FINAL REPORT

Capstone Project- The Battle of Neighborhoods

INTRODUCTION:

The purpose of this Project is to help people in exploring better facilities around their neighborhood. It will help people making smart decision on selecting appropriate neighborhood. It will help people to get awareness of the area and neighborhood before moving to a new city, state, country or place for their work or to start a new fresh life. Developers, investors, policy makers and/or city planners have an interest in the need for additional services and citizen protection. Lots of people are migrating to various states of Canada and needed lots of research for good hotels, restaurants etc. This project is for those people who are looking for better neighborhoods. For ease of accessing to Cafe, Restaurant, Shopping Stores, Hotels etc.

This Project aim to create an analysis of features for a people migrating to Toronto to search a best neighborhood as a comparative analysis between neighborhoods. It will help people to get awareness of the area and neighborhood before moving to a new city, state, country or place for their work or to start a new fresh life.

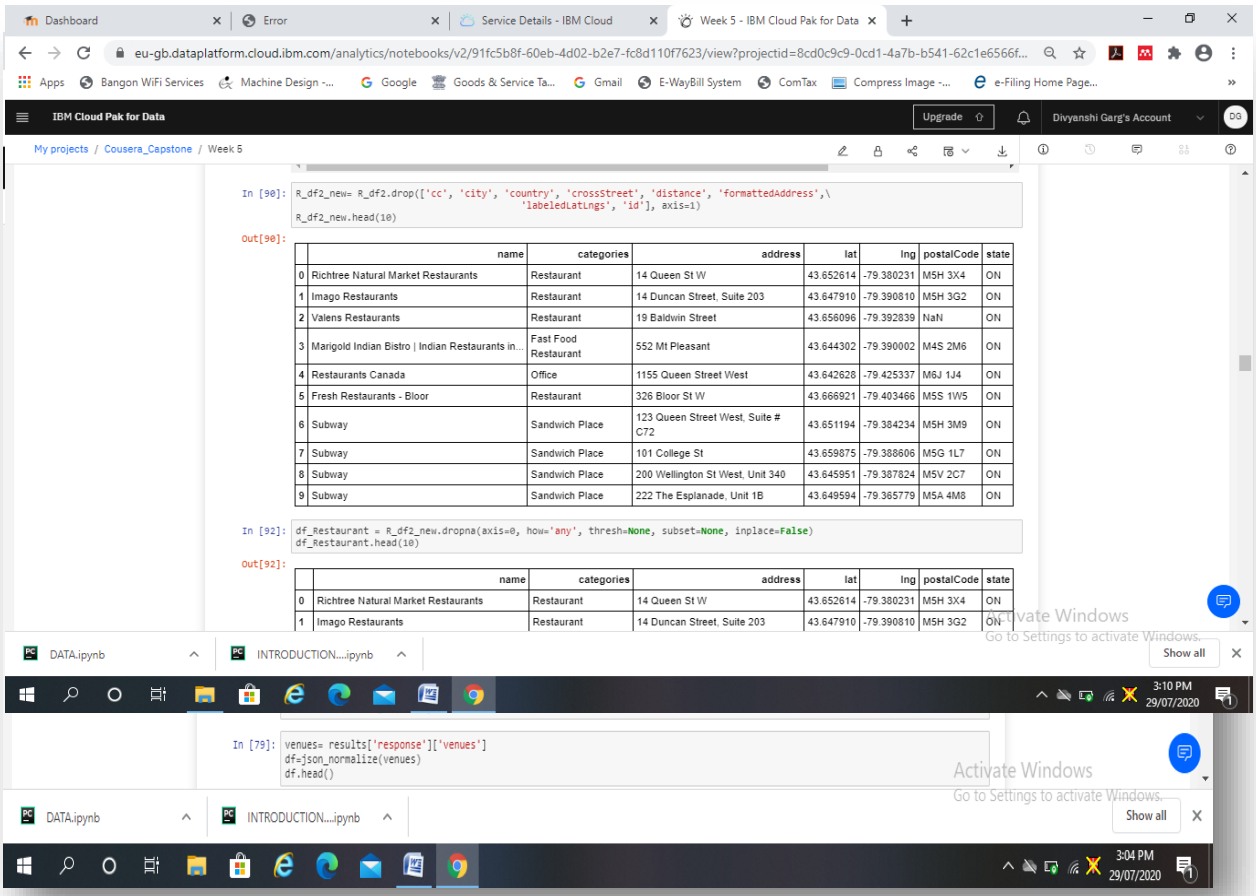
DATA:

This data will allow analyze and examine to justified problem. The data will enable us to group venues by neighborhood. The data used is provided by Foursquare API. The data are grouped by landscape area and all information about cafe, shopping stores, hotels and restaurants is gathered relevant to conduct any event. Toronto locations of interest will cluster the venues most common to that location.

Foursquare Developers Access to venue data: https://foursquare.com/

METHODOLOGY:

- Import Libraries
- Define Foursquare Credentials
- Define the city and get its coordinates.
- Search for Hotels in Toronto and clean data frame.



In [90]:
```
R_df2_new= R_df2.drop(['cc', 'city', 'country', 'crossStreet', 'distance', 'formattedAddress',\
                       'labeledLatLngs', 'id'], axis=1)
R_df2_new.head(10)
```

Out[90]:

	name	categories	address	lat	lng	postalCode	state
0	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	M5H 3X4	ON
1	Imago Restaurants	Restaurant	14 Duncan Street, Suite 203	43.647910	-79.390810	M5H 3G2	ON
2	Valens Restaurants	Restaurant	19 Baldwin Street	43.656096	-79.392839	NaN	ON
3	Marigold Indian Bistro | Indian Restaurants in...	Fast Food Restaurant	552 Mt Pleasant	43.644302	-79.390002	M4S 2M6	ON
4	Restaurants Canada	Office	1155 Queen Street West	43.642628	-79.425337	M6J 1J4	ON
5	Fresh Restaurants - Bloor	Restaurant	326 Bloor St W	43.666921	-79.403466	M5S 1W5	ON
6	Subway	Sandwich Place	123 Queen Street West, Suite # C72	43.651194	-79.384234	M5H 3M9	ON
7	Subway	Sandwich Place	101 College St	43.659875	-79.388606	M5G 1L7	ON
8	Subway	Sandwich Place	200 Wellington St West, Unit 340	43.645951	-79.387824	M5V 2C7	ON
9	Subway	Sandwich Place	222 The Esplanade, Unit 1B	43.649594	-79.365779	M5A 4M8	ON

In [92]:
```
df_Restaurant = R_df2_new.dropna(axis=0, how='any', thresh=None, subset=None, inplace=False)
df_Restaurant.head(10)
```

Out[92]:

	name	categories	address	lat	lng	postalCode	state
0	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	M5H 3X4	ON
1	Imago Restaurants	Restaurant	14 Duncan Street, Suite 203	43.647910	-79.390810	M5H 3G2	ON

DATA.ipynb INTRODUCTION....ipynb Show all

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In [79]:
```
venues= results['response']['venues']
df=json_normalize(venues)
df.head()
```


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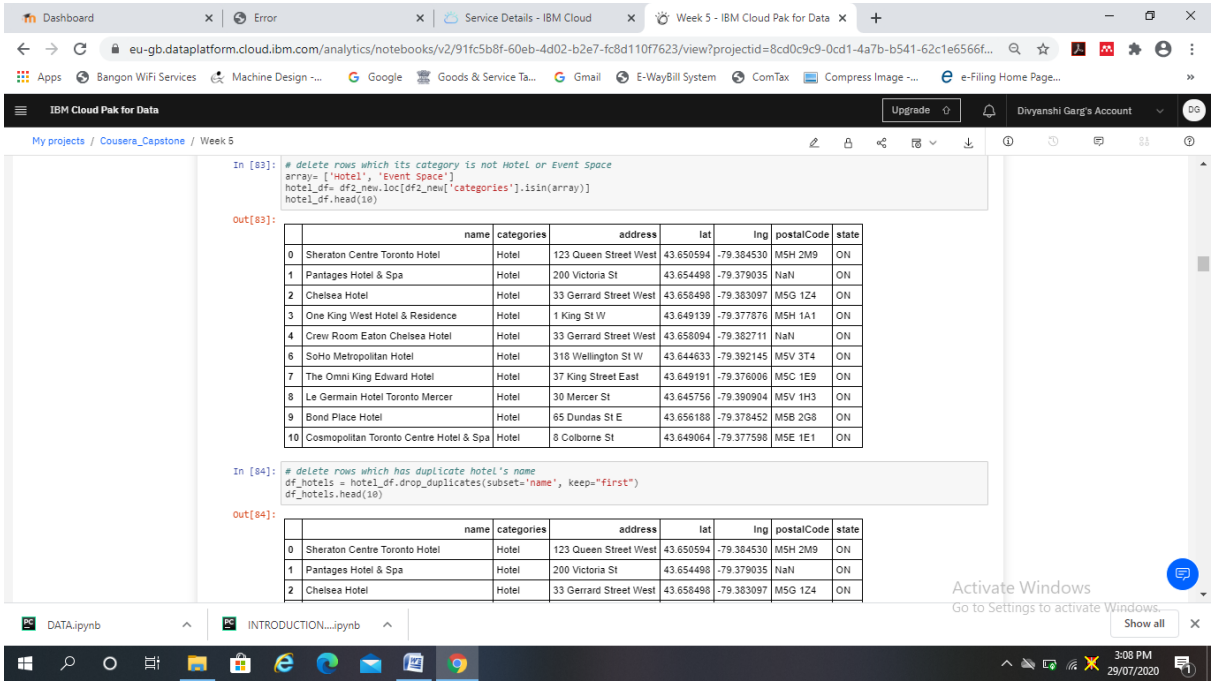

In [83]:
```
# delete rows which its category is not Hotel or Event Space
array= ['Hotel', 'Event Space']
hotel_df= df2_new.loc[df2_new['categories'].isin(array)]
hotel_df.head(10)
```

Out[83]:

	name	categories	address	lat	lng	postalCode	state
0	Sheraton Centre Toronto Hotel	Hotel	123 Queen Street West	43.650594	-79.384530	M5H 2M9	ON
1	Pantages Hotel & Spa	Hotel	200 Victoria St	43.654498	-79.379035	NaN	ON
2	Chelsea Hotel	Hotel	33 Gerrard Street West	43.658498	-79.383097	M5G 1Z4	ON
3	One King West Hotel & Residence	Hotel	1 King St W	43.649139	-79.377876	M5H 1A1	ON
4	Crew Room Eaton Chelsea Hotel	Hotel	33 Gerrard Street West	43.658094	-79.382711	NaN	ON
6	SoHo Metropolitan Hotel	Hotel	318 Wellington St W	43.644633	-79.392145	M5V 3T4	ON
7	The Omni King Edward Hotel	Hotel	37 King Street East	43.649191	-79.376006	M5C 1E9	ON
8	Le Germain Hotel Toronto Mercer	Hotel	30 Mercer St	43.645756	-79.390904	M5V 1H3	ON
9	Bond Place Hotel	Hotel	65 Dundas St E	43.656188	-79.378452	M5B 2G8	ON
10	Cosmopolitan Toronto Centre Hotel & Spa	Hotel	8 Colborne St	43.649064	-79.377598	M5E 1E1	ON

In [84]:
```
# delete rows which has duplicate hotel's name
df_hotels = hotel_df.drop_duplicates(subset='name', keep="first")
df_hotels.head(10)
```

Out[84]:

	name	categories	address	lat	lng	postalCode	state
0	Sheraton Centre Toronto Hotel	Hotel	123 Queen Street West	43.650594	-79.384530	M5H 2M9	ON
1	Pantages Hotel & Spa	Hotel	200 Victoria St	43.654498	-79.379035	NaN	ON
2	Chelsea Hotel	Hotel	33 Gerrard Street West	43.658498	-79.383097	M5G 1Z4	ON

DATA.ipynb INTRODUCTION....ipynb Show all

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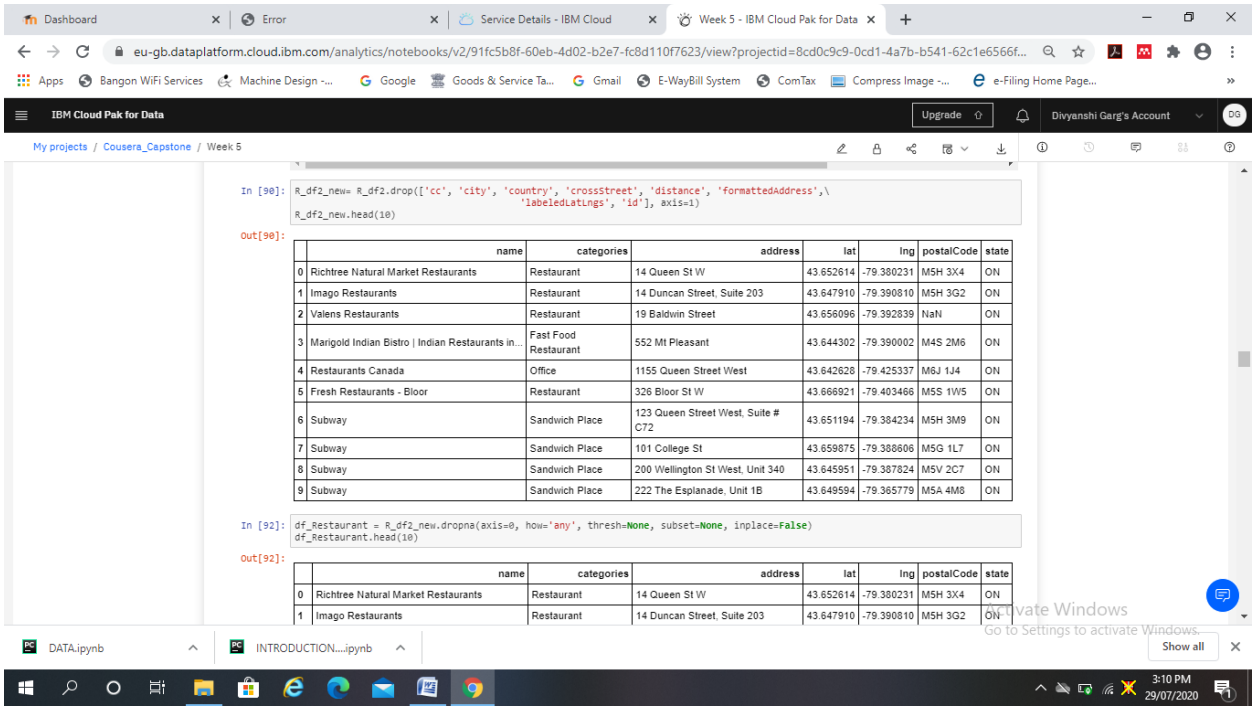
- Search for Restaurants and clean data frame.



```
In [90]: R_df2_new= R_df2.drop(['cc', 'city', 'country', 'crossstreet', 'distance', 'formattedAddress',\
                                'labeledLatLngs', 'id'], axis=1)
         R_df2_new.head(10)
```

Out[90]:

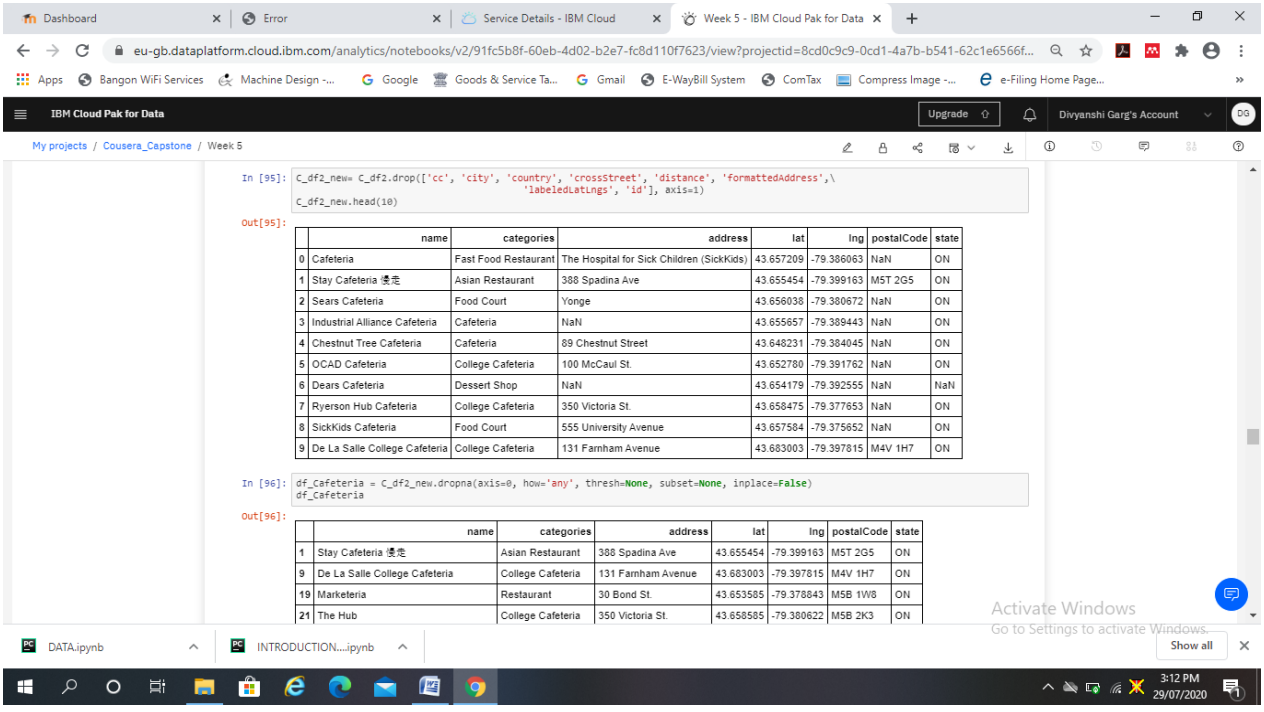
	name	categories	address	lat	lng	postalCode	state
0	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	M5H 3X4	ON
1	Imago Restaurants	Restaurant	14 Duncan Street, Suite 203	43.647910	-79.390810	M5H 3G2	ON
2	Valens Restaurants	Restaurant	19 Baldwin Street	43.656096	-79.392839	NaN	ON
3	Marigold Indian Bistro | Indian Restaurants in...	Fast Food Restaurant	552 Mt Pleasant	43.644302	-79.390002	M4S 2M6	ON
4	Restaurants Canada	Office	1155 Queen Street West	43.642628	-79.425337	M6J 1J4	ON
5	Fresh Restaurants - Bloor	Restaurant	326 Bloor St W	43.666921	-79.403466	M5S 1W5	ON
6	Subway	Sandwich Place	123 Queen Street West, Suite # C72	43.651194	-79.384234	M5H 3M9	ON
7	Subway	Sandwich Place	101 College St	43.659875	-79.388606	M5G 1L7	ON
8	Subway	Sandwich Place	200 Wellington St West, Unit 340	43.645951	-79.387824	M5V 2C7	ON
9	Subway	Sandwich Place	222 The Esplanade, Unit 1B	43.649594	-79.365779	M5A 4M8	ON

```
In [92]: df_Restaurant = R_df2_new.dropna(axis=0, how='any', thresh=None, subset=None, inplace=False)
         df_Restaurant.head(10)
```

Out[92]:

	name	categories	address	lat	lng	postalCode	state
0	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	M5H 3X4	ON
1	Imago Restaurants	Restaurant	14 Duncan Street, Suite 203	43.647910	-79.390810	M5H 3G2	ON

- Search for Cafeteria and clean data frame.



```
In [95]: C_df2_new= C_df2.drop(['cc', 'city', 'country', 'crossstreet', 'distance', 'formattedAddress',\
                                'labeledLatLngs', 'id'], axis=1)
         C_df2_new.head(10)
```

Out[95]:

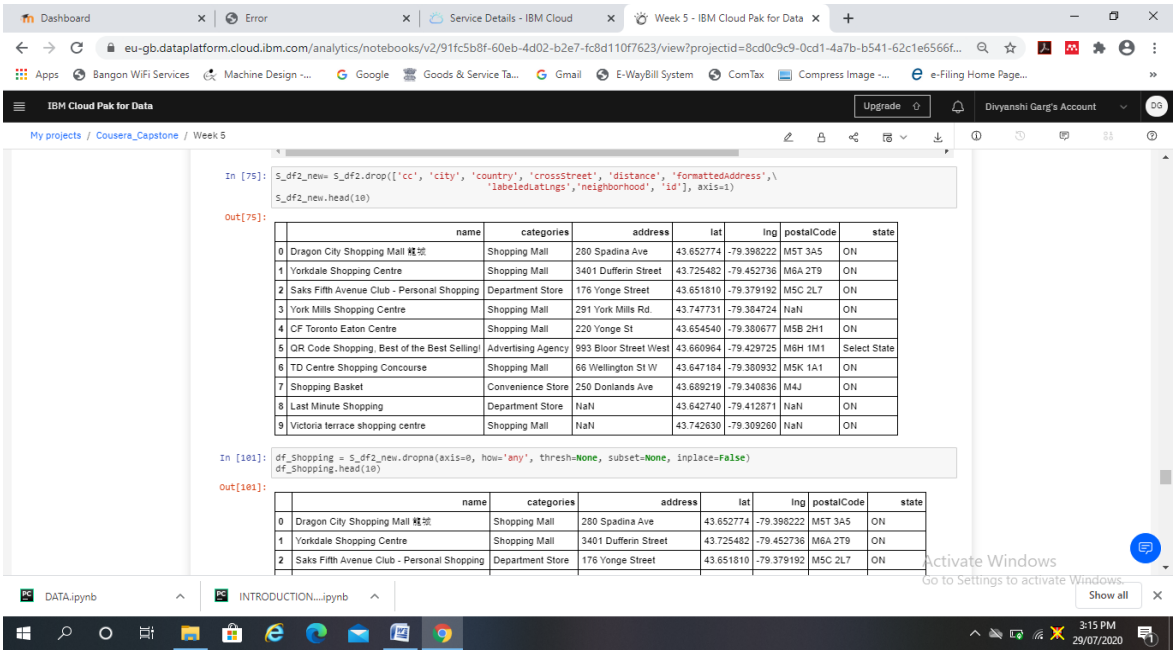
	name	categories	address	lat	lng	postalCode	state
0	Cafeteria	Fast Food Restaurant	The Hospital for Sick Children (SickKids)	43.657209	-79.386063	NaN	ON
1	Stay Cafeteria 燒走	Asian Restaurant	388 Spadina Ave	43.655454	-79.399163	M5T 2G5	ON
2	Sears Cafeteria	Food Court	Yonge	43.656038	-79.380672	NaN	ON
3	Industrial Alliance Cafeteria	Cafeteria	NaN	43.655657	-79.389443	NaN	ON
4	Chestnut Tree Cafeteria	Cafeteria	89 Chestnut Street	43.648231	-79.384045	NaN	ON
5	OCAD Cafeteria	College Cafeteria	100 McCaul St.	43.652780	-79.391762	NaN	ON
6	Dears Cafeteria	Dessert Shop	NaN	43.654179	-79.392555	NaN	NaN
7	Ryerson Hub Cafeteria	College Cafeteria	350 Victoria St.	43.658475	-79.377653	NaN	ON
8	SickKids Cafeteria	Food Court	555 University Avenue	43.657584	-79.375652	NaN	ON
9	De La Salle College Cafeteria	College Cafeteria	131 Farnham Avenue	43.683003	-79.397815	M4V 1H7	ON

```
In [96]: df_Cafeteria = C_df2_new.dropna(axis=0, how='any', thresh=None, subset=None, inplace=False)
         df_Cafeteria
```

Out[96]:

	name	categories	address	lat	lng	postalCode	state
1	Stay Cafeteria 燒走	Asian Restaurant	388 Spadina Ave	43.655454	-79.399163	M5T 2G5	ON
9	De La Salle College Cafeteria	College Cafeteria	131 Farnham Avenue	43.683003	-79.397815	M4V 1H7	ON
19	Marketeria	Restaurant	30 Bond St.	43.653585	-79.378843	M5B 1W8	ON
21	The Hub	College Cafeteria	350 Victoria St.	43.658585	-79.380622	M5B 2K3	ON

- Search for Shopping Stores and clean data frame.



```
In [75]: S_df2_new= S_df2.drop(['cc', 'city', 'country', 'crossStreet', 'distance', 'formattedAddress',\
                                'labeledLatLngs','neighborhood', 'id'], axis=1)
         S_df2_new.head(10)
```

Out[75]:

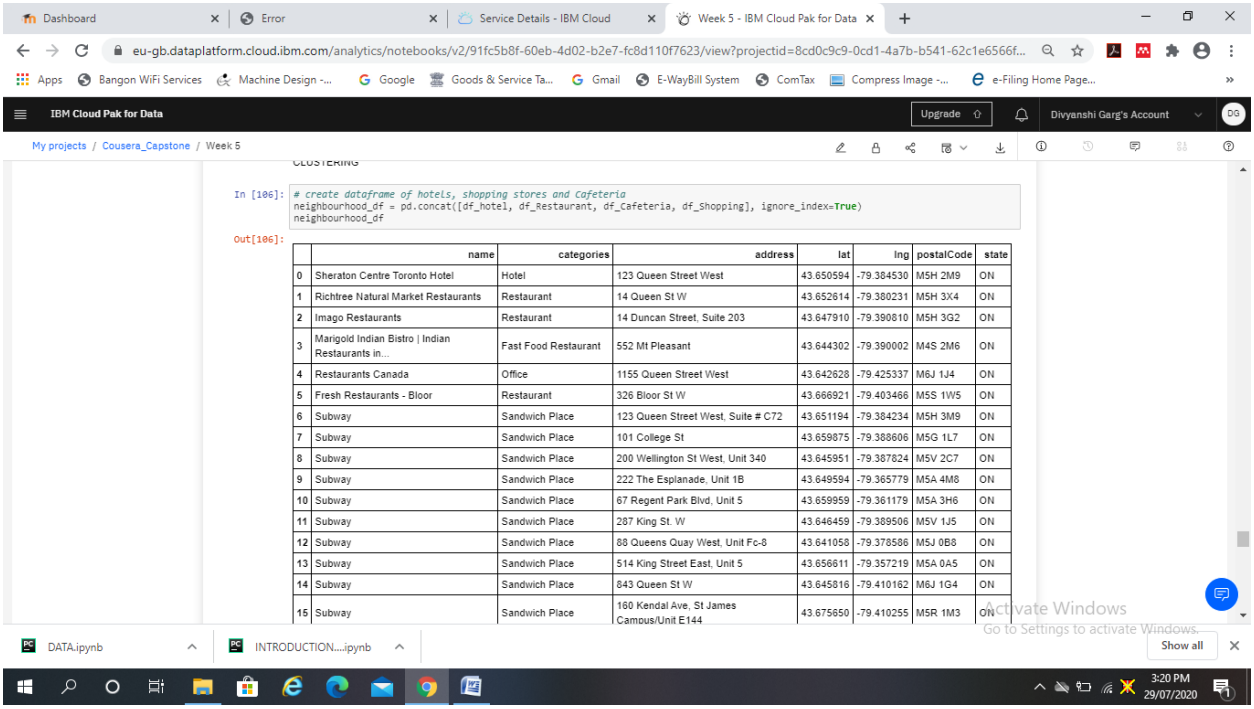
	name	categories	address	lat	lng	postalCode	state
0	Dragon City Shopping Mall 耗坡	Shopping Mall	280 Spadina Ave	43.652774	-79.398222	M5T 3A5	ON
1	Yorkdale Shopping Centre	Shopping Mall	3401 Dufferin Street	43.725482	-79.452736	M6A 2T9	ON
2	Saks Fifth Avenue Club - Personal Shopping	Department Store	176 Yonge Street	43.651810	-79.379192	M5C 2L7	ON
3	York Mills Shopping Centre	Shopping Mall	291 York Mills Rd.	43.747731	-79.384724	NaN	ON
4	CF Toronto Eaton Centre	Shopping Mall	220 Yonge St	43.654540	-79.380677	M5B 2H1	ON
5	QR Code Shopping. Best of the Best Selling!	Advertising Agency	993 Bloor Street West	43.660964	-79.429725	M6H 1M1	Select State
6	TD Centre Shopping Concourse	Shopping Mall	66 Wellington St W	43.647184	-79.380932	M5K 1A1	ON
7	Shopping Basket	Convenience Store	250 Donlands Ave	43.689219	-79.340836	M4J	ON
8	Last Minute Shopping	Department Store	NaN	43.642740	-79.412871	NaN	ON
9	Victoria terrace shopping centre	Shopping Mall	NaN	43.742630	-79.309260	NaN	ON

```
In [101]: df_Shopping = S_df2_new.dropna(axis=0, how='any', thresh=None, subset=None, inplace=False)
          df_Shopping.head(10)
```

Out[101]:

	name	categories	address	lat	lng	postalCode	state
0	Dragon City Shopping Mall 耗坡	Shopping Mall	280 Spadina Ave	43.652774	-79.398222	M5T 3A5	ON
1	Yorkdale Shopping Centre	Shopping Mall	3401 Dufferin Street	43.725482	-79.452736	M6A 2T9	ON
2	Saks Fifth Avenue Club - Personal Shopping	Department Store	176 Yonge Street	43.651810	-79.379192	M5C 2L7	ON

- Cluster together Hotels, Restaurants, Cafeteria and Shopping Stores.



```
In [106]: # create dataframe of hotels, shopping stores and cafeteria
          neighbourhood_df = pd.concat([df_hotel, df_Restaurant, df_Cafeteria, df_Shopping], ignore_index=True)
          neighbourhood_df
```

Out[106]:

	name	categories	address	lat	lng	postalCode	state
0	Sheraton Centre Toronto Hotel	Hotel	123 Queen Street West	43.650594	-79.384530	M5H 2M9	ON
1	Richtree Natural Market Restaurants	Restaurant	14 Queen St W	43.652614	-79.380231	M5H 3X4	ON
2	Imago Restaurants	Restaurant	14 Duncan Street, Suite 203	43.647910	-79.390810	M5H 3G2	ON
3	Marigold Indian Bistro | Indian Restaurants in...	Fast Food Restaurant	552 Mt Pleasant	43.644302	-79.390002	M4S 2M6	ON
4	Restaurants Canada	Office	1155 Queen Street West	43.642628	-79.425337	M6J 1J4	ON
5	Fresh Restaurants - Bloor	Restaurant	326 Bloor St W	43.666921	-79.403466	M5S 1W5	ON
6	Subway	Sandwich Place	123 Queen Street West, Suite # C72	43.651194	-79.384234	M5H 3M9	ON
7	Subway	Sandwich Place	101 College St	43.659875	-79.388606	M5G 1L7	ON
8	Subway	Sandwich Place	200 Wellington St West, Unit 340	43.645951	-79.387824	M5V 2C7	ON
9	Subway	Sandwich Place	222 The Esplanade, Unit 1B	43.649594	-79.365779	M5A 4M8	ON
10	Subway	Sandwich Place	67 Regent Park Blvd, Unit 5	43.659959	-79.361179	M5A 3H6	ON
11	Subway	Sandwich Place	287 King St. W	43.646459	-79.389506	M5V 1J5	ON
12	Subway	Sandwich Place	88 Queens Quay West, Unit Fc-8	43.641058	-79.378586	M5J 0B8	ON
13	Subway	Sandwich Place	514 King Street East, Unit 5	43.656611	-79.357219	M5A 0A5	ON
14	Subway	Sandwich Place	843 Queen St W	43.645816	-79.410162	M6J 1G4	ON
15	Subway	Sandwich Place	160 Kendal Ave, St James Campus/Unit E144	43.675650	-79.410255	M5R 1M3	ON

- Generate map to visualize clustering of hotels, shopping stores, cafeteria & restaurants.