Report by : Deepak Kashyap

● Introduction/Business Problem

A client targets to open a food place that will be situated in New York area but he is not able to figure out what type of eating place will be best welcome by New Yorker and also the choices of location so that his investment more secure and the ROI will be higher.

First of all, questions have been asked to the investor in order to better understand his requirement and also help to find out appropriate suggestion for him. Here are the summary of those questions and answer.

- What kind of restaurant you are target to invest?
  It is quite open and really depends on which kinds of food that New Yorker usually like to try. It is better to have some study to find out what New Yorker like most.

- What is your expect location for the restaurant?
  The most popular the better. I will target to open a spectacular type of restaurant that attract people eyeball and also easy reach by my customers. As a business point of view, area that has a lot of hot spot venues will grab people attention. I am not affair of competition. As long as my restaurant has special features, it is better to open in a crowded place to draw more attention.

- What is your target customer or type of customer?
  Well, it is better to suitable for whole family gathering and enjoy their meal in my restaurant. I do not mean not welcome to individual or couples but really prefer to have a place for family members suitable for kids, parent and their aged family members are all welcome.

- Do you have any prefer diet type provide?
  Since I want to host a family style customers, variety of food type could be considered. However, I also want to understand what kinds of food is most popular be accepted in the target area that the restaurant will be located. Taking reference to surrounding venues will always be a good practice.

By collecting the requirement from our investor, we can collect data from possible source including web pages, from map and also from location based data provider foursquare.com and analysis with scientific method to find some answer for the investor.

● Downloading and Prepping Data

There are 5 boroughs within New York namely Bronx, Brooklyn (Kings County), Manhattan (New York County), Queens and New York City. In order to find a suitable place for the new restaurant, an understand of the population size and density of the 5 boroughs has to be found out.
Luckily, a website (https://en.wikipedia.org/wiki/Demographics_of_New_York_City) contains valuable data about the population size and density about New York city. That exactly what we need as the basic information for choosing the highest population density to be the potential target to open the restaurant as it provides a better customers pool.
Another important data source will be from FOURSQUARE website. By using API call to find out the "Top Picks" and "Food" venues from the neighborhoods of the 5 boroughs, a list of favour activities and food can help to decide what type of restaurant will be best suite New Yorker. The key idea is to suggest a fusion place to provide the most favour diet together with most interested

activity to customers. That aims to provide a good place for New Yorker to join together with their family and friends and enjoy their preferred foods.

Both the population data from wikipedia and venues data from FOURSQUARE will be gone through machine learning process to find out the best combination of food and activity that New Yorker love to have and the best location that the restaurant will be placed. With such processes, it is believe that the investor request can be fulfilled.

● Methodology

- Data Preparation for Population Status of New York
- Finding data from webpage to dataframe
- Scraping webpage content for New York City population
- Prepared the population density data of New York City and display in a choropleth map
- Get the latitude and longitude values of New York City from webpage
- Prepared a bar chart to graphically understand the population density in New York City
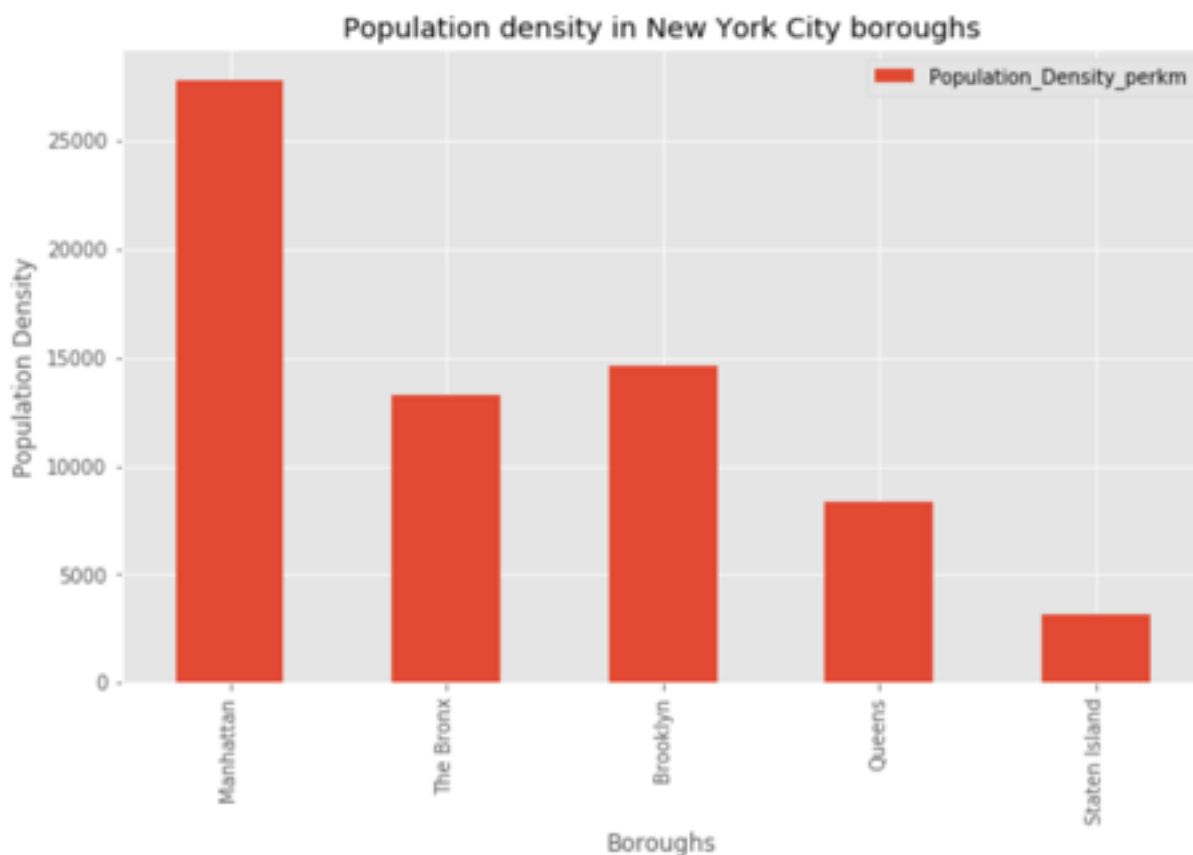
- It came out that Manhattan got the highest population density, so we focused our attention on the further study of Manhattan area.
- Prepared a choropleth map centred around Manhattan

- Next prepared a bar graph to visualise the population distribution in Manhattan neighborhood.

Population distribution in Manhattan neighborhoods
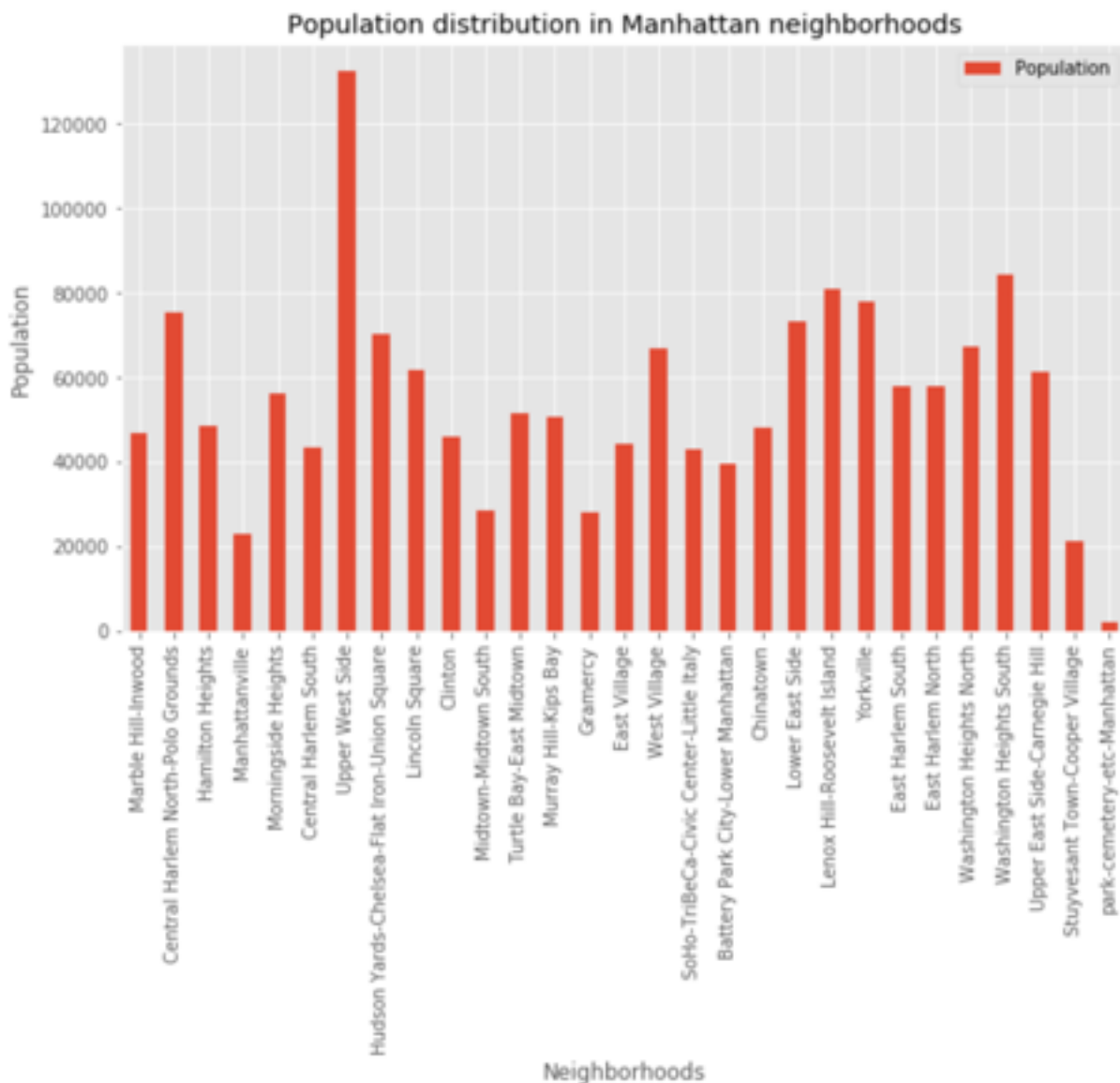
- The bar graph indicated that Upper West Side (MN12) of Manhattan shows the highest potential customers there. So I converged my focus around this area.

- Then I used 'FOURSQUARE' to find out the most favious food and place that Upper West Side residence love to have. And finally generated a bar graph visualisation showing restaurant type distribution in Upper West Side.

Restaurant type distribution in Upper West Side
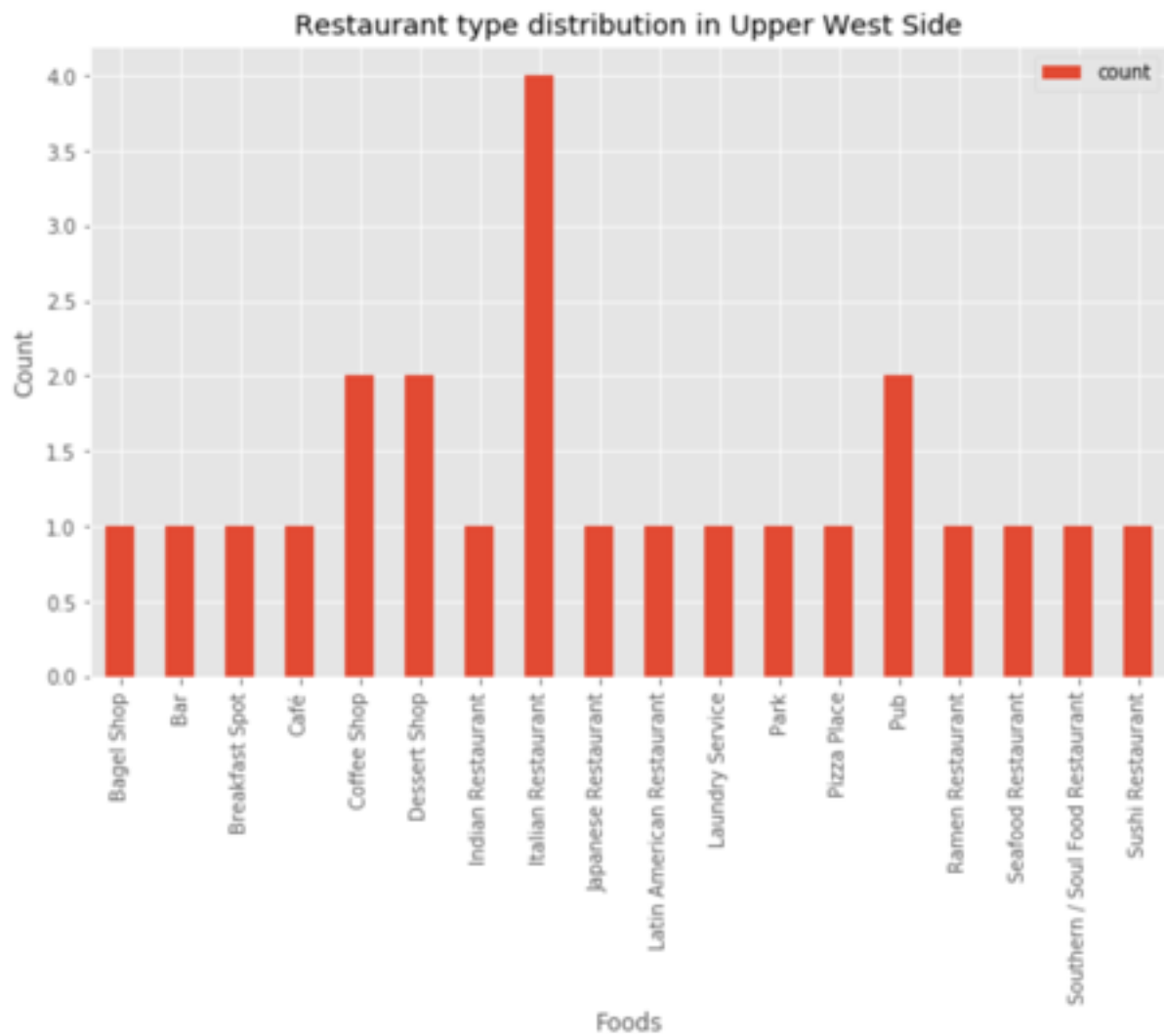
- As my final step I also tried to find out the places where the people around this area love to go and got the following scenario:

Which place that Upper West Side residence love to go?
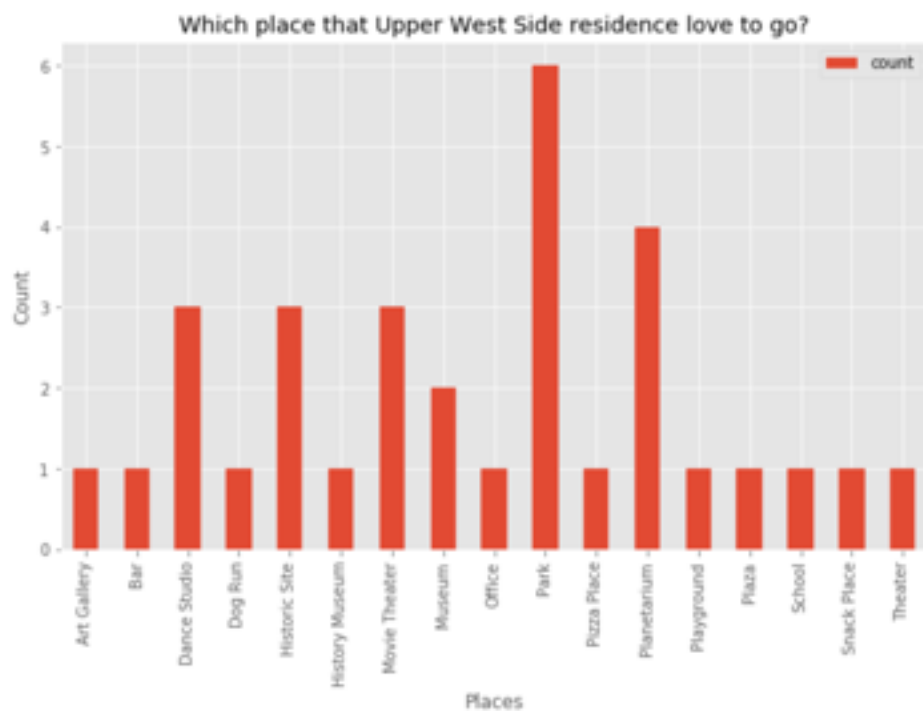
● Result

From the population information of Manhattan neighborhoods, the restaurant will target to locate at Upper West Side (MN12) of Manhattan which shows the highest potential customers there. After further analysis we found that Italian restaurants types tops the restaurant distribution in this area. So I decided to suggest an Italian restaurant to my client. I also found that most of the people in this area love to hang out in a park that's why I would also recommend my client to set the theme such that the restaurant mimic a park environment.

● Discussion

From the previous studies, there are some findings that help to make decision at various steps:
1. Manhattan have the highest population density throughout New York City.
2. Upper West Side being the neighborhood area that has the highest population.
3. Italian food is the most favor food that Upper West Side people like.
4. Going to park is the most interest place that Upper West Side people like to visit.

● Conclusion

After a thorough analysis from various angles it is suggested to open an Italian restaurant with the decoration theme of mimic a park environment will likely to fit the citizen taste.