



Lebanon: Small Country Large Variety

- PowerPoint Presentation -

IBM Data Science Professional Certificate

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BUSINESS PROBLEM

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Lebanon is one of the most culturally diverse countries in the Middle East having over 300 breathtaking touristic sites just within a 10452 km² area

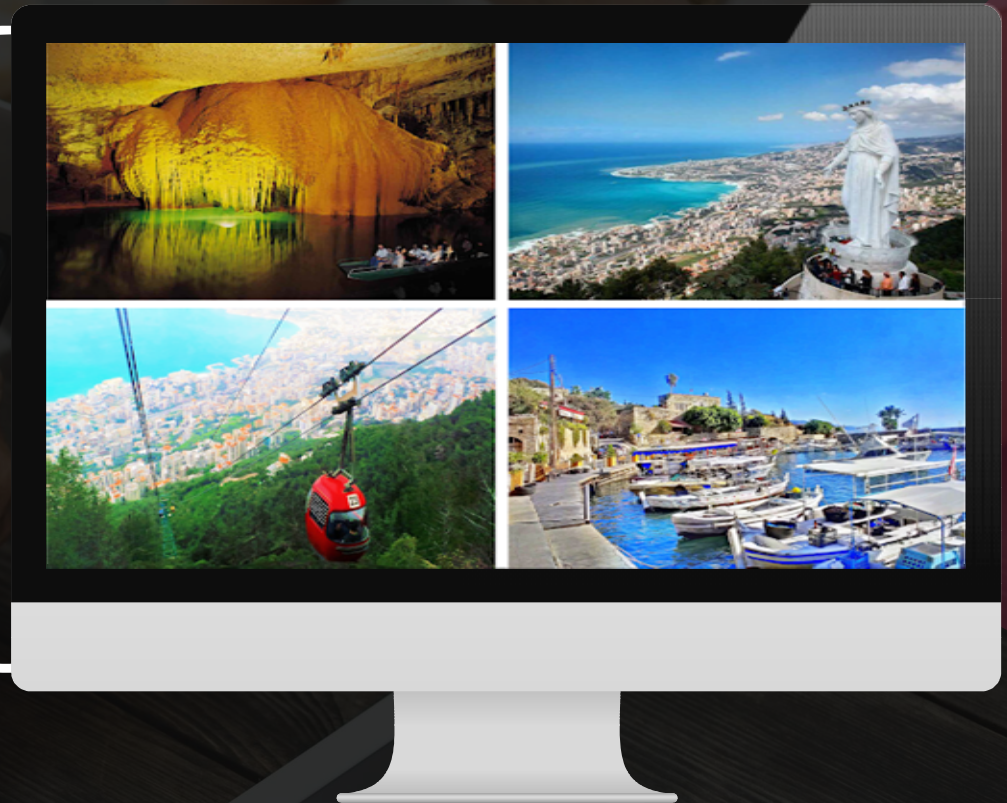
Roads in Lebanon are poorly maintained to the extent where traffic is part of the population's daily lives. So a tourist that is unfamiliar with the country could waste a lot of time just to find a place to drink a simple cup of coffee.

Our project aims to give tourists a better idea about Lebanon and where to go for specific preferences using Data science and machine learning tools by clustering areas based on what are the most common venues.

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2

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THE DATA SET

8

Governorates

Like states in USA

28 Districts

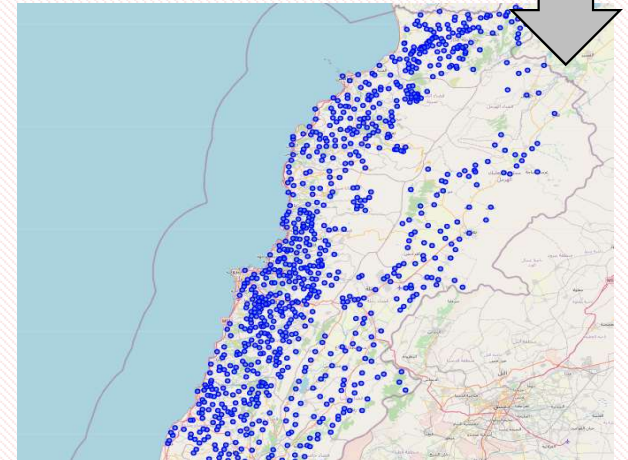
Like Boroughs in USA

Upcoming Deposits

1005

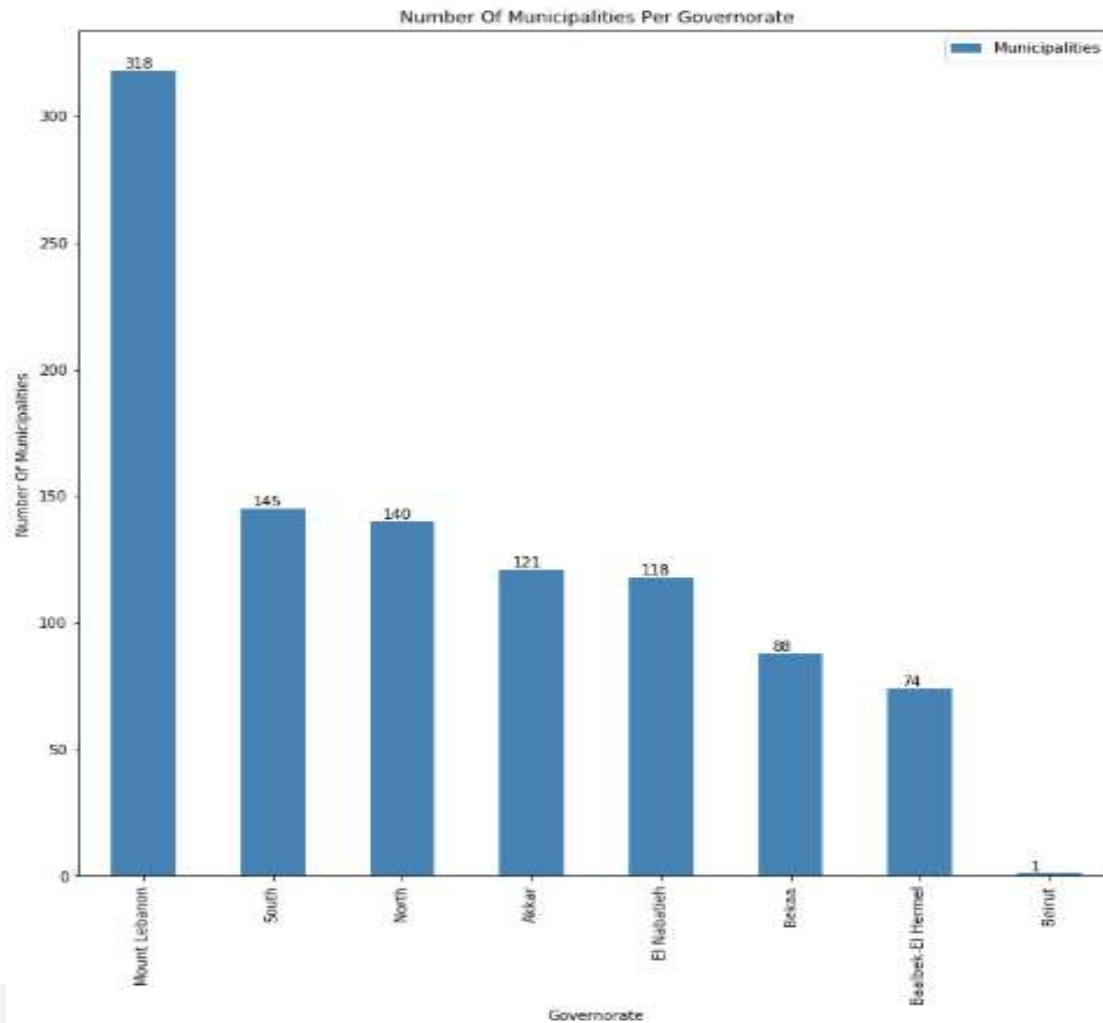
Municipalities

Like Neighborhoods in USA



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Number of municipalities per Governorate



Mount Lebanon is the Governorate with the most municipalities (318) and Beirut is the capital of Lebanon so these 2 governorates are the ones chosen for the study



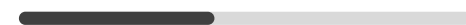
Mount Lebanon



31.6% of municipalities



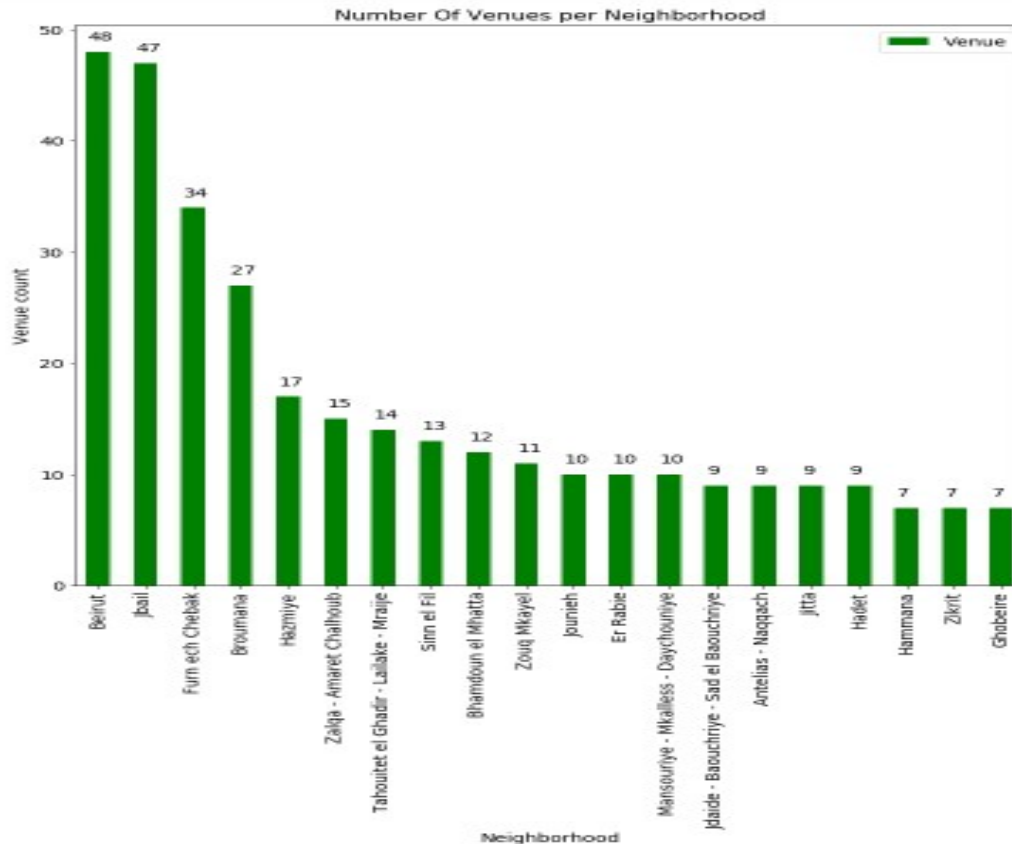
Beirut



40% of Lebanon's population

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GENERAL OVERVIEW AFTER USING FOURSQUARE API



Beirut has 48 venues
Jbail has 47



125 municipalities were removed
because they had less than 5 venues



We then listed the top 5 venues for
Every municipality



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FINAL DATASET

Exported data

Cleaned data

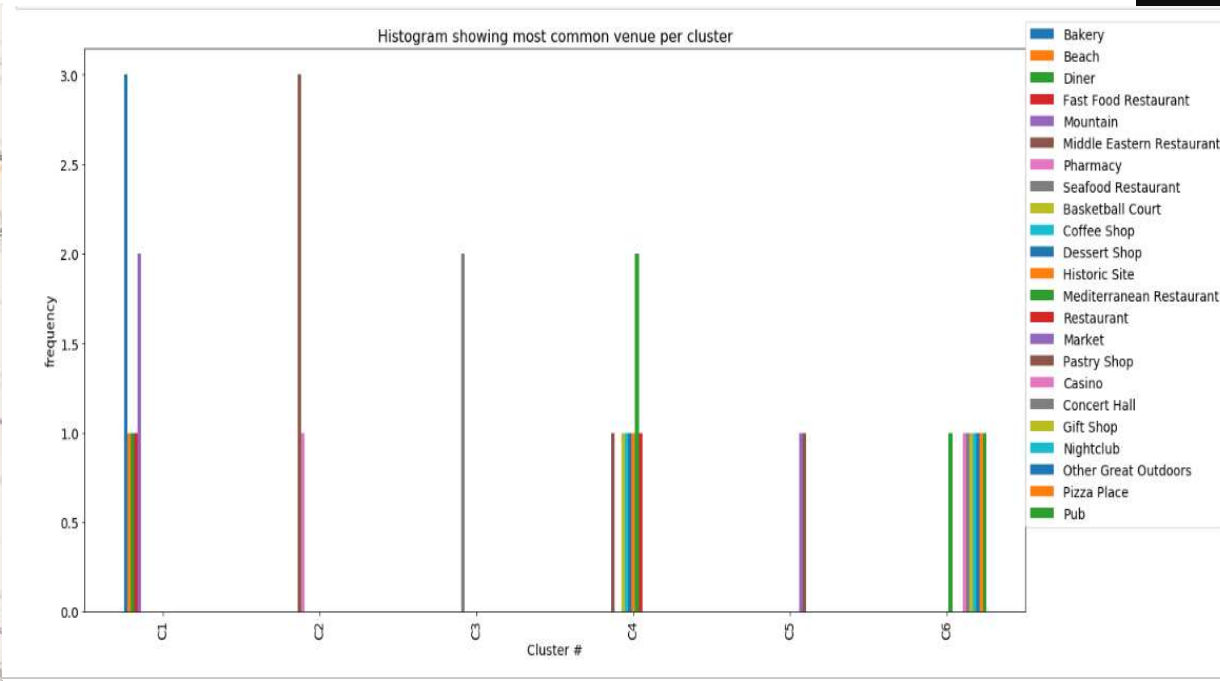
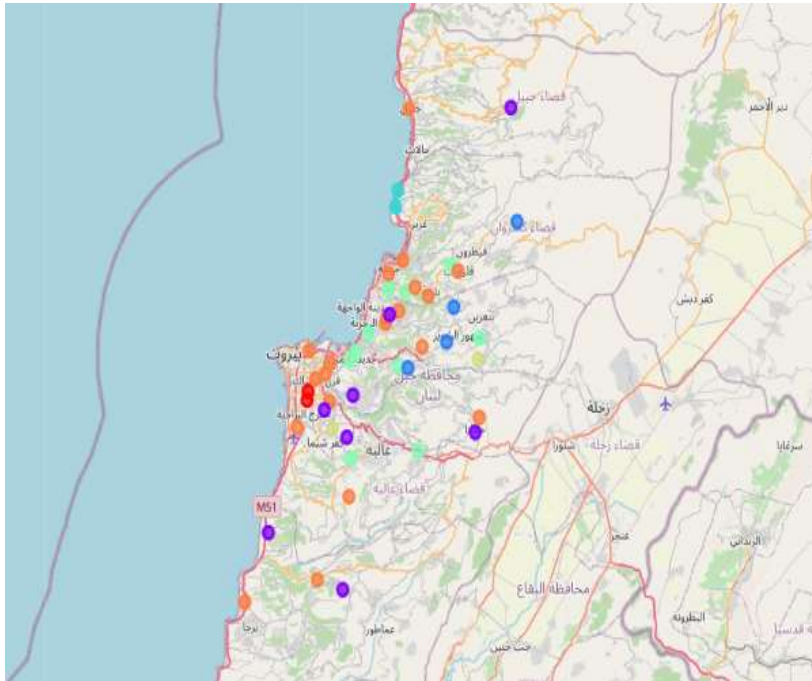
Clustered data

	Municipality Name_EN	Latitude	Longitude	Governorate	District	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Beirut	33.89890	35.51240	Beirut	Beirut	6	Pub	Bar	Cocktail Bar	Restaurant	Café
1	Jbail	34.12042	35.64711	Mount Lebanon	Jbeil	6	Mediterranean Restaurant	Pub	French Restaurant	Seafood Restaurant	Bar
2	Ehmej	34.12178	35.78399	Mount Lebanon	Jbeil	1	Mountain	Food Court	Plaza	Bakery	Women's Store
3	Jounieh	33.98231	35.63818	Mount Lebanon	Kesrwan	6	Pizza Place	Surf Spot	Racetrack	Bar	Bakery
4	Balloune	33.94877	35.67224	Mount Lebanon	Kesrwan	6	Gift Shop	Pharmacy	Sushi Restaurant	Pizza Place	Sandwich Place

After performing extensive data cleaning and used the machine learning tool K-means clustering we were able to cluster municipalities based on their most common venue. The data was divided into 6 clusters and we then obtained the following dataset to then plot and analyze the results



RESULTS



Cluster 1: the necessities cluster as discussed in the results are in fact located around Beirut which makes sense given that living around the capital is a good place to live given there is less traffic and you are still near the capital where all the big businesses are concentrated

Cluster 2: Mountain cluster, the location was as expected on the map

Cluster 3: Seafood restaurants are obviously on the coastline and are apparently famous on the kesserwan coastline

Cluster 4: is a cluster with a lot of variety concerning restaurants, nightlife etc... and are abundant in Beirut and around it which is natural given that Lebanon is known for its nightlife

Cluster 5 is a bit random however it was found that markets are abundant in those random areas

Cluster 6: has as much variety as cluster 4 but less nightlife. It is located in the south of the capital mostly. This may be due to the presence of some quiet neighborhoods in Beirut where people prefer to live to encounter less noise.



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CONCLUSION

- Finally, in such a small country as Lebanon it would take a tourist not more than 20 minutes to switch from a cluster to another given that they are almost divided into different zones. More specifically, we have provided a map where one can identify in what cluster he is situated and where to go based on his needs.
- For future research, I would recommend to use different API sources more familiar with Lebanese restaurant and nightlife venues alone, because one limitation of this research was the lack of necessary API calls, which lead us to conduct a more general clustering. In other words, future research can tackle the regions where to find specific types of restaurants for hangouts and tourism.

