

The Battle of Seattle Neighborhoods

IBM Applied Data Science Capstone Project

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Introduction

Graduating from college is a big deal! My parents are just as excited as I am, and they were planning to fly to Seattle to attend my graduation. Unfortunately, the plan is cancelled due to the COVID-19 outbreak... But if they were to come here in Seattle to attend my college graduation, where would be the best location for them to stay? The most ideal location should be close to local attractions, nearby restaurants, public transportation, and more importantly, it can't be too far from my school! In this project, I will be using what we learned in this course to try to find this ideal location.



Data and Sources

I will need to search for or generate the following data to solve the problem:

- Coordinates of my school (University of Washington) using Google Maps API geocoding
- Centers of candidate areas and their approximate addresses using Google Maps API geocoding
- Number of restaurants and their ratings in every candidate neighborhood using Foursquare API
- Number of attractions in every candidate neighborhood using Foursquare API



Methodology

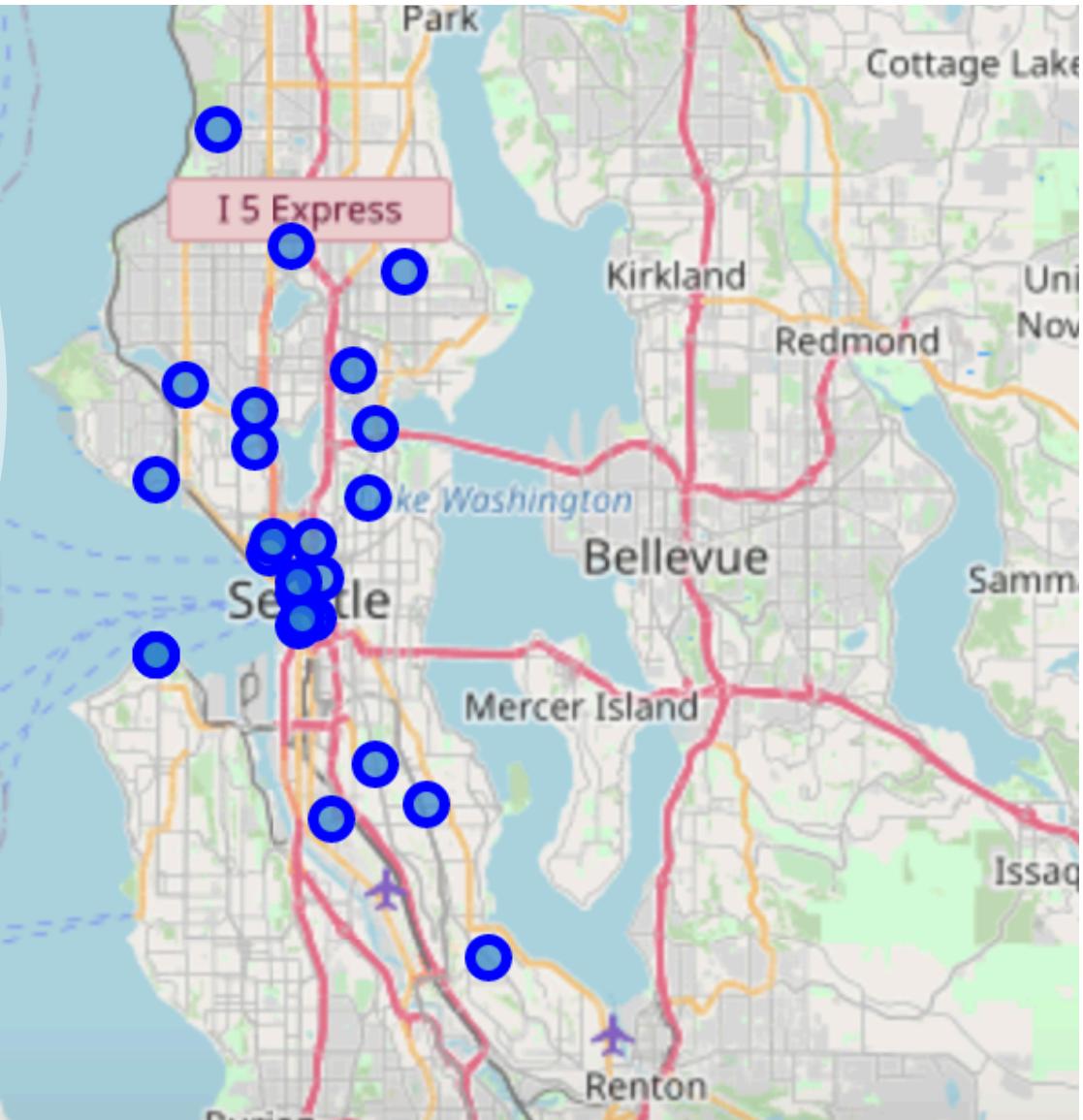
In this project we will mainly search for areas of Seattle that have high restaurant density and high attraction density. We will limit our analysis to areas about 6 miles around university of Washington.

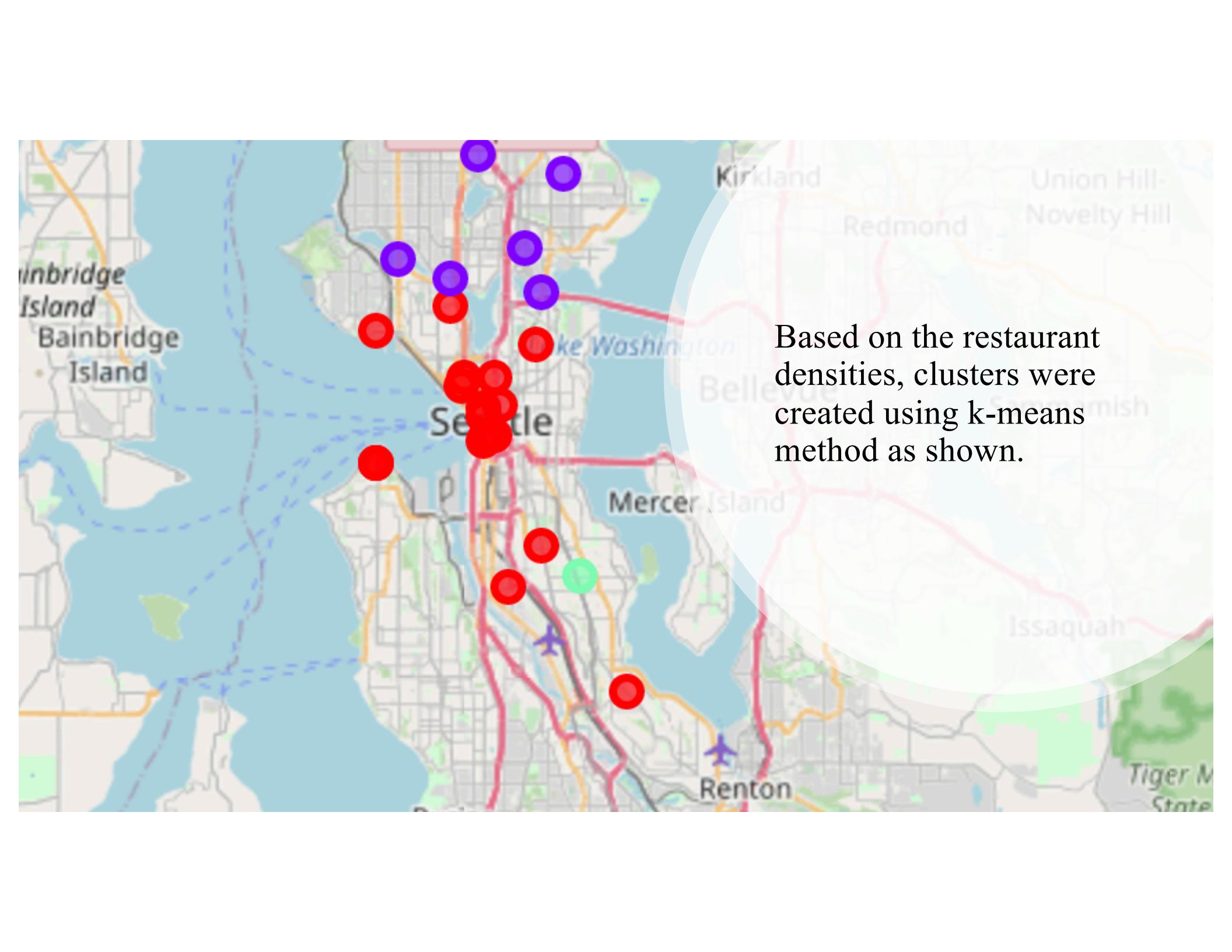
- Collect coordinate data on my school and limit our search area to within the radius 6 miles from my school.
- Collect data on restaurant densities on those qualifying areas using heatmaps.
- Present a map of all such locations as well as clusters using k-means clustering.



Analysis

A map showing neighborhoods in nearby areas around my school, including Downtown Seattle, University District, Capitol Hill, etc.



A map of Seattle and the surrounding Puget Sound area. Various red and purple dots of different sizes are scattered across the map, representing clusters of restaurants. The map includes labels for Bainbridge Island, Seattle, Mercer Island, Renton, Kirkland, Redmond, Union Hill, Novelty Hill, and Issaquah.

Based on the restaurant densities, clusters were created using k-means method as shown.

Each of these different kinds of clusters were examined.

```
In [31]: sea_merged.loc[sea_merged['Cluster Labels'] == 0]
```

```
Out[31]:
```

	Neighborhood	Restaurant	Cluster Labels	Latitude	Longitude
26	► West Seattle, Seattle (36 P)	0.01	0	47.607620	-122.333590
17	► Pioneer Square, Seattle (20 P)	0.01	0	47.598680	-122.332910
21	► SoDo, Seattle (12 P)	0.01	0	47.589357	-122.388168
15	► Magnolia, Seattle (13 P)	0.01	0	47.633481	-122.387028
14	► Georgetown, Seattle (6 P)	0.01	0	47.547510	-122.321490
22	► South Lake Union, Seattle (22 P)	0.01	0	47.618530	-122.343290
12	► First Hill, Seattle (1 C, 10 P)	0.01	0	47.608780	-122.326430
11	► Eastlake, Seattle (6 P)	0.01	0	47.618157	-122.329181
10	► Downtown Seattle (3 C, 64 P)	0.01	0	47.589357	-122.388168
9	► Denny Triangle, Seattle (13 P)	0.01	0	47.596800	-122.334230
8	► Chinatown-International District, Seattle ...	0.01	0	47.599170	-122.327960
6	► Central District, Seattle (12 P)	0.01	0	47.605530	-122.334320
5	► Cascade, Seattle (4 P)	0.01	0	47.589357	-122.388168
4	► Capitol Hill, Seattle (46 P)	0.01	0	47.629700	-122.308610
2	► Belltown, Seattle (20 P)	0.01	0	47.615760	-122.344640
1	► Beacon Hill, Seattle (10 P)	0.01	0	47.562010	-122.305145
18	► Queen Anne, Seattle (14 P)	0.01	0	47.642541	-122.351152
19	► Rainier Beach, Seattle (8 P)	0.01	0	47.512350	-122.262770

```
In [32]: sea_merged.loc[sea_merged['Cluster Labels'] == 1]
```

```
Out[32]:
```

	Neighborhood	Restaurant	Cluster Labels	Latitude	Longitude
23	► University District, Seattle (1 C, 15 P)	0.0	1	47.661270	-122.313070
24	► Wallingford, Seattle (5 P)	0.0	1	47.693001	-122.336484
0	► Ballard, Seattle (1 C, 16 P)	0.0	1	47.657813	-122.376231
16	► Montlake, Seattle (9 P)	0.0	1	47.647309	-122.304613
25	► Wedgwood, Seattle (5 P)	0.0	1	47.687010	-122.294940
7	► Central Waterfront, Seattle (13 P)	0.0	1	39.952224	-75.141729
3	► Broadview, Seattle (3 P)	0.0	1	47.722380	-122.364980
13	► Fremont, Seattle (15 P, 1 F)	0.0	1	47.651150	-122.349940

```
In [33]: sea_merged.loc[sea_merged['Cluster Labels'] == 2]
```

```
Out[33]:
```

	Neighborhood	Restaurant	Cluster Labels	Latitude	Longitude
20	► Rainier Valley, Seattle (1 C, 9 P)	0.02	2	47.55123	-122.28675



Results and Discussion

- Most of the restaurants are concentrated in rainier valley (cluster 2), moderate number in cluster 1 and a relatively small number of restaurants in cluster 0.
- Therefore, this project indicates that if my parents were here to attend graduation and were looking for somewhere with a lot of restaurants to stay, cluster 2 might be their best choice, where cluster 0 will be the next option and cluster 1 for the last option.

Conclusion

In this project, through thorough analysis with the help from various sources, we can conclude that if my parents were here to attend graduation and were looking for somewhere with a lot of restaurants to stay, Rainier Valley would be the best neighborhood for them to stay.



Bibliography

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