1.Introduction

1.1 Background
New York is the most populous city in the United States. With an estimated 2019 population of 8,336,817 distributed over about 302.6 square miles (784 km2), New York City is also the most densely populated major city in the United States.New York City has been described as the cultural, financial, and media capital of the world, significantly influencing commerce, entertainment, research, technology, education, politics, tourism, art, fashion, and sports. Therefore, it is advantageous for investors to do different types of business. For example, open the restaurant in New York.

1.2 Problem
New York is the big city. what factors should you analyze to determine the best place in the city to start your dream restaurant, and how do you do it? This project include some basic assumptions, data set, and data analysis could help you making decision when selecting the optimal neighborhood in New York for opening restaurant.

1.3 Interest
Obviously, Entrepreneurs or Business owners would be very interested in opening restaurant or grow their current business in New York. Business Analyst or Data Scientists, who want to analyze the neighborhoods of New York.

2.Data description

2.1 Data Source
To consider the problem we can list the datas as follows:

> I used Google Map, search for nearby places and explore the area.

> I used Foursquare API to search for venues, learn more about particular venues, and explore Foursquare users.

2.2 Data Processing

Neighborhood has a total of 5 boroughs and 306 neighborhoods. In order to segment the neighborhoods and explore them, we will essentially need a dataset that contains the 5 boroughs and the neighborhoods that exist in each borough as well as the latitude and longitude coordinates of each neighborhood.

First of all, I would download the files and place it on the server. Second, I would load the data to the notebook, and transfer data into a pandas data-frame to explore and exam the resulting data-frame. Finally, I would use GEOPY library to get the latitude and longitude values of New York City.

3.Methodology

As a database, I used GitHub repository in my study. My master data which has main components Borough, Neighborhood, Latitude and Longitude.

I used python folium library to visualize geographic details of New York and its boroughs and I created a map of New York city.

I used the Foursquare API to explore the boroughs and segment them. I designed the limit as 100 venues and the radius 500 meter for each borough from their given latitude and longitude.

I used some of basic lumpy, pandas and other basic fundamental methods to deal with simple calculations or simulations.

4.Results

In New York City, most of the neighborhoods have the most common venues of coffee shops, pubs and parks. In central of New York, most of the neighborhoods have the most common venues of lakes, grocery stores and restaurants. In downtown, cafes and different kinds of restaurants are distributed in different neighborhoods. Actually, New York City is one of the world's most populous megacities, investors could choose their preferable neighborhoods to open the restaurants if budget is umlimited.

In my opinion, the neighborhood should be more crowds and more developed. Data shown in my notebook told us comprehensive kinds of venues in different areas of New York.

5.Discussion

From data of top 10 common venues in New York City, there are plenty of the best place for investors to open a restaurant, that means investor have lots of choices. The data only told us the current numbers of each kind of venues, but no other factors such as cost of the place or environment. The investor should compare each neighborhoods and find the preferable place to open restaurant.

6.Conclusion

As a result, The investors to open a restaurant in New York city should consider several factors. First , consider the number of restaurants in different neighborhoods of each district of New York. Second is the population of different districts, which depends on the kinds of venues in different areas. For example,If the restaurant is opened close to downtown, it must be more people.

The investors should consider competitive restaurants in the same district also.
Try not to open restaurant with more similar restaurants nearby. It helps restaurant get easy start.