Choosing the best location for a hotel in Barcelona

CAPSTONE PROJECT: THE BATTLE OF NEIGHBORHOODS

Introduction

- This report is targeted to stakeholders interested in opening an **hotel business in Barcelona (Spain)**

- Barcelona is one of the **world's leading tourist destinations** and has lots of accommodation options. The aim of this project is to identify the **areas less crowded with hotels**, specially those **with tourist landmarks nearby**, which could most likely attract potential customers.

- Data science tools will be used to identify the most promising areas based on these criteria

Data

The factors that will influence the decision will be:

- **Number of existing tourist attractions nearby**
- **Number of existing hotels nearby**
- **Existing public transport** stations nearby
- **Restaurant offer** nearby

The following data sources will be used:

- Tourist attractions and their location from the **OPEN DATA BCN** website
- Hotel businesses and their location from **OPEN DATA BCN** website
- geojson file with the neighborhood boundaries from https://github.com/martgnz/bcn-geodata/tree/master/districtes

*The use of **Foursquare API** has not been contemplated in the analysis phase since the data retrieved from this source is insufficient for the purpose of this report. Foursquare API is used after a suitable location is selected in order to explore the restaurant options nearby, also an important factor for visitors.*

Methodology

In this project we will explore areas of Barcelona high in tourist attractions and low or moderately low in hotel density.

- First we will collect data of the Tourist landmarks of the city.

- The second step in our analysis will be the exploration of the hotel density across different neighborhoods in Barcelona.

- After a candidate location is selected, we will look for other aspects that are also key for a hotel location: access to public transport and the restaurants nearby.

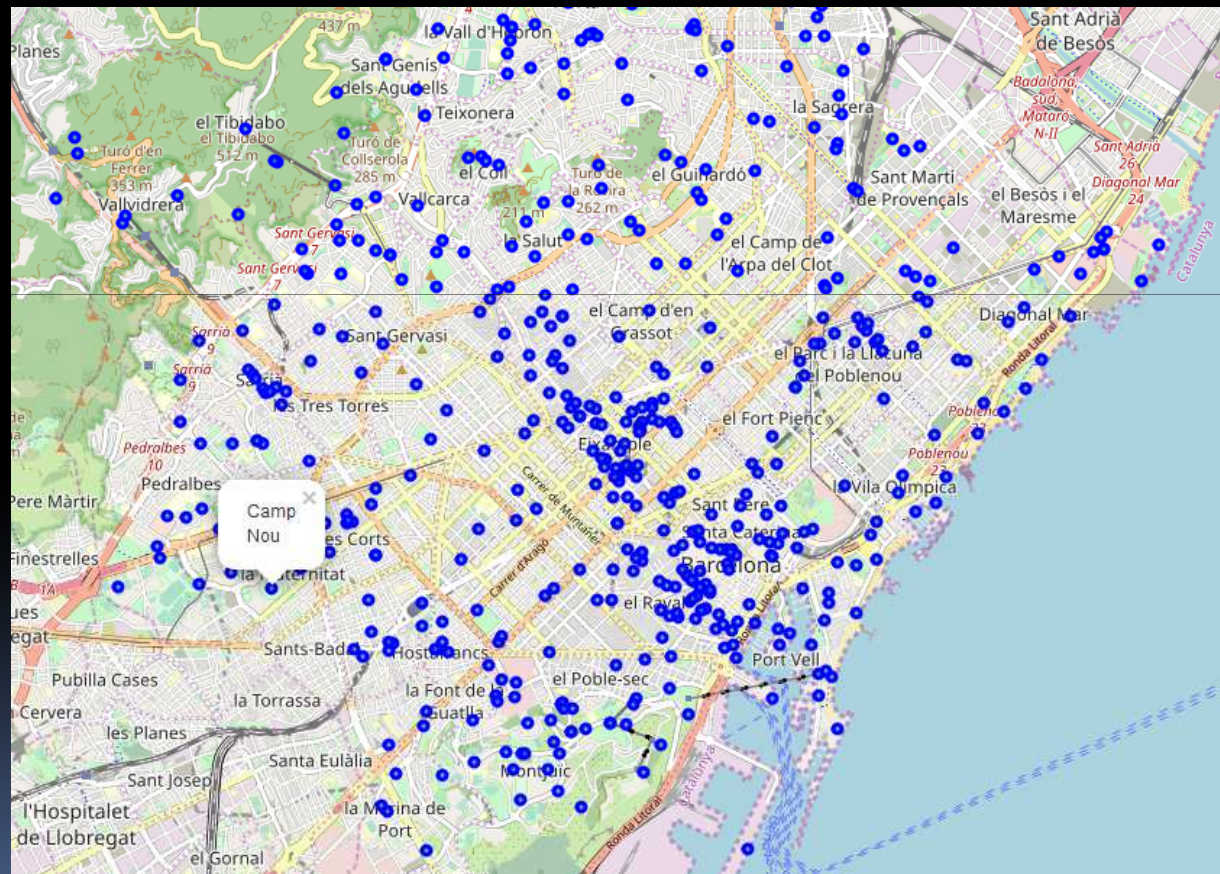*We will use follium and choropleth maps to better visualize these areas.*

Analysis: Tourist attractions

The data with the Tourist Attractions of the city can be obtained from the OPEN DATA BCN website (http://www.bcn.cat/tercerlloc/pits_opendata_en.xml).

After cleaning the data, we obtain a dataframe with the relevant information of all the tourist attractions:

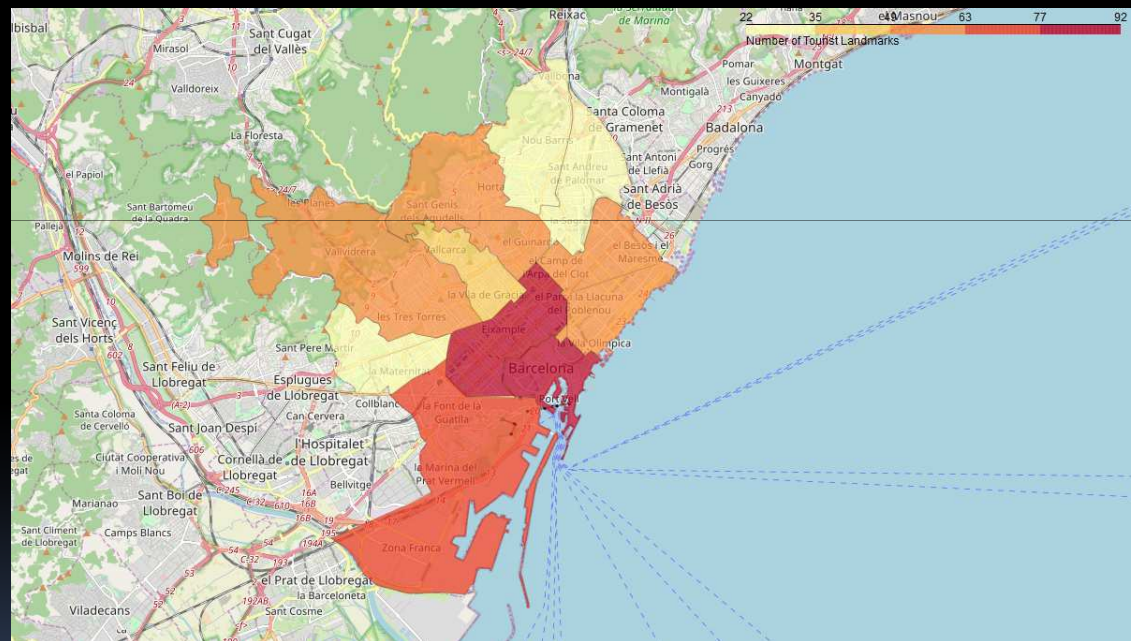|	Name	Latitude	Longitude	Neighborhood	Information
0	The Auditori	41.398743	2.1851413	Eixample	Much more than a concert hall. Drop by the Aud...
1	Camp Nou	41.380775	2.1228578	Les Corts	Did you know that the Museu del Camp Nou is Sp...
2	Magic Fountain	41.371197	2.1517797	Sants-Montjuïc	Visit the Magic Fountain light and colour show...
3	Estació del Nord and Parc de l'Estació del Nord	41.394295	2.1823204	Eixample	The Estació del Nord bus station and the park ...
4	Museu Nacional d'Art de Catalunya	41.368855	2.1533628	Sants-Montjuïc	The Museu Nacional d'Art de Catalunya, a palac...
5	La Casa de la Caritat (CCCB)	41.383884	2.1667948	Ciutat Vella	Casa de la Caritat, contemporary culture in an...
6	Estació de França	41.384426	2.1853333	Ciutat Vella	Come and see #Estació de França, a station of ...
7	Piscines Bernat Picornell	41.3663	2.150775	Sants-Montjuïc	The Picornell pools, part of the Barcelona 92 ...
8	Palau Sant Jordi	41.36197	2.1523776	Sants-Montjuïc	A symbol of sport and big occasions. Discover ...
9	Mar Bella Beach	41.39855	2.2123103	Sant Martí	Cosmopolitan, urban and always buzzing. Come t...
10	Parc del Laberint d'Horta	41.437927	2.1475434	Horta-Guinardó	Enter Parc del Laberint d'Horta, you'll be ama...
11	El Park Güell	41.41348	2.1531093	Gràcia	Enter and discover the fantastic world of Park...
12	Parc de la Ciutadella	41.38584	2.1860828	Ciutat Vella	History, memory, the open air and nature. Parc...

Analysis: Tourist attractions

We visualize the data on a map:

Analysis: Tourist attractions

We create a rank list and a choropleth map for the number of POIs:

Neighborhood	Count
Ciutat Vella	91
Eixample	81
Sants-Montjuïc	64
Sant Martí	56
Sarrià-Sant Gervasi	54
Horta-Guinardó	49
Gràcia	38
Les Corts	33
Sant Andreu	33
Nou Barris	22

The more important areas are: ciutat vella /Old town (in red), Eixample (in red) and Sants-Montjuïc (in dark orange)
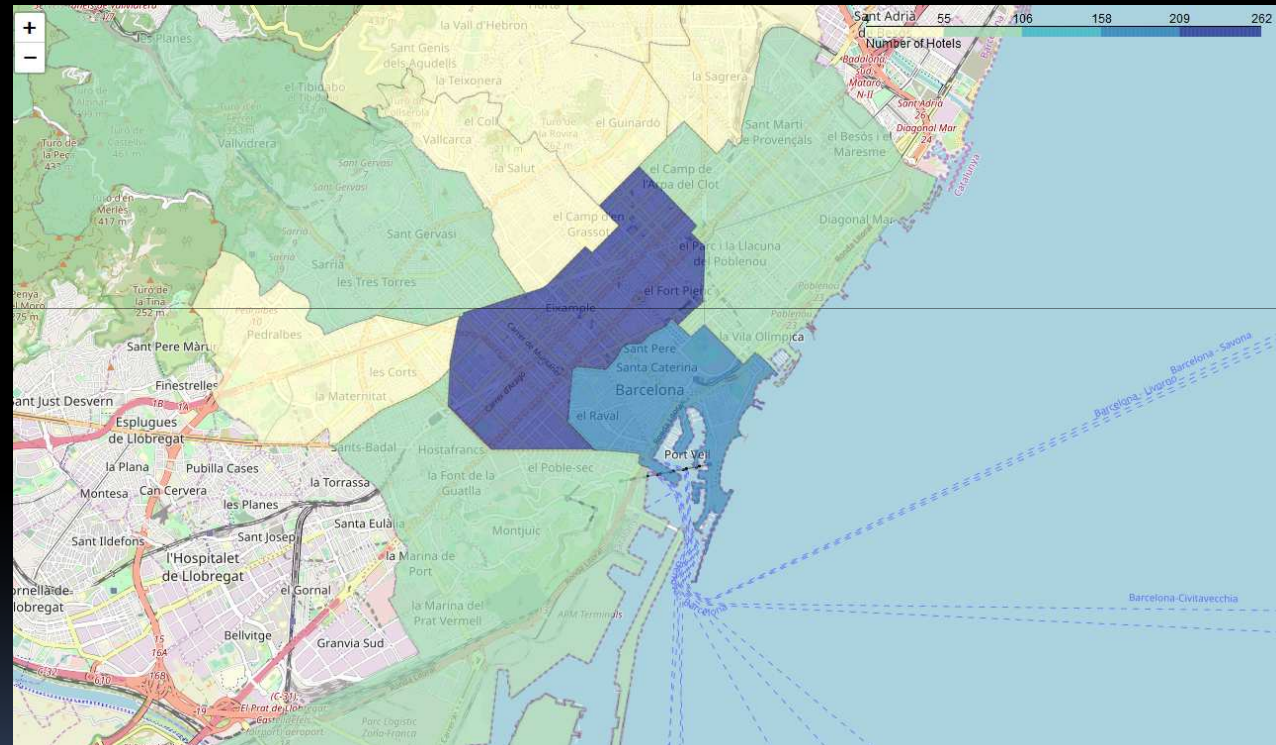
Analysis: existing hotels

- Data of the existing hotel businesses can be obtained from the economic census of the city council.

- We create a dataframe with the relevant information:

	Name	Latitude	Longitude	Neighborhood
0	CASA MACA	41.397340	2.165709	2
1	GRAN HOTEL BARCINO	41.383098	2.177786	1
2	HOSTAL EUROPA	41.381504	2.174413	1
3	SUNOTEL CLUB CENTRAL	41.387976	2.156864	2
4	YELLOW NEST HOSTEL	41.377135	2.123807	4
5	GOLDEN TULIP	41.400258	2.190726	10
6	MAJESTIC RESIDENCE	41.393373	2.162895	2
7	HOTEL SB GLOW	41.402442	2.190840	10
8	CIUTAT BARCELONA HOTEL	41.385945	2.181089	1
9	HOSTAL PARIS	41.381497	2.173453	1
10	THE URBAN SUITS	41.377327	2.144460	3
11	HOTEL REGAS	41.398720	2.152064	5
12	HOTEL RIALTO	41.382017	2.176414	1
13	SERHS RIVOLI RAMBLA	41.384266	2.171197	1
14	BCN40 ACTAHHOTELS	41.382614	2.165783	1
15	DURAN Y BAS	41.385550	2.174183	1
16	BARCELONA HOTELSHOP	41.398217	2.172662	2

Analysis: existing hotels

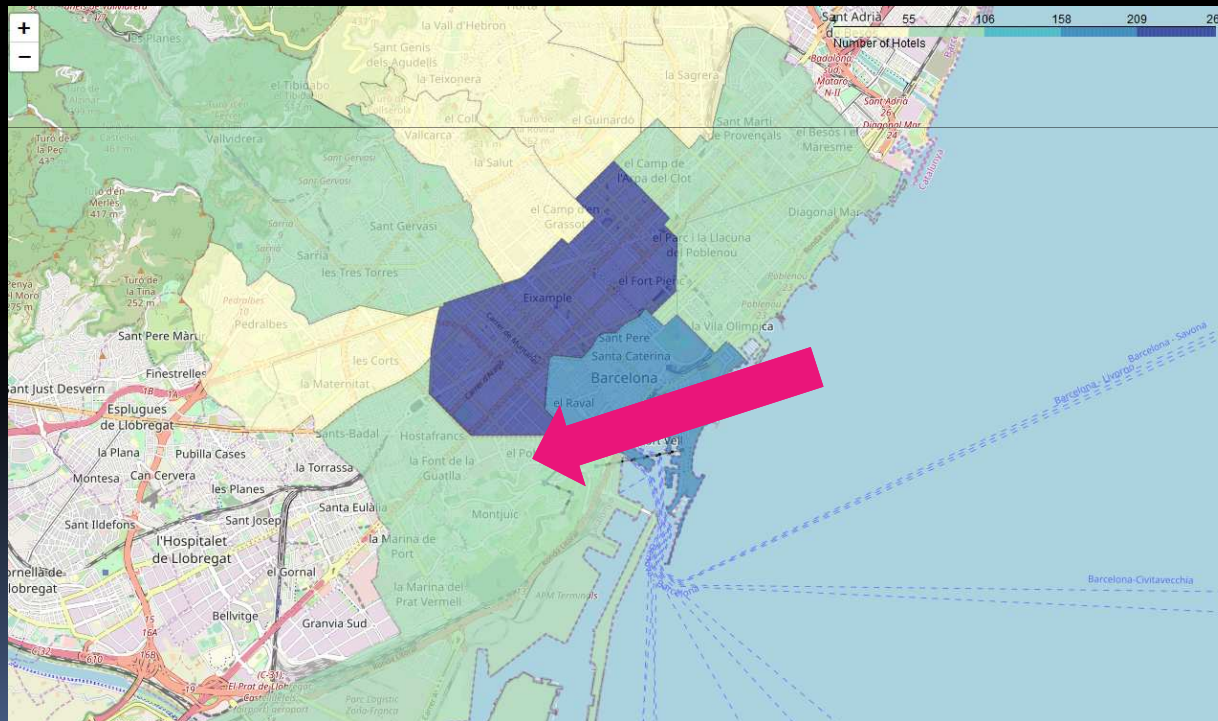We create a rank list and a choropleth map for the hotel density:

Neighborhood	Count
2	261
1	192
3	72
10	61
5	57
6	41
4	30
7	17
9	5
8	4

The more dense areas are: Eixample (in dark blue) and the Old Town (in blue)
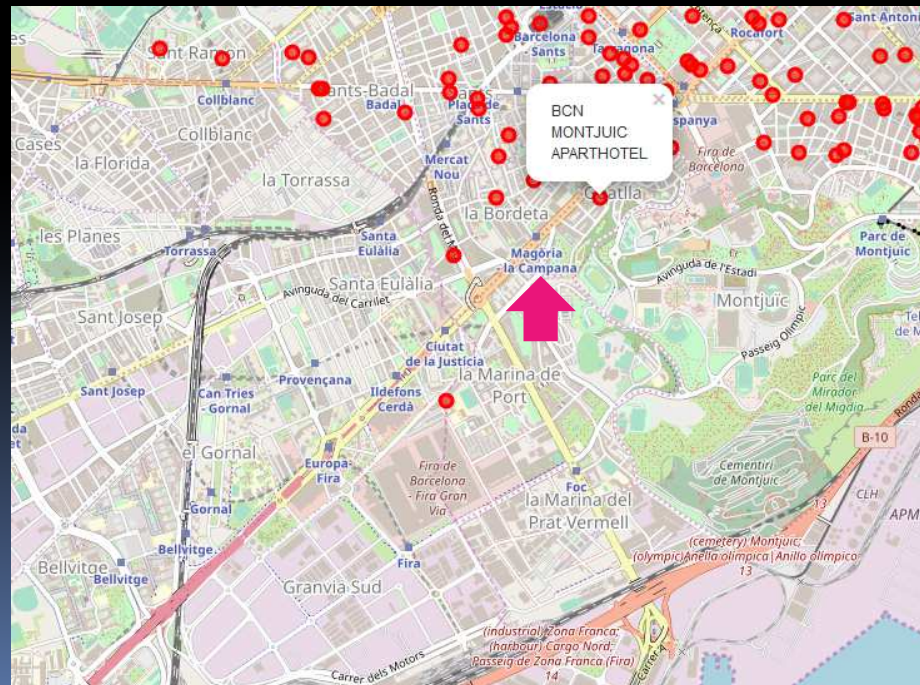
Analysis: existing hotels

The borough of Sants-Montjuïc has a fair good amount of Tourist attractions (64). However, it has a moderate amount of hotels (72). This area (specially the zones neighboring the Old Town and Eixample) is a good candidate for opening a new hotel.

Analysis: existing hotels

Further exploration confirms that the area of Sants-Montjuïc is less crowded with hotels compared to the neighboring ones. The labels in blue on the map are metro and train stations. Ideally a hotel business should be near those convenient locations, since tourists usually get around the city by foot. A good option would around the 'Magoria - La Campana' station, in the center of the map.
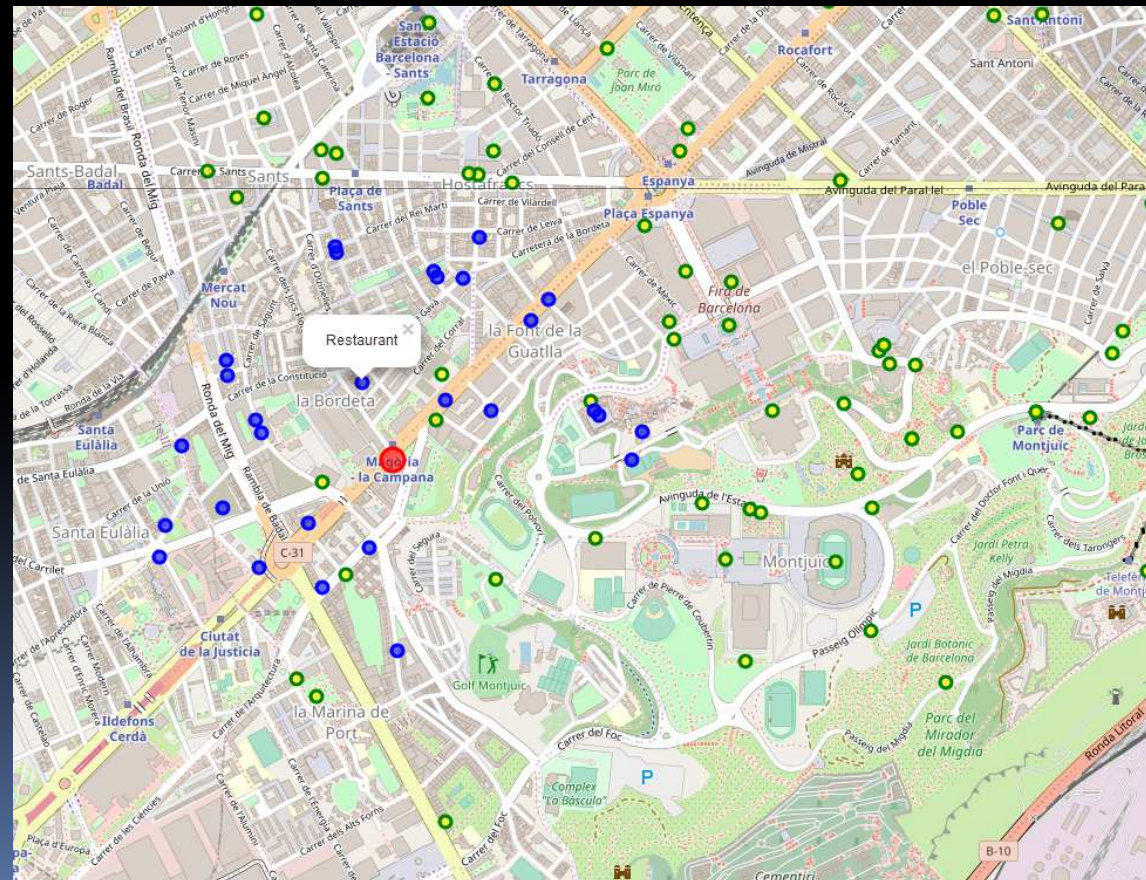
Analysis: Restaurant offer nearby

For our candidate location, we want to make sure that besides public means of transport and tourist attractions, there is enough restaurant offer nearby. For this purpose we use the Foursquare API:

Markers:

Restaurants (blue)

POIs (yellow)

Results and Conclusion

- There is a great number of Tourist attractions in Barcelona (more than 500 according to the Open Data BCN). The more dense areas are Ciutat Vella (Old Town) and Eixample, are also very densely crowded with accommodation options, hence opening a hotel business in those areas could be high risk.

- Alternatively our attention was focused on a moderately low hotel density area but still offering lots of Tourist attractions and with access to the public transport. The candidate area is the borough of Sants-Montjuïc, which is located in the southeast of Barcelona. This Olympic-inspired district is full of attractions: the Montjuïc Park, museums, a castle, and fantastic city views. We selected an hotel-empty area around the Magòria-La Campana station. A fair amount of restaurants was detected near the candidate location, which adds attractiveness to the eventual hotel.