

King Country House Sales Prices and Seattle Venues Exploring

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1. Introduction

1.1 Background

King County is a beautiful and romantic county in the United States, even though there is a lot of rain. With the increasing of tech job opportunities in Seattle, more and more people are considering about moving to this county. The population was about 2,233,163 in the 2018 census estimate. According to Zillow, the median home value in King County is \$626,665. King County home values have declined -2.1% over the past year and Zillow also predicts they will rise 1.6% within the next year.

1.2 Problem

If people who just got a job offer with a considerable salary, they are probably thinking about moving to Seattle or King county. Before they accept this offer, they might want to know the average house price in each cities of King county and try to explore some interesting venues in this county to help them make this important decision.

2. Data Acquisition and Cleaning

2.1 Data Sources

To approach this topic, we will have following data:

1. Coordinates in each cities of King county to locate the position on the map for further analysis.
2. King county house values csv file shows average house price by cities.
3. Foursquare API can help to explore various kinds of venues around places.

2.2 Data Cleaning

Since the original US cities coordinates file are containing each cities of all over the counties, we have to extract only cities belong to King county in Washington state, and we need to do the same thing for King county house value file to extract the average home price only.

After extracting the useful data from the original files, we start to detect any null data and drop them.

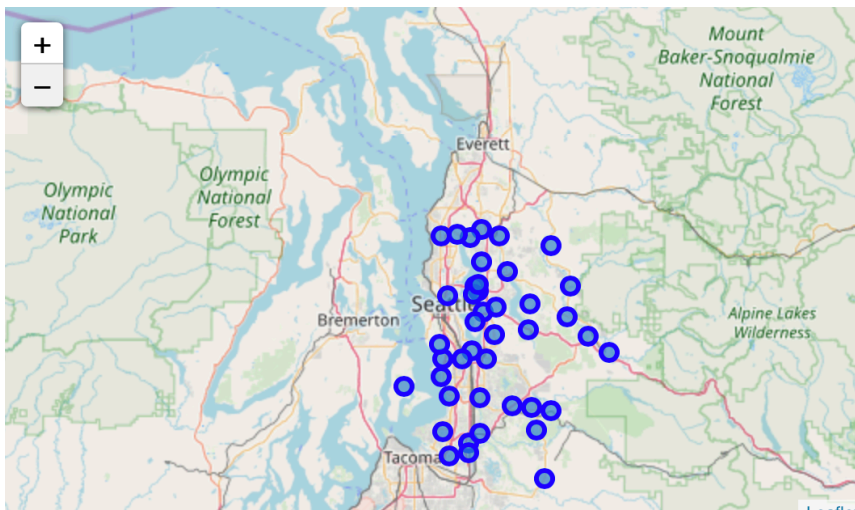
2.3 Data Preparation

After data cleaning, we joined two tables on Cities. As a result there were 6 columns and 43 rows samples left including the geo information, average home price, population and density .

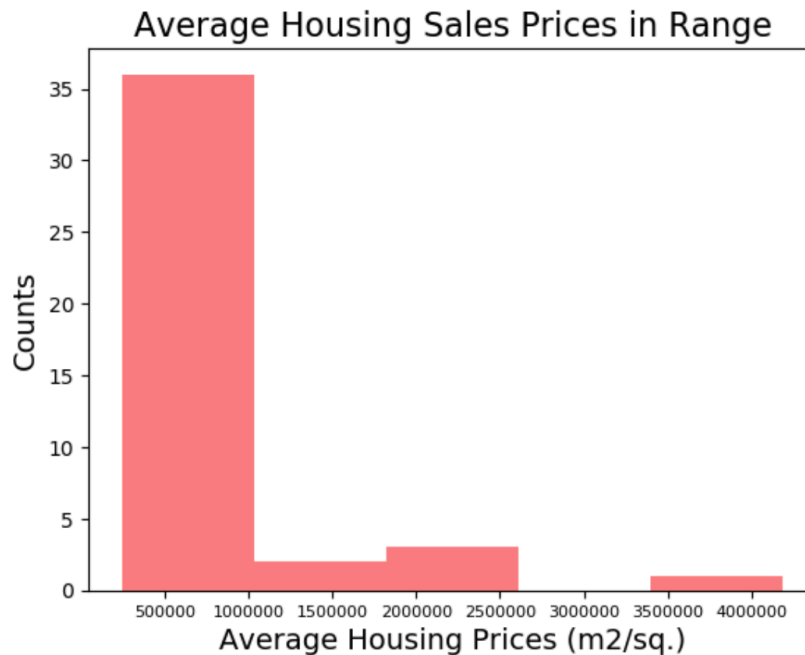
	City	Average Home Price	Lat	Lng	Population	Density
0	Algona	2.432883e+05	47.2822	-122.2504	3185.0	933.0
1	Auburn	2.872033e+05	47.3041	-122.2110	80776.0	1057.0
2	Beaux Arts Village	1.413122e+06	47.5854	-122.2009	326.0	1524.0
3	Bellevue	6.713283e+05	47.5953	-122.1550	144444.0	1666.0
4	Black Diamond	3.513033e+05	47.3130	-122.0181	4436.0	262.0
5	Bothell	4.604383e+05	47.7736	-122.2044	45533.0	1287.0
6	Bryn Mawr-Skyway	3.407217e+05	47.4949	-122.2411	18365.0	2500.0
7	Burien	3.216875e+05	47.4762	-122.3393	51671.0	1983.0

3. Data Visualization

In order to convert the geo data in map and visualize it on map, we need to import relative packages such as Nominatim, folium, Matplotlib, and add markers on it.



For someone or a family who are considering to move to Seattle, the most important thing is to find an affordable and nice place to settle in. Therefore, people might want to see the distribution of housing sales prices in range. By categorized house sales prices in 5 levels as the figures showing as following, and appended categories to the cleaning data frame, we can tell the majority regions house price are in low level and might be affordable for the a new settle family who are considering move to Seattle.



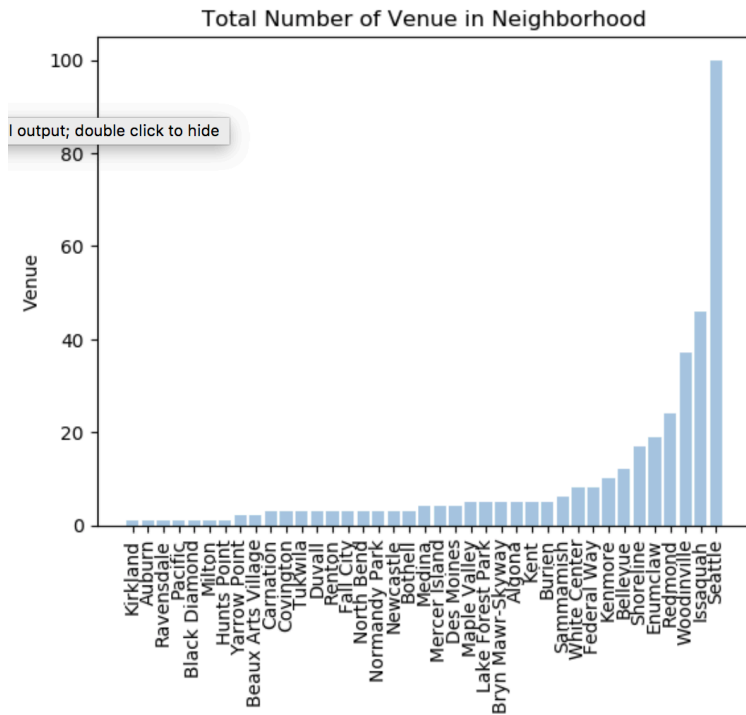
	City	Average Home Price	Population	Density	Level_labels
0	Algona	2.432883e+05	3185.0	933.0	Low Level HSP
1	Pacific	2.639242e+05	7184.0	1149.0	Low Level HSP
2	Milton	2.704925e+05	8230.0	1185.0	Low Level HSP
3	Tukwila	2.735375e+05	20144.0	847.0	Low Level HSP
4	Federal Way	2.853875e+05	96690.0	1679.0	Low Level HSP
5	Auburn	2.872033e+05	80776.0	1057.0	Low Level HSP
6	Des Moines	2.954717e+05	31238.0	1875.0	Low Level HSP

4. Venues Exploring

By using Foursquare API, we can go through and exploring each of cities in our final table. The function named `getNearbyVenues` will help us loop through and extract the result each by each. Finally, we constructed a new `seattle_venues` table by grouping the result by cities with their venues name and categories.

In order to figure out which cities has the most number of venues in King county, we constructed table named as `summary` by ranking and counting the number of venues we have explored.

Intuitively, we created a bar chart by the result of number of venues in cities. You can easily find out that Seattle contains the highest number of venues.



Generally, people will have their own favorite venues. If people who are thinking about move to a city, which is supposed to contain the most common venues matching their interests. By ranking the common venues in each city, we can tell which city might be the best place to fit your personal interesting.

	Neighborhood	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	Algona	Home Service	Convenience Store	Bar	Food	Business Service	Diner	Electronics Store	Eastern European Restaurant	Donut Shop	Dog Run
1	Auburn	Train Station	Yoga Studio	Dessert Shop	Electronics Store	Eastern European Restaurant	Donut Shop	Dog Run	Discount Store	Diner	Dim Sum Restaurant
2	Beaux Arts Village	Beach	Playground	Dim Sum Restaurant	Ethiopian Restaurant	Electronics Store	Eastern European Restaurant	Donut Shop	Dog Run	Discount Store	Diner

5. Conclusion

As a result, we can combine the common venue ranking with the average home price, price level, population and density in one data frame to present to the clients who are interested in moving to King County.

As we all known, living cost and entertainments are always the most two important factors, which might be considered by people are thinking moving to a new city.

For people who has sufficient budget and looking for a high resident environment and community, we will highly recommended that Mercer island, Beaux Arts Village, Clyde Hill, Yarrow Point, Medina and Hunts Point might be the ideal options.

If you would like to have a lively and convenient city life around by various entertainments and restaurants, Seattle must be your top one choice in terms of the our results. After that, Redmond, Sammamish, Issaquah, Bellevue are also very coinvent to live and work.

However, if you are the person who would like to live quiet and far away from cities. You probably need conduct a further research in Auburn, Kirkland, Pacific and Ravensdale.

All in all, clients can make individual choice to fit their personalized requirement based on our final report table.

	City	Average Home Price	Lat	Lng	Population	Density	Common Venue	Level_labels
0	Algona	2.432883e+05	47.2822	-122.2504	3185.0	933.0	1 Bar, 1 Business Service, 1 Convenience Store	Low Level HSP
1	Auburn	2.872033e+05	47.3041	-122.2110	80776.0	1057.0	1 Pharmacy, 1 Train Station	Low Level HSP
2	Beaux Arts Village	1.413122e+06	47.5854	-122.2009	326.0	1524.0	1 Beach, 1 Playground	Mid-1 Level HSP
3	Bellevue	6.713283e+05	47.5953	-122.1550	144444.0	1666.0	1 Bus Stop, 1 Chinese Restaurant, 1 Coffee Shop	Low Level HSP
4	Black Diamond	3.513033e+05	47.3130	-122.0181	4436.0	262.0	1 Athletics & Sports	Low Level HSP
5	Bothell	4.604383e+05	47.7736	-122.2044	45533.0	1287.0	2 Park, 1 Brewery	Low Level HSP
6	Bryn Mawr-Skyway	3.407217e+05	47.4949	-122.2411	18365.0	2500.0	1 Casino, 1 Coffee Shop, 1 Hobby Shop	Low Level HSP

6. Reference:

1. [simplemaps United Satates Cities Database](#)
2. [King County house sales price by zillow](#)
3. [FourSquare API](#)