Battle of the Neighborhoods

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1. Introduction/Business Problem

A large company that owns various restaurant chains having diverse menus is interested in growing their business further in North America. Senior management is interested in exploring the business opportunities of upscale restaurants.

North America is a continent with only three countries:
- Mexico,
- United States
- Canada

However, these three countries have diverse cultures. The goal of this project is to explore the neighborhoods in order to determine whether there is a clear target market and business opportunity for additional upscale restaurants.

In order to narrow the focus of exploration on the continent,
the neighborhoods of the capitals of these three nations was explored:
- Mexico City, Mexico
- Washington D.C., United States
- Ottawa, Canada

2. Data Acquisition and Cleaning

Foursquare location data was used for the analysis of the neighborhoods in the 3 national capitals. Foursquare is a technology company that has built a massive dataset of location data. Currently its location data is comprehensive and accurate. The company powers location data for many popular services including Apple Maps, Uber, Snapchat and Twitter.

Geographical data for the analysis of the neighborhoods was collected from various internet sources including the following:
- Wikipedia
- Washington.org
- Tripsavvy.com
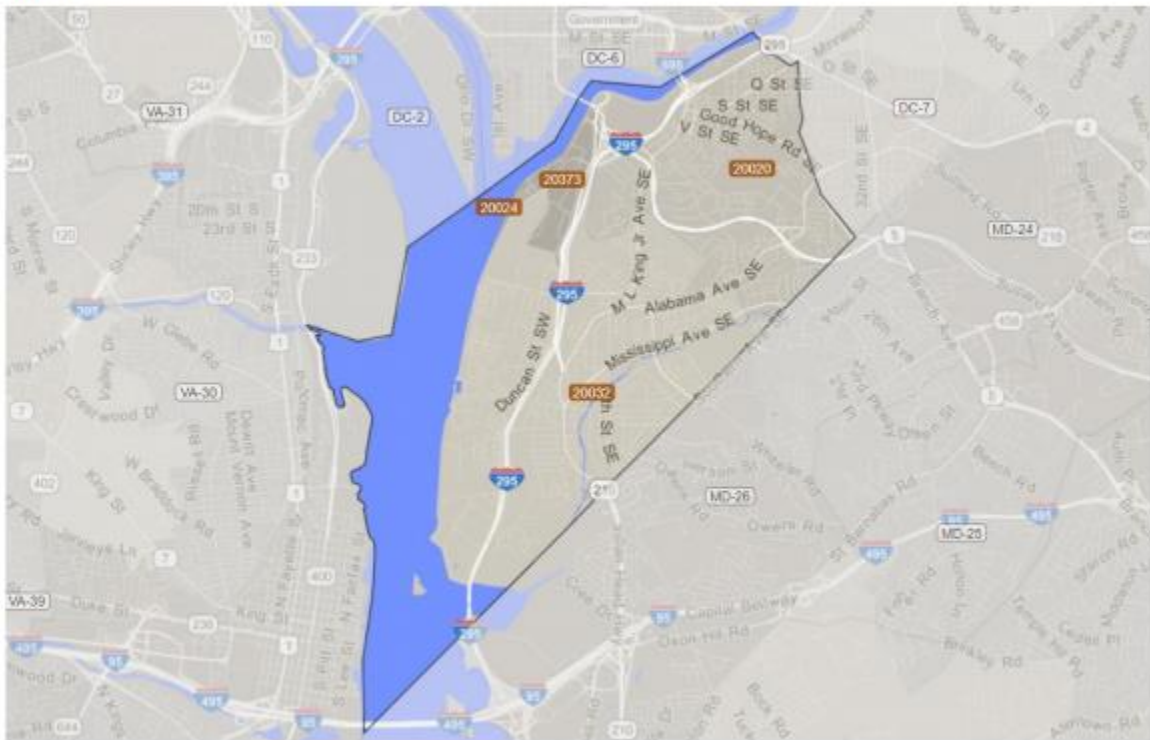- Geonames.org
- Gps-coordinates.org

The data was manually copied from the web sites and cleansed using Excel spreadsheets. The data was then saved as CSV files. Each CSV file was accessed by the Jupyter Notebook that I submitted for this project.

During the data gathering phase, I found that the cleanest data immediately available was for Mexico City. Using the boroughs and the neighborhoods that I found using Wikipedia.org, I was able to retrieve all the latitude/longitude coordinates for the neighborhoods using Python software accessing Nominatim which is a tool to search data by name and address (geocoding). It can be found at nominatim.openstreetmap.org.

Washington DC and Ottawa were more of a challenge to get the data. Unlike other large cities, Washington DC (District of Columbia) does not have boroughs. Instead, the city is divided into eight wards. Each ward has a number of zip codes.

The Eighth Ward here is one example.

Ward 8

For Ottawa, Canada, I found that it was easier to get the postal codes but not the neighborhood names associated with the postal codes.

For Washington DC and Ottawa, Canada, I was able to use the postal codes and manually retrieve their latitude/longitude coordinates using a tool at Gps-coordinates.org.

Example data for the capital cities is on the next 3 pages

Mexico City, Mexico

PostalCode	Borough	Neighborhood	Latitude	Longitude
1020	Álvaro Obregón	San José Insurgentes	19.3664738	-99.1855021
1110	Álvaro Obregón	Las Palmas	19.3991314	-99.2112644
1790	Álvaro Obregón	Lomas de San Ángel Inn	19.3447856	-99.2061455
2460	Azcapotzalco	La Preciosa	19.4866073	-99.1940677
2630	Azcapotzalco	Coltongo	19.4829532	-99.1529598
2770	Azcapotzalco	Santa Cruz Acayucan	19.4757517	-99.1945786
2800	Azcapotzalco	Nueva Santa María	19.4638348	-99.1682205
2870	Azcapotzalco	San Salvador Xochimanca	19.4596354	-99.1738867
3020	Benito Juárez	Narvarte	19.4013738	-99.1471758
3100	Benito Juárez	Del Valle	19.3942366	-99.1670335
3400	Benito Juárez	Alamos	25.6253737	-100.0737539
3510	Benito Juárez	Moderna	19.3953179	-99.1344949
3700	Benito Juárez	Nonoalco	19.3813136	-99.1883226
3810	Benito Juárez	Nápoles	19.3937697	-99.1766017
3900	Benito Juárez	San José Insurgentes	19.3664738	-99.1855021
3940	Benito Juárez	Crédito Constructor	19.3650598	-99.1802816
4100	Coyoacán	del Carmen	19.3542897	-99.1617971
4620	Coyoacán	San Pablo Tepetlapa	19.3231821	-99.1424377
4910	Coyoacán	Santa Úrsula Coapa	19.3066608	-99.1454865

Washington DC, United States

PostalCode	Borough	Neighborhood	Latitude	Longitude
20020	Hillcrest	Hillcrest	29.3921958	-95.2244908
20012	Shepherd Park	Shepherd Park	29.8176278	-95.4098911
20019	River Terrace	River Terrace	30.101878	-95.133057
20016	Spring Valley	Spring Valley	32.7296395	-116.9668618
20007	Georgetown	Georgetown	33.376834	-79.2944965
20319	Fort McNair	Fort McNair	33.4203987	-82.1396027
20020	Fort Stanton	Fort Stanton	33.4947532	-105.5233513
20007	Hillandale	Hillandale	35.68662465	-78.58738319
20016	Hillbrook	Hillbrook	35.701506	-78.633948
20012	Colonial Village	Colonial Village	36.0252158	-78.8847203
20008	Forest Hills	Forest Hills	37.6892033	-97.23082254
20015	Chevy Chase	Chevy Chase	38.0189622	-84.4861348
20011	Crestwood	Crestwood	38.5680546	-90.37938958
20032	Congress Heights	Congress Heights	38.84243725	-76.99667613
20020	Douglass	Douglass	38.84728535	-76.98047355
20020	Garfield Heights	Garfield Heights	38.8542371	-76.97274602
20020	Naylor Gardens	Naylor Gardens	38.85676205	-76.96302936
20020	Barry Farm	Barry Farm	38.86097975	-76.99595701
20020	Historic Anacostia	Historic Anacostia	38.8625806	-76.98444095

Ottawa, Canada

PostalCode	Borough	Neighborhood	Location	Latitude	Longitude
K1A 0A1	K1A 0A1	K1A 0A1	K1A 0A1	45.445473	-75.689448
K1A 0A2	K1A 0A2	K1A 0A2	K1A 0A2	45.44484	-75.69154
K1A 0A3	K1A 0A3	K1A 0A3	K1A 0A3	45.423382	-75.697892
K1A 0A4	K1A 0A4	K1A 0A4	K1A 0A4	45.423787	-75.69746
K1A 0A5	K1A 0A5	K1A 0A5	K1A 0A5	45.44255	-75.69156
K1A 0A6	K1A 0A6	K1A 0A6	K1A 0A6	45.423787	-75.69746
K1A 0A8	K1A 0A8	K1A 0A8	K1A 0A8	45.44484	-75.69154
K1A 0A9	K1A 0A9	K1A 0A9	K1A 0A9	45.423787	-75.69746
K1A 0B1	K1A 0B1	K1A 0B1	K1A 0B1	45.44484	-75.69154
K1A 0B2	K1A 0B2	K1A 0B2	K1A 0B2	45.44484	-75.69154
K1A 0B4	K1A 0B4	K1A 0B4	K1A 0B4	45.44484	-75.69154
K1A 0B9	K1A 0B9	K1A 0B9	K1A 0B9	45.44484	-75.69154
K1A 0C1	K1A 0C1	K1A 0C1	K1A 0C1	45.44484	-75.69154
K1A 0C5	K1A 0C5	K1A 0C5	K1A 0C5	45.44484	-75.69154
K1A 0C6	K1A 0C6	K1A 0C6	K1A 0C6	45.395506	-75.71189877
K1A 0C7	K1A 0C7	K1A 0C7	K1A 0C7	45.44484	-75.69154
K1A 0C8	K1A 0C8	K1A 0C8	K1A 0C8	45.44484	-75.69154
K1A 0E4	K1A 0E4	K1A 0E4	K1A 0E4	45.44484	-75.69154
K1A 0E6	K1A 0E6	K1A 0E6	K1A 0E6	45.417293	-75.701051

3. Exploratory Data Analysis

3.1 Model Used in the Analysis

K-Means is the model that was used for the analysis. There are various types of clustering algorithms such as partitioning, hierarchical or density-based clustering. K-Means is a type of partitioning clustering. It divides the data into K non-overlapping subsets or clusters without any cluster internal structure or labels. This means that it is an unsupervised algorithm. Objects within a cluster are very similar, and objects across different clusters are very different or dissimilar.

This clustering algorithm provided me with insight into the dataset. From there I decided to group the data into five clusters.

3.2 Modelling Approach

Jupyter Notebook with Python 3.0 was used as the tool for the modelling in this project. Essentially, after manually cleaning the data, the same steps were performed for each of the capital cities:

- Read the CSV file
- View the data in a Python dataframe
- Explore the capital city:
  - Show a map of the city
  - Log into FourSquare and get the venues for the city
  - Get the total number of venues in each neighborhood
  - Get the unique venue categories (e.g. Restaurant, Pizza Place, Park, etc.) in each neighborhood
- Apply One Hot Encoding to the data
  (One hot encoding is a process by which categorical variables are converted into a form that could be provided to Machine Learning algorithms to do a better job in prediction.)
- For each neighborhood, get the top 10 most common venues
- Cluster the neighborhoods:
  - Run k-means to cluster the neighborhood into 5 clusters

3.3 Results of the Models

K-Means grouped various numbers of neighborhoods into the clusters. Washington DC had a large number of neighborhoods (87) in cluster 0. All the clusters for the capital neighborhoods are shown starting on the next page.

Capital	Cluster	Number of Neighborhoods
Mexico City	0	1
Mexico City	1	7
Mexico City	2	15
Mexico City	3	14
Mexico City	4	23
Washington DC	0	87
Washington DC	1	2
Washington DC	2	4
Washington DC	3	1
Washington DC	4	2
Ottawa, Canada	0	19
Ottawa, Canada	1	12
Ottawa, Canada	2	1
Ottawa, Canada	3	3
Ottawa, Canada	4	1

Mexico City

Cluster 0

PostalCode	Latitude	Longitude	Cluster Labels	1st Most Common Venue	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
11820	64.77054	-147.268434	0.0	Bakery	Italian Restaurant	Empanada Restaurant	Food Stand	Food Court	Food & Drink Shop	Food	Fondue Restaurant	Flea Market	Fish & Chips Shop

Cluster 1

PostalCode	Latitude	Longitude	Cluster Labels	1st Most Common Venue	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
1790	19.344786	-99.206145	1.0	Taco Place	Café	Restaurant	Garden Center	General Entertainment	Pizza Place	Sushi Restaurant	Swim School	Breakfast Spot	Music Venue
6800	19.415073	-99.139208	1.0	Taco Place	Mexican Restaurant	Bar	Bakery	Wings Joint	BBQ Joint	Indie Theater	Gym	Liquor Store	Fried Chicken Joint
7800	19.474962	-99.125778	1.0	Taco Place	Mexican Restaurant	Restaurant	Wings Joint	Park	Bakery	Snack Place	Ice Cream Shop	Veterinarian	Sushi Restaurant
8400	19.402445	-99.105140	1.0	Taco Place	Restaurant	Seafood Restaurant	Dessert Shop	Convenience Store	Furniture / Home Store	Fish & Chips Shop	Fast Food Restaurant	Farmers Market	Empanada Restaurant
8500	19.395608	-99.070934	1.0	Taco Place	Mexican Restaurant	Restaurant	Burger Joint	Bakery	Convenience Store	BBQ Joint	Pizza Place	Seafood Restaurant	Café
11800	19.401632	-99.178989	1.0	Taco Place	Mexican Restaurant	Bakery	Burger Joint	Bar	Coffee Shop	Restaurant	Ice Cream Shop	Park	Diner
15820	19.415902	-99.124786	1.0	Taco Place	Seafood Restaurant	Mexican Restaurant	Martial Arts Dojo	Park	Restaurant	Convenience Store	Snack Place	Farmers Market	Fast Food Restaurant

Cluster 2

PostalCode	Latitude	Longitude	Cluster Labels	1st Most Common Venue	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
6700	28.404122	-106.85044	2.0	Gym	Gym / Fitness Center	Steakhouse	Wings Joint	Farmers Market	English Restaurant	Event Space	Fair	Falafel Restaurant	Fast Food Restaurant

Cluster 3

PostalCode	Latitude	Longitude	Cluster Labels	1st Most Common Venue	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
2460	19.486607	-99.194068	3.0	Mexican Restaurant	Lounge	Bakery	Market	BBQ Joint	Gym	Ice Cream Shop	Convenience Store	Burrito Place	Burger Joint
2770	19.475752	-99.194579	3.0	Mexican Restaurant	Taco Place	Ice Cream Shop	BBQ Joint	Market	Diner	Cemetery	Café	Seafood Restaurant	Burger Joint
3510	19.395318	-99.134495	3.0	Mexican Restaurant	Taco Place	Bar	Gym	Seafood Restaurant	Bakery	Restaurant	Convenience Store	Pet Store	Burger Joint
4910	19.306661	-99.145487	3.0	Mexican Restaurant	Soccer Stadium	Light Rail Station	Motel	Sculpture Garden	Campground	Taco Place	Brewery	Creperie	Hotel
6400	18.921928	-99.230001	3.0	Mexican Restaurant	Ice Cream Shop	Restaurant	Coffee Shop	Park	Café	Nightclub	Hotel	Gluten-free Restaurant	Sandwich Place
6720	19.416965	-99.148986	3.0	Mexican Restaurant	Taco Place	Bar	Hotel	Coffee Shop	Flea Market	Burger Joint	Shopping Mall	Fried Chicken Joint	Spanish Restaurant
8200	19.401302	-99.131585	3.0	Mexican Restaurant	Bakery	Taco Place	Juice Bar	Café	Burger Joint	Fast Food Restaurant	Seafood Restaurant	Ice Cream Shop	Bar
8300	19.401020	-99.123317	3.0	Mexican Restaurant	Taco Place	Restaurant	Speakeasy	Soccer Stadium	Motorcycle Shop	Motel	Metro Station	Liquor Store	Gym
11400	19.450595	-99.201378	3.0	Mexican Restaurant	Taco Place	Restaurant	Bakery	Sandwich Place	Theater	Burger Joint	Pharmacy	Street Food Gathering	Brewery
14090	19.281359	-99.165162	3.0	Mexican Restaurant	Taco Place	Pharmacy	Burger Joint	Sports Club	Bakery	Sporting Goods Shop	Diner	Steakhouse	Coffee Shop
15400	19.442181	-99.097357	3.0	Mexican Restaurant	Taco Place	Bakery	BBQ Joint	Breakfast Spot	Burger Joint	Burrito Place	Seafood Restaurant	Squash Court	Farmers Market
15810	17.952608	-102.194257	3.0	Seafood Restaurant	Mexican Restaurant	Bar	Diner	Gastropub	BBQ Joint	Bus Station	Fried Chicken Joint	Convenience Store	Flea Market
15900	19.415836	-99.106971	3.0	Mexican Restaurant	Burger Joint	Taco Place	Bakery	Pizza Place	Ice Cream Shop	Pool Hall	Pharmacy	Coffee Shop	Café
16050	19.013788	-98.226998	3.0	Mexican Restaurant	Convenience Store	Bar	Seafood Restaurant	Gym	Health & Beauty Service	Flea Market	Fish & Chips Shop	Fast Food Restaurant	Empanada Restaurant

Cluster 4

PostalCode	Latitude	Longitude	Cluster Labels	1st Most Common Venue	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
1020	19.366474	-99.185502	4.0	Mexican Restaurant	Coffee Shop	Ice Cream Shop	Bakery	Taco Place	Sandwich Place	Pizza Place	Farmers Market	Italian Restaurant	Seafood Restaurant
1110	19.399131	-99.211264	4.0	Taco Place	Convenience Store	Pizza Place	Mexican Restaurant	Cafeteria	Brewery	Stables	Bistro	Sporting Goods Shop	Breakfast Spot
2630	19.482953	-99.152960	4.0	Mexican Restaurant	Clothing Store	Fast Food Restaurant	Ice Cream Shop	BBQ Joint	Coffee Shop	Sandwich Place	Snack Place	Breakfast Spot	Food Truck
2800	19.463835	-99.168220	4.0	Mexican Restaurant	Ice Cream Shop	Taco Place	Café	Bakery	Coffee Shop	Sushi Restaurant	Restaurant	Burger Joint	Snack Place
2870	19.459635	-99.173887	4.0	Gastropub	Food Truck	Diner	Bar	Tennis Court	Mediterranean Restaurant	Arts & Crafts Store	Restaurant	Fish & Chips Shop	Flea Market
3020	19.401374	-99.147176	4.0	Seafood Restaurant	Mexican Restaurant	Taco Place	Burger Joint	Café	Bar	Vegetarian / Vegan Restaurant	Beer Bar	Pizza Place	Nail Salon
3100	19.394237	-99.167034	4.0	Mexican Restaurant	Seafood Restaurant	Coffee Shop	Bakery	Restaurant	Café	Taco Place	BBQ Joint	Pizza Place	Spa
3700	19.381314	-99.188323	4.0	Mexican Restaurant	Taco Place	Restaurant	Coffee Shop	Café	Food Truck	Bar	Convenience Store	Pet Store	Dance Studio
3810	19.393770	-99.176602	4.0	Coffee Shop	Mexican Restaurant	Café	Taco Place	Ice Cream Shop	Restaurant	Spa	Italian Restaurant	Japanese Restaurant	Pizza Place
3900	19.366474	-99.185502	4.0	Mexican Restaurant	Coffee Shop	Ice Cream Shop	Bakery	Taco Place	Sandwich Place	Pizza Place	Farmers Market	Italian Restaurant	Seafood Restaurant
3940	19.365060	-99.180282	4.0	Coffee Shop	Mexican Restaurant	Restaurant	Seafood Restaurant	Steakhouse	Café	Park	Clothing Store	Pub	Theater
11000	19.422286	-99.215255	4.0	Bakery	Coffee Shop	Yoga Studio	Park	Café	Spa	Salon / Barbershop	Furniture / Home Store	Restaurant	Steakhouse
11230	-33.230112	-70.812910	4.0	Moving Target	Plaza	Skate Park	Fair	Electronics Store	Food & Drink Shop	Food	Fondue Restaurant	Flea Market	Fish & Chips Shop
11500	19.442536	-99.210291	4.0	Mexican Restaurant	Café	Coffee Shop	Park	Ice Cream Shop	Restaurant	Bakery	Convenience Store	German Restaurant	Pharmacy
11510	19.438070	-99.209560	4.0	Coffee Shop	Mexican Restaurant	Café	Deli / Bodega	Bakery	Restaurant	Fast Food Restaurant	Bike Rental / Bike Share	Snack Place	Ice Cream Shop
11520	19.440256	-99.192632	4.0	Restaurant	Mexican Restaurant	Convenience Store	Café	Bakery	Coffee Shop	Food Truck	Burger Joint	Brewery	Gym
11560	19.431511	-99.207199	4.0	Mexican Restaurant	Coffee Shop	Ice Cream Shop	Seafood Restaurant	Steakhouse	Café	Furniture / Home Store	Mediterranean Restaurant	Restaurant	Comfort Food Restaurant
11580	19.433530	-99.190915	4.0	Mexican Restaurant	Bakery	Restaurant	Coffee Shop	Italian Restaurant	Spanish Restaurant	Steakhouse	Pizza Place	Taco Place	Pharmacy
11590	19.432097	-99.177165	4.0	Mexican Restaurant	Coffee Shop	Café	Japanese Restaurant	Restaurant	Liquor Store	Health & Beauty Service	Fried Chicken Joint	Bar	Gym / Fitness Center
11650	19.426193	-99.221662	4.0	Furniture / Home Store	Food	Taco Place	Gym / Fitness Center	Breakfast Spot	Bookstore	Mexican Restaurant	Steakhouse	Chinese Restaurant	French Restaurant
11700	19.403526	-99.245493	4.0	Ice Cream Shop	Sushi Restaurant	Restaurant	Coffee Shop	Breakfast Spot	Electronics Store	Bakery	Tea Room	Salad Place	Furniture / Home Store
11850	19.411038	-99.185778	4.0	Mexican Restaurant	Taco Place	Restaurant	Yoga Studio	Café	Seafood Restaurant	Diner	Deli / Bodega	Coffee Shop	Art Gallery
13270	19.287484	-99.061139	4.0	Food Truck	Pharmacy	Café	Taco Place	Flea Market	Event Space	Fair	Falafel Restaurant	Farmers Market	Wings Joint

4100	19.354290	-99.161797	4.0	Mexican Restaurant	Café	Ice Cream Shop	Taco Place	Theater	Bakery	Pizza Place	Bar	Coffee Shop	Italian Restaurant	
4620	19.323182	-99.142438	4.0	Taco Place	Mexican Restaurant	Food	Gym	Supermarket	Restaurant	Museum	Bakery	Seafood Restaurant	BBQ Joint	
5100	19.376341	-99.269323	4.0	Food Truck	Coffee Shop	Soccer Stadium	Gym	Bakery	Pool	Deli / Bodega	English Restaurant	Food & Drink Shop	Food	
5120	19.390955	-99.253789	4.0	Ice Cream Shop	Sushi Restaurant	Restaurant	Coffee Shop	Breakfast Spot	Electronics Store	Bakery	Tea Room	Salad Place	Furniture / Home Store	
6600	19.426593	-99.162368	4.0	Coffee Shop	Restaurant	Ice Cream Shop	Café	Pizza Place	Italian Restaurant	Mexican Restaurant	Japanese Restaurant	French Restaurant	Cosmetics Shop	
6900	19.455014	-99.143169	4.0	Pizza Place	Mexican Restaurant	Burger Joint	Theater	Park	Pool	Taco Place	Gym	Bakery	Restaurant	
7780	19.471245	-99.143528	4.0	Coffee Shop	Taco Place	Mexican Restaurant	Gym / Fitness Center	Restaurant	Electronics Store	Fast Food Restaurant	Italian Restaurant	Seafood Restaurant	Pizza Place	
7820	19.471418	-99.111671	4.0	Supermarket	Taco Place	Mexican Restaurant	Gym	Flea Market	Wings Joint	Pizza Place	Pet Store	Italian Restaurant	Gym / Fitness Center	
7920	19.468475	-99.085254	4.0	Lounge	Wings Joint	Tennis Court	Coffee Shop	Convenience Store	Gym	Seafood Restaurant	Shopping Mall	Ice Cream Shop	Venezuelan Restaurant	
8100	19.411237	-99.064047	4.0	Pizza Place	Convenience Store	Taco Place	Food Truck	Diner	Food Court	Mexican Restaurant	Market	Drugstore	Park	
10300	19.313879	-99.258423	4.0	Park	Taco Place	Deli / Bodega	Candy Store	Pizza Place	Bakery	Diner	Other Great Outdoors	Gym	Mexican Restaurant	
10370	19.313406	-99.250622	4.0	Taco Place	Convenience Store	Pizza Place	Mexican Restaurant	Cafeteria	Brewery	Stables	Bistro	Sporting Goods Shop	Breakfast Spot	
14020	19.288420	-99.167051	4.0	Mexican Restaurant	Café	Bar	Pizza Place	Italian Restaurant	Market	Art Gallery	Coffee Shop	Park	Burger Joint	
15850	19.408565	-99.117470	4.0	Pet Store	Mexican Restaurant	Market	Hotel	Bakery	Restaurant	Athletics & Sports	Distillery	Candy Store	Food Truck	

Washington DC

Cluster 0

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
Shepherd Park	-95.409891	0.0	Pizza Place	Beer Garden	BBQ Joint	Park	Burger Joint	Mexican Restaurant	Food	Business Service	Fast Food Restaurant	Beer Store
Spring Valley	-116.966862	0.0	Mexican Restaurant	Chinese Restaurant	Dessert Shop	Cosmetics Shop	Convenience Store	Vietnamese Restaurant	Sandwich Place	Laundromat	Lounge	Zoo
Georgetown	-79.294496	0.0	Seafood Restaurant	American Restaurant	Chinese Restaurant	Food	Grocery Store	Discount Store	Pharmacy	Convenience Store	Diner	Filipino Restaurant
Fort McNair	-82.139603	0.0	Food Court	American Restaurant	Coffee Shop	Gym	Pizza Place	Field	Filipino Restaurant	Fast Food Restaurant	Farmers Market	Electronics Store
Fort Stanton	-105.523351	0.0	National Park	Historic Site	Zoo	Farm	Ethiopian Restaurant	Event Service	Event Space	Exhibit	Falafel Restaurant	Fast Food Restaurant
Hillbrook	-78.633948	0.0	Music Venue	Construction & Landscaping	Zoo	Farmers Market	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Field
Colonial Village	-78.884720	0.0	Coffee Shop	Home Service	Zoo	Farmers Market	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Fast Food Restaurant
Forest Hills	-97.230823	0.0	Photography Studio	Dance Studio	Department Store	Gym	Road	Zoo	Event Service	Event Space	Exhibit	Falafel Restaurant
Chevy Chase	-84.486135	0.0	American Restaurant	Bank	Pharmacy	Ice Cream Shop	Dry Cleaner	Insurance Office	Supermarket	Restaurant	Event Service	Event Space
Crestwood	-90.379390	0.0	Clothing Store	Basketball Court	Playground	Music Store	Pizza Place	Construction & Landscaping	BBQ Joint	Farm	Event Space	Exhibit
Congress Heights	-76.996676	0.0	Liquor Store	Tennis Court	Fried Chicken Joint	Ice Cream Shop	Deli / Bodega	American Restaurant	Convenience Store	Event Service	Event Space	Exhibit
Douglass	-76.980474	0.0	Breakfast Spot	Pizza Place	Business Service	Video Store	Smoke Shop	Women's Store	Sandwich Place	Field	Filipino Restaurant	Fast Food Restaurant
Naylor Gardens	-76.963029	0.0	Convenience Store	Liquor Store	Shoe Store	Bank	Coffee Shop	Gym	Grocery Store	Cosmetics Shop	Pizza Place	Wings Joint
Barry Farm	-76.995957	0.0	Bus Stop	Spa	Basketball Court	Convenience Store	Rental Car Location	Metro Station	Bus Station	Gym	Exhibit	Falafel Restaurant
Historic Anacostia	-76.984441	0.0	Sandwich Place	Convenience Store	American Restaurant	History Museum	Gym	Farm	Ethiopian Restaurant	Event Service	Event Space	Exhibit
Buzzard Point	-77.011618	0.0	Harbor / Marina	Soccer Stadium	Boat or Ferry	American Restaurant	Pizza Place	Gay Bar	River	Zoo	Falafel Restaurant	Ethiopian Restaurant
Fairlawn	-76.979039	0.0	Other Repair Shop	Deli / Bodega	Pool	Basketball Court	Shop & Service	General Entertainment	Exhibit	Ethiopian Restaurant	Event Service	Event Space
Randle Highlands	-76.963417	0.0	Convenience Store	Sandwich Place	Pharmacy	Seafood Restaurant	Liquor Store	Bike Rental / Bike Share	Restaurant	Laundromat	Intersection	Gym / Fitness Center
Dupont Park	-76.963225	0.0	Liquor Store	Convenience Store	Mobile Phone Shop	Intersection	Sandwich Place	Restaurant	Bike Rental / Bike Share	Pharmacy	Seafood Restaurant	Gym / Fitness Center
Twining	-76.959815	0.0	Liquor Store	Restaurant	Food Truck	Convenience Store	Bike Rental / Bike Share	Pharmacy	Farm	Event Service	Event Space	Exhibit
Navy Yard	-77.007181	0.0	Food Truck	Mexican Restaurant	Burger Joint	Hotel	Liquor Store	Korean Restaurant	Beer Garden	Coffee Shop	Sports Bar	Salad Place
Southwest Waterfront	-77.017231	0.0	Theater	Park	Baseball Field	BBQ Joint	Boat or Ferry	Laundry Service	Asian Restaurant	Grocery Store	Recreation Center	Pharmacy
Near Southeast	-77.003563	0.0	Park	Food Truck	Burger Joint	Mediterranean Restaurant	Salad Place	Coffee Shop	Liquor Store	Korean Restaurant	Bar	Residential Building (Apartment / Condo)

Marshall Heights	-76.928162	0.0	Building	Soccer Field	Basketball Court	Liquor Store	Other Repair Shop	Zoo	Farm	Event Space	Exhibit	Falafel Restaurant
Southwest Employment Area	-77.020453	0.0	Food Truck	Sandwich Place	Science Museum	Exhibit	Coffee Shop	Hotel	Snack Place	Rental Car Location	Mexican Restaurant	Burger Joint
Fort Dupont	-76.950955	0.0	Skating Rink	Baseball Field	Liquor Store	Market	Zoo	Exhibit	Falafel Restaurant	Farm	Farmers Market	Event Service
Benning Heights	-76.948831	0.0	Gay Bar	Restaurant	Fast Food Restaurant	Café	Fried Chicken Joint	Liquor Store	Sandwich Place	Pharmacy	Grocery Store	Fish & Chips Shop
Stanton Park	-76.999510	0.0	Convenience Store	Pub	Modern European Restaurant	Bike Rental / Bike Share	Bookstore	Breakfast Spot	Café	Sandwich Place	Coffee Shop	Park
Kingman Park	-76.978793	0.0	Park	Bus Station	Pool	Intersection	Bar	Taco Place	Farm	Event Service	Event Space	Exhibit
Carver Langston	-76.976840	0.0	Intersection	Shoe Store	Liquor Store	Chinese Restaurant	Fried Chicken Joint	Pizza Place	Café	Sandwich Place	Light Rail Station	Sporting Goods Shop
Foggy Bottom	-77.054728	0.0	Hotel	Theater	Performing Arts Venue	American Restaurant	Hotel Bar	Concert Hall	Italian Restaurant	New American Restaurant	Sandwich Place	Salad Place
Burrville	-76.922507	0.0	Chinese Restaurant	Football Stadium	Beer Garden	Convenience Store	Seafood Restaurant	Fish & Chips Shop	Filipino Restaurant	Field	Fast Food Restaurant	Empanada Restaurant
Mayfair	-76.952706	0.0	River	Soccer Field	Zoo	Ethiopian Restaurant	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Farmers Market
Deanwood	-76.932695	0.0	Basketball Court	Coffee Shop	Playground	Gym / Fitness Center	Zoo	Falafel Restaurant	Event Service	Event Space	Exhibit	Farm
Dupont Circle	-77.043438	0.0	Italian Restaurant	Coffee Shop	Burger Joint	Mediterranean Restaurant	Hotel	Yoga Studio	Ice Cream Shop	Bookstore	Pizza Place	Cosmetics Shop
Logan Circle	-77.029629	0.0	American Restaurant	Hotel	Cocktail Bar	Coffee Shop	Italian Restaurant	Furniture / Home Store	Sushi Restaurant	Gay Bar	Ethiopian Restaurant	Salad Place

Woodland-Normanstone Terrace	-77.061477	0.0	Sculpture Garden	Pedestrian Plaza	Outdoor Sculpture	Gym	Zoo	Empanada Restaurant	Ethiopian Restaurant	Event Service	Event Space	Exhibit
Fort Lincoln	-76.958508	0.0	Park	Convenience Store	Automotive Shop	Liquor Store	Chinese Restaurant	Fried Chicken Joint	Field	Fast Food Restaurant	Farmers Market	Filipino Restaurant
Lanier Heights	-77.042797	0.0	Coffee Shop	Bar	Zoo Exhibit	Indian Restaurant	Ice Cream Shop	Asian Restaurant	Yoga Studio	New American Restaurant	BBQ Joint	Pizza Place
Massachusetts Avenue Heights	-77.069763	0.0	Playground	Hookah Bar	Italian Restaurant	Shipping Store	Bus Stop	Food Truck	Liquor Store	Garden	Tennis Court	German Restaurant
Woodley Park	-77.057388	0.0	Hotel Bar	Gym	Shipping Store	Bakery	Bike Rental / Bike Share	Bus Station	Bus Stop	Coffee Shop	Convenience Store	Hotel
Palisades	-77.102675	0.0	American Restaurant	Park	Coffee Shop	Intersection	Sushi Restaurant	Belgian Restaurant	Shipping Store	Bistro	Forest	Chinese Restaurant
Columbia Heights	-77.032794	0.0	Ice Cream Shop	Latin American Restaurant	Gym	Bakery	Pizza Place	Asian Restaurant	Shoe Store	Filipino Restaurant	South American Restaurant	Café
Pleasant Plains	-77.022834	0.0	Bar	Coffee Shop	Hookah Bar	Filipino Restaurant	Garden	Beer Garden	Bookstore	Southern / Soul Food Restaurant	Mexican Restaurant	Bus Station
Wesley Heights	-77.088286	0.0	Bus Stop	Gourmet Shop	Intersection	Coffee Shop	Gift Shop	Park	Grocery Store	Italian Restaurant	Drugstore	Shopping Mall
Cathedral Heights	-77.082190	0.0	Pool	Dog Run	Tennis Court	Park	Gourmet Shop	Coffee Shop	Drugstore	Italian Restaurant	Trail	Gift Shop
Cleveland Park	-77.058042	0.0	Mediterranean Restaurant	Thai Restaurant	Italian Restaurant	Trail	Mexican Restaurant	Liquor Store	Supplement Shop	Irish Pub	Steakhouse	Sports Bar
McLean Gardens	-77.076280	0.0	Indian Restaurant	American Restaurant	Mexican Restaurant	Gift Shop	Pizza Place	Pharmacy	Dog Run	Coffee Shop	Sandwich Place	Seafood Restaurant
Georgetown Reservoir	-77.092937	0.0	Park	Deli / Bodega	Lake	Farm	Ethiopian Restaurant	Event Service	Event Space	Exhibit	Falafel Restaurant	Latin Fast Food Restaurant
Truxton Circle	-77.012017	0.0	Chinese Restaurant	Wine Shop	Caribbean Restaurant	American Restaurant	Liquor Store	Pub	BBQ Joint	Pharmacy	Sandwich Place	Farmers Market
Ivy City	-76.992537	0.0	Hotel	Gourmet Shop	Ice Cream Shop	Juice Bar	Tiki Bar	Cocktail Bar	Furniture / Home Store	Latin American Restaurant	Coffee Shop	Market
Shaw	-77.026380	0.0	Coffee Shop	Italian Restaurant	Bar	Ethiopian Restaurant	Wine Bar	Thai Restaurant	New American Restaurant	Seafood Restaurant	Sushi Restaurant	Furniture / Home Store
Foxhall Village	-77.084448	0.0	Trail	Lake	Bakery	Sandwich Place	Dog Run	Exhibit	Empanada Restaurant	Ethiopian Restaurant	Event Service	Event Space
Burleith	-77.074319	0.0	Bagel Shop	Deli / Bodega	Dog Run	Food	Flower Shop	Fish Market	Fish & Chips Shop	Filipino Restaurant	Ethiopian Restaurant	Field
Le Droit Park	-77.018142	0.0	Liquor Store	Bar	Café	Thai Restaurant	New American Restaurant	Cocktail Bar	Pizza Place	Hot Dog Joint	Coffee Shop	Chinese Restaurant
Cardozo	-77.028083	0.0	Bar	Coffee Shop	New American Restaurant	Restaurant	Southern / Soul Food Restaurant	American Restaurant	Mexican Restaurant	Mediterranean Restaurant	Italian Restaurant	Ice Cream Shop
Adams Morgan	-77.042493	0.0	Bar	Coffee Shop	Ethiopian Restaurant	Pizza Place	Ice Cream Shop	Café	Spa	Asian Restaurant	Park	Diner
Howard University	-77.019536	0.0	Caribbean Restaurant	Sandwich Place	Hookah Bar	Chinese Restaurant	Fried Chicken Joint	Pizza Place	Mexican Restaurant	Middle Eastern Restaurant	Coffee Shop	Tennis Court
Glover Park	-77.076220	0.0	Pharmacy	Park	Mexican Restaurant	Baseball Field	Italian Restaurant	Pizza Place	Gym	Bar	Bus Stop	Bus Station
Foxhall Crescent	-77.092138	0.0	College Stadium	Museum	Playground	Zoo	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Fast Food Restaurant

Woodland-Normanstone Terrace	-77.061477	0.0	Sculpture Garden	Pedestrian Plaza	Outdoor Sculpture	Gym	Zoo	Empanada Restaurant	Ethiopian Restaurant	Event Service	Event Space	Exhibit
Fort Lincoln	-76.958508	0.0	Park	Convenience Store	Automotive Shop	Liquor Store	Chinese Restaurant	Fried Chicken Joint	Field	Fast Food Restaurant	Farmers Market	Filipino Restaurant
Lanier Heights	-77.042797	0.0	Coffee Shop	Bar	Zoo Exhibit	Indian Restaurant	Ice Cream Shop	Asian Restaurant	Yoga Studio	New American Restaurant	BBQ Joint	Pizza Place
Massachusetts Avenue Heights	-77.069763	0.0	Playground	Hookah Bar	Italian Restaurant	Shipping Store	Bus Stop	Food Truck	Liquor Store	Garden	Tennis Court	German Restaurant
Woodley Park	-77.057388	0.0	Hotel Bar	Gym	Shipping Store	Bakery	Bike Rental / Bike Share	Bus Station	Bus Stop	Coffee Shop	Convenience Store	Hotel
Palisades	-77.102675	0.0	American Restaurant	Park	Coffee Shop	Intersection	Sushi Restaurant	Belgian Restaurant	Shipping Store	Bistro	Forest	Chinese Restaurant
Columbia Heights	-77.032794	0.0	Ice Cream Shop	Latin American Restaurant	Gym	Bakery	Pizza Place	Asian Restaurant	Shoe Store	Filipino Restaurant	South American Restaurant	Café
Pleasant Plains	-77.022834	0.0	Bar	Coffee Shop	Hookah Bar	Filipino Restaurant	Garden	Beer Garden	Bookstore	Southern / Soul Food Restaurant	Mexican Restaurant	Bus Station
Wesley Heights	-77.088286	0.0	Bus Stop	Gourmet Shop	Intersection	Coffee Shop	Gift Shop	Park	Grocery Store	Italian Restaurant	Drugstore	Shopping Mall
Cathedral Heights	-77.082190	0.0	Pool	Dog Run	Tennis Court	Park	Gourmet Shop	Coffee Shop	Drugstore	Italian Restaurant	Trail	Gift Shop
Cleveland Park	-77.058042	0.0	Mediterranean Restaurant	Thai Restaurant	Italian Restaurant	Trail	Mexican Restaurant	Liquor Store	Supplement Shop	Irish Pub	Steakhouse	Sports Bar
McLean Gardens	-77.076280	0.0	Indian Restaurant	American Restaurant	Mexican Restaurant	Gift Shop	Pizza Place	Pharmacy	Dog Run	Coffee Shop	Sandwich Place	Seafood Restaurant
Petworth	-77.024562	0.0	Pizza Place	Coffee Shop	Bar	Grocery Store	Farmers Market	Indoor Play Area	Japanese Restaurant	Sports Bar	Lounge	Latin American Restaurant
Van Ness	-77.066450	0.0	Rental Car Location	Sandwich Place	Italian Restaurant	Pizza Place	Mediterranean Restaurant	Shipping Store	Market	Dry Cleaner	Sushi Restaurant	Noodle House
North Michigan Park	-76.983420	0.0	Grocery Store	Park	Convenience Store	Discount Store	Zoo	Falafel Restaurant	Ethiopian Restaurant	Event Service	Event Space	Exhibit
Tenleytown	-77.080426	0.0	Pizza Place	Furniture / Home Store	Gym / Fitness Center	Sandwich Place	Mexican Restaurant	Coffee Shop	Yoga Studio	Convenience Store	Korean Restaurant	Bus Stop
North Cleveland Park	-77.071436	0.0	Bus Station	Gym	Cafeteria	Farmers Market	Event Space	Exhibit	Falafel Restaurant	Farm	Zoo	Ethiopian Restaurant
American University Park	-77.089978	0.0	Food Truck	Art Gallery	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Farmers Market	Fast Food Restaurant	Empanada Restaurant
Fort Totten	-77.002162	0.0	Bus Station	Park	Convenience Store	Gym / Fitness Center	Liquor Store	Home Service	Mobile Phone Shop	Metro Station	Gym	Farm
Queens Chapel	-76.996589	0.0	Liquor Store	Chinese Restaurant	Mobile Phone Shop	Big Box Store	Sandwich Place	Pet Store	Gym / Fitness Center	Convenience Store	Burger Joint	Field
Friendship Heights	-77.084996	0.0	Department Store	Coffee Shop	American Restaurant	Cosmetics Shop	Gym / Fitness Center	Furniture / Home Store	Italian Restaurant	Chinese Restaurant	Dance Studio	Spa
Lamond Riggs	-77.005716	0.0	Baseball Field	Rental Car Location	Smoke Shop	Brewery	Liquor Store	Video Store	Bus Station	Convenience Store	Field	Filipino Restaurant
Takoma	-77.017897	0.0	Vegetarian / Vegan Restaurant	Convenience Store	Martial Arts Dojo	Park	Metro Station	Farmers Market	Café	Southern / Soul Food Restaurant	Spa	Music Venue

Barnaby Woods	-77.059582	0.0	BBQ Joint	Field	Gym / Fitness Center	Park	Zoo	Falafel Restaurant	Ethiopian Restaurant	Event Service	Event Space	Exhibit
Knox Hill	-92.163507	0.0	Flower Shop	Coffee Shop	Zoo	Farmers Market	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Fast Food Restaurant
Fairmont Heights	-79.711384	0.0	Laundromat	Bus Station	Playground	Pizza Place	Ethiopian Restaurant	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm
University Heights	-73.913545	0.0	Train Station	Convenience Store	Liquor Store	Bakery	BBQ Joint	Fried Chicken Joint	Auto Dealership	Grocery Store	Latin American Restaurant	Pizza Place

Cluster 1

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
Capitol View	-76.924900	1.0	Park	Cosmetics Shop	Café	Bed & Breakfast	Bus Station	Zoo	Farm	Event Space	Exhibit	Falafel Restaurant
Woodland	-111.227121	1.0	Food	Café	Bed & Breakfast	Zoo	Farmers Market	Event Space	Exhibit	Falafel Restaurant	Farm	Fast Food Restaurant

Cluster 2

	Borough	Longitude	Cluster Labels	1st Most Common Venue	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
5	Garfield Heights	-76.972746	2.0	Convenience Store	Museum	Wings Joint	Chinese Restaurant	Zoo	Farm	Ethiopian Restaurant	Event Service	Event Space	Exhibit
9	Fairfax Village	-76.951749	2.0	Wings Joint	Convenience Store	Bike Rental / Bike Share	Pizza Place	Shopping Mall	Zoo	Farm	Event Service	Event Space	Exhibit
1	Fort Davis Park	-76.949141	2.0	Wings Joint	Convenience Store	Bike Rental / Bike Share	Pizza Place	Shopping Mall	Zoo	Farm	Event Service	Event Space	Exhibit
3	Penn Branch	-76.953623	2.0	Food Truck	Wings Joint	Bike Rental / Bike Share	Convenience Store	Laundromat	Fish & Chips Shop	Fish Market	Flower Shop	Filipino Restaurant	Ethiopian Restaurant

Cluster 3

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
Hillcrest	-95.224491	3.0	American Restaurant	Zoo	Fast Food Restaurant	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Farmers Market	Field

Cluster 4

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
Eastland Gardens	-76.943617	4.0	Fast Food Restaurant	Snack Place	Bookstore	Event Service	Event Space	Exhibit	Falafel Restaurant	Farm	Farmers Market	Zoo
Michigan Park	-76.994335	4.0	Fast Food Restaurant	Zoo	Empanada Restaurant	Food	Flower Shop	Fish Market	Fish & Chips Shop	Filipino Restaurant	Field	Farmers Market

Ottawa

Cluster 0

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
K1A 0A2	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0A5	-75.69156	0	Waterfall	Dog Run	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Food Truck
K1A 0A8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B4	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C5	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C7	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0E4	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0E9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G2	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G6	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H5	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H7	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck

Cluster 1

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
West Block	-75.700929	1	Coffee Shop	Hotel	Restaurant	Sandwich Place	Café	Plaza	Food Truck	Gym	Museum	Concert Hall
K1A 0A3	-75.697892	1	Coffee Shop	Hotel	Restaurant	Café	Sandwich Place	Concert Hall	Plaza	Museum	Bookstore	Lounge
K1A 0A4	-75.697460	1	Coffee Shop	Hotel	Restaurant	Concert Hall	Sandwich Place	Plaza	Café	Clothing Store	Bookstore	Japanese Restaurant
K1A 0A6	-75.697460	1	Coffee Shop	Hotel	Restaurant	Concert Hall	Sandwich Place	Plaza	Café	Clothing Store	Bookstore	Japanese Restaurant
K1A 0A9	-75.697460	1	Coffee Shop	Hotel	Restaurant	Concert Hall	Sandwich Place	Plaza	Café	Clothing Store	Bookstore	Japanese Restaurant
K1A 0E6	-75.701051	1	Coffee Shop	Hotel	Sushi Restaurant	Greek Restaurant	Food Truck	Café	Middle Eastern Restaurant	Tapas Restaurant	Gym	Italian Restaurant
K1A 0E8	-75.705606	1	Italian Restaurant	Coffee Shop	Pub	Wine Bar	Spa	Korean Restaurant	Mediterranean Restaurant	Greek Restaurant	Molecular Gastronomy Restaurant	Diner
K1A 0G5	-75.696918	1	Coffee Shop	Café	Restaurant	Salad Place	Italian Restaurant	Japanese Restaurant	Sandwich Place	Smoothie Shop	Greek Restaurant	Gym
K1A 0G7	-75.700194	1	Coffee Shop	Restaurant	Sushi Restaurant	Middle Eastern Restaurant	Greek Restaurant	Café	Food Truck	Sandwich Place	Hotel	Japanese Restaurant
K1A 0G8	-75.698643	1	Dessert Shop	Coffee Shop	Yoga Studio	Spa	Jazz Club	Gift Shop	German Restaurant	Furniture / Home Store	Museum	Diner
K1A 0G9	-75.702908	1	Coffee Shop	Restaurant	Hotel	Food Truck	Salad Place	Café	Museum	Gym	Lounge	Library
K1A 0H2	-75.700333	1	Coffee Shop	Restaurant	Sushi Restaurant	Hotel	Café	Food Truck	Sandwich Place	Japanese Restaurant	Tapas Restaurant	Museum

Cluster 2

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
K1A 0A1	-75.689448	2	Brewery	Sculpture Garden	Historic Site	Garden	Café	Gift Shop	Deli / Bodega	Dessert Shop	Diner	Dog Run

Cluster 3

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
K1A 0A7	-75.71000	3	Pub	Hotel	Restaurant	Rock Climbing Spot	Library	Park	Memorial Site	Garden	Cosmetics Shop	Deli / Bodega
K1A 0B2	-75.69154	3	Park	Bar	Library	Memorial Site	Rock Climbing Spot	Restaurant	Café	Historic Site	Pub	Waterfall
K1A 0B2	-75.71000	3	Park	Bar	Library	Memorial Site	Rock Climbing Spot	Restaurant	Café	Historic Site	Pub	Waterfall

Cluster 4

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
K1A 0C6	-75.711899	4	Wine Bar	Sports Club	Indian Restaurant	Light Rail Station	Mediterranean Restaurant	Harbor / Marina	Gym / Fitness Center	Greek Restaurant	Park	Diner

4.0 Conclusions

As stated previously in the Business Problem section, senior management is interested in exploring the business opportunities of upscale restaurants.

After analyzing the clusters, I picked the neighborhoods below which appear to have potential to be a site for a new upscale restaurant. I used the following criteria:
- Potential ambiance of the neighborhood
- Few or no restaurants in the neighborhood

4.1 Mexico City

The Borough of Cuauhtémoc is the historic center of Mexico City (Spanish: Centro Histórico de la Ciudad de México), also known as the Centro or Centro Histórico, is the central neighborhood in Mexico City, Mexico, focused on Zócalo or main plaza and extending in all directions for a number of blocks, with its farthest extent being west to the Alameda Central. The Zocalo is the largest plaza in Latin America. It can hold up to nearly 100,000 people.

The neighborhoods below comprise the historic center of Mexico City.

Cluster 1

6800	19.415073	-99.139208	1.0	Taco Place	Mexican Restaurant	Bar	Bakery	Wings Joint	BBQ Joint	Indie Theater	Gym	Liquor Store	Fried Chicken Joint

Cluster 2

6700	28.404122	-106.85044	2.0	Gym	Gym / Fitness Center	Steakhouse	Wings Joint	Farmers Market	English Restaurant	Event Space	Fair	Falafel Restaurant	Fast Food Restaurant

Cluster 3

6400	18.921928	-99.230001	3.0	Mexican Restaurant	Ice Cream Shop	Restaurant	Coffee Shop	Park	Café	Nightclub	Hotel	Gluten-free Restaurant	Sandwich Place
6720	19.416965	-99.148986	3.0	Mexican Restaurant	Taco Place	Bar	Hotel	Coffee Shop	Flea Market	Burger Joint	Shopping Mall	Fried Chicken Joint	Spanish Restaurant

Cluster 4

6600	19.426593	-99.162368	4.0	Coffee Shop	Restaurant	Ice Cream Shop	Café	Pizza Place	Italian Restaurant	Mexican Restaurant	Japanese Restaurant	French Restaurant	Cosmetics Shop
6900	19.455014	-99.143169	4.0	Pizza Place	Mexican Restaurant	Burger Joint	Theater	Park	Pool	Taco Place	Gym	Bakery	Restaurant

4.2 Washington DC

Washington DC has a large number of upscale restaurants which may make it difficult from a marketing standpoint to achieve differentiation with a new upscale restaurant. Nevertheless, I found four potential neighborhood sites including the prestigious section of Georgetown below.

Cluster 0

Georgetown	-79.294496	0.0	Seafood Restaurant	American Restaurant	Chinese Restaurant	Food	Grocery Store	Discount Store	Pharmacy	Convenience Store	Diner	Filipino Restaurant
Stanton Park	-76.999510	0.0	Convenience Store	Pub	Modern European Restaurant	Bike Rental / Bike Share	Bookstore	Breakfast Spot	Café	Sandwich Place	Coffee Shop	Park

Cluster 1

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
Capitol View	-76.924900	1.0	Park	Cosmetics Shop	Café	Bed & Breakfast	Bus Station	Zoo	Farm	Event Space	Exhibit	Falafel Restaurant
Woodland	-111.227121	1.0	Food	Café	Bed & Breakfast	Zoo	Farmers Market	Event Space	Exhibit	Falafel Restaurant	Farm	Fast Food Restaurant

4.3 Ottawa

Numerous neighborhoods in the historic area of Ottawa seem to have potential for an upscale restaurant as shown in this cluster.

Cluster 0

Borough	Longitude	Cluster Labels	1st Most Common Venue	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
K1A 0A2	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0A5	-75.69156	0	Waterfall	Dog Run	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Food Truck
K1A 0A8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B4	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0B9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C5	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C7	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0C8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0E4	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0E9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G1	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G2	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0G6	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H5	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H7	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H8	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck
K1A 0H9	-75.69154	0	Waterfall	Park	Historic Site	Bar	Café	Gift Shop	Dessert Shop	Diner	Dog Run	Food Truck

5.0 Future Directions

Addional analysis is recommended to determine the ideal sites for new upscale restaurants. Since this project had a relatively tight timeframe, additional analysis also should be performed in order to confirm the correct names of the boroughs and neighborhoods in Ottawa that are associated with the postal addresses.

Other factors to be considered should include:

- Zoning regulations in each city that may prohibit additional restaurants
  or perhaps prohibit restaurants in historic areas
- Construction costs in each city
- Workforce availability and culinary talent of available chefs

Once the above is analyzed for further filtering of the available neighborhoods, it is further recommended that appropriate company staff visit and explore the potential sites.