

Barcelona: tourists vs. residents?

Project for Coursera Applied Data Science Capstone

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Problem description and background

Tourists vs. Residents in Barcelona

- **Millions of tourists** coming every year, in every season (8 UNESCO World Heritage Sites)
- Strong impact on the **apartments value** near to the most popular places: official actions have been taken by the mayor to moderate the problem (source: Wikipedia)
- Visualization:
 - **historical trend of the average rent and sell values** from 2014 to 2018 in the 10 districts
 - geographical analysis in the 10 districts focusing on **public transportation** and **venues**
- Main goal is to understand better the tourism business **impact on Barcelona residents' life** and find an eventual correlation by house prices and facilities / points of interests nearby.



Data description and source

Tourists vs. Residents in Barcelona

Barcelona Ajuntament (City Hall) has an extensive collection of [open datasets](#): for my project, I chose:

- **Territory / Housing**

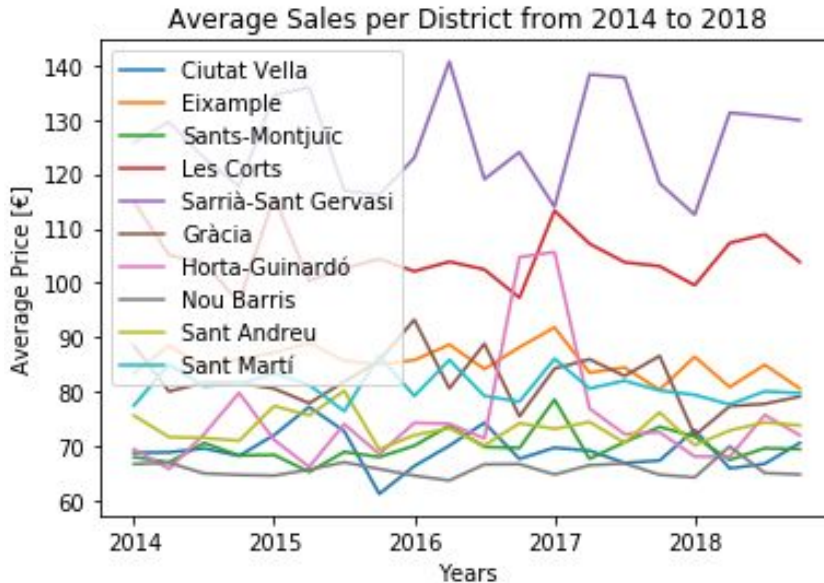
1. [Average monthly rent \(€ / month\) and rent per surface \(€ / m2 per month\)](#): downloading the data from 2014 to 2018, for the 10 districts
2. [Purchase of registered properties of Barcelona by average surface](#): downloading the data from 2014 to 2018, for the 10 districts

- **City and Services / Transport**

1. [Bus stops of the city of Barcelona](#)
2. [Public transports of the city of Barcelona](#):

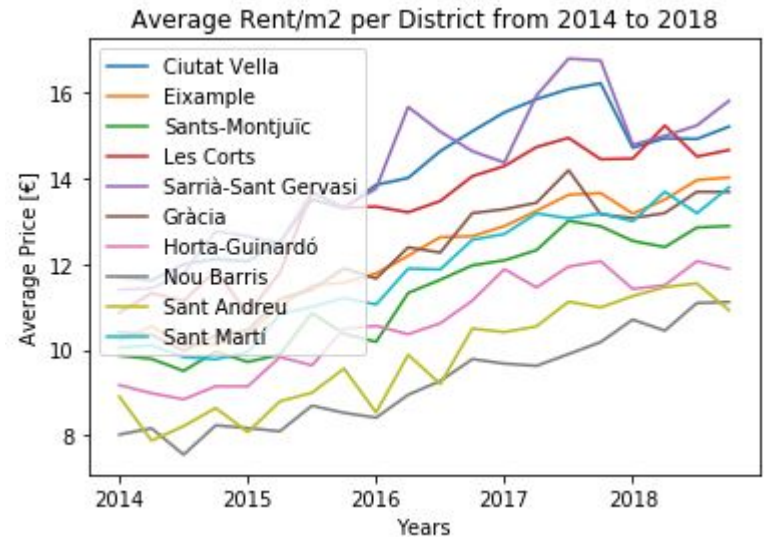
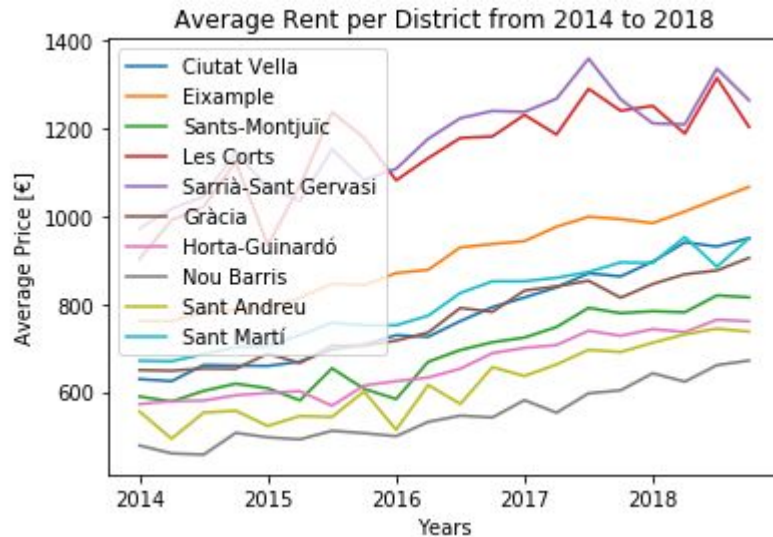
Geo-coordinates of the 73 barrios will be used to explore the venues by querying the Foursquare API.

Historical trends of the sales



- Apartment sales show an almost flat or decreasing trend from 2014 to 2018
- This is a common pattern in all big cities: apartments owners do not tend to live in Barcelona, but they prefer to rent flats for investment to short-term residents (students, B&B, expats...)
- Apartments are not going to be renovated, thus slowing down sales demand and decreasing values

Historical trends of the rents



As apartments are more dedicated to renting and investments, all districts show an absolute average rent increase: moving to Barcelona is more and more expensive for short-term residents.

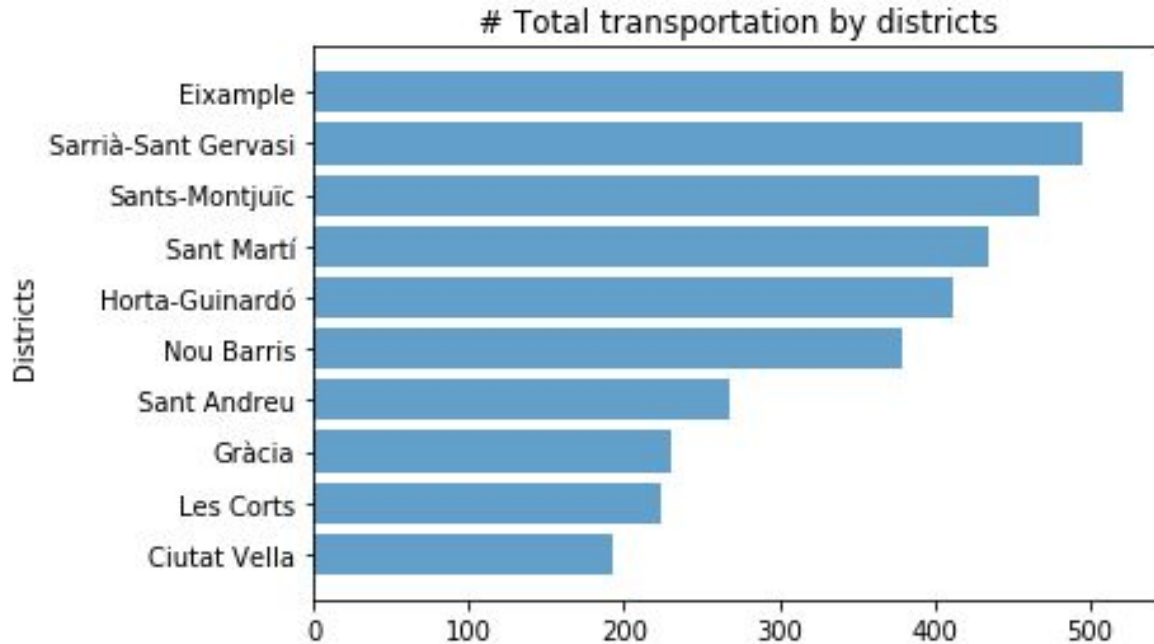


Historical trends of sales / rents

	DistrictName	DistrictCode	RentsValue	RentsM2Value	SalesValue
0	Ciutat Vella	1	50.934436	30.010695	2.615329
1	Eixample	2	40.001620	37.273469	-3.356643
2	Sants-Montjuïc	3	38.193336	30.605446	2.112805
3	Les Corts	4	33.220556	34.815951	-9.657773
4	Sarrià-Sant Gervasi	5	30.049369	38.587513	3.246323
5	Gràcia	6	39.229024	31.404959	-10.596475
6	Horta-Guinardó	7	32.866642	29.505339	3.708939
7	Nou Barris	8	40.358805	38.456224	-2.891249
8	Sant Andreu	9	32.665005	22.597889	-2.370161
9	Sant Martí	10	41.355651	37.150532	2.942315

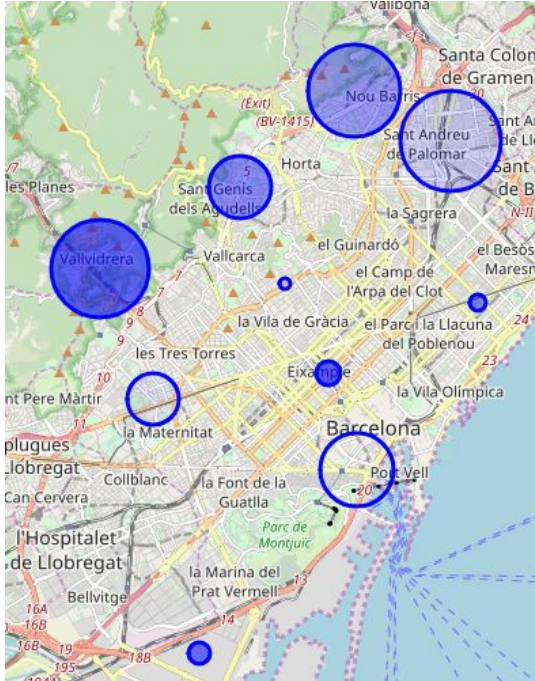
- Taking into account the relative variation, it can be seen that for every district there is about > 30 % increase in rents
- Sales value relative variation shows a flat / negative trend: standard owners in Barcelona tend not to live in the city / not to renovate the apartment

Geo-analysis of public transports



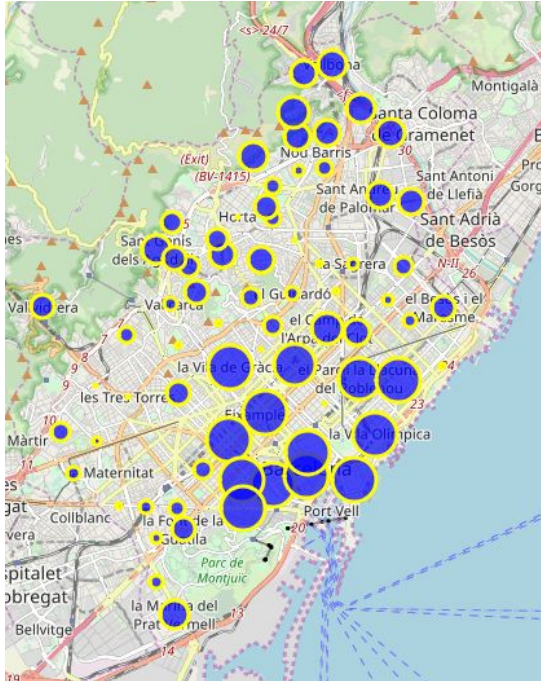
- Bar chart shows the number of available public transportation lines and stops in the same district
- Eixample, modern residential zone, is the best furnished and has more than double spots than the old turistic part (Ciutat Vella)

Geo-analysis of public transports



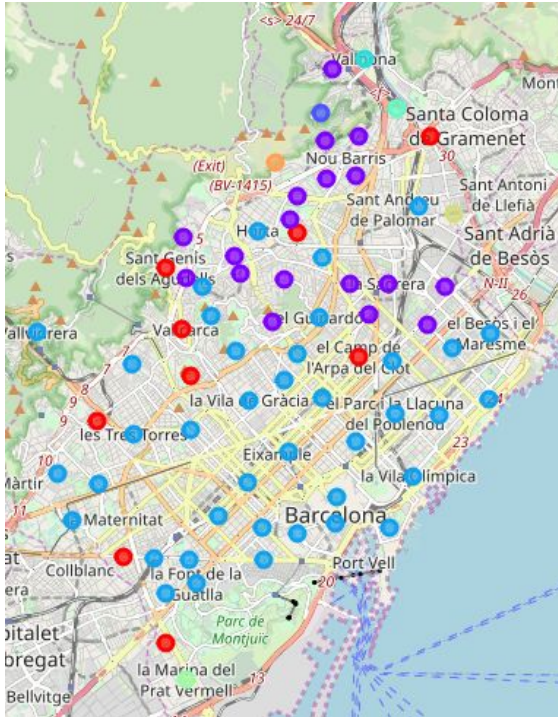
- In this map, the **circle radius** is proportional to the average rent / m², while the **opacity** is proportional to the public transportation services
- **Eixample and Gracia** are the best compromises for residents, while **Ciutat Vella and Sant Andreu** districts are clearly dedicated to short-term residents
- **Sarria and Sant-Gervasi** district is the high-end zone for residents, and many investors are renting flats with high profit increase year over year.

Geo-analysis of venues



- In this map, the **circle radius** is proportional to the number of the venues found by querying the Foursquare API from each barrio center
- **Barrios in Ciutat Vella and Eixample** show the highest number of available spots registered in Foursquare, confirming their touristic and nightlife characteristics
- **Sarria and Sant-Gervasi** and other peripheral districts, show their residential zone nature, where the number of the venues is very limited

Barrios clustering by K-means



- All 73 barrios have been clustered by K-means method in 10 different clusters
- It is clearly seen that Ciutat Vella, Garcia, Les Corts, and Eixample districts show similar characteristics (light blue), as they are a good mix of residential and touristic areas: venues categories are then quite similar
- Nou Barris and Sant-Andreu barrios belong to a different cluster (violet), probably thanks to their quiet zone characteristics
- The peripheral barrios in red are most likely industrial



Conclusions and future work

- A **quantitative and qualitative analysis** of Barcelona districts and barrios has been performed to evaluate current tourism impact on residents' life
- Main conclusion from **historical trends analysis** is that rents are steadily increasing year over year while sales remain almost flat: apartments are then usually rent to short-term residents (students, B&Bs, expats...), rather than occupied and renovated by locals
- **Geo-analysis** of public transportations and venues showed the contrast between quiet residential zones and active touristic and nightlife barrios
- Possible **future works** could be the analysis of other [datasets](#) in other categories to better understand current status and future challenges of Barcelona