Finding best neighbourhood to open American restaurant in Seattle

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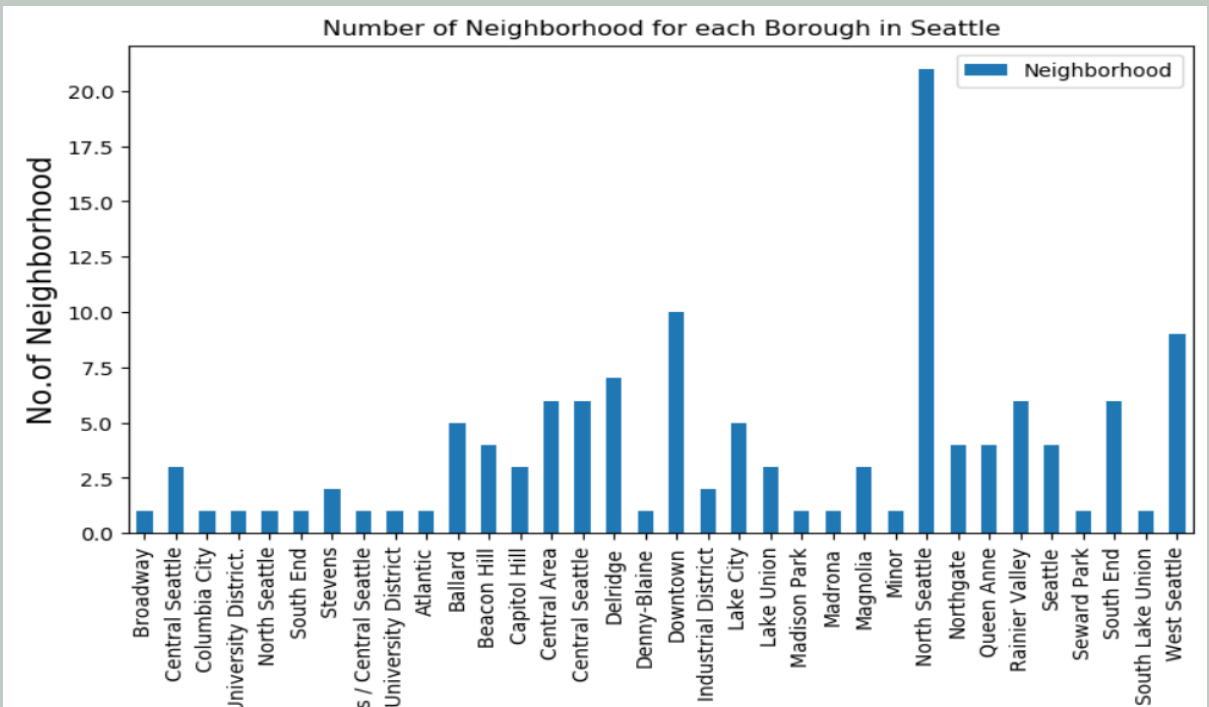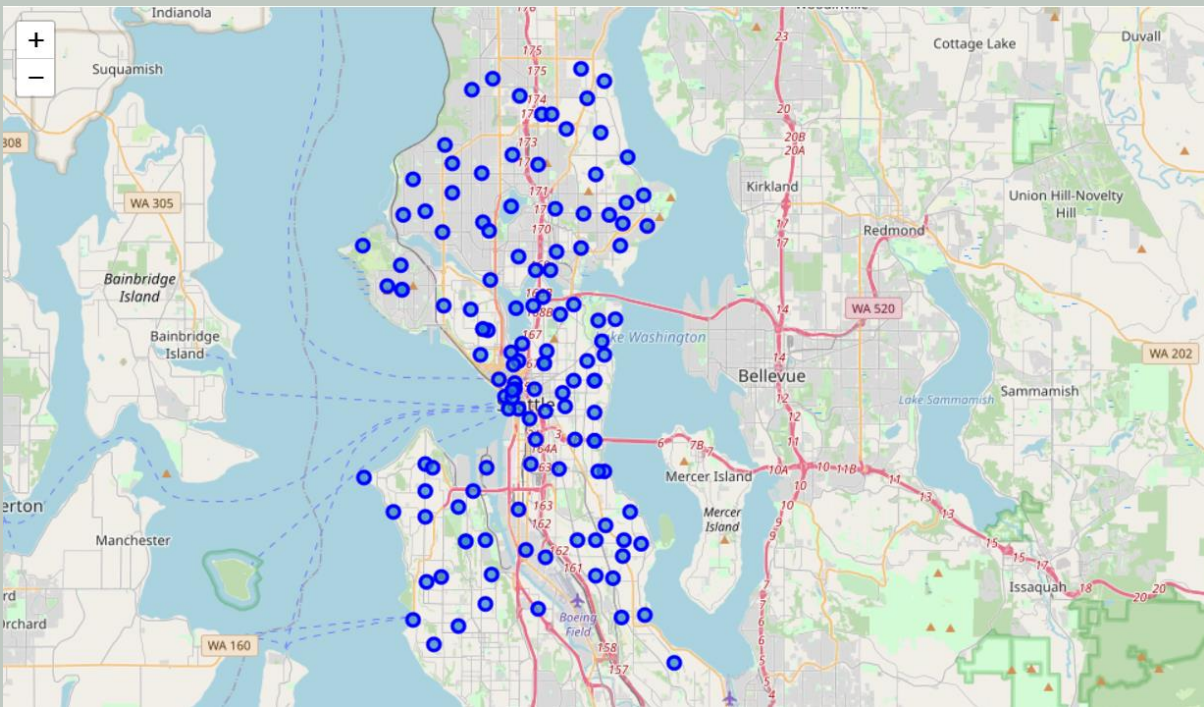
Why finding Best Location for any Restaurant is necessary ?

01 To avoid unwanted competition

02 To get right type of crowd to visit our restaurant
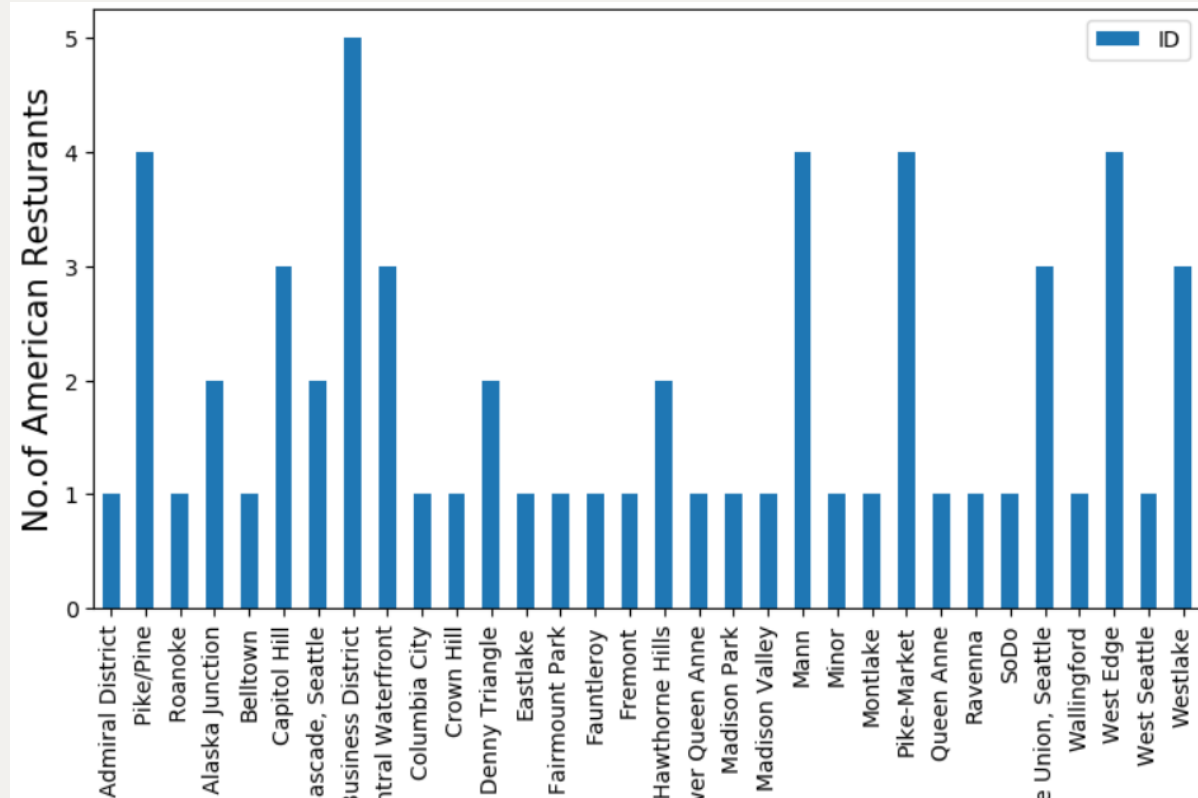
03 Make profit

04 Grow and expand

Data Acquisition and cleaning

01

- Wikipedia: https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Seattle use this to solve our first requirement.

- GeoPy: We will use this package to solve our second requirement.

- Foursquare API: We will use this API to solve our third requirement.

- Data containing NaN values were replaced with correct values or dropped.

- Cleaned data contained 127 rows and 4 rows having latitude , longitude, neighbourhood and borough
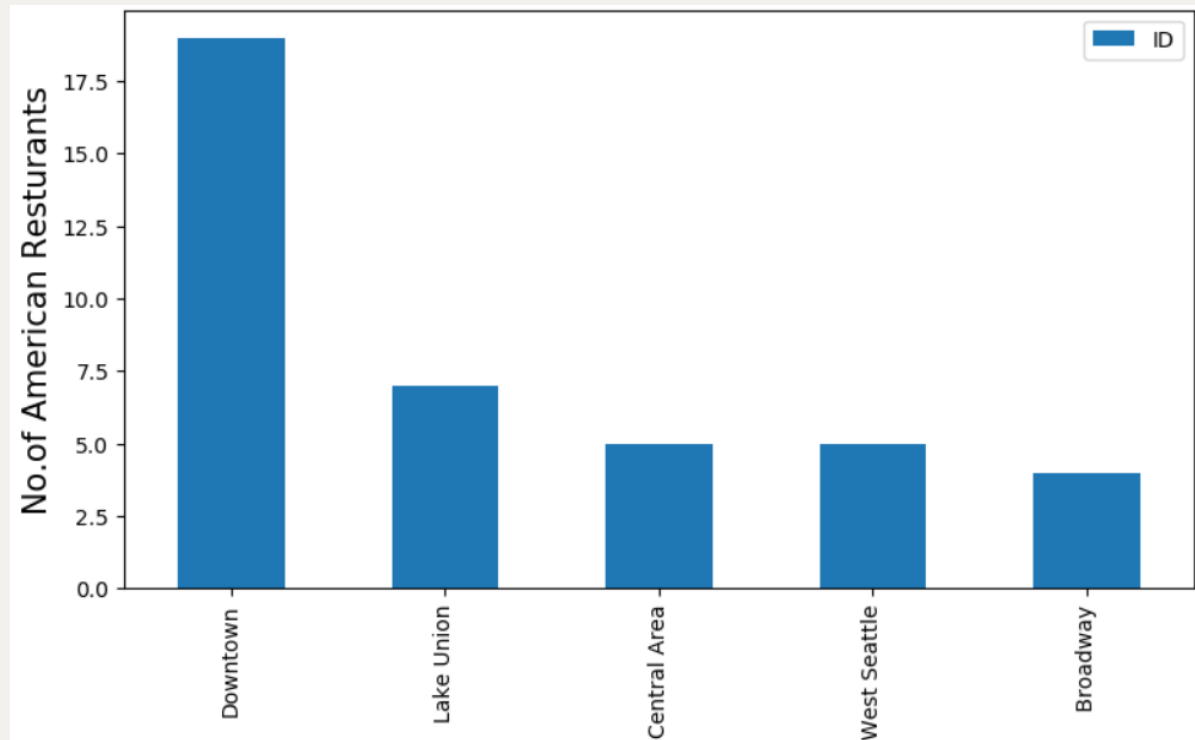
02 Plotting graph for Borough and neighborhood analysis

Plotting Number of American restaurants for each neighbourhood in Seattle

Plotting Number of American Restaurants for each Borough in Seattle

03 Data Exploring for all Neighborhood

Now we perform one hot encoding venue category for each neighbourhood. Now we get top 5 common venues for each neighbourhood

```
---- Mee-Kwa-Mooks----
                venue  freq
0                 Gym  0.33
1                Park  0.33
2      Scenic Lookout  0.33
3          Zoo Exhibit  0.00
4   Other Repair Shop  0.00


---- NewHolly----
                  venue  freq
0                  Park  0.5
1            Playground  0.5
2           Zoo Exhibit  0.0
3             Pet Store  0.0
4   Performing Arts Venue  0.0
```
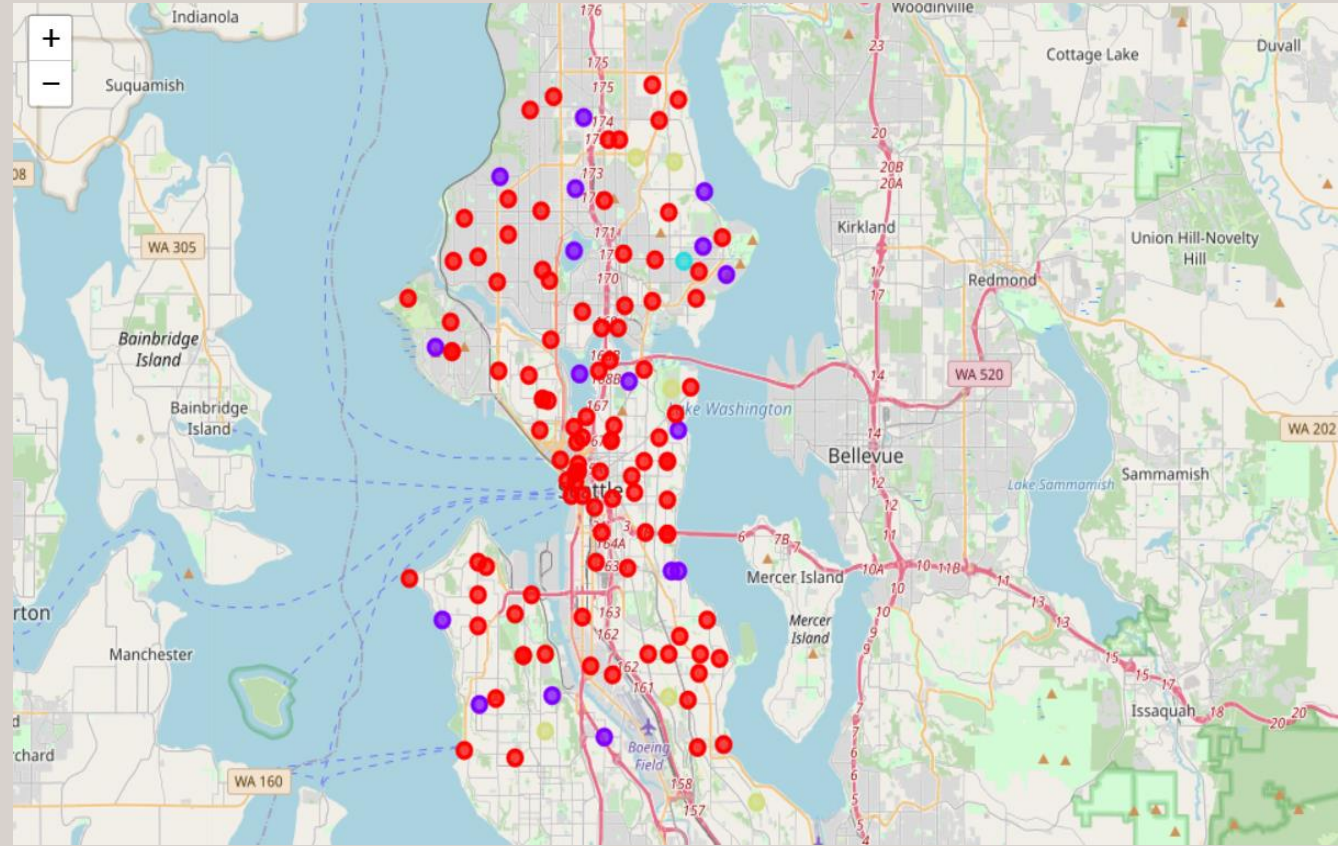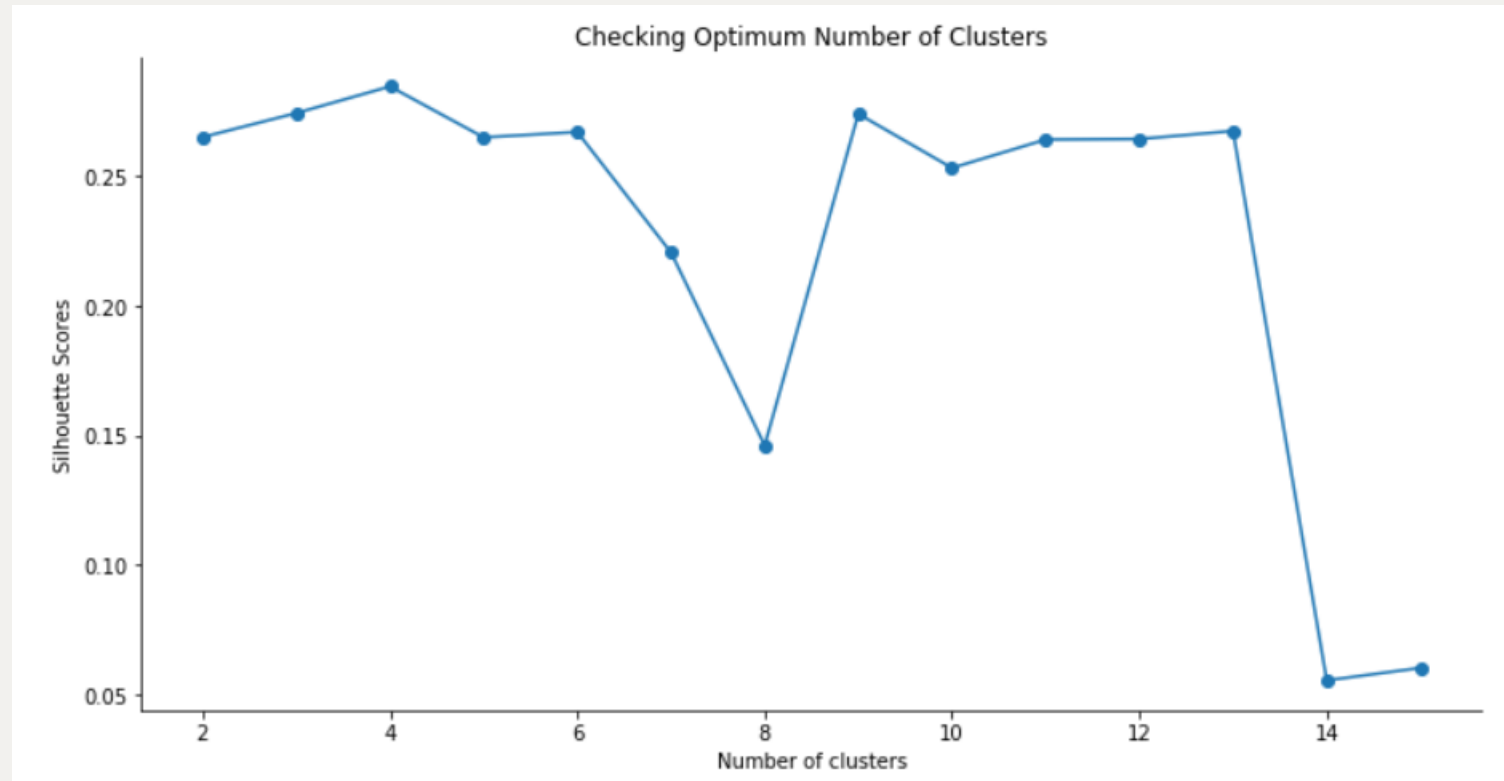
	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Admiral District	Coffee Shop	Theater	Thai Restaurant	Pub	Frozen Yogurt Shop	Middle Eastern Restaurant	Bar	Gas Station	Supermarket	Market
1	Atlantic City Beach	Mexican Restaurant	Garden	Grocery Store	Pharmacy	Gym / Fitness Center	Coffee Shop	Pier	Marijuana Dispensary	Pizza Place	Breakfast Spot
2	Blue Ridge	Park	Garden Center	Café	Pool	Zoo	Fish & Chips Shop	Farm	Farmers Market	Fast Food Restaurant	Field
3	Central District	Coffee Shop	Performing Arts Venue	Ethiopian Restaurant	Vietnamese Restaurant	Bus Stop	Fish & Chips Shop	Chinese Restaurant	Liquor Store	BBQ Joint	Gym
4	Denny-Blaine	Park	Playground	Beach	Surf Spot	Monument / Landmark	Food Truck	Falafel Restaurant	Farm	Farmers Market	Fast Food Restaurant

Now we sort venues in descending order and print top 10 venues for each neighbourhood

04 Clustering analysis

Checking Optimum Number of Cluster

65	Eastlake	Lake Union	47.640825	-122.325723	0	Sandwich Place	Coffee Shop	Italian Restaurant	Playground	Bus Stop	Pizza Place	General Travel
66	Downtown	Central Seattle	47.598122	-122.328053	0	Chinese Restaurant	Coffee Shop	Sports Bar	General Entertainment	Bubble Tea Shop	Japanese Restaurant	Lounge
67	Denny Triangle	Downtown	47.618565	-122.337059	0	Coffee Shop	Hotel	Food Truck	Café	Mexican Restaurant	Bar	Italian Restaurant
68	Belltown	Downtown	47.613231	-122.345361	0	Coffee Shop	Bar	Hotel	Sushi Restaurant	Bakery	Seafood Restaurant	Breakfast Spot
69	Pike-Market	Downtown	47.619002	-122.319851	0	Bar	Coffee Shop	Mexican Restaurant	American Restaurant	Salon / Barbershop	Smoke Shop	Pizza Place
70	Central Business District	Downtown	47.609532	-122.336290	0	Coffee Shop	Hotel	American Restaurant	Breakfast Spot	Cocktail Bar	Seafood Restaurant	Clothing Store
71	First Hill	Downtown	47.609305	-122.324984	0	Sandwich Place	Coffee Shop	Hotel	Asian Restaurant	Pharmacy	Pizza Place	Food & Drink Shop

Above graph shows that k=4 gives the highest score so we cluster our neighbourhoods at k=4. We perform clustering and labels to that data frame. We drop nan rows and convert cluster labels column from float to int.

Conclusion

If we take careful look, we see that Downtown has highest number of American restaurants and all the downtown neighbourhoods are present in cluster 1

Cluster 2 has different types of restaurants and cafe in its top 10 venues which shows that people are open to different tastes and as there is no American restaurant in there top 10 venues new American restaurants might have a chance

In Cluster 1 there is a lot of competition but there is an upside that is people might be familiar with American restaurants taste and if new restaurant has best taste it might work

Cluster 3&4 is cluster which has liking of Fast-Food Filipino and Falafel Restaurants so opening new American restaurant there might be a challenging task

Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of neighbourhoods and locations in every recommended zone, taking into consideration additional factors like attractiveness of each location (proximity to park or water), levels of noise / proximity to major roads, real estate availability, prices, social and economic dynamics of every neighbourhood etc