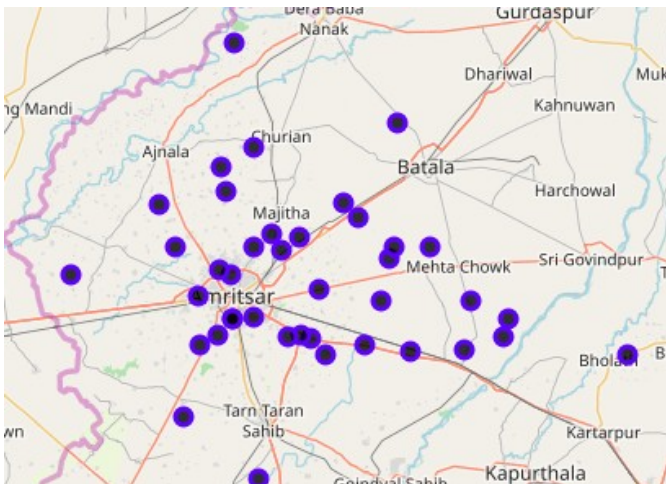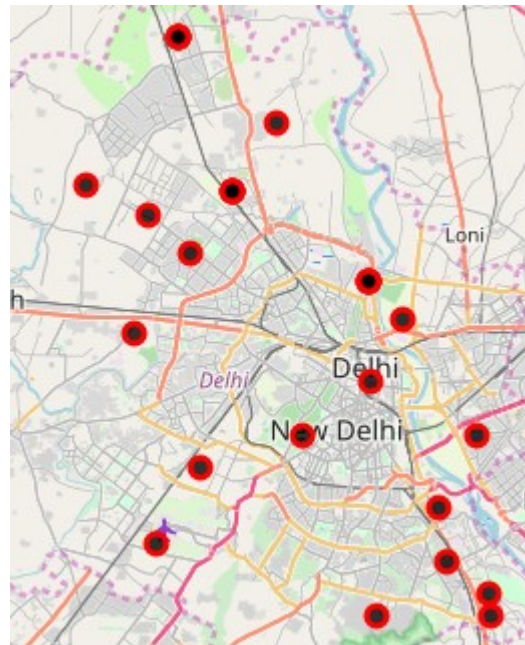# Business Problem

Amritsar and Delhi are the 2 popular cities in India . Both of these cities are located in North India. So, with this project we shall compare these 2 cities on the basis of the popular venues in these cities using the neighborhood data. By this project we shall see the similarities and dissimilarities between these 2 cities.This is a project that attempts to analyze the neighborhoods in each of these two cities and tries to understand what is popular in them and what they have to offer to someone who is contemplating to make a choice on seeking a life in either of the cities.The business problem in this study assumes that people who would be interested in this study are those who would like to create a projection of potential life and activities in the neighborhoods of the city if the subject moves to live in one of them.The decision to choose one over the other would depend on popular venues in the neighborhoods in each of these cities.

Data Section

The data used in this problem will be extracted from [here](#) .
which is provided by the govenment of India.The data is available in csv format and we will read it in a pandas dataframe. As this dataset contains data of the various post offices in india so we first need to drop unnecessary columns from the database and make it suitable according to our problem. Since this dataset contains data of all indian cities so we need to read the data only releated to Amritsar and Delhi. So, we made 2 dataframes one for Amritsar and other for Delhi. Now in these 2 datasets there is same pincode for different neighborhood so neighborhood names with the same pincode will be combined as a single row separated by commas. We will use pgeocode library to get latitude and longitue values for different pincodes and combine it with databases of Amritsar and Delhi. We now have the necessary information to plot the cities on a folium map.

Amritsar   Delhi

Methodology Section

Analyzing the Neighborhood of Amritsar

We will use foursquare api to get nearby venues in the neighborhood of Amritsar. We will make iterative api calls for each neighborhood and get the nearby venues in 2000m radius of neighborhood. Next we will make dataframe consisting of the frequency of venue type, venue latitude etc. From the analysis we see that there are 32 unique categories consisting of various restraunts, theme park, shopping mall, departmental stores and so on. Then we make a dataframe that consists of top 5 venues for each neighborhood as shown below-

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Adliwala,Bagga,Heir,Jagdev Kalan,Jhanjoti,Kotl...	Farm	Vegetarian / Vegan Restaurant	Toll Booth	Accessories Store	Asian Restaurant
1	Akalgarh Dhupaian,Bhattike,Bolara,Jabbowal,Lol...	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
2	Amritsar -I	Vegetarian / Vegan Restaurant	Clothing Store	Jewelry Store	Market	Business Service
3	Amritsar -I,Amritsar -I	Vegetarian / Vegan Restaurant	Clothing Store	Jewelry Store	Market	Business Service
4	Amritsar -I,Amritsar -I,Amritsar -I,Amritsar -...	Café	Bakery	Punjabi Restaurant	Sandwich Place	Toll Booth

Then we cluster neighborhoods of Amritsar based on similarity of the type of venues they have. For this we will be using K-Means clustering algorithm and we will be clustering the neighborhoods of Amritsar into 5 clusters. We used kmeans because it is the simplest and easy to implement algorithm and it uses less resources.
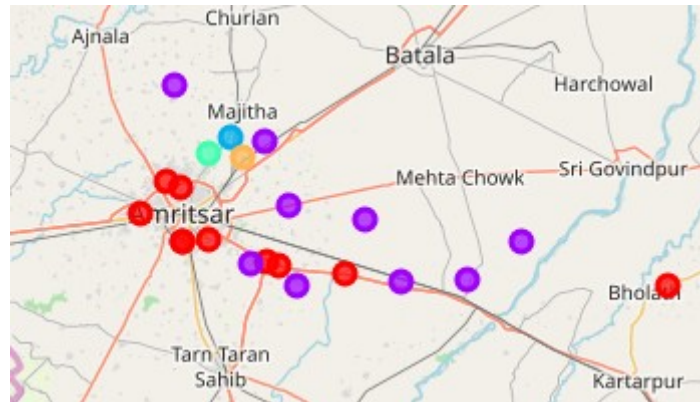
Analyzing the Neighborhood of Delhi

We will use foursquare api to get nearby venues in the neighborhood of Amritsar. We will make iterative api calls for each neighborhood and get the nearby venues in 2000m radius of neighborhood. Next we will make dataframe consisting of the frequency of venue type, venue latitude etc. From the analysis we see that there are 115 unique categories consisting of various restraunts, theme park, shopping mall, departmental stores and so on. Then we make a dataframe that consists of top 5 venues for each neighborhood as shown below-

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	Ali BO,Madanpur Khadar BO	Indian Restaurant	Train Station	ATM	Indian Sweet Shop	Duty-free Shop
1	Aliganj,Kasturba Nagar	Indian Restaurant	Hotel	Café	Bar	Snack Place
2	Daryapur Village,Sanot,Mungeshpur Village,Dary...	ATM	Vietnamese Restaurant	Food & Drink Shop	Deli / Bodega	Department Store
3	Deoli	Flea Market	Plaza	Mattress Store	Pool	Indian Restaurant
4	Goyla Khurd	Coffee Shop	Airport Lounge	Hotel	Airport Service	Café

Then we cluster neighborhoods of Delhi based on similarity of the type of venues they have. For this we will be using K-Means clustering algorithm and we will be clustering the neighborhoods of Delhi into 5 clusters. We used kmeans because it is the simplest and easy to implement algorithm and it uses less resources.

Results

We clustered the neighborhoods of Amritsar which can be shown as

Cluster 0

This cluster is popular for Cafe's,vegetarian restraunts,Fast food restraunts, Punjabi restraunts, Hotel's, ATM's, Supermarkets, Theme park, Departmental store, Clothing stores. This cluster will be suitable for foodies, shoppers and due to presence of theme parks this cluster will be good for people who have children.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	AMRITSAR	0	Café	Bakery	Punjabi Restaurant	Sandwich Place	Toll Booth
1	AMRITSAR	0	Vegetarian / Vegan Restaurant	Clothing Store	Jewelry Store	Market	Business Service
2	AMRITSAR	0	Vegetarian / Vegan Restaurant	Clothing Store	Jewelry Store	Market	Business Service
3	AMRITSAR	0	Vegetarian / Vegan Restaurant	Clothing Store	Jewelry Store	Market	Business Service
4	AMRITSAR	0	Café	Department Store	Accessories Store	Diner	Shopping Mall
5	AMRITSAR	0	Fast Food Restaurant	Hotel	Snack Place	Shopping Mall	Sandwich Place
6	AMRITSAR	0	ATM	Breakfast Spot	Sandwich Place	Toll Booth	Bakery
9	AMRITSAR	0	Indian Restaurant	Preschool	Asian Restaurant	Café	Hotel
10	AMRITSAR	0	ATM	Theme Park	Sandwich Place	Restaurant	Café
15	AMRITSAR	0	Punjabi Restaurant	Dhaba	Restaurant	Vegetarian / Vegan Restaurant	Farm

Cluster 1

This Cluster is popular with ATM's, Toll booths, Accessories stores, Asian Restraunts and bakeries. This cluster shows that this cluster is popular with tourists and people who like Asian food and bakery products.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
8	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
11	AMRITSAR	1	ATM	Dhaba	Toll Booth	Accessories Store	Asian Restaurant
12	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
13	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
14	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
16	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
17	AMRITSAR	1	ATM	Toll Booth	Accessories Store	Asian Restaurant	Bakery
18	AMRITSAR	1	ATM	Supermarket	Hotel	Accessories Store	Asian Restaurant
21	AMRITSAR	1	ATM	Dhaba	Toll Booth	Accessories Store	Asian Restaurant

Cluster 2

There are very less neighborhoods that belong to this cluster. Farm, Vegetarian/Vegan Restaurant, Toll booth, Accessories store and Asian Restraunt are popular venues in this cluster. Presence of farm indicate this cluster lie on outskirts of the city.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
7	AMRITSAR	2	Farm	Vegetarian / Vegan Restaurant	Toll Booth	Accessories Store	Asian Restaurant

Cluster 3

There are very less neighborhoods that belong to this cluster. Clothing stores, Vegetarian/Vegan Restaurant, Toll booth, Accessories store, Asian Restraunt are popular venues in this cluster.
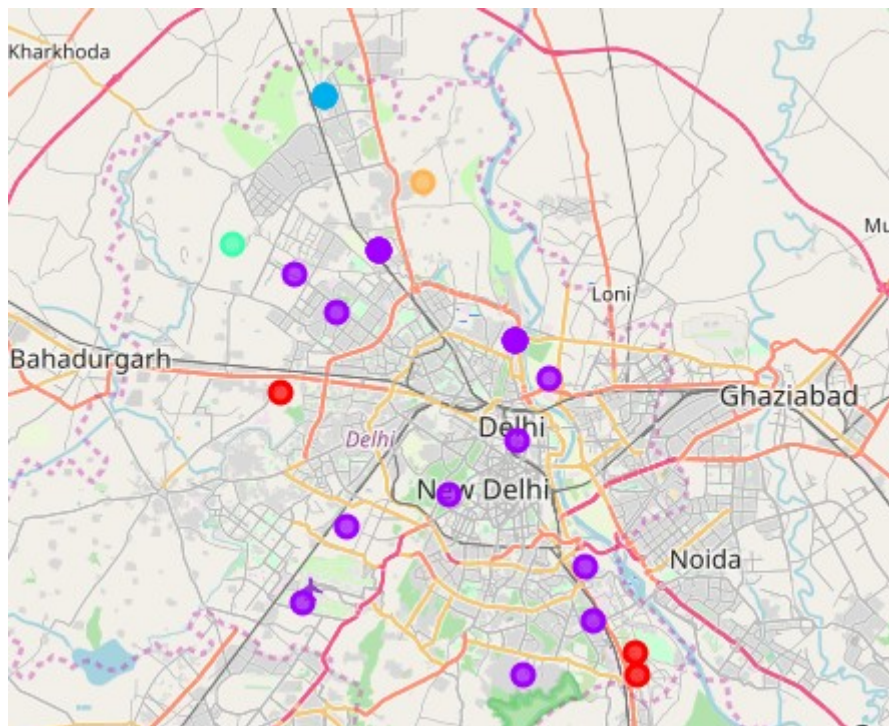
	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
19	AMRITSAR	3	Clothing Store	Vegetarian / Vegan Restaurant	Toll Booth	Accessories Store	Asian Restaurant

Cluster 4

There are very less neighborhoods that belong to this cluster. Indian Restaurant, Toll booth, Accessories store, Asian Restraunt and bakery are popular venues in this cluster.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
20	AMRITSAR	4	Indian Restaurant	Toll Booth	Accessories Store	Asian Restaurant	Bakery

We also clustered the neighborhoods of Delhi which can be as shown

Cluster 0

This cluster doesnot comprises of many neighborhoods. This cluster is popular with Train Station, Construction sites, ATM, Indian Restraunts, Shoe Store, Pizza Palace, Indian sweet shop. This cluster would be interesting to those who depend more on the public commute since these neighborhoods are closer to train stations.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
14	SOUTH EAST DELHI	0	Train Station	Construction & Landscaping	ATM	Food Service	Liquor Store
16	SOUTH EAST DELHI	0	ATM	Shoe Store	Pizza Place	Breakfast Spot	Soccer Field
24	SOUTH EAST DELHI	0	Indian Restaurant	Train Station	ATM	Indian Sweet Shop	Duty-free Shop

Cluster 1

The neighborhood of this cluster is popular with a mix of Cafe's,Indian, Chinese, Vietnamese, Korean, Asian restraunts, Mobile phone shops, Fast food restraunts and many more. This cluster would be interesting to those who depend more on the public commute since these neighborhoods are closer to metro stations. This cluster is also good for foodies as it has a wide variety of restraunts with different cusines like Indian, Vietnamese, Korean, Chinese, Italian, Asian and is also popular for cafe's, coffee shops, food court. These neighborhoods also provide for some recreational places like Multiplex, Lake, Pool, Plaza, Spa. This cluster is also good for people who are interested in sports due to presence of soccer stadium, cricket ground, Sporting goods shop. This cluster is also good for shoppers due to presence of shopping malls, departmental store.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	SOUTH EAST DELHI	1	Indian Restaurant	Hotel	Café	Bar	Snack Place
1	SOUTH EAST DELHI	1	Indian Restaurant	Café	Hotel	Chinese Restaurant	Hotel Bar
2	SOUTH EAST DELHI	1	Café	Pizza Place	Hotel	Soccer Stadium	Restaurant
3	SOUTH EAST DELHI	1	Hotel	Café	Indian Restaurant	Pizza Place	Fast Food Restaurant
10	NORTH DELHI	1	Mobile Phone Shop	Metro Station	Food Court	Bank	Plaza
11	NORTH DELHI	1	Mobile Phone Shop	Metro Station	Food Court	Bank	Plaza
12	NORTH WEST DELHI	1	Mobile Phone Shop	Metro Station	Food Court	Bank	Plaza
13	NORTH WEST DELHI	1	Mobile Phone Shop	Metro Station	Food Court	Bank	Plaza
15	WEST DELHI	1	Indian Restaurant	Shoe Store	Sporting Goods Shop	Vietnamese Restaurant	Cricket Ground
17	CENTRAL DELHI	1	Restaurant	Hotel	Asian Restaurant	Korean Restaurant	Metro Station
18	CENTRAL DELHI	1	Restaurant	Hotel	Asian Restaurant	Korean Restaurant	Metro Station
19	NORTH DELHI	1	Restaurant	Hotel	Asian Restaurant	Korean Restaurant	Metro Station
20	NORTH DELHI	1	Restaurant	Hotel	Asian Restaurant	Korean Restaurant	Metro Station
21	NORTH WEST DELHI	1	Flea Market	Lake	Metro Station	Vietnamese Restaurant	Food
22	SOUTH DELHI	1	Flea Market	Plaza	Mattress Store	Pool	Indian Restaurant
23	SOUTH WEST DELHI	1	Coffee Shop	Airport Lounge	Hotel	Airport Service	Café
25	NORTH WEST DELHI	1	Shopping Mall	Department Store	Fast Food Restaurant	Indian Restaurant	Multiplex
26	NORTH WEST DELHI	1	Heliport	Business Service	Public Bathroom	Spa	Vietnamese Restaurant

Cluster 2

This cluster is popuar with Women's store, ATM's, Electronics, Food and drink shops and Deli / Bodega (restraunt). This area is also good for foodies who prefer american food.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
6	NORTH DELHI	2	Women's Store	ATM	Electronics Store	Food & Drink Shop	Deli / Bodega
7	NORTH DELHI	2	Women's Store	ATM	Electronics Store	Food & Drink Shop	Deli / Bodega
8	NORTH WEST DELHI	2	Women's Store	ATM	Electronics Store	Food & Drink Shop	Deli / Bodega
9	NORTH WEST DELHI	2	Women's Store	ATM	Electronics Store	Food & Drink Shop	Deli / Bodega

Cluster 3

There are very less neighborhoods that belong to this cluster. This cluster is popular with ATM's, Vietnamese Restraunts, Food and drink shop, Deli / Bodega and departmental store.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
5	NORTH DELHI	3	ATM	Vietnamese Restaurant	Food & Drink Shop	Deli / Bodega	Department Store

Cluster 4

There are not many neighborhoods that belong to this cluster. The popular areas in this cluster are Farm, Resort, Event Service, Vietnamese Restraunts and construction and landscaping. All popular venues nearby show that these areas lie on the outskirts of Delhi.

	Districtname	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
4	NORTH DELHI	4	Farm	Resort	Event Service	Vietnamese Restaurant	Construction & Landscaping

Discussion and conclusion

In this project, we have analyzed the neighborhoods of India's two prime cities Amritsar and Delhi on the basis of their top and popular venues. We have clustered the neighborhoods based on top 5 most common venues in the neighborhood of each of these cities. My intention with this project was to analyze and understand the difference in the type of life in these cities, which can offer decision points for anybody who is considering to settle in either of these cities and can get a peek into what type of experience and facilities he will be provided with.

Given our cluster information for both Amritsar and Delhi, we see that both these cities and its neighbourhoods are a great place for a foodie. There are a lot of restaurants, cafes, bars, etc in these neighbourhoods. The difference is that Amritsar is popular for most probably Indian and punjabi restraunts but apart from indian food Delhi also offers all types of international cusines. Thus Delhi is more preferable for foodies. But Amritsar also has theme parks, museums which would be good for tourists.

Thus with this project we have tried to analyze the life in these cities based on the type of neighborhood.

Another observation is that the number of venues Delhi has to offer are far too many as compared to Amritsar. This means Amritsar becomes restrictive in terms of variety and convinience. So, according to data Delhi wins this battle.