Exploring Bogota venues across all its neighborhoods using the Foursquare API

IBM Data Science Capstone project

Daniel Andrade

Outline
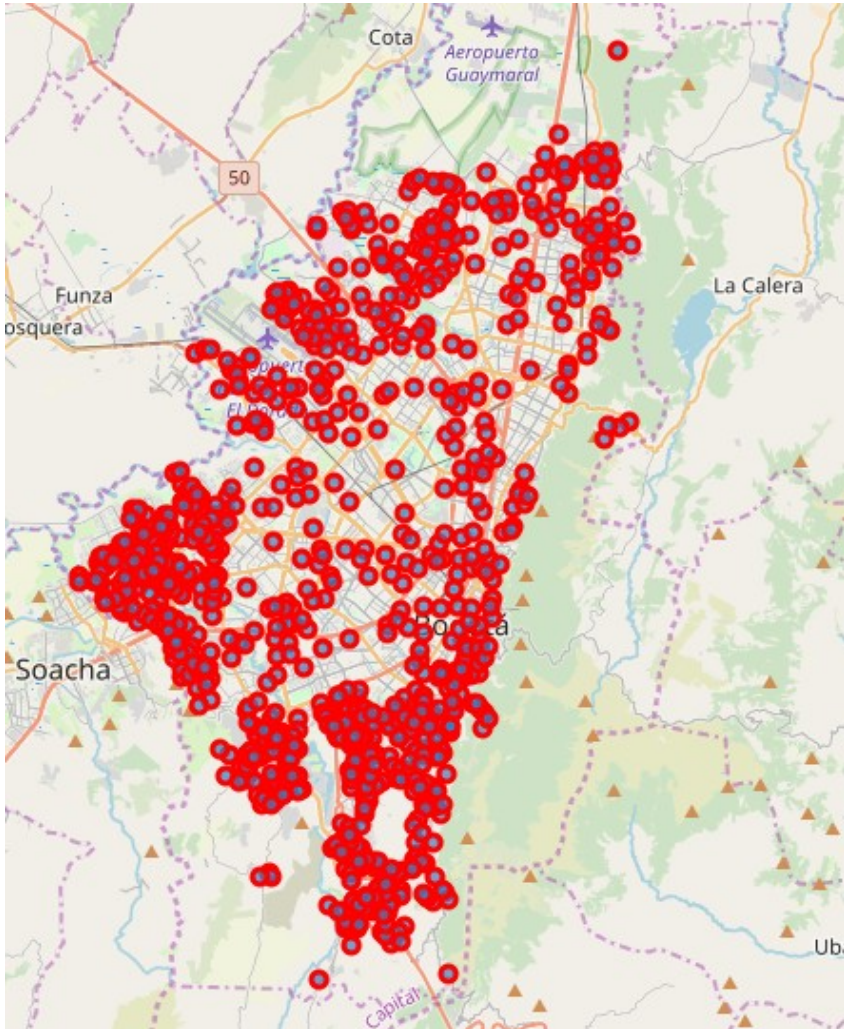
- **Introduction**
- **Data Description**
- **Methodology**
- **Results**
- **Conclusions**
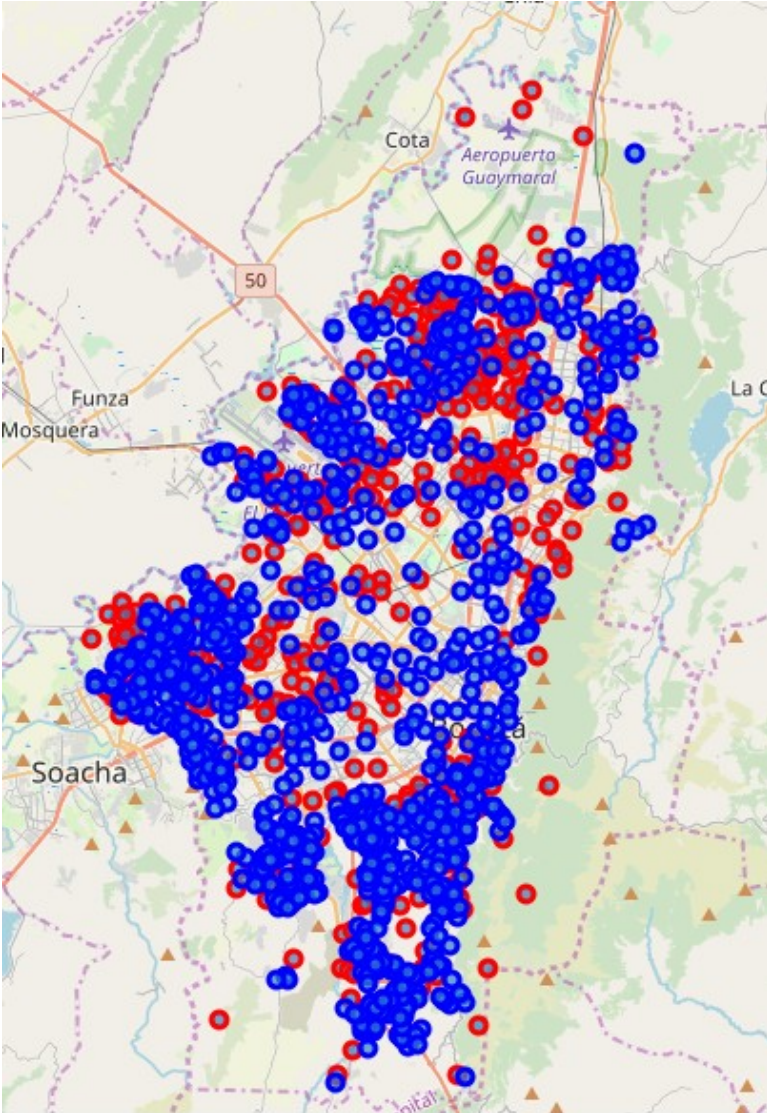- **Future Work**

Introduction

- Bogota has near 3800 small neighborhoods

- Some are legalized some are not

- Using the Foursquare API to determine most frequent venues

- Determine the distrubution of the city using k-means ML algorithm

Bogota Legalized Neihborhoods distribution

- Some neighborhoods acummulations in the peripherical areas

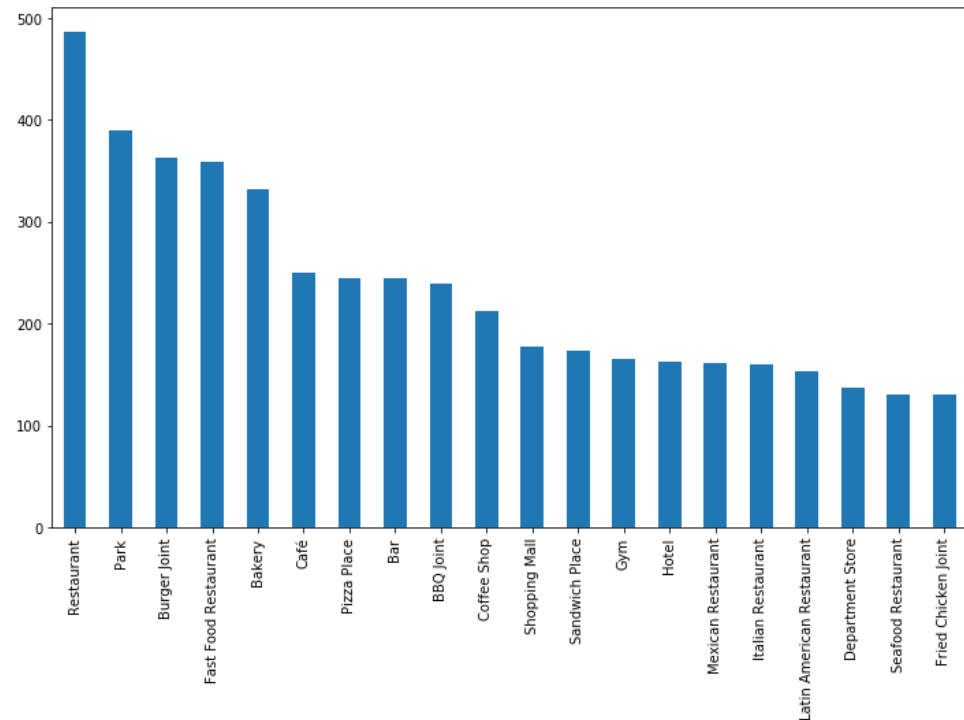- Less density in the central areas of the city

Legalized vs Non-Legalized

- **Non legalized neighborhood consist of new areas and buildings near to the legalized neighborhoods.**

- **Almost same distribution**

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FS Most frequent venues in Bogota

- Restaurants
- Parks
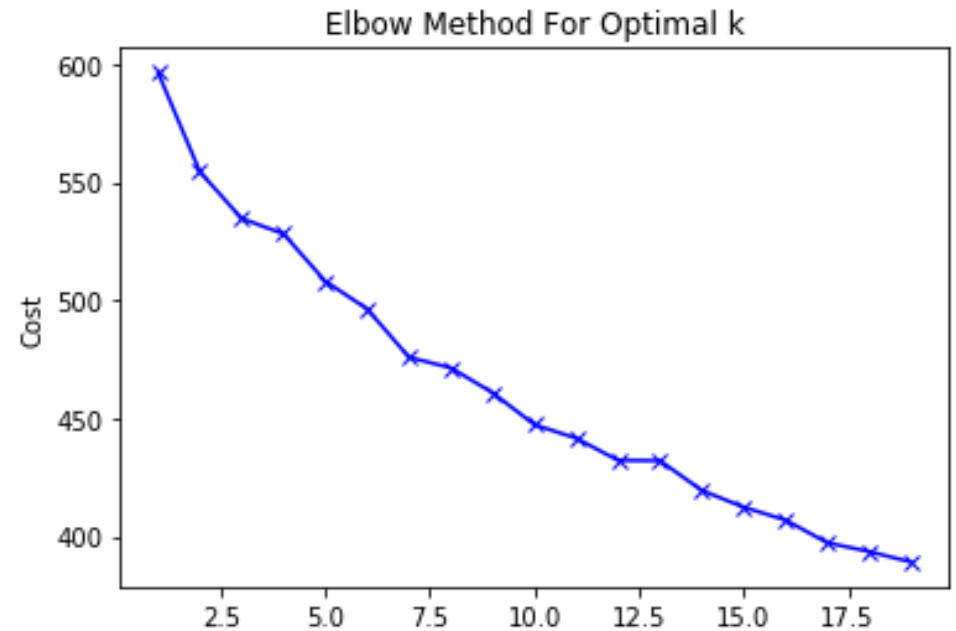- Burger joints
- Bakeries
- So on.

Most frequent venues per neighborhood

	Neighborhood	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	11 de Noviembre	BBQ Joint	Fast Food Restaurant	Latin American Restaurant	Donut Shop	Restaurant	Furniture / Home Store	Farmers Market	Motorcycle Shop	South American Restaurant	Fish & Chips Shop
1	12 de Octubre	BBQ Joint	Fast Food Restaurant	Latin American Restaurant	Donut Shop	Restaurant	Furniture / Home Store	Farmers Market	Movie Theater	South American Restaurant	Fish & Chips Shop
2	8 de Diciembre	Non-Profit	Yoga Studio	Eastern European Restaurant	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Factory	Falafel Restaurant
3	Abraham Lincoln	Gift Shop	Café	Breakfast Spot	Shopping Mall	Yoga Studio	Factory	Event Service	Event Space	Exhibit	Fabric Shop
4	Acacia III Parte Baja	Motorcycle Shop	Eastern European Restaurant	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Factory	Falafel Restaurant	Farmers Market

- **Most frequent venues are determined for each legalized neighborhoods in Bogota.**
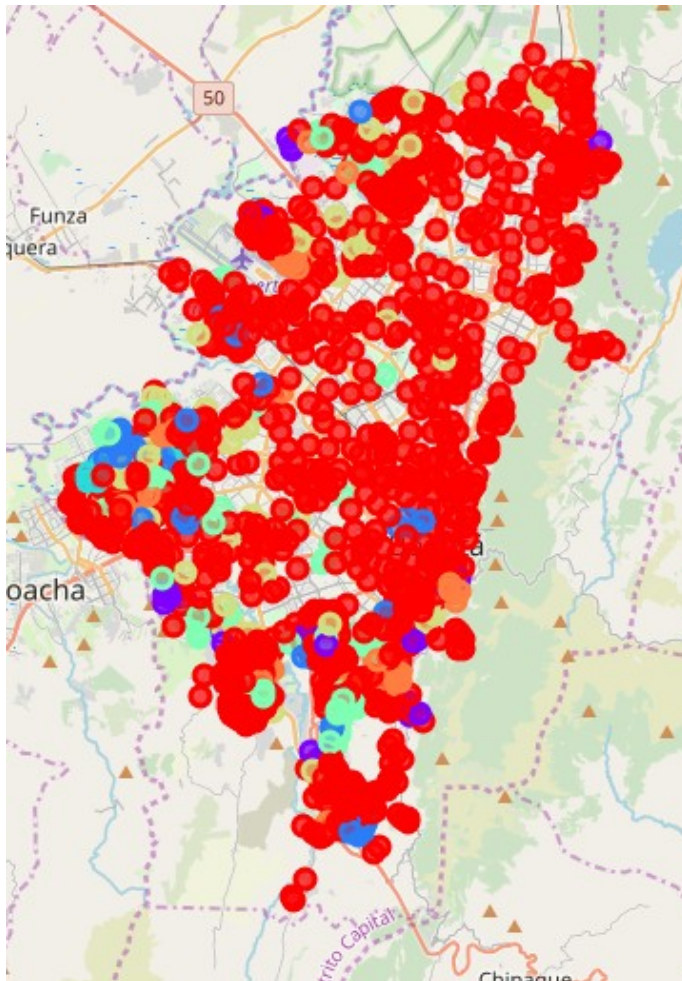
K-Means: The best K

- **The elbow method is used to determine the best K, calculating the cost function.**

- **K=7**

Clustering Neighborhoods in Bogota

- Super Cluster (red) in almost all the city.
- Some specific clusters are formed across the city
- Purple: Construction and landscaping
- Cerulean: Grocery stores
- And so on.

Detailed clustering per Neighborhood

```
bogota_merged.loc[bogota_merged['Cluster Labels'] == 4, bogota_merged.columns[[1] + list(range(5, bogota_merged.shape
```

	Neighborhood	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
56	San Isidro_II	Park	Yoga Studio	Factory	Electronics Store	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Falafel Restaurant
57	Urb. Ayacucho Sur	Park	Yoga Studio	Factory	Electronics Store	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Falafel Restaurant
58	El Angulo	Park	Gymnastics Gym	Bar	Yoga Studio	Eastern European Restaurant	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop
79	Palermo Sur Los Arrayanes	Park	Market	Yoga Studio	Factory	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Falafel Restaurant
95	Villa Carolina	Park	Yoga Studio	Factory	Electronics Store	Empanada Restaurant	Event Service	Event Space	Exhibit	Fabric Shop	Falafel Restaurant
...	...	...	...	...	...	...	...	...	...	...	...

- **All the most frequent venues are clusterd by each legalized neighborhood.**

Conclusions

- Non-legalized neighborhoods of the city of Bogota are not found exclusively in the pernicious areas

- Existence of small clusters of neighborhoods sharing similarities based on the category but it is not a generality in the city.

- Most frequent sites that are registered on the foursquare site are sites related to the city's tourist activity such as restaurants

Future work

- Non-legalized neighborhoods analysis.

- Local data to compare with the Foursquare data in both cases.

Thanks for your attention!!