Top Cities to visit in India

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Introduction

India is the seventh biggest country in the world. It has numerous languages, ethnic groups, cultures, monuments, palaces, backwaters, waterfalls and other spectaculars. There is no such place in India that can be tagged as a boring destination for tourism. With endless man-made and natural marvels, this analysis hand picks top twenty cities that one has to visit in India. These twenty cities would leave you in awe.

The Subcontinent has wide variety of flavors to **offer the tourists with wide diversity in Heritage sites, Food, Temples it makes it easier** for a tourist if guided with visual analysis of the different venues each destination offers and how similar and dissimilar the cities are!

Also, it would be quiet helpful for a tourist to pick top 'most visited' cities and its top venues which helps him plan the stay/vacation much pleasant in a diverse country.

As per the website: https://www.travelogyindia.com/blog/the-top-20-must-visit-cities-in-india

These are the top 20 travel destinations in India →

1. Udaipur
2. Bhubaneswar
3. Kodaikanal
4. Darjeeling
5. Havelock Island
6. Khajjiar
7. Aurangabad
8. Varanasi
9. Agra
10. Amritsar
11. Madurai
12. Kochi
13. Bengaluru
14. Mumbai
15. Jaipur
16. Sri Nagar
17. Shimla
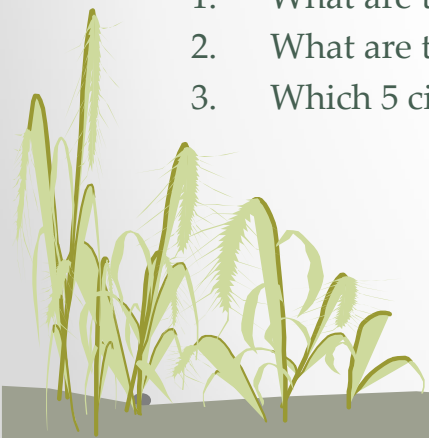18. Hyderabad
19. Chennai
20. Pondicherry

Objective

- The objective of this project is to compare the above 20 cities and determine how similar or dissimilar they are.

  The aim is to determine the similarity or dissimilarity of the 20 cities in the India based on tourism venues like; food, historic sites, Travel and Transport and Spiritual Centers by performing a K-means clustering.

- Analyze the diversity of the city venues:

  1. What are the most common venues types (venues count)
  2. What are the recommending scores of the top 10 venues based on 'ratings'
  3. Which 5 cities has the highest mean recommending scores based on all venue 'ratings'

Data

- For this project the data of foursquare (website: www.foursquare.com) is used for information about venues and ratings. The Foursquare explore function will be used to get the most common venue categories in each city, and then use this feature to group the cities into clusters. Another venue query is performed to retrieve venue ratings for each city to find the most popular places.

- Data is fetched from: https://www.travelogyindia.com/blog/the-top-20-must-visit-cities-in-india and a csv contains the city names as per the website.

- Note: since the 'venue-details' service has limit 500 calls per day for free subsciption, I will be generating random numbers for getting the ratings of each venue instead of actual API call.
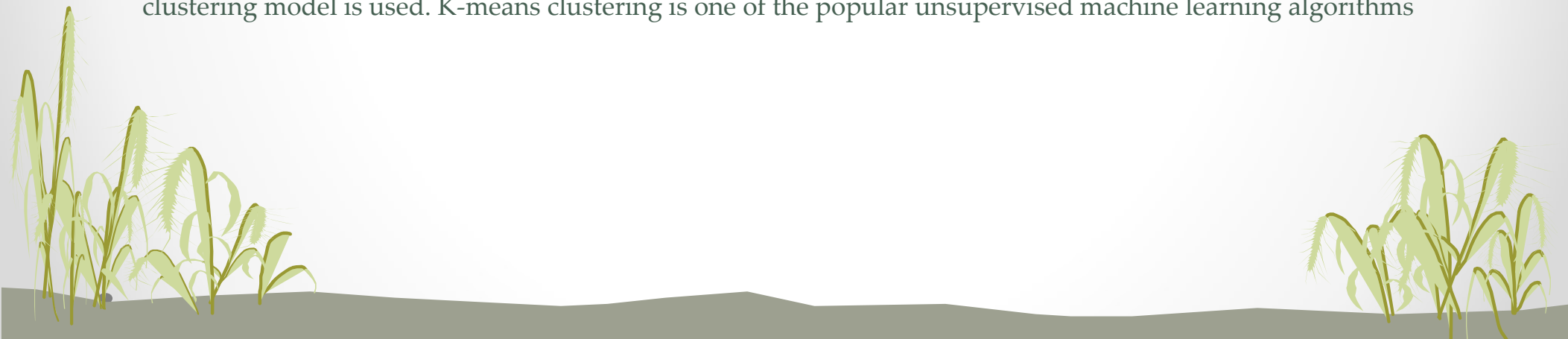
Methodology

- ## Data Collection:

  Collect location data First the Foursquare API is used to explore a city and to get trending venues around a point of interest. Another venue query is performed to retrieve venue ratings for each city to find the most popular places.
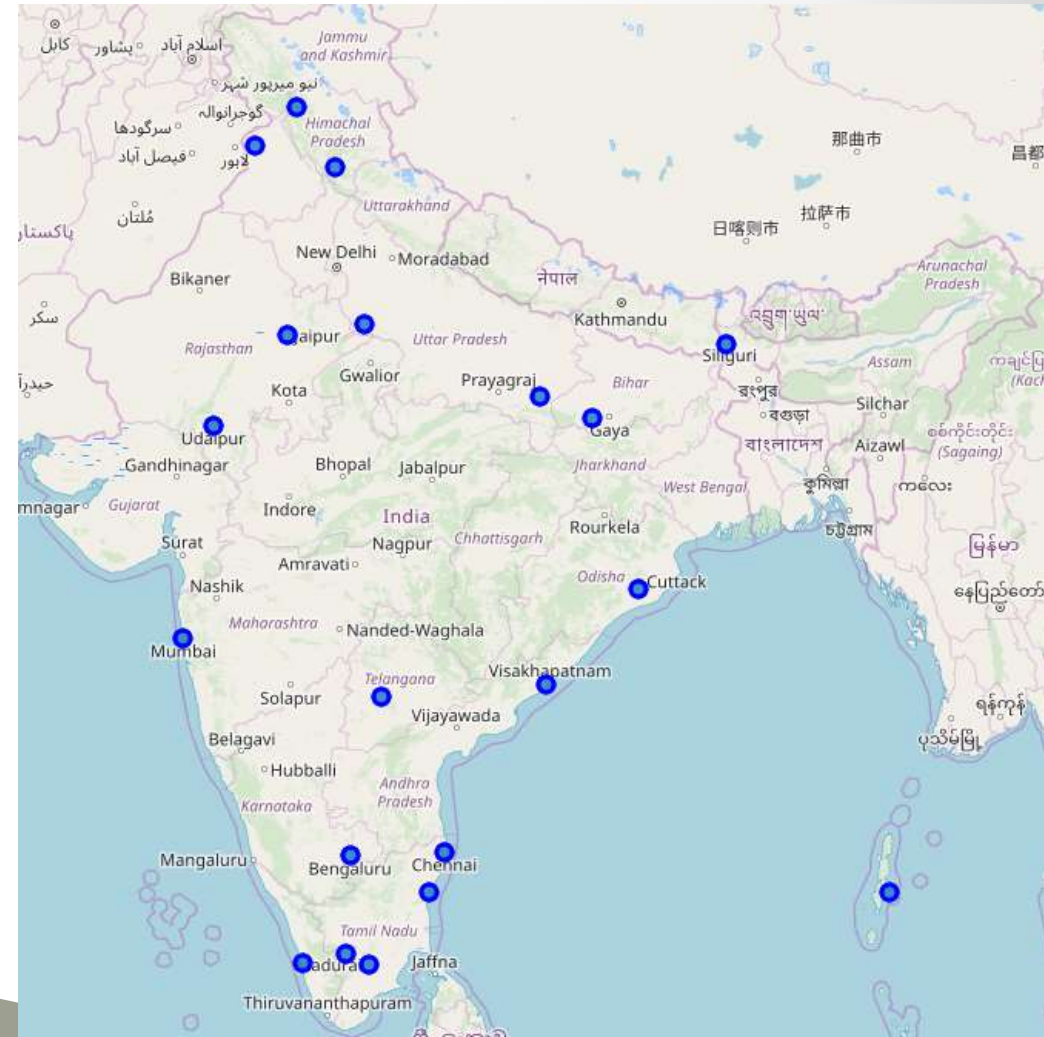
- ## Clustering:

  After collecting data with the Foursquare API we start analyzing the list of cities using location data. To explore cities, segment them and group them into clusters to find similarity or dissimilarity an unsupervised k-means clustering model is used. K-means clustering is one of the popular unsupervised machine learning algorithms

Results

The master data contains the city names and the corresponding longitude and latitudes :

	Cities	Latitude	Longitude
0	Udaipur	24.578721	73.686257
1	Bhubaneswar	20.266567	85.843759
2	Kodaikanal	10.235117	77.493831
3	Darjeeling	26.682113	88.329069
4	Havelock Island	11.965195	92.995621
5	Khajjiar	32.548570	76.059722
6	Aurangabad	24.750000	84.500000
7	Varanasi	25.335649	83.007629
8	Agra	27.175255	78.009816
9	Amritsar	31.634308	74.873679
10	Madurai	9.926115	78.114098
11	Kochi	9.963386	76.253661
12	Bengaluru	12.979120	77.591300
13	Mumbai	18.938771	72.835335
14	Jaipur	26.916194	75.820349
15	Sri Nagar	17.677936	83.189845
16	Shimla	31.104153	77.170973
17	Hyderabad	17.361608	78.474629
18	Chennai	13.080172	80.283833
19	Pondicherry	11.934057	79.830645

- Collect location data First the Foursquare API is used to explore a city and to get trending venues around a point of interest. Another venue query is performed to retrieve venue ratings for each city to find the most popular places. The venue categories chosen for the analysis included Historic Sites, Food, Transport and Travel and Spiritual Centers.

- Below is the merged data after all the venues:

	City	City Latitude	City Longitude	VenueID	VenueName	score	category	catID	latitude	longitude	Primary_category
0	Udaipur	24.578721	73.686257	4bc2b8a4abf495218ce8c293	City Palace Museum	9.4	Museums	4bf58dd8d48988d181941735	24.576911	73.683544	Historic Sites
1	Udaipur	24.578721	73.686257	5bee895e1953f3002c19955c	Chini Chitrashala	6.4	Historic Sites	4deefb944765f83613cdba6e	24.576450	73.683530	Historic Sites
2	Udaipur	24.578721	73.686257	5bee89c073fe25002cc8d5da	Mor Chowk	8.2	Historic Sites	4deefb944765f83613cdba6e	24.576523	73.683416	Historic Sites
3	Udaipur	24.578721	73.686257	5bee6f421953f3002c003e99	Badi Mahal	6.7	Gardens	4bf58dd8d48988d15a941735	24.577316	73.683452	Historic Sites
4	Udaipur	24.578721	73.686257	56ae2a19498e71625c63a461	Manek Chowk	4.8	Historic Sites	4deefb944765f83613cdba6e	24.576747	73.683902	Historic Sites

```
print('There are {} uniques venue categories.'.format(len(India_city_venues['category'].unique())))

There are 97 uniques venue categories.
```
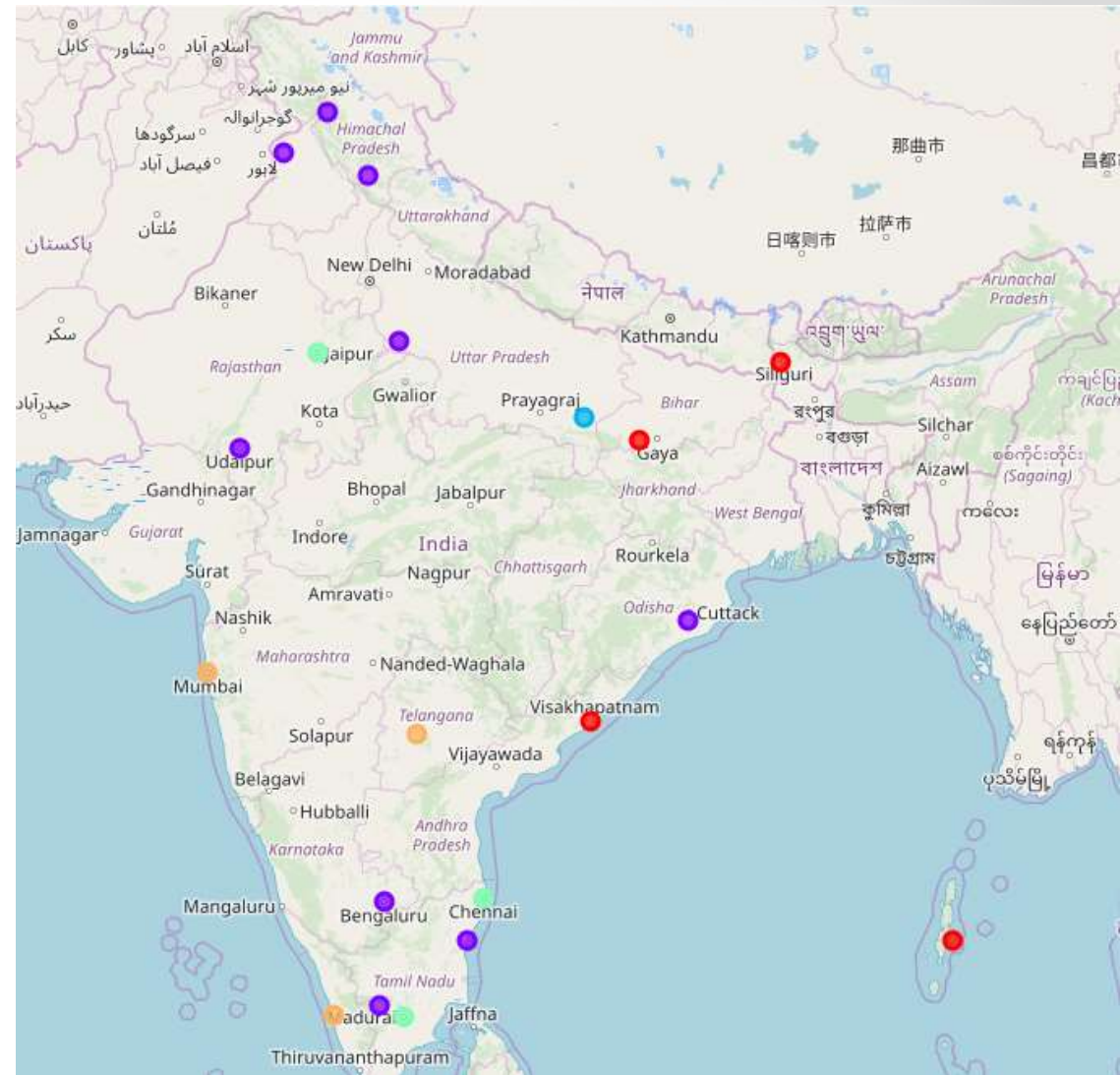
Top 10 Venues for each city

	City	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	Agra	Hotels	General Travel	Dessert Shops	Indian Sweet Shops	Indian Restaurants	Tea Rooms	Bus Lines	Travel Lounges	Restaurants	Chaat Places
1	Amritsar	Hotels	Indian Restaurants	Dessert Shops	Fast Food Restaurants	Bakeries	Cafés	Vegetarian / Vegan Restaurants	Platforms	Pizza Places	Motels
2	Bengaluru	Hotels	Food Trucks	Indian Restaurants	Cafeterias	Fast Food Restaurants	Seafood Restaurants	Moving Targets	Capitol Buildings	Metro Stations	Pizza Places
3	Bhubaneswar	Hotels	Indian Restaurants	Platforms	Restaurants	Ice Cream Shops	Temples	Bakeries	Vegetarian / Vegan Restaurants	Cafés	Bus Lines
4	Chennai	Indian Restaurants	Historic Sites	Train Stations	Ice Cream Shops	Churches	South Indian Restaurants	Vegetarian / Vegan Restaurants	Cupcake Shops	Cantonese Restaurants	Capitol Buildings
5	Darjeeling	Airport Terminals	Airport Services	Airport Gates	Airport Food Courts	Airports	Baggage Claims	Dhabas	Chaat Places	Chinese Restaurants	Churches
6	Hyderabad	Indian Restaurants	Mosques	Juice Bars	Food Trucks	South Indian Restaurants	Monuments / Landmarks	Middle Eastern Restaurants	Snack Places	Cafés	Historic Sites
7	Jaipur	Indian Restaurants	Ice Cream Shops	Historic Sites	Tea Rooms	Dessert Shops	Hotels	Markets	Multicuisine Indian Restaurants	Juice Bars	Fast Food Restaurants
8	Khajjiar	Hotels	Historic Sites	Bus Stops	Bus Stations	Indian Restaurants	Motels	Cupcake Shops	Capitol Buildings	Chaat Places	Chinese Restaurants
9	Kochi	Mosques	Fast Food Restaurants	Juice Bars	Snack Places	Churches	Hotels	Food Trucks	Historic Sites	Temples	Coffee Shops
10	Kodaikanal	Hotels	Indian Restaurants	Resorts	Cafés	Motels	Asian Restaurants	Churches	Burger Joints	Temples	Restaurants
11	Madurai	Indian Restaurants	Hindu Temples	Cafés	Hotels	Juice Bars	Snack Places	Bakeries	Restaurants	Bed & Breakfasts	Temples
12	Mumbai	Mosques	Cafés	Indian Restaurants	Temples	Hotels	Platforms	Seafood Restaurants	Fast Food Restaurants	General Travel	Rest Areas
13	Pondicherry	Hotels	Cafés	Indian Restaurants	Italian Restaurants	Temples	Bed & Breakfasts	Motels	Historic Sites	Boarding Houses	Churches
14	Shimla	Hotels	Indian Restaurants	Restaurants	Chinese Restaurants	Coffee Shops	Motels	Resorts	Cafés	Tea Rooms	North Indian Restaurants
15	Udaipur	Hotels	Indian Restaurants	Restaurants	Historic Sites	Cafés	Hostels	Temples	Bed & Breakfasts	Gardens	Ice Cream Shops
16	Varanasi	Hotels	Vegetarian / Vegan Restaurants	Dessert Shops	Cantonese Restaurants	Capitol Buildings	Chaat Places	Chinese Restaurants	Churches	Coffee Shops	Comfort Food Restaurants

- After this step, I have used k-Means clustering to cluster the cities and use Folium to pin the clusters on the Map.
- Below is the dataframe with cluster numbers with top 10 venues for each city:

	Cluster Labels	City	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	1	Agra	Hotels	General Travel	Dessert Shops	Indian Sweet Shops	Indian Restaurants	Tea Rooms	Bus Lines	Travel Lounges	Restaurants	Chaat Places
1	1	Amritsar	Hotels	Indian Restaurants	Dessert Shops	Fast Food Restaurants	Bakeries	Cafés	Vegetarian / Vegan Restaurants	Platforms	Pizza Places	Motels
2	1	Bengaluru	Hotels	Food Trucks	Indian Restaurants	Cafeterias	Fast Food Restaurants	Seafood Restaurants	Moving Targets	Capitol Buildings	Metro Stations	Pizza Places
3	1	Bhubaneswar	Hotels	Indian Restaurants	Platforms	Restaurants	Ice Cream Shops	Temples	Bakeries	Vegetarian / Vegan Restaurants	Cafés	Bus Lines
4	3	Chennai	Indian Restaurants	Historic Sites	Train Stations	Ice Cream Shops	Churches	South Indian Restaurants	Vegetarian / Vegan Restaurants	Cupcake Shops	Cantonese Restaurants	Capitol Buildings
5	0	Darjeeling	Airport Terminals	Airport Services	Airport Gates	Airport Food Courts	Airports	Baggage Claims	Dhabas	Chaat Places	Chinese Restaurants	Churches
6	4	Hyderabad	Indian Restaurants	Mosques	Juice Bars	Food Trucks	South Indian Restaurants	Monuments / Landmarks	Middle Eastern Restaurants	Snack Places	Cafés	Historic Sites
7	3	Jaipur	Indian Restaurants	Ice Cream Shops	Historic Sites	Tea Rooms	Dessert Shops	Hotels	Markets	Multicuisine Indian Restaurants	Juice Bars	Fast Food Restaurants
8	1	Khajjiar	Hotels	Historic Sites	Bus Stops	Bus Stations	Indian Restaurants	Motels	Cupcake Shops	Capitol Buildings	Chaat Places	Chinese Restaurants
9	4	Kochi	Mosques	Fast Food Restaurants	Juice Bars	Snack Places	Churches	Hotels	Food Trucks	Historic Sites	Temples	Coffee Shops
10	1	Kodaikanal	Hotels	Indian Restaurants	Resorts	Cafés	Motels	Asian Restaurants	Churches	Burger Joints	Temples	Restaurants
11	3	Madurai	Indian Restaurants	Hindu Temples	Cafés	Hotels	Juice Bars	Snack Places	Bakeries	Restaurants	Bed & Breakfasts	Temples
12	4	Mumbai	Mosques	Cafés	Indian Restaurants	Temples	Hotels	Platforms	Seafood Restaurants	Fast Food Restaurants	General Travel	Rest Areas
13	1	Pondicherry	Hotels	Cafés	Indian Restaurants	Italian Restaurants	Temples	Bed & Breakfasts	Motels	Historic Sites	Boarding Houses	Churches
14	1	Shimla	Hotels	Indian Restaurants	Restaurants	Chinese Restaurants	Coffee Shops	Motels	Resorts	Cafés	Tea Rooms	North Indian Restaurants
15	1	Udaipur	Hotels	Indian Restaurants	Restaurants	Historic Sites	Cafés	Hostels	Temples	Bed & Breakfasts	Gardens	Ice Cream Shops
16	2	Varanasi	Hotels	Vegetarian / Vegan Restaurants	Dessert Shops	Cantonese Restaurants	Capitol Buildings	Chaat Places	Chinese Restaurants	Churches	Coffee Shops	Comfort Food Restaurants

Map of India with clusters

Cluster 0

```
In [50]: India_city_merged.loc[India_city_merged['Cluster Labels'] == 0]
```

Out[50]:

	Cities	Latitude	Longitude	Cluster Labels	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
3	Darjeeling	26.682113	88.329069	0	Airport Terminals	Airport Services	Airport Gates	Airport Food Courts	Airports	Baggage Claims	Dhabas	Chaat Places	Chinese Restaurants	Churches
4	Havelock Island	11.965195	92.995621	0	0	0	0	0	0	0	0	0	0	0
6	Aurangabad	24.750000	84.500000	0	0	0	0	0	0	0	0	0	0	0
15	Sri Nagar	17.677936	83.189845	0	0	0	0	0	0	0	0	0	0	0

Cluster 1: This is the cluster with most cities

```
India_city_merged.loc[India_city_merged['Cluster Labels'] == 1]
```

]:

	Cities	Latitude	Longitude	Cluster Labels	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	Udaipur	24.578721	73.686257	1	Hotels	Indian Restaurants	Restaurants	Historic Sites	Cafés	Hostels	Temples	Bed & Breakfasts	Gardens	Ice Cream Shops
1	Bhubaneswar	20.266567	85.843759	1	Hotels	Indian Restaurants	Platforms	Restaurants	Ice Cream Shops	Temples	Bakeries	Vegetarian / Vegan Restaurants	Cafés	Bus Lines
2	Kodaikanal	10.235117	77.493831	1	Hotels	Indian Restaurants	Resorts	Cafés	Motels	Asian Restaurants	Churches	Burger Joints	Temples	Restaurants
5	Khajjiar	32.548570	76.059722	1	Hotels	Historic Sites	Bus Stops	Bus Stations	Indian Restaurants	Motels	Cupcake Shops	Capitol Buildings	Chaat Places	Chinese Restaurants
8	Agra	27.175255	78.009816	1	Hotels	General Travel	Dessert Shops	Indian Sweet Shops	Indian Restaurants	Tea Rooms	Bus Lines	Travel Lounges	Restaurants	Chaat Places
9	Amritsar	31.634308	74.873679	1	Hotels	Indian Restaurants	Dessert Shops	Fast Food Restaurants	Bakeries	Cafés	Vegetarian / Vegan Restaurants	Platforms	Pizza Places	Motels
12	Bengaluru	12.979120	77.591300	1	Hotels	Food Trucks	Indian Restaurants	Cafeterias	Fast Food Restaurants	Seafood Restaurants	Moving Targets	Capitol Buildings	Metro Stations	Pizza Places
16	Shimla	31.104153	77.170973	1	Hotels	Indian Restaurants	Restaurants	Chinese Restaurants	Coffee Shops	Motels	Resorts	Cafés	Tea Rooms	North Indian Restaurants
19	Pondicherry	11.934057	79.830645	1	Hotels	Cafés	Indian Restaurants	Italian Restaurants	Temples	Bed & Breakfasts	Motels	Historic Sites	Boarding Houses	Churches

Cluster 2, 3 and 4

```
India_city_merged.loc[India_city_merged['Cluster Labels'] == 2]
```

2]:

	Cities	Latitude	Longitude	Cluster Labels	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
7	Varanasi	25.335649	83.007629	2	Hotels	Vegetarian / Vegan Restaurants	Dessert Shops	Cantonese Restaurants	Capitol Buildings	Chaat Places	Chinese Restaurants	Churches	Coffee Shops	Comfort Food Restaurants

```
India_city_merged.loc[India_city_merged['Cluster Labels'] == 3]
```

3]:

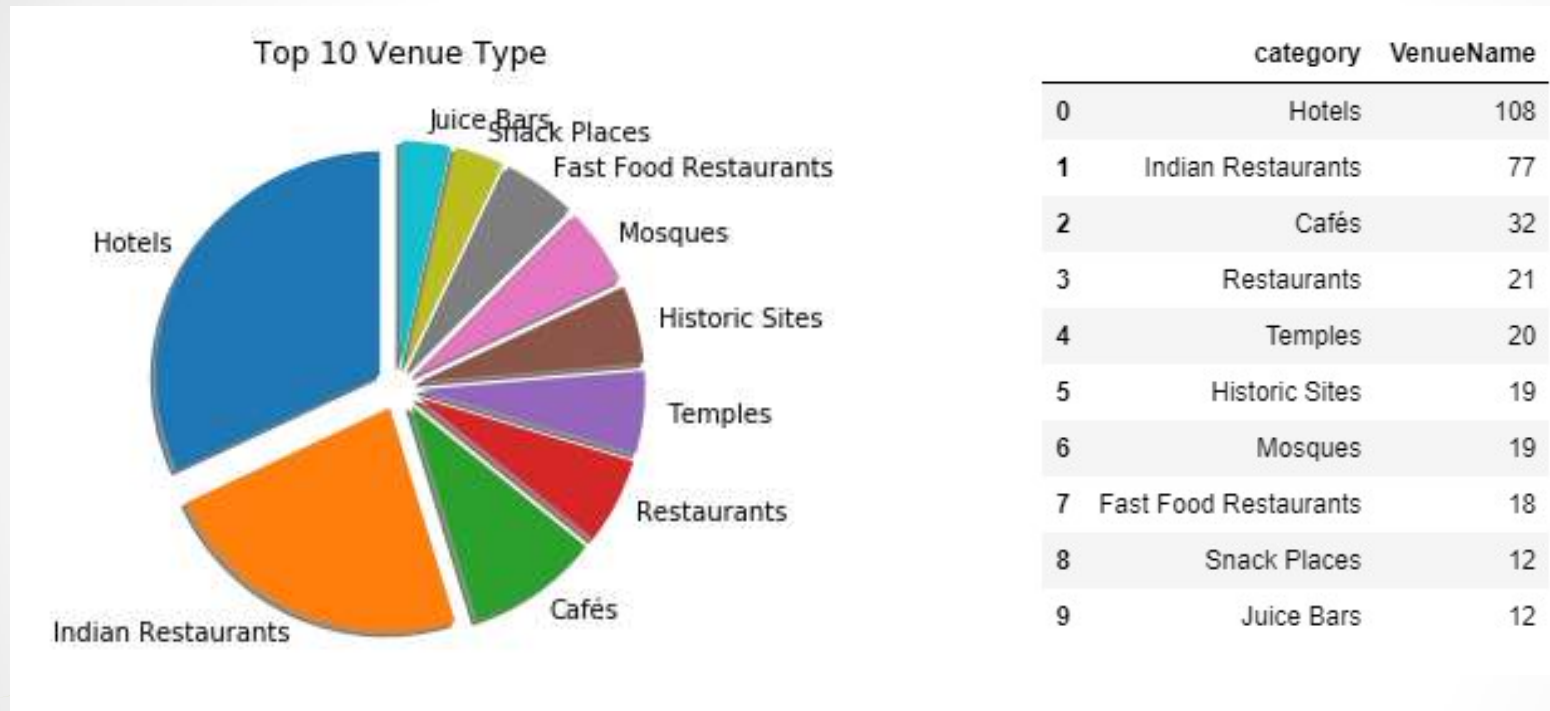|	Cities	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
10	Madurai	9.926115	78.114098	3	Indian Restaurants	Hindu Temples	Cafés	Hotels	Juice Bars	Snack Places	Bakeries	Restaurants	Bed & Breakfasts	Temples
14	Jaipur	26.916194	75.820349	3	Indian Restaurants	Ice Cream Shops	Historic Sites	Tea Rooms	Dessert Shops	Hotels	Markets	Multicuisine Indian Restaurants	Juice Bars	Fast Food Restaurants
18	Chennai	13.080172	80.283833	3	Indian Restaurants	Historic Sites	Train Stations	Ice Cream Shops	Churches	South Indian Restaurants	Vegetarian / Vegan Restaurants	Cupcake Shops	Cantonese Restaurants	Capitol Buildings

```
India_city_merged.loc[India_city_merged['Cluster Labels'] == 4]
```

4]:

	Cities	Latitude	Longitude	Cluster Labels	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
11	Kochi	9.963386	76.253661	4	Mosques	Fast Food Restaurants	Juice Bars	Snack Places	Churches	Hotels	Food Trucks	Historic Sites	Temples	Coffee Shops
13	Mumbai	18.938771	72.835335	4	Mosques	Cafés	Indian Restaurants	Temples	Hotels	Platforms	Seafood Restaurants	Fast Food Restaurants	General Travel	Rest Areas
17	Hyderabad	17.361608	78.474629	4	Indian Restaurants	Mosques	Juice Bars	Food Trucks	South Indian Restaurants	Monuments / Landmarks	Middle Eastern Restaurants	Snack Places	Cafés	Historic Sites

Top 10 venue types

Top 10 Venue Type

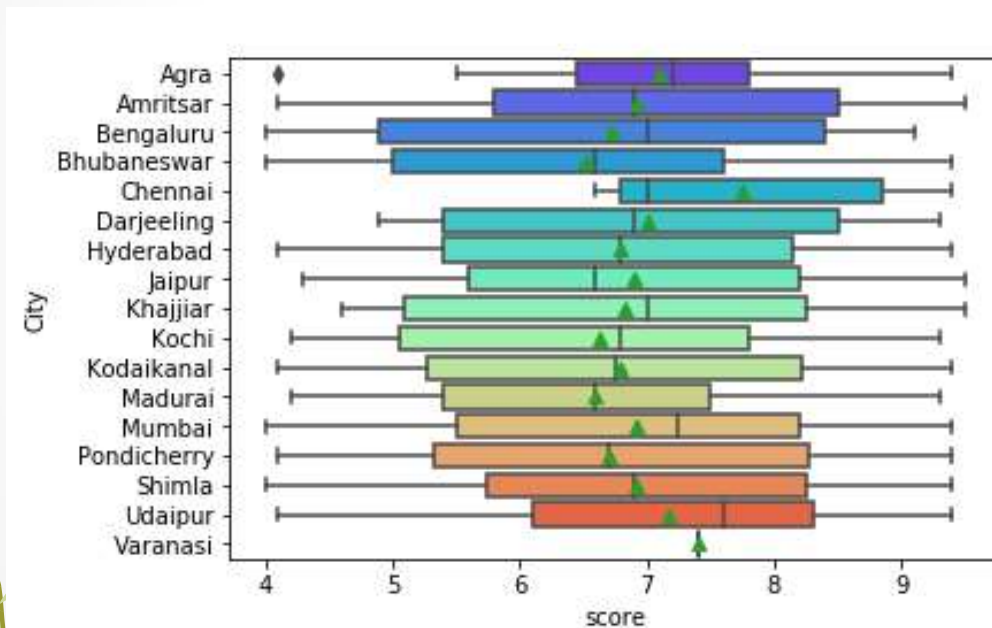|	category	VenueName
0	Hotels	108
1	Indian Restaurants	77
2	Cafés	32
3	Restaurants	21
4	Temples	20
5	Historic Sites	19
6	Mosques	19
7	Fast Food Restaurants	18
8	Snack Places	12
9	Juice Bars	12

5 cities has the highest mean recommending scores
based on all venue 'ratings'

As per the ratings Chennai, Varanasi, Udaipur, Agra and Darjeeling are the top 5 cities to visit.
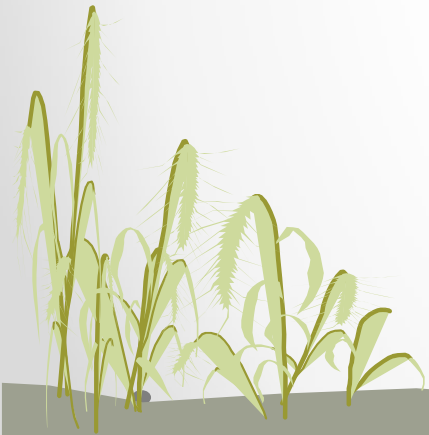

	City	score
0	Chennai	7.757143
1	Varanasi	7.400000
2	Udaipur	7.172857
3	Agra	7.090909
4	Darjeeling	7.000000
5	Amritsar	6.920755
6	Mumbai	6.918750
7	Shimla	6.918182
8	Jaipur	6.908000
9	Khajjiar	6.828571
10	Hyderabad	6.794872
11	Kodaikanal	6.782143
12	Bengaluru	6.714286
13	Pondicherry	6.701613
14	Kochi	6.631915
15	Madurai	6.585185
16	Bhubaneswar	6.524444

Using the above data analysis, we can even fetch all the venue information for a single city of tourist's choice.

```
: # Here we have selected Bengaluru and find the different venue counts in Bengaluru.
City_bengaluru_venues = India_city_venues[(India_city_venues['City'] == 'Bengaluru')]
City_bengaluru_count = City_bengaluru_venues.groupby('Primary_category')['VenueName'].count().sort_values(ascending=False)[:10].reset_index()
City_bengaluru_count
```

59]:

	Primary_category	VenueName
0	Food	14
1	Travel	6
2	Historic Sites	1

Discussion

In this notebook, an analysis of 20 top cities of India is done. The results may help the tourists choose a city based on their likes. Using Foursquare API, a good amount of venur recommendations are collected for the cities. Sourcing venue recommendation from Foursquare for this analysis had a limitation of search distance to 500m and querying limit of 500 calls per day for venue ratings for free subscription. Because of these limitations, the list of venues is not the complete list of all available venues in the cities.

Also because of the querying limit of 500 calls per day for venue ratings, a random score is calculated using Python Random module. So the results of the assignment may vary significantly from the actual ratings of the cities.

Conclusion

- **Conclusion 1:**

  Almost 9 cities are similar : Udaipur, Bhubaneswar, Kodaikanal, Khajjiar, Agra, Amritsar, Bengaluru, Shimla and Pondicherry. These cities are the most visited tourist places with best Hotel, Resorts, Transport and Restaurants

- **Conclusion 2:**

  Most of the venue types are Hotel, Indian Restaurants, Cafes

- **Conclusion 3:**

  As per the ratings Chennai, Varanasi, Udaipur, Agra and Darjeeling are the top 5 cities to visit.

The above conclusion/analysis provides the tourist an overall information of top 20 cities to visit in India and all possible venue information including the Transport/ Historic Sites/Temples and many more. Thus addressing one of the tedious part of travel plan and making the travel, stay and the experience of enjoying the multi-cultural subcontinent much more memorable and hassle-free.