

Foursquare Battle of Delhi, India 2020

MAY 27

COMPANY NAME

Authored by: KT



Business Problem

Leverage Foursquare locations data to explore venues in Delhi, India.

Find insights of most popular venues in sub-parts of Delhi.

“Delhi's 2020 population is now estimated at 30,290,936.”

It covers a large area, totaling around 1,484 square kilometers. The city has a population density of 20,412 people per square km which is one of the highest in the world.

Using tools learnt in coursera's [IBM Data Science Professional Certificate](#) will help explore the same.

Data

On searching over the internet, an informative blogpost mentions all the “PostalCodes” along with “Districts” of Delhi.

<https://www.whatsuplife.in/delhi/blog/zip-pin-postal-code-pincodes-delhi>

Below are a couple of screenshots of the data from this webpage that were extracted:

Here's a detailed list of the pincodes, postal codes, zip codes in the city of Delhi:

CENTRAL DELHI

A.G.c.r.	110002
A.K.market	110055
Ajmeri Gate extn.	110002

Tugalkabad Railway colony	110044
Zakir Nagar	110025

WEST DELHI

A-3 Janak puri	110058
Ashok Nagar	110018
Ashoka Park extn.	110026
B-1 Janak puri	110058

This blogpost webpage was scrapped to get –

1. Districts in Delhi

```
['CENTRAL DELHI',  
 'SOUTH DELHI',  
 'WEST DELHI',  
 'NORTH DELHI',  
 'EAST DELHI',  
 'SOUTH WEST DELHI',  
 'NORTH WEST DELHI']
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2. Corresponding Neighborhoods and PostalCodes

	District	Neighborhood	PostalCode
0	CENTRAL DELHI	A.G.c.r.	110002
1	CENTRAL DELHI	A.K.market	110055
2	CENTRAL DELHI	Ajmeri Gate extn.	110002
3	CENTRAL DELHI	Anand Parbat	110005
4	CENTRAL DELHI	Anand Parbat indl. area	110005

As you can notice in the data above, same postal codes have multiple neighborhoods, which are contributing to multiple rows.

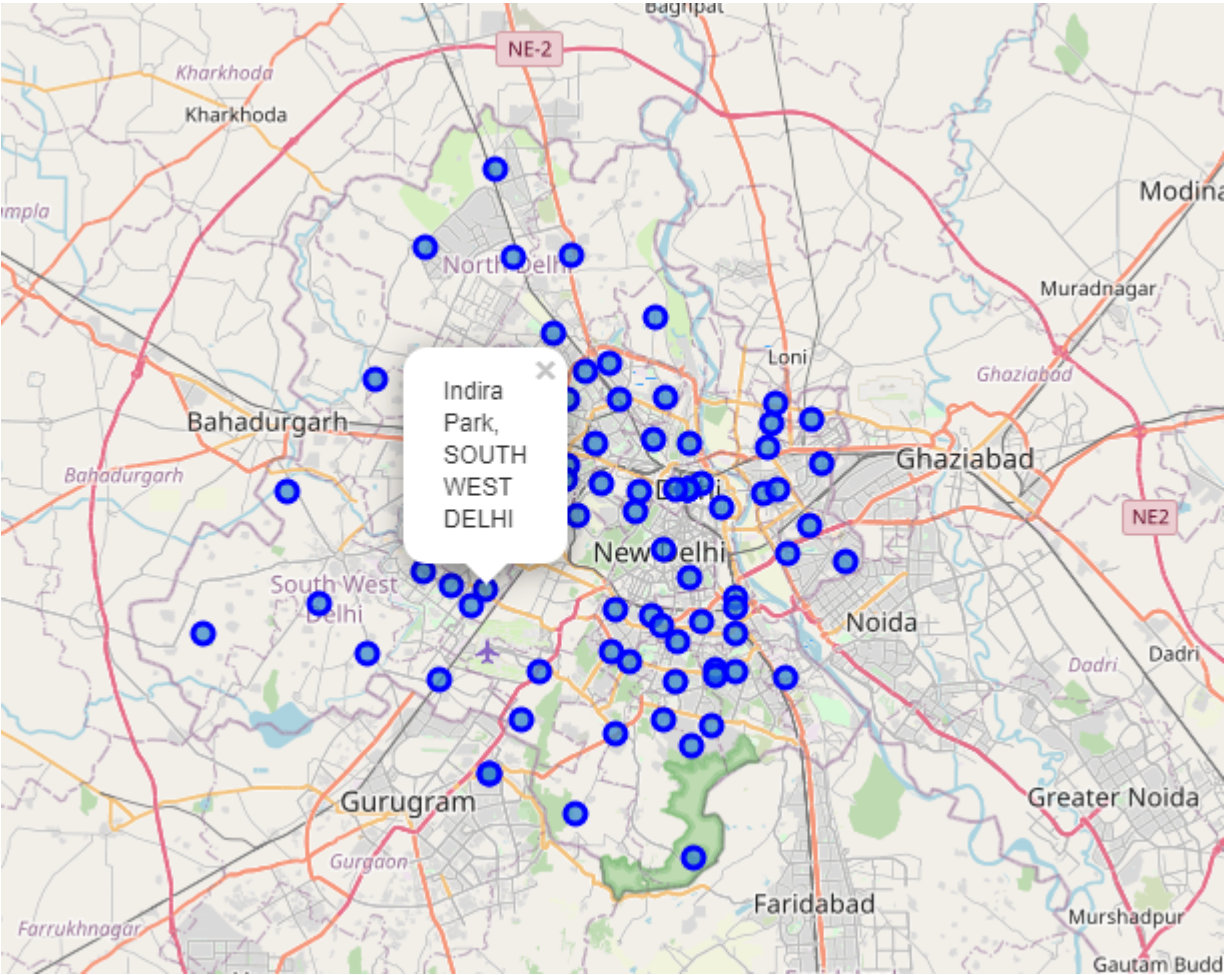
	District	Neighborhood	PostalCode
count	425	425	425
unique	7	424	84
top	SOUTH DELHI	Shivaji Park	110001
freq	77	2	19

Therefore, merge the neighborhoods that have same postal code and get corresponding latitude and longitude of the same.

Here it is how it looks as the final data set that was used to explore Delhi.

	District	Neighborhood	PostalCode	Latitude	Longitude
0	CENTRAL DELHI	Connaught Place, Bengali Market, Janpath, Nort...	110001	28.651718	77.221939
1	CENTRAL DELHI	Indraprastha, Gandhi Smarak nidhi, Darya Ganj,...	110002	28.640964	77.245468
2	CENTRAL DELHI	Pandara Road, Pragati Vihar, Delhi High court,...	110003	28.598731	77.222996
3	CENTRAL DELHI	Rashtrapati Bhawan	110004	28.616082	77.204501
4	CENTRAL DELHI	Bank Street, Sat Nagar, Desh Bandhu gupta road...	110005	28.650529	77.189018

Neighborhoods and Postal Codes on Delhi Map



Exploration

Used foursquare venues explore API - <https://api.foursquare.com/v2/venues/explore> to fetch the top 100 venues corresponding to each postal code.

Number of venues fetched for 84 Postal Codes were 409 which on an average is less than five venues per postal code

Here is a snapshot of Delhi venues –

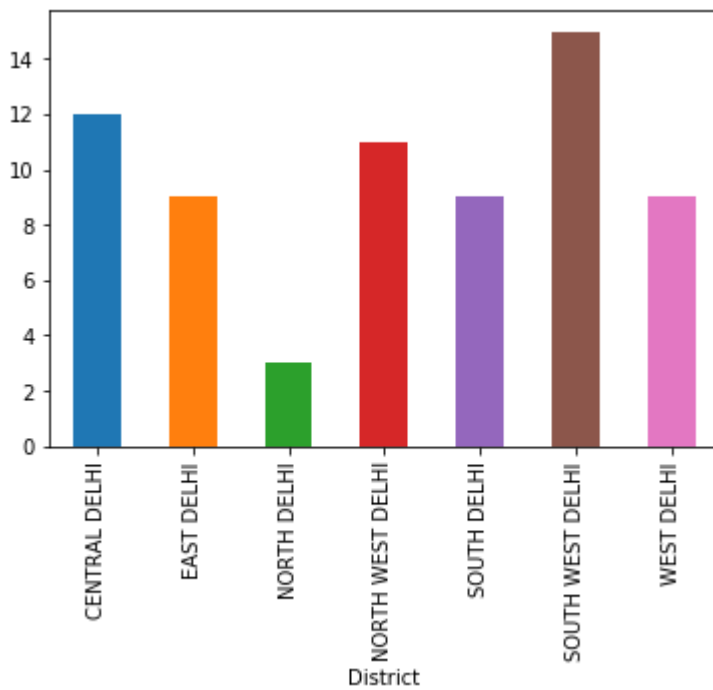
	PostalCode	PostalCode Latitude	PostalCode Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	110002	28.640964	77.245468	National Gandhi Museum	28.638919	77.245926	History Museum
1	110002	28.640964	77.245468	Feroz Shah Kotla Stadium फिरोज शाह कोटला स्...	28.637907	77.241869	Cricket Ground
2	110002	28.640964	77.245468	Ansari Road, Daryaganj	28.642258	77.241534	Road
3	110003	28.598731	77.222996	L'Opera	28.599784	77.226144	Café
4	110003	28.598731	77.222996	SODABOTTLEOPENERWALA	28.600141	77.226273	Irani Cafe

Snapshots of venues categories per postal code as returned by the Foursquare API –

110076	18	110027	11	110088	1
110077	2	110029	4	110091	1
110078	2	110030	6	110092	7
110083	2	110031	2	110093	1
110084	1	110032	1	110094	1
110087	4	110033	1	110095	3
110088	1	110034	4	110096	1

There are 99 unique categories for 84 postal codes from the foursquare data.

Since number of venues per postal code is very small, let us group venue categories by Districts.



From the above graph, we can see venue categories have a good distribution over districts of Delhi.

Using one-hot encoding, top three venue categories were calculated for each district.

----CENTRAL DELHI----

	venue	freq
0	Pizza Place	0.08
1	Café	0.08
2	Indian Restaurant	0.08

----EAST DELHI----

	venue	freq
0	ATM	0.2
1	Café	0.1
2	Fried Chicken Joint	0.1

----SOUTH DELHI----

	venue	freq
0	Indian Restaurant	0.23
1	BBQ Joint	0.15
2	Café	0.15

----NORTH DELHI----

	venue	freq
0	Food & Drink Shop	0.33
1	Breakfast Spot	0.33
2	Café	0.33

----SOUTH WEST DELHI----

	venue	freq
0	Snack Place	0.14
1	Café	0.09
2	Chinese Restaurant	0.09

----NORTH WEST DELHI----

	venue	freq
0	Café	0.14
1	Fast Food Restaurant	0.14
2	Breakfast Spot	0.14

----WEST DELHI----

	venue	freq
0	Indian Restaurant	0.2
1	Japanese Restaurant	0.1
2	Asian Restaurant	0.1

Printing in a dataframe

	District	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	CENTRAL DELHI	Cricket Ground	Road	Indian Restaurant
1	EAST DELHI	ATM	Fried Chicken Joint	Diner
2	NORTH DELHI	Breakfast Spot	Food & Drink Shop	Café
3	NORTH WEST DELHI	Café	Breakfast Spot	Fast Food Restaurant
4	SOUTH DELHI	Indian Restaurant	Café	BBQ Joint
5	SOUTH WEST DELHI	Snack Place	Café	Chinese Restaurant
6	WEST DELHI	Indian Restaurant	Dessert Shop	Hotel

As you can see from above analysis - Central Delhi, North Delhi and North West Delhi top three venues have the same frequency, therefore the results are ambiguous. This proves the Foursquare API does not have enough "good" data for Delhi to perform analysis.

Conclusion

Using foursquare API data, I tried to explore different postal codes of Delhi, but the data was very limited, therefore I switched to districts and analyzed the venues available. During analysis of top venues in district, I found out the data is ambiguous also which can be seen from Central Delhi, North Delhi and North West Delhi top three venues have the same frequency, therefore the results are ambiguous.

Lesson learnt

This project is a very good reference and start point for me to further pursue exploration of Delhi, India from other data sources like google places API, and may be some local places providers.