

Comparing neighborhoods in New York and Toronto for a new Italian Restaurant

SASWAT SAHOO

Introduction

- ▶ New York and Toronto are financial capitals of their respective countries, with a vibrant food scene, nightlife, numerous tourist hotspots and hosting world class universities with a sizable student population. They are perfect destinations for a restaurant chain to consider while opening a new chain.
- ▶ Stakeholders wanted to figure out which localities and neighborhoods would suit better for opening a new Italian restaurant. With a wide variety and quantity of restaurants already populating the map of both the cities, it is imperative to use data analysis to create clusters of areas with low restaurant densities, particularly Italian, while considering a new location expanding. The stakeholders most importantly wanted to compare these chosen neighborhoods between New York and Toronto.

Data acquisition and cleaning

► 2.1 Data sources

Location coordinates were acquired using Google Maps API. Foursquare API was used to get nearby restaurants and other facilities. Toronto and New York restaurants around Times Square and Downtown Toronto were collected using the above.

► 2.2 Data cleaning

Data downloaded or scraped from multiple sources were combined into one dataframe. Since most data was accumulated from scratch from location APIs, there was no issue of missing data. New columns were created as our analysis progressed. Lastly, dataframe was reduced to contain only those locations with low number of restaurants, particularly Italian.

Feature selection

- For New York we mined information of about 2565 restaurants in a radius of 1000m from city center. For Toronto we mined about 1244 restaurants. Italian restaurants constituted about 377 or around 14.7% of all restaurants in New York. In Toronto, they made up around 121 or 9.37%. Initially the dataframe had addresses, Latitude & Longitudes values and distance from city centers. In the next step number of restaurants in the area was added to the dataframe. Next distance from nearest Italian restaurant is calculate.

Exploratory Data Analysis

► 3.1 Calculation of target variable

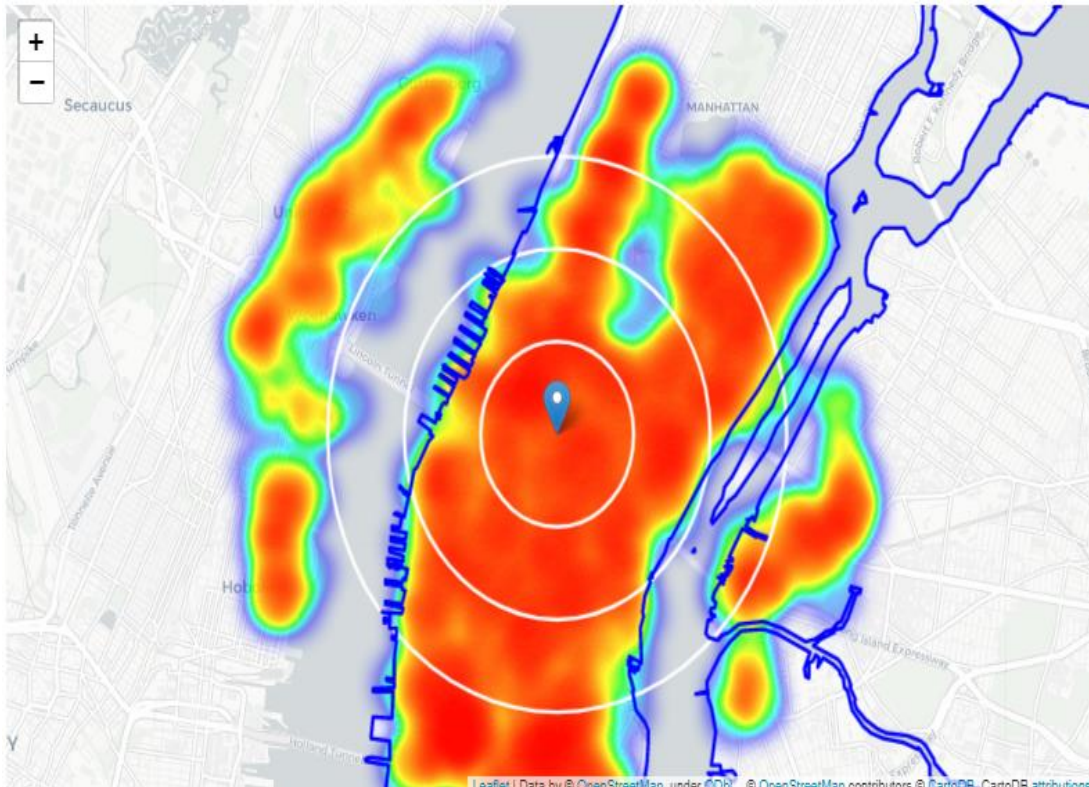
Distance from city center was calculated from respective city centers. Further, number of restaurants in the neighborhood areas was calculated. Going forward distance from nearest Italian restaurant was also calculated. Finally, the dataframe was reduced to contain only those locations which did not have any restaurant in a radius of 250m and no Italian restaurant within 400m.

► 3.2 Difference between New York and Toronto by restaurants

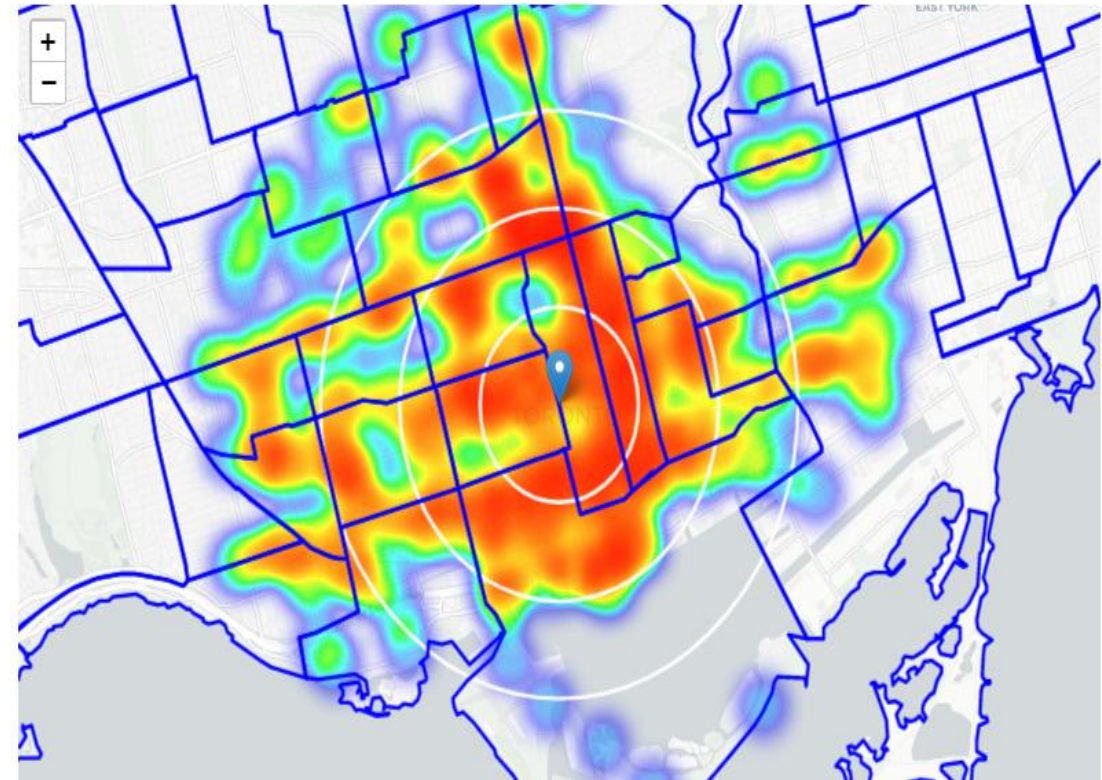
New York is more densely populated and has higher per capita income than Toronto. Hence, intuitively it was expected and later found through analysis that there is higher restaurant density, as well as Italian, in New York than Toronto.

Total Restaurants Heat Map

New York



Toronto

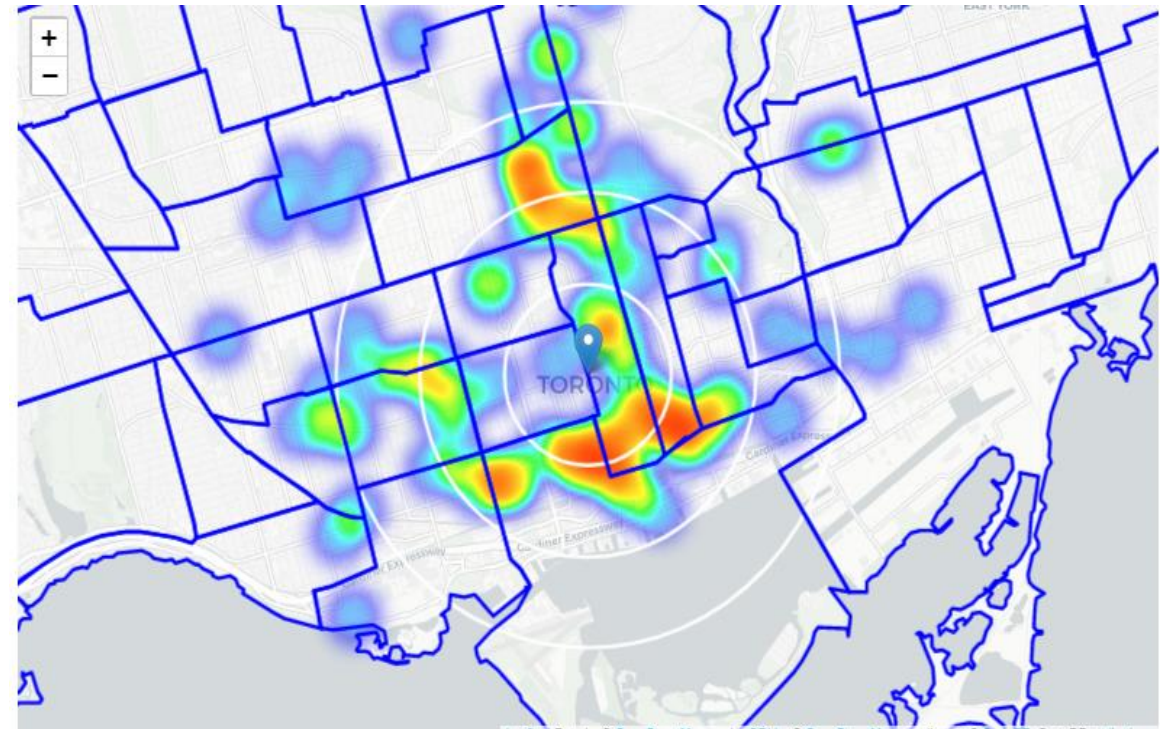


Italian Restaurants Heat Map

New York



Toronto



Neighborhoods of Interest in New York (Colombus Circle, Hell's Kitchen and Greenwich Village)

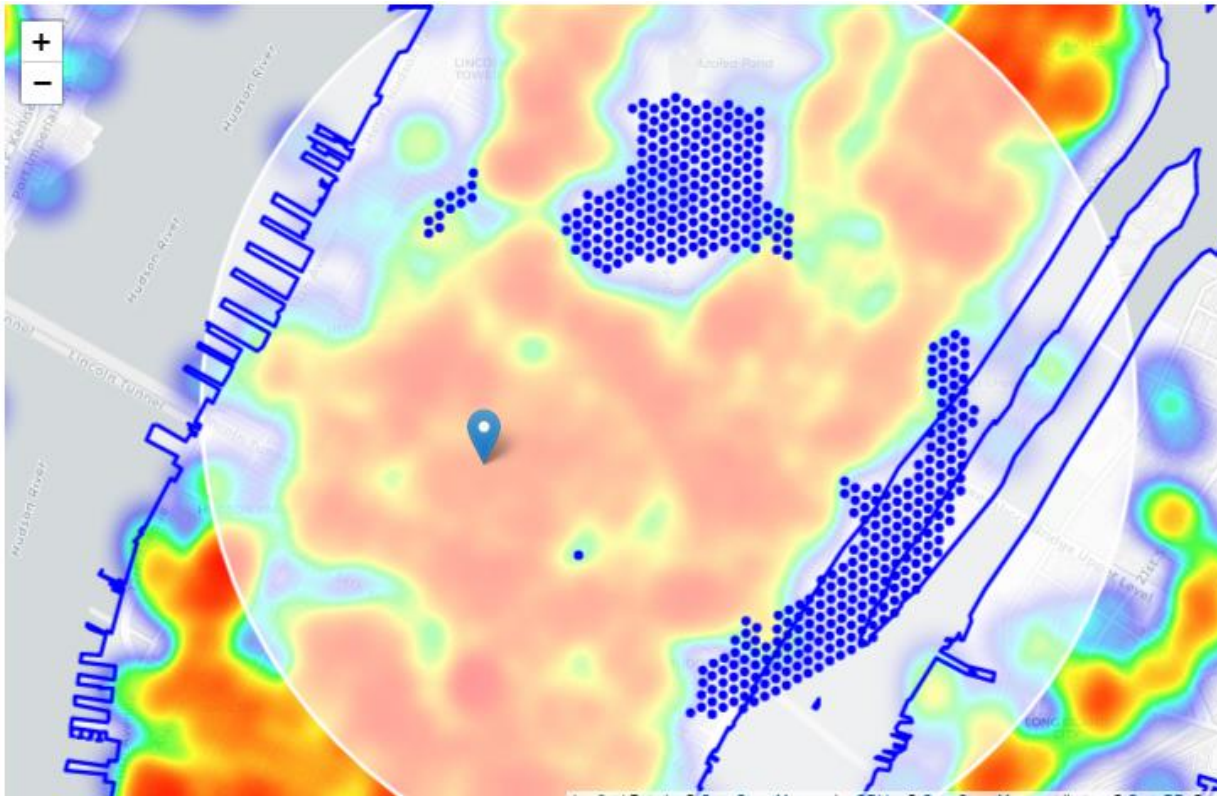
- ▶ **Colombus Circle** is a heavily trafficked busy intersection. **Greenwich Village** is a hub of popular cafes, bars and restaurants and **Hell's Kitchen** is considered home of actors and arts organizations where tourists from Times Square and workers from office high-rises jam the international restaurants, bars and pubs along 8th and 9th avenues.
- ▶ Analysis of popular travel guides and web sites often mention Colombus Circle, Hell's Kitchen and Greenwich Village as busy, heavily visited, tourist heavy New York neighborhoods popular with visitors and locals alike.

Neighborhoods of Interest in Toronto (The Annex and Liberty Village)

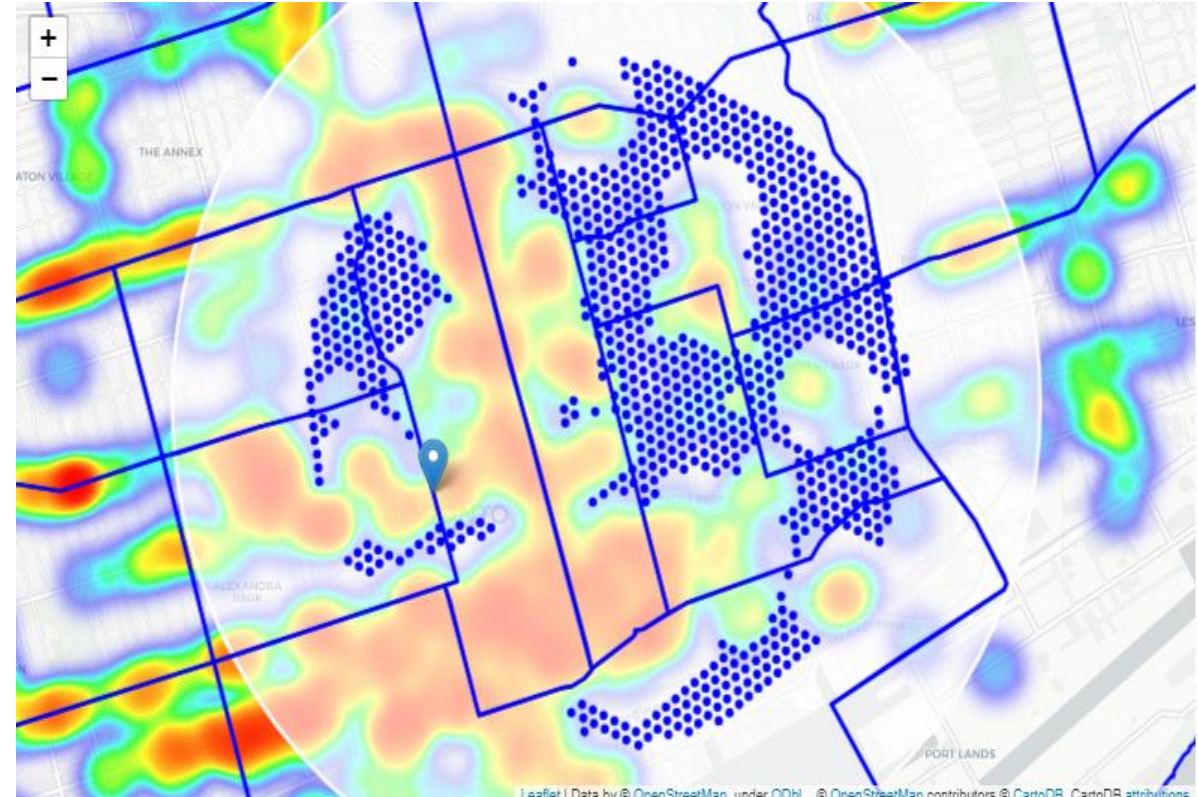
- ▶ **The Annex and Liberty Village.**The **Annex** draws students to its casual eateries, indie bookshops, bars and cafes on Bloor Street West. **Liberty Village** is a hub of bars, restaurants, shops and services.
- ▶ Analysis of popular travel guides and web sites often mention The Annex and Liberty Village as beautiful, interesting, rich with culture, 'hip' and 'cool' Toronto neighborhoods popular with tourists, students and locals alike.

Locations with no more than two restaurants in radius of 250 meters, and no Italian restaurants within 400 meters

New York



Toronto

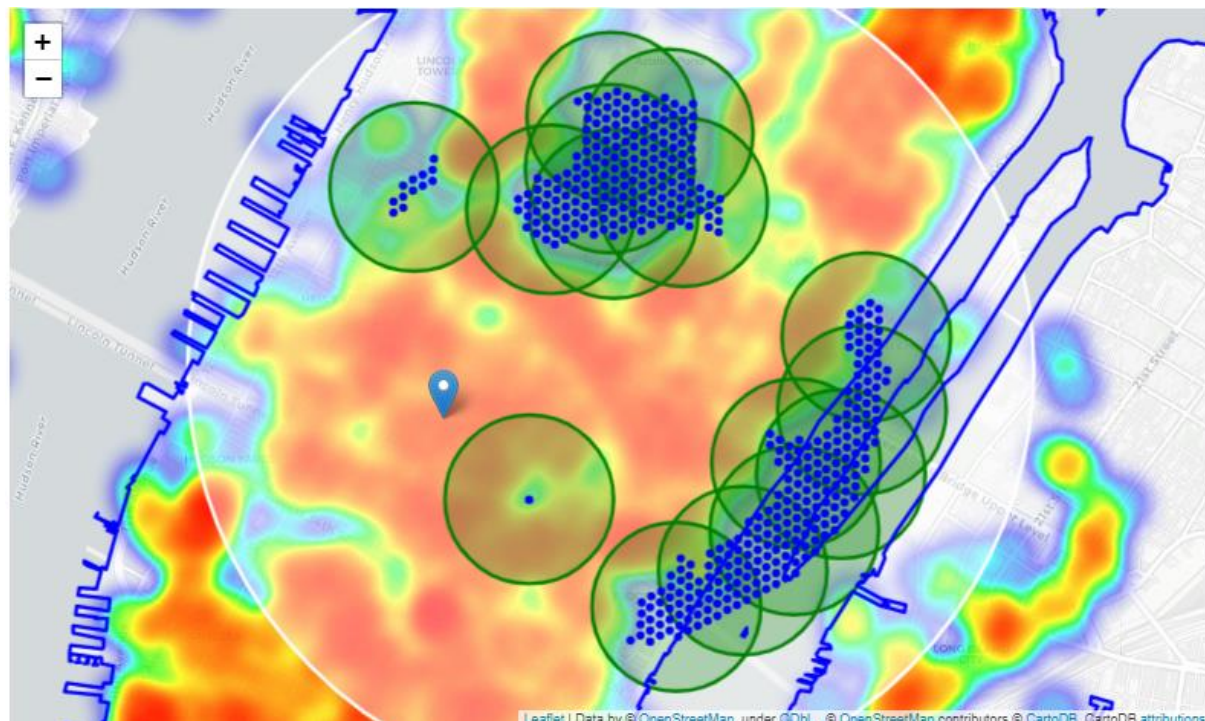


K-Means Cluster Modeling

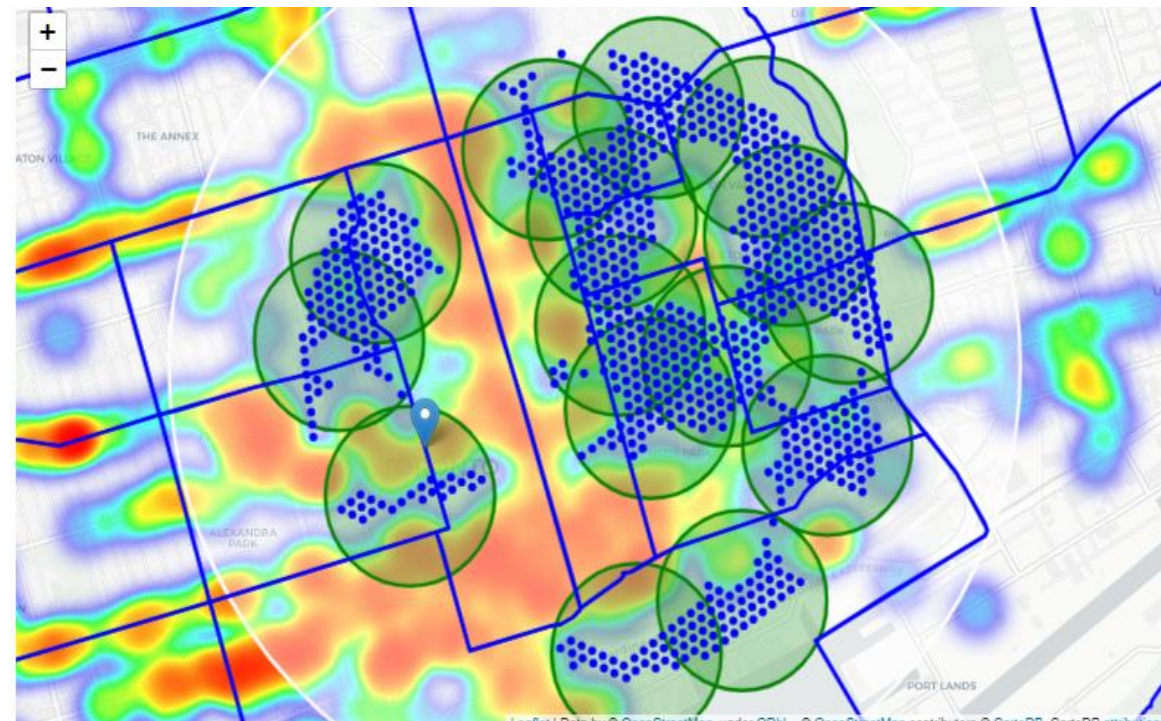
- ▶ The selected locations are **clustered** to create **centers of zones containing good locations**. Those zones, their centers and addresses will be the final result of our analysis.
- ▶ Our clusters represent groupings of most of the candidate locations and cluster centers are placed nicely in the middle of the zones 'rich' with location candidates. Addresses of those cluster centers will be a good starting point for exploring the neighborhoods to find the best possible location based on neighborhood specifics.

Clusters

New York



Toronto



Results and Discussion

Toronto

- ▶ Our analysis shows that although there is a great number of restaurants in **Toronto**, there are pockets of low restaurant density fairly close to city center. Highest concentration of restaurants was detected north, east and south from Downtown Toronto, so we focused our attention to areas north-west and south-west, corresponding to boroughs The Annex and Liberty Village. Other boroughs were also identified as potentially interesting, but our attention was focused on The Annex and Liberty Village which offer a combination of popularity among tourists, closeness to city center, strong socio-economic dynamics and a number of pockets of low restaurant density.

Results and Discussion

New York

- ▶ Our analysis shows that although there is a great number of restaurants in **New York**, there are pockets of low restaurant density fairly close to city center. Highest concentration of restaurants was detected east and west from Times Square, so we focused our attention to areas south, south-east and north-west, corresponding to boroughs Colombus Circle, Hell's Kitchen and Greenwich Village. Other boroughs were also identified as potentially interesting, but our attention was focused on Colombus Circle, Hell's Kitchen and Greenwich Village which offer a combination of tourist heavy traffic, closeness to city center, strong socio-economic dynamics and a number of pockets of low restaurant density.
- ▶ New York has a higher a overall restaurant and Italian restaurant density that is higher than that of Toronto. But NYC also has a higher tourist footfall, higher per capita income and higher overall population and population density than Toronto. Therefore, the stakeholders should take these fatcors into consideration while making their decisions to set up new Italian restaurants.

Conclusions

- ▶ Final decision on optimal restaurant location will be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone, taking into consideration additional factors like attractiveness of each location (proximity to park or water), levels of noise and proximity to major roads, real estate availability, prices, social and economic dynamics of every neighborhood etc.