IBM APPLIED DATA SCIENCE CAPSTONE

APPROPRIATE LOCATIONS TO OPEN AN ARABIC FOOD NEW RESTAURANT IN NEW YORK, USA

INTRODUCTION

The demand on restaurants and good food are increasing, not only due to the number of populations that have been increased in the past 5 years. However, it becomes a part of breaking the routine of always eating food at home or bringing special guests for dinner at home. Restaurants usually have various types of dishes that match different tastes and given the fact of a very good reputable restaurant you would never think twice to bring your special guests or even hold a business dinner out there. But, where should you, as an investor, consider opening a new restaurant? What are the factors you should consider when making this decision? The answer would really depend on how you would position yourself among competitors.

BUSSINESS PROBLEM

So, this project aims to study the best place for a new investor to open his or her restaurant. We will assume that this restaurant targets specific segment of customers, mainly those who are planning to host their guests at a very high quality and reputable Arabic food. It is not about the number of populations in the nearby! It's about making sure that the investor will open the restaurant in a high-income area, a very well paved infrastructure and a very close to one of the big famous restaurants. You would be wondering, why to take a risk and open a restaurant next to a very well know and high-quality restaurant? The answer is simple, but first have you asked yourself why KFC and Popeye's restaurants are always close to each other? Take it easy, these restaurants are not owned by the same owner or group. It's about the strategy, Popeye's strategy is to open a restaurant that is always nearby the KFC, they are taking the bargaining power of KFC customers, that is their audience, and this is their strategy! You like KFC, but you will give yourself an opportunity to try another brand if you, for example, liked its teaser! We will advise the investor to open his restaurant next to one of the other famous restaurants, we start by positioning this new investor among these tops! And yes, we will spend on the marketing ads, plan to expand, pricing schema, dishes and most importantly on the weakness and threats of the competitors.

TARGET AUDIENCE

This project aims to help new investor to select the right location of a new Arabic restaurant.

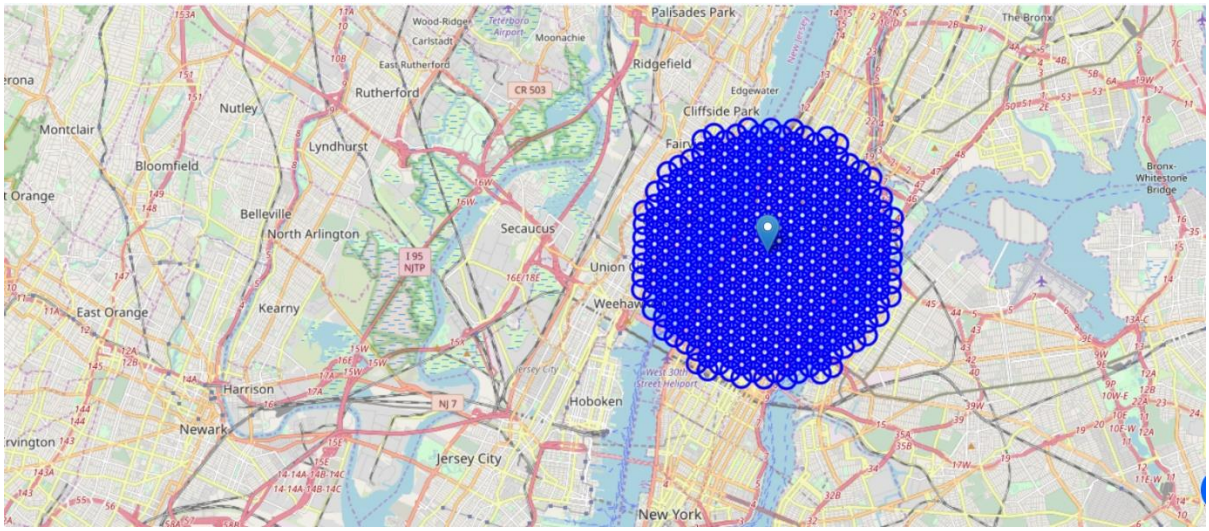
DATA

- List of neighborhoods in N.Y, USA
- Latitude and longitude coordinates of those neighborhoods, in order to plot the map
- Data related to highly reviewed Arabic restaurants in New York, in order to perform clustering on the neighborhoods

First, we extract the neighborhoods in N.Y, using web scraping as we did in Week #3. Then, we use the Geocoder library to extract the coordinates of each neighborhood. Then, we use the Foursquare API to get the venue data for each of the neighborhoods. It provides us with a lot of venues, but we are interested in specific restaurants category, to solve our problem. We also make use of machine learning techniques, such as K means clustering and map visualization using Folium.

Methodology

In first step we have collected the required data: location and type (category) of every restaurant within 6km from Manhatten center (N.Y). We have also identified Arabic restaurants (according to Foursquare categorization). Second step in our analysis will be calculation and exploration of 'restaurant density' across different areas of Manhatten - we will use heatmaps to identify a few promising areas close to center and focus our attention on those areas. In third and final step we will focus on most promising areas and within those create clusters of locations that meet some basic requirements established in discussion with stakeholders: we will take into consideration. We will present map of all such locations but also create clusters (using k-means clustering) of those locations to identify general zones / neighborhoods / addresses which should be a starting point for final 'street level' exploration and search for optimal venue location by stakeholders.

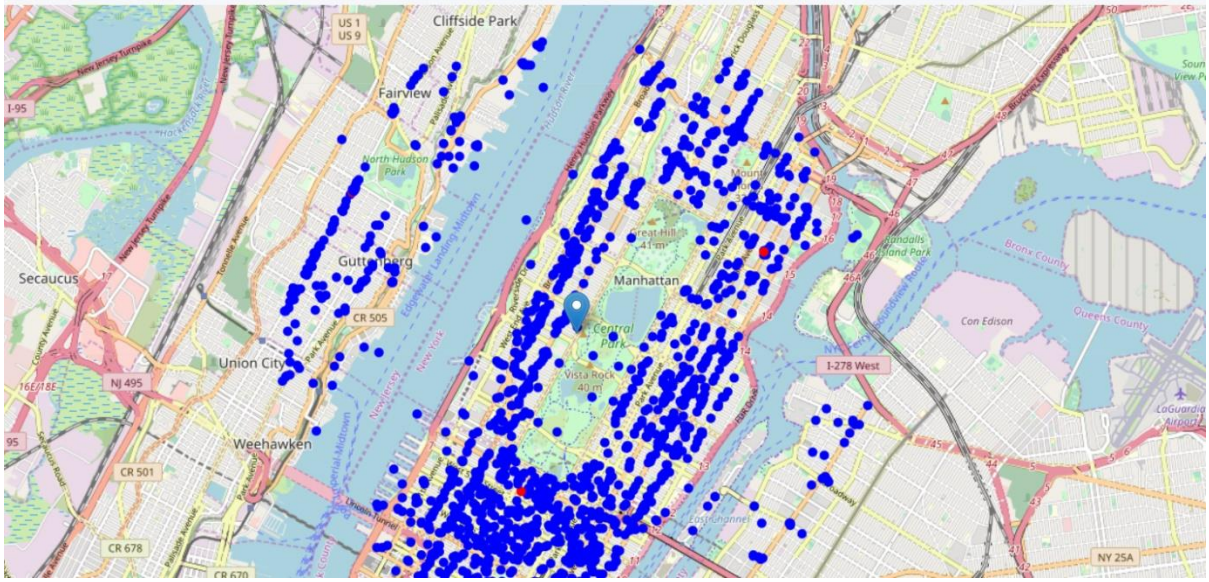


Results and Discussion

Our analysis shows that although there is a great number of restaurants in New York, Manhatten. However, Arabic restaurants are very few which grants us a privilege to be assured about this new business.

Those location candidates were then clustered to create zones of interest which contain greatest number of location candidates. Addresses of centers of those zones were also generated using reverse geocoding to be used as markers/starting points for more detailed local analysis based on other factors.

Result of all this is 15 zones containing largest number of potential new restaurant locations based on number of and distance to existing venues - both restaurants in general and Arabic restaurants particularly. This, of course, does not imply that those zones are optimal locations for a new restaurant! Purpose of this analysis was to only provide info on areas close to Manhatten center but not crowded with existing restaurants (particularly Arabic) - it is entirely possible that there is a very good reason for small number of restaurants in any of those areas, reasons which would make them unsuitable for a new restaurant regardless of lack of competition in the area. Recommended zones should therefore be considered only as a starting point for more detailed analysis which could eventually result in location which has not only no nearby competition, but also other factors considered, and all other relevant conditions met.



Conclusion

Purpose of this project was to identify Manhatten areas close to center with low number of restaurants (particularly Arabic restaurants) in order to aid stakeholders in narrowing down the search for optimal location for a new Arabic restaurant. Clustering of those locations was then performed in order to create major zones of interest (containing greatest number of potential locations) and addresses of those zone centers were created to be used as starting points for final exploration by stakeholders.

Final decission 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 / proximity to major roads, real estate availability, prices, social and economic dynamics of every neighborhood etc.

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