

IBM Data Science Professional Certificate capstone project

**Analysis of the communes / neighborhoods of the
city of Buenos Aires**

Introduction

- Approximately 2,000,000 immigrants born in another country resided in Argentina, equivalent to 4.5% of the population.
- he largest recipient of immigrants from Latin America.
- Buenos Aires being one of the main cities that houses this foreign population.

01

The large amount of immigrant population, it is presented as a great opportunity

02

Open a restaurant that satisfies a gastronomic need for typical food of some foreign country

03

Analyzing the number of immigrant population and the existing competition by areas

04

Obtain as a result the best area to open the restaurant and the best type of food to sell



Business Problem



Data used

1 - Foursquare Location Data: Venues information of each commune/neighborhood. We are only going to use the restaurants and their coordinates.

2 - Buenos Aires communes and neighbourhoods dataset: All the names of Buenos Aires communes and its neighborhoods.

<https://cdn.buenosaires.gob.ar/datosabiertos/datasets/comunas/comunas.csv>

3 - GeoJson dataset: Communes boundaries that will help to visualize communes on the map.

https://cdn.buenosaires.gob.ar/datosabiertos/datasets/comunas/CABA_comunas.geojson

4 - Coordinates of Buenos Aires communes: Latitude and longitude of each Buenos Aires commune.

<https://www.municipalidad-argentina.com.ar/municipalidad-buenos-aires-ar.html>

5 - Foreign population of communes dataset: Number of foreign population of each commune.

<https://www.indec.gob.ar/indec/web/Nivel4-Tema-2-41-135>

Methodology



Figure out
frequency of each
type of restaurant



Figure out density
of restaurants by
communes



Based on predominant
foreign population, and
the existing foreign food
restaurants, **figure out**
the most promising area
to open a new restaurant

frequency of each type of restaurant

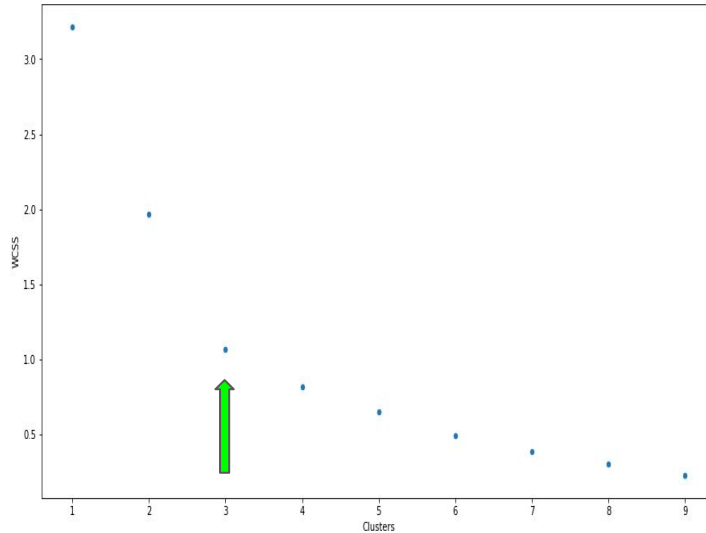
Neighborhood	1st Most Common Restaurant	2nd Most Common Restaurant	3rd Most Common Restaurant	4th Most Common Restaurant	5th Most Common Restaurant	6th Most Common Restaurant	7th Most Common Restaurant	8th Most Common Restaurant	9th Most Common Restaurant	10th Most Common Restaurant
AGRONOMIA, CHACARITA, PARQUE CHAS, PATERNAL, V...	Italian Restaurant	Restaurant	Argentinian Restaurant	Vegetarian / Vegan Restaurant	Mexican Restaurant	South American Restaurant	Thai Restaurant	Tapas Restaurant	Swiss Restaurant	Sushi Restaurant
ALMAGRO, BOEDO	Argentinian Restaurant	Restaurant	Sushi Restaurant	Spanish Restaurant	Italian Restaurant	Paella Restaurant	Food Service	Fast Food Restaurant	Eastern European Restaurant	Mexican Restaurant
BALVANERA, SAN CRISTOBAL	Fast Food Restaurant	Peruvian Restaurant	Argentinian Restaurant	American Restaurant	Vegetarian / Vegan Restaurant	Sushi Restaurant	Spanish Restaurant	Restaurant	Japanese Restaurant	Italian Restaurant
BARRACAS, BOCA, NUEVA POMPEYA, PARQUE PATRICIOS	Argentinian Restaurant	Restaurant	Latin American Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	Peruvian Restaurant	American Restaurant	Japanese Restaurant
BELGRANO, COLEGIALES, NUNEZ	Argentinian Restaurant	Peruvian Restaurant	Sushi Restaurant	Restaurant	Latin American Restaurant	Chinese Restaurant	Italian Restaurant	Japanese Restaurant	French Restaurant	Food Service
CABALLITO	Argentinian Restaurant	Restaurant	Sushi Restaurant	Fast Food Restaurant	Empanada Restaurant	Food Service	Spanish Restaurant	Italian Restaurant	Tapas Restaurant	Vegetarian / Vegan Restaurant
COGHIAN, SAAVEDRA, VILLA PUEYRREDON, VILLA URG...	Argentinian Restaurant	Food & Drink Shop	American Restaurant	Thai Restaurant	Tapas Restaurant	Swiss Restaurant	Sushi Restaurant	Spanish Restaurant	Latin American Restaurant	Restaurant
CONSTITUCION, MONSERRAT, PUERTO MADERO, RETIRO...	Argentinian Restaurant	Italian Restaurant	Japanese Restaurant	Fondue Restaurant	Vegetarian / Vegan Restaurant	Swiss Restaurant	Restaurant	Mediterranean Restaurant	German Restaurant	French Restaurant
FLORES, PARQUE CHACABUCO	South American Restaurant	Fast Food Restaurant	Restaurant	Japanese Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	Peruvian Restaurant	American Restaurant
FLORESTA, MONTE CASTRO, VELEZ SARSFIELD, VERSA...	Argentinian Restaurant	Restaurant	Latin American Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	Peruvian Restaurant	American Restaurant	Japanese Restaurant
LINERS, MATADEROS, PARQUE AVELLANEDA	Argentinian Restaurant	Sushi Restaurant	Spanish Restaurant	Peruvian Restaurant	Latin American Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	American Restaurant
PALERMO	Argentinian Restaurant	Italian Restaurant	Middle Eastern Restaurant	Thai Restaurant	Sushi Restaurant	Indian Restaurant	French Restaurant	Restaurant	Mediterranean Restaurant	Cuban Restaurant
RECOLETA	Argentinian Restaurant	Italian Restaurant	Restaurant	Empanada Restaurant	French Restaurant	Peruvian Restaurant	Spanish Restaurant	South American Restaurant	Vegetarian / Vegan Restaurant	Sushi Restaurant
VILLA DEL PARQUE, VILLA DEVOTO, VILLA GRAL. M...	Argentinian Restaurant	Restaurant	Spanish Restaurant	Latin American Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	Peruvian Restaurant	American Restaurant
VILLA LUGANO, VILLA RIACHUELO, VILLA SOLDATI	Fast Food Restaurant	American Restaurant	Mediterranean Restaurant	Mexican Restaurant	Middle Eastern Restaurant	Paella Restaurant	Peruvian Restaurant	Restaurant	South American Restaurant	Japanese Restaurant

Finding best **K** clusters

Elbow
method

Silhouette
method

Clusters		WCSS
0	1	3.218239
1	2	1.966600
2	3	1.060794
3	4	0.814606
4	5	0.650428
5	6	0.489234
6	7	0.382789
7	8	0.296772
8	9	0.223413



Silhouette score for k = 2(clusters) is 0.41841303408853303
Silhouette score for k = 3(clusters) is 0.4459333520668169 ✓
Silhouette score for k = 4(clusters) is 0.3422741180343111
Silhouette score for k = 5(clusters) is 0.28756087544124714
Silhouette score for k = 6(clusters) is 0.2702451620281194
Silhouette score for k = 7(clusters) is 0.1881355835457263
Silhouette score for k = 8(clusters) is 0.178412665788756
Silhouette score for k = 9(clusters) is 0.18666878808806045

**Based on trend
restaurant, we
can say that**

- **Cluster 0:** Argentinian, Fast food, italian, japanese, middle eastern, peruvian, south american, spanish and sushi restaurant are the most common in this cluster.
- **Cluster 1:** American, Fast food and mediterranean are the most common in this cluster.
- **Cluster 2:** American, argentinian, food & drink and latin american are the most common in this cluster.

top 10 foreign population of each Cluster

Cluster 0



Cluster 1



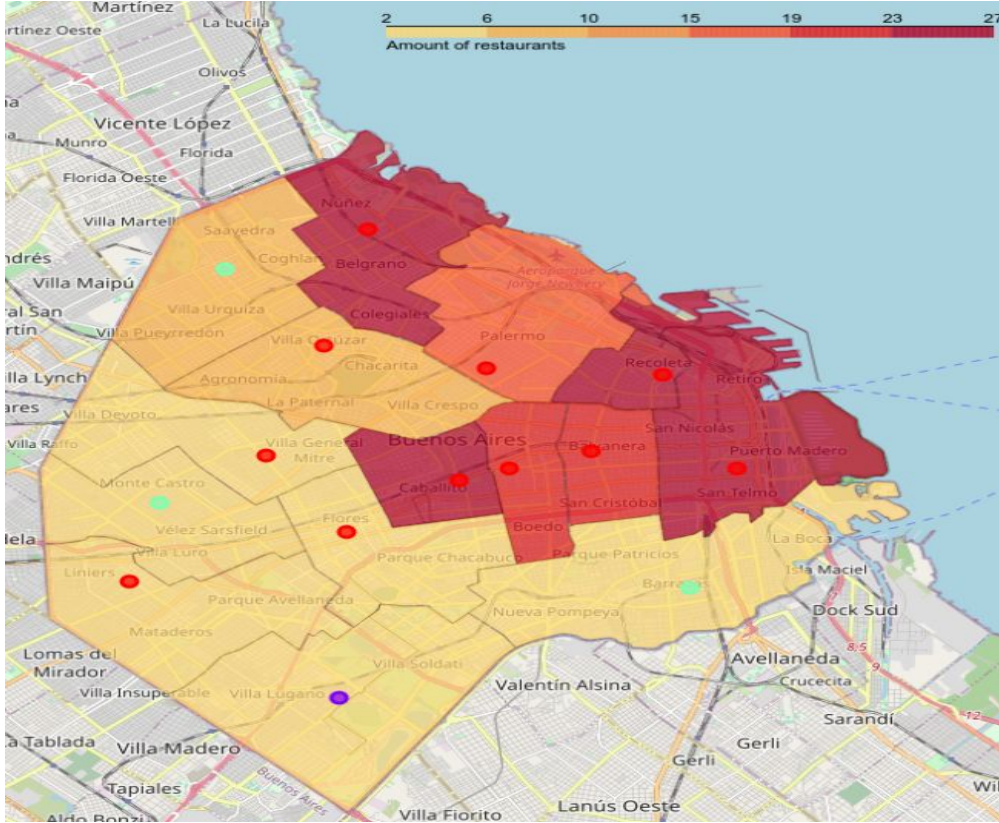
Cluster 2

	Birthplace	Total_foreign-born_population
0	Perú	46143
1	Bolivia	45350
2	Paraguay	42679
3	Resto de América	26770
4	Uruguay	23824
5	España	20084
6	Italia	15419
7	Resto de Europa	10882
8	Brasil	9282
9	Chile	8103

	Birthplace	Total_foreign-born_population
0	Bolivia	20365
1	Paraguay	16597
2	Perú	2265
3	Italia	1688
4	Uruguay	941
5	España	841
6	Chile	309
7	Resto de América	237
8	Resto de Europa	164
9	Brasil	149

	Birthplace	Total_foreign-born_population
0	Paraguay	21874
1	Perú	12392
2	Bolivia	11021
3	Uruguay	6435
4	España	5356
5	Italia	4606
6	Resto de América	3988
7	Resto de Europa	2147
8	Chile	1778
9	Brasil	1423

Density of restaurants in each commune



Results and conclusion

Highest concentration of restaurants was detected in commune 1, 2, 3, 5, 6, 13 and 14

01

In cluster 0, foreign population that predominates are from Peru, Bolivia and Paraguay, also the same type of restaurants predominante

02

In cluster 2, foreign population that predominates are from Paraguay, Peru and Bolivia also the same type of restaurants predominante

03

In cluster 1, foreign population that predominates are from Bolivia, Paraguay and Peru. The predominant restaurants in this cluster are american, Fast food and mediterranean restaurants. Restaurants of typical food from these countries do not predominate in this cluster. **Commune 8** (VILLA LUGANO, VILLA RIACHUELO, VILLA SOLDATI) are presented as a potential area to open a **bolivian, paraguayan, peruvian or Latin American restaurant**

04

