Data

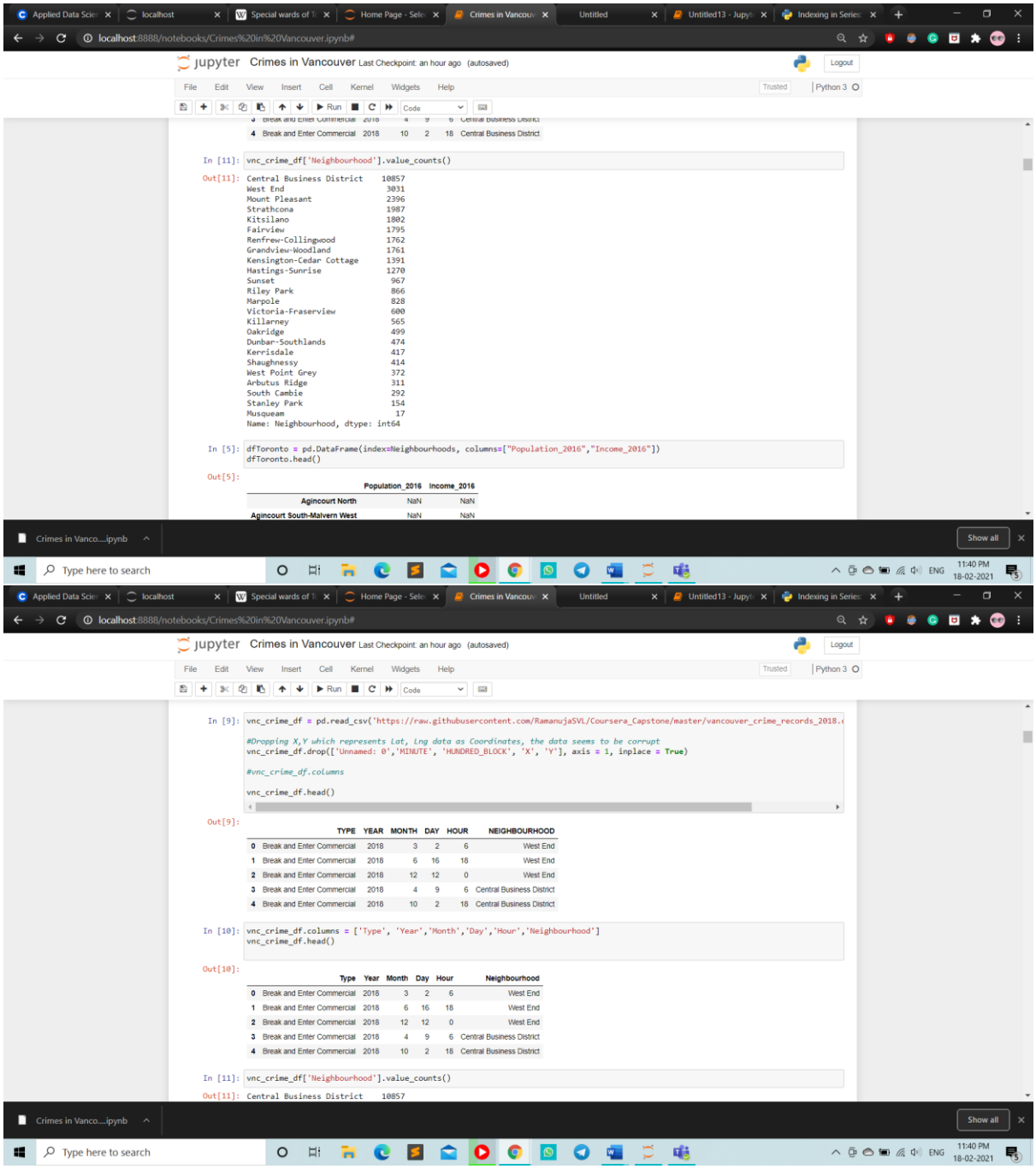
Based on definition of our problem, factors that will influence our decission are:

- finding the safest borough based on crime statistics
- finding the most common venues
- choosing the right neighbourhood within the borough

We will be using the geographical coordinates of Vancouver to plot neighbourhoods in a borough that is safe and in the city's vicinity, and finally cluster our neighborhoods and present our findings.

Following data sources will be needed to extract/generate the required information:

- **Part 1**: Using a real world data set from Kaggle containing the Vancouver Crimes from 2003 to 2019: A dataset consisting of the crime statistics of each Neighbourhoof in Vancouver along with type of crime, recorded year, month and hour.
- **Part 2**: Gathering additional information of the list of officially categorized boroughs in Vancouver from Wikipedia.: Borough information will be used to map the existing data where each neighbourhood can be assigned with the right borough.
- **Part 3**: Creating a new consolidated dataset of the Neighborhoods, along with their boroughs, crime data and the respective Neighbourhood's co-ordinates.: This data will be fetched using OpenCage Geocoder to find the safest borough and explore the neighbourhood by plotting it on maps using Folium and perform exploratory data analysis.
- **Part 4**: Creating a new consolidated dataset of the Neighborhoods, boroughs, and the most common venues and the respective Neighbourhood along with co-ordinates.: This data will be fetched using Four Square API to explore the neighbourhood venues and to apply machine learning algorithm to cluster the neighbourhoods and present the findings by plotting it on maps using Folium.



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4	Break and Enter Commercial	2018	10	2	18	Central Business District

In [11]:
```
vnc_crime_df['Neighbourhood'].value_counts()
```

Out[11]:
```
Central Business District    10857
West End                      3031
Mount Pleasant                2396
Strathcona                    1987
Kitsilano                     1802
Fairview                      1795
Renfrew-Collingwood           1762
Grandview-Woodland            1761
Kensington-Cedar Cottage      1391
Hastings-Sunrise              1270
Sunset                         967
Riley Park                     866
Marpole                        828
Victoria-Fraserview            600
Killarney                      565
Oakridge                       499
Dunbar-Southlands              474
Kerrisdale                     417
Shaughnessy                    414
West Point Grey                372
Arbutus Ridge                  311
South Cambie                   292
Stanley Park                   154
Musqueam                        17
Name: Neighbourhood, dtype: int64
```

In [5]:
```
dfToronto = pd.DataFrame(index=Neighbourhoods, columns=["Population_2016","Income_2016"])
dfToronto.head()
```

Out[5]:

	Population_2016	Income_2016
Agincourt North	NaN	NaN
Agincourt South-Malvern West	NaN	NaN

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In [9]:
```
vnc_crime_df = pd.read_csv('https://raw.githubusercontent.com/RamanujaSVL/Coursera_Capstone/master/vancouver_crime_records_2018.

#Dropping X,Y which represents Lat, Lng data as Coordinates, the data seems to be corrupt
vnc_crime_df.drop(['Unnamed: 0','MINUTE', 'HUNDRED_BLOCK', 'X', 'Y'], axis = 1, inplace = True)

#vnc_crime_df.columns

vnc_crime_df.head()
```

Out[9]:

	TYPE	YEAR	MONTH	DAY	HOUR	NEIGHBOURHOOD
0	Break and Enter Commercial	2018	3	2	6	West End
1	Break and Enter Commercial	2018	6	16	18	West End
2	Break and Enter Commercial	2018	12	12	0	West End
3	Break and Enter Commercial	2018	4	9	6	Central Business District
4	Break and Enter Commercial	2018	10	2	18	Central Business District

In [10]:
```
vnc_crime_df.columns = ['Type', 'Year','Month','Day','Hour','Neighbourhood']
vnc_crime_df.head()
```

Out[10]:

	Type	Year	Month	Day	Hour	Neighbourhood
0	Break and Enter Commercial	2018	3	2	6	West End
1	Break and Enter Commercial	2018	6	16	18	West End
2	Break and Enter Commercial	2018	12	12	0	West End
3	Break and Enter Commercial	2018	4	9	6	Central Business District
4	Break and Enter Commercial	2018	10	2	18	Central Business District

In [11]:
```
vnc_crime_df['Neighbourhood'].value_counts()
```

Out[11]:
```
Central Business District    10857
```

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