New Peruvian Restaurant in Manhattan city

Capstone Project

A New Peruvian Restaurant in Manhattan, NY.

- Introduction to Business Case
- Released Questions in the business case
- Data Required
- Methodology
- Results
- Recommendations

Introduction to Business Case

- A Peruvian entrepreneur wish to open a new Peruvian Restaurant in Manhattan, NY.
- Manhattan is associated as the city never sleeps, hence most of restaurants in that borough have achieved economic successes.
- Peruvian food have gained high reputation in the last ten year in the world. It is considered one of the best potage in the world.
- The gastronomic entrepreneur wants to take advantage of exponential increase of the Peruvian food and open a new Peruvian restaurant in Manhattan.
- The question is where will be the optimal neighborhood to initiate the gastronomic business adventure.

Released Question in The Business Case

The following questions should be answered after the evaluation of business case.

1) How many Peruvian restaurants are in Manhattan?
2) What is the best location in Manhattan City to open a Peruvian restaurant?
3) Which are other potential neighborhoods in Manhattan for Peruvian Cuisine?
4) Which neighborhoods lack Peruvian restaurants?

Data Section

The following data is needed to get the solution for this case.

- List of Boroughs, Neighborhoods, as well as the latitudes and longitudes from each neighborhoods in New York: https://cocl.us/new_york_dataset
- List of 100 venues around 1000 meters of radius in Manhattan: **Foursquare API**
- Venue data of Peruvian restaurants in Manhattan city: **Foursquare API**

Methodology

The methodology established for this business case follows the process shown in figure 1.

Figure 1

a) Data Acquisition and Cleaning

- Download and acquiring the data of New York neighborhoods fron link https://cocl.us/new_york_dataset .
- Converting it to data frame format using Pandas as shown in Table 1.

Table 1

	Borough	Neighborhood	Latitude	Longitude
0	Bronx	Wakefield	40.894705	-73.847201
1	Bronx	Co-op City	40.874294	-73.829939
2	Bronx	Eastchester	40.887556	-73.827806
3	Bronx	Fieldston	40.895437	-73.905643
4	Bronx	Riverdale	40.890834	-73.912585

b) Exploratory Data Analysis

- Determining the number of borough and neighborhoods in New York. Figure 1 displays that there are 5 boroughs and 306 neighborhoods in New York.
- Manhattan counts with 40 neighborhoods.
- The figure 2 shows the 306 neighborhoods in a folium map.

Figure 2

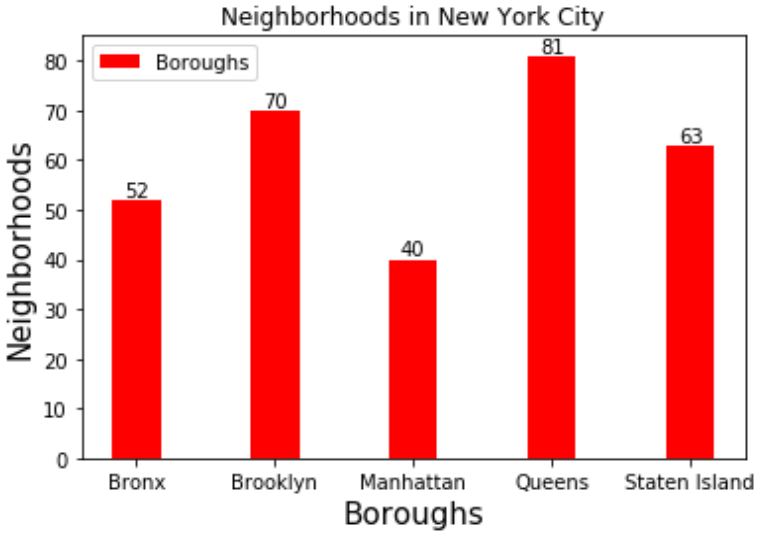
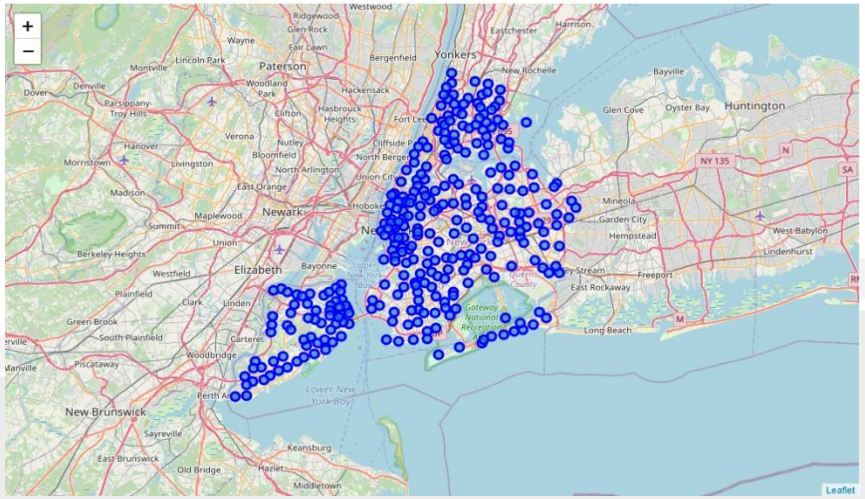


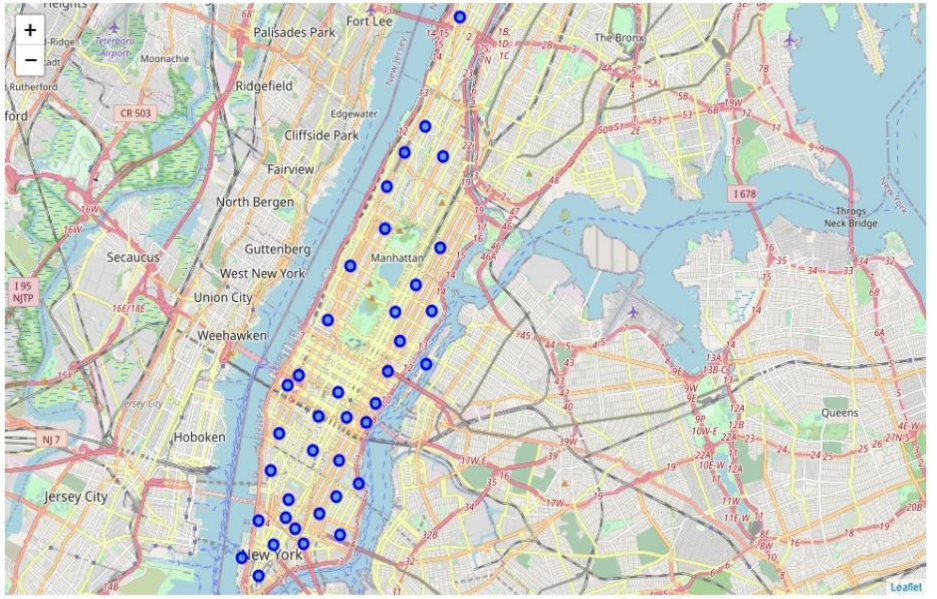
Figure 3



b) Exploratory Data Analysis

- As the Peruvian Entrepreneur wants to open a new Peruvian restaurant in Manhattan city, hence the analysis will be focused in Manhattan's neighborhoods as depicted in the figure 4, Manhattan city counts with 40 neighborhoods

Figure 4



b) Exploratory Data Analysis

- Foursquare API with 100 venues of limit and 1000 meters radius is used to obtain the venues from Manhattan, which yields 3178 venues around the city. As shown in table 2, it displays the first five venues in the Marble Hill neighborhood. For a space issue in the report only the first five venues are displayed in Table 2.

Table 2

```
print(manhattan_venues.shape)
manhattan_venues.head()
```

```
(3178, 7)
```

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Marble Hill	40.876551	-73.91066	Arturo's	40.874412	-73.910271	Pizza Place
1	Marble Hill	40.876551	-73.91066	Bikram Yoga	40.876844	-73.906204	Yoga Studio
2	Marble Hill	40.876551	-73.91066	Tibbett Diner	40.880404	-73.908937	Diner
3	Marble Hill	40.876551	-73.91066	Starbucks	40.877531	-73.905582	Coffee Shop
4	Marble Hill	40.876551	-73.91066	Astral Fitness & Wellness Center	40.876705	-73.906372	Gym

b) Exploratory Data Analysis

- Once the venues from Manhattan are converted to data frame, we use dummies function to convert it from categorical to numerical values. Then the data frame can be grouped by neighborhoods by taking the mean of the frequency of occurrence of each category, as shown in table 3, it shows the first ten neighborhoods grouped by each category.

Table 3

	Neighborhood	Accessories Store	Adult Boutique	Afghan Restaurant	African Restaurant	American Restaurant	Antique Shop	Arcade	Arepa Restaurant	Argentinian Restaurant	Art Gallery	Art Museum	Arts & Crafts Store
0	Battery Park City	0.000000	0.00	0.00	0.000000	0.014925	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
1	Carnegie Hill	0.000000	0.00	0.00	0.000000	0.010989	0.00	0.000000	0.000000	0.010989	0.000000	0.010989	0.000000
2	Central Harlem	0.000000	0.00	0.00	0.066667	0.044444	0.00	0.000000	0.000000	0.000000	0.022222	0.000000	0.000000
3	Chelsea	0.000000	0.00	0.00	0.000000	0.040000	0.00	0.000000	0.010000	0.000000	0.050000	0.000000	0.000000
4	Chinatown	0.000000	0.00	0.00	0.000000	0.030000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
5	Civic Center	0.000000	0.00	0.00	0.000000	0.030000	0.01	0.000000	0.000000	0.000000	0.010000	0.000000	0.000000
6	Clinton	0.000000	0.00	0.00	0.000000	0.040000	0.00	0.000000	0.000000	0.000000	0.010000	0.000000	0.000000
7	East Harlem	0.000000	0.00	0.00	0.000000	0.000000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
8	East Village	0.000000	0.00	0.00	0.000000	0.020000	0.00	0.000000	0.010000	0.010000	0.010000	0.000000	0.010000
9	Financial District	0.000000	0.00	0.00	0.000000	0.040000	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
10	Flatiron	0.000000	0.00	0.00	0.000000	0.030000	0.00	0.000000	0.000000	0.000000	0.020000	0.000000	0.000000

b) Exploratory Data Analysis

- To display the actual Peruvian restaurants, a justification is made to grouped values to look for Peruvian restaurants around Manhattan. It yields Peruvian restaurants operating in different neighborhoods as sown in table 4.

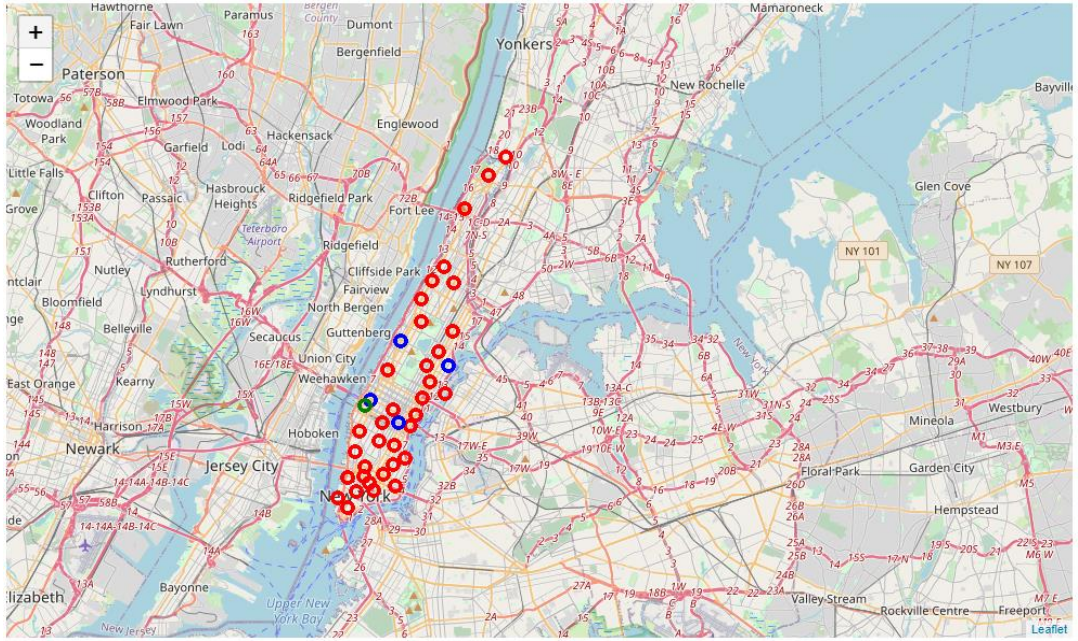
Table 4

	Neighborhoods	Peruvian Restaurant
0	Battery Park City	0.0
1	Carnegie Hill	0.0
2	Central Harlem	0.0
3	Chelsea	0.0
4	Chinatown	0.0

c) Predictive Modeling.

- K-means clustering method is used to cluster the existing Peruvian restaurants by neighborhoods in Manhattan.
- The Neighborhoods are clustered in three groups (red, blue and green)
- The figure 5 depicts that a new Peruvian restaurant can be opened in any of the neighborhoods located in the red cluster.

Figure 5



- ✓ Cluster 0: Neighborhoods with cero Peruvian restaurants
- ✓ Cluster 1: Neighborhoods with more Peruvian Restaurants
- ✓ Cluster 2: Neighborhoods with less Peruvian Restaurants

Results

How many Peruvian restaurants are in Manhattan? Five Peruvian restaurants around Manhattan

What is the best location in Manhattan City to open a Peruvian restaurant? The best place for opening a new Peruvian restaurant is in the red clustered neighborhoods, not far from an existing restaurant on the blue cluster. For example, a possible optimal location could be the East Harlem neighborhood. As shown in figure 5, the East Harlem area is not far from the Yorkville neighborhood that is clustered with blue color. The reason to open the new Peruvian restaurant not far from an actual Peruvian restaurant clustered in blue color is that actual restaurants already have a gained reputation, thus it can be favorable to open the new restaurant not far from a restaurant located in the blue cluster.

What are other potential neighborhoods in Manhattan for Peruvian Cuisine? Another option is to open a Peruvian restaurant in a red cluster neighborhood but far away from an existing Peruvian restaurant because it can be an excellent opportunity to obtain new customers without any similar competition around the neighborhood.

What neighborhoods lack Peruvian restaurants? The Manhattan neighborhoods in the red cluster don’t have a Peruvian restaurant, a great business opportunity to open a new Peruvian restaurant in one of these neighborhoods.

Recommendation

- This evaluation shows that most of the Peruvian restaurants are in the blue cluster neighborhoods (cluster 1) which is around Murray Hill, Yorkville, Clinton, and Upper West Side. The green cluster neighborhoods (cluster 2) has the less Peruvian restaurants around Manhattan. Finally, the red clusters (cluster cero) doesn’t have Peruvian restaurants in its neighborhoods. Therefore, a new Peruvian restaurant can be opened in one of these neighborhoods clustered in red, not far from an existing Peruvian restaurant located in the blue cluster, for instance in the East Harlem neighborhood that is clustered in red.