

The Battle of Neighborhoods

House Hunters
Looking for the ideal neighborhood



House hunters: Problematic

Looking for a place where to live has never been such an arduous task as it is nowadays:

Requirements for our apartment:

- Nice
- Apartment with all the facilities we could need
- Budget
- Location
 - Do we even know the city?

House hunters: Our case studio

- City where to look for an apartment: Madrid (Spain)
- Reference neighborhood: Soto del Henares (Torrejón de Ardoz, Spain)









WHAT IS NEXT...?



House hunters: Data sources

- Wikipedia

Districts and neighborhoods in Madrid city

District name (number) ↕	District location ↕	Number ↕	Name ↕	Image ↕
Centro (1)		11	Palacio	
		12	Embajadores	
		13	Cortes	
		14	Justicia	
		15	Universidad	
		16	Sol	
		21	Imperial	

- Nominatim

Latitude and longitude for all neighborhoods including the reference

- Foursquare

Venues in all neighborhoods including the reference



House hunters: Data extraction

- Adding latitude and longitude

	District	Neighborhood	Latitude	Longitude
0	Centro	Palacio	40.4151	-3.71562
1	Centro	Embajadores	40.4097	-3.70164
2	Centro	Cortes	40.4148	-3.69758
3	Centro	Justicia	40.424	-3.69575
4	Centro	Universidad	40.4254	-3.70599
5	Centro	Sol	40.4178	-3.70222

- Retriveing the list of venues per neighborhood

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Palacio	40.415129	-3.715618	Santa Iglesia Catedral de Santa María la Real ...	40.415767	-3.714516	Church
1	Palacio	40.415129	-3.715618	Plaza de La Almudena	40.416320	-3.713777	Plaza
2	Palacio	40.415129	-3.715618	Cervecería La Mayor	40.415218	-3.712194	Beer Bar
3	Palacio	40.415129	-3.715618	Taberna Rayuela	40.413179	-3.713496	Tapas Restaurant
4	Palacio	40.415129	-3.715618	Palacio Real de Madrid	40.417940	-3.714259	Palace

House hunters: Data preparation

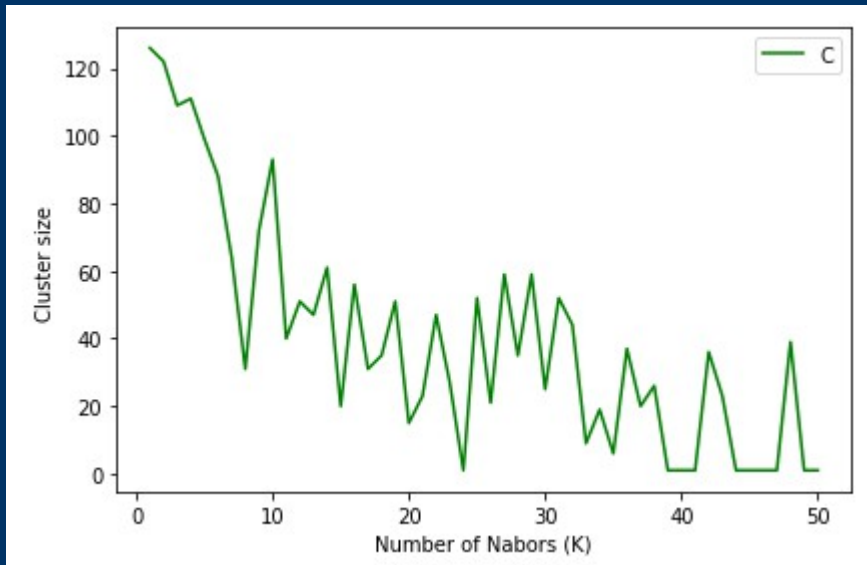
- Frequency of categories venues in each neighborhood

	Neighborhood	Accessories Store	Adult Boutique	American Restaurant	Arcade	Argentinian Restaurant	Art Gallery	Art Museum	Art Studio	Arts & Crafts Store	Asian Restaurant	Athletics & Sports	BBQ Joint	Bage Sho
0	Abrantes	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.000000	0.166667	0.000000	0.0
1	Acacias	0.00	0.00	0.000000	0.000000	0.000000	0.066667	0.000000	0.000000	0.00	0.000000	0.000000	0.000000	0.0
2	Adelfas	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.026316	0.000000	0.000000	0.0
3	Alameda de Osuna	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.000000	0.0
4	Almagro	0.00	0.00	0.010000	0.000000	0.000000	0.020000	0.010000	0.000000	0.00	0.020000	0.000000	0.000000	0.0
5	Almenara	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.076923	0.0
6	Almendrales	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.055556	0.0
7	Aluche	0.00	0.00	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.000000	0.0

- 126 records including Soto del Henares
 - Filtered records with no coordinates or venues

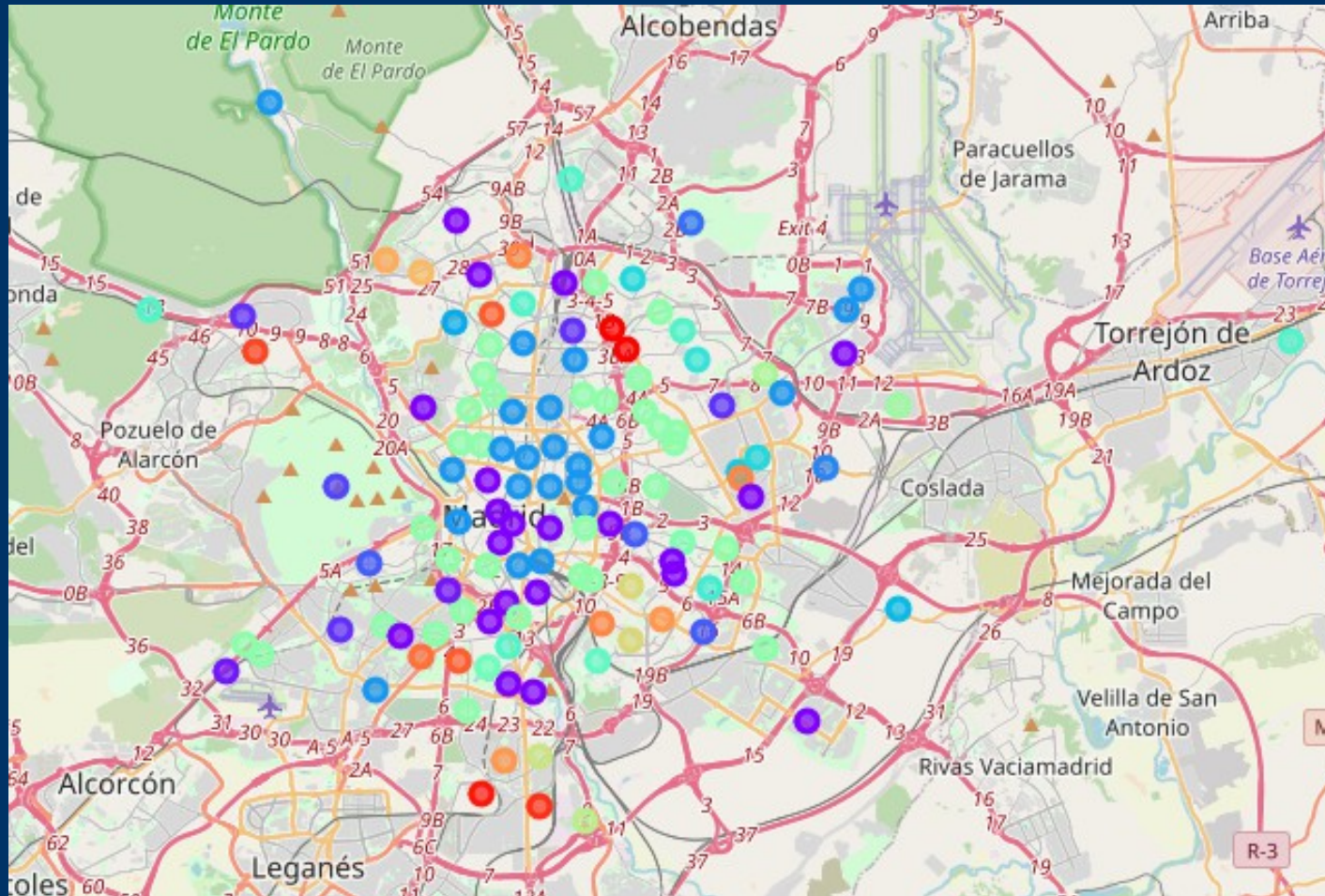
House hunters: Clustering

- K-means algorithm for k in range $[1, 50]$ and get the size of the cluster containing Soto del Henares



- K too small => Big and heterogeneous clusters. Stakeholders cannot search into too many neighborhoods.
- Number of clusters too big => Not enough neighborhoods in the cluster
- Optimal value at $k = 35$ with cluster size = 6

House hunters: Results I



House Hunters: Results II

- Recommended neighborhoods by similarity: Almenara, Valverde, El Plantío, Almendrales and Canillas

	Neighborhood	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
34	Almenara	Spanish Restaurant	BBQ Joint	Department Store	Chinese Restaurant	Flea Market	Seafood Restaurant	Sandwich Place	Library	Restaurant	Gym / Fitness Center
48	Valverde	Italian Restaurant	Train Station	Breakfast Spot	Sushi Restaurant	Tapas Restaurant	Mediterranean Restaurant	Tennis Court	Bakery	Spanish Restaurant	Historic Site
56	El Plantío	Italian Restaurant	Spanish Restaurant	Asian Restaurant	Burger Joint	Sporting Goods Shop	Shopping Mall	Seafood Restaurant	Bookstore	Mediterranean Restaurant	Gym
74	Almendrales	Spanish Restaurant	Bar	Seafood Restaurant	Grocery Store	Fast Food Restaurant	Bakery	Train Station	BBQ Joint	Chinese Restaurant	Noodle House
101	Canillas	Spanish Restaurant	Italian Restaurant	Juice Bar	Gym	Clothing Store	Pub	Soccer Field	Skating Rink	Shopping Mall	Sandwich Place
128	Soto del Henares	Gastropub	Train Station	Cafeteria	Seafood Restaurant	Mediterranean Restaurant	Market	Spanish Restaurant	Eastern European Restaurant	Electronics Store	Furniture / Home Store

House Hunters: Future work

- Size of our initial sample too big
- We are not considering prices... Price is a stopwatch!!
- Filter the neighborhoods by some criteria as close to an specific location – maybe the stakeholder workplace - or a crèche, school or university.
- Cross our neighborhoods data with other databases containing some price statistics as average price by squared meter

Thank you!

