

# 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.

**Figure.2 Map of Barranquilla neighborhoods using Folium**

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).

	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 Jardín	Yona's Burger House	Burger Joint	10.996785	-74.816428
1	Ciudad Jardín	Pietrini's La Pizza	Pizza Place	10.997197	-74.821125
2	Ciudad Jardín	Panadería Zapatoca	Bakery	10.996531	-74.815711
3	Ciudad Jardín	Narcobollo	Arepa Restaurant	10.999031	-74.821824
4	Ciudad Jardín	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 Ciudad Jardín 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 Jardín	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 10 y 11, 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 Jardín	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

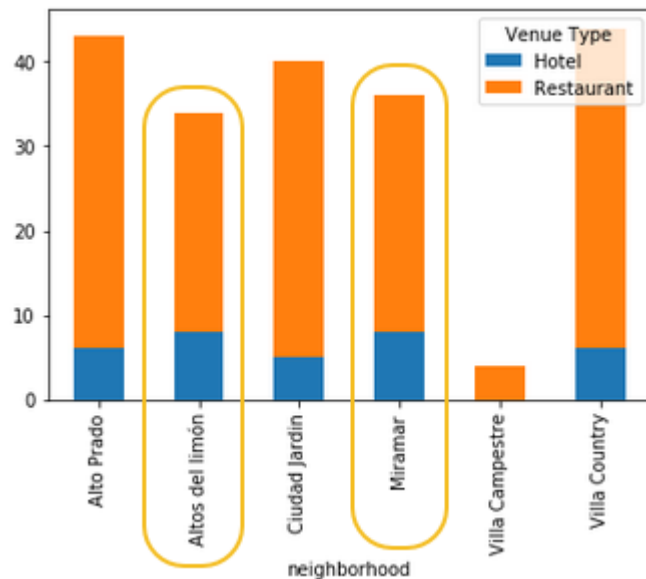
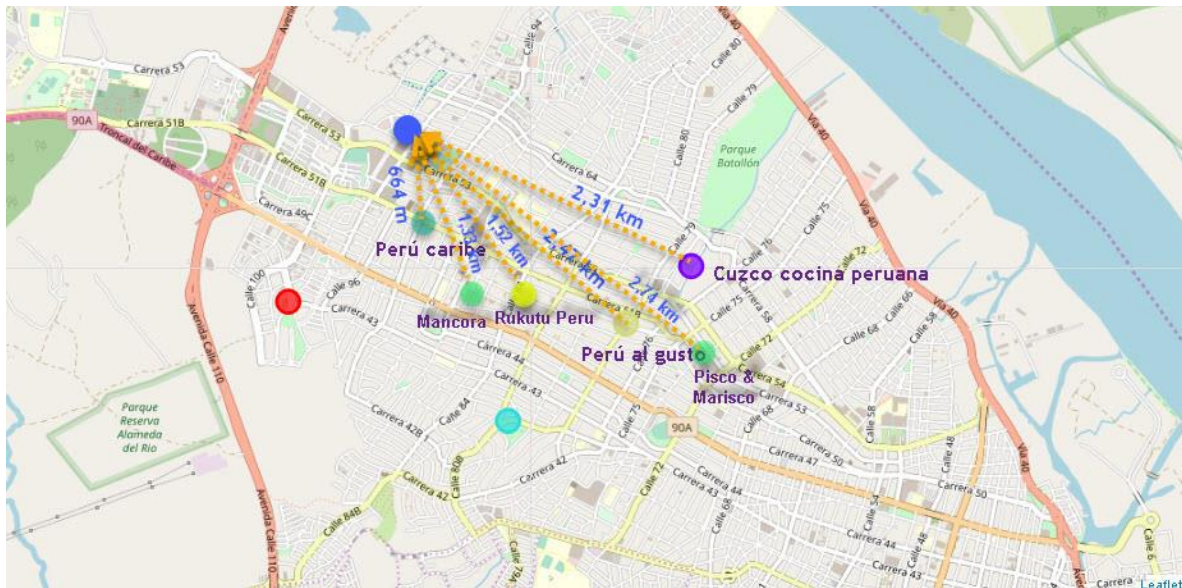


Figure 11. Hotels and restaurants grouped by sectors of the city

## 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**

Adding the result of the distances obtained from the 6 places: Peru Caribbean (644 m), Mancora (1.33 km), Rukutu Peru Restaurant (1.52 km), Cuzco Peruvian Cuisine (2.31 km), Peru to taste (2.47 km) and Pisco & Marisco (2.74 km) gives as a result that the average distance to the recommended place to open the new restaurant is 1.84 km, which is quite positive and meets the requirements raised at the beginning of the present 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 6 restaurants in this category.