

Capstone Project

Toronto vs New York – Battle of Neighbourhoods

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1. Introduction

1.1. Background

Today Tourism is one of the pillars of the economy and the people most often visits those countries who are rich in heritage and developed enough from a foreign perspective, like friendly environment.

Toronto and New York are the famous places in the world. They are diverse in many ways. Both are multicultural as well as the financial hubs of their respective countries. We want to explore how much they are similar or dissimilar in aspects from a tourist point of view regarding food, accommodation, beautiful places, and many more.

1.2. Problem

Every city is unique in its own way and give something new. And now the information is so common regarding location of every place around the world on your fingertips which make it easier to explore. Therefore, tourists always eager to travel to different places on the basis of available information, and the comparison (the part of the information) between the two cities always assist to choose the specific places or according to their choice. This project analyses the two boroughs from each of the cities- Downtown Toronto, Toronto and Manhattan, New York for their appeal to attract tourist.

1.3. Interest

This project will interest the tourists who are planning to visit these two cities but are confused as to which tour will be economical for them and what are the gains and pains that they will be facing during a tour.

2. Data Acquisition and cleaning

2.1. Data Sources

For this problem, we will get the services of Foursquare API to explore the data of two cities, in terms of their neighbourhoods. The data also include the information about the places around each neighbourhood like restaurants, hotels, coffee shops, parks, theatres, art galleries, museums and many more. We selected one Borough from each city to analyse their neighbourhoods. Manhattan from New York and Downtown Toronto from Toronto.

For Downtown Toronto the neighbourhood's data is not readily available on the internet. But there exists a Wikipedia Page exists that has all the information that we need to explore and

cluster the neighbourhoods in Toronto. This data will have to be scraped from the page, wrangle and clean it and then read into the pandas dataframe.

For Manhattan, a saved data file was explored through Foursquare API. In this all boroughs along with their coordinates are readily available.

2.2 Data Cleaning

Data for Toronto scraped from the Wikipedia page required wrangling and cleaning it and then read into the pandas dataframe. Cleaning involved dropping the rows to which Borough was "Not Assigned". Also, later on coordinates of each borough were obtained from the internet and then merged into the previous dataframe.

3. Methodology

We will use machine learning technique, "Clustering" to segment the neighbourhoods with similar objects on the basis of each neighbourhood's data. These objects will be given priority on the basis of foot traffic (activity) in their respective neighbourhoods. This will help to locate the tourist's areas and hubs, and then we can judge the similarity or dissimilarity between two cities on that basis.

Both the neighbourhoods were then explored separately as venues and venue categories and then they were subjected to machine learning model of "Clustering" using "k-means" technique.

Using the k-means clustering, each neighbourhood will be categorized into 5 number of clusters based on their similarities.

Exploratory Data Analysis

Here, under EDA, the number of venues for each of the neighbourhood in the city is calculated.

The Venues per Neighbourhood is restricted to 20 so as to limit the dataset.

1. Venues in Downtown Toronto-

Neighborhood	Venue
Berczy Park	20
CN Tower, King and Spadina, Railway Lands, Harbourfront West, Bathurst Quay, South Niagara, Island airport	16
Central Bay Street	20
Christie	16
Church and Wellesley	20
Commerce Court, Victoria Hotel	20
First Canadian Place, Underground city	20
Garden District, Ryerson	20
Harbourfront East, Union Station, Toronto Islands	20
Kensington Market, Chinatown, Grange Park	20
Queen's Park, Ontario Provincial Government	20
Regent Park, Harbourfront	20
Richmond, Adelaide, King	20

Rosedale	4
St. James Town	20
St. James Town, Cabbagetown	20
Stn A PO Boxes	20
Toronto Dominion Centre, Design Exchange	20
University of Toronto, Harbord	20

2. Venues in Manhattan, New York-

Neighborhood	Venue
Battery Park City	20
Carnegie Hill	20
Central Harlem	20
Chelsea	20
Chinatown	20
Civic Center	20
Clinton	20
East Harlem	20
East Village	20
Financial District	20
Flatiron	20
Gramercy	20
Greenwich Village	20
Hamilton Heights	20
Hudson Yards	20
Inwood	20
Lenox Hill	20
Lincoln Square	20
Little Italy	20
Lower East Side	20
Manhattan Valley	20
Manhattanville	20
Marble Hill	20
Midtown	20
Midtown South	20
Morningside Heights	20
Murray Hill	20
Noho	20
Roosevelt Island	20
Soho	20
Stuyvesant Town	17
Sutton Place	20
Tribeca	20
Tudor City	20
Turtle Bay	20
Upper East Side	20
Upper West Side	20
Washington Heights	20

West Village	20
Yorkville	20

4. Result

After clustering the data of the respective neighborhoods, both cities (Boroughs) have venues which can be explored and attract the Tourists. The neighborhoods are much similar in features like Theaters, opera houses, food places, clubs, museums, parks etc. As far as concern to dissimilarity, it differs in terms of some unique places like veterinary hospitals, historical places and monuments

Clusters identified for Downtown Toronto-

- Cluster 1- Airport Lounge and Service, Coffee Shop, Cafe, Restaurants & Grocery Store
- Cluster 2- Children Friendly- Parks, Playgrounds
- Cluster 3- Coffee Shops
- Cluster 4- Cafes and Restaurants
- Cluster 5- Residential, Cafe

Clusters identified for Downtown Toronto-

- Cluster 1- Residential
- Cluster2 - Restaurants and cafes
- Cluster 3- Going Out/ Entertainment
- Cluster 4- Restaurant, Cafe, Entertainment
- Cluster 5- Restaurants, cafes, Residential and Music Venues

5. Discussion and Recommendation

When I compared the tourist places, I observed that the historical place is only situated in Downtown Toronto and the Monument or landmark venue is in Manhattan neighbourhoods. Similarly, Airport facility, Harbor, Sculpture garden and Boat or ferry services are also available in Downtown Toronto while venues like Nightlife, climbing gym and Museums are present in Manhattan.

As far as concern to recommendations, I recommend Downtown Toronto Neighbourhoods will be considered first to visit. The tourists have an easily travelling access due to Airport facility, which not only saves time but also helps to save money. This saved money can be utilized to explore more, the attracting venues.

6. Conclusion

The Downtown Toronto and Manhattan neighbourhoods have more like similar venues. As we know that every place is unique in its own way, so that's argument is present in both neighbourhoods. The dissimilarity exists in terms of some different venues and facilities but not on a larger extent