Tourist Parents Project

Camilo A. Suarez B.

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Introduction

In this project, I suppose that my parents want to travel around South America and visit the main museums in Bogota-Colombia, La Paz-Bolivia, Rio de Janeiro-Brazil and Buenos Aires-Argentina. They do not know much about museums and want me to help them with data science to find out which are the top 10 in each city.

Those interested in the project are people who want to make trips and find the most recommended sites according to their specific tastes, with all the information that is around these sites.

Business Problem

In the modern globalized world, people like to travel according to their particular tastes, but when we get to tourist cities, we lose our particular interest in all the options that are in the cities and at the end of the trip there is a bit of frustration. by not having fulfilled the objective of the proposed visit.

This project seeks to filter out very particular interests for tourists and help them organize their visits so as not to waste time on their main objective and after achieving their objective you can do other interesting things in these cities or places.

Data

To filter and recommend tourist places, the variable that we must know is the preference of tourists, their specific objectives in the trip.

Data Collection

For the respective recommendations we must consider the following:

Museums Data for Bogotá, La Paz, Rio de Janeiro and Buenos Aires

Using Foursquare we can extract the data of places in these cities, and in this way filter the museums of each one of these cities.

Rating Data for the Museums

It is used the places API provided by Foursquare to gather the ratings data for the museums in each city.

Data Cleaning

This museums data set had a lot of duplicate in each city. This data set was processed to remove the duplicate entries. This reduced the size of the restaurant dataset by ~90%. Other problems were identified with this museum's dataset. The problems identified are as follows:

1. The dataset included data for museums-restaurants. It is not the objective of recommendations.

2. The data set included museums that were not categorized. it is needed the museums to be categorized appropriately for our analysis.

Based on the above observations, the data had to be cleaned up before we could continue with our analysis but when these museums were clustered appear a lot of information eliminated before.

Methodology

- The main component in this project was the extraction of data using Foursquare APIs, organizing the information in dataframes, searching through the list of museums and finding the rating of each one.

- Use bar ranking to select the top 10 museums in each city.

- From this, you group each museum into its respective category, make the analysis of each museum and create a dataframe with the 5 most recommended places for each museum.

- Run K-means in five clusters and finally be able to visualize and decide which museums to visit according to personal interest.
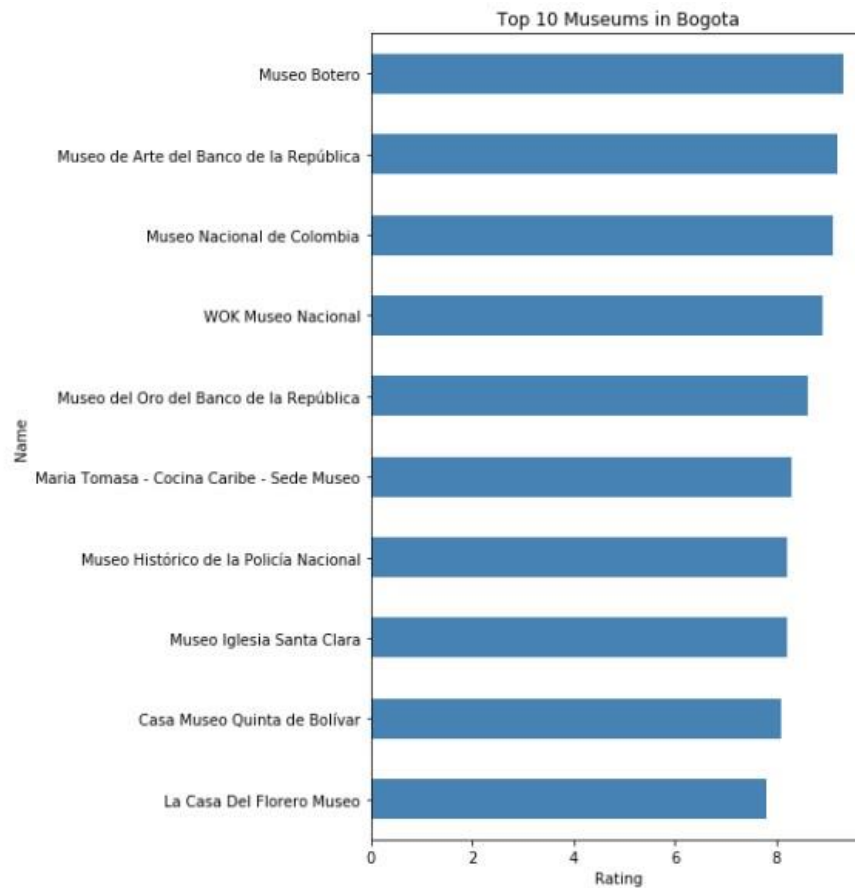
Results and Discussion

Bogotá

Figure 1. Top 10 of the rating of museums in Bogota

The following museums were found between the top 10, the first 10 seem to be remarkably interesting due to the excellent rating of tourists, where the first is a museum of an incredibly famous Colombian painter.

Figure 2. Map of Bogotá with five groups representing the category found for each museum of tourist interest.

5 clusters were generated and found in different interests, art museums, history museums, science museums, bars, and restaurants in these points of interest.

One of these clusters is shown in this report

Museo_name	Museo_city	Museo_Address	Museo_Address	Museo_Latitude	Museo_Longitude	Museo_Category	Museum_Venue_id	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
Museo de la Sociedad de Cirugía de Bogotá	Bogotá	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	4.602948	-74.087057	Science Museum	539ef1e2498e2eba582537ac	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
MUSEO LA SALLE		[Colombia]	[Colombia]	4.594646	-74.070519	Science Museum	4f8cbb54e4b05ee6cd444404	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
Museo del Mar UTADEO		[Colombia]	[Colombia]	4.607131	-74.067674	Science Museum	511128d7e4b00d021dbe61c8	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
MUSEO LA SALLE		[Colombia]	[Colombia]	4.594646	-74.070519	Science Museum	4f8cbb54e4b05ee6cd444404	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
Museo de la Sociedad de Cirugía de Bogotá	Bogotá	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	4.602948	-74.087057	Science Museum	539ef1e2498e2eba582537ac	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
...				...		...			...		...		
Museo de la Sociedad de Cirugía de Bogotá	Bogotá	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	4.602948	-74.087057	Science Museum	539ef1e2498e2eba582537ac	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
Museo del Mar UTADEO		[Colombia]	[Colombia]	4.607131	-74.067674	Science Museum	511128d7e4b00d021dbe61c8	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
MUSEO LA SALLE		[Colombia]	[Colombia]	4.594646	-74.070519	Science Museum	4f8cbb54e4b05ee6cd444404	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
Museo de la Sociedad de Cirugía de Bogotá	Bogotá	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	[Cra. 19 No. 8a - 32, Los Mártires, Bogotá, Bo...	4.602948	-74.087057	Science Museum	539ef1e2498e2eba582537ac	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant
Museo del Mar UTADEO		[Colombia]	[Colombia]	4.607131	-74.067674	Science Museum	511128d7e4b00d021dbe61c8	3.0	Science Museum	Restaurant	Art Gallery	Art Museum	Asian Restaurant

Figure 3. Cluster 3 is categorized in science museums localized in universities in the city
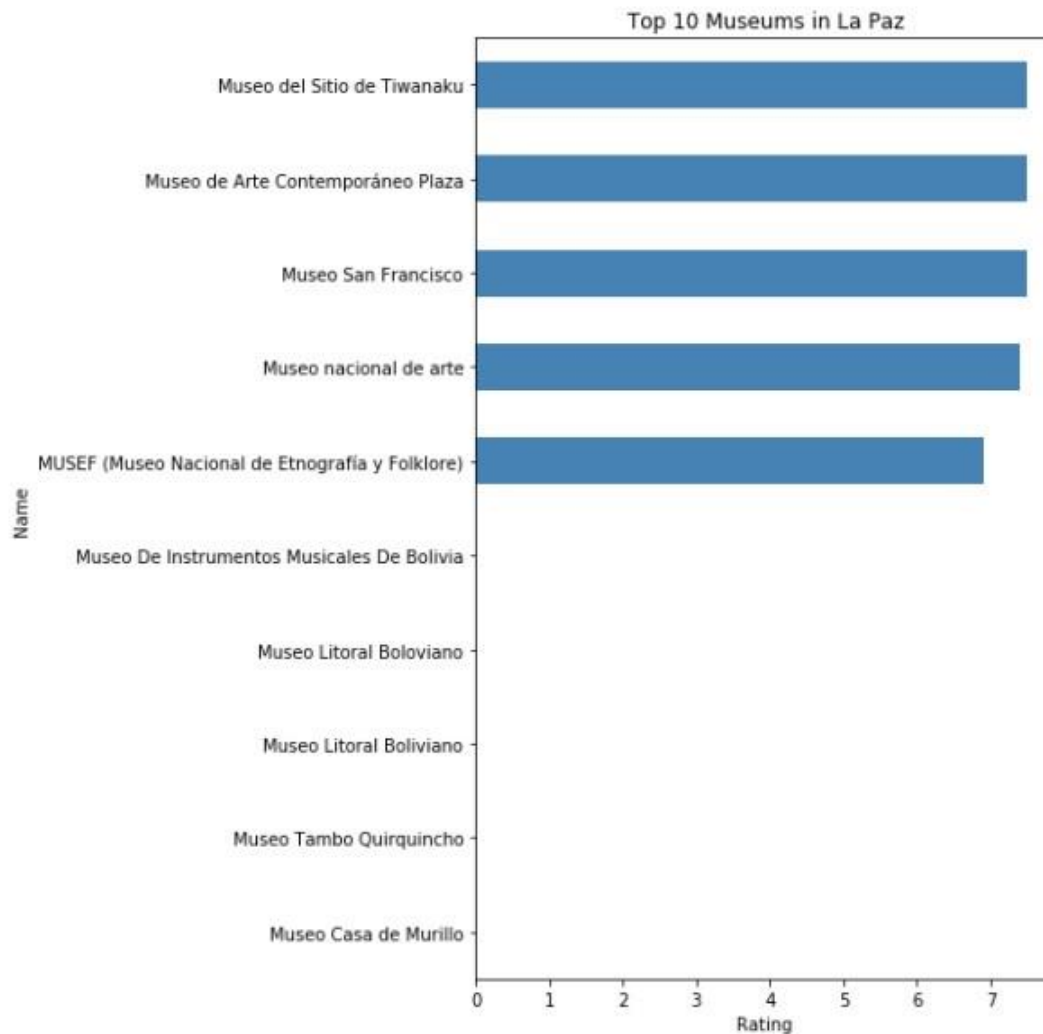
La Paz

Figure 4. Only five museums were rate in the city of La Paz and it is folklore museums.

In La Paz only 5 museums were ranked and compared to the museums in Bogota it has a rating between 8 and 7, showing less acceptance by tourists.

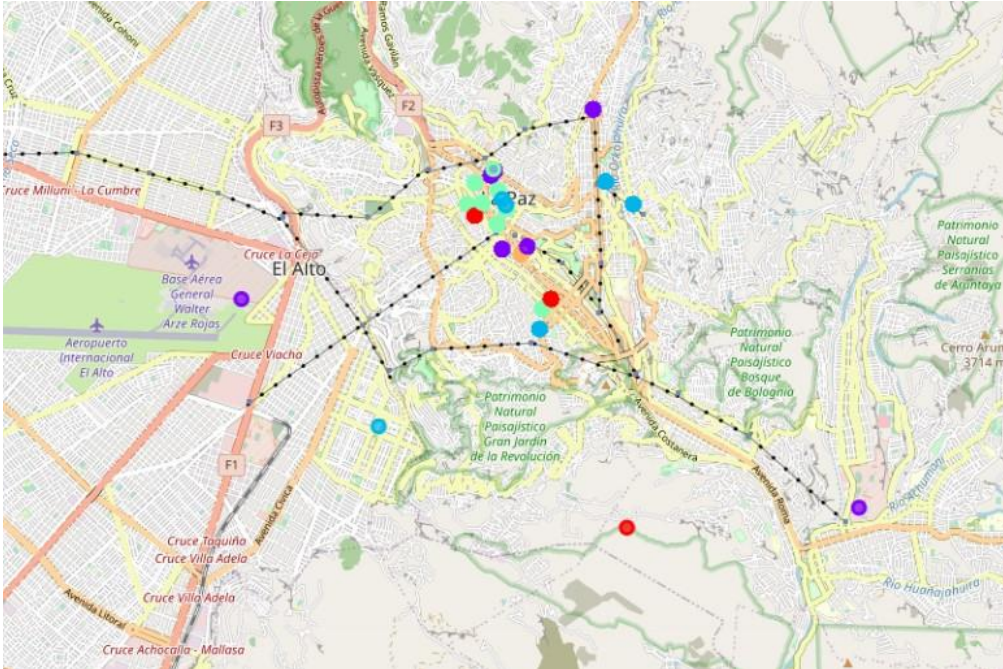There are other museums, but they have not been racked, it may be due to a lack of publicity or lack of information technology.

Figure 5. Map of La Paz with five groups representing the category found for each museum of tourist interest.

The museums in La Paz are less concentrated than in Bogota and it was also observed that the clusters do not show much information around these museums, due to this it is better to visit museums where there is the largest concertation of clusters

One of these clusters is shown in this report

	Museo_Paz	Museo_name_Paz	Museo_city_Paz	Museo_Address_Paz	Museo_Address_Paz	Museo_Latitude_Paz	Museo_Longitude_Paz	Museo_Category_Paz	Museum_Venue_id_Paz	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th M Comm Ven
9	Museo De Metales Preciosos Precolombinos	Museo De Instrumentos Musicales De Bolivia	La Paz	[La Paz, Bolivia]	[La Paz, Bolivia]	-16.492571	-68.136041	History Museum	50365ddce4b0c5e43dbc0b4e	1	History Museum	Science Museum	Museum	Cultural Center	
11	Museo De Metales Preciosos Precolombinos	Museo Casa de Murillo	La Paz	[C. Jaén Nº 790, La Paz, Bolivia]	[C. Jaén Nº 790, La Paz, Bolivia]	-16.492160	-68.135877	History Museum	4fb8260d7b0cd3a6863a31f7	1	History Museum	Science Museum	Museum	Cultural Center	
13	Museo De Metales Preciosos Precolombinos	Museo Litoral Boliviano	La Paz	[La Paz, Bolivia]	[La Paz, Bolivia]	-16.502280	-68.134459	History Museum	598f36a4c4df1d322f5f0100	1	History Museum	Science Museum	Museum	Cultural Center	
14	Museo De Metales Preciosos Precolombinos	Museo Litoral Boliviano	La Paz	[La Paz, Bolivia]	[La Paz, Bolivia]	-16.491901	-68.135560	History Museum	5d55d5b55560bc000711939d	1	History Museum	Science Museum	Museum	Cultural Center	
15	Museo De Metales Preciosos Precolombinos	Museo Nacional Arqueologia Tiwanaku	La Paz	[Calle Tiahuanacu 93, La Paz, Bolivia]	[Calle Tiahuanacu 93, La Paz, Bolivia]	-16.501941	-68.130968	History Museum	56d0c3b1498e35e1311d0dba	1	History Museum	Science Museum	Museum	Cultural Center	
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
545	Museo Historico del Colegio Militar del Ejercito	Museo Historico del Colegio Militar del Ejercito		[Bolivia]	[Bolivia]	-16.536262	-68.085426	History Museum	4fb86465e4b057d6087c659f	1	History Museum	Science Museum	Museum	Cultural Center	
546	Museo Del Litoral Boliviano	Museo Del Litoral Boliviano	La Paz	[Calle Jaén 789, La Paz, Bolivia]	[Calle Jaén 789, La Paz, Bolivia]	-16.564583	-68.136944	History Museum	55287bd5498e1661c47e1621	1	History Museum	Science Museum	Museum	Cultural Center	

Figure 6. Cluster 1 is categorized in history museums localized in universities in the city

Rio de Janeiro

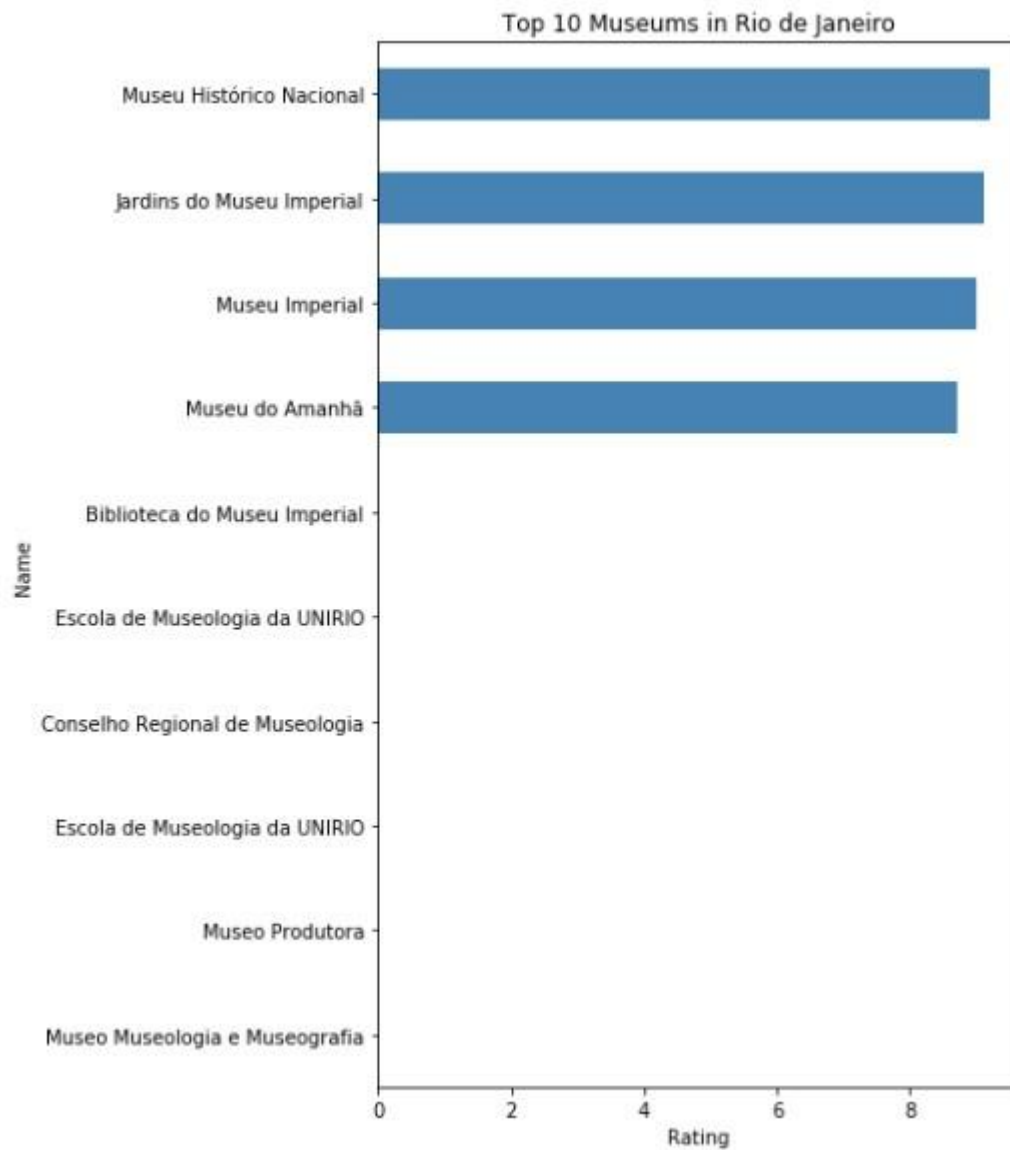Top 10 Museums in Rio de Janeiro

Figure 7. Only four museums were rate in the city of Rio de Janeiro, it can be thar few people visit museums it their vacations.

It is curious to observe that Rio de Janeiro, being such a tourist city, does not have a tourism to museums, only 4 with a good rating are observed.
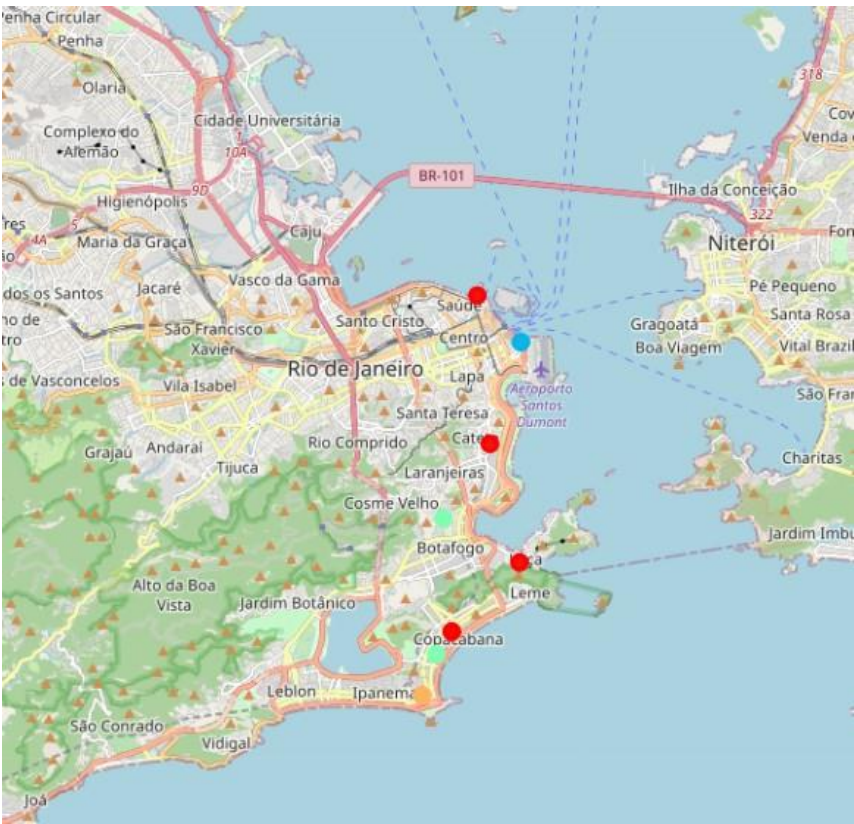
Figure 8. Map of Rio de Janeiro with five groups representing the category found for each place of tourist interest.

The distribution of museums in the city of Rio de Janeiro is very dispersed, if you want to know a museum, you must have an idea of what you like, or you can waste a lot of time on your trip around the city

One of these clusters is shown in this report

	Museo_Rio	Museo_name_Rio	Museo_city_Rio	Museo_Address_Rio	Museo_Address_Rio	Museo_Latitude_Rio	Museo_Longitude_Rio	Museo_Category_Rio	Museum_Venue_id_Rio	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Mos Commo Venu
22	Museu Imperial	Biblioteca do Museu Imperial	Petrópolis	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	-22.507681	-43.174805	Library	5c9e04abf1936e002c9758cf	1	Library	Office	Housing Development	History Museum	Garde
23	Biblioteca do Museu Imperial	Biblioteca do Museu Imperial	Petrópolis	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	-22.507681	-43.174805	Library	5c9e04abf1936e002c9758cf	1	Library	Office	Housing Development	History Museum	Garde
28	Jardins do Museu Imperial	Biblioteca do Museu Imperial	Petrópolis	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	[Museu Imperial, Petrópolis, RJ, 25610-320, Br...	-22.507681	-43.174805	Library	5c9e04abf1936e002c9758cf	1	Library	Office	Housing Development	History Museum	Garde

Figure 9. The clusters found in Rio de Janeiro do not show associated with museums, extraordinarily little information provided in this regard.
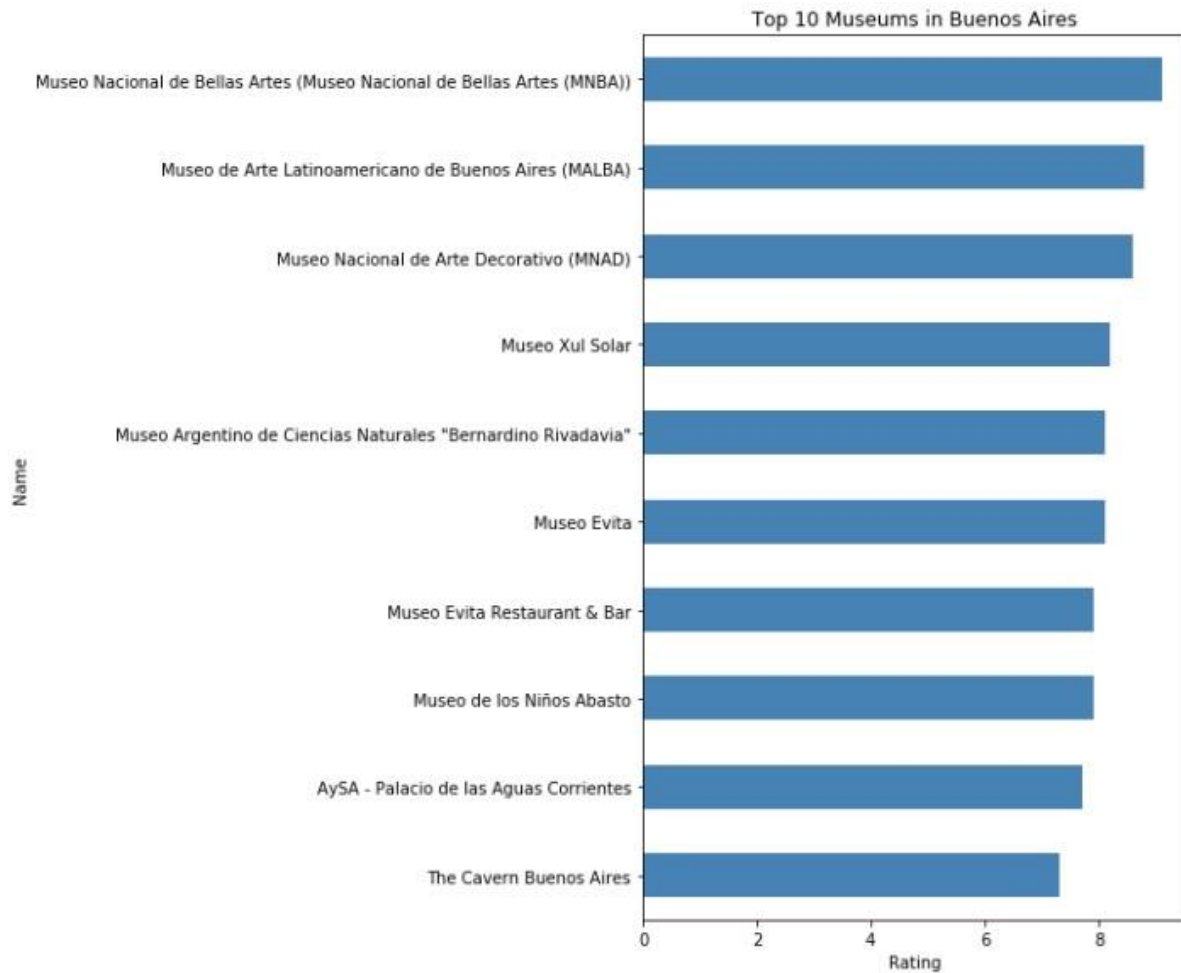
Buenos Aires

Figure 10. Top 10 of the rating of museums in Buenos Aires, city with a lot of history similar to Bogota

The city of Buenos Aires similarly that Bogota has a great affluence in its museums, it seems that it has incredibly good art museums according to the qualification of the tourists.
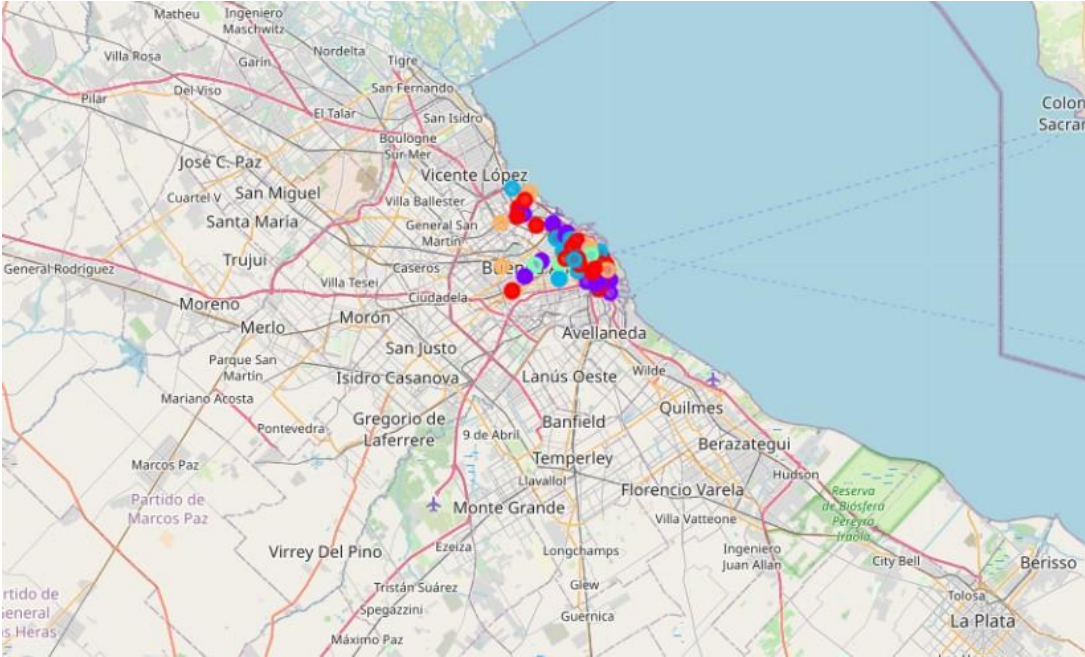
Figure 11. Map of Buenos Aires with five groups representing the category found for each museum of tourist interest.

The city of Buenos Aires seems that its museums are concentrated in the center of the city, this makes it easy to visit and mainly the art museums.

One of these clusters is shown in this report

	Museo_Air	Museo_name_Air	Museo_city_Air	Museo_Address_Air	Museo_Address_Air	Museo_Latitude_Air	Museo_Longitude_Air	Museo_Category_Air	Museum_Venue_id_Air	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
1	Museo Argentino de Ciencias Naturales "Bernard...	Museo de Esculturas Luis Perlotti	Buenos Aires	[Pujol 644 (e/ Méndez de Andes y Felipe Valles...	[Pujol 644 (e/ Méndez de Andes y Felipe Valles...	-34.615083	-58.448306	Art Museum	51681520e4b05224c5b8b4e5	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
2	Museo Argentino de Ciencias Naturales "Bernard...	Museo Kosice	Buenos Aires	[Humahuaca 4662 (e/ Avenida Estado de Israel y...	[Humahuaca 4662 (e/ Avenida Estado de Israel y...	-34.601000	-58.430614	Art Museum	59ffecb8f870fd480c06df94	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
3	Museo de Esculturas Luis Perlotti	Museo de Esculturas Luis Perlotti	Buenos Aires	[Pujol 644 (e/ Méndez de Andes y Felipe Valles...	[Pujol 644 (e/ Méndez de Andes y Felipe Valles...	-34.615083	-58.448306	Art Museum	51681520e4b05224c5b8b4e5	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
5	Museo de Esculturas Luis Perlotti	Museo Kosice	Buenos Aires	[Humahuaca 4662 (e/ Avenida Estado de Israel y...	[Humahuaca 4662 (e/ Avenida Estado de Israel y...	-34.601000	-58.430614	Art Museum	59ffecb8f870fd480c06df94	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
12	Museo Casa de Ricardo Rojas	Museo Nacional de Arte Decorativo (MNAD)	Buenos Aires	[Av. del Libertador 1902 (esq. Pereyra Lucena)...	[Av. del Libertador 1902 (esq. Pereyra Lucena)...	-34.582668	-58.400644	Art Museum	4b1aaf7cf964a5205eef23e3	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
953	Museo de Arquitectura y Diseño (MARQ)	Museo de Arte Latinoamericano de Buenos Aires ...	Buenos Aires	[Av. Figueroa Alcorta 3415 (e/ Jerónimo Salgue...	[Av. Figueroa Alcorta 3415 (e/ Jerónimo Salgue...	-34.577051	-58.403826	Art Museum	4b37a2db f964a520684325e3	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
954	Museo de Arquitectura y Diseño (MARQ)	Museo de Arte Popular José Hernández	Buenos Aires	[Avenida del Libertador 2373 (esq. Av. Cnel. D...	[Avenida del Libertador 2373 (esq. Av. Cnel. D...	-34.579512	-58.404988	Art Museum	4b05871af964a520cf7f22e3	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
981	Universidad del Museo Social Argentino (UMSA)	Museo de Arte Hispanoamericano Isaac Fernández...	Buenos Aires	[Hipólito Yrigoyen 1420 (entre San José y Pres...	[Hipólito Yrigoyen 1420 (entre San José y Pres...	-34.610063	-58.386646	Art Museum	5366a6cf498e0d4ed6a02d96	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
997	Universidad del Museo Social Argentino (UMSA)	Museo de Arte Hispanoamericano Isaac Fernández...	Buenos Aires	[Suipacha 1422 (entre Av. del Libertador y Arr...	[Suipacha 1422 (entre Av. del Libertador y Arr...	-34.590759	-58.380054	Art Museum	4b700f58f964a52067052de3	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery
1025	Universidad del Museo Social Argentino (UMSA)	Museo de la Caricatura	Buenos Aires	[Lima 1037, Argentina]	[Lima 1037, Argentina]	-34.620201	-58.381474	Art Museum	5297cfca498e0d9907d4b215	1	Art Museum	Spanish Restaurant	History Museum	Argentinian Restaurant	Art Gallery

138 rows × 15 columns

Figure 12. City with many museums of art and history

Finally, we have built a recommendation system that would recommend the top 10 museums that are closest to the location provided by the user. We have validated the results based on the distance of each museums from the user provided location.

We have also visualized the recommended museums locations on the map each city to validate our recommendation.

There is ample scope for future studies to improve this recommendation engine and expanding it to include other aspects that we have identified above for making a more complete recommendation. Although we also have information regarding the Categories of the museums, we are not able to use this data to make a recommendation in the absence of information regarding user Preferences and user past ratings for various cities.

- The cities to take more time to visit museums are Bogota and Buenos Aires, Bogota shows remarkably interesting museums of History and Buenos Aires interesting art museums.

- Rio de Janeiro and La Paz are cities that have another focus of tourism, tourists do not seem interested in museums.

Conclusion

If my parents like to visit museums, I recommend Bogota and Buenos Aires, the only problem is that they are at the ends of South America!!!

There is a whole world of people traveling, who are looking out for recommendations to meet their needs. The goal here is to provide better outcomes to such people that are looking for recommendations.