

The Event for the Best Photographers

Capstone Project for Coursera course Applied Data Science Capstone

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1 The Business Problem

XYZ is a company based in Toronto for organizing events, currently it works on a project to organize an event for 6 days for a group of photographers from all over the world. The company has to put a good program, including a hotel of residence, a hall for meetings, places of landscape to visit, stores for shopping, restaurants and cafes. So, the company's purpose is to make a list of places of landscape in Toronto, including the nearest restaurants, cafes, and shopping stores for each place.

2 Research Outline

1) To answer question one, I will estimate with the data model of the places which provided near the area surrounding and I will then extract the importance from the model to identify the main drivers of places in Toronto. The direction of the relationship from can then be derived from the correlations of these features with the places.

2) For question two I will predict price levels for all neighbourhoods using the model from above and use the residuals as an indicator of under or overvaluation.

3) I will use the relevant features derived in to run a KMeans cluster analysis and then characterize the resulting clusters based on the most prevalent differences of the clusters compared with the city average.

3 Data preparation

Define Foursquare Credentials

```
] : CLIENT_ID = '4FQQJE2LMGVLERRRE2BOFR1LQQR5ZEHLTD1WRAFKOFT4TI0' # your Foursquare ID
CLIENT_SECRET = 'RCSNR5TH31NQRG2QYCHK101HRMTUZHBB2TSJ1CJU5UOGRXRQ' # your Foursquare Secret
VERSION = '20180604'
LIMIT = 30
print('Your credentials:')
print('Foursquare_ID: ' + CLIENT_ID)
print('Foursquare_Secret: ' + CLIENT_SECRET)
```

```
Your credentials:
Foursquare_ID: 4FQQJE2LMGVLERRRE2BOFR1LQQR5ZEHLTD1WRAFKOFT4TI0
Foursquare_Secret: RCSNR5TH31NQRG2QYCHK101HRMTUZHBB2TSJ1CJU5UOGRXRQ
```

Search For Hotels

Search for Hotels

```
# search for hotels
search_query = 'Hotel'
radius = 500

# Define the corresponding URL
url = 'https://api.foursquare.com/v2/venues/search?client_id={}&client_secret={}&ll={},{&v={}&query={}&radius={}&limit={}'\
.format(CLIENT_ID, CLIENT_SECRET, latitude, longitude, VERSION, search_query, radius, LIMIT)
url
```

```
Out[11]:
```

| | name | categories | address | lat | lng | postalCode | state |
|----|--|-------------|--------------------------|-----------|------------|------------|-------|
| 0 | Sheraton Centre Toronto Hotel | Hotel | 123 Queen Street West | 43.651052 | -79.384026 | M5H 2M9 | ON |
| 3 | DoubleTree by Hilton Hotel Toronto Downtown | Hotel | 108 Chestnut Street | 43.654608 | -79.385942 | M5G 1R3 | ON |
| 4 | VFM Test Hotel | Hotel | 123 Test Drive | 43.658434 | -79.387894 | M2M 2M2 | ON |
| 11 | Hilton Toronto | Hotel | 145 Richmond Street West | 43.649852 | -79.385576 | M5H 2L2 | ON |
| 14 | Marriott Downtown at CF Toronto Eaton Centre | Hotel | 525 Bay Street | 43.654728 | -79.382422 | M5G 2L2 | ON |
| 15 | Shangri-La Toronto | Hotel | 188 University Ave. | 43.649129 | -79.386557 | M5H 0A3 | ON |
| 21 | Grand Ballroom | Event Space | 123 Queen St. W | 43.651217 | -79.383771 | M5H 2M9 | ON |

Search For Park

Out[19]:

| | name | categories | address | lat | lng | postalCode | state |
|----|----------------------------|------------|------------------------------|-----------|------------|------------|-------|
| 4 | Queen's Park | Park | University Ave. | 43.663946 | -79.392180 | M5R 2E8 | ON |
| 7 | Trinity Bellwoods Park | Park | 1053 Dundas St. W. | 43.647072 | -79.413756 | M5H 2N2 | ON |
| 16 | Bellevue Square Park | Park | btwn Bellevue & Augusta Ave. | 43.653610 | -79.402199 | M5T 2N4 | ON |
| 17 | Riverdale Park West | Park | 500 Gerrard St. | 43.666048 | -79.360941 | M5A 2H3 | ON |
| 20 | Riverdale Park East | Park | 550 Broadview Ave | 43.669951 | -79.355493 | M4K 2P1 | ON |
| 21 | Barbara Hall Park | Park | 519 Church St | 43.666879 | -79.381068 | M4Y 2K9 | ON |
| 24 | High Park | Park | 1873 Bloor St. W | 43.646479 | -79.463425 | M6R 2Z3 | ON |
| 26 | Canoe Landing Park | Park | 50 Fort York Blvd | 43.638762 | -79.397067 | M5V 3Z1 | ON |
| 28 | Sir Winston Churchill Park | Park | 301 St Clair Ave W | 43.683732 | -79.409881 | M4V 1S4 | ON |
| 29 | Coronation Park | Park | 711 Lake Shore Blvd. W | 43.634553 | -79.405403 | M5V 3T7 | ON |

Search For Resturant

Out[25]:

| | name | categories | address | lat | lng | postalCode | state |
|---|---------------------------------|---------------------|---------------------|-----------|------------|------------|-------|
| 0 | Hemispheres Restaurant & Bistro | American Restaurant | 110 Chestnut Street | 43.654884 | -79.385931 | M5G 1R3 | ON |
| 1 | Marché Restaurant | Restaurant | 181 Bay St. | 43.647232 | -79.377591 | M5J 2T3 | ON |
| 2 | Rol San Restaurant 龍笙棧 | Dim Sum Restaurant | 323 Spadina Ave. | 43.654318 | -79.398650 | M5T 2E9 | ON |
| 3 | 360 Restaurant | Wine Bar | 301 Front St W | 43.642537 | -79.387042 | M5V 2T6 | ON |
| 4 | Swatow Restaurant 汕頭小食家 | Chinese Restaurant | 309 Spadina Ave. | 43.653866 | -79.398334 | M5T 2E6 | ON |
| 5 | Goldstone Noodle Restaurant 金石 | Noodle House | 266 Spadina Ave | 43.652278 | -79.398039 | M5T 2E4 | ON |
| 6 | Victoria's Restaurant | Restaurant | 37 King Street East | 43.649298 | -79.376431 | M5C 1E9 | ON |
| 8 | New Sky Restaurant 小沙田食家 | Chinese Restaurant | 353 Spadina Ave. | 43.655337 | -79.398897 | M5T 2G3 | ON |
| 9 | The Hot House Restaurant & Bar | American Restaurant | 35 Church St | 43.648683 | -79.373741 | M5E 1T3 | ON |

Search For Café

Out[31]:

| | name | categories | address | lat | lng | postalCode | state |
|----|---------------------------------------|--------------------|--------------------|-----------|------------|------------|-------|
| 1 | Stay Cafeteria 慢走 | Asian Restaurant | 388 Spadina Ave | 43.655454 | -79.399163 | M5T 2G5 | ON |
| 2 | Cafeteria | Mexican Restaurant | 974 College St | 43.653419 | -79.427678 | M6H 1A5 | ON |
| 9 | De La Salle College Cafeteria | College Cafeteria | 131 Farnham Avenue | 43.683003 | -79.397815 | M4V 1H7 | ON |
| 18 | Marketeria | Restaurant | 30 Bond St. | 43.653585 | -79.378843 | M5B 1W8 | ON |
| 21 | One Hour | Chinese Restaurant | 435 Spadina Ave. | 43.657399 | -79.399649 | M5T 2T6 | ON |
| 23 | The Hub | College Cafeteria | 350 Victoria St. | 43.658585 | -79.380622 | M5B 2K3 | ON |
| 27 | Innis College | Student Center | 2 Sussex Ave | 43.665556 | -79.399298 | M5S 1J5 | ON |
| 29 | 6th Floor Cafeteria 12 Concorde Place | Café | 12 Concorde Place | 43.721861 | -79.329339 | m3c 3k7 | ON |

Search For Shopping Stores

Out[61]:

| | name | categories | address | lat | lng | postalCode | state |
|---|------------------------------|---------------|--------------------|-----------|------------|------------|-------|
| 0 | Dragon City Shopping Mall 龍城 | Shopping Mall | 280 Spadina Ave | 43.652774 | -79.398222 | M5T 3A5 | ON |
| 1 | CF Toronto Eaton Centre | Shopping Mall | 220 Yonge St | 43.654265 | -79.380567 | M5B 2H1 | ON |
| 2 | TD Centre Shopping Concourse | Shopping Mall | 66 Wellington St W | 43.647184 | -79.380932 | M5K 1A1 | ON |

Generating Visualization for Hotel, Shopping, Cafeteria

Generate map to visualize hotels, shopping stores and Cafeteria and how they cluster together

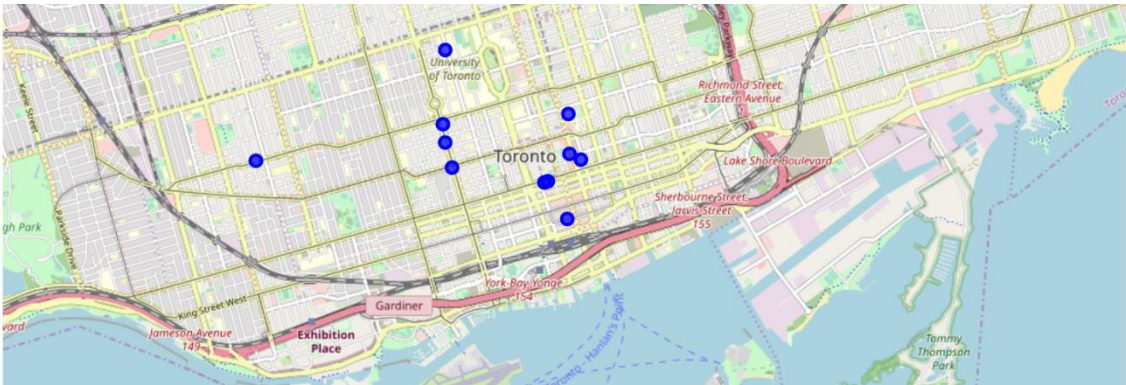
In [38]:

create dataframe of hotels, shopping stores and Cafeteria
hotel_neighbourhood_df = pd.concat([df_hotel, df_Cafeteria, df_Shopping], ignore_index=True)
hotel_neighbourhood_df

Out[38]:

| | name | categories | address | lat | lng | postalCode | state |
|---|-------------------------------|--------------------|-----------------------|-----------|------------|------------|-------|
| 0 | Sheraton Centre Toronto Hotel | Hotel | 123 Queen Street West | 43.651052 | -79.384026 | M5H 2M9 | ON |
| 1 | Grand Ballroom | Event Space | 123 Queen St. W | 43.651217 | -79.383771 | M5H 2M9 | ON |
| 2 | Stay Cafeteria 慢走 | Asian Restaurant | 388 Spadina Ave | 43.655454 | -79.399163 | M5T 2G5 | ON |
| 3 | Cafeteria | Mexican Restaurant | 974 College St | 43.653419 | -79.427678 | M6H 1A5 | ON |
| 4 | De La Salle College Cafeteria | College Cafeteria | 131 Farnham Avenue | 43.683003 | -79.397815 | M4V 1H7 | ON |
| 5 | Marketeria | Restaurant | 30 Bond St. | 43.653585 | -79.378843 | M5B 1W8 | ON |
| 6 | One Hour | Chinese Restaurant | 435 Spadina Ave. | 43.657399 | -79.399649 | M5T 2T6 | ON |
| 7 | The Hub | College Cafeteria | 350 Victoria St. | 43.658585 | -79.380622 | M5B 2K3 | ON |
| 8 | Innis College | Student Center | 2 Sussex Ave | 43.665556 | -79.399298 | M5S 1J5 | ON |

Map



Generating visualization for Park , Restaurant, Cafeteria

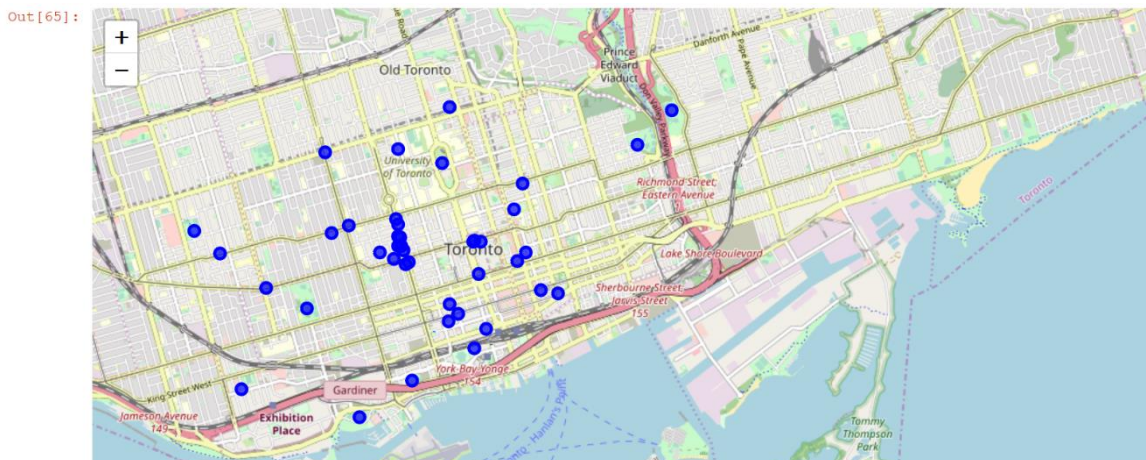
Generate map to visualize Park, Restaurant and Cafeteria and how they cluster together ¶

```
In [40]: # create dataframe of Park, Restaurant and Cafeteria
park_neighbourhood_df = pd.concat([df_park, df_Restaurant, df_Cafeteria,], ignore_index=True)
park_neighbourhood_df
```

Out[40]:

| | name | categories | address | lat | lng | postalCode | state |
|---|----------------------------|------------|------------------------------|-----------|------------|------------|-------|
| 0 | Queen's Park | Park | University Ave. | 43.663946 | -79.392180 | M5R 2E8 | ON |
| 1 | Trinity Bellwoods Park | Park | 1053 Dundas St. W. | 43.647072 | -79.413756 | M5H 2N2 | ON |
| 2 | Bellevue Square Park | Park | btwn Bellevue & Augusta Ave. | 43.653610 | -79.402199 | M5T 2N4 | ON |
| 3 | Riverdale Park West | Park | 500 Gerrard St. | 43.666048 | -79.360941 | M5A 2H3 | ON |
| 4 | Riverdale Park East | Park | 550 Broadview Ave | 43.669951 | -79.355493 | M4K 2P1 | ON |
| 5 | Barbara Hall Park | Park | 519 Church St | 43.666879 | -79.381068 | M4Y 2K9 | ON |
| 6 | High Park | Park | 1873 Bloor St. W | 43.646479 | -79.463425 | M6R 2Z3 | ON |
| 7 | Canoe Landing Park | Park | 50 Fort York Blvd | 43.638762 | -79.397067 | M5V 3Z1 | ON |
| 8 | Sir Winston Churchill Park | Park | 301 St Clair Ave W | 43.683732 | -79.409881 | M4V 1S4 | ON |

MAP



Conclusion:

In the final map visual we can see the blue dots which represents Park, Restaurants, Cafeteria, Shopping Stores which concludes for analysis where the event for the desired photography could be taken place.