

The quest for the perfect Neighbourhood

Hanna L. Aguilar

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!

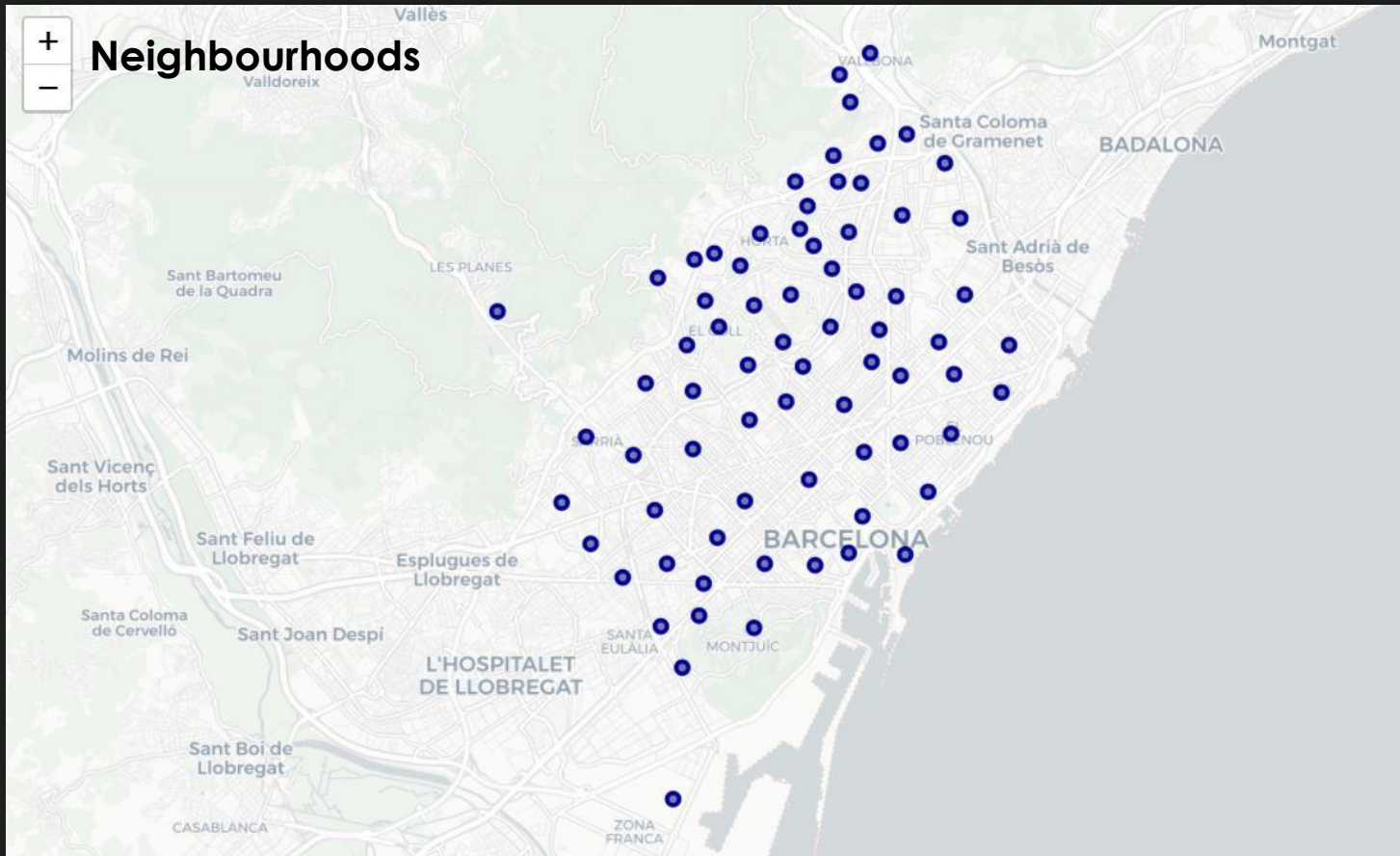


CIRO

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

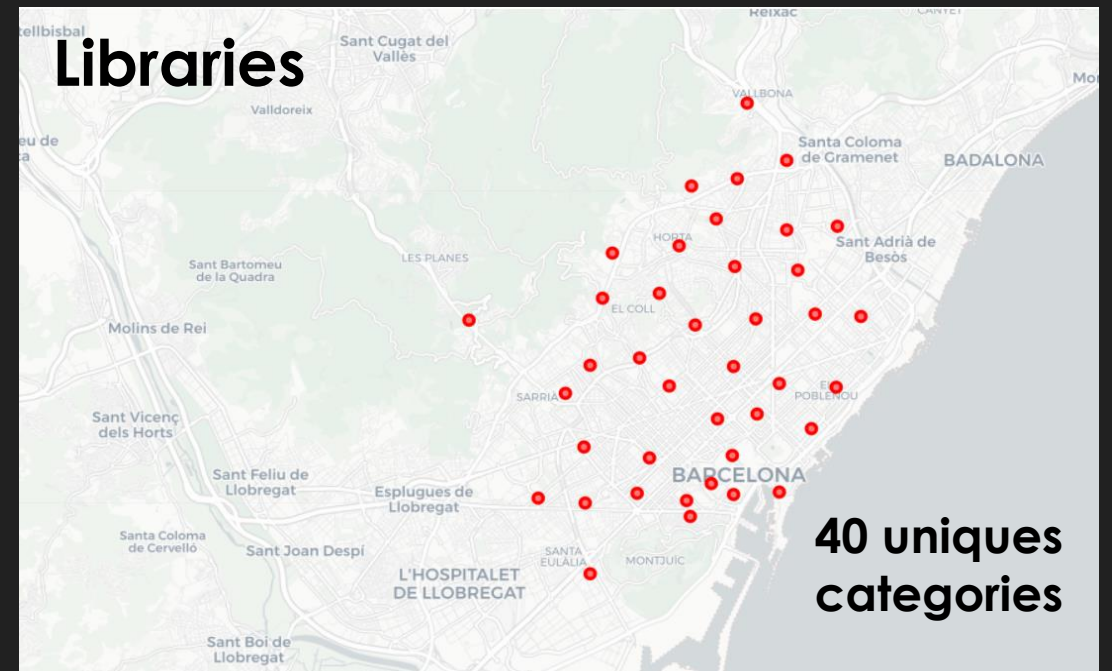
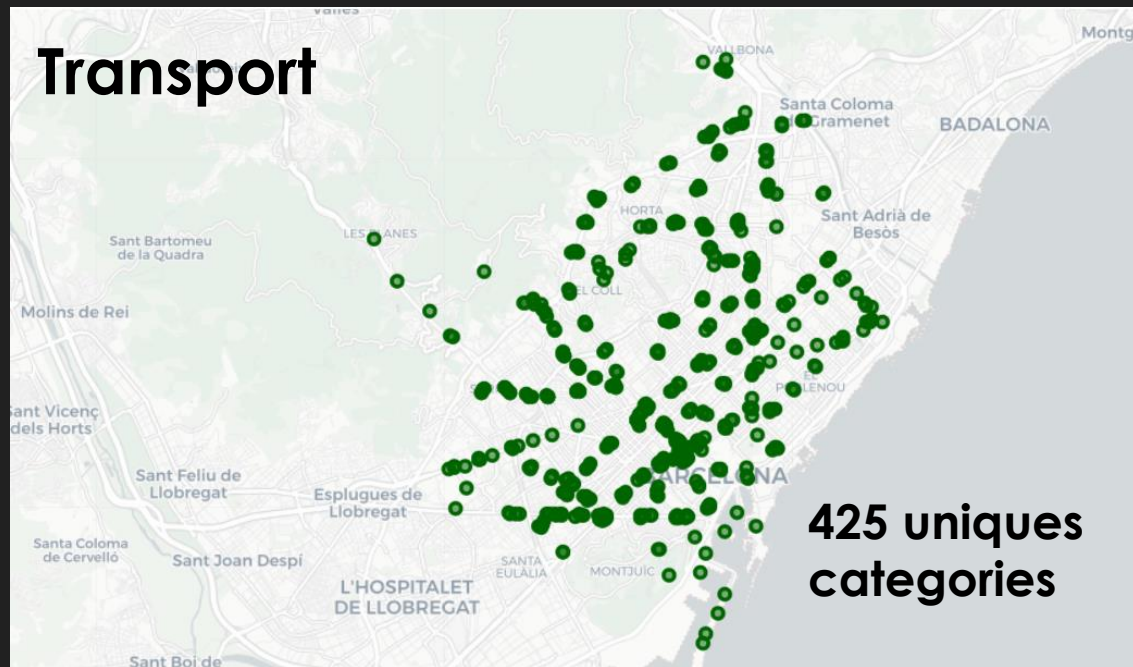
○ Data cleaning and extraction of relevant information

| 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 |

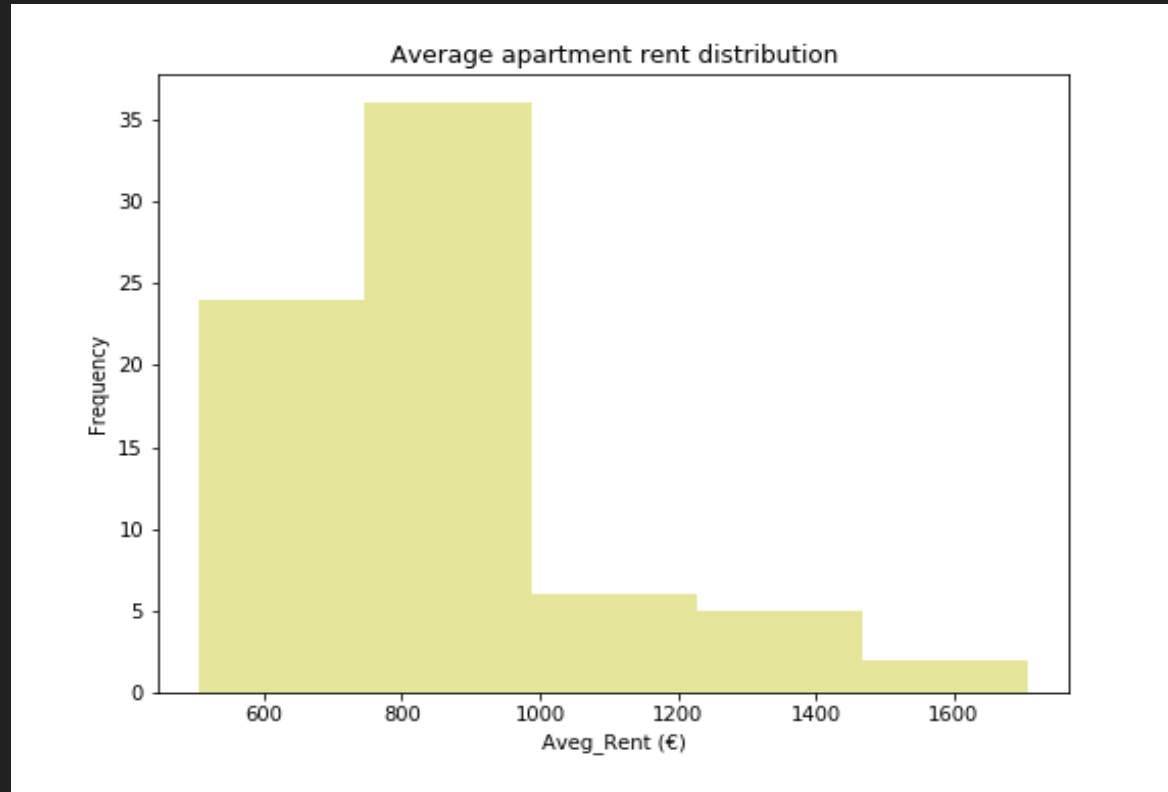


| | Library Name | Neighbourhood | Latitud | Longitud |
|---|---|---------------------------------------|-----------|----------|
| 0 | Biblioteca Barceloneta - La Fraternitat | la Barceloneta | 41.379201 | 2.188854 |
| 1 | Biblioteca Francesca Bonnemaison | Sant Pere, Santa Caterina i la Ribera | 41.386937 | 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

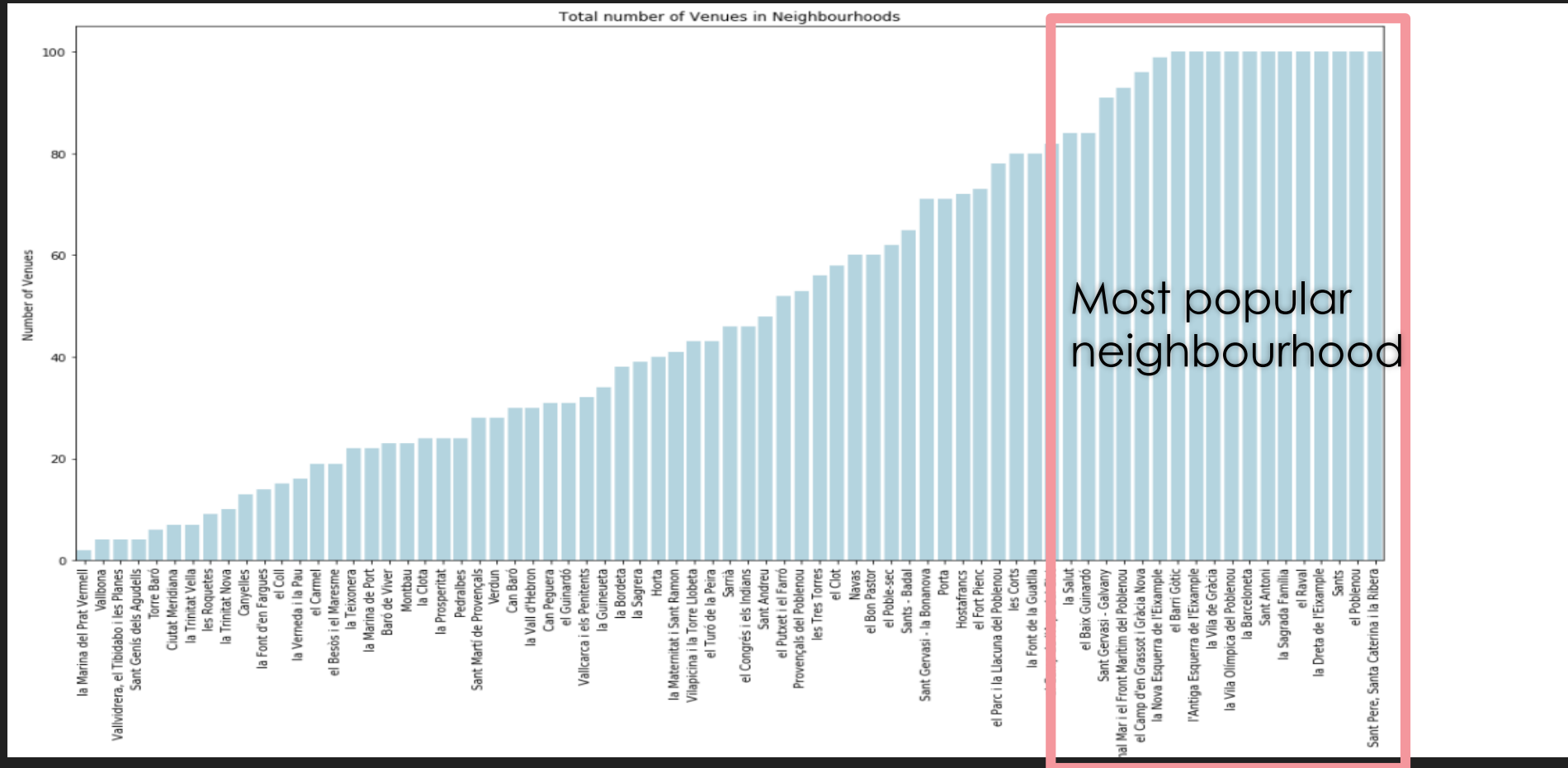


Foursquare: 100 limit, 600 m radius

| | 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

Foursquare



Final dataframe



Final dataframe

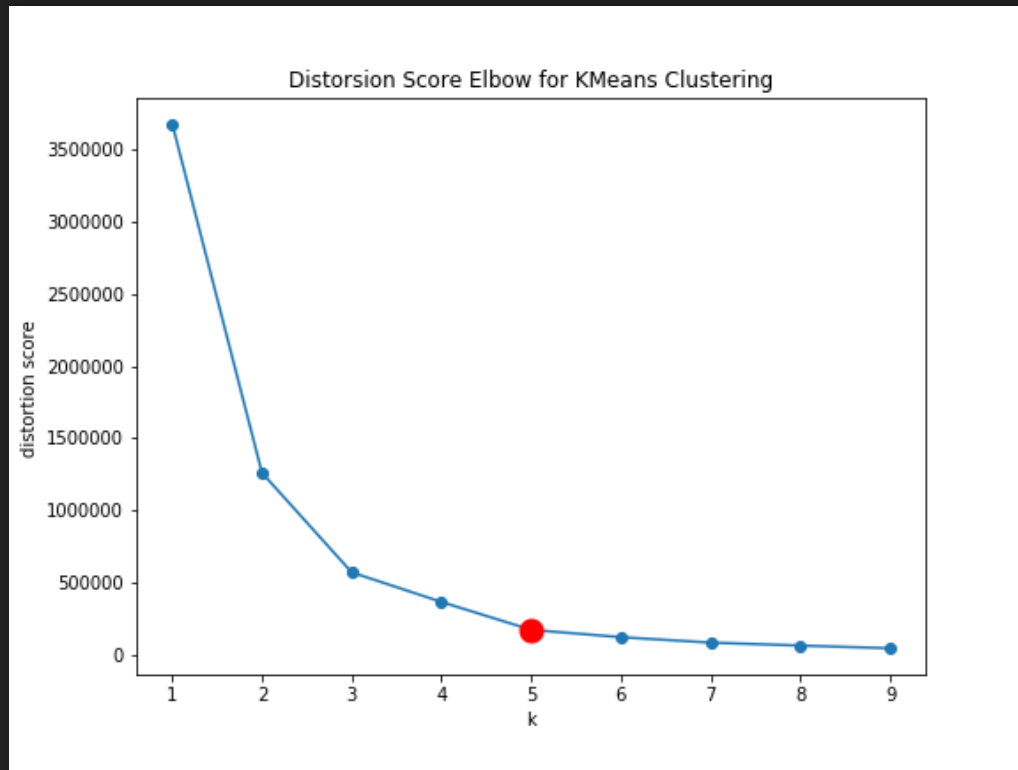
Final dataframe

| | 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

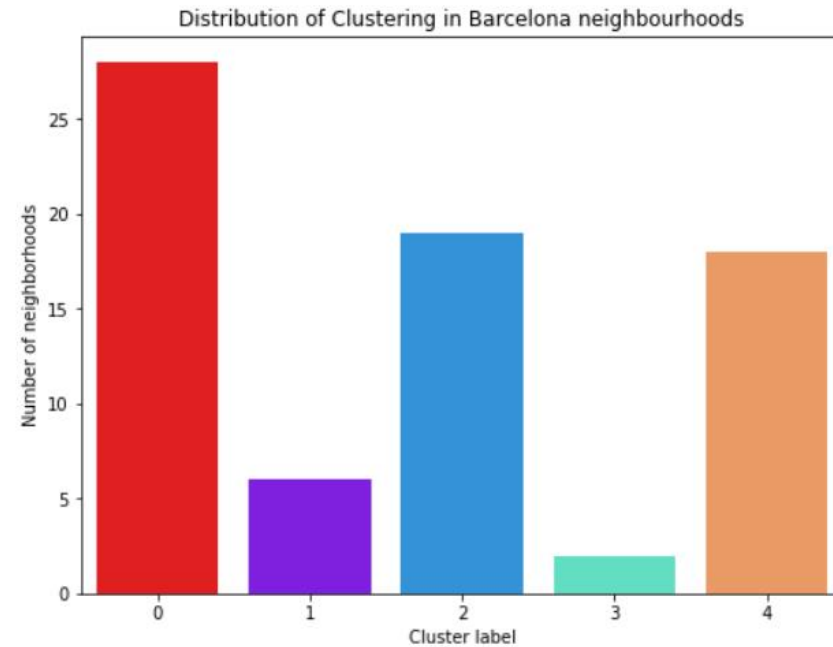
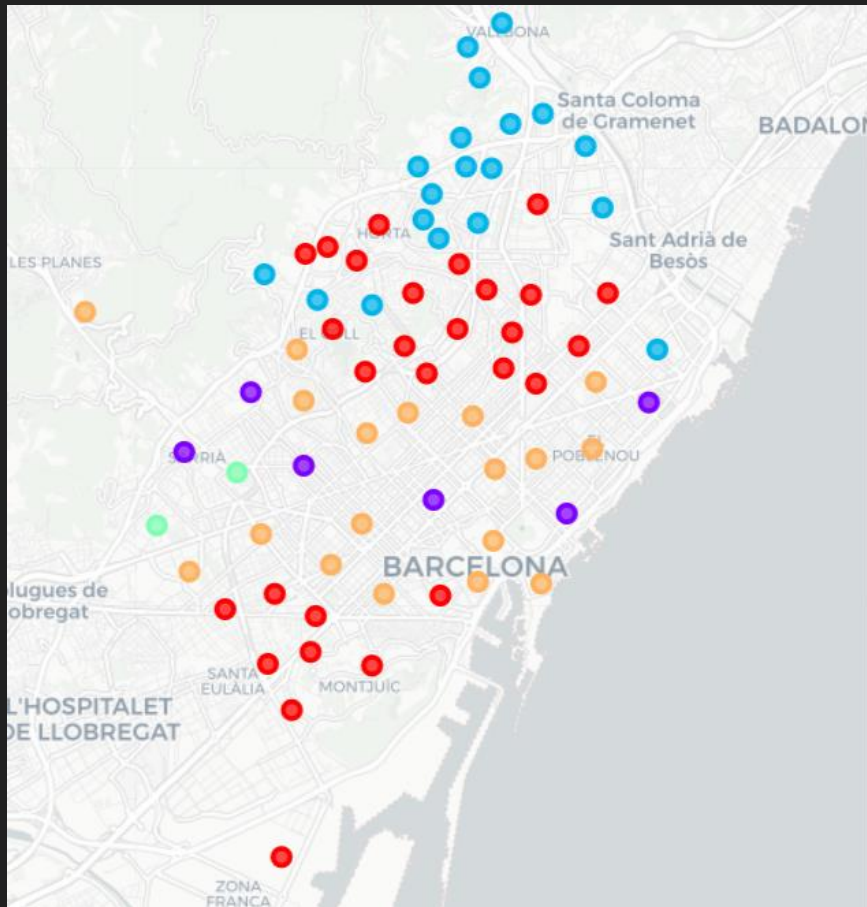
Modeling: *k*-means clustering



○ 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.

