

# COURSERA CAPSTONE – THE BATTLE OF THE NEIGHBORHOOD

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## OPENING OF A NEW PERUVIAN RESTAURANT IN BARRANQUILLA

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### 1. Introduction

#### 1.1 Problem

According to the economic projections with respect to Peruvian restaurants in Colombia, it is expected that by 2019 they will exceed sales to 62 million dollars<sup>1</sup>. Up to 2018, 81 Peruvian food points were registered in the country, 33 are in Bogotá and 29 in Medellín<sup>2</sup>, the rest are in other regions.

A franchise of Peruvian restaurants has decided to start a new plaza in the city of Barranquilla, among its reasons is: geographically strategic position with opening to the Magdalena River and for being one of the epicenters in terms of business in Colombia. The central objective of this research study is to analyze and select the best locations in the city of Barranquilla, Colombia so that the franchise opens to its new location. With the use of data science methodology and automatic learning techniques such as grouping.

My proposal is to analyze the sectors of Barranquilla to consider the opening of new Peruvian restaurants, according to the requirements demanded by the franchise:

- Proximity and ease for customers
- There is no presence of the competition at least with a radius of 1km away.
- It is surrounded by companies from different economic sectors.
- The proximity to places of high influx of traffic, via major.

#### 1.2 Interest

Of course, any investor who is thinking of opening a new restaurant of Peruvian food in the city and also for Big Data students who want to expand their knowledge and be able to carry out similar projects.

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<sup>1</sup> <https://www.semana.com/contenidos-editoriales/especiales-regionales-peru/articulo/la-gastronomia-peruana-en-colombia/532431>

<sup>2</sup> <http://www.franquiciascolombia.co/952-visitaran-a-colombia-12-franquicias-gastronomicas-de-peru-para-identificar-posibles-inversionistas>

## 2. Data acquisition and cleaning

### 2.1 Data sources

To make a good choice to open Peruvian restaurants in Barranquilla, the following information is required:

- List / Information on the Barranquilla sectors with their Geodata (latitude and longitude).
- List / Information on the main roads in Barranquilla with geographic data.

### 2.2 Data cleaning

The data that we will use for this analysis is a combination of a CSV file that has been prepared for the purposes of the analysis of multiple sources (Barrios\_coord.csv) and the location / location information on Foursquare.

The file will be read directly in Jupiter's notebook for convenience and space saving. However, the grouping of city sectors and mapping will be shown. An algorithm was used to determine the Nominatim geodata. The coding of the real algorithm can be shown in 'markdown', keep in mind that this will take a while to be executed.

**Source 1:** Barrios\_coord.csv

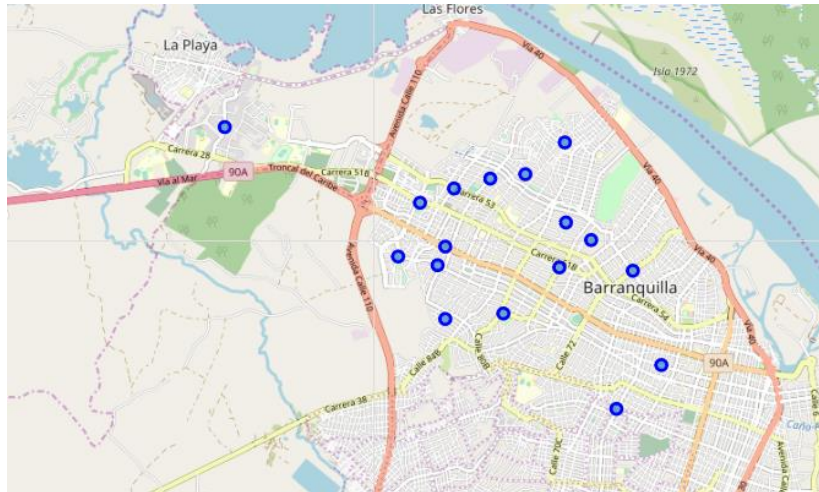
## 3. Exploratory Data Analysis

16 strategic neighborhoods were commercially taken in the city of Barranquilla and the latitudes and longitudes of their locations were manually searched with the help of Google Maps (See Figure 1) and with the data provided by the DANE (National Administrative Department of Statistics, by its acronyms in Spanish). The latter happened, because it was not possible to find in Wikipedia the list of neighborhoods in the city of Barranquilla. Next, an example of the table generated by the obtained data.

|   | Neighborhood    | Latitude  | Longitude  |
|---|-----------------|-----------|------------|
| 0 | Altos De Riomar | 11.015578 | -74.820644 |
| 1 | Miramar         | 11.003472 | -74.835111 |
| 2 | Andalucia       | 11.016125 | -74.815162 |
| 3 | Altos Del Limon | 11.013992 | -74.826282 |
| 4 | El Golf         | 11.008695 | -74.808828 |
| 5 | Riomar          | 11.011865 | -74.831650 |

**Figure 1.** Example of data table

Then we examined the most common places by neighborhood on Foursquare (figure 2). The reader is reminded that Foursquare has one of the largest databases of more than 105 million places and is used by more than 125,000 developers. Foursquare API will provide many categories of local data, we are particularly interested in the category of Peruvian Restaurant to help us solve the commercial problem presented. When we group the data and classify by "the most common", it seems that Peruvian places have a minimal participation in the city that, of course, could be analyzed as little presence of competitors.



This is a project used many data science skills, working with API (Foursquare), data cleansing, data contention, machine learning (K-means grouping) and map display (Folium).

In the same sense, with the objective of understanding and analyzing in greater depth the data of the 16 main neighborhoods that were chosen as a sample for the present study, 6 neighborhoods were chosen as a representative sample, among which are: Miramar, Altos del Limón, Villa Country , Alto Prado Villa Campestre and Ciudad Jardín. Then, each of these neighborhoods are specified with the names of the places in their respective category for a subsequent analysis.

|   | neighborhood | name                   | categories                | lat       | lng        |
|---|--------------|------------------------|---------------------------|-----------|------------|
| 0 | Miramar      | Bodytech Miramar       | Gym / Fitness Center      | 11.003574 | -74.835128 |
| 1 | Miramar      | Arabe Internacional    | Falafel Restaurant        | 11.006065 | -74.826594 |
| 2 | Miramar      | Zahle                  | Middle Eastern Restaurant | 11.005083 | -74.826653 |
| 3 | Miramar      | Hamburguesas El Corral | Burger Joint              | 11.005160 | -74.827853 |
| 4 | Miramar      | Popsy                  | Ice Cream Shop            | 11.004006 | -74.827308 |

**Figure. 3 Places / categories of the sector of Miramar with their respective location**

It can be seen that the 5 main places of Miramar 3 of them are restaurants, that is, it can be concluded that it is an area with a high flow of commercial premises in the category of restaurants.

|   | neighborhood    | name                           | categories        | lat       | lng        |
|---|-----------------|--------------------------------|-------------------|-----------|------------|
| 0 | Altos del limón | Parque Bulevar Buenavista      | Park              | 11.015699 | -74.826604 |
| 1 | Altos del limón | Centro Comercial Buenavista II | Shopping Mall     | 11.014037 | -74.828110 |
| 2 | Altos del limón | Salvator's Pizza               | Pizza Place       | 11.014151 | -74.826245 |
| 3 | Altos del limón | Centro Comercial Buenavista I  | Shopping Mall     | 11.013445 | -74.827561 |
| 4 | Altos del limón | Crepes & Waffles               | French Restaurant | 11.013738 | -74.827594 |

**Figure. 4 Places / categories of the sector of Altos del Limón with their respective location**

It can be seen that the 5 main places of Altos del Limón 2 are in the Shopping Mall category, that is, it is a highly commercial area whose restaurant presence is minimal since only 1 of them is in this category.

|   | neighborhood  | name                      | categories          | lat       | lng        |
|---|---------------|---------------------------|---------------------|-----------|------------|
| 0 | Villa Country | Country Club              | Golf Course         | 11.004848 | -74.804546 |
| 1 | Villa Country | Tienda MONO               | Clothing Store      | 11.003164 | -74.805265 |
| 2 | Villa Country | Noa Sushi & Robata        | Japanese Restaurant | 11.003397 | -74.808010 |
| 3 | Villa Country | SUSHI MAS Comida Japonesa | Sushi Restaurant    | 11.004008 | -74.803655 |
| 4 | Villa Country | Falabella                 | Department Store    | 11.004020 | -74.805983 |

**Figure. 5 Places / categories of the sector of Villa Country with their respective location**

According to the 5 main places in this sector you can see that their categories are quite varied, except for the category of restaurants that are 2, and in addition they offer the same type of cuisine: Japanese.

|   | neighborhood | name                         | categories           | lat       | lng        |
|---|--------------|------------------------------|----------------------|-----------|------------|
| 0 | Alto Prado   | Varadero Pescados & Mariscos | Caribbean Restaurant | 11.002769 | -74.810050 |
| 1 | Alto Prado   | Noa Sushi & Robata           | Japanese Restaurant  | 11.003397 | -74.808010 |
| 2 | Alto Prado   | Discovery Sushi Bar          | Sushi Restaurant     | 10.999717 | -74.809828 |
| 3 | Alto Prado   | Crepes & Waffles             | French Restaurant    | 11.001006 | -74.808344 |
| 4 | Alto Prado   | Fior Di Pizza                | Pizza Place          | 11.001325 | -74.807735 |

**Figure. 6 Places / categories of the sector of Alto Prado with their respective location**

According to the 5 main places of Alto Prado it can be seen that it is a high-flow zone of restaurants where 4 places belong to this category, although it can be concluded that the restaurants offer a variety of foreign and local foods.

|   | neighborhood    | name                                   | categories           | lat       | lng        |
|---|-----------------|--|----------------------|-----------|------------|
| 0 | Villa Campestre | Centro Comercial Villa Campestre Plaza | Shopping Mall        | 11.022525 | -74.862863 |
| 1 | Villa Campestre | Centro Comercial Le Champ              | Shopping Mall        | 11.018798 | -74.864641 |
| 2 | Villa Campestre | Valestrino Pastas y Pizzas             | Pizza Place          | 11.021320 | -74.868225 |
| 3 | Villa Campestre | La panatta                             | Pizza Place          | 11.016883 | -74.849814 |
| 4 | Villa Campestre | Burger King                            | Fast Food Restaurant | 11.018184 | -74.864852 |

**Figure. 7 Places / categories of the sector of Villa Campestre with their respective location**

Villa Campestre according to the 5 main places is a sector of the city where there is 2 Shopping Mall, which means that it is a highly commercial and also 3 places belong to the category of restaurants where 2 of them are pizzeria.

|   | neighborhood  | name                | categories       | lat       | lng        |
|---|---------------|---------------------|------------------|-----------|------------|
| 0 | Ciudad Jardin | Yona's Burger House | Burger Joint     | 10.996785 | -74.816428 |
| 1 | Ciudad Jardin | Pietrini's La Pizza | Pizza Place      | 10.997197 | -74.821125 |
| 2 | Ciudad Jardin | Panadería Zapatoca  | Bakery           | 10.996531 | -74.815711 |
| 3 | Ciudad Jardin | Narcobollo          | Arepa Restaurant | 10.999031 | -74.821824 |
| 4 | Ciudad Jardin | Salvator's Pizza    | Pizza Place      | 11.002856 | -74.818450 |

**Figure. 8 Places / categories of the sector of Ciudad Jardín with their respective location**

It can be concluded that Garden City according to the 5 main places is a sector where there is a variety of restaurants among them are offered: pizzeria, bakery and arepas.

After making this analysis, we proceeded to classify and group each of the 6 selected sectors of the city in order to check the presence of Peruvian restaurants, as can be seen (Figure 9) in the neighborhoods of Altos del Limón, Miramar and Villa Campestre it does not have the presence of restaurants in this category, therefore, this is a basis to build the final recommendations and conclusions.

|   | neighborhood    | Peruvian Restaurant | Cluster Labels | Latitude  | Longitude  |
|---|-----------------|---------------------|----------------|-----------|------------|
| 1 | Altos del limón | 0.000000            | 0              | NaN       | NaN        |
| 3 | Miramar         | 0.000000            | 0              | 11.003472 | -74.835111 |
| 4 | Villa Campestre | 0.000000            | 0              | 11.023403 | -74.862230 |
| 5 | Villa Country   | 0.021739            | 1              | 11.006075 | -74.804908 |
| 2 | Ciudad Jardin   | 0.022727            | 2              | 10.994720 | -74.818642 |
| 0 | Alto Prado      | 0.022222            | 3              | 11.001832 | -74.809796 |

**Figure. 9 Classification and grouping of Peruvian restaurants by neighborhood**

## 4. Recommendations

The 98th street between 53-56 races is currently having a large population growth (more and more buildings are being made in the sector), along with it can be said that this sector has a great commercial influence in the city. At present there is not a Peruvian food restaurant around, the closest one is 644m, however, it is considered that you can still take advantage of the opportunity due to its strategic geographical position. As can be seen in figure 5, Altos del Limón is where major hotels are present, as is Miramar, but which has few restaurants compared to other sectors. This also represents a great opportunity since many tourists will have more access to foreign food, especially Peruvian food.

| neighborhood    | Venue Type | count |
|-----------------|------------|-------|
| Alto Prado      | Hotel      | 6     |
|                 | Restaurant | 37    |
| Altos del limón | Hotel      | 8     |
|                 | Restaurant | 26    |
| Ciudad Jardin   | Hotel      | 5     |
|                 | Restaurant | 35    |
| Miramar         | Hotel      | 8     |
|                 | Restaurant | 28    |
| Villa Campestre | Restaurant | 4     |
| Villa Country   | Hotel      | 6     |
|                 | Restaurant | 38    |

Figure 10. Hotels and restaurants by sector

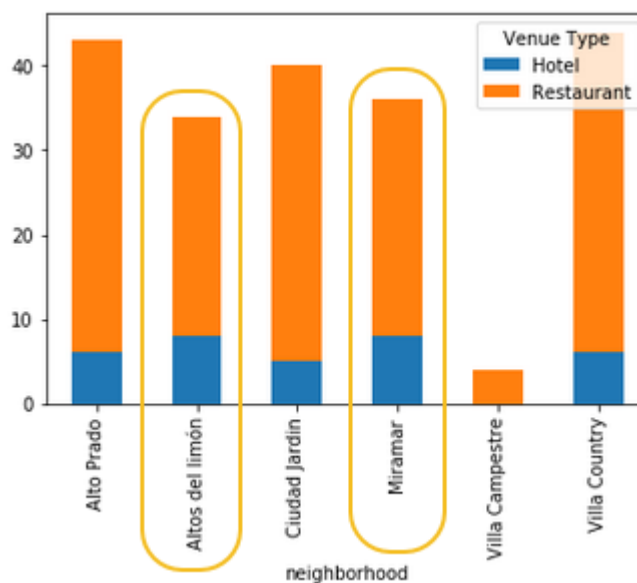


Figure 11. Hotels and restaurants grouped by sectors of the city

## 5. Conclusion

The final result of this research study recommends the sector of Altos del Limón, on Calle 98 with carrera 56 for the reasons mentioned in the Recommendations section, and it is considered the best option considering all the factors: relatively volume high of activities for tourists and locals, it is a business center, it is close to other high rental neighborhoods and the proportion of hotels to restaurants is not too high and it is located in main roads, this makes it easy to access.

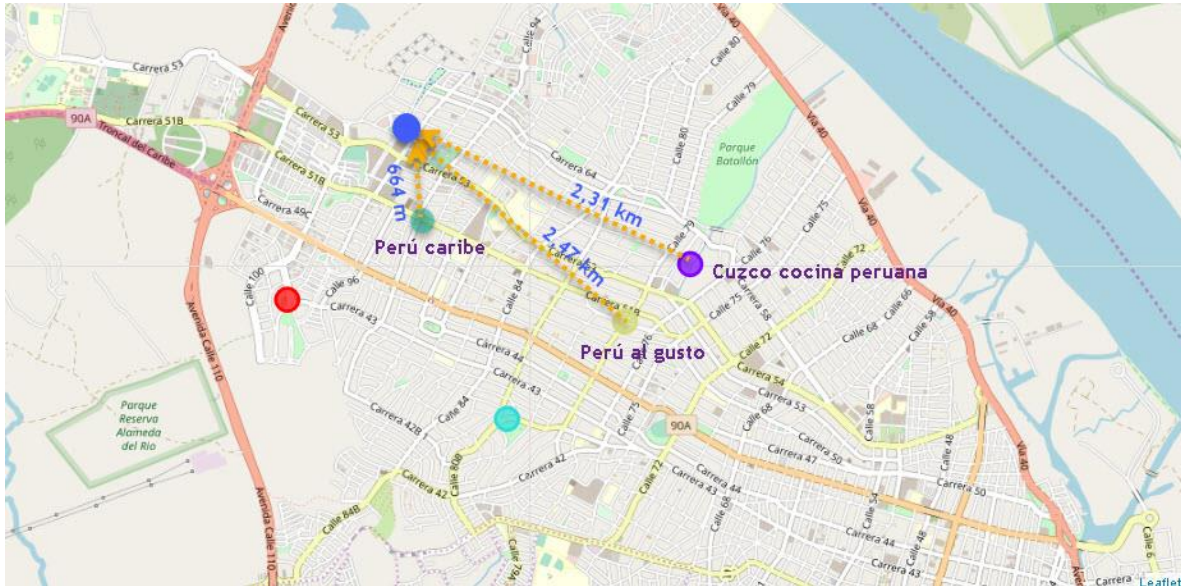


Figure 12. Final location as a result of the study

It is important to note that other neighborhoods that were considered were Alto Prado, Ciudad Jardín, Miramar, Villa Campestre and Villa Country, but when not fulfilling most of the requirements, Altos de Limón was chosen as an option, and it was also essential to make the final decision about the distance between the competition. Finally, it is concluded that Barranquilla is not saturated in restaurants whose niche market is Peruvian food, only in the city there are 3 restaurants in this category.