Introduction:-

There are many international tourist destinations in the world like Paris, London, Sydney and many more. International Tour requires a good budget out of individual income averaging around 5000 GBP per tour. It would be better if we know that we are guaranteed to have new experience or going to enjoy the tour.

Data Collection:-

We have considered Paris, London, Sydney, New York, Toronto, and Wellington for comparison as this cities are major tourist destination around the world. The table below shows the location of this cities extracted using Geopy library.

Table 1. Location of cities.

	Cites	Latitude	Longitude
0	Paris	48.856610	2.351499
1	London	51.507322	-0.127647
2	Sydney	-33.854816	151.216454
3	New York	40.712728	-74.006015
4	Toronto	43.653963	-79.387207

Foursquare API is used to extract top 10 venues of each city and a new dataset with venues details is created. The sample of this dataset is shown below

Table 2. First 5 rows of complete dataset with venues details

	City	City Latitude	City Longitude	Venue	Venue id	Venue Latitude	Venue Longitude	Venue Category
0	Paris	48.856610	2.351499	Place de l Hôtel de Ville – Esplanade de la Li...	4bf41231e5eba59334341f90	48.856925	2.351412	Plaza
1	Paris	48.856610	2.351499	Parc Rives de Seine	58e0f18f561ded7abcbbbd01	48.855510	2.351419	Park
2	Paris	48.856610	2.351499	Berges de Seine – Rive droite	58d800df9435a979b8a645fa	48.855131	2.352289	Pedestrian Plaza
3	Paris	48.856610	2.351499	L Alsacien	54351b59498e123ee4afc7ff	48.858275	2.350381	Alsatian Restaurant
4	Paris	48.856610	2.351499	Häagen-Dazs	4cb2fc20db32f04d6da9d34d	48.854879	2.350233	Ice Cream Shop

The dataset had 45 different categories of venues which included Plaza, Park, Pedestrian Plaza, Alsatian Restaurant, Ice Cream Shop, Cosmetics Shop, Department Store, Pastry Shop, Historic Site, Art Museum, Fountain, Spa, Church, Hotel, Monument / Landmark, Art Gallery, Outdoor Sculpture, Concert Hall, Theater, Opera House, Australian Restaurant, Café Cocktail Bar, Hotel Bar, Laundry Service, Coffee Shop, Dance Studio, French Restaurant, Gym / Fitness Center, Bakery, Indian Restaurant, Neighborhood, Sushi Restaurant, Poke Place, Ramen Restaurant, Tea Room, Japanese Restaurant, Arts & Crafts Store, Bubble Tea Shop, Waterfront, Creperie, Burger Joint, Gastropub, Vietnamese Restaurant and Beer Bar

K-Means Clustering:-

Kmeans clustering algorithm is used to for clusters of similar cities based on venues in the cities. The value of K is considered 3 to get 3 clusters of similar cities. To apply kmeans first the venues category are onehot encoded.
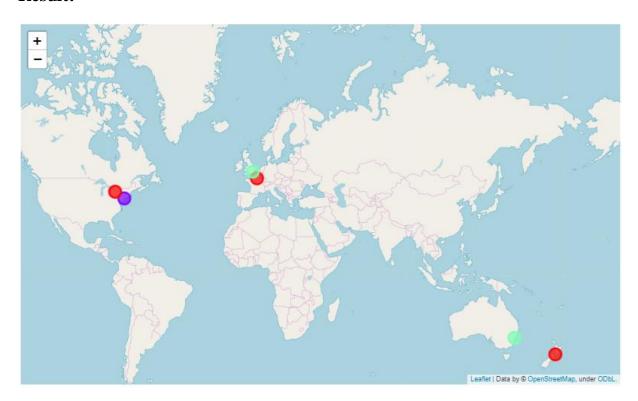
Result:-

Figure 1. World map with clusters of similar cities

There are 3 clusters with first cluster consists of Wellington, Paris and Toronto. Second cluster has London and Sydney. New York forms the third cluster.

Conclusion and Future Scope:-

The result clearly shows the similar cities based on venues of the cities. More cities can be included to get good comparison. To improve clustering or comparison more venues or only specific category of venues like Historic site, Monuments, Landmarks etc., can be used for clustering.