Battle of Neighborhoods

IBM PROFESSIONAL DATA SCIENCE CERTIFICATE

(Capstone Project)

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January 2021

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Introduction

Tourism is a popular industry to develop local economics in the world. It provides governments with several benefits, including boosting the economy's revenue, investing thousands of jobs, and evolving countries' infrastructures. Hence, governments are enthusiastic about attracting more and more tourists to visit their country, which requires presenting safe and advanced facilities. Furthermore, tourism leads to entrepreneurs' opportunities to establish new products and services that would not be sustainable for the local population of residents alone. Therefore, residents also experience tourist destinations' advantages in their own country (Yehia, 2019.)

In 2019, it was estimated that the number of international tourist arrivals worldwide would reach approximately 1.46 billion while there were 35.4 million tourist arrivals in hotels in Paris. It is one of the most visited cities in Europe attracts millions of visitors from abroad or France. It appears that French tourists are discovering Paris as same as internationals. However, international visitors are more than French ones and spend more on food and drink as well as shopping than French. Moreover, visiting museums and monuments possesses the most significant proportion of French and foreign tourists' holiday motivations (Statista Research Department, 2020.)

Lan Xue and Yi Zhang have investigated the effect of distance on tourist behavior. The study explored tourists' behavioral patterns in three groups: long-haul tourists, short-haul tourists, and local visitors who visited Suzhou, China, from April 2012 to October 2013. It results in different motivations behind trips. Local visitors are keen on relaxation and shopping. They are interested in theme hotels and hostels and less enthusiastic about local foods. While Short-haul tourists mixed relaxation with sightseeing, such as visit cultural heritage, famous sites, and favored high-end hotels and restaurants. On the other side, Long-haul tourists principally visited Suzhou for sightseeing and seeking product features and qualities because they consider it a once-in-a-lifetime trip (Lan Xue and Yi Zhang, 2020.)

According to several trips' motivations, book a hotel based on the intention helps tourists save time and assets. Short-haul tourists enjoy high-end hotels in a neighborhood close to top-ranked restaurants, while long-haul tourists are keen to accommodate nearby museums and attractions. So, the question is which hotel and which neighborhood satisfy visitors' various motivations? Therefore, this article focused on supporting visitors to book the fittest hotel in Paris by clustering neighborhoods based on time distance to attractions, restaurants, and shopping malls. It satisfies visitors to choose the best neighborhood and makes stakeholders like the government, restaurant managers, and hotel managers alliances to invest in a particular region.

Data Collection

Paris is the most exciting place with an endless array of sites, activities and a vast selection of hotels. Most of these hotels are located around the main attractions such as Eiffel Tower, Champs Elysees, or Louvre. This article considers ninety-nine hotels in the capital of France. Foursquare API extracts hotels locating less than twenty kilometers from Paris. The API response provides Hotels' attributes such as name, rate, and geographical coordinates. Foursquare places API enables access to global POI data from over 100K trusted sources. It provides real-time data access, which discovers and ranks venues.

Table 1: List of hotels

|	Id	Name	Latitude	Longitude	Rate
0	560ac500498e8ff36b2be81d	Hôtel Providence	48.869283	2.356851	9.1
1	599f10d89b04730cde6d8bf4	The Hoxton Paris	48.870179	2.346632	9.1
2	505ec24de4b011bf1f426e58	Hotel Atmospheres	48.848695	2.348145	8.8
3	53b65301498e8cb57224f80c	Hôtel Ritz	48.868145	2.328962	9.4
4	4adcda00f964a520de3021e3	Hôtel d'Aubusson	48.854729	2.339505	8.7
...	...	...	...	...	...
94	5bd97fb41fa763002cbcf8ba	Hôtel Brach	48.861217	2.275082	8.1
95	4c5b3ef07f661b8ddf73451c	Ibis Bastille - Faubourg St-Antoine	48.851802	2.378642	7.7
96	4bc9a6d7fb84c9b6215d1b3e	Étoile Saint Honoré by HappyCulture	48.875651	2.304157	7.9
97	59254c3a9e0d54127012e45f	citizenM Paris la Défense	48.894040	2.229927	9.3
98	5984512af5e9d7171635e0e9	Hôtel National des Arts et Métiers	48.865812	2.353347	7.5

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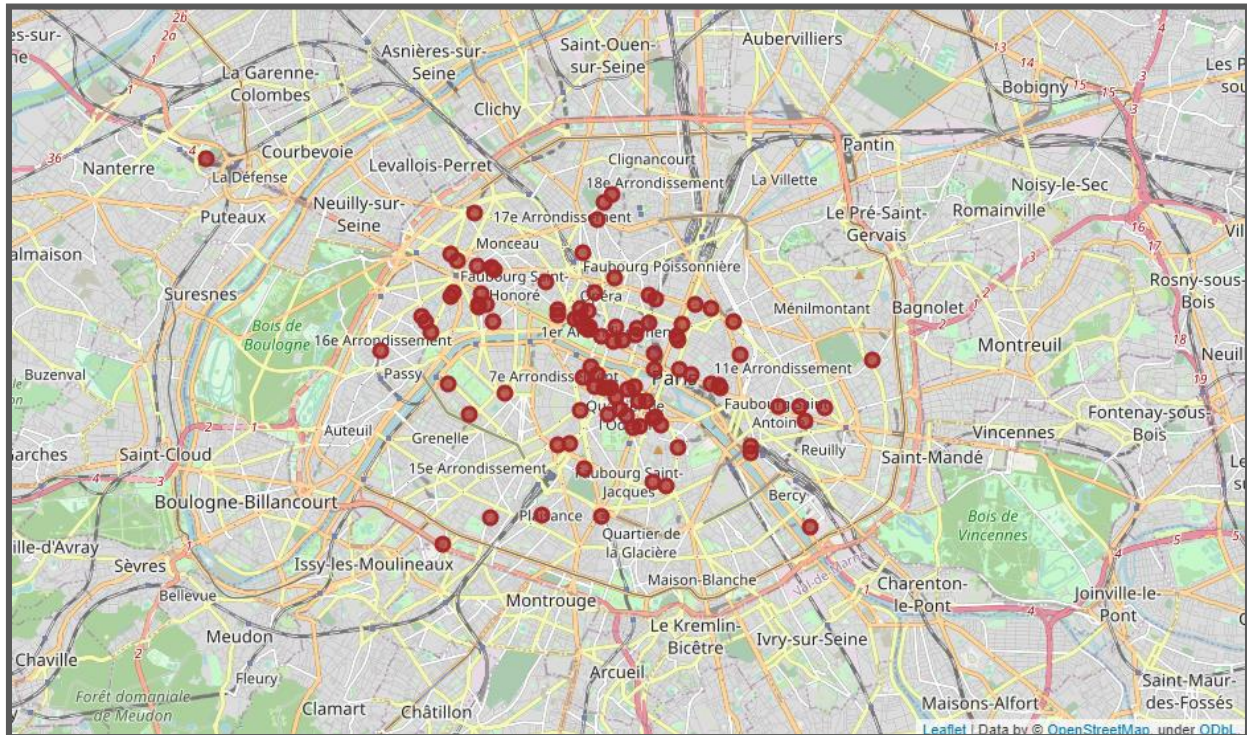
Figure 1: Hotels are landmarked in Paris Map

Annually thirty million foreign tourists visit Paris's sights include monuments and architecture such as Arc de Triomphe, neo-classic Haussmannian boulevard, buildings as well as museums, operas and concert halls. With its many monuments, Paris is a symbol of French culture. Therefore, nineteen top tourist attractions and twenty top-ranked restaurants are chosen from the Tripadvisor website that is the world's largest travel platform that supports millions of travelers. Tripadvisor website presents millions of reviews and opinions of millions of restaurants, accommodations, airlines and cruises. It is the best platform to compare venues, flights, tours and attractions.

Paris competes with other cities such as New York, London, and Milan to be among the most remarkable fashion capitals. So it is a best place for shopping. There is a list of the best shopping centers, Malls, boutiques, and second-hand clothes stores in and around Paris, which is ranked by the France-hotel-guide website. It is an online booking website since 1996 that organizes travel around events and the visit of iconic places. Therefore, it has gathered information about venues that might be interesting to travelers. The top five shopping malls are considered that tourists are immensely eager to visit.

Data collecting in three categories is expressed in the following tables. All geographical coordinates of venues in tables are extracted by the Geopy package in python.

Table 2: List of tourist attractions

	Name	Category	Price	TIME TO SPEND	Value	Facilities	Atmosphere	Latitude	Longitude
0	Cathedrale de Notre Dame de Paris	Turist Attraction	Free	2 hours to Half Day	5.0	4.0	4.5	48.8529	2.3501
1	Musée du Louvre	Turist Attraction	15 euros	Half Day to Full Day	4.5	4.5	4.5	48.8611	2.3380
2	Eiffel Tower	Turist Attraction	17 euros	1 to 2 hours	4.5	4.5	4.5	48.8583	2.2945
3	Jardin des Tuileries	Turist Attraction	Free	1 to 2 hours	5.0	3.0	5.0	48.8637	2.3268
4	Le Marais	Turist Attraction	Free	2 hours to Half Day	5.0	4.5	4.5	48.8604	2.3607
5	Sacré-Cœur	Turist Attraction	Free	2 hours to Half Day	5.0	4.0	4.5	48.8868	2.3430
6	Musée d'Orsay	Turist Attraction	12 euros	2 hours to Half Day	4.0	4.5	5.0	48.8599	2.3266
7	Musee de l'Orangerie	Turist Attraction	6 euros	1 to 2 hours	4.0	4.5	4.0	48.8638	2.3227
8	Pere-Lachaise Cemetery	Turist Attraction	Free	1 to 2 hours	5.0	0.0	4.0	48.8612	2.3939
9	Palais Garnier - Opera National de Paris	Turist Attraction	11 euros	1 to 2 hours	4.0	4.0	4.5	48.8714	2.3320
10	Luxembourg Gardens	Turist Attraction	Free	1 to 2 hours	5.0	2.0	5.0	48.8462	2.3345
11	Arc de Triomphe	Turist Attraction	8 euros	1 to 2 hours	4.0	3.5	4.5	48.8738	2.2950
12	Versailles Palace	Turist Attraction	18 euros	Half Day to Full Day	4.0	3.5	4.0	50.8486	4.3509
13	Musée Rodin	Turist Attraction	10 euros	2 hours to Half Day	4.5	4.0	4.5	48.8547	2.3159
14	Centre Pompidou	Turist Attraction	14 euros	2 hours to Half Day	4.0	4.0	3.5	48.8606	2.3525
15	Paris Catacombs	Turist Attraction	12 euros	1 to 2 hours	4.0	0.0	3.5	48.8337	2.3323
16	Champs-Élysées	Turist Attraction	Free	1 to 2 hours	5.0	3.5	4.0	48.8708	2.3053
17	Sainte-Chapelle	Turist Attraction	15 euros	Less than 1 hour	4.0	3.0	4.0	48.8554	2.3450
18	Galeries Lafayette Paris Haussmann	Turist Attraction	Free	1 to 2 hours	5.0	4.0	4.0	48.8736	2.3321

Table 3: List of shopping malls

	Name	Category	Shop Range	Latitude	Longitude
0	Le Bon Marché	Shopping Mall	High	48.8513	2.3244
1	Beaugrenelle Paris shopping mall	Shopping Mall	High	48.8488	2.2827
2	Le Carrousel du Louvre	Shopping Mall	High	48.8629	2.3348
3	Forum des Halles	Shopping Mall	Medium	48.8623	2.3447
4	Italie Deux	Shopping Mall	Medium	48.8293	2.3552

Table 4: List of restaurants

|	Name	Category	Price	Details	Latitude	Longitude
0	Brasserie Cézanne	Restaurant	Medium	French, Seafood, Mediterranean	48.8689	2.2912
1	Il Etait Un Square	Restaurant	Medium	French, Steakhouse, European	48.8323	2.3476
2	Mayfair Garden Paris	Restaurant	High	Indian, Contemporary, Healthy	48.8650	2.2896
3	Boutary	Restaurant	High	French, Seafood, European	48.8560	2.3379
4	La Table de Colette	Restaurant	High	French, European, Healthy	48.8474	2.3472
5	Baoli Bao	Restaurant	Low	Asian, Fusion, Healthy	48.8769	2.3486
6	Joyti Restaurant	Restaurant	Medium	Indian, Vegetarian Friendly, Vegan Options	48.8439	2.3152
7	Bistrot Kinzo	Restaurant	High	Japanese, Healthy, Japanese Fusion	48.8721	2.3459
8	Via Emilia	Restaurant	Medium	Italian, Mediterranean, European	48.8798	2.3352
9	Pur' - Jean-Francois Rouquette	Restaurant	High	French, European, Vegan Options	48.8690	2.3302
10	O'Bergine	Restaurant	Medium	French, Lebanese, Healthy	48.8649	2.3481
11	Bistrot Instinct	Restaurant	Medium	French, European, Healthy	48.8639	2.3625
12	Domenico's	Restaurant	Medium	Italian, Mediterranean, Campania	48.8770	2.3383
13	Epicure	Restaurant	High	French, European, Vegetarian Friendly	48.8726	2.3154
14	La MiN	Restaurant	Medium	French, International, European	48.8508	2.3154
15	Les Apotres de Pigalle	Restaurant	Medium	Brew Pub, European, South American	48.8832	2.3364
16	Chez Pitou	Restaurant	Medium	French, European, Healthy	48.8904	2.3344
17	Madito	Restaurant	Medium	Lebanese, Mediterranean, Middle Eastern	48.8514	2.3801
18	India StreEAT	Restaurant	Medium	Indian, Healthy, Street Food	48.8405	2.3518
19	Frog & Underground	Restaurant	Medium	American, Brew PubBar	48.8713	2.3431
20	ASPIC	Restaurant	High	French, European, Contemporary	48.8793	2.3437
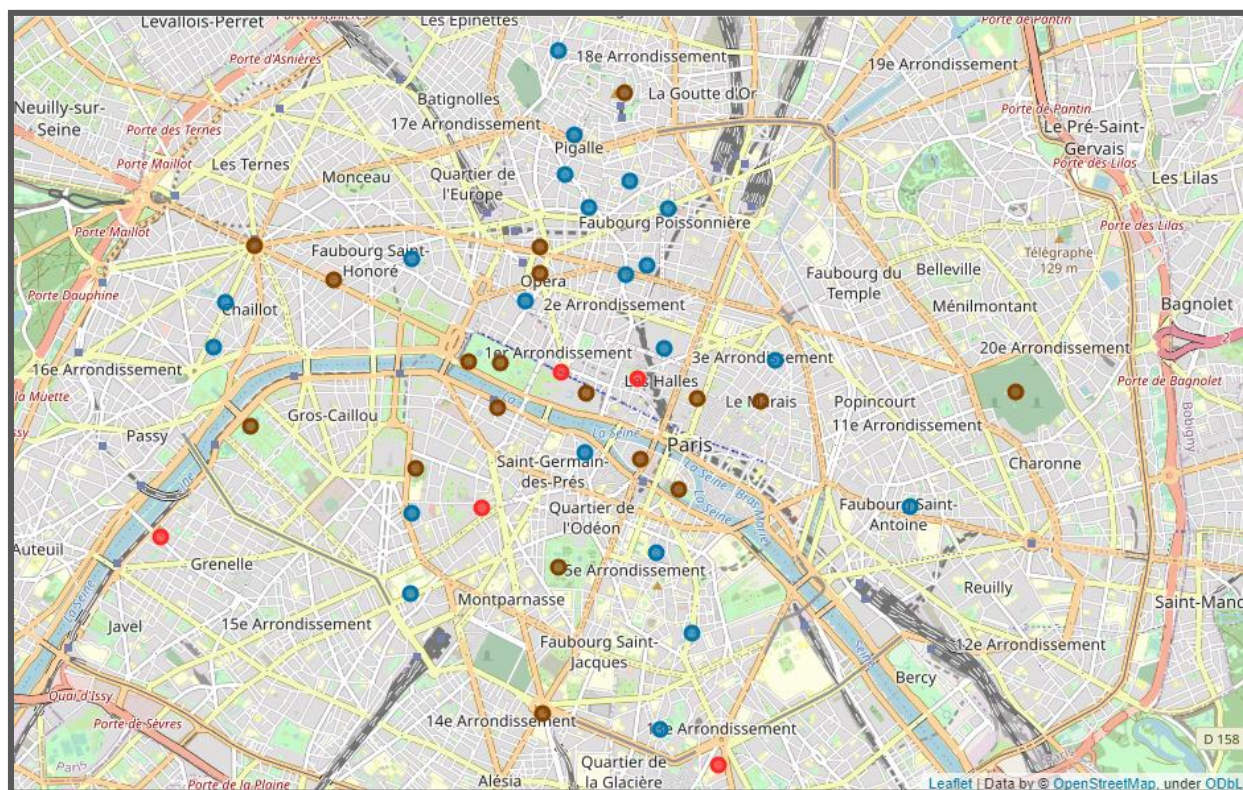
Figure 2: Restaurants, attractions, and shopping malls are landmarked by blue, brown, and pink points, respectively