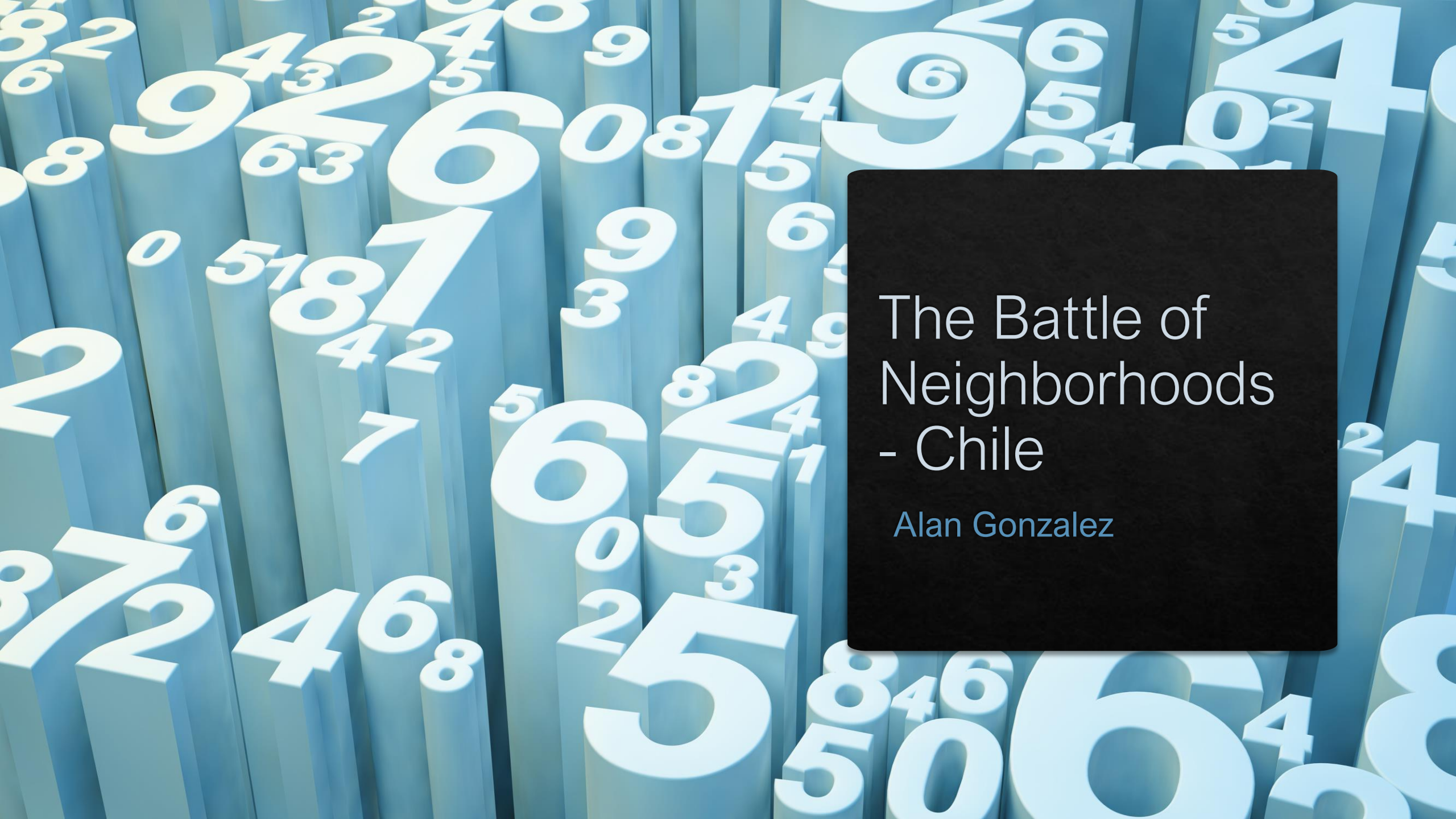

The Battle of Neighborhoods - Chile

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Introduction / Business Problem

- In this project we will try to find an optimal location for a Hotel. Specifically, this report will be targeted to stakeholders interested in opening a new Hotel in one of the regional capital cities of Chile.
- Since there are not lots of hotels in Chile, we will try to detect locations that are not already crowded with hotels. We are also particularly interested in areas with no Hotels in the principal venues.
- We will use our data science powers to generate a few most promising cities based on these criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

Data

- Based on definition of our problem, factors that will influence our decision are:
  - Location of each regional capital city in Chile
  - List of the venues of each capital city.
- The data used for this project was taken from the Wikipedia web page https://es.wikipedia.org/wiki/Anexo:Ciudades_de_Chile, which was processed in Excel to obtain the table with the latitude and longitude for each capital city.
- The Foursquare API search feature will be used to collect the venues registered in each capital city with and specific radius from the location.
- In addition, various Python packages will be used to create maps and machine learning models to understand the data collected and give the best advice for the business problem.

Methodology

1. Get the data from the Wikipedia Web Page using excel to export the table with the location from the capital cities of each region in Chile.
2. Export the data to the Jupiter Notebook in IBM Watson Studio
3. Using the location (latitude and longitude) of each regional capital in Chile and the Foursquare API feature, get the venues for a radius of 40 km around of the city location.
4. Folium visualization library will be used to show the location of the capital cities in Chile.
5. K-means machine learning will be used to create 5 cluster depending of the venues of each capital city.
6. The clusters will be showed at the same map created before for the capital cities in Chile, but at this time in different cluster.
7. Analise each cluster and look for the best to open a new hotel in Chile.

Results

- Even tough, the radius used for the analysis was 40 km and the top of venues was 100, the number of venues obtained for each capital city was 100 just for 6 of the 13 cities in Chile. This means that the Foursquare data for this country is not sufficient to complete the requirements.
- Even so, I continued with the analysis to check which are the most common venues used in Chile and the results were the following.

	City_fixed	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Antofagasta	Beach	Restaurant	Chinese Restaurant	Bistro	Park	Peruvian Restaurant	Seafood Restaurant	Hotel	Soccer Field	Pizza Place
1	Arica	Restaurant	Beach	Hotel	Ice Cream Shop	Surf Spot	Chinese Restaurant	History Museum	South American Restaurant	Pub	Vegetarian / Vegan Restaurant
2	Calama	Hotel	Restaurant	Breakfast Spot	Gym	Fast Food Restaurant	Historic Site	Convenience Store	Nightclub	Chinese Restaurant	Mountain
3	Chillan	Plaza	Restaurant	Sushi Restaurant	Pizza Place	Coffee Shop	Park	Hotel	Peruvian Restaurant	Café	Asian Restaurant
4	Concepcion	Beach	Sandwich Place	Pizza Place	Italian Restaurant	Hotel	Park	City	Ice Cream Shop	Sushi Restaurant	Plaza
5	Copiapo	Hotel	Nightclub	Pizza Place	Café	History Museum	Diner	Restaurant	Pub	Sushi Restaurant	Movie Theater
6	Coyhaique	Bed & Breakfast	Café	Restaurant	Park	Pub	Sushi Restaurant	BBQ Joint	Scenic Lookout	Sandwich Place	Hotel
7	Iquique	Hotel	Plaza	Ice Cream Shop	Beach	Latin American Restaurant	Restaurant	Museum	Pizza Place	Sandwich Place	Coffee Shop
8	La Serena	Seafood Restaurant	Restaurant	Beach	Burger Joint	Surf Spot	Pizza Place	Dessert Shop	Spa	Sandwich Place	Pool
9	Puerto Montt	Hotel	Restaurant	Café	Scenic Lookout	Beach	Boat or Ferry	German Restaurant	History Museum	Rental Car Location	Bed & Breakfast
10	Punta Arenas	Restaurant	Hotel	Café	History Museum	Other Great Outdoors	Hostel	Scenic Lookout	Tea Room	Gastropub	Diner
11	Rancagua	Restaurant	Pizza Place	Hotel	BBQ Joint	Soccer Field	Plaza	Gastropub	Gas Station	Ice Cream Shop	Sandwich Place
12	Santiago	Park	Bakery	Pizza Place	Vineyard	Golf Course	Snack Place	Scenic Lookout	Deli / Bodega	Museum	Mountain
13	Talca	Park	Coffee Shop	Ice Cream Shop	Vineyard	Pizza Place	Other Great Outdoors	Cocktail Bar	Resort	Restaurant	Bookstore
14	Temuco	Plaza	Café	Sandwich Place	Sushi Restaurant	Tea Room	Pizza Place	Diner	Burger Joint	Restaurant	Coffee Shop
15	Valdivia	Restaurant	Scenic Lookout	Hotel	Bed & Breakfast	Beach	Bar	Café	Brewery	Historic Site	Park

Results

- Looking at the results for the 10 most common venues in the capital cities of Chile, it is possible to see into the 3rd first categories the venue Hotel which means that although the data created for Chile is not enough, Hotels are one of the most popular to include in Foursquare.
- After this, I used k-means machine learning to divide the cities in 5 different clusters depending of the venues of each one.

Conclusion

- After clustering the regional capital cities of Chile was possible to realise that Calama and Copiapo are the cities where Hotel is the most popular venues. It could be possible because the main industry in both cities is the mining industry. This could be produced because a lot of people use the flight in and flight out system, demanding a lot of accommodation places.
- In addition, the data obtained from the Foursquare API is not good enough to do a deep analysis for the venues in the capital cities in Chile. Just 6 of the 13 cities got the maximum number of venues required which means that the data for the rest of the cities is not enough or that not too many people use this app in the country.

	City	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
3	Calama	3	Hotel	Restaurant	Breakfast Spot	Gym	Fast Food Restaurant	Historic Site	Convenience Store	Nightclub	Chinese Restaurant	Mountain
4	Copiapo	3	Hotel	Nightclub	Pizza Place	Café	History Museum	Diner	Restaurant	Pub	Sushi Restaurant	Movie Theater