

Coursera Capstone

IBM Applied Data Science Capstone

Opening a New Lebanese Restaurant in New York, USA

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INTRODUCTION

The Lebanon kitchen is immensely famous for the variety of spices and ingredients. The mouth-watering authentic flavorful recipes are well known throughout the world. In Lebanon, most local restaurants serve typical Lebanese mezze, an array of more than 60 small hot and cold, fresh savory dishes, mostly eaten with bread ('khebbez'). Lebanon, especially Beirut, is crammed with attractive restaurants, lunch places and bars. For each destination, a selection of bars, restaurants and other eateries is provided.

The City of New York, is the most populous city in the United States. It is diverse and is the financial capital of USA. It is multicultural. It provides lot of business opportunities and business friendly environment. It has attracted many different players into the market.

A Lebanese businessman approached me, Data Scientist Consultant, aiming to open a Lebanese Food Restaurant in New York. The location of the restaurant is one of the important decisions that will determine whether the restaurant will be profitable or not.

Business Problem

The objective of this Capstone Project is to analyze and select the best location in New York City to open the Lebanese Restaurant. Using state-of-the-art machine learning techniques like clustering, this project aims to help answer the business question: Which neighborhood is the most favorable one for the Businessman to consider for his new Lebanese Restaurant?

Target Audience

This project is extremely useful to all businessmen and investors aiming to open or invest in a new restaurant in New York City.

Data

We will need the following data in order to solve the current problem:

- List of Neighborhoods in New York.
- Latitude and Longitude coordinates of each Neighborhood. This will allow us to plot the map and to get the venues in each neighborhood.
- Venue data, especially the ones related to Lebanese Restaurants (used for clustering)

Sources of Data and Methods:

- New York City data will be downloaded from the following website:
https://geo.nyu.edu/catalog/nyu_2451_34572
- Geographical coordinates of the neighborhoods using Python Geocoder package
- Foursquare API to get the Venue Data

Methodology

In order to solve our business problem, we had some clear steps to follow:

- 1- Load the Libraries along with the dataset
- 2- Do some exploratory analysis
- 3- Make assumption (In our case we chose the neighborhoods in the Borough Manhattan)
- 4- Explore the venues in each neighborhoods and run additional statistics
- 5- Identify neighborhoods with Lebanese Restaurants
- 6- Cluster Neighborhoods and Determine the ones that are similar to the Neighborhoods with Lebanese Restaurants

Results and Conclusion

As result, we found that a total of 20 clusters were required in order to separate the neighborhoods of Manhattan into similar groups. Greenwich Village was the only Neighborhood containing Lebanese Restaurants. We found that 4 other neighborhoods belong to the same group with Greenwich Village.

	Borough	Neighborhood	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	
12	Manhattan	Upper West Side	40.787858	-73.977059	12	Italian Restaurant	Wine Bar	Bar	Coffee Shop	Indian Restaurant	Bakery	Mediterranean Restaurant	Café	R
18	Manhattan	Greenwich Village	40.726933	-73.999914	12	Italian Restaurant	Sushi Restaurant	Clothing Store	Café	French Restaurant	Indian Restaurant	Seafood Restaurant	Cosmetics Shop	
19	Manhattan	East Village	40.727847	-73.982228	12	Bar	Ice Cream Shop	Wine Bar	Pizza Place	Chinese Restaurant	Mexican Restaurant	Italian Restaurant	Korean Restaurant	R
34	Manhattan	Sutton Place	40.760280	-73.963556	12	Gym / Fitness Center	Italian Restaurant	Furniture / Home Store	Gym	Coffee Shop	Yoga Studio	Dessert Shop	Beer Garden	R
35	Manhattan	Turtle Bay	40.752042	-73.967708	12	Italian Restaurant	Coffee Shop	Steakhouse	Sushi Restaurant	Wine Bar	Park	Indian Restaurant	Café	R

Therefore, we conclude that all 4 neighborhoods are highly recommended for the Business Man as a location for his Lebanese Restaurant.