

Finding the best location and neighborhood in Vancouver to establish Convenient/Franchisee store (Business Hours 24/7.)



Description and Discussion

- Project for : Business Investor/Stakeholders/Small Business Owner / Franchisee Opener
- Project Purpose : To establish retail business in the appropriate place .
- Project Goal: Finding the best location and neighborhood in Vancouver to establish Daily Convenient/Franchisee store which will be operated 24 Hours a Day (24/7).

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Data acquisition and cleaning

**** Data scraped from**

<https://www.kaggle.com/agilesifaka/vancouver-crime-report/version/2>

****More Data Collected from**

https://en.wikipedia.org/wiki/List_of_neighbourhoods_in_Vancouver

**** In total 34,828 rows in the raw dataset collected from Year 2018.**

**** Cleaned data contains with 10 features.**

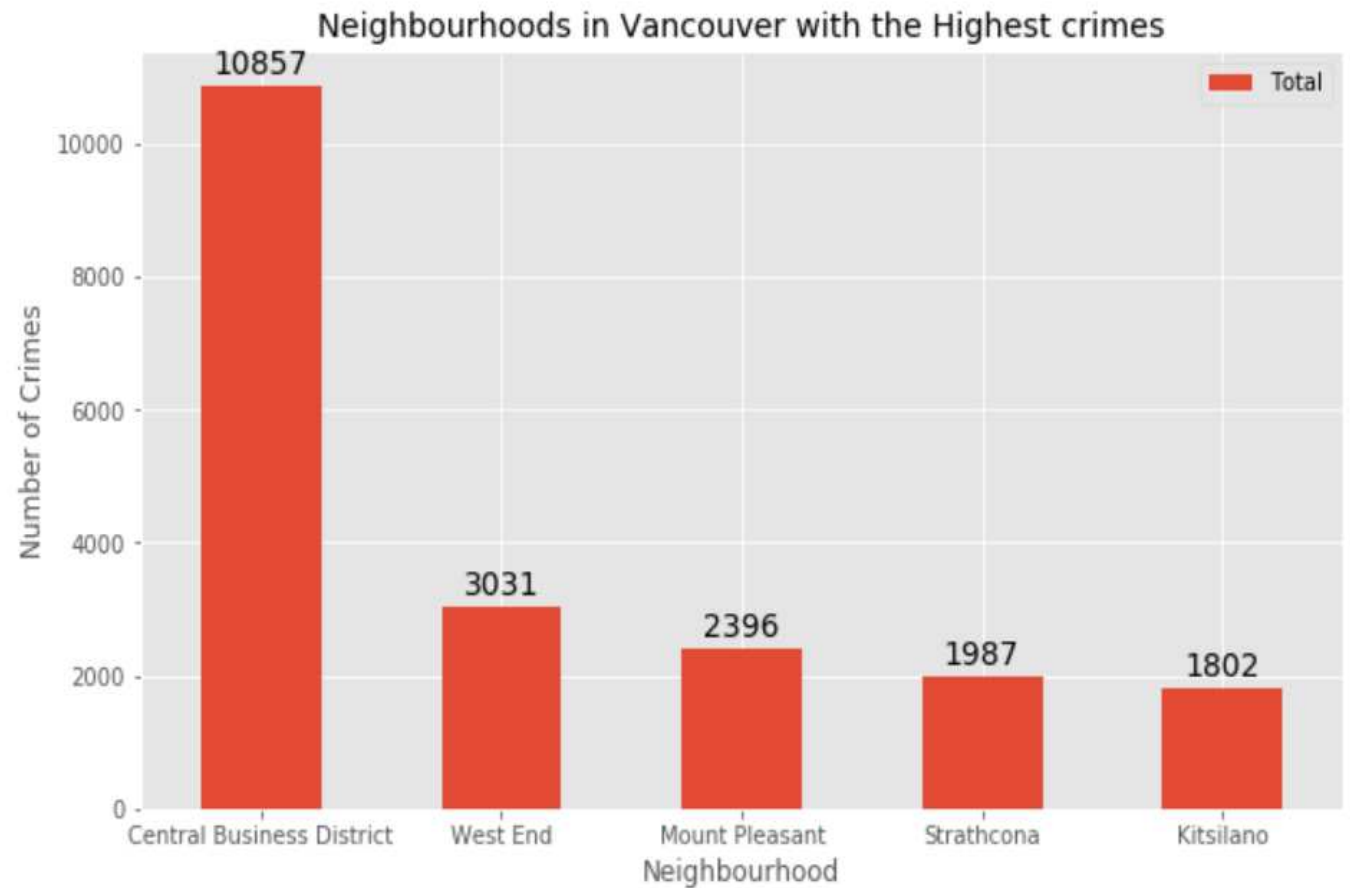
Methodology

- Categorized by two parts:
- 3.1) Exploratory Data Analysis:
 - To identify the safest borough and normalize the neighborhoods of that borough visualize the crime reports in different Vancouver boroughs . By using the data result finding 10 most common venues in each neighborhood.
- 3.2) Modeling:
 - By using modeling Business Investor/Stakeholders/Small Business Owner / Franchisee Opener will have advantage to choose the right neighborhood within a borough which will be clustered similar neighborhoods using K - means clustering which is a form of unsupervised machine learning algorithm as per predefined cluster size. This K - means clustering will help in the decision-making process.

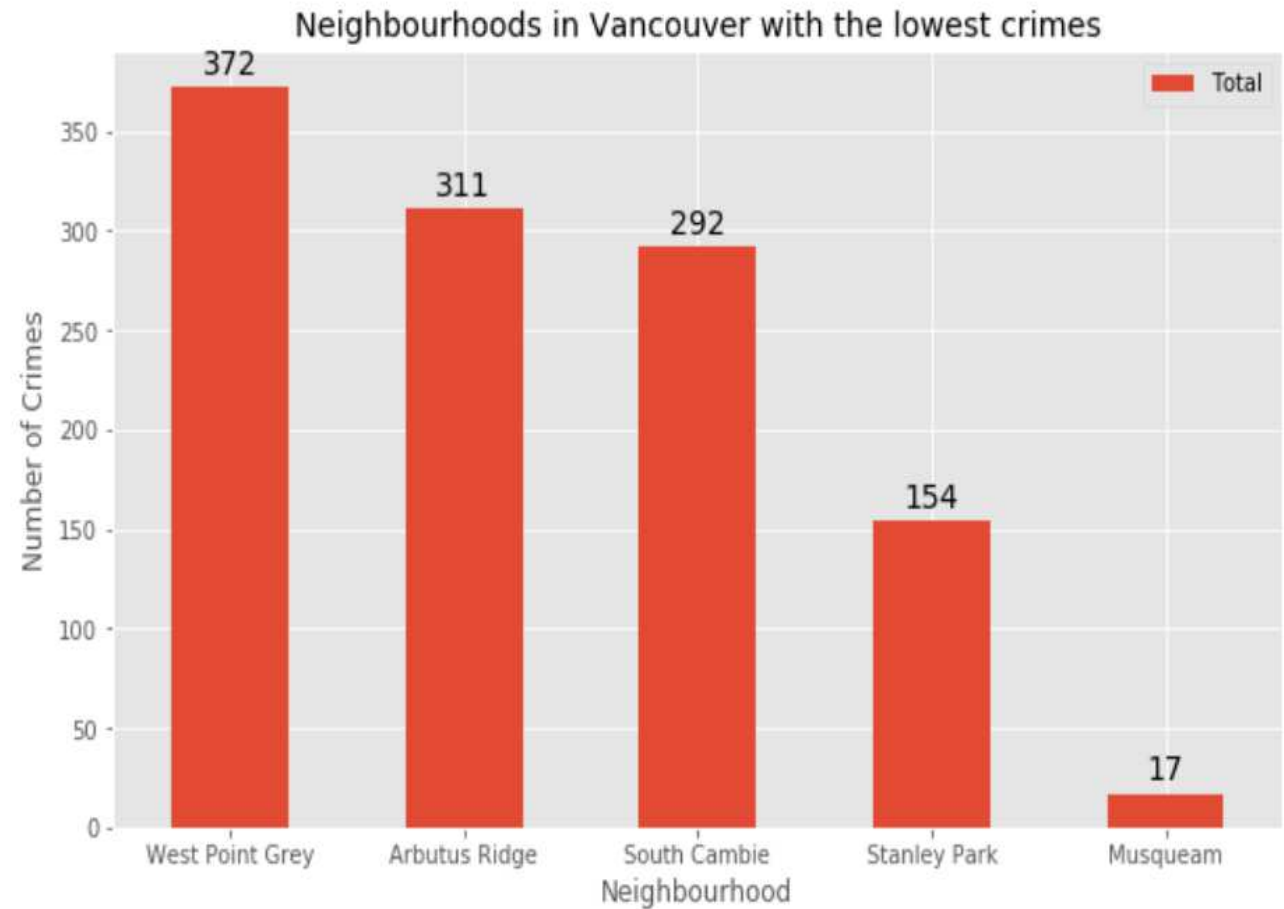
Basic statistical details like percentile, mean, std etc. of a data frame

	YearBreak and Enter Commercial	YearBreak and Enter Residential/Other	YearMischief	YearOther Theft	YearTheft from Vehicle	YearTheft of Bicycle	YearTheft of Vehicle	YearVehicle Collision or Pedestrian Struck (with Fatality)	YearVehicle Collision or Pedestrian Struck (with Injury)	Total
count	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000	4.000000
mean	506.250000	599.250000	1430.250000	1236.750000	3736.500000	539.750000	286.500000	3.250000	368.500000	8707.000000
std	354.409721	488.189427	997.26572	1060.087221	2723.536977	353.955153	226.117226	3.304038	227.060198	5801.870618
min	49.000000	156.000000	187.000000	88.000000	483.000000	36.000000	71.000000	1.000000	111.000000	1182.000000
25%	314.500000	187.500000	843.250000	544.000000	2249.250000	450.000000	186.500000	1.000000	263.250000	5698.500000
50%	594.500000	599.000000	1627.000000	1185.000000	3796.000000	633.000000	235.000000	2.000000	351.500000	9802.000000
75%	786.250000	1010.750000	2214.000000	1877.750000	5283.250000	722.750000	335.000000	4.250000	456.750000	12810.500000
max	787.000000	1043.000000	2280.000000	2489.000000	6871.000000	857.000000	605.000000	8.000000	660.000000	14042.000000

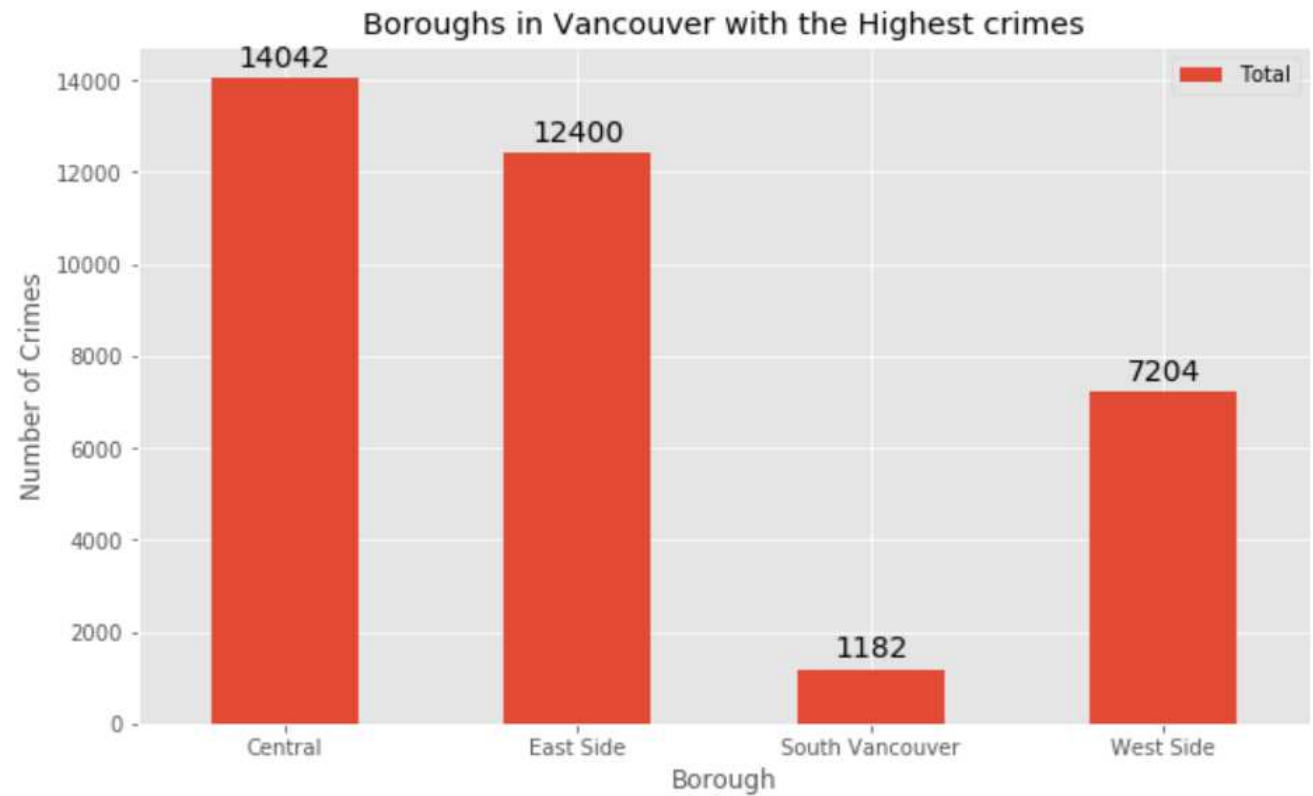
Five Neighborhoods with highest crime in Vancouver



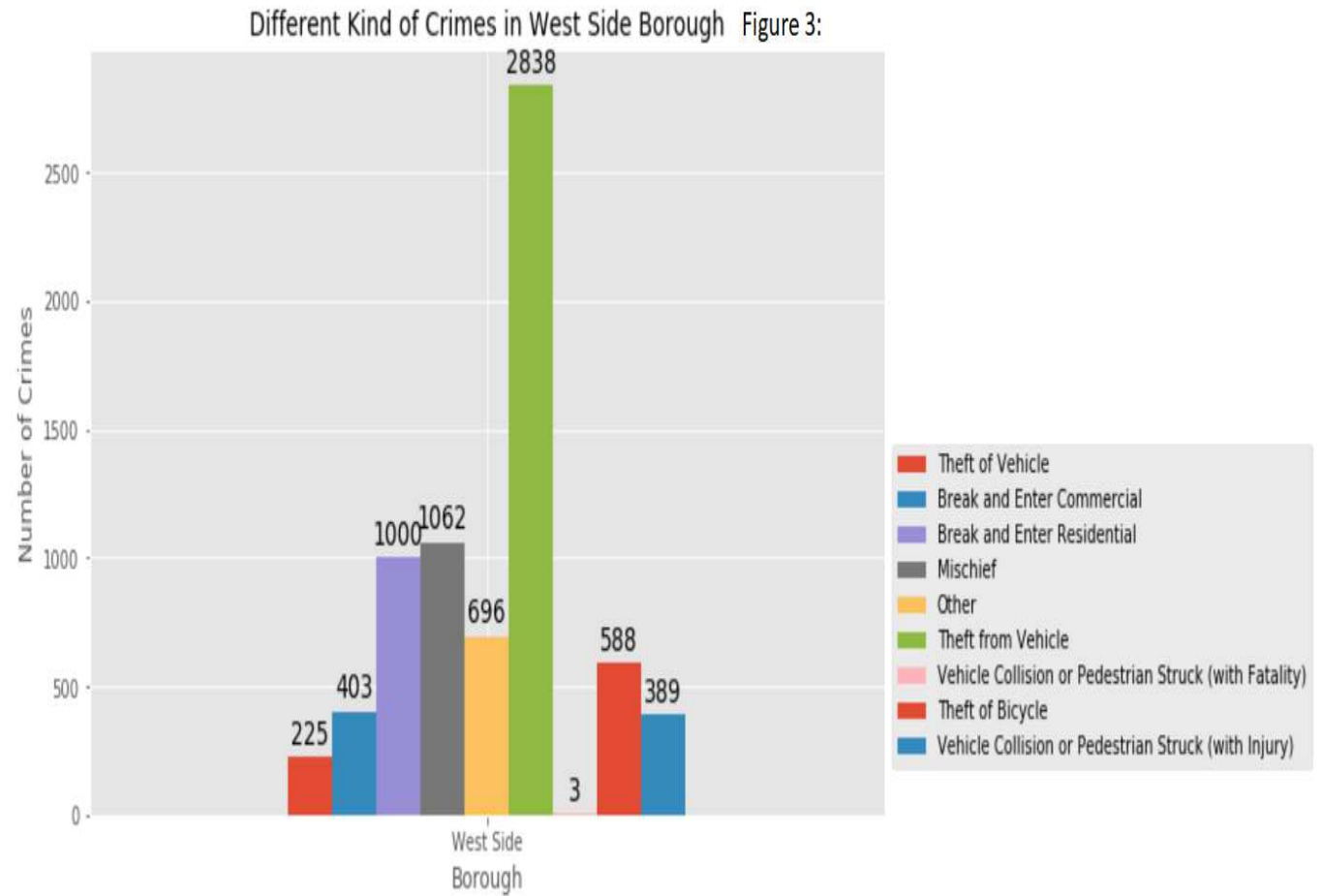
Five Neighborhoods with lowest crime in Vancouver



Borough in Vancouver with Highest Crime



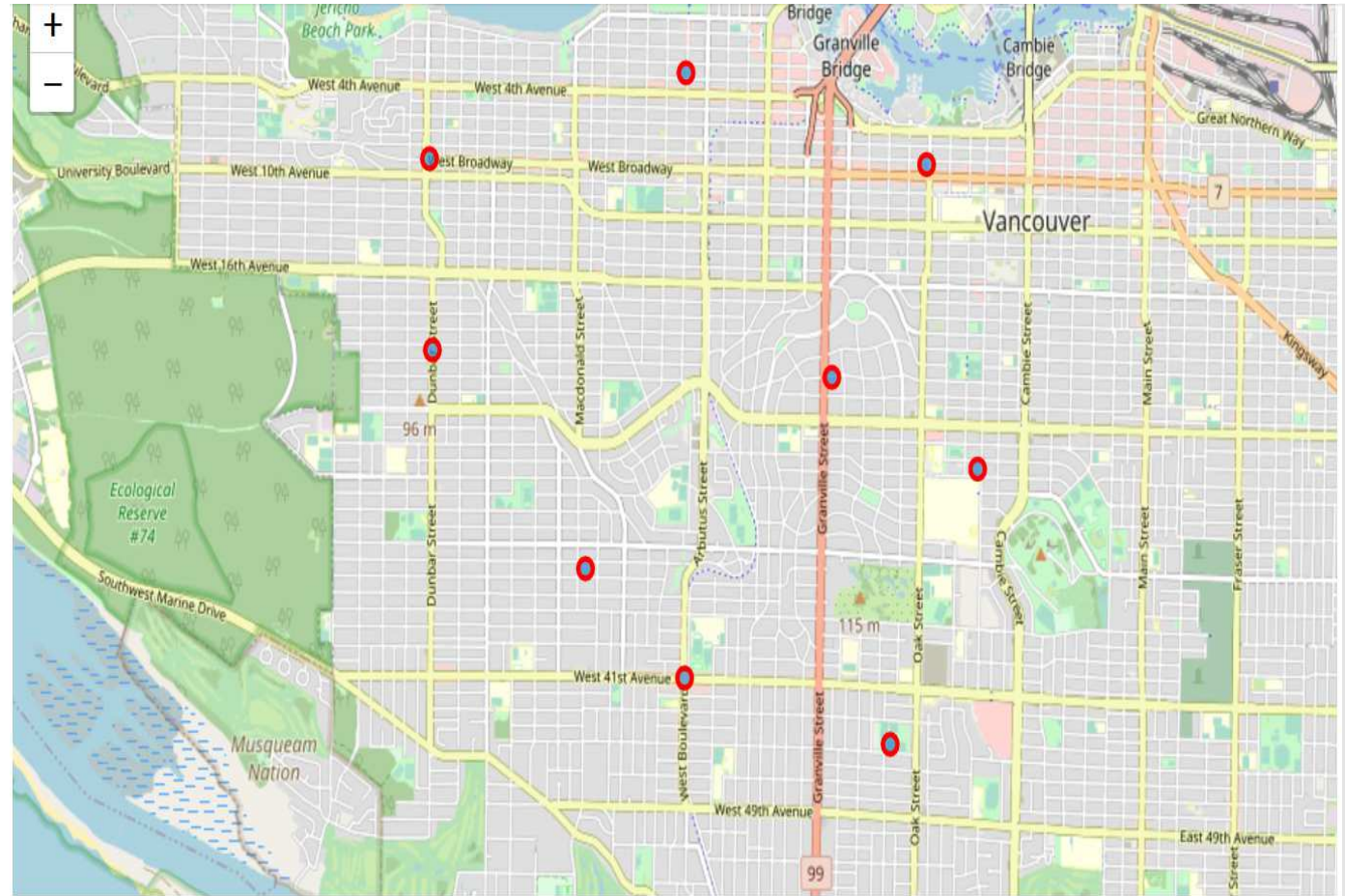
crimes recorded in the West Side Borough



Neighborhoods in West Side Borough with Latitude and Longitude

	Neighbourhood	Borough	Latitude	Longitude
0	Shaughnessy	West Side	49.251863	-123.138023
1	Fairview	West Side	49.264113	-123.126835
2	Oakridge	West Side	49.230829	-123.131134
3	Marpole	West Side	49.209223	-123.136150
4	Kitsilano	West Side	49.269410	-123.155267
5	Kerrisdale	West Side	49.234673	-123.155389
6	West Point Grey	West Side	49.264484	-123.185433
7	Arbutus Ridge	West Side	49.240968	-123.167001
8	South Cambie	West Side	49.246685	-123.120915
9	Dunbar-Southlands	West Side	49.253460	-123.185044

City's West Side Borough and it's Neighborhoods



Venue Count Per Neighborhood

Neighbourhood	Venue
Arbutus Ridge	5
Dunbar-Southlands	9
Fairview	26
Kerrisdale	37
Kitsilano	47
Marpole	30
Oakridge	7
Shaughnessy	2
South Cambie	18
West Point Grey	42

Modeling: Group By

	Neighbourhood	American Restaurant	Asian Restaurant	BBQ Joint	Bakery	Bank	Bar	Beach	Bookstore	Boutique	...	Taiwanese Restaurant	Tea Room	Tennis Court	Thai Restaurant	Thrift / Vintage Store	Vegetarian / Vegan Restaurant	Video Store	Vietnamese Restaurant	Wine Shop	Yoga Studio
0	Arbutus Ridge	0.000000	0.000000	0.000000	0.200000	0.000000	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1	Dunbar-Southlands	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	Fairview	0.000000	0.076923	0.038462	0.000000	0.038462	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.038462	0.000000	0.000000
3	Kerrisdale	0.000000	0.027027	0.000000	0.027027	0.027027	0.000000	0.000000	0.000000	0.054054	...	0.000000	0.054054	0.000000	0.027027	0.000000	0.000000	0.000000	0.027027	0.000000	0.000000
4	Kitsilano	0.042553	0.021277	0.000000	0.063830	0.000000	0.000000	0.021277	0.000000	0.000000	...	0.000000	0.021277	0.021277	0.042553	0.000000	0.021277	0.000000	0.000000	0.000000	0.021277
5	Marpole	0.000000	0.000000	0.000000	0.000000	0.033333	0.033333	0.000000	0.000000	0.000000	...	0.033333	0.000000	0.000000	0.033333	0.000000	0.000000	0.000000	0.033333	0.000000	0.000000
6	Oakridge	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.142857	0.000000	0.000000
7	Shaughnessy	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
8	South Cambie	0.000000	0.000000	0.000000	0.000000	0.055556	0.000000	0.000000	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.055556	0.000000	0.000000
9	West Point Grey	0.000000	0.047619	0.000000	0.023810	0.023810	0.023810	0.000000	0.047619	0.000000	...	0.000000	0.000000	0.000000	0.000000	0.023810	0.047619	0.023810	0.000000	0.023810	0.023810

10 rows x 86 columns

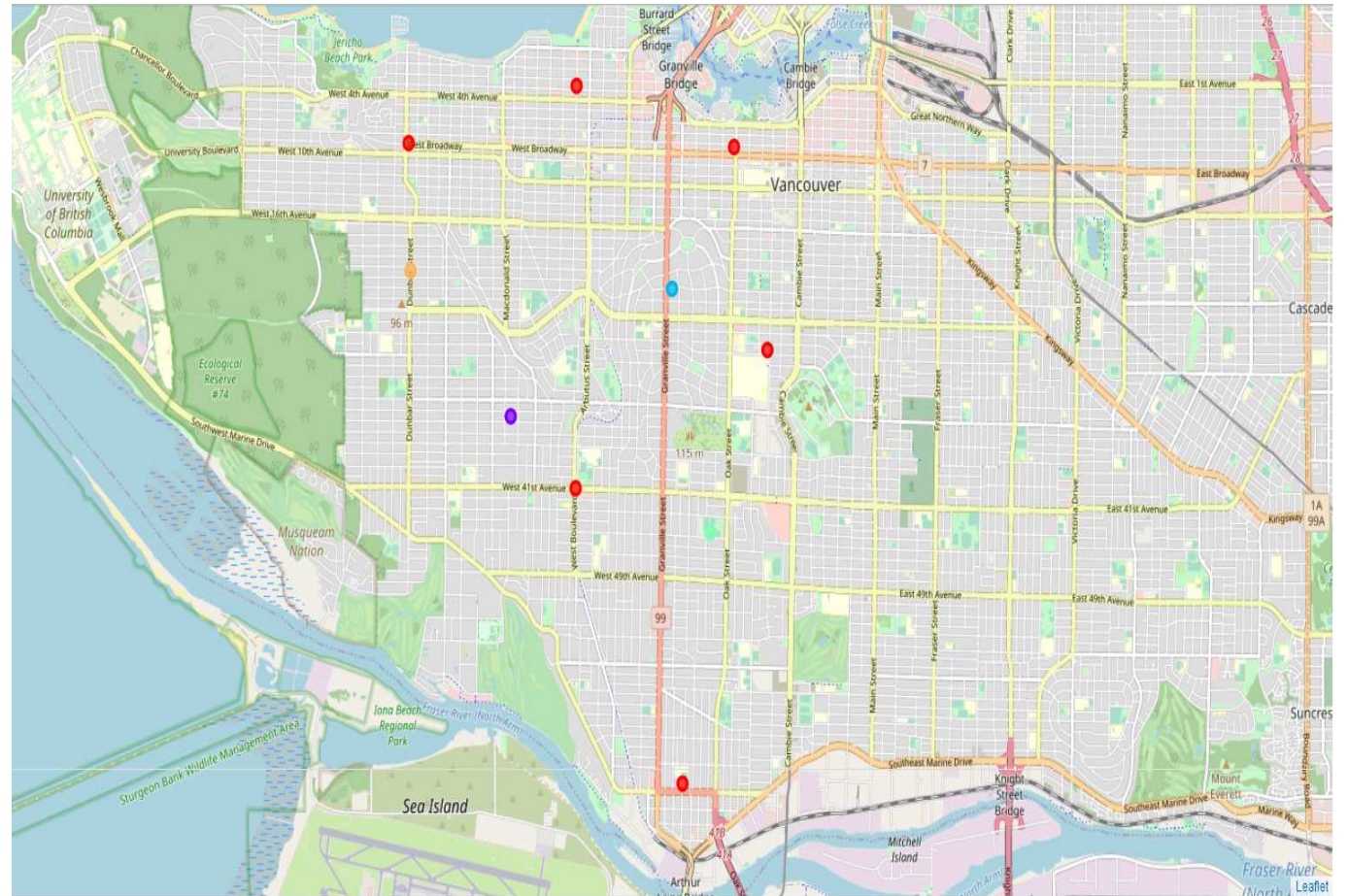
Top 10 venues for each neighborhood

	Neighbourhood	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	Arbutus Ridge	Nightlife Spot	Spa	Bakery	Grocery Store	Pet Store	Dessert Shop	Dim Sum Restaurant	Diner	Falafel Restaurant	Fast Food Restaurant
1	Dunbar-Southlands	Sushi Restaurant	Liquor Store	Italian Restaurant	Indian Restaurant	Ice Cream Shop	Coffee Shop	Sporting Goods Shop	Japanese Restaurant	Bookstore	Gastropub
2	Fairview	Coffee Shop	Park	Asian Restaurant	Chinese Restaurant	Malay Restaurant	Diner	Falafel Restaurant	Nail Salon	Camera Store	Restaurant
3	Kerrisdale	Coffee Shop	Chinese Restaurant	Sandwich Place	Pharmacy	Boutique	Tea Room	Sushi Restaurant	Hobby Shop	Portuguese Restaurant	Pizza Place
4	Kitsilano	Bakery	American Restaurant	Coffee Shop	Restaurant	Japanese Restaurant	Ice Cream Shop	French Restaurant	Sushi Restaurant	Food Truck	Thai Restaurant

Clustering Neighborhoods

	Neighbourhood	Borough	Latitude	Longitude	Cluster Labels	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	Shaughnessy	West Side	49.251863	-123.138023	2	Park	French Restaurant	Yoga Studio	Dessert Shop	Dim Sum Restaurant	Diner	Falafel Restaurant	Fast Food Restaurant	Food Truck	Gas Station
1	Fairview	West Side	49.264113	-123.126835	0	Coffee Shop	Park	Asian Restaurant	Chinese Restaurant	Malay Restaurant	Diner	Falafel Restaurant	Nail Salon	Camera Store	Restaurant
2	Oakridge	West Side	49.230829	-123.131134	3	Sushi Restaurant	Concert Hall	Sandwich Place	Pharmacy	Fast Food Restaurant	Convenience Store	Vietnamese Restaurant	Gym Pool	Falafel Restaurant	Deli / Bodega
3	Marpole	West Side	49.209223	-123.136150	0	Sushi Restaurant	Pizza Place	Chinese Restaurant	Bus Stop	Bubble Tea Shop	Liquor Store	Gas Station	Dessert Shop	Coffee Shop	Plaza
4	Kitsilano	West Side	49.269410	-123.155267	0	Bakery	American Restaurant	Coffee Shop	Restaurant	Japanese Restaurant	Ice Cream Shop	French Restaurant	Sushi Restaurant	Food Truck	Thai Restaurant

Clustering Neighborhoods. Table 15, Map 2:



Analysis: Examining the result

- Examining the result through 5 Clusters:
- for Westside Borough.

Results and Discussion

- Successfully achieved the goal by using necessary powerful data science tools by grouping the neighborhoods into clusters to assist the Business Investor/Stakeholders/Small Business Owner / Franchisee Opener by providing them with relevant data about venues and safety of a given neighborhood.
- West Side as an ideal destination for opening and establishing Daily Convenient Store/Retail store/Franchisee which can be operated 24 hours a day (24/7).

Conclusion

- Once we confirmed the borough with least crime but due to neighborhoods factor we could not choose the South borough, then further shortlist the neighborhoods based on the less crime, common venues, sufficient neighborhood which is **West Side Borough** the best suits for Business Investor/Stakeholders/Small Business Owner / Franchisee Opener to establish Daily Convenient Store/Retail store/Franchisee which will be operated 24 hours a day (24/7).