Capstone Project
IBM Applied Data Science

Opening a Sushi Restaurant in Buenos Aires

by
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Introduction

- Buenos Aires is the capital and largest city of Argentina. It is a multicultural city, being home to multiple ethnic and religious groups. Several languages are spoken in the city in addition to Spanish, contributing to its culture and the dialect spoken in the city and in some other parts of the country.

- This is because since the 19th century the city, and the country in general, has been a major recipient of millions of immigrants from all over the world, making it a melting pot where several ethnic groups live together and being considered one of the most diverse cities of the Americas.

- The city is divided into 48 barrios (neighborhoods) for administrative purposes.

- Buenos Aires is not traditionally known for its Asian food, meat is more the order of the day. There are thousands of non asian restaurants to choose from, but the Asian cuisine, even though is growing consistently, doesn't have the representation it could.

- In recent years the number of asian restaurant, by it sushi, ramen, Thai, etc, has augmented, but I think it could be a good project for a developer to invest in one of these different categories.

Business problem

- A developer is looking to invest and open a new sushi restaurant in the city.

- This project, using data science methodology and machine learning, will help analyze and select the best location for it.

- Which neighborhood lacks sushi restaurants?

- Which neighborhood would be the best option for opening one?

Data Section

- For this project we will need the following data:

  - Buenos Aires data containing a list of its neighborhoods along with their latitude and longitude.

  - Data source: https://en.wikipedia.org/wiki/Neighbourhoods_of_Buenos_Aires

- GeoSpace data.

  - This will let us retrieve the geographical coordinates (latitude and longitude) of the city of Buenos Aires and of all its neighborhoods.

- Venues data by neighborhood.

  - From this list we'll get all the restaurants on each neighborhood and filter the neighborhoods with sushi restaurants.

  - Data source: Foursquare API

Methodology

- Getting information from the web, using the wikipedia page, for all the information concerning the neighborhoods.

- Getting latitude and longitude coordinates using Geocoder.

- Using the Foursquare API to get venue data.

- Filtering venues containing sushi restaurants.

- Running k-means clustering to group the neighborhoods in different clusters.

- Visualizing the clusters in maps using Folium.

Results

- Information from the web transformed into DataFrames.

- Getting the Data for the venues using Foursquare API.

- Filtering the venues including sushi restaurants.

	Neighborhood	Latitude	Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Agronomía	-34.59243	-58.49659	Bonafide	-34.590722	-58.498184	Coffee Shop
1	Agronomía	-34.59243	-58.49659	Baraba	-34.590674	-58.500094	Restaurant
2	Agronomía	-34.59243	-58.49659	Bien de Bien	-34.592322	-58.500959	Café
3	Agronomía	-34.59243	-58.49659	Renatto Cucina Italiana	-34.591342	-58.500781	Italian Restaurant
4	Agronomía	-34.59243	-58.49659	Plaza Martín Rodríguez	-34.590837	-58.501098	Plaza
5	Agronomía	-34.59243	-58.49659	Ladobueno Patisserie & Café	-34.596536	-58.498617	Coffee Shop
6	Agronomía	-34.59243	-58.49659	Repostería Papá Eduvilio	-34.595906	-58.499338	Bakery
7	Agronomía	-34.59243	-58.49659	Club El Talar	-34.591820	-58.498330	Sports Club

	Neighborhood	Sushi Restaurant	Cluster Labels	Population	Latitude	Longitude
0	Agronomía	0.00000	0	13963	-34.59243	-58.49659
1	Almagro	0.00000	0	128206	-34.61108	-58.43028
2	Balvanera	0.00000	0	137521	-34.61011	-58.40602
3	Barracas	0.00000	0	73377	-34.64990	-58.38910
4	Belgrano	0.02381	3	126816	-34.56153	-58.45702

Results

- Visualizing the maps using Folium.

- Regular neighborhood map and neighborhood clustering map.
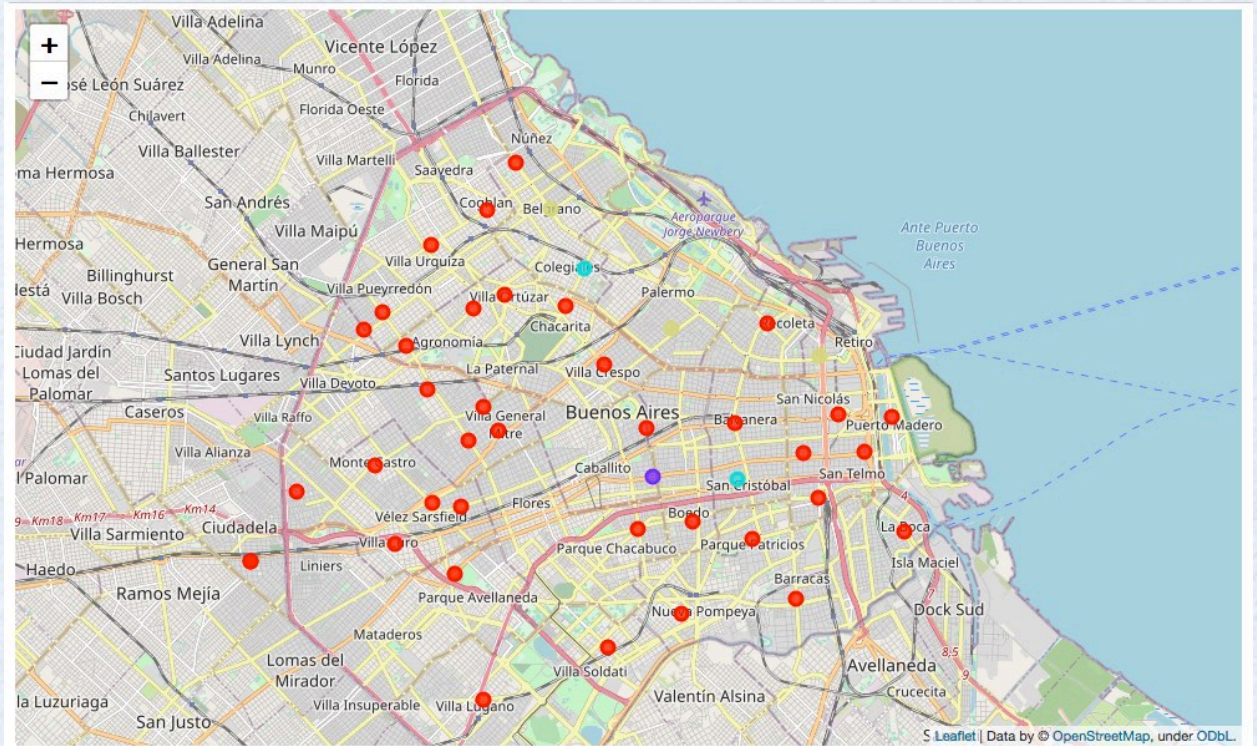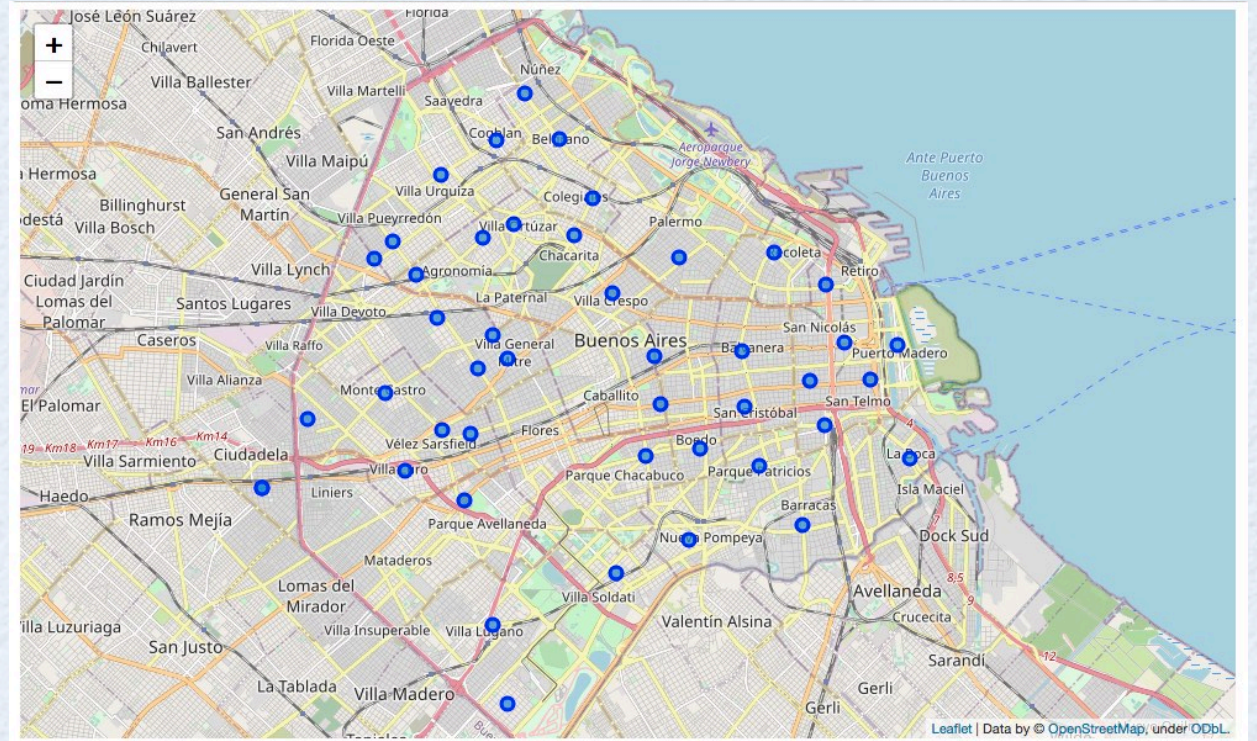
Analyzing the clusters

Examine the clusters

`bsas_merged.loc[bsas_merged['Cluster Labels']==0]`

	Neighborhood	Sushi Restaurant	Cluster Labels	Population	Latitude	Longitude
0	Agronomía	0.0	0	13963	-34.592430	-58.496590
1	Almagro	0.0	0	128206	-34.611080	-58.430280
2	Balvanera	0.0	0	137521	-34.610110	-58.406020
3	Barracas	0.0	0	73377	-34.649900	-58.389100
5	Boedo	0.0	0	45563	-34.632280	-58.417790
7	Chacarita	0.0	0	25778	-34.583510	-58.452870
8	Coghlan	0.0	0	18021	-34.561580	-58.474280

`bsas_merged.loc[bsas_merged['Cluster Labels']==1]`

	Neighborhood	Sushi Restaurant	Cluster Labels	Population	Latitude	Longitude
6	Caballito	0.04878	1	170309	-34.62218	-58.42858

`bsas_merged.loc[bsas_merged['Cluster Labels']==2]`

	Neighborhood	Sushi Restaurant	Cluster Labels	Population	Latitude	Longitude
9	Colegiales	0.037037	2	52391	-34.57502	-58.44777
28	San Cristóbal	0.035714	2	46494	-34.62288	-58.40532

`bsas_merged.loc[bsas_merged['Cluster Labels']==3]`

	Neighborhood	Sushi Restaurant	Cluster Labels	Population	Latitude	Longitude
4	Belgrano	0.023810	3	126816	-34.56153	-58.45702
20	Palermo	0.014286	3	225245	-34.58845	-58.42343
27	Retiro	0.010000	3	38635	-34.59475	-58.38273

- Cluster 0 contains neighborhoods with no sushi restaurants at all.

- Clusters 1, 2 and 3, contain neighborhoods with sushi restaurants.

Discussion

- By analyzing the clusters on the map, most of the sushi restaurants are located around the center of the city. All these areas are particularly close to each other. This is understandable because these are the areas containing all the markets, shopping centers, economic activities, and so on.

- If you analyze in detail, you can see the neighborhood of Recoleta is also very close to the center of the city and very close to Palermo (cluster 3), which is one of the most visited neighborhoods in the city.

- It is also close to the port, which gives an extra benefit to the location, and has a large number of inhabitants.
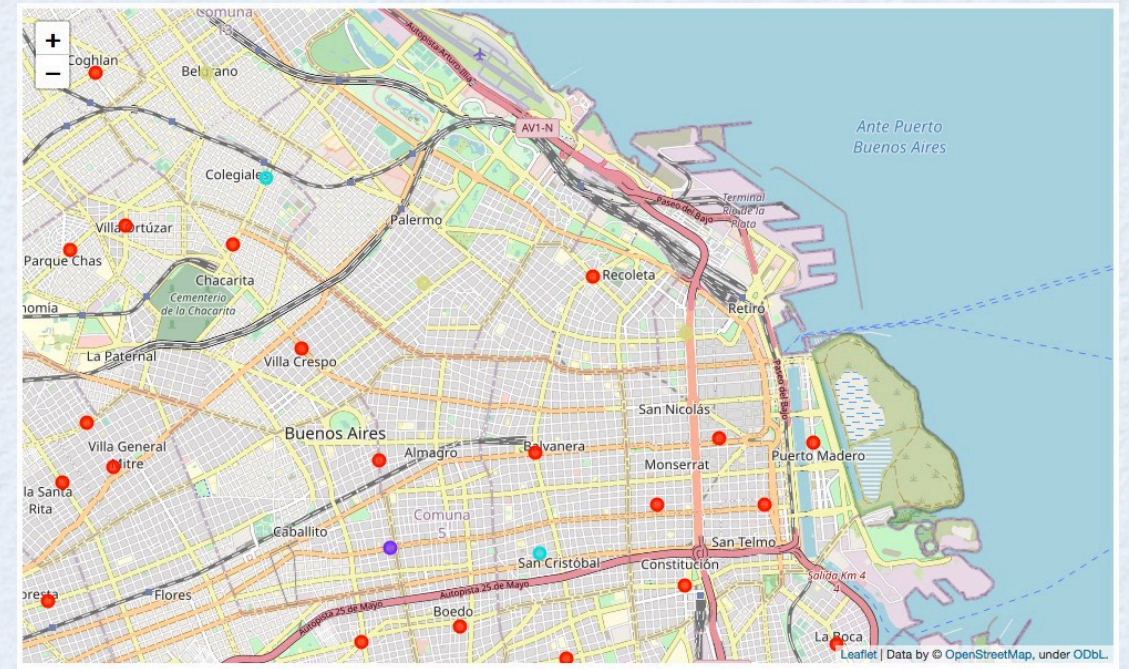
Conclusion
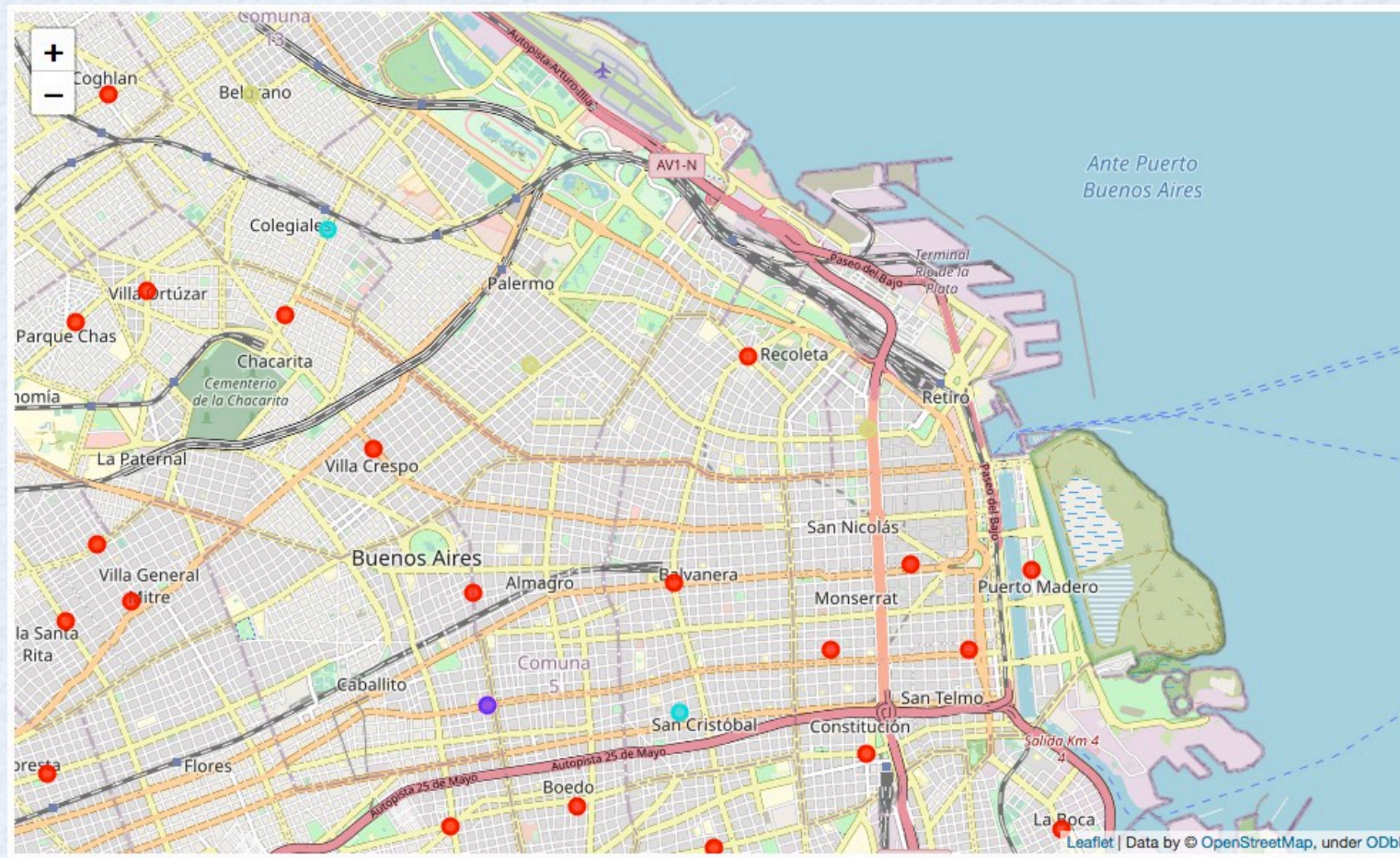
- The neighborhood of Recoleta, with a population of 165494 inhabitants, would be a very good option for opening a sushi restaurant. It is one of the most populated neighborhoods in cluster 0, and, as you can see from the map, it is located near Palermo and the port, which means the number of passing by people is very high. I believe this is a good location for opening a sushi restaurant.