



# Optimal business location in Barcelona

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# How?

Get the proper data:

- Find the best of immigration
- Find the best datasets for price by district



Make a segmentation by clusters using k-means algorithm to find similar Barcelona districts



Analyse the data and clusters obtained and place the final project conclusion



# Dataset: Immigration

	Lloc_de_procedencia	Nom_districte	Nombre
2	Andalusia	Ciutat Vella	223
3	Andalusia	Eixample	476
4	Andalusia	Gracia	187
5	Andalusia	Horta-Guinardó	180
6	Andalusia	Les Corts	89
7	Andalusia	Nou Barris	204
8	Andalusia	Sant Andreu	125
9	Andalusia	Sant Martí	302
0	Andalusia	Sants-Montjuic	290
1	Andalusia	Sarria-Sant Gerv	125
2	Aragó	Ciutat Vella	69
3	Aragó	Eixample	167
4	Aragó	Gracia	49
5	Aragó	Horta-Guinardó	64
6	Aragó	Les Corts	54
7	Aragó	Nou Barris	57
8	Aragó	Sant Andreu	52



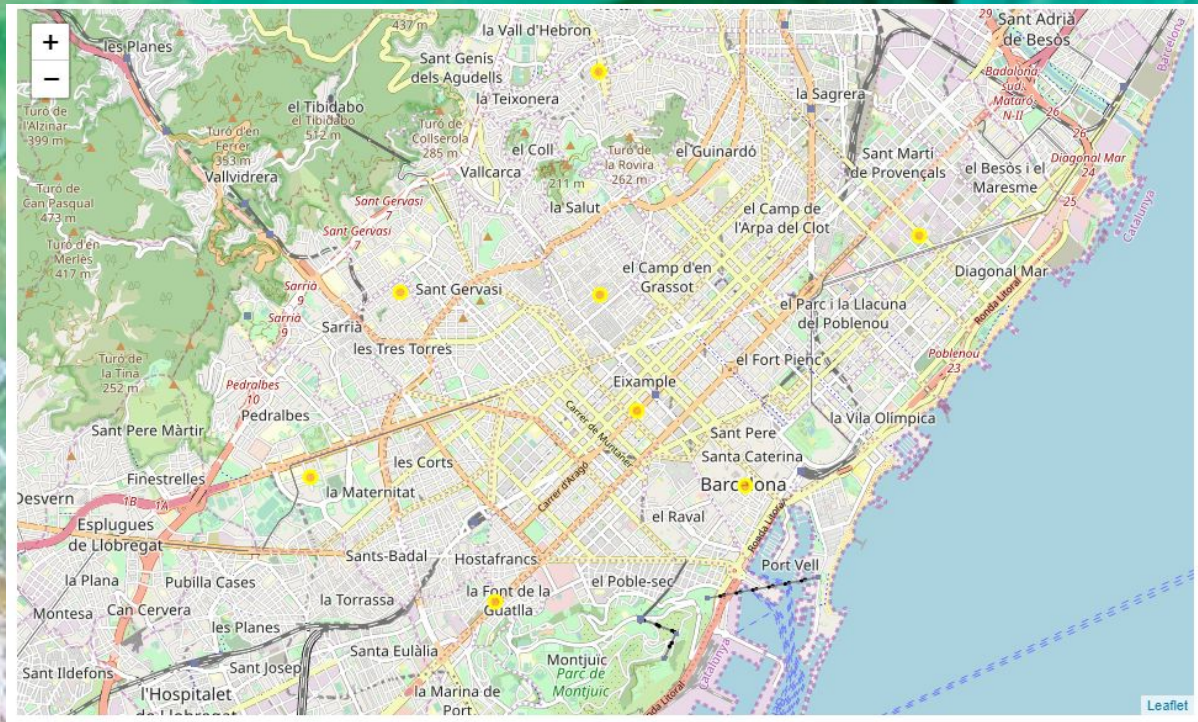
	Unnamed: 0	Ciutat Vella	Eixample	Gracia	Horta-Guinardó	Les Corts	Nou Barris	Sant Andreu	Sant Martí	Sants-Montjuic	Sarria-Sant Gervasi
0	Andalusia	223	476	187	180	89	204	125	302	290	125
1	Aragó	69	167	49	64	54	57	52	84	103	43
2	Canaries	106	181	60	65	28	69	38	103	104	70
3	Cantabria	19	32	17	12	5	11	22	13	27	8
4	Castella - la Manxa	49	77	26	36	20	39	40	71	43	20

# Dataset: Venues (Foursquare)

	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
0	Ciutat Vella	Tapas Restaurant	Plaza	Bar	Spanish Restaurant	Wine Bar	Hotel	Cocktail Bar	Vegetarian / Vegan Restaurant	Ice Cream Shop	Tea Room
1	Eixample	Hotel	Tapas Restaurant	Boutique	Clothing Store	Mediterranean Restaurant	Hostel	Japanese Restaurant	Cocktail Bar	Gym	Bookstore
2	Gracia	Tapas Restaurant	Cocktail Bar	Bar	Café	Plaza	Pizza Place	Ice Cream Shop	Restaurant	Mediterranean Restaurant	Arts & Crafts Store
3	Horta-Guinardó	Supermarket	Food & Drink Shop	Plaza	Gym	Grocery Store	Food Court	Café	Coffee Shop	Metro Station	Chinese Restaurant
4	Les Corts	Tram Station	Soccer Field	Nightclub	Gym	Garden	Print Shop	College Cafeteria	Donut Shop	Museum	Science Museum
5	Nou Barris	Spanish Restaurant	Grocery Store	Plaza	Park	Diner	Building	Seafood Restaurant	Metro Station	Brewery	Skate Park
6	Sant Andreu	Spanish Restaurant	Café	Supermarket	Restaurant	Tapas Restaurant	Park	Brewery	Plaza	Coffee Shop	Bar
7	Sant Martí	Hotel	Pizza Place	Supermarket	Park	Convenience Store	Office	Falafel Restaurant	Mediterranean Restaurant	Café	Kebab Restaurant
8	Sants-Montjuïc	Spanish Restaurant	Restaurant	Grocery Store	Plaza	Hotel	Tapas Restaurant	Breakfast Spot	Burger Joint	Supermarket	Bakery
9	Sarrià-Sant Gervasi	Bakery	Restaurant	Coffee Shop	Spanish Restaurant	Hotel	Seafood Restaurant	Bar	Café	Mediterranean Restaurant	Japanese Restaurant



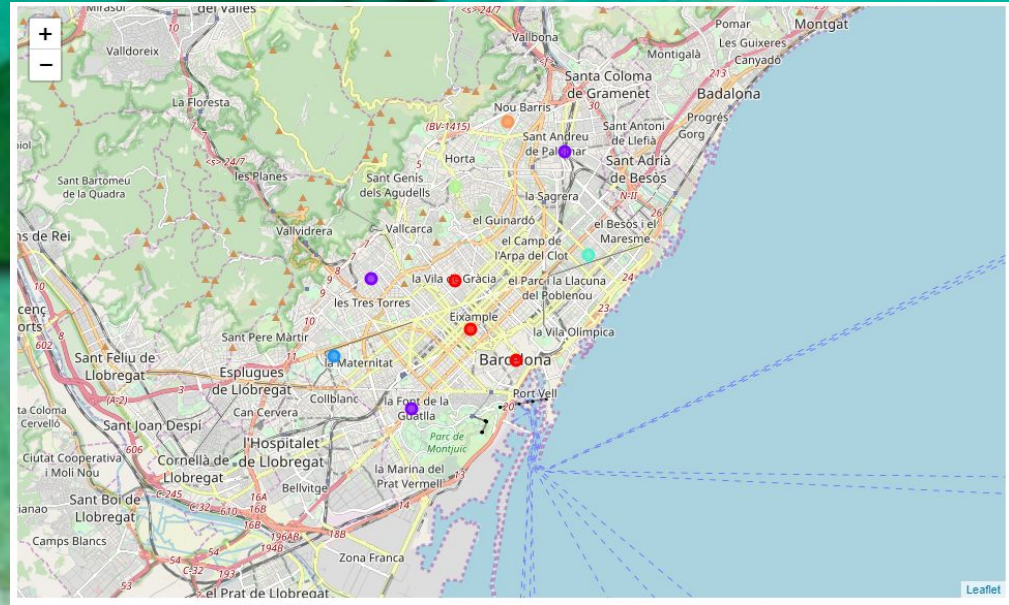
# Barcelona districts





The graph illustrates the Elbow Method for determining the optimal number of clusters (k). The x-axis represents the number of clusters (k), ranging from 1 to 9. The y-axis represents the Sum of squared distances, ranging from 0.00 to 0.30. The curve shows a sharp decrease in distance as k increases from 1 to 4, followed by a more gradual decline, suggesting k=4 as a potential optimal number of clusters.

k	Sum of squared distances
1	0.32
2	0.25
3	0.19
4	0.14
5	0.11
6	0.07
7	0.05
8	0.03
9	0.02



# Clustering and results

	Unnamed: 0	Ciutat Vella	Eixample	Gracia	Horta-Guinardó	Les Corts	Nou Barris	Sant Andreu	Sant Martí	Sants-Montjuïc	Sarria-Sant Gervasi	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue
0	Andalusia	223	476	187	180	89	204	125	302	290	125	Ciutat Vella	0	Tapas Restaurant	Plaza	
1	Aragó	69	167	49	64	54	57	52	84	103	43	Eixample	0	Hotel	Tapas Restaurant	Bar
2	Canaries	106	181	60	65	28	69	38	103	104	70	Gracia	0	Tapas Restaurant	Cocktail Bar	
3	Cantabria	19	32	17	12	5	11	22	13	27	8	Horta-Guinardó	4	Supermarket	Food & Drink Shop	
4	Castella - la Manxa	49	77	26	36	20	39	40	71	43	20	Les Corts	2	Tram Station	Soccer Field	Nightclub
5	Castella i Lleó	67	146	52	75	43	54	60	103	105	39	Nou Barris	5	Spanish Restaurant	Grocery Store	
6	Catalunya	2619	4541	1960	2799	1579	3265	2639	3889	4214	2297	Sant Andreu	1	Spanish Restaurant	Café	Supermarket
7	Ceuta	5	2	0	5	1	4	0	5	5	4	Sant Martí	3	Hotel	Pizza Place	Supermarket
8	Comunitat Foral de Navarra	15	59	18	20	12	16	20	25	24	29	Sants-Montjuïc	1	Spanish Restaurant	Restaurant	Coffee Shop
9	Comunitat Valenciana	218	432	175	190	96	144	167	309	297	141	Sarria-Sant Gervasi	1	Bakery	Restaurant	Coffee Shop



# Conclusion

Analysing the data that we have been working in with the main goal to find the best districts to place a luxury product supermarket, the conclusions are as follow:

- The district where service similar to our luxury supermarket exist is the district of Sarria, where we can find that there are supermarkets similar.
- With that, we can assume that this district, the current population of it, likes this type of supermarkets.
- Then, the next step is to find similar districts where population is quite similar to Sarria, but no services like this exist.

**Conclusion: We can figure out that district cluster 2 is the most suitable to place our supermarket, so districts of Sants-Monjuic and Sant Andreu should be a good place to start our new supermarket.**