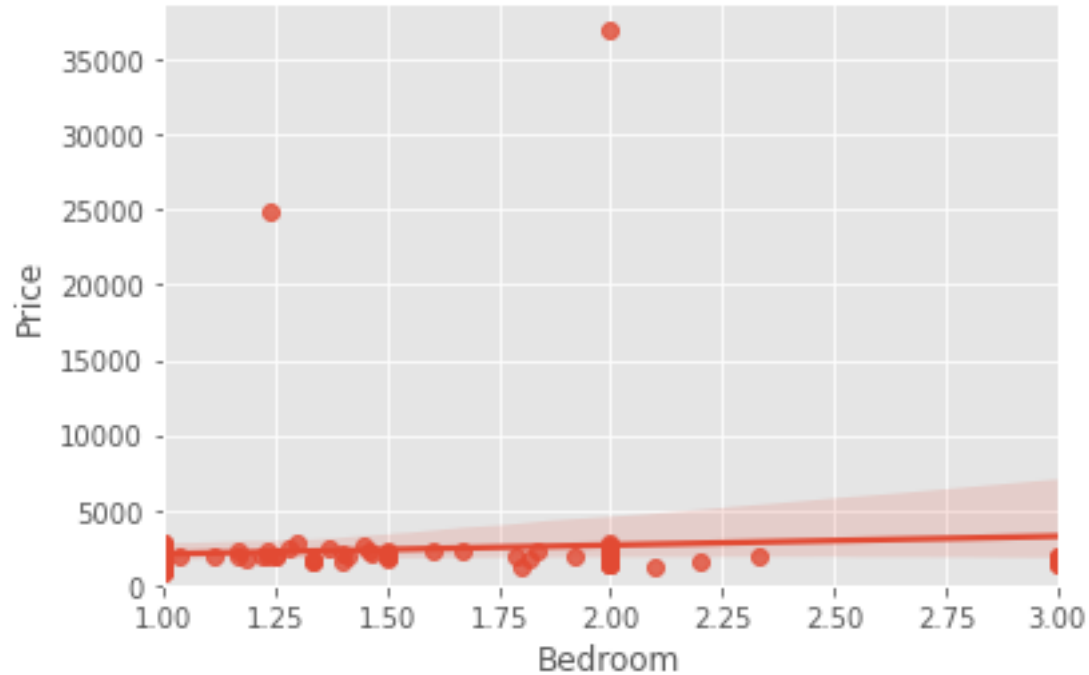


- Number of bedrooms, number of bathrooms and Den are used in our model to predict price.

- The equation is given by :

$$Y = 2353 + 1347 * X_1 - 1470 * X_2 - 479 * X_3$$

Predict the rental based on number of bedroom



Number of bedroom is highly related to the price of renting an apartment

More Bedrooms in Apartment

Higher the Price

Model: Linear regression

The equation is given by $Y=1238+840*X1$

Conclusion

- From the analyze, we offer a valuable suggestion to students based on their habit and budget.
- K-mean was used to train the model and do the cluster.
- Two of cluster (colored in red and green in the map) is suitable for student' accommodation .
- Linear regression is used to predict the rental.

