

## Introduction

Toronto is the economic hub of Canada. A lot of tourists visit Toronto for different purposes and variable time periods. Some come to visit, some for business purpose etc. Many people who are unfamiliar with the area find it difficult to decide that which borough is the best for them to stay. This project will help us find the best borough to stay considering different priorities like business, sightseeing, enjoying a holiday etc.

## Data

For this project the postal code of Toronto will be fetched from the Wikipedia page. data will be retrieved to get the boroughs.

[https://en.wikipedia.org/wiki/List\\_of\\_postal\\_codes\\_of\\_Canada:\\_M](https://en.wikipedia.org/wiki/List_of_postal_codes_of_Canada:_M)

This will provide the data for each borough and then the neighborhood.

We will use geopy library to get the longitudes and latitudes of the boroughs

Foursquare API will be used to get the categories of the type of things present in the borough and neighborhood like pubs, restaurants etc.

A Foursquare API Call is like the following:

```
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    u'city': u'Toronto',
    u'country': u'Canada',
    u'crossStreet': u'at Main St.',
    u'distance': 486,
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      u'Canada'],
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```

```

    u'lng': -79.2980449760153}},
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    u'items': [{u'reasonName': u'globalInteractionReason',
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    u'suffix': u'.png'},
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    u'name': u'Pub',
    u'pluralName': u'Pubs',
    u'primary': True,
    u'shortName': u'Pub'}]},
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    u'country': u'Canada',
    u'crossStreet': u'at Main St.',
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    u'Canada'],
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    u'lng': -79.29721535878515}],
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    u'lng': -79.29721535878515,
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    u'items': [{u'reasonName': u'globalInteractionReason',
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    u'type': u'general'}]},
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    u'name': u'Neighborhood',
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    u'primary': True,
    u'shortName': u'Neighborhood'}]},
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```

```

    u'labeledLatLngs': [{u'label': u'display',
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    u'lng': -79.2928688743688,
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    {u'reasons': {u'count': 0,
        u'items': [{u'reasonName': u'globalInteractionReason',
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            u'type': u'general'}]},
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            u'name': u'Gym / Fitness Center',
            u'pluralName': u'Gyms or Fitness Centers',
            u'primary': True,
            u'shortName': u'Gym / Fitness'}]},
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                    u'Canada'],
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                    u'lng': -79.29099082946777}],
                u'lat': 43.68031856425797,
                u'lng': -79.29099082946777,
                u'postalCode': u'M4E 1S3',
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            u'headerLocation': u'The Beaches',
            u'headerLocationGranularity': u'neighborhood',
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                u'sw': {u'lat': 43.6718573955, u'lng': -79.29924148550948}},
                u'totalResults': 4}}

```

## Methodology

The following process was used for this task:

1. Crawled data from Canada Postal Code API
2. Built Dataframe using Beautiful soup with neighbor, postal code and Borough
3. Divided the data into boroughs
4. Get Co-ordinates of Each Borough
5. Get categories of venues in the borough through Foursquare API
6. Get the top 15 categories
7. Apply clustering (5 clusters)
8. Analyze the Clusters

## Result

There are 5 clusters. As shown below.

	Borough	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	Cor
0	Central Toronto	Café	Deli / Bodega	Hotel	Aquarium	Restaurant	Italian Restaurant	Sports Bar	Sporting Goods Shop	Salad Place	Irish Pub	Concert Hall	Scenic Lookout	Seafood Restaurant	
2	East Toronto	Café	Deli / Bodega	Hotel	Aquarium	Restaurant	Italian Restaurant	Sports Bar	Sporting Goods Shop	Salad Place	Irish Pub	Concert Hall	Scenic Lookout	Seafood Restaurant	
7	Queen's Park	Café	Italian Restaurant	Sandwich Place	Ice Cream Shop	Vegetarian / Vegan Restaurant	Japanese Restaurant	Park	Indian Restaurant	Office	Restaurant	Bubble Tea Shop	Portuguese Restaurant	Burrito Place	Pha
9	West Toronto	Café	Deli / Bodega	Hotel	Aquarium	Restaurant	Italian Restaurant	Sports Bar	Sporting Goods Shop	Salad Place	Irish Pub	Concert Hall	Scenic Lookout	Seafood Restaurant	

```
toronto_merged.loc[toronto_merged['Cluster Labels'] == 1, toronto_merged.columns[[0] + list(range(5, toronto_merged.sha
```

	Borough	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue
1	Downtown Toronto	Coffee Shop	Cosmetics Shop	Café	American Restaurant	Italian Restaurant	Tea Room	Restaurant	Pizza Place	Sandwich Place	Theater	Breakfast Spot	Gastropub	Bubble 1 Sh
4	Etobicoke	American Restaurant	Hotel	Convenience Store	Gym	Grocery Store	Farmers Market	Coffee Shop	Clothing Store	Café	Discount Store	Electronics Store	Donut Shop	Wings Jc
6	North York	Ramen Restaurant	Coffee Shop	Restaurant	Sandwich Place	Pizza Place	Café	Japanese Restaurant	Dessert Shop	Burrito Place	Pool	Plaza	Pet Store	Mo Thea
8	Scarborough	Cosmetics Shop	Sporting Goods Shop	Sandwich Place	Coffee Shop	Tea Room	Wings Joint	Smoothie Shop	Shopping Mall	Fast Food Restaurant	Big Box Store	Pizza Place	Discount Store	Departm St

	Borough	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Most Common Venue
	East York	Pizza Place	Sandwich Place	Italian Restaurant	Athletics & Sports	Farmers Market	Café	Electronics Store	Donut Shop	Discount Store	Department Store	Diner	Dessert Shop	Deli / Bodega	Cosmetics Shop
	Borough	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	11th Most Common Venue	12th Most Common Venue	13th Most Common Venue	14th Most Common Venue	15th Common \
10	York	Park	Grocery Store	Sandwich Place	Discount Store	Wings Joint	Farmers Market	Convenience Store	Cosmetics Shop	Deli / Bodega	Department Store	Dessert Shop	Diner	Donut Shop	Elect

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5	Mississauga	Intersection	Pub	Bus Station	Wings Joint	Fast Food Restaurant	Cosmetics Shop	Deli / Bodega	Department Store	Dessert Shop	Diner	Discount Store	Donut Shop	Electronics Store	Recreation Center

## Discussion

1. Central, East and West Toronto and Queens park are best to enjoy the scenic beauty of Toronto, go around etc. Food of different types is easily available. This is the area to stay and enjoy Toronto as a short-term tourist
2. Downtown, North York and Scarborough are the happening area with a lot of activities and eatery around. To enjoy the Toronto lifestyle one should prefer staying in these areas for socializing etc.
3. York, and East York are on the sides, especially good for natives and settling.

## Conclusion

Toronto Boroughs can optimally divide into 5 clusters. Using clustering and foursquare API we could find the best place for tourist for different purposes. Central, East, West Toronto and Queens Park give the real feel of Toronto. Downtown North York and Scarborough are the happening lifestyle of the city.