



SAFE AREA IN VANCOUVER
CANADA FOR THE
RESTAURANT BUSINESS

IS VANCOUVER A SAFE CITY?

As in any big city, big crime. Vancouver, all in all, is a very safe place to visit or live but keeping a smart lookout while venturing around the city is key. Downtown is very busy for most hours of the day and therefore is fairly safe, particularly the West End. Personal safety is extremely high in Vancouver.

Robberies and property crime

Bank robberies were down, according to the VPD's data. Officers said there were 23 reports, compared to 39 in 2018. Last year marked the lowest number of reported bank robbery incidents in the last decade, police said. But the property crime rate went up to 5.2 per cent. Twice as many break-and-enter incidents occurred at businesses than residential properties, and thefts from vehicles were up 12.9 per cent.

<https://bc.ctvnews.ca/there-were-10-homicides-23-bank-robberies-and-4-521-assaults-in-vancouver-last-year-police-stats-1.4818912>

Therefore, we must remember the criminal activities of the neighborhood before finally determining the location. We strive to solve this problem by analyzing crime data in Vancouver and finding the safest area and the area in the area that best meets the requirements of our business task.

DATA SOURCES

- ❖ To obtain details about crime in Vancouver, historical real data published in Kaggle was used. The data set included the type, time and coordinates of the criminal activity. Since the data set did not contain specific neighborhoods of the city of Vancouver, the data was supplemented from Wikipedia. The Foursquare API is used to select locations for listed areas.
- ❖ The second data source is based on data from Wikipedia that did not require any analysis, since these were direct classifications. The page contains additional information about the area and its areas.
- ❖ A third data source is generated from the Open Cage API

DATA CLEANING

- Data from the Kaggle data source was a heavy file that Git could not accommodate. Therefore, it was decided to focus on recent crimes of 2018, which significantly reduced the number of lines in csv file from 600,000 to 37,000.
- I found out that not all the categories of data in a dataset are useful for this case. Therefore, information such as the month and hour in which the crime occurred were excluded.

METHODOLOGY

Pandas describe() is used to view some basic statistical details like percentile, mean, std etc. of a data frame or a series of numeric values. When this method is applied to a series of string, it returns a different output which is shown in the examples below.

In [71]:

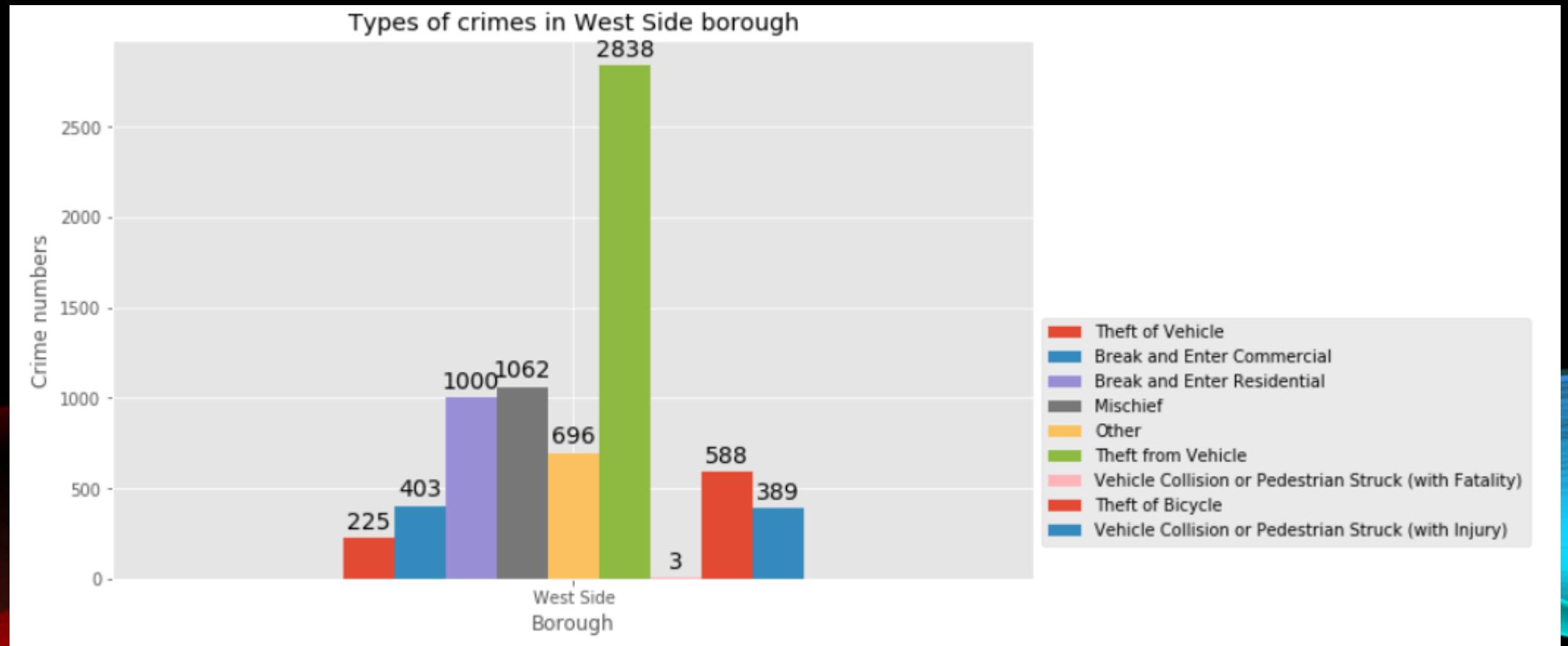
```
van_crime_d.describe()
```

Out[71]:

	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

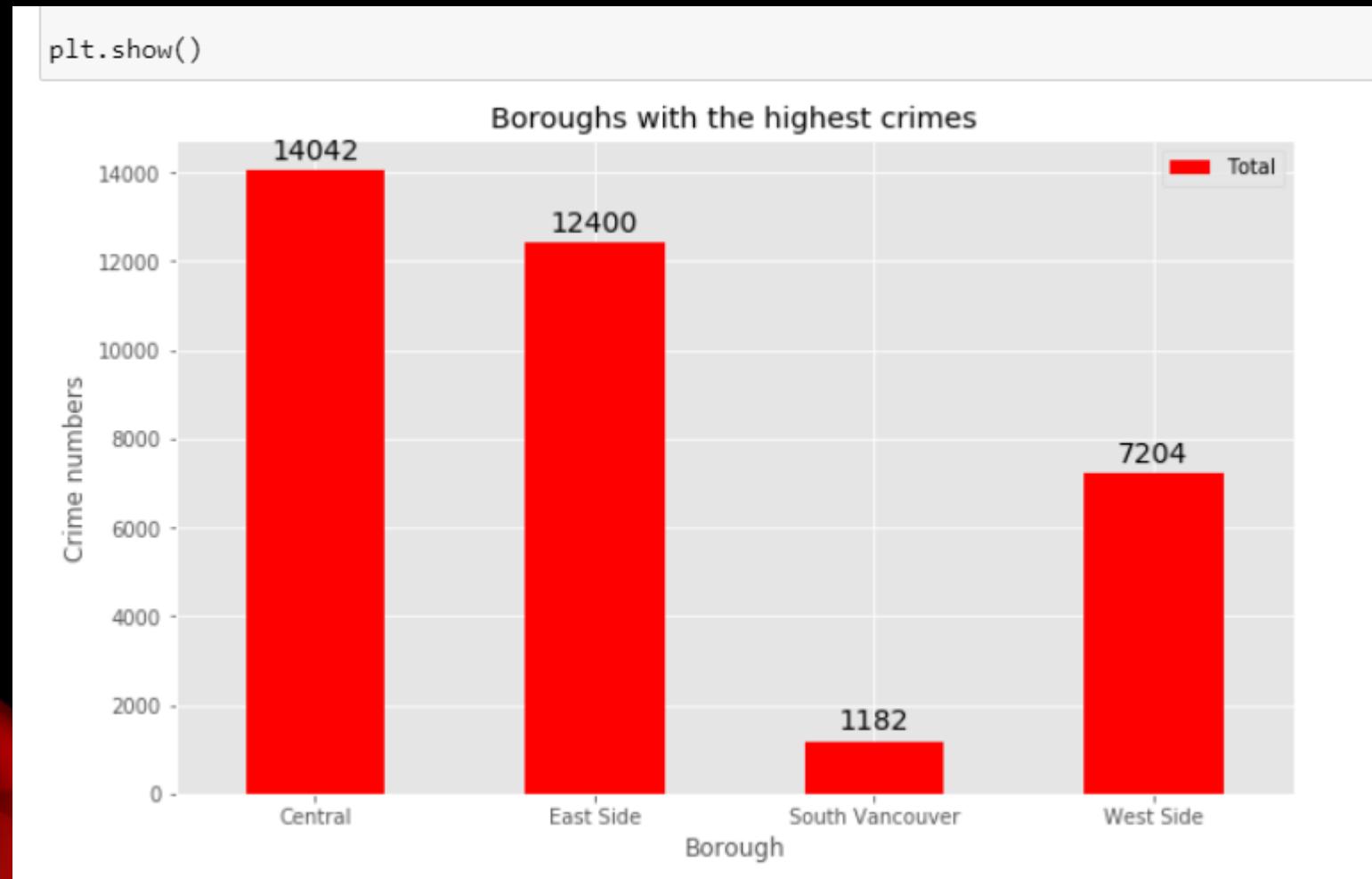
VISUALIZATION

In my business case bar chart is great at visualizing counts of categorical data.



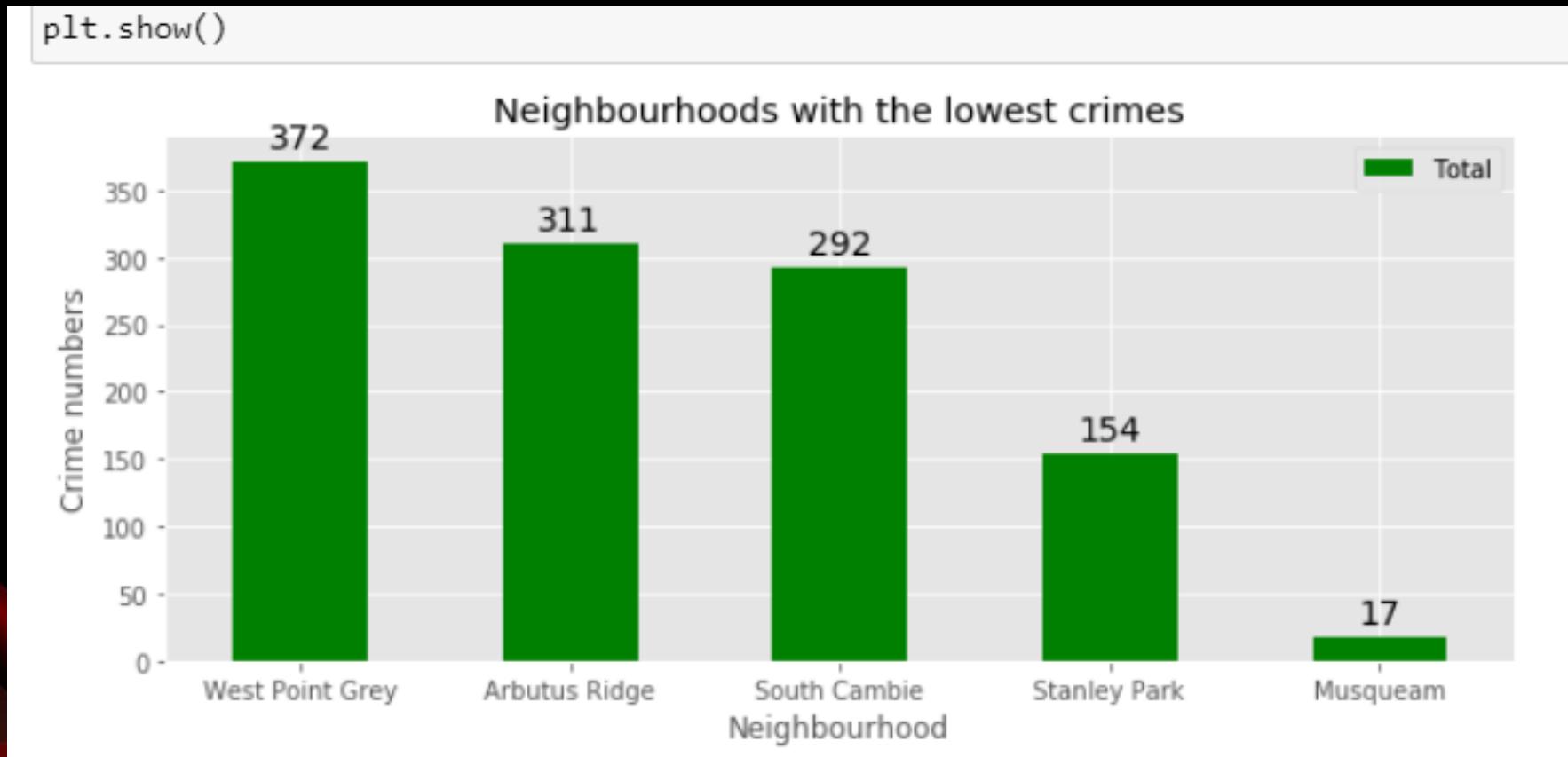
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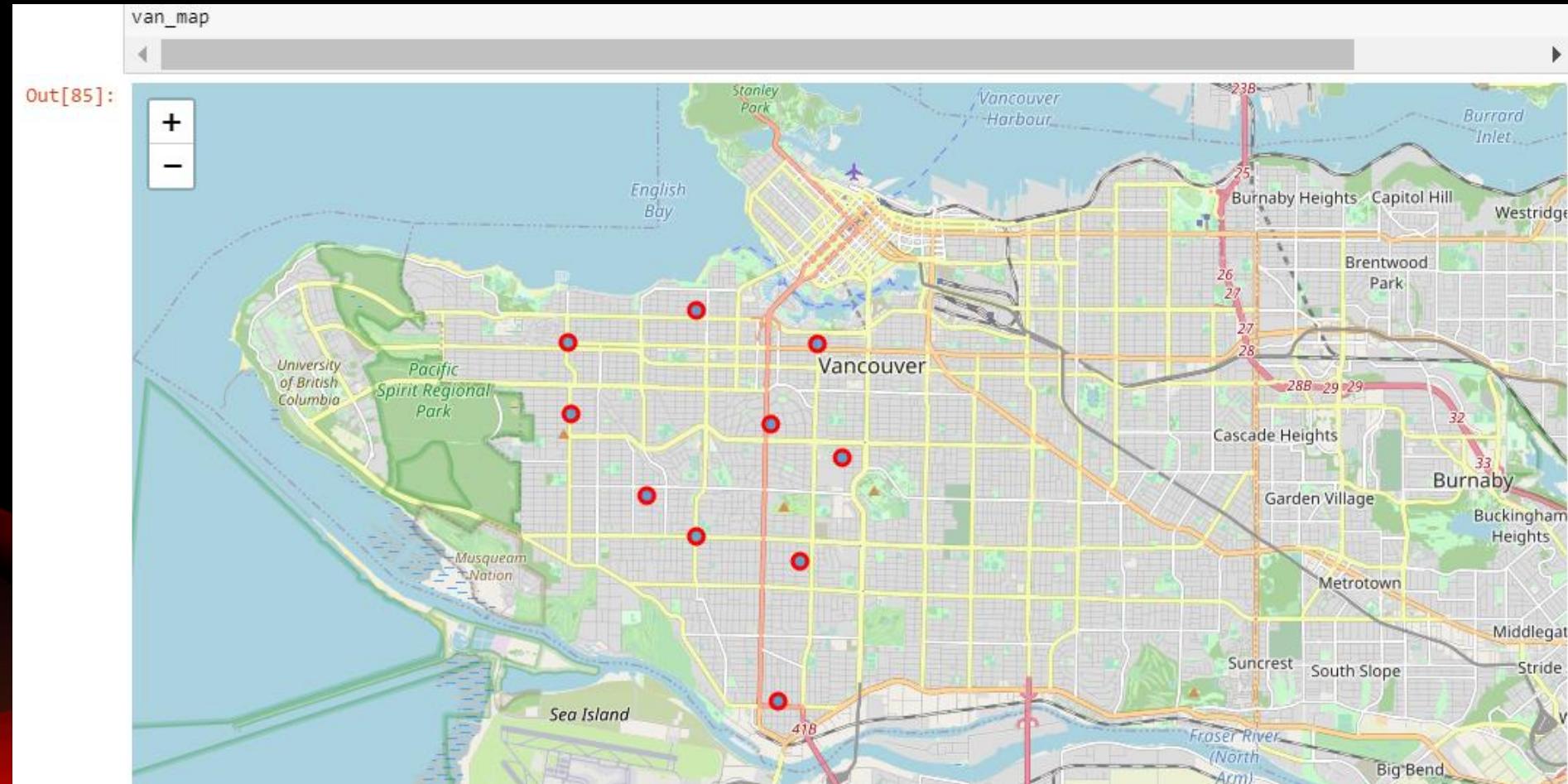
VISUALIZATION

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WEST SIDE BOROUGH NEIGHBORHOODS

Python Folium library has been a helpful resource for me to utilize the power of geospatial visual analysis



MODEL

Based on the data set of the neighborhoods and areas, as well as the latitude and longitude of the western part of Vancouver, we can find all objects within a radius of 500 meters from each area by connecting to FourSquareAPI, where json was used that contains all the places in each neighborhood. This data frame is as follows:

```
In [161]: print(van_ws_venue.shape)  
van_ws_venue.head()
```

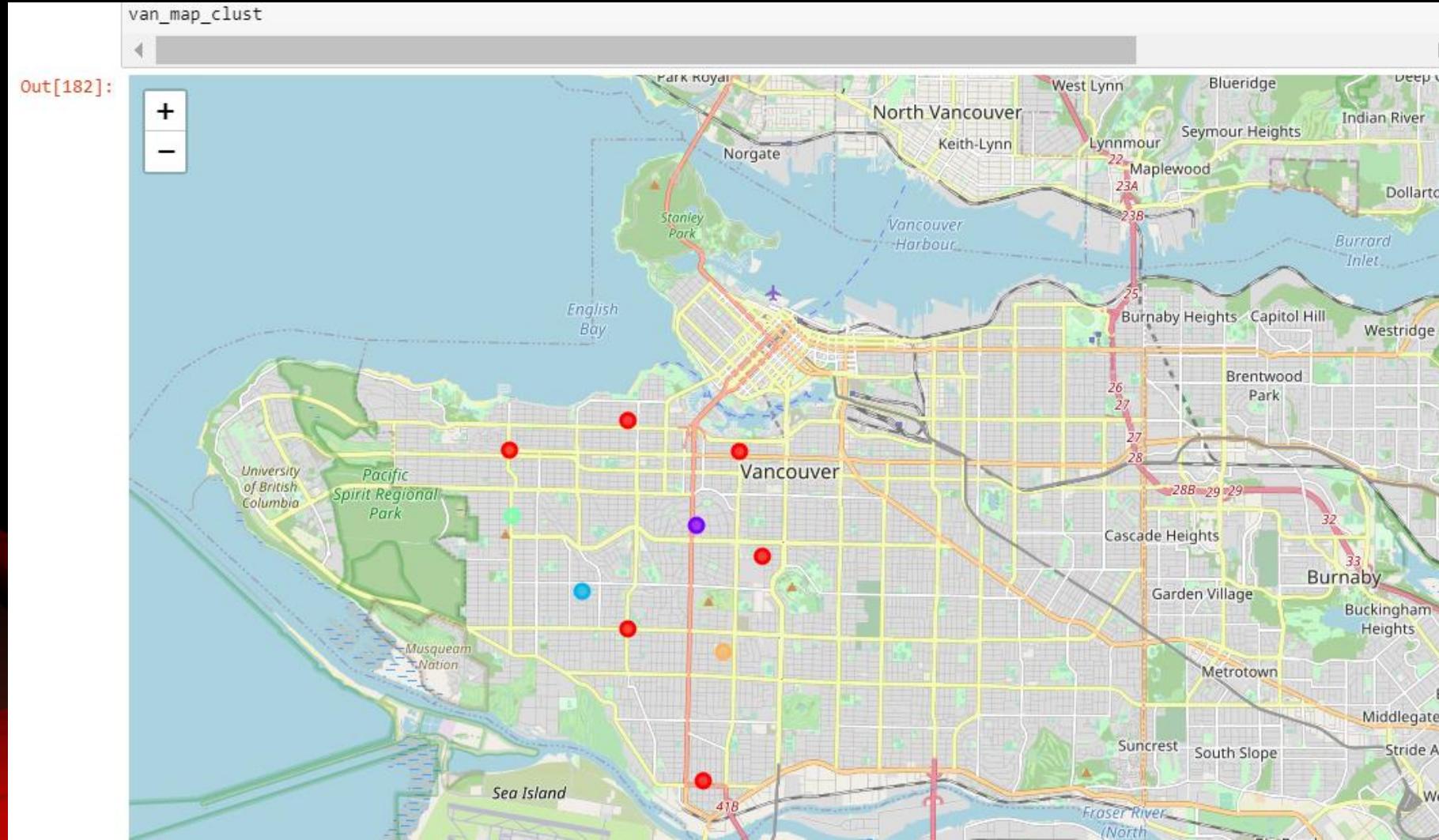
```
(227, 5)
```

Out[161]:

	Neighbourhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Category
0	Shaughnessy	49.251863	-123.138023	Angus Park	Park
1	Shaughnessy	49.251863	-123.138023	Crepe & Cafe	French Restaurant
2	Fairview	49.264113	-123.126835	Gyu-Kaku Japanese BBQ	BBQ Joint
3	Fairview	49.264113	-123.126835	CRESCENT nail and spa	Nail Salon
4	Fairview	49.264113	-123.126835	Charleson Park	Park

WHAT I GOT

After debugging the clustering of K-means access to each created cluster was obtained to see which neighborhoods were assigned to each of the five clusters. Here's what the map looks like:



CLUSTER RESULTS

Clusters shows what types of businesses are running in West side Borough.

Out[174]:											
	Borough	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
1	West Side	Coffee Shop	Park	Asian Restaurant	Malay Restaurant	Diner	Pharmacy	Nail Salon	Falafel Restaurant	Chinese Restaurant	Camera Store
3	West Side	Sushi Restaurant	Chinese Restaurant	Vietnamese Restaurant	Pizza Place	Dessert Shop	Dim Sum Restaurant	Coffee Shop	Falafel Restaurant	Plaza	Massage Studio
4	West Side	Bakery	American Restaurant	Thai Restaurant	Japanese Restaurant	Coffee Shop	Sushi Restaurant	Ice Cream Shop	Food Truck	French Restaurant	Grocery Store
5	West Side	Coffee Shop	Chinese Restaurant	Tea Room	Pharmacy	Sushi Restaurant	Sandwich Place	Thai Restaurant	Bakery	Gym Pool	Pizza Place
6	West Side	Coffee Shop	Japanese Restaurant	Sushi Restaurant	Café	Bakery	Bookstore	Pub	Asian Restaurant	Vegetarian / Vegan Restaurant	Women's Store
8	West Side	Coffee Shop	Bus Stop	Juice Bar	Vietnamese Restaurant	Light Rail Station	Liquor Store	Bank	Café	Malay Restaurant	Sushi Restaurant

BRIEF DISCUSSION

The task of the business task was to help interested parties determine one of the safest areas and whether there is an analogue of the business being launched in this area to create a restaurant business of Russian cuisine. This was achieved thanks to the first use of crime data in Vancouver to identify a safe area with a significant number of neighbors so that any business is viable. After choosing the area, it was necessary to choose the right area where the planned business was not among the places in close proximity to each other. We achieved this by grouping the areas in clusters to help stakeholders by providing them with relevant information about the locations and security of the area.

CONCLUSION

Crime data was studied to understand the different types of crimes in all areas of Vancouver, and then categorized them into different areas, which helped us group the areas into areas and first choose the safest area. After we confirmed that the number of areas to be considered is also decreasing, we additionally selected areas based on common locations to select the area that is best suited for the restaurant business. In the future, the scale of this project can be taken into account by the population of the region, which is an additional factor that will have a big impact for further positive decisions.