

# The quest for the perfect Neighbourhood

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# Business Problem

Imagine you are a foreign student in Barcelona. You must prepare all the things you need for your trip, your papers, where will you live, which are the most popular neighbourhoods? which means of transport will you take? So you enter the internet to look for useful information but bad news: your city is big and there's so much information it confuses you. By this point you are already very stressed, so, what could you do?



# The Solution: Ciro!



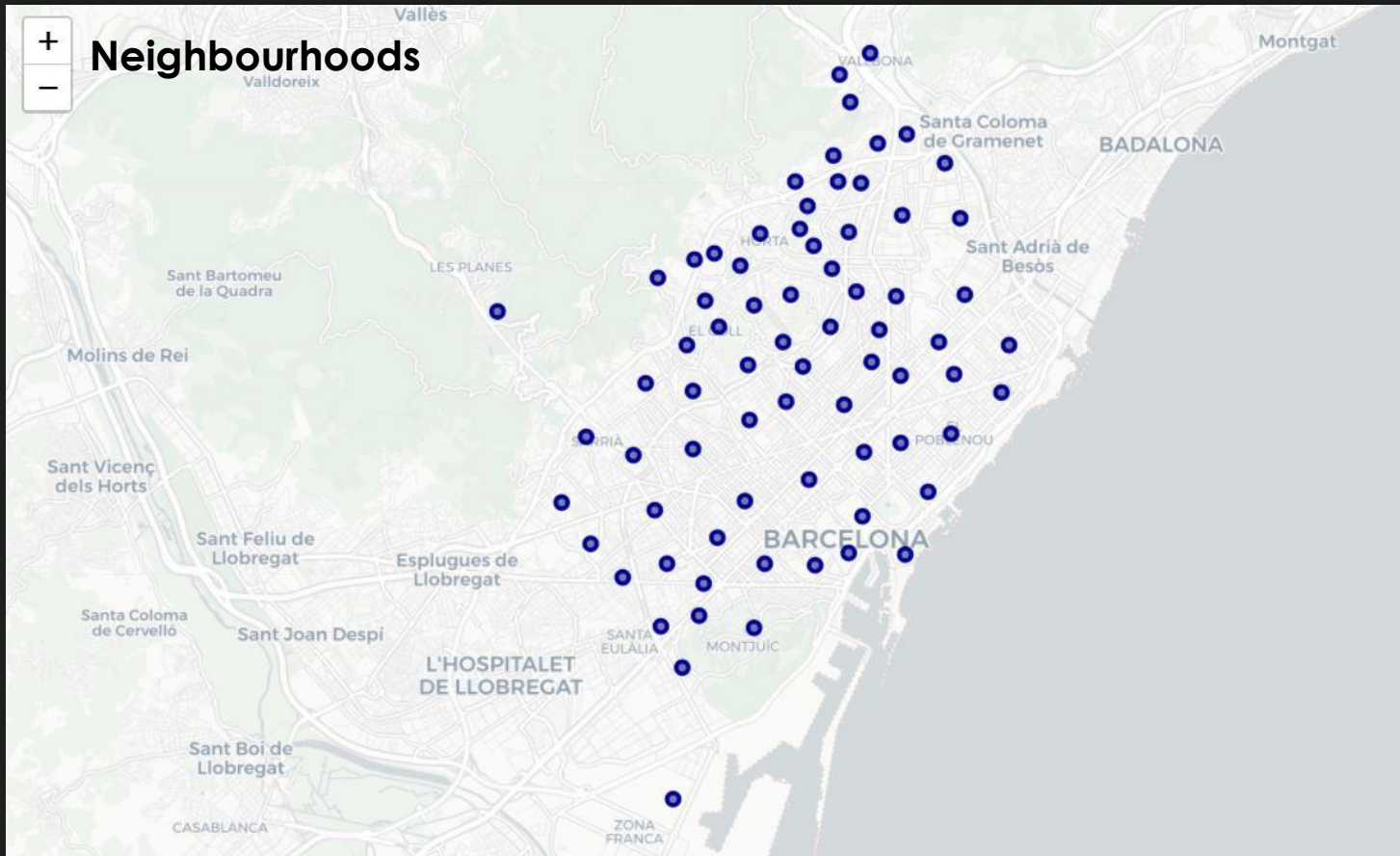
CIRO

THE RIGHT PLACE

- Enter to the new and fresh app called Ciro! With only a few questions about your personality, college, budget and interests, Ciro recommends you the three best neighbourhoods!



# Knowing Barcelona



- 1.6 million people
- 10 districts
- 73 neighbourhoods

# Methodology



# Data Collection

- Foursquare: to get the venue data from the neighbourhoods
- Open Data BCN: to get information about:
  - Coordinates of the neighbourhoods
  - Apartment rental by neighborhood
  - Public libraries
  - Public transportation

**FOURSQUARE** DEVELOPERS



Open Data **BCN**

Servicio de datos abiertos del Ajuntament de Barcelona

# Data wrangling

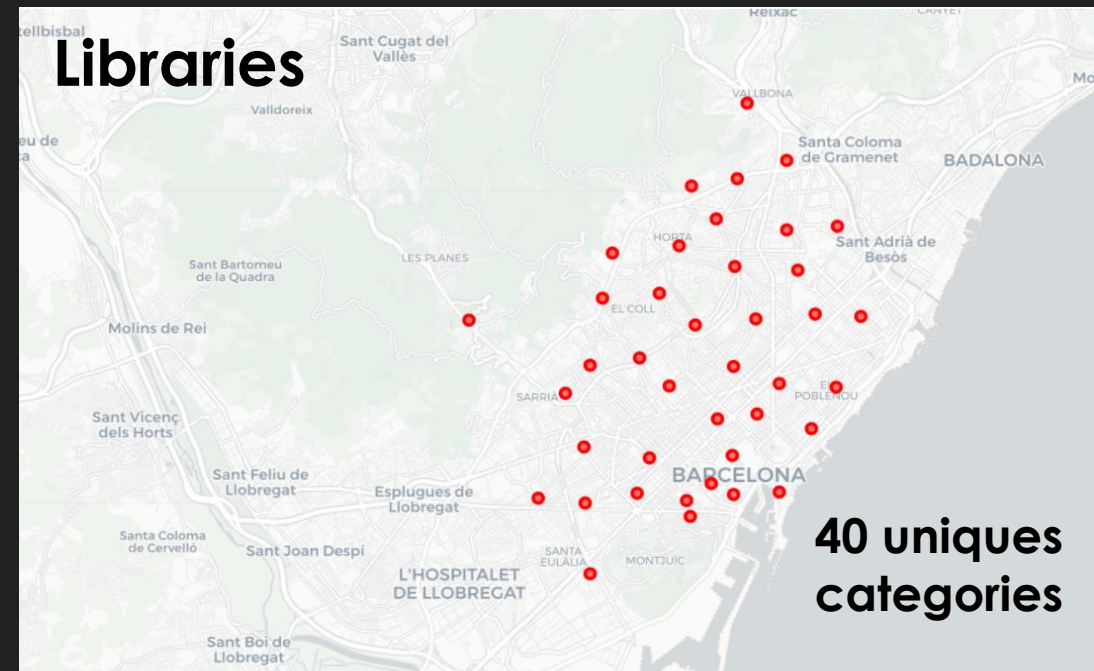
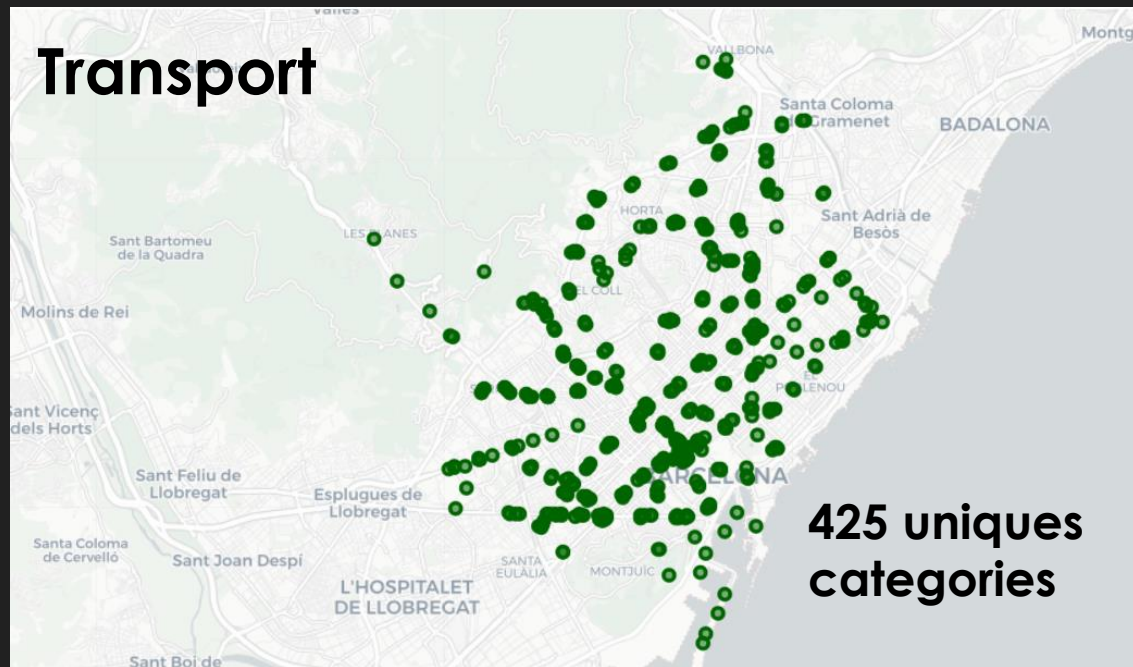
## ○ Data cleaning and extraction of relevant information

Any		Indicador	Equipament	Valor	Notes_Dades	Notes_Equipament	Codi_Districte	Nom_Districte	Codi_Barri	Nom_Barri	Titularitat	TipusGeneral	TipusEquipament	Ambit	Lati
0	2017	Assistents_Activitats	Biblioteca Barceloneta - La Fraternitat	1007	NaN	NaN	1	Ciutat Vella	3	la Barceloneta	Consorci o fundació amb presència municipal	Biblioteques de Barcelona	Biblioteques	Lletres	41.379
1	2017	Assistents_Activitats	Biblioteca Francesca Bonnemaison	2732	NaN	NaN	1	Ciutat Vella	4	Sant Pere, Santa Caterina i la Ribera	Consorci o fundació amb presència municipal	Biblioteques de Barcelona	Biblioteques	Lletres	41.386
2	2017	Assistents_Activitats	Biblioteca Gòtic - Andreu Nin	1430	NaN	NaN	1	Ciutat Vella	2	el Barri Gòtic	Consorci o fundació amb presència municipal	Biblioteques de Barcelona	Biblioteques	Lletres	41.378
3	2017	Assistents_Activitats	Biblioteca Sant Pau i Santa Creu	1009	NaN	NaN	1	Ciutat Vella	1	el Raval	Consorci o fundació amb presència municipal	Biblioteques de Barcelona	Biblioteques	Lletres	41.381
4	2017	Assistents_Activitats	Biblioteca Esquerra de l'Eixample-Agustí Cente...	4754	NaN	NaN	2	Eixample	9	la Nova Esquerra de l'Eixample	Consorci o fundació amb presència municipal	Biblioteques de Barcelona	Biblioteques	Lletres	41.386



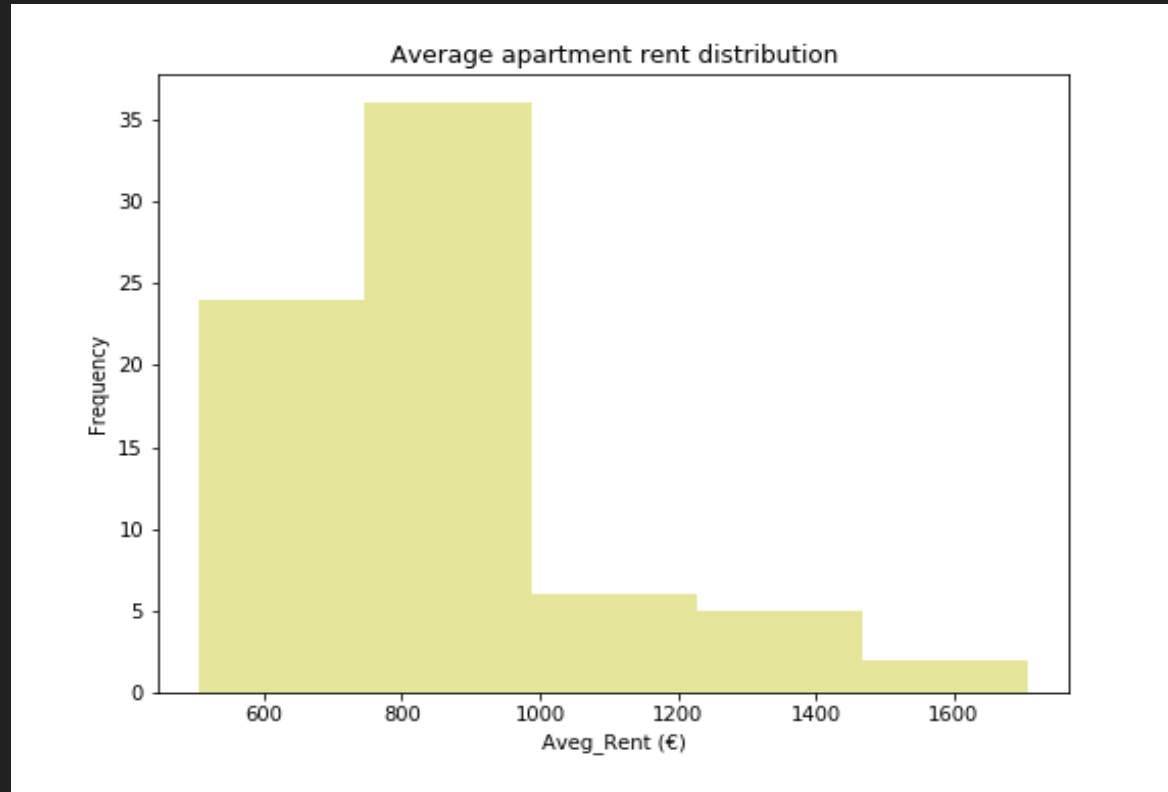
	Library Name	Neighbourhood	Latitud	Longitud
0	Biblioteca Barceloneta - La Fraternitat	la Barceloneta	41.379201	2.188854
1	Biblioteca Francesca Bonnemaison	Sant Pere, Santa Caterina i la Ribera	41.386937	2.175790
2	Biblioteca Gòtic - Andreu Nin	el Barri Gòtic	41.378730	2.175979
3	Biblioteca Sant Pau i Santa Creu	el Raval	41.381057	2.169794
4	Biblioteca Esquerra de l'Eixample-Agustí Cente...	la Nova Esquerra de l'Eixample	41.386449	2.152790

# Dataframes: categorical data





# Dataframes: Rent Apartment



# Foursquare: 100 limit, 600 m radius

	Neighbourhood	Neighbourhood Latitude	Neighbourhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Baró de Viver	41.44603	2.199706	Ibericus	41.441505	2.197812	Food
1	Baró de Viver	41.44603	2.199706	Pasteleria Buenavista	41.442172	2.199977	Dessert Shop
2	Baró de Viver	41.44603	2.199706	Restaurant Enriqueta	41.445684	2.206801	Spanish Restaurant
3	Baró de Viver	41.44603	2.199706	Lefties	41.441089	2.198103	Clothing Store
4	Baró de Viver	41.44603	2.199706	A Loja do Gato Preto	41.441689	2.197742	Furniture / Home Store

- Dataframe size: 3759 rows
- 292 uniques categories

# Final dataframe



Final dataframe

# Final dataframe

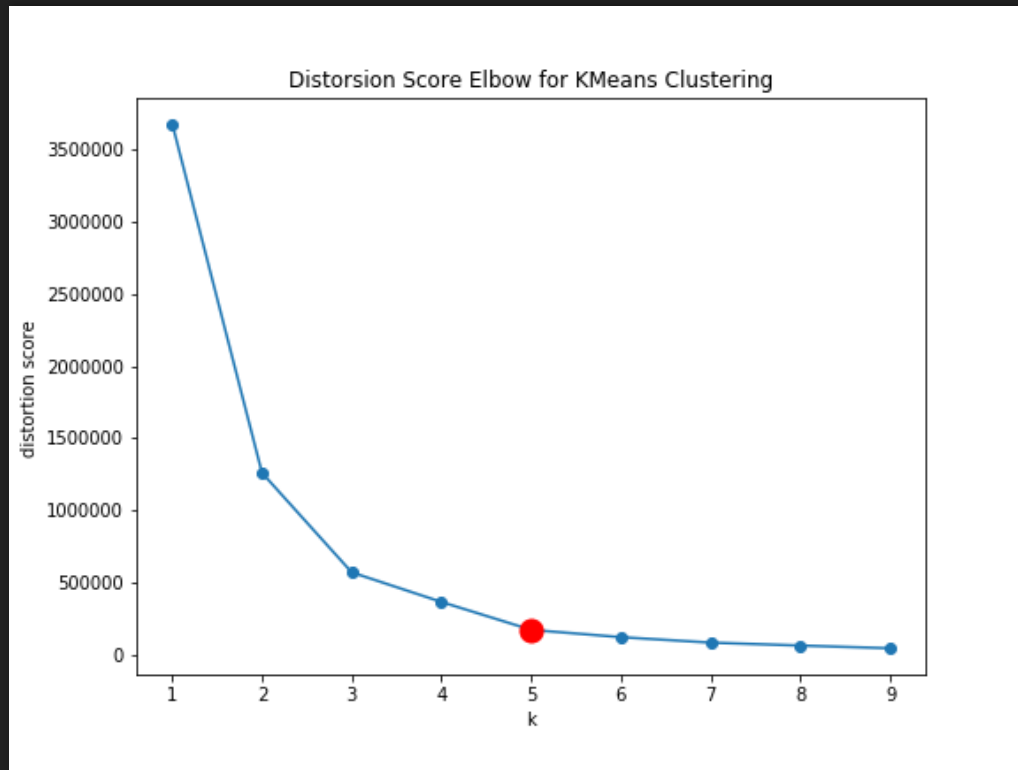
	Aveg_Rent	Biblioteca Barceloneta - La Fraternitat	Biblioteca Bon Pastor	Biblioteca Camp de l'Arpa - Caterina Albert	Biblioteca Can Rosés	Biblioteca Canyelles	Biblioteca Clarà	Biblioteca Collserola - Josep Miracle	Biblioteca El Carmel - Juan Marsé	Biblioteca El Clot - Josep Benet	...	Video Game Store	Video Store	Vietnamese Restaurant	Water Park	Wine Bar	Wine Shop	Winery	Wings Joint	V
Baró de Viver	716.818900	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Can Baró	738.177500	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Can Peguera	648.947561	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Canyelles	716.597500	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ciutat Meridiana	506.965000	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	...	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

5 rows × 757 columns

○ Final dataframe size: 73 rows  
and 758 columns



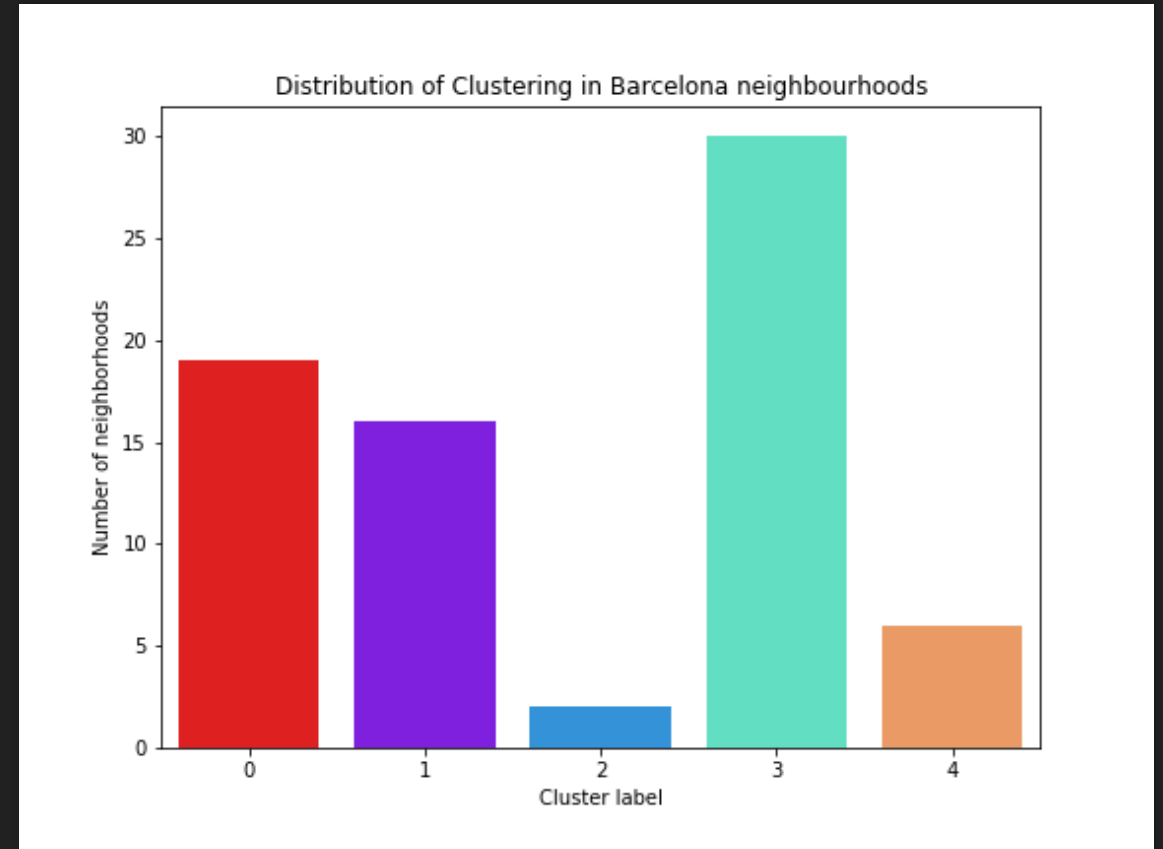
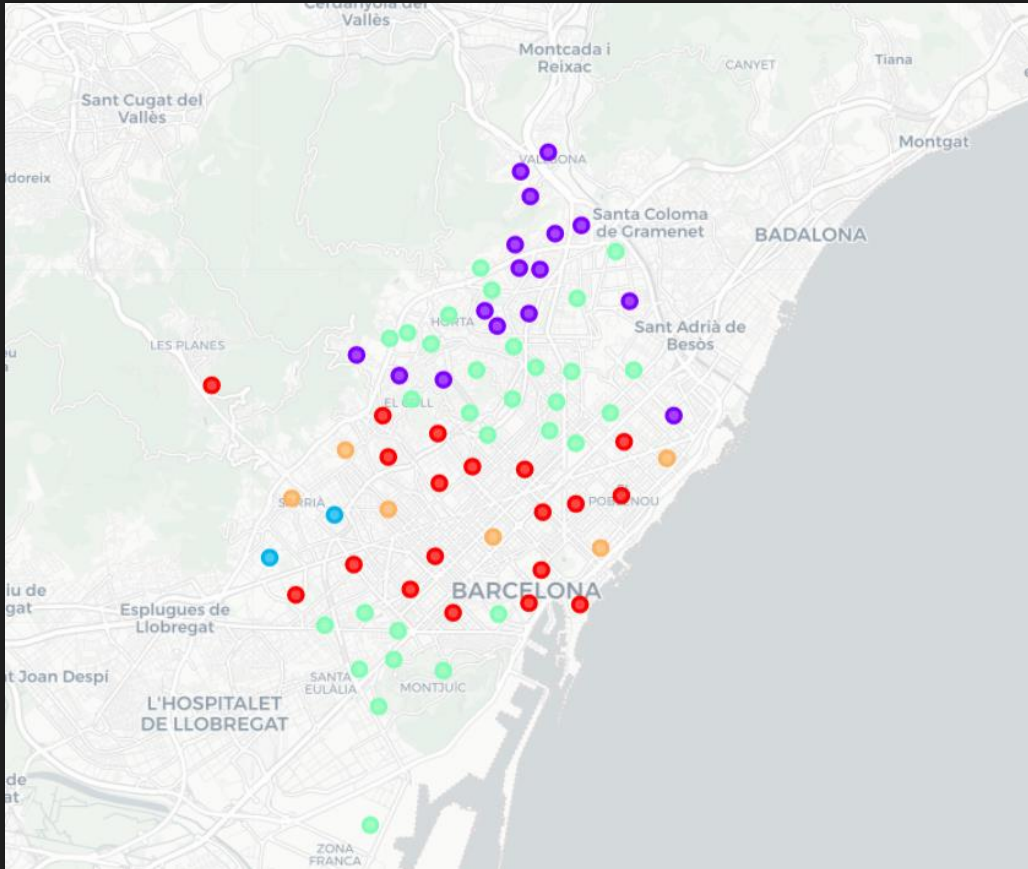
# Modeling: *k*-means clustering



○ To find the appropriate number of clusters in a dataset, use the graphic method Elbow.

○  $k = 5$

# Modeling: $k$ -means clustering



# Conclusions

- The main objective of the proposed application Ciro is to recommend to each student according to their personality and interests the best neighbourhoods to live in. In this analysis only the objective of segmenting the neighborhoods of Barcelona according to four features has been achieved, it would be necessary to complement this with an analysis of what type of client (student) each cluster corresponds to.

