Capstone Project:
The Battle of Neighborhoods

Peer-graded assignment (week 5)

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Introduction

- Peruvian cuisine is as diverse as its environment – an immense Pacific coast crashing against the mirage of the desert, leading up to some of the tallest peaks in the Andes mountains, and then falling back down into the dense, lush Amazon.

- With all that it has to offer, it is no wonder that the Peruvian cuisine has successfully established itself in a city like New York.

- However, it is still a small branch of the culinary world. Therefore, we will have a look at Peruvian restaurants in New York city and explore where the best Pisco and Ceviche can be found.

Data

- **We will use the following data sources:**

- The **New York City data** (https://cocl.us/new_york_dataset) including boroughs and neighborhoods. We will use this dataset to get a list of all boroughs and neighborhoods n New York City and to get their respective geographical coordinates (latitude, longitude)

- **Foursquare API** to obtain venues as well as venue details. First, we will use the Places API to find all venues around given coordinates, e.g. the location of a neighborhood. Second, we will download venue details like the ratings or likes of a venue for further analysis.

Analysis

1. How many Peruvian restaurants exist in New York City?
2. Which borough and which neighborhood of New York City has the highest number of Peruvian restaurants?
3. Which is the best Peruvian restaurant in New York City?
4. Which borough and which neighborhood has the best Peruvian restaurants?
5. Which borough has the highest density of top-rated Peruvian restaurants?

Methodology

1. We start with defining the functions to request the required data.
2. We then collect the list of all boroughs and neighborhoods in New York City.
3. We identify the Peruvian restaurans in each neighborhood using the Foursquare API.
4. We then collect venue information (ratings) for all identified restaurants.
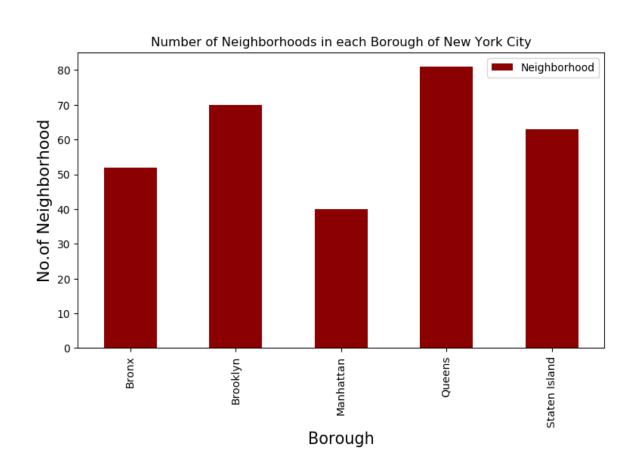5. We combine geographical data (step 1) with venue data (step 3) to find and map the best areas for Peruvian cuisine.

1) Import packages and define functions for API requests

```python
results = requests.get(url).json()
venue_data=results['response']['groups'][0]['items']
venue_details=[]
for row in venue_data:
    try:
        venue_id=row['venue']['id']
        venue_name=row['venue']['name']
        venue_category=row['venue']['categories'][0]['name']
        venue_details.append([venue_id,venue_name,venue_category])
    except KeyError:
        pass
```

2) Get information about boroughs and neighborhoods in New York City

	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

2) Get information about boroughs and neighborhoods in New York City
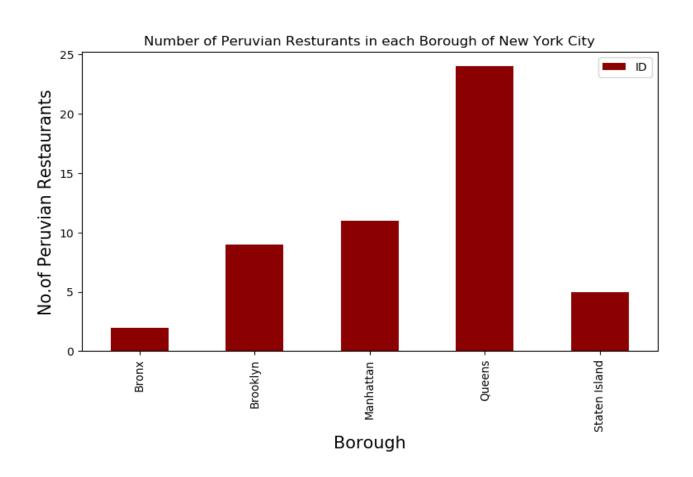
Number of Neighborhoods in each Borough of New York City

We can see in this diagram that Queens has the highest number of neighborhoods.

3) Get information about Peruvian Restaurants in New York City

	Borough	Neighborhood	ID	Name
0	Bronx	Mott Haven	4bb28791715eef3b9f5e85bb	Pio Pio
1	Bronx	Port Morris	4bb28791715eef3b9f5e85bb	Pio Pio
2	Brooklyn	Bushwick	4c117b66416620a12136d9e4	Inca Chicken
3	Brooklyn	Gowanus	4db8c0fcfa8c978590c0f6f1	Surfish
4	Brooklyn	Bath Beach	4e3c94bc483b04e17a8b15a6	La granja

3) Get information about Peruvian Restaurants in New York City

Number of Peruvian Resturants in each Borough of New York City

We can see that the borough with the highest number of Peruvian restaurants is Queens with 24 restaurants in total.

4) Analyze the ratings of all restaurants

	Borough	Neighborhood	ID	Name	Likes	Rating	Tips
0	Bronx	Mott Haven	4bb28791715eef3b9f5e85bb	Pio Pio	67.0	8.8	23.0
1	Bronx	Port Morris	4bb28791715eef3b9f5e85bb	Pio Pio	67.0	8.8	23.0
2	Brooklyn	Bushwick	4c117b66416620a12136d9e4	Inca Chicken	34.0	8.5	15.0
3	Brooklyn	Gowanus	4db8c0fcfa8c978590c0f6f1	Surfish	134.0	8.2	58.0
4	Brooklyn	Bath Beach	4e3c94bc483b04e17a8b15a6	La granja	6.0	6.9	6.0

4) Analyze the ratings of all restaurants

First, we determine the restaurant with the best ratings:

```
peru_rest_stats_ny.iloc[peru_rest_stats_ny['Rating'].idxmax()]
Borough                          Manhattan
Neighborhood             Greenwich Village
ID                  5b95359481a0ea002cdce0ce
Name                             Llama-San
Likes                                   80
Rating                                   9
Tips                                    14
Name: 12, dtype: object
```
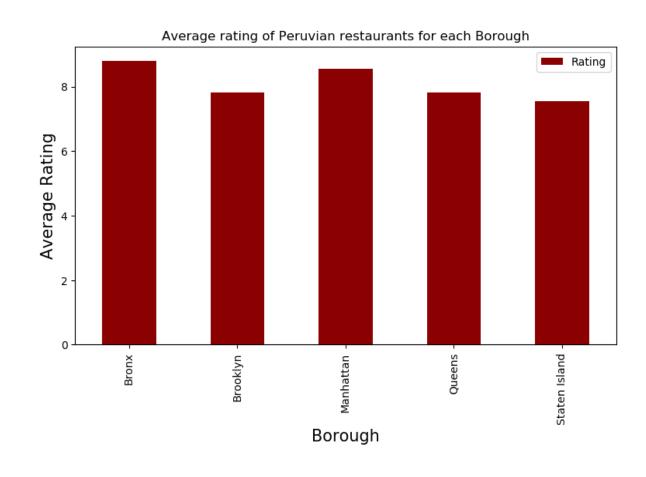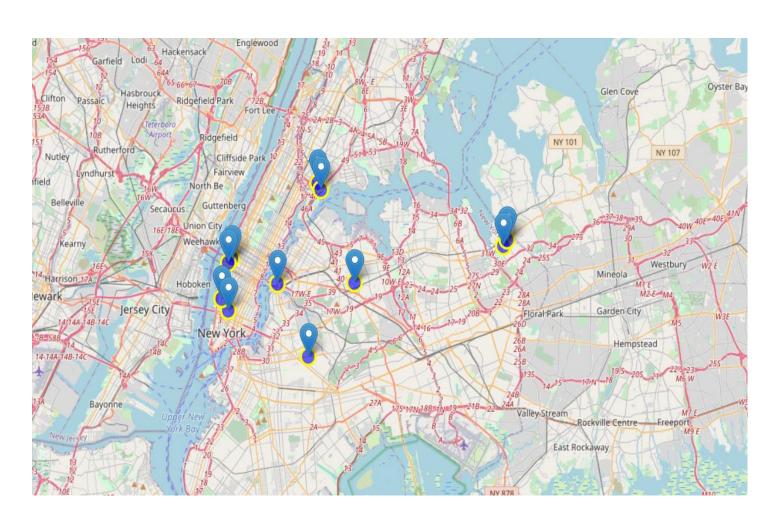
The restaurant with the highest rating is Llama-San in Greenwich Village, Manhattan.

5) Identify and plot the best areas for Peruvian cuisine in New York City

	Neighborhood	Average Rating
39	West Village	9.0
17	Greenwich Village	9.0
20	Hudson Yards	8.8
27	Mott Haven	8.8
5	Clinton	8.8
31	Port Morris	8.8
23	Little Neck	8.5
21	Hunters Point	8.5
11	Elmhurst	8.5
8	Douglaston	8.5

Average rating of Peruvian restaurants for each Borough

5) Identify and plot the best areas for Peruvian cuisine in New York City

We can see in the map, that four highly rated restaurants can be found in Manhattan.

Summary

Question 1: How many Peruvian restaurants exist in New York City?

In June 2020, there are 51 Peruvian restaurants in New York City.

Question 2: Which borough and which neighborhood of New York City has the highest number of Peruvian restaurants?

The borough with the highest number of Peruvian restaurants is Queens with 24 restaurants in total. The neighborhood with the highest number of Peruvian restaurants is Jackson Heights which is located in Queens.

Question 3: Which is the best Peruvian restaurant in New York City?

The restaurant with the highest rating is Llama-San in Greenwich Village, Manhattan. The restaurant with the highest number of likes is Pio Pio which is also located in Manhattan (Clinton).

Question 4: Which borough and which neighborhood has the best Peruvian restaurants?

The neighborhoods with the highest rating are West Village and Greenwich Village. Both are in Manhattan and have an average rating of 9. But although Queens has the most Peruvian restaurants and although the best two neighborhoods are in Manhattan, the Bronx has the highest average rating.

Question 5: Which borough has the highest density of top-rated Peruvian restaurants?

Four highly rated restaurants are located relatively close to another in Manhattan so that this borough has the highest density of top Peruvian restaurants.