BATTLE OF THE NEIGHBORHOODS

1. Introduction: Business understanding, target audience

Before Covid-19, tourists used to travel all over the world very easily. In a post-Covid environment, they will hopefully be able to resume traveling. They may however have different expectations and change the way they travel. Maybe they will no more rush to foreign cities, spend a few days running from one interest point to another and come back? Maybe they will take time to relax, enjoy, listen to birds and breathe cleaner air in gardens, parks and trails? Wouldn't it be nice for a travel agency to be able to recommend a city trip based on what their clients truly expect?

With a bit of data science, travel agencies can get an overview of what some well-known European cities have to offer to visitors. These cities are famous for their historical buildings and their shopping streets, but what can they also offer to their clients in terms of 'ecotourism' or 'green travel'? We'll try to compare them so that travel agencies can recommend the right trip to their clients, depending on their wishes. And, once they decide, the travel agencies would be able to deliver maps of the chosen city with recommendation of where to go depending on what visitors want to experience.

Let's have a look at two cities in Southern Europe (Rome and Barcelona) and two cities a few degrees further North (Paris and London). These cities are amongst the top destinations for tourism in Europe, with London ranking 1st, Paris 2nd, Rome 5th and Barcelona 8th *(source: Statista, 2018 data).*

2. Data strategy

We quickly notice that cities are very different in size from one another. As we assume most tourists are interested in spending time between cultural locations, shopping tours, sightseeing, exploring museums or getting fresh air in green spaces, we chose to focus on the most active and richest part of cities ie downtown areas. This will lead us to scan the Inner London (330 km^2 already, as opposed to Greater London which is more like 1600km^2) and Paris '*intra-muros*' (meaning without suburbs, for a total of c. 87 km^2). Barcelona is similar to Paris in size whereas Rome is much larger (c. 1300km^2) and we'll have to stick to central districts.

As far as Paris is concerned, we include the two public parks respectively West and East of the central city. These parks are actually owned by Paris city but are often excluded from statistics as nobody lives there.

Our primary purpose being a comparative analysis, we chose to stick to the borough level and not adopt a thinner split. A thinner split would have given a better analysis of each city on its own, but might have given too many details and no trend in a comparative exercise.

Data is available from different websites. Wikipedia provides the list of their boroughs. We can find GPS coordinates with Geocoder. We come up with four databases, one per city (table 1).

	City	Borough	Latitude	Longitude
0	Barcelona	Ciutat Vella	41.382700	2.183185
1	Barcelona	Eixample	41.383700	2.152700
2	Barcelona	Sants Montjuic	41.353600	2.143800
3	Barcelona	Les Corts	41.389000	2.133000
4	Barcelona	Sarria Sant Gervasi	41.402700	2.116700
5	Barcelona	Gracia	41.401100	2.157800
6	Barcelona	Horta Guinardo	41.421600	2.164055
7	Barcelona	Nou Barris	41.444743	2.178422
8	Barcelona	Sant Andreu	41.435700	2.194700
9	Barcelona	Sant Marti	41.408387	2.200759

	City	Borough	Latitude	Longitude
0	London	London City	51.5155	-0.0922
1	London	Camden	51.5290	-0.1255
2	London	Greenwich	51.4892	-0.0648
3	London	Hackney	51.5450	-0.0553
4	London	Hammersmith and Fulham	51.4927	-0.2339
5	London	Haringey	51.6000	-0.1119
6	London	Islington	51.5416	-0.1022
7	London	Kensington and Chelsea	51.5020	-0.1947
8	London	Lambeth	51.4607	-0.1163
9	London	Levisham	51.4452	-0.0209
10	London	Southwark	51.5035	-0.0804
11	London	Tower Hamlets	51.5099	-0.0059
12	London	Wandsworth	51.4567	-0.1910
13	London	Westminster	51.4973	-0.1372

	City	Borough	Latitude	Longitude
0	Paris	Louvre	48.8592	2.3417
1	Paris	Bourse	48.8655	2.3426
2	Paris	Temple	48.8637	2.3415
3	Paris	Hotel de Ville	48.8601	2.3507
4	Paris	Pantheon	48.8448	2.3471
5	Paris	Luxembourg	48.8493	2.3300
6	Paris	Palais Bourbon	48.8565	2.3210
7	Paris	Elysees	48.8763	2.3183
8	Paris	Opera	48.8718	2.3399
9	Paris	Entrepot	48.8709	2.3561
10	Paris	Popincourt	48.8574	2.3795
11	Paris	Reuilly	48.8412	2.3876
12	Paris	Gobelins	48.8322	2.3561
13	Paris	Observatoire	48.8331	2.3264
14	Paris	Vaugirard	48.8412	2.3003
15	Paris	Passy	48.8637	2.2769
16	Paris	Batignolles	48.8835	2.3219
17	Paris	Montmartre	48.8925	2.3444
18	Paris	Buttes Chaumont	48.8817	2.3822
19	Paris	Menilmontant	48.8640	2.3984
20	Paris	Bois de Boulogne	48.5148	2.1508
21	Paris	Bois de Vincennes	48.4948	2.2600

	City	Borough	Latitude	Longitude
0	Rome	Historical centre	41.89	12.49
1	Rome	Parioli Nomentano	41.92	12.50
2	Rome	Monte Sacro	41.96	12.52
3	Rome	Tiburtana	41.92	12.56
4	Rome	Prenestino Centocelle	41.90	12.56
5	Rome	Roma delle torri	41.88	12.57
6	Rome	Appio Latino	41.86	12.55
7	Rome	Appia antica	41.84	12.52
8	Rome	Business District	41.96	12.42

Table 1. Databases

For each city, we then retrieve FourSquare data relative to venues. Using FourSquare clearly limits the view we'll have of what is available in the city:

- FourSquare does not scan all available venues: it's not a phone book!
- FourSquare does not scan venues in different cities in a consistent manner, depending on whether the application exists in the local language, whether FourSquare members usually travel there or not. As FourSquare is an American company, it probably has more venues in North America than in Europe. When comparing cities, we will be vigilant and weigh the number of venues vs. total of available venues for each city.

However, the advantage of FourSquare is that posted venues will be open to most and will also be suitable for visitors.

We end up this data acquisition phase with four new databases including FourSquares venues, like the Paris one below (5 first rows only):

	City	Borough	BoroughLatitude	BoroughLongitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory
0	Paris	Louvre	48.8592	2.3417	Place du Louvre	48.859841	2.340822	Plaza
1	Paris	Louvre	48.8592	2.3417	Cour Carrée du Louvre	48.860360	2.338543	Pedestrian Plaza
2	Paris	Louvre	48.8592	2.3417	La Vénus de Milo (Vénus de Milo)	48.859943	2.337234	Exhibit
3	Paris	Louvre	48.8592	2.3417	Musée du Louvre	48.860847	2.336440	Art Museum
4	Paris	Louvre	48.8592	2.3417	Chez Nous	48.855823	2.340271	Wine Bar

Table 2. Databases with Four Square venues

At some point, we decided to 1/ not treat hotels, coffee shops… as specific items as they are fairly common in all touristic destinations, and 2/ **regroup several venues under different themes**, for simplification purpose and for a better understanding of the final results, e.g.:

- HISTORY regroups historic sites, monuments / landmarks, plazas, churches, fountains;
- CULTURAL LIFE includes art museums, art galleries, theaters, concert halls, bookstores;
- GASTRONOMY is an elegant name for… local specialty food or drink, e.g. tapas restaurant in Barcelona, wine bar in Paris, pub / beer bar in London;
- ECOTOURISM is based on the number of parks, gardens, trails.

3. Methodology

We have proceeded in two steps. First, a city-by-city analysis (one after another) with the same stages for each, and, second, an analysis of a merged database to make comparisons. Please note all results are presented in the chapter 4.

3.1. City-by-city analysis

We first looked at **what venues were the most widely available in the city** based on all venues retrieved from Four Square (as seen in table 2 supra).

- **WordCloud analysis:** we extracted a text from the VenueCategory column and applied the `word_cloud` package. As bigger and bolder words being the more preeminent in the text, this means these venues are amongst the most common;
- Counting / getting the **occurrence of each individual venue**. We quickly pointed out a few very common venues, often quite different from one city to another. We managed to visualize this with Matplotlib horizontal bar charts.

We then looked at **what venues were the most appreciated in the city.**

- We sorted out the database to get the **10 most common venues per borough**.
- In some cases, the most common, i.e. appreciated, venues were not the most widely available.

We afterwards tried to find out whether boroughs were similar or not, and what this similarity consisted of. We then performed a **clustering analysis with KMeans**.

We eventually used **Folium maps** to better show the clusters.

3.2. Merged analysis

We conducted another clustering analysis on the merged dataframe, to see whether there were boroughs from different cities in a same cluster. E.g. if a client wants to visit historic sites, will the travel agent be able to tell him/her: "Yes for sure! You can go to such borough in Rome, or in the borough X in Barcelona".

We finally weighted the most common venues vs. total venues for each city (previously gathered under the four themes mentioned supra - History, gastronomy, cultural life, ecotourism) and compared the four cities with a Matplotlib bar chart. This will allow the travel agent to tell his client: "You should probably prefer Paris (borough Y) because this is the city for history lovers!"
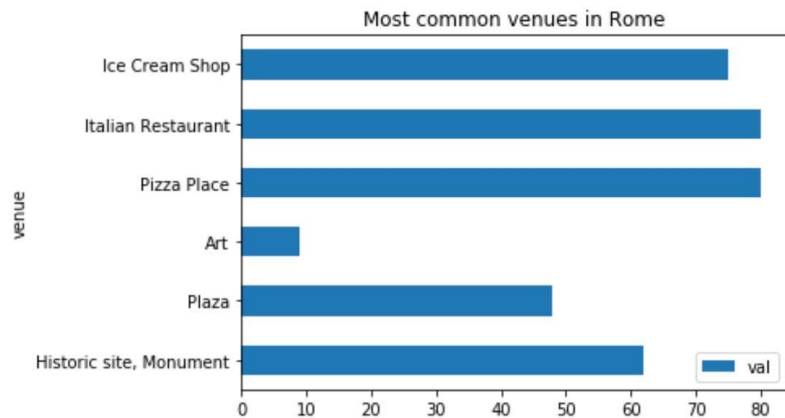
4. Results

4.1. ROME

Rome's **most widely available venues** can be visualized as follows:

Rome's **most common venues** can also be visualized as follows:

Most common venues in Rome

Ranking of available venues is confirmed by preferred venues with **gastronomy coming up as the most popular activity** in 2/3 of the boroughs:

- In 6 out of 9 boroughs, at least 2 out of the 3 top venues **are ice-cream shops or pizza places / Italian restaurants**.
- Rome ice-creams must be some of the best in Europe as ice-cream shops are amongst the top 5 venues in all but one borough, and the top venue in 2 boroughs! Or is it because it is a rather hot city?
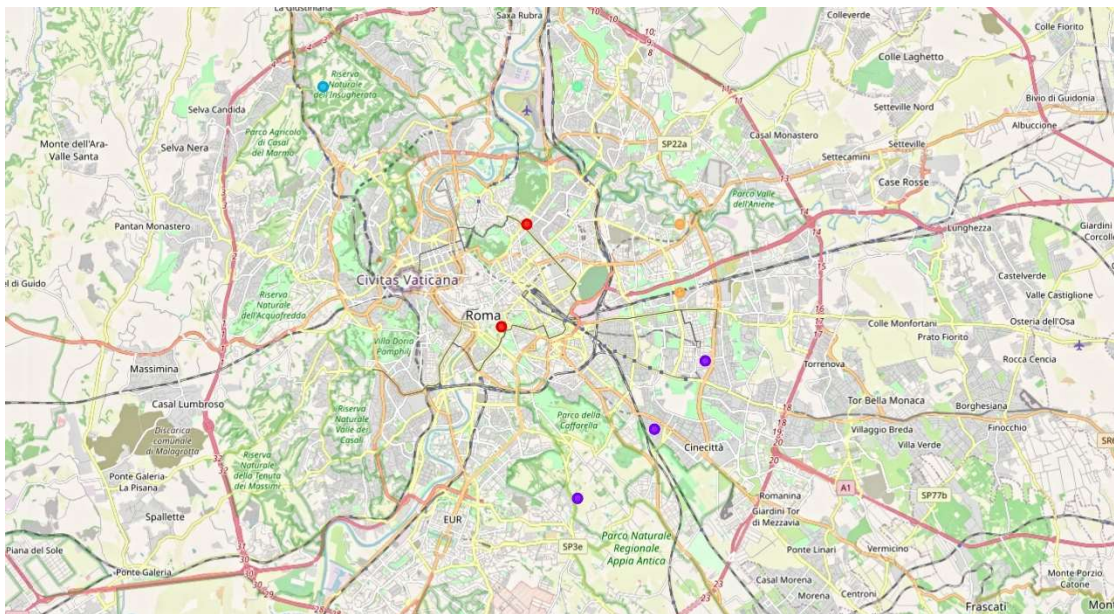- Pizzas come as the second preferred dish.

Ecotourism is very limited, with a park between the 3rd and the 10th most common venues in 7 out of the 9 boroughs.

If you go to Rome, don't miss **monuments / landmarks**: Rome is a great city for **History** lovers to hang around. Go to Historical Centre or Parioli Nomentano (in red cluster 0 below), where 6 to 7 amongst the 10 most common venues are historical sites.

Borough	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
Historical centre	41.89	12.49	0	Plaza	Historic Site	Ice Cream Shop	Sandwich Place	Fountain	Italian Restaurant	Monument / Landmark	Church	Hotel	Wine Bar
Parioli Nomentano	41.92	12.50	0	Plaza	Ice Cream Shop	Historic Site	Hotel	Monument / Landmark	Fountain	Sandwich Place	Art Museum	Italian Restaurant	Park
Monte Sacro	41.96	12.52	3	Italian Restaurant	Pizza Place	Park	Cocktail Bar	Ice Cream Shop	Dessert Shop	Café	Restaurant	Steakhouse	Electronics Store
Tiburtana	41.92	12.56	4	Ice Cream Shop	Pizza Place	Italian Restaurant	Hotel	Steakhouse	Dessert Shop	Cocktail Bar	Park	Chinese Restaurant	Gastropub
Prenestino Centocelle	41.90	12.56	4	Ice Cream Shop	Pizza Place	Hotel	Italian Restaurant	Park	Café	Cocktail Bar	Dessert Shop	Plaza	Steakhouse
Roma delle torri	41.88	12.57	1	Pizza Place	Italian Restaurant	Ice Cream Shop	Park	Gym / Fitness Center	Historic Site	Dessert Shop	Café	Sandwich Place	Gastropub
Appio Latino	41.86	12.55	1	Italian Restaurant	Pizza Place	Ice Cream Shop	Historic Site	Park	Gym / Fitness Center	Café	Hotel	Market	Plaza
Appia antica	41.84	12.52	1	Pizza Place	Ice Cream Shop	Italian Restaurant	Historic Site	Park	Plaza	Hotel	Café	Gastropub	Tennis Court
Business District	41.96	12.42	2	Italian Restaurant	Supermarket	Hotel	Pizza Place	Café	Restaurant	Fast Food Restaurant	Pub	Chinese Restaurant	Ice Cream Shop

Monte Sacro (light green on the map below, North East of the city) is probably the place to eat or have a cup of coffee; there is little visiting there but a pleasant park (3rd most common venue) to get a rest while sipping an ice-cream.

Boroughs of cluster 1 (in purple below, South-East of the city) is probably the living area for residents with venues like tennis courts or gyms.
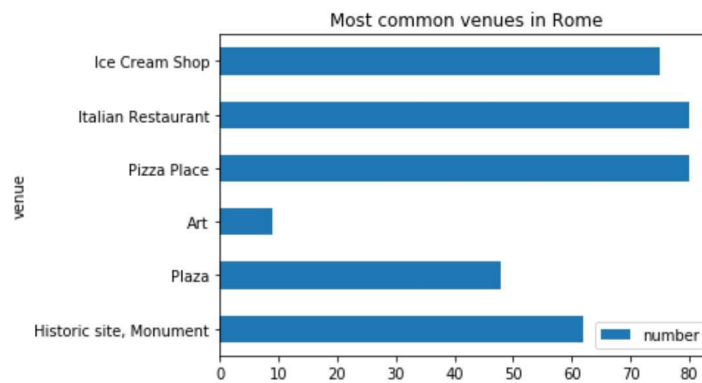
4.2. PARIS

Paris' **most widely available venues** can be visualized as follows:

Paris' **most common venues** can also be visualized as follows
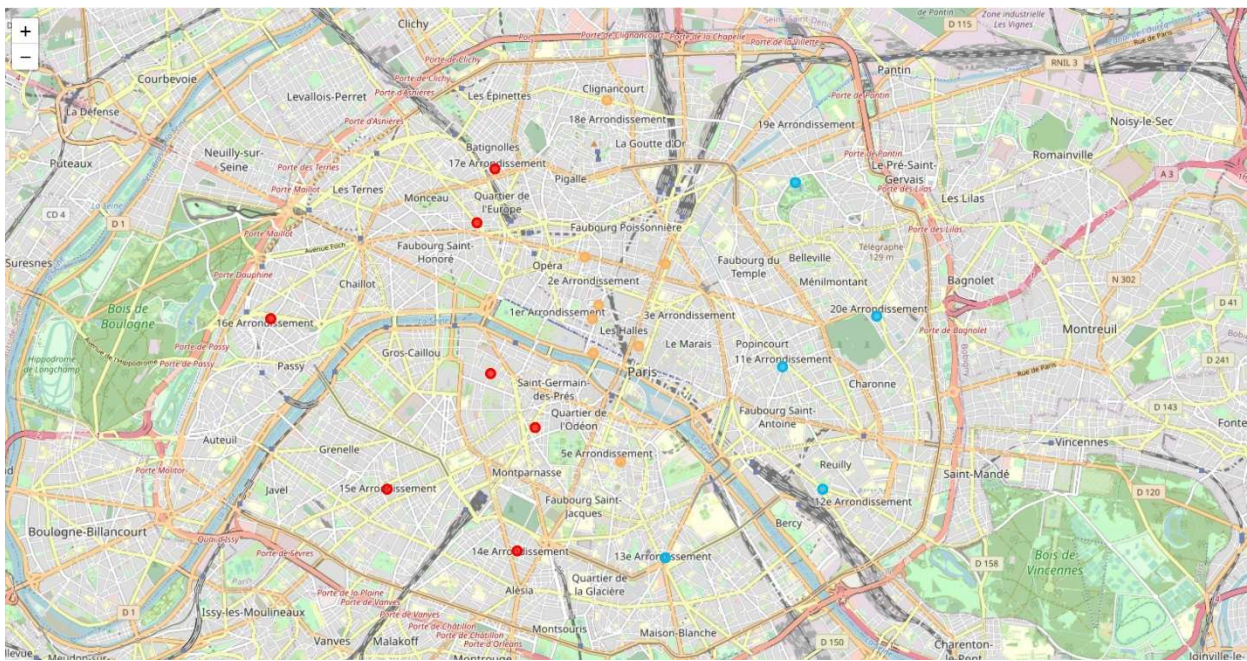

Most common venues in Rome

Paris is another great destination for history lovers with plenty of plazas, historic sites and some monuments. **Second available venue category is cultural life** (art galleries and museums, bookstores) while **gastronomy is also widely available** meaning French restaurants & wine bars. No wonder as the country as a whole is famous worldwide for its cuisine and its wine.

The analysis of most common venues vs. all available venues emphasizes the specificities of the city: Visitors plebiscite history, cultural and gastronomy venues.

Clusters 0 and 2 seem pretty close as areas for tourists with hotels / plazas / art museums and bookstores as preferred venues, meaning history and cultural life. The two themes are however widely spread in pretty much all the city: even if we requested 5 clusters, the whole city (excluding the two woods) is split into three clusters only. Cluster 1 and 3, with only one borough in each, are pretty close as well as including the large woods, train station and supermarket: this is the 'greenest' part of Paris. Cluster 4 in blue is more related to restaurants, cocktail bars and coffee shops.

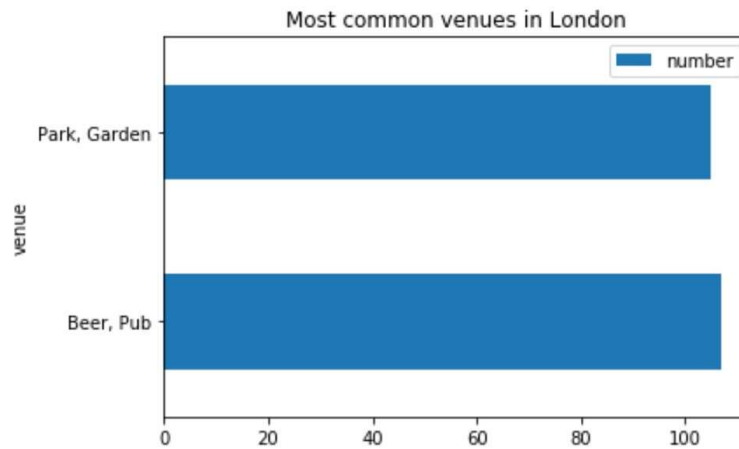| Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
Louvre	48.8592	2.3417	2	Plaza	Hotel	Art Museum	Ice Cream Shop	Bookstore	Seafood Restaurant	French Restaurant	Garden	Sandwich Place	Wine Bar
Bourse	48.8655	2.3426	2	Plaza	Cocktail Bar	Hotel	Wine Bar	Art Museum	Bookstore	French Restaurant	Seafood Restaurant	Coffee Shop	Sandwich Place
Temple	48.8637	2.3415	2	Plaza	Cocktail Bar	Hotel	Art Museum	Bookstore	Wine Bar	French Restaurant	Seafood Restaurant	Garden	Sandwich Place
Hotel de Ville	48.8601	2.3507	2	Plaza	Bookstore	Hotel	Wine Bar	French Restaurant	Art Museum	Bakery	Cocktail Bar	Seafood Restaurant	Garden
Pantheon	48.8448	2.3471	2	Plaza	French Restaurant	Wine Bar	Art Museum	Bookstore	Seafood Restaurant	Cocktail Bar	Garden	Italian Restaurant	Park
Luxembourg	48.8493	2.3300	0	Plaza	French Restaurant	Art Museum	Garden	Hotel	Ice Cream Shop	Historic Site	Bookstore	Pedestrian Plaza	Art Gallery
Palais Bourbon	48.8565	2.3210	0	Plaza	Hotel	Art Museum	French Restaurant	Garden	Historic Site	Ice Cream Shop	Bookstore	Pedestrian Plaza	Art Gallery
Elysees	48.8763	2.3183	0	Plaza	Hotel	Art Museum	Garden	French Restaurant	Historic Site	Wine Bar	Pedestrian Plaza	Italian Restaurant	Indie Movie Theater
Opera	48.8718	2.3399	2	Plaza	Hotel	Art Museum	Bookstore	Cocktail Bar	Wine Bar	Coffee Shop	Italian Restaurant	Historic Site	Sandwich Place
Entrepot	48.8709	2.3561	2	Plaza	Cocktail Bar	Bookstore	Hotel	Wine Bar	Art Museum	French Restaurant	Sandwich Place	Coffee Shop	Bakery
Popincourt	48.8574	2.3795	4	French Restaurant	Cocktail Bar	Wine Bar	Bakery	Sandwich Place	Bookstore	Italian Restaurant	Vegetarian / Vegan Restaurant	Coffee Shop	Bar
Reuilly	48.8412	2.3876	4	French Restaurant	Cocktail Bar	Bakery	Wine Bar	Italian Restaurant	Bar	Sandwich Place	Bookstore	Hotel	Farmers Market
Gobelins	48.8322	2.3561	4	French Restaurant	Plaza	Cocktail Bar	Wine Bar	Seafood Restaurant	Park	Italian Restaurant	Sandwich Place	Bar	Art Museum
Observatoire	48.8331	2.3264	0	Plaza	French Restaurant	Art Museum	Garden	Ice Cream Shop	Bookstore	Historic Site	Hotel	Park	Art Gallery
Vaugirard	48.8412	2.3003	0	French Restaurant	Hotel	Art Museum	Plaza	Garden	Historic Site	Ice Cream Shop	Bookstore	Exhibit	Fountain
Passy	48.8637	2.2769	0	Hotel	French Restaurant	Art Museum	Plaza	Garden	Park	Historic Site	Tennis Court	Botanical Garden	Boutique
Batignolles	48.8835	2.3219	0	Hotel	Art Museum	Plaza	French Restaurant	Historic Site	Garden	Wine Bar	Italian Restaurant	Pedestrian Plaza	Bookstore
Montmartre	48.8925	2.3444	2	Hotel	Plaza	Art Museum	Italian Restaurant	Coffee Shop	Park	Wine Bar	Cocktail Bar	Sandwich Place	Garden
Buttes Chaumont	48.8817	2.3822	4	French Restaurant	Wine Bar	Italian Restaurant	Coffee Shop	Hotel	Sandwich Place	Cocktail Bar	Bakery	Art Museum	Bookstore
Menilmontant	48.8640	2.3984	4	French Restaurant	Cocktail Bar	Bakery	Wine Bar	Italian Restaurant	Park	Pizza Place	Bar	Bookstore	Sandwich Place
Bois de Boulogne	48.5148	2.1508	3	Train Station	Supermarket	Furniture / Home Store	Campground	Park	Wine Bar	Clothing Store	Cocktail Bar	Coffee Shop	Comic Shop
Bois de Vincennes	48.4948	2.2600	1	Train Station	Supermarket	Park	Wine Bar	Deli / Bodega	Clothing Store	Cocktail Bar	Coffee Shop	Comic Shop	Concert Hall

4.3. *LONDON*

London's **most widely available venues** can be visualized as follows:

London's **most common venues** can also be visualized as follows:
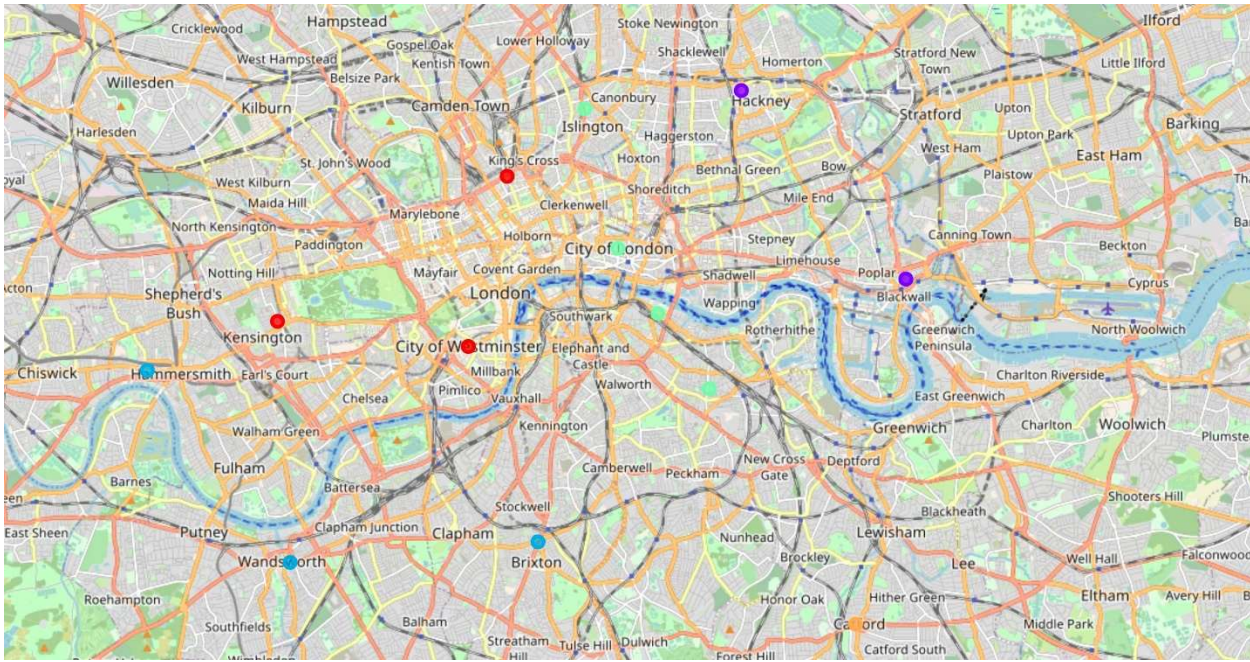
Most common venues in London

London seems to be a more diversified city with **only two venues emerging as much more widely available than others: ecotourism (parks, gardens) and beer-related economy (brewery, beer bars, pubs)!** We are tempted to say that there is no gastronomy per se in London as visitors ignore specific dishes or English cooking tradition. FourSquare did not send any date relative to "English restaurant". Indeed, the city is open to foreign cooking, for example Indian restaurants, Italian restaurants or Asian-style food stores.

Cultural life is somewhat present with art galleries and theaters plus some bookstores.

Cluster 2 (light blue on the map below) seems to be the greenest part of London, together with cluster 4 (orange bubbles below) which is also a good place for drinking bear in a pub, as is cluster 1 (purple bubbles below).There is no striking difference between the other clusters.

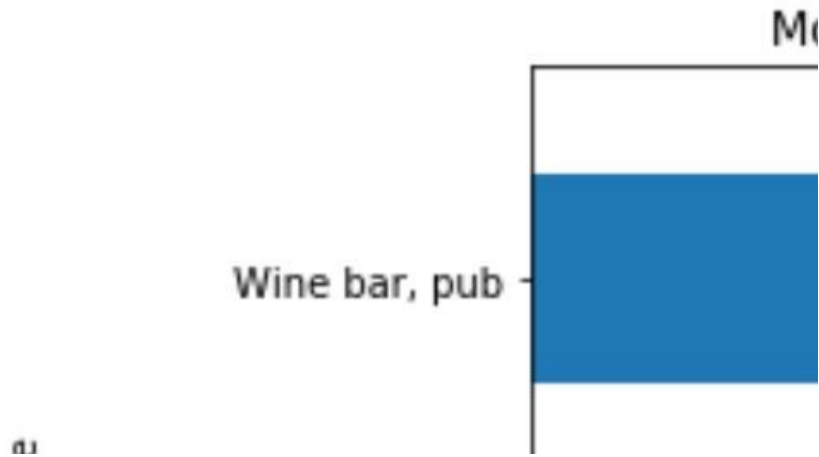| Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
London City	51.5155	-0.0922	3	Hotel	Coffee Shop	Cocktail Bar	Theater	Garden	Bookstore	Scenic Lookout	Street Food Gathering	Italian Restaurant	Performing Arts Venue
Camden	51.5290	-0.1255	0	Hotel	Cocktail Bar	Theater	Lounge	Indian Restaurant	Department Store	Garden	Bookstore	Ice Cream Shop	Market
Greenwich	51.4892	-0.0648	3	Hotel	Coffee Shop	Italian Restaurant	Cocktail Bar	Scenic Lookout	Market	Theater	Pizza Place	Street Food Gathering	Bar
Hackney	51.5450	-0.0553	1	Cocktail Bar	Pub	Bakery	Pizza Place	Park	Coffee Shop	Ice Cream Shop	Italian Restaurant	Beer Bar	Market
Hammersmith and Fulham	51.4927	-0.2339	2	Café	Park	Pizza Place	Restaurant	Pub	Coffee Shop	Gym / Fitness Center	Gastropub	Bar	Italian Restaurant
Haringey	51.6000	-0.1119	4	Pub	Café	Turkish Restaurant	Park	Coffee Shop	Trail	Bakery	Pizza Place	Brewery	Climbing Gym
Islington	51.5416	-0.1022	3	Hotel	Cocktail Bar	Coffee Shop	Pub	Market	Park	Bakery	Ice Cream Shop	Bookstore	Theater
Kensington and Chelsea	51.5020	-0.1947	0	Hotel	Park	Ice Cream Shop	Art Gallery	Café	Japanese Restaurant	Hotel Bar	Gym / Fitness Center	Pizza Place	Garden
Lambeth	51.4607	-0.1163	2	Park	Coffee Shop	Art Gallery	Pizza Place	Café	Hotel	Ice Cream Shop	Italian Restaurant	Brewery	Pub
Levisham	51.4452	-0.0209	4	Park	Pub	Coffee Shop	Italian Restaurant	Café	Indian Restaurant	Bar	Historic Site	Pizza Place	Museum
Southwark	51.5035	-0.0804	3	Hotel	Coffee Shop	Cocktail Bar	Pizza Place	Italian Restaurant	Art Museum	Scenic Lookout	Garden	Theater	Street Food Gathering
Tower Hamlets	51.5099	-0.0059	1	Pub	Coffee Shop	Brewery	Park	Market	Café	Cocktail Bar	Farm	Beer Bar	Flea Market
Wandsworth	51.4567	-0.1910	2	Park	Café	Coffee Shop	Pub	Pizza Place	Tennis Stadium	Ice Cream Shop	Soccer Stadium	Garden	Science Museum
Westminster	51.4973	-0.1372	0	Hotel	Lounge	Indian Restaurant	Plaza	Art Gallery	Art Museum	Park	Cocktail Bar	Department Store	Café

4.4. *BARCELONA*

Barcelona's **most widely available venues** can be visualized as follows:

Barcelona's **most common venues** can also be visualized as follows:
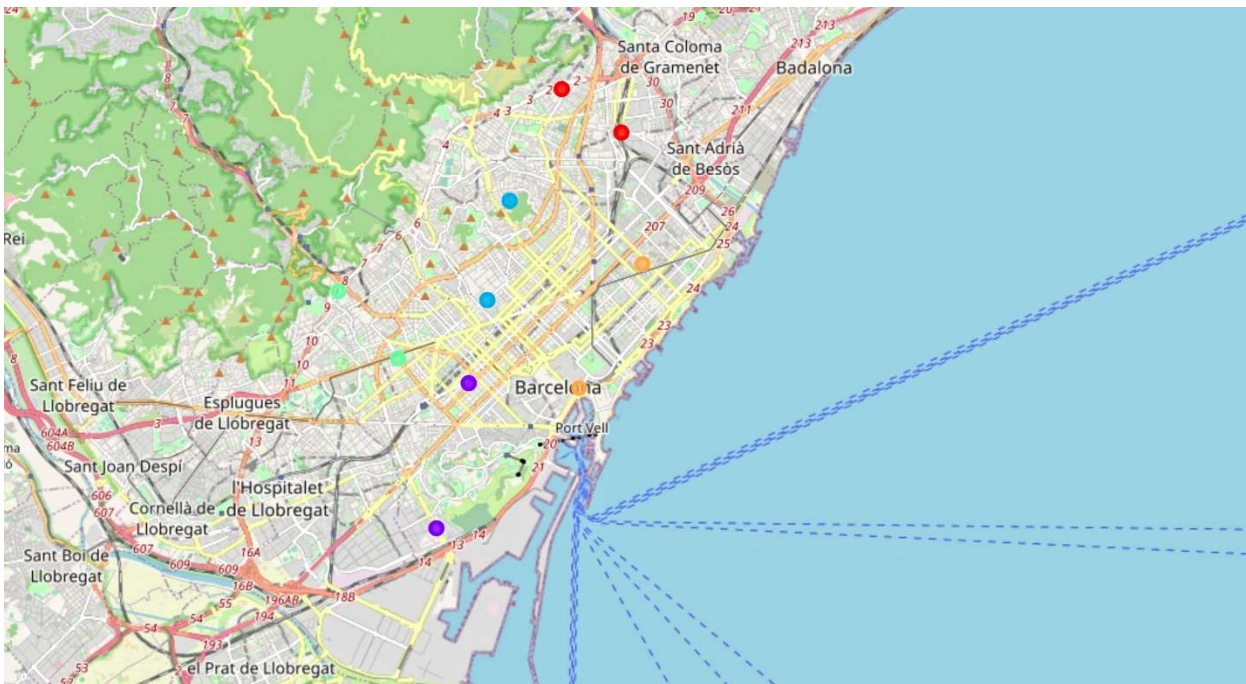
Wine bar, pub

History is somewhat present with lots of plazas and some historic sites, spread all over the city, but the **most widely available activity in Barcelona relates to gastronomy, namely tapas and wine bars / pubs**. This is definitely the most common / the most preferred as Tapas / Spanish restaurants come as the preferred activity in half of the boroughs (and second in four other boroughs), whereas wine bars come as most preferred activity in two boroughs.

Ecotourism is about the same as in Rome, with some green areas spread all over the city.

Clustering analysis has limited interest but to show there is no clear specificity of any borough.

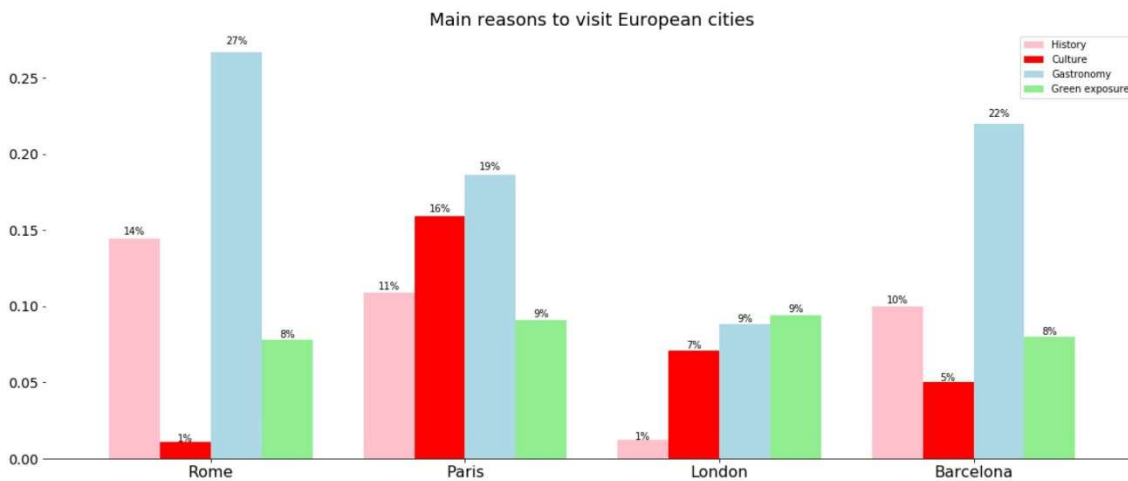| City	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3r Common
rcelona	Ciutat Vella	41.382700	2.183185	1	Tapas Restaurant	Hotel	Coffe
rcelona	Eixample	41.383700	2.152700	4	Pizza Place	Plaza	Tapas Res
rcelona	Sants Montjuic	41.353600	2.143800	4	Pizza Place	Coffee Shop	
rcelona	Les Corts	41.389000	2.133000	0	Wine Bar	Park	Coffe

4.5. *MERGED RESULTS / COMPARATIVE ANALYSIS*

We tried to compare the four cities and see whether there was a chance to get a clear view on historic boroughs, or cultural boroughs, or green boroughs. We requested 8 then 7 clusters, and all we got was the four cities split in two clusters each. Only the two 'historic' boroughs of Rome were placed in the same cluster than Parisian boroughs when we requested 7 clusters (instead of 8).

We tried again with 4 clusters, to 'force' the algorithm to put boroughs from different cities in the same clusters. We got Barcelona and London in the same cluster, Rome in a second cluster except for two 'historic boroughs' which were with Paris in a third quarter. The two woods of Paris were in a fourth cluster.

To understand this, let's visualize the specificities of the cities on a bar chart, based on the 10 most preferred venues for all boroughs of each city:

Paris and London have a more balanced range of preferred activities than Barcelona and Rome. But for London, and Barcelona in a lesser extent, the sum of the four percentages is far lower than for Paris and Rome, meaning the very few specific items highlighted in the previous pages explain less of what tourists like in London and Barcelona (respectively 26% and 45%). Is it because tourists are more diverse in these cities?

If we build the same chart with available venues and compare it with the chart above (most preferred), we find out that in some cases, preferences of tourists "exaggerate" the available specificities:

- Rome has low availability of cultural life, and this is almost neglected by tourists. Same for historic venues / monuments in London;
- Paris has mid-level ecotourism but tourists make it look like more important in relative terms. Same for green areas in Paris and Rome, and culture and gastronomy Paris and Barcelona.

5. Discussion

Bar chart above makes us think tourists know what they want when they go to one city or another. They know what to expect and they enjoy it when on site. Further research with FourSquare data may allow determining whether visitors to a single city have a similar profile (age, nationality, occupation?).

Indeed, our comparison could be easily extended to any city for which FourSquare have venues. It would be interesting to compare European cities with cities from other continents, e.g. North America and Asia. This would help put into perspective what tourists like about European cities vs. other parts of the world.

One should not conclude too quickly about the touristic offer of our four European cities. The analysis come from FourSquare users' posts, which may differ from another application's users or from tourists that don't use applications at all. The coverage of FourSquare may also differ from one country to another, as we saw in the total number of venues.

6. Conclusion

It seems that the typical day of a FourSquare tourist is as follows:

- visit historic sites then go for a pizza (and an ice-cream!) in Rome,
- visit plazas and museums, then enjoy the French cuisine and wine in Paris,
- spend a day in a park, then have a beer in a pub before going to the theater in London,
- enjoy a day in a park and have tapas for a meal in Barcelona.

Travel agencies are able to advise their clients on a trip destination based on what they want to experience. Agencies can also advise them on which part of the city they should visit. Agencies can even give them a map with proposed venues, based once again on their expectations.

Have a happy journey!