Battle Of Neighborhood

1. Introduction

The Battle Of Neighborhood project help to peoples finding or best nearest venues around their neighborhoods .And Explores the location data based on user problem. The Business Problem is ,the user start their business based on most liked venues around the location radius(like radius=500),The Particular address contains number of neighborhoods with in that different venues, based on venues category and number of likes got the venue and nearest distance venue to recommended to user for start their business.

1.1 Background

Before start the problem need location data for exploring location data. The use Foursquare API ,it is location data Provider about venue names and locations ,menus, photos, tips, likes etc. It is a sole data source all the required data obtained through the API. After explore all Neighborhoods ,to uses the likes along with venue_id to gather likes for venues.

1.2 Problem

If a user wants to start their business into north York, Toronto, Canada, we recommend to what type of venues are mostly liked and categories and venues names .Based on the data user starts their business venues in that location.

1.3 Interest and solution

The user is interested for type of venues are most popular(based on likes) and categories (like coffee shop ,restaurants etc.)

The Solution for the problem is recommend venues based foursquare api location data

2. Data acquisition and cleaning

Data can be getting from wiki pages('https') , to access the page using requests module to scrap all web page data . after using Beautiful Soup for extracting html data in raw-data . Now clean the data and extract the requirements likes all Postal Codes and Neighborhoods and Borough from wiki page. Finally convert into Data Frame.

2.1 Data Sources

1. Data Source: https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M
2. Using Foursquare Api for Accessing Location Data

   Process

   - Create a account in foursquare Api
   - After getting credentials like Client id ,Client secret

   Based on credentials create a url and explore the location data.

2.2 Data Cleaning

The wiki page data contain raw_data after extracting data apply the Beautiful Soup to extract the html data.

Data_Before_wiki page

Data After using Beautiful Soup:

```
df.head()
```

Out[37]:

	Postal Code	Borough	Neighbourhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government

3.Analysis of Neighborhood

Now, Analysis the Location Neighborhoods in the location data using foursquare Api

Choose the address for the neighborhood analysis like

Address =Toronto, Canada

Find out the Latitude and Longitude of Address

location=Nominatim(user_agent='nr_explorer')

data=location.geocode(Address)

latitude=data.latitude

longitude=data.longitude

now create a url along with client id and client secret credentials based on that analyze the neighborhoods.

	Postal Code	Borough	Neighbourhood
0	M3A	North York	Parkwoods
1	M4A	North York	Victoria Village
2	M5A	Downtown Toronto	Regent Park, Harbourfront
3	M6A	North York	Lawrence Manor, Lawrence Heights
4	M7A	Downtown Toronto	Queen's Park, Ontario Provincial Government

In [38]:
```
df1.head()
```

Out[38]:

	Postal Code	Latitude	Longitude
0	M1B	43.806686	-79.194353
1	M1C	43.784535	-79.160497
2	M1E	43.763573	-79.188711
3	M1G	43.770992	-79.216917
4	M1H	43.773136	-79.239476

In [39]:
```
df_final.head()
```

Out[39]:

	Postal Code	Borough	Neighbourhood	Latitude	Longitude
0	M3A	North York	Parkwoods	43.753259	-79.329656
1	M4A	North York	Victoria Village	43.725882	-79.315572
2	M5A	Downtown Toronto	Regent Park, Harbourfront	43.654260	-79.360636
3	M6A	North York	Lawrence Manor, Lawrence Heights	43.718518	-79.464763

All locations in Toronto , Canada

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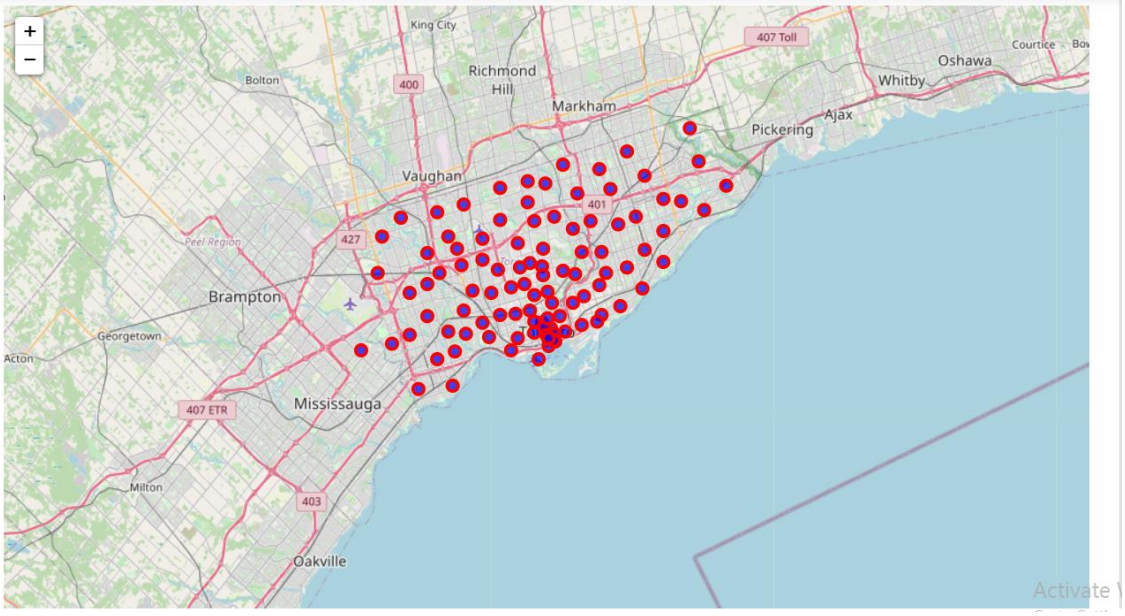
Out[33]:



After Analyze the venues in North York , Toronto , Canada (Borough)

1)address='North York '

2)find out the Latitude and Longitude of the address

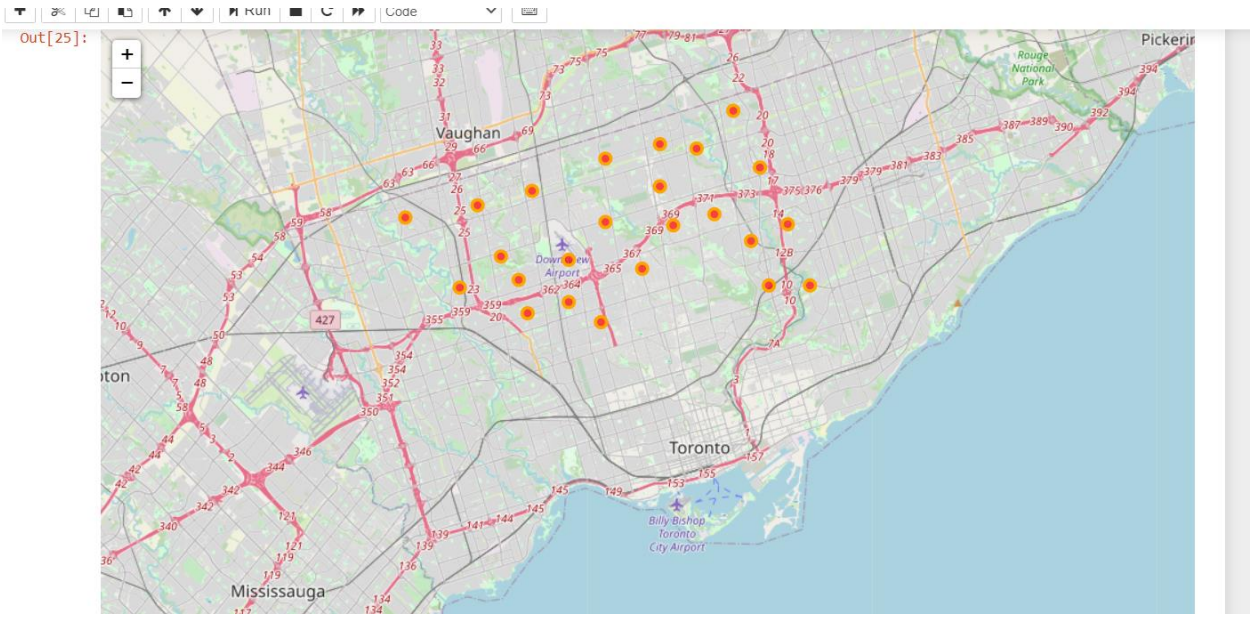
3)create url for that and explore the Neighborhoods in the address

Ex:

url='https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&ll={},{}&v={}&radius={}&limit={}'.format(client_id,client_secret,latitude,longitude,version,radius,limit)

client_id and client_secret are the foursquare api app credentials .

Now visualize all Neighborhoods in North York ,Toronto , Canada.

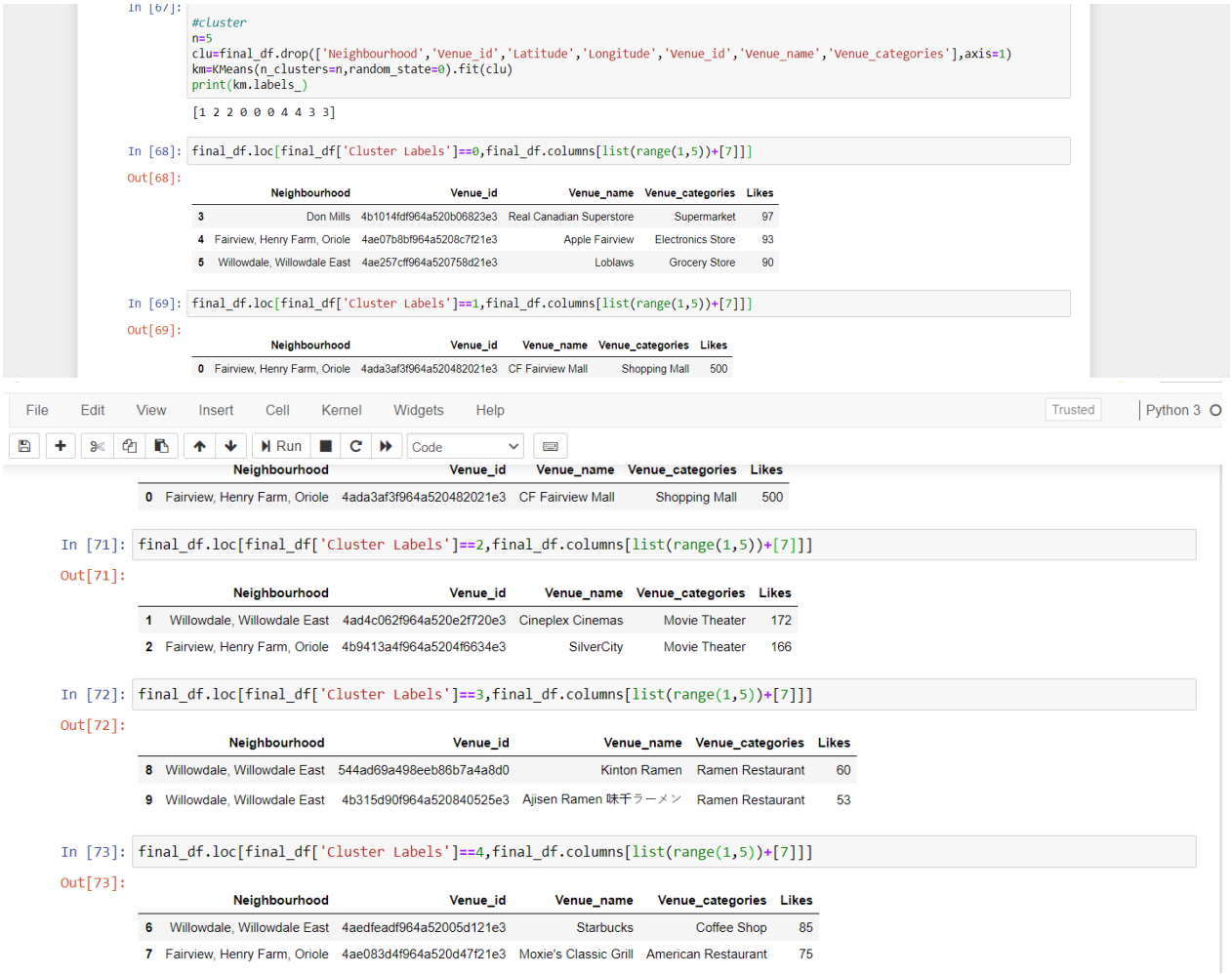


4.Modeling

Using The KMeans Clustering Algorithms for segmenting and clustering venues in the location

Process:

- Choose Number of cluster want to create ex: n=5
- Create a KMeans cluster object and fit the data
- Finally use the KMeans cluster object . labels_ get the labels.
- Insert cluster labels column into data frame
- Now examine the results of the each clusters.



In [67]:
```
#cluster
n=5
clu=final_df.drop(['Neighbourhood','Venue_id','Latitude','Longitude','Venue_id','Venue_name','Venue_categories'],axis=1)
km=KMeans(n_clusters=n,random_state=0).fit(clu)
print(km.labels_)
```

```
[1 2 2 0 0 0 4 4 3 3]
```

In [68]:
```
final_df.loc[final_df['Cluster Labels']==0,final_df.columns[list(range(1,5))+[7]]]
```

Out[68]:

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
3	Don Mills	4b1014fdf964a520b06823e3	Real Canadian Superstore	Supermarket	97
4	Fairview, Henry Farm, Oriole	4ae07b8bf964a5208c7f21e3	Apple Fairview	Electronics Store	93
5	Willowdale, Willowdale East	4ae257cff964a520758d21e3	Loblaws	Grocery Store	90

In [69]:
```
final_df.loc[final_df['Cluster Labels']==1,final_df.columns[list(range(1,5))+[7]]]
```

Out[69]:

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
0	Fairview, Henry Farm, Oriole	4ada3af3f964a520482021e3	CF Fairview Mall	Shopping Mall	500

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Run Code

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
0	Fairview, Henry Farm, Oriole	4ada3af3f964a520482021e3	CF Fairview Mall	Shopping Mall	500

In [71]:
```
final_df.loc[final_df['Cluster Labels']==2,final_df.columns[list(range(1,5))+[7]]]
```

Out[71]:

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
1	Willowdale, Willowdale East	4ad4c062f964a520e2f720e3	Cineplex Cinemas	Movie Theater	172
2	Fairview, Henry Farm, Oriole	4b9413a4f964a5204f6634e3	SilverCity	Movie Theater	166

In [72]:
```
final_df.loc[final_df['Cluster Labels']==3,final_df.columns[list(range(1,5))+[7]]]
```

Out[72]:

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
8	Willowdale, Willowdale East	544ad69a498eeb86b7a4a8d0	Kinton Ramen	Ramen Restaurant	60
9	Willowdale, Willowdale East	4b315d90f964a520840525e3	Ajisen Ramen 味千ラーメン	Ramen Restaurant	53

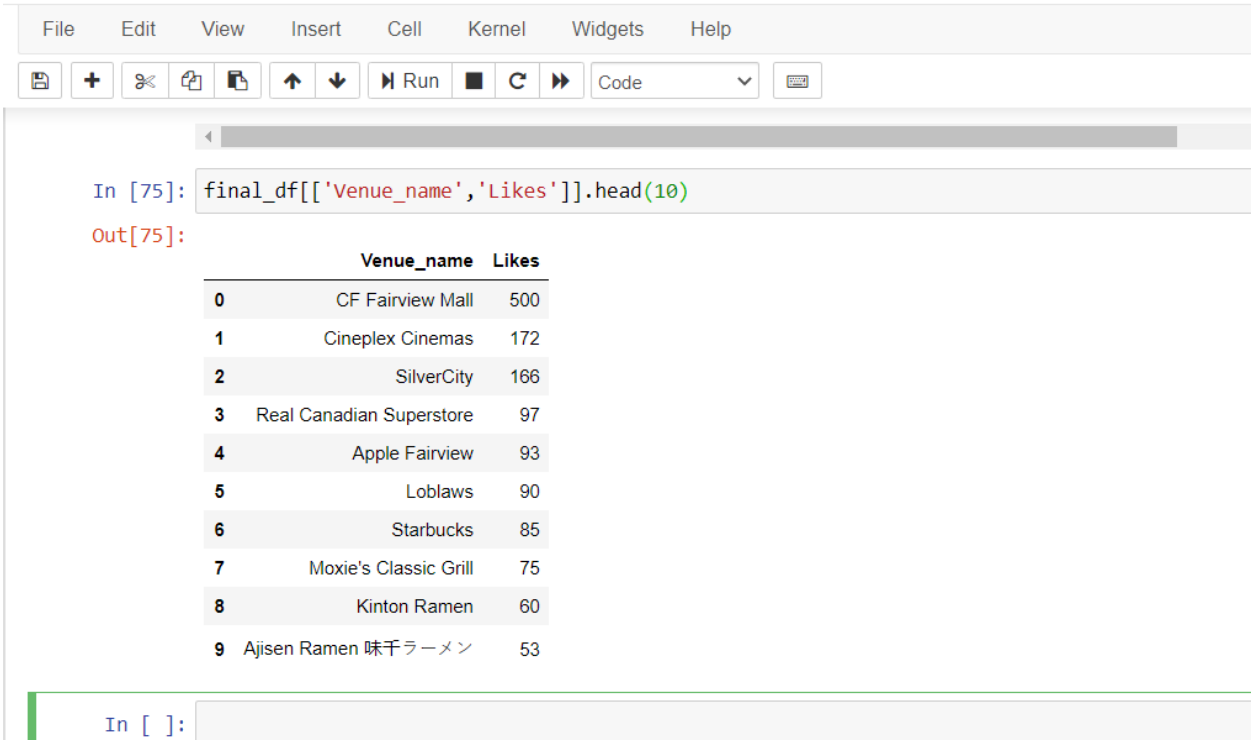
In [73]:
```
final_df.loc[final_df['Cluster Labels']==4,final_df.columns[list(range(1,5))+[7]]]
```

Out[73]:

	Neighbourhood	Venue_id	Venue_name	Venue_categories	Likes
6	Willowdale, Willowdale East	4aedfeadf964a52005d121e3	Starbucks	Coffee Shop	85
7	Fairview, Henry Farm, Oriole	4ae083d4f964a520d47f21e3	Moxie's Classic Grill	American Restaurant	75

5.Results

Top 10 Mostly Liked Venues in North York, Toronto ,Canada



	Venue_name	Likes
0	CF Fairview Mall	500
1	Cineplex Cinemas	172
2	SilverCity	166
3	Real Canadian Superstore	97
4	Apple Fairview	93
5	Loblaws	90
6	Starbucks	85
7	Moxie's Classic Grill	75
8	Kinton Ramen	60
9	Ajisen Ramen 味千ラーメン	53

6.Conclusion

Successfully analyze and segmenting the top 10 liked Venues in North York Toronto, Canada.