

Capstone Project - The Battle of Neighborhoods

Opening Middle Eastern Restaurant in Ottawa (Canada)

1. Introduction

1.1 Background

- **About Ottawa:**

Ottawa is Canada's capital, in the east of southern Ontario, near the city of Montréal and the U.S. border. Sitting on the Ottawa River, it has at its center Parliament Hill, with grand Victorian architecture and museums such as the National Gallery of Canada, with noted collections of indigenous and other Canadian art. The park-lined Rideau Canal is filled with boats in summer and ice-skaters in winter.

Ottawa is the nation's capital and the fourth largest urban region in Canada. It includes over 1.4 million people, 66% of whom live in Ottawa and the rest in neighboring municipalities, including Gatineau (located across the Ottawa River in Quebec). A special feature of the region is that both English and French are widely spoken and reflected in the City's culture and commerce. Ottawa is also multicultural with a large and growing immigrant population that enriches the city.

- **About Economic:**

On the economic front, Ottawa is a major economic engine, offering jobs and opportunities in high tech industries, government, and important sectors such as health and education. The City is home to world-class research centers, top notch academic institutions and operations by major international companies.

- **About Population:**

The city grew more than 9% from 2006 to 2011, surpassing the national average of 5.9%. Ottawa is currently bracing itself for a population boom outside of the Greenbelt, which is expected to grow from 291,000 now to 432,000 by 2031.

1.2. Problem

In this project, I will investigate that if there is any good location in Ottawa for opening Middle Eastern restaurant,

And should I open an Middle Eastern restaurant restaurant to have the best chance of being successful?

1.3. Interest

Anyone who wants to open a new venue in any geographic location may be interested in this project by modifying search criteria.

2. Data

2.1 Data sources

To consider the problem we can list the data as below:

- I get the neighborhood data of Ottawa from Google Search.
- I will use python geocoder library to get geographical coordinates of neighborhoods.
- I will use Foursquare API venues explore method to get the venues of given neighborhoods of Ottawa.
- I will use Foursquare API venues method to get ranks and likes of restaurants by given venue id.

A. References:

- [1] [Ottawa - Google Search](#)
- [2] [Ottawa Ranking Communities](#)
- [3] [Python Geocoder Library](#)
- [4] [Foursquare API](#)

2.2 Feature Selection and Data Usage

I will use neighborhood location values to analyze Ontario geographical structure. I will use folium library of python to draw maps by using given latitude and longitudes of neighborhoods. Selected features will be as below.

	Neighborhood	Latitude	Longitude
0	Orléans	45.481032	-75.510000
1	Downtown	45.42849	-75.692673
2	Barrhaven	45.265225	-75.765974
3	ByWard Market	45.427917	-75.692601
4	Stittsville	45.269066	-75.914523
5	Manotick	45.212412	-75.708178
6	Westboro	45.391962	-75.754290
7	Skyline	44.142188	-84.030789

I will also classify neighborhoods by using venues distribution and counts. In this way, I will find similarities of neighborhoods which will help me to choose location for opening a new restaurant. Similar structured neighborhoods may handle same type of venue.

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	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Barrhaven	Convenience Store	Health & Beauty Service	Playground	Tattoo Parlor	Dog Run
1	Bells Corners	Construction & Landscaping	Food Truck	Fast Food Restaurant	Thai Restaurant	Sandwich Place
2	Billings Bridge	Restaurant	Coffee Shop	Spa	Pet Store	Breakfast Spot
3	Blackburn Hamlet	Convenience Store	Pub	Skating Rink	Supermarket	Sandwich Place
4	Britannia Bay	Curling Ice	Insurance Office	Harbor / Marina	Women's Store	Donut Shop

I will use venue list category to find distribution of restaurants and Middle Eastern restaurants in neighborhoods.

	Venue	Venue Latitude	Venue Longitude	Venue Category
	Shenkman Arts Centre / Centre des Arts Shenkman	45.480352	-75.511153	Concert Hall
	St. Martha's Brasserie d'Orléans	45.480228	-75.509322	French Restaurant
	Farm Boy	45.477637	-75.513385	Grocery Store
	Ruddy Family YMCA-YWCA	45.481075	-75.509561	Gym
	D'Arcy McGee's Orleans	45.480339	-75.509677	Irish Pub

	Arturo's Market	45.440045	-75.675879	Italian Restaurant
	Second Cup	45.440062	-75.676216	Coffee Shop
	Metro	45.439402	-75.676033	Supermarket
	Beechwood Oasis	45.440160	-75.675160	Spa
	Quickie	45.440067	-75.675232	Convenience Store

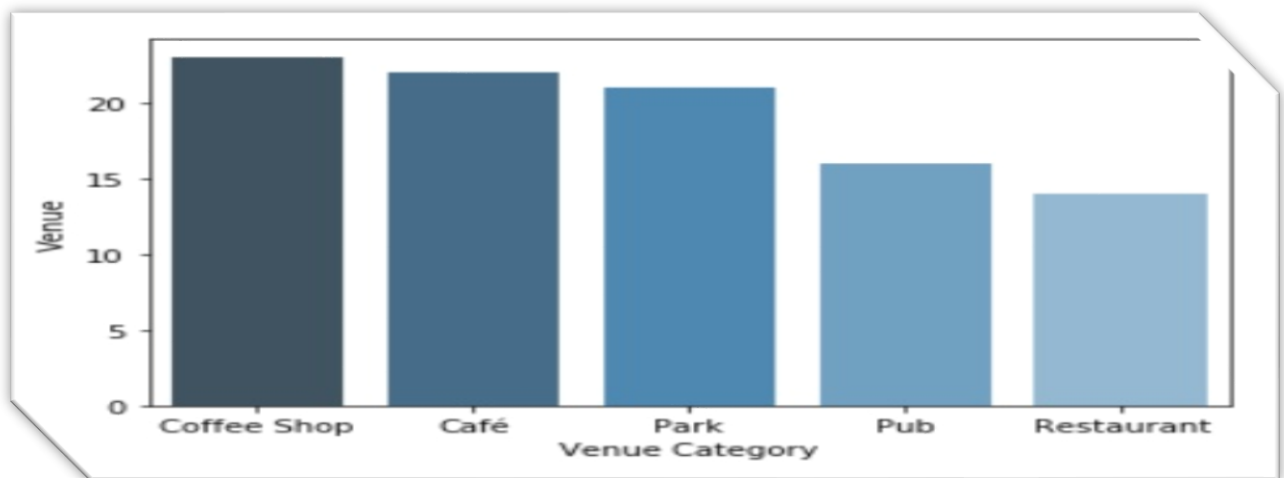
3. Methodology

First we will begin analyzing the data frames to find out what types of restaurants we can find in each venue, and the types of restaurants that we can find in Ottawa. In order to make easy to visualize, we will use bar plots graphs. Second, we will check the most diverse gastronomic neighborhood for each venue.

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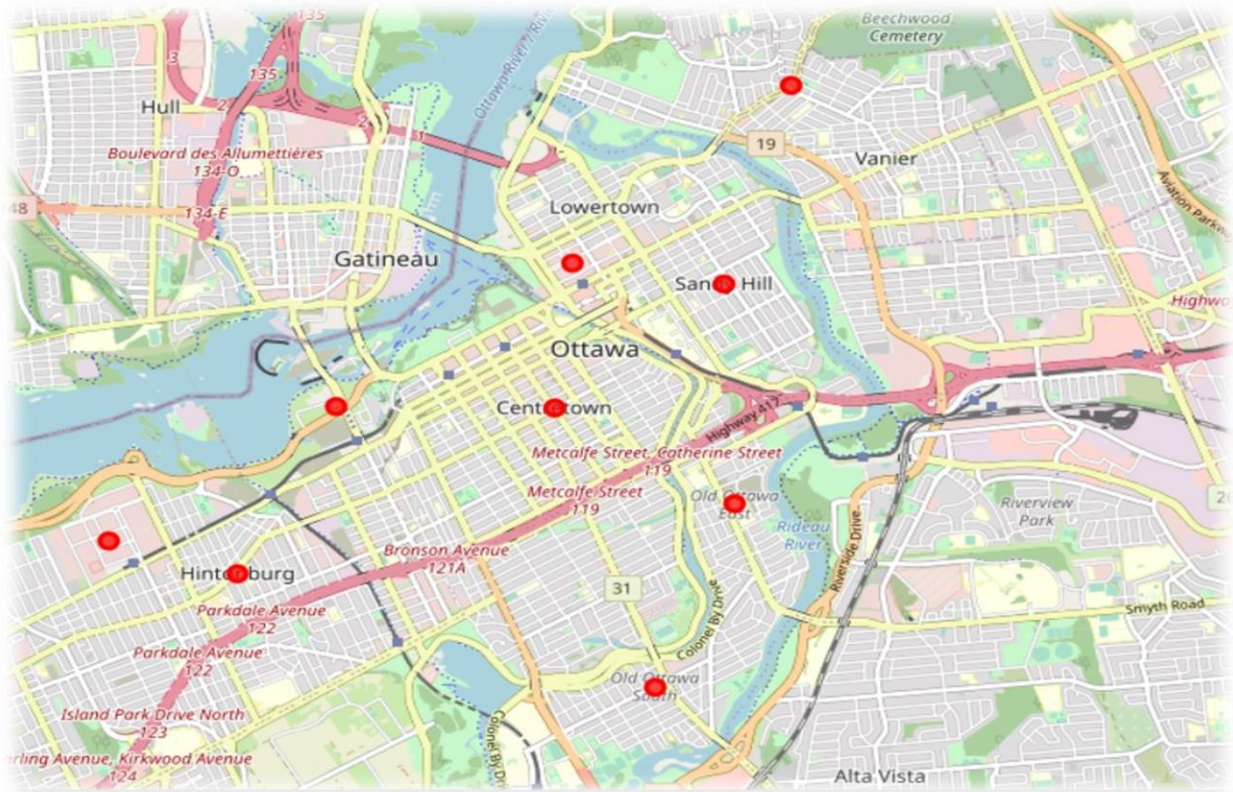
Exploratory Data Analysis

- I used GitHub repository for code versioning.
- The Ottawa data is available with the neighborhood name in google search, Wikipedia.
- Location information (latitude and longitude) of neighborhoods are taken from geocoder library.
- Transform the data of nested python dictionaries into a pandas dataframe.
- This data will be used to get Venues data from Foursquare.
- We used geopy and folium libraries to create a map of Ottawa city with neighborhoods.
- I used Clustering to cluster neighborhoods according to count of venue categories in each neighborhood. According to the below graph, I decided to separate our neighborhoods into 4 clusters.



	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue
0	Barrhaven	Convenience Store	Health & Beauty Service	Gym	Tattoo Parlor	Dive Bar	Fast Food Restaurant
1	Bells Corners	Middle Eastern Restaurant	Thai Restaurant	Fast Food Restaurant	Seafood Restaurant	Sandwich Place	Construction & Landscaping
2	Billings Bridge	Coffee Shop	Restaurant	Grocery Store	Supermarket	Pet Store	Luggage Store
3	Blackburn Hamlet	Coffee Shop	Gas Station	Pharmacy	Chinese Restaurant	Pub	Discount Store
4	Britannia Bay	Harbor / Marina	Curling Ice	Insurance Office	Winery	Dive Bar	Flea Market
5	ByWard Market	Coffee Shop	Restaurant	New American Restaurant	Dessert Shop	Hotel	Ice Cream Shop
6	Cardinal Creek	Electronics Store	College Cafeteria	Food Service	Pharmacy	Juice Bar	Theater
7	Carleton Heights	Farmers Market	Winery	Wine Shop	Flower Shop	Flea Market	Fast Food Restaurant
8	Carlington	Convenience Store	Italian Restaurant	Park	Vietnamese Restaurant	Laundromat	Pizza Place
9	Carlsbad Springs	Italian Restaurant	Food & Drink Shop	Flea Market	Fast Food Restaurant	Farmers Market	Electronics Store
10	Carson Grove	Park	Gym	Bus Station	Mexican Restaurant	Dive Bar	Fast Food Restaurant

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4. Results

I investigated that there is no Middle Eastern restaurant in Ottawa.

5. Discussion

Cluster 2 and 3 suffers from activities. Especially there is no many restaurant.

Cluster 4 have Eastern European Restaurant and fast food Restaurant, may be these neighborhoods will not like Middle Eastern tastes. but still good to choose this cluster.

Cluster 1 are centers full of restaurants as we saw there in the table. So we can think about these areas because it have most of the activities and restaurant and for sure this cluster have a heavy population.

6. Conclusion

I have chosen 2 locations for opening Middle Eastern Restaurant. Below are locations of neighborhoods. I hope this work will help somebody who wants to open a new Arab Eastern Restaurant in Ottawa.