BATTLE OF THE NEIGHBORHOODS

WHICH METROPOLITAN AREAS ARE MOST SIMILAR?

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APPLIED DATA SCIENCE CAPSTONE PROJECT

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INTRODUCTION

Which metropolitan areas are most similar?

A business planning to expand into new countries or regions may want to know which metropolitan areas are similar to the areas in which they already have existing branches.

There are different ways to classify similar. In this project, I will classify similar based on the types of venues foursquare returns for top picks in the metro area.

DATA

DATA FROM WIKIPEDIA FOR THE 100 MOST POPULATED METROPOLITAN AREAS

	Metropolitan	Country	Continent
0	Tokyo	Japan	Asia
1	Delhi	India	Asia
2	Shanghai	China	Asia
3	Jakarta	Indonesia	Asia
4	Seoul	South Korea	Asia

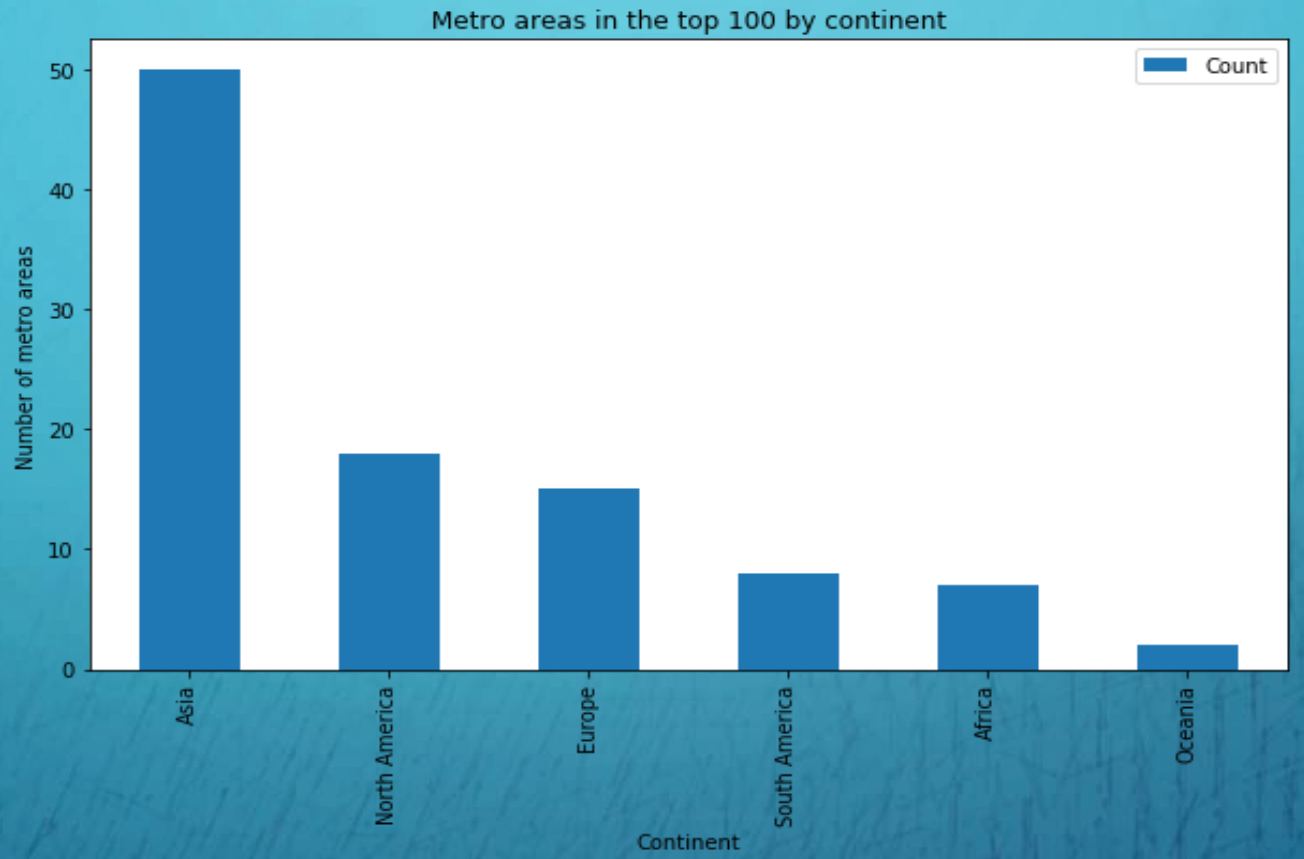
GEOPY GEOCODERS NOMINATIM LATITUDE AND LONGITUDE FOR EACH METRO AREA

	Metropolitan	Country	Continent	Latitude	Longitude
0	Tokyo	Japan	Asia	35.6828	139.759
1	Delhi	India	Asia	28.6517	77.2219
2	Shanghai	China	Asia	31.2323	121.469
3	Jakarta	Indonesia	Asia	-6.17539	106.827
4	Seoul	South Korea	Asia	37.5667	126.978

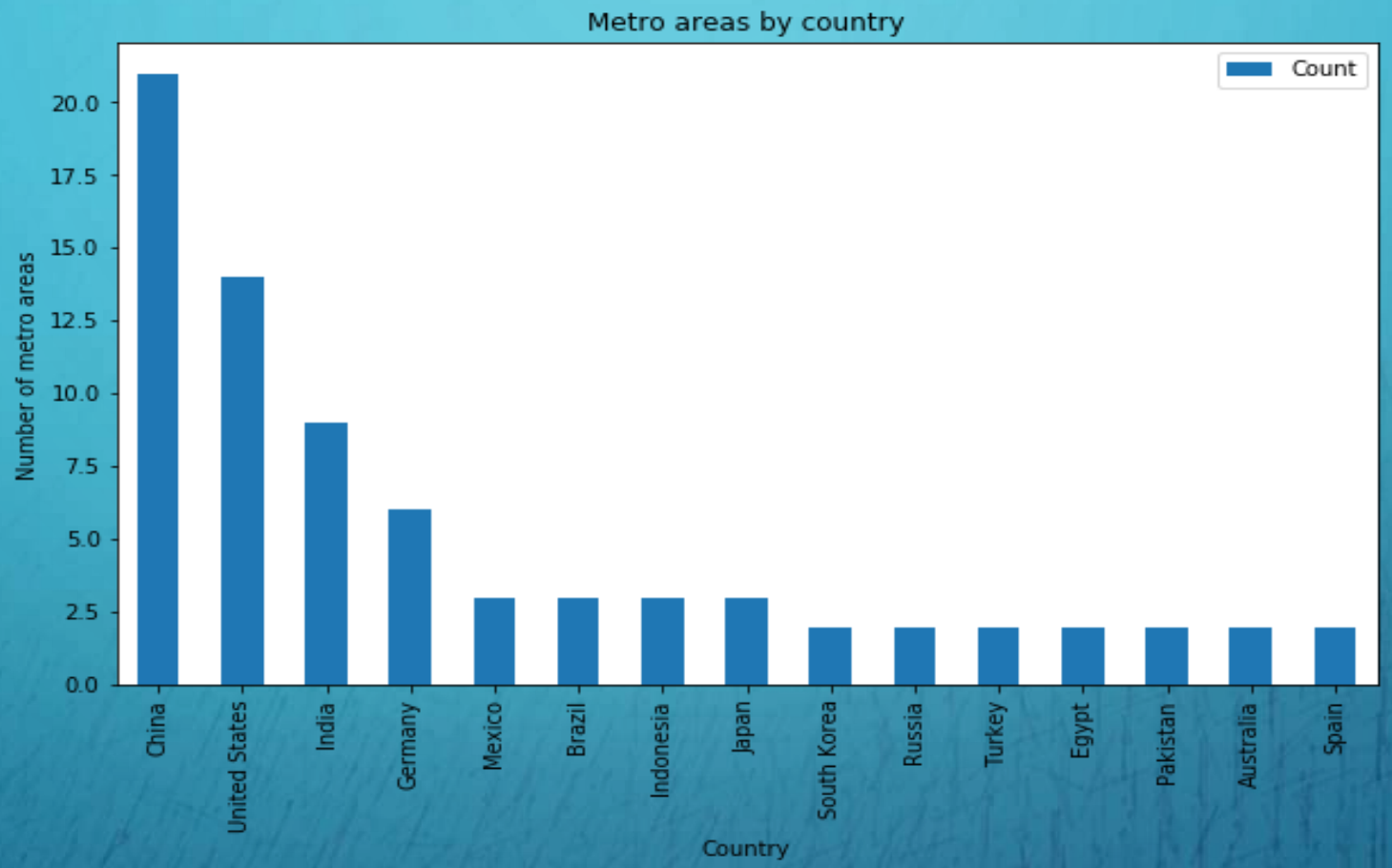
THE FOURSQUARE API 'TOP PICKS' VENUE CATEGORIES

	Metropolitan	Country	Continent	Latitude	Longitude	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Category 7	Category 8
0	Tokyo	Japan	Asia	35.682839	139.759455	Café	Japanese Restaurant	Italian Restaurant	Sushi Restaurant	Lounge	Garden	French Restaurant	Dessert Shop
1	Delhi	India	Asia	28.651718	77.221939	Indian Restaurant	Bar	Café	Flea Market	Lounge	Asian Restaurant	Ice Cream Shop	South Indian Restaurant
2	Mexico City	Mexico	North America	19.432601	-99.133342	Mexican Restaurant	Art Museum	Museum	Arts & Crafts Store	Bar	Ice Cream Shop	Boutique	Bakery
3	São Paulo	Brazil	South America	-23.550651	-46.633382	Brazilian Restaurant	Japanese Restaurant	Café	Bakery	Snack Place	Bookstore	Cosmetics Shop	Asian Restaurant
4	Lagos	Nigeria	Africa	6.455057	3.394179	Lounge	African Restaurant	Bar	Café	Shopping Mall	Pizza Place	Hotel	Art Gallery

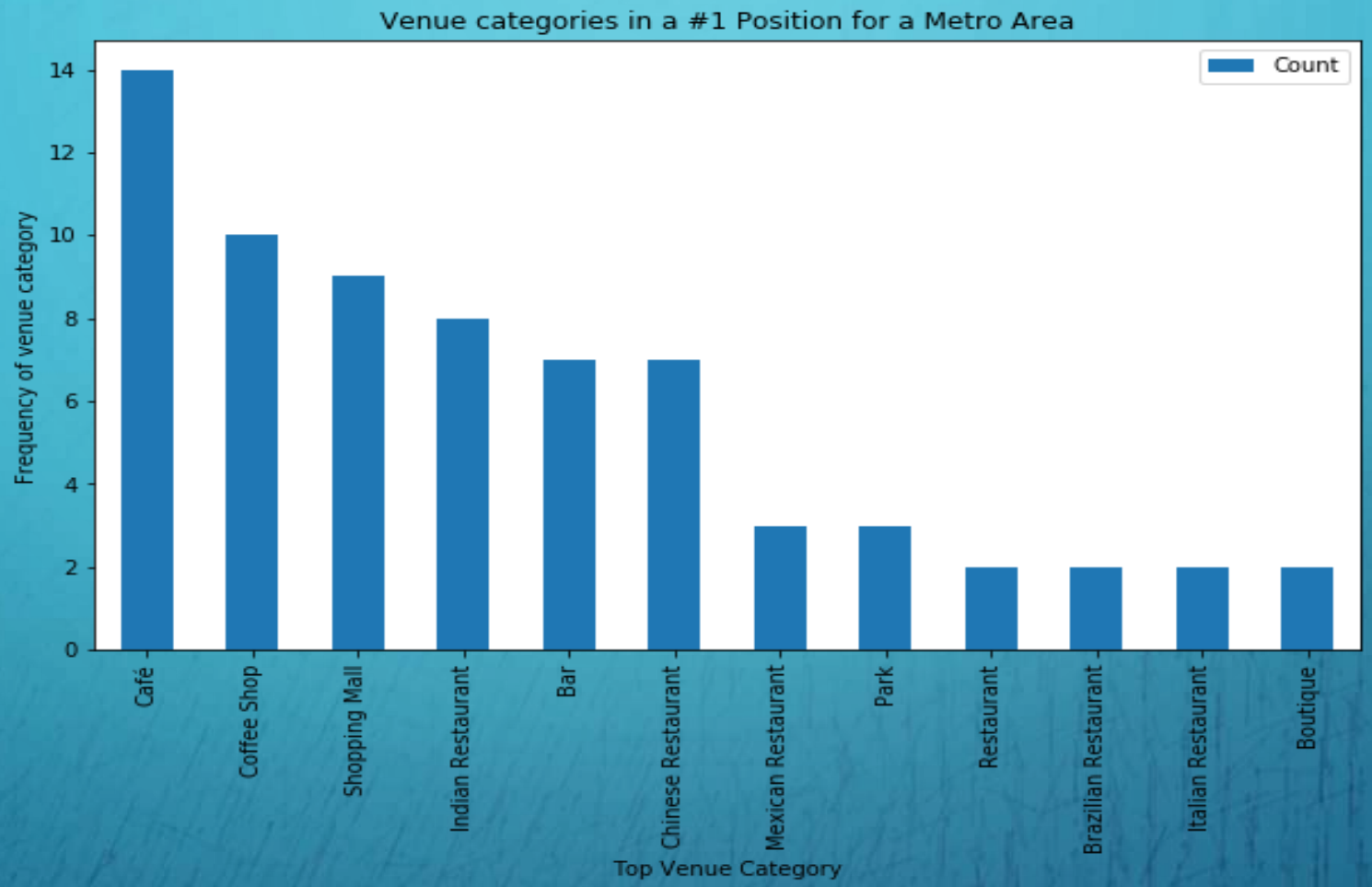
EXPLORATORY DATA ANALYSIS



EXPLORATORY DATA ANALYSIS



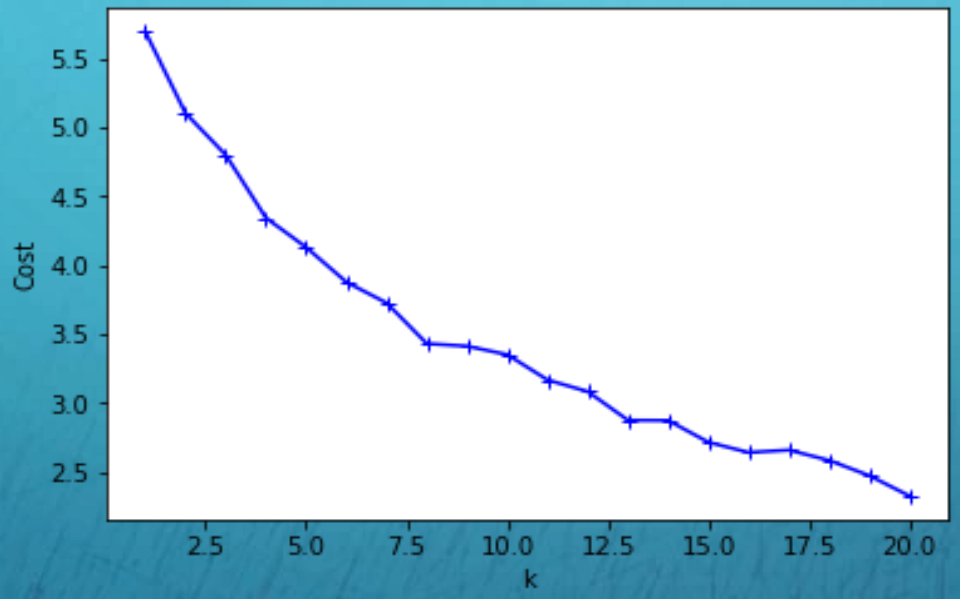
EXPLORATORY DATA ANALYSIS



EXPLORATORY DATA ANALYSIS

METHODS

I used KMeans to cluster the metro areas into groups. There was not obvious best k (number of clusters) to use, so based on cluster size, I chose k=16.



RESULTS

CONCLUSIONS

WHICH METROPOLITAN AREAS ARE MOST SIMILAR?

- Using Foursquare venue category data, I grouped the 100 most populated metropolitan areas into 16 clusters
- 10 clusters with two or more metro areas
- 6 clusters with a single metro area, the outliers

CONCLUSIONS
WHICH METROPOLITAN AREAS ARE MOST SIMILAR?

- Most of the outlier metro areas had fewer than ten venue categories returned by Foursquare.
- Of the remaining 10 clusters, four contained only metro areas in Asia.
- Clusters 1, 3, 9, 13, and 14 contained a mixture of metro areas from different continents.
- Geographic areas tended to contain only a few clusters with the exception of China. China had the most metro areas in the list.

NOTEBOOKS

- Part 1: https://nbviewer.jupyter.org/github/KathrynDH/IBMCapstoneFinalProject/blob/master/Final%20Project%20Get%20Data.ipynb
- Part 2: https://nbviewer.jupyter.org/github/KathrynDH/IBMCapstoneFinalProject/blob/master/Final%20Project%20-%20Get%20FourSquare%20Data.ipynb
- Part 3: https://nbviewer.jupyter.org/github/KathrynDH/IBMCapstoneFinalProject/blob/master/Explore%20Location%20Data.ipynb
- Part 4: https://nbviewer.jupyter.org/github/KathrynDH/IBMCapstoneFinalProject/blob/master/Cluster%20Metro%20Areas.ipynb
- Part 5: https://nbviewer.jupyter.org/github/KathrynDH/IBMCapstoneFinalProject/blob/master/Explore%20the%20Clusters.ipynb

REFERENCES

Course Reference:

https://www.coursera.org/learn/applied-data-science-capstone

Data sources:

https://en.wikipedia.org/wiki/List_of_metropolitan_areas_by_population

https://developer.foursquare.com/