A social-economic comparative between Barcelona and Madrid

Applied Data Science Capstone

IBM Data Science Professional Certificate

Introduction

Largest cities in **Spain**:

- **Madrid**, the administrative capital
- **Barcelona**, the industrial capital

The **Spanish government** is interested on **understanding how different or similar** are they from a socio-economic point of view in order to study if they can **apply the same actions**.

Barcelona, a population of 1.7 millions and 10 districts, located on the Mediterranean cost at the north-east of the Iberian peninsula.

Madrid, a population of 3.3 millions and 21 districts, located on the center of the Iberian peninsula.
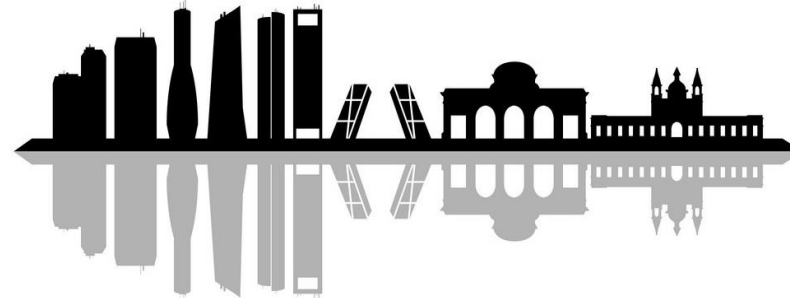
Data

We need information about the **geographical income distributions**:
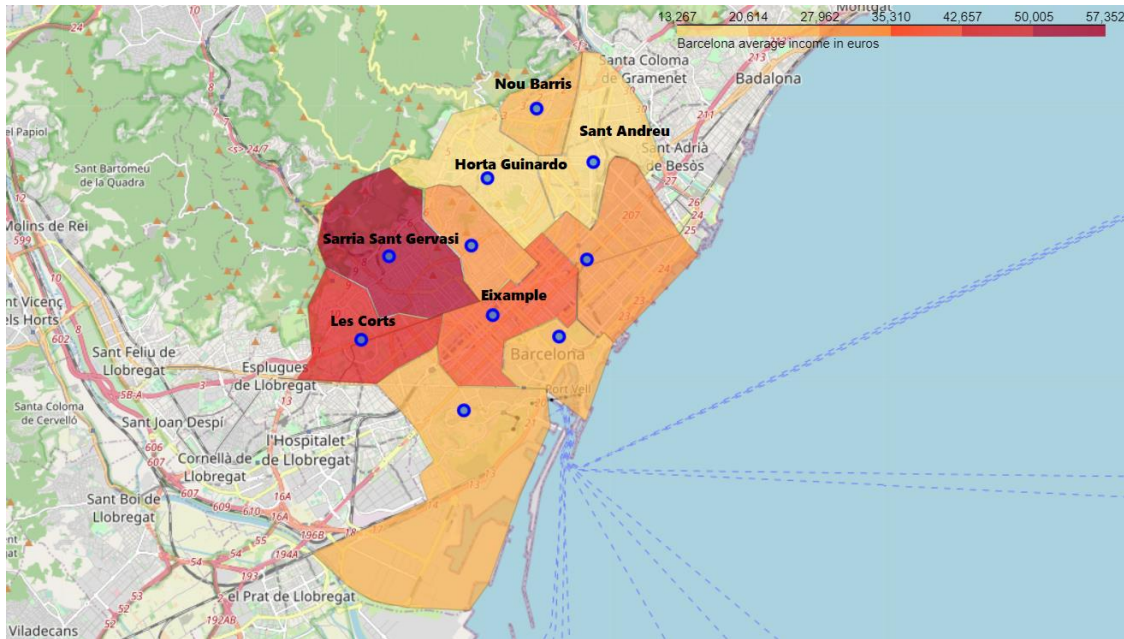
Income by postal code: https://www.epdata.es/
Districts by postal code: http://es.postcode.info/
Coordinates by postal codes: geocoder package

We need information about the services for each district, for this we will get the information using **FourSquare** API:

Venues by coordinates: https://foursquare.com/

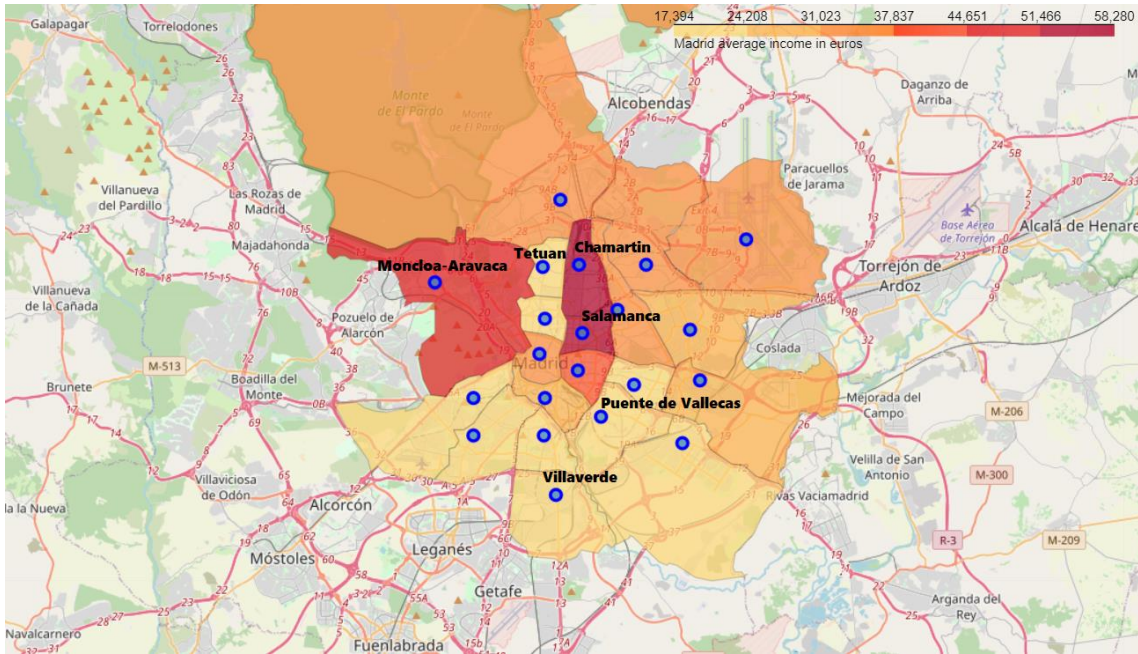# Net mean income (I) - Barcelona

Wealthy:
- Sarria-San Gervasi (North-West)
- Les Corts (West)
- Eixample (Center)

Poorest:
- Sant Andreu (North-East)
- Horta Guinardo (North-East)
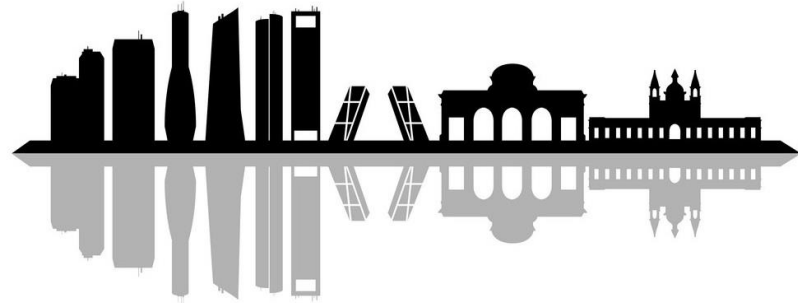- Nou Barris (North-East)
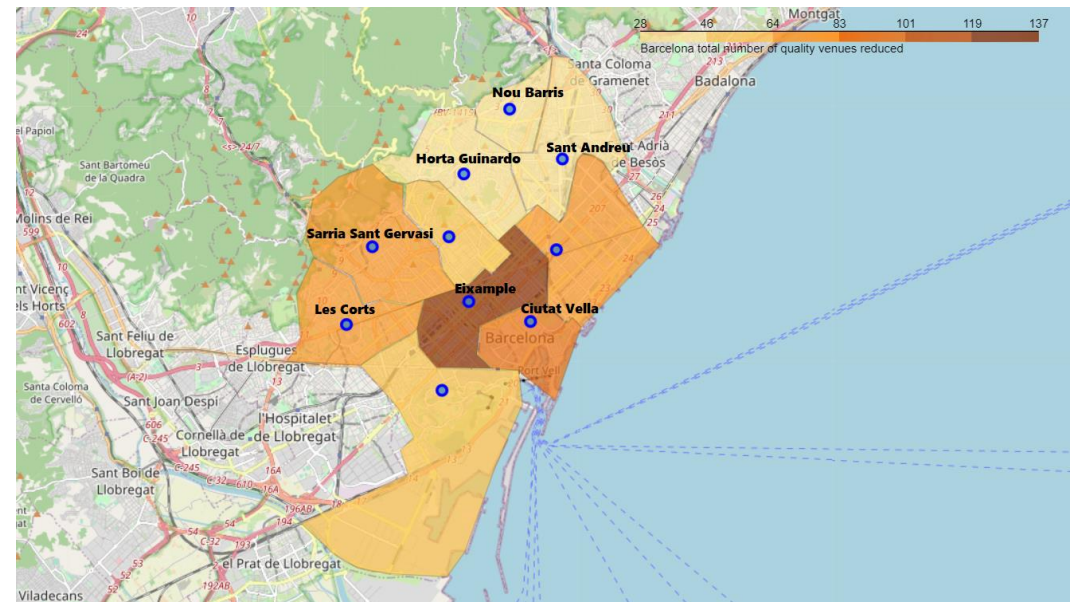
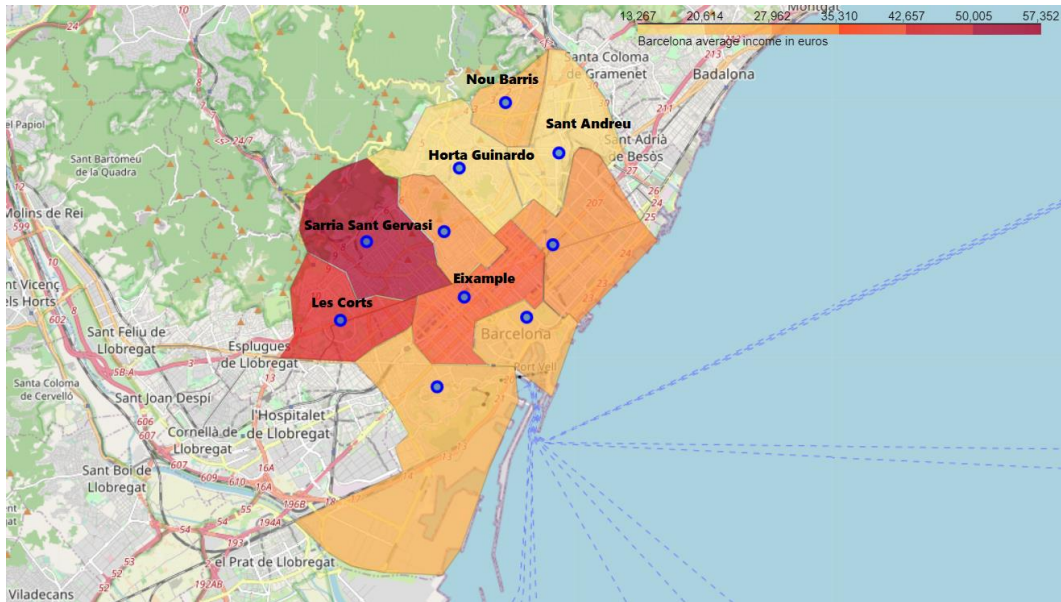# Net mean income (II) - Madrid

Wealthy:
- Salamanca (Center-East)
- Chamartin (Center-East)
- Moncloa-Aravaca (Center-West)

Poorest:
- Tetuan (Center-North)
- Villaverde (South)
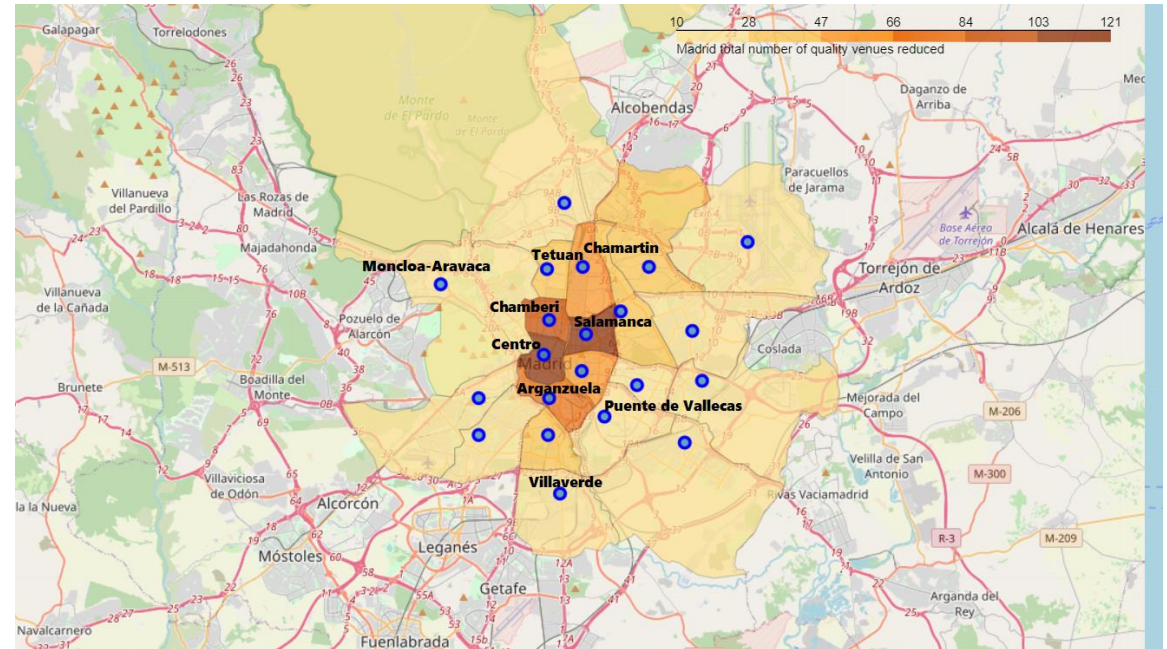- Puente de Vallecas (South)
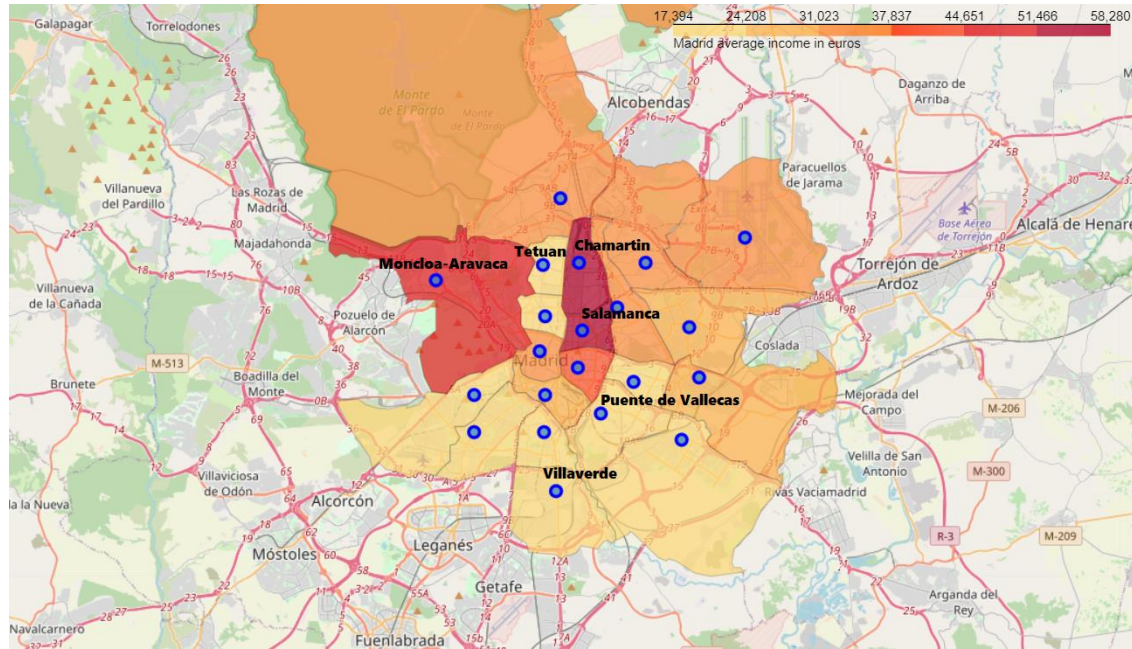
Venues distributions (I)

(most relevant venues distribution)

Good correlation between income and relevant venues

Venues distributions (II)

(most relevant venues distribution)

Wealthy district close to the center and poorest at the south are enough correlated – not so clear.
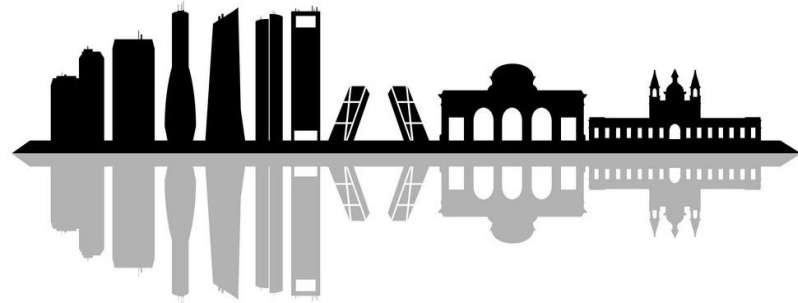
Barcelona - Clustering

Poorest districts clustered together (red)
Wealthy districts clustered together (green)

Madrid - Clustering

The poorest districts are located on three different clusters

Barcelona and Madrid - Clustering

Top ten venues (I)
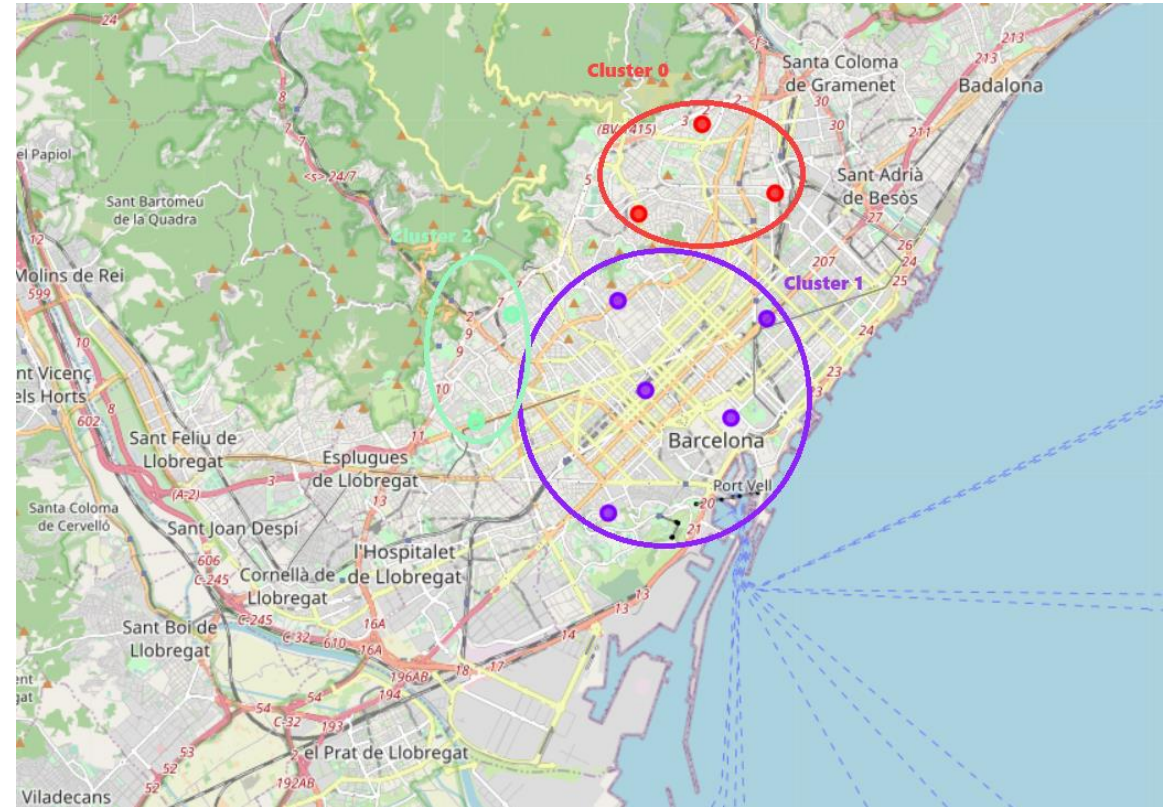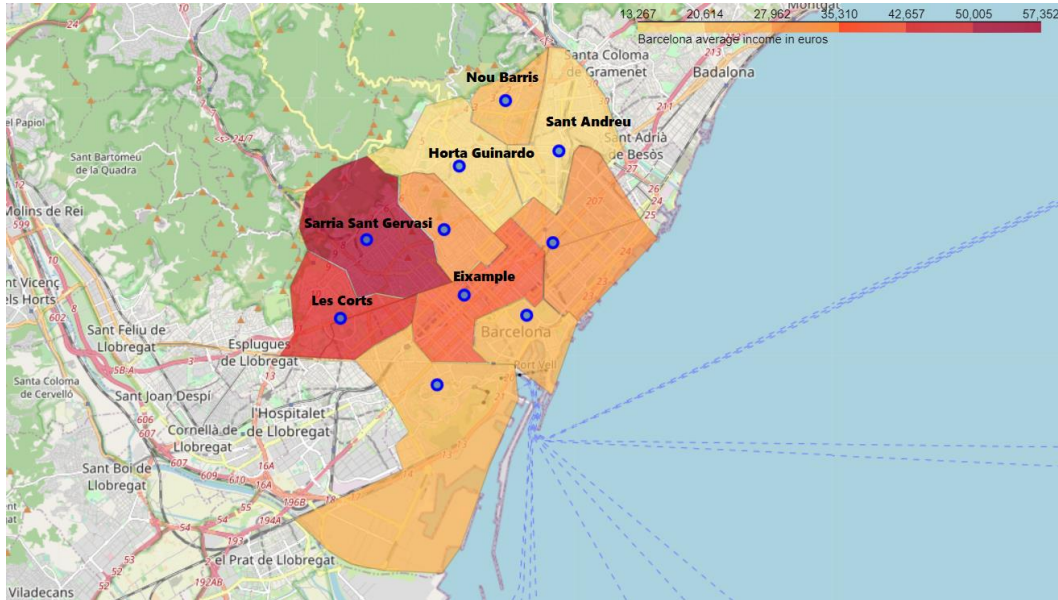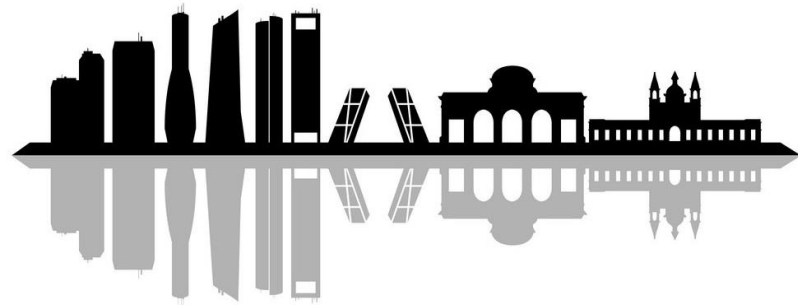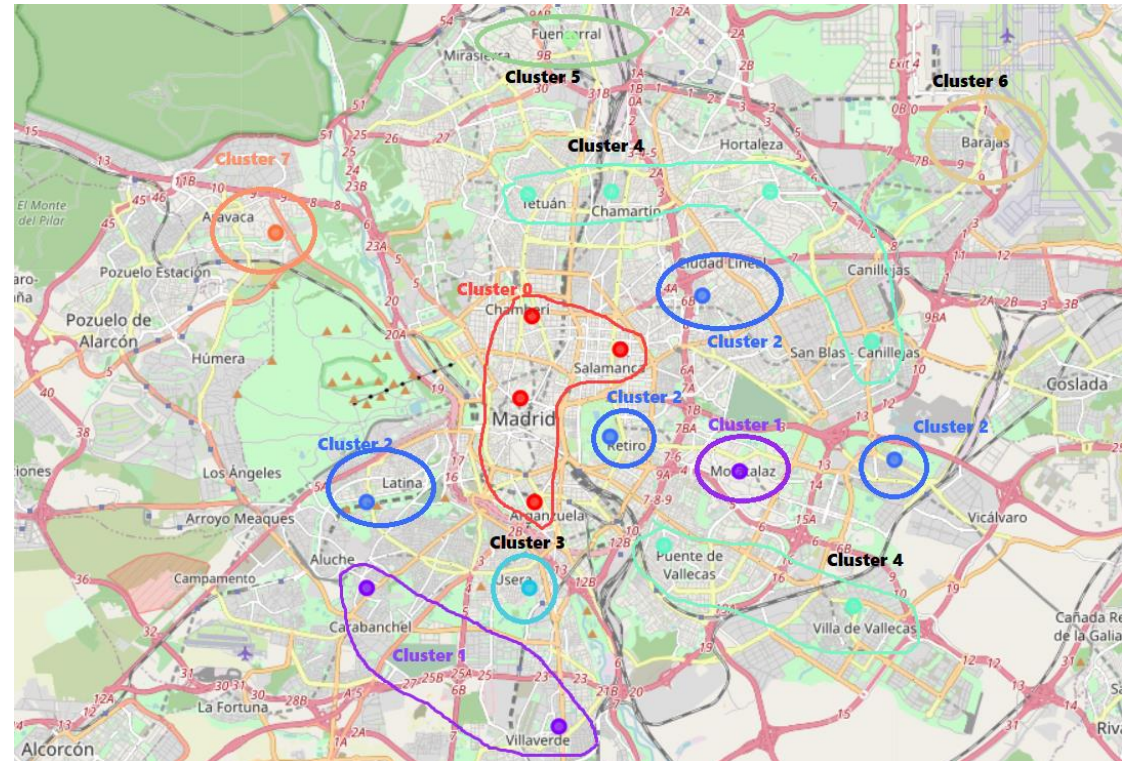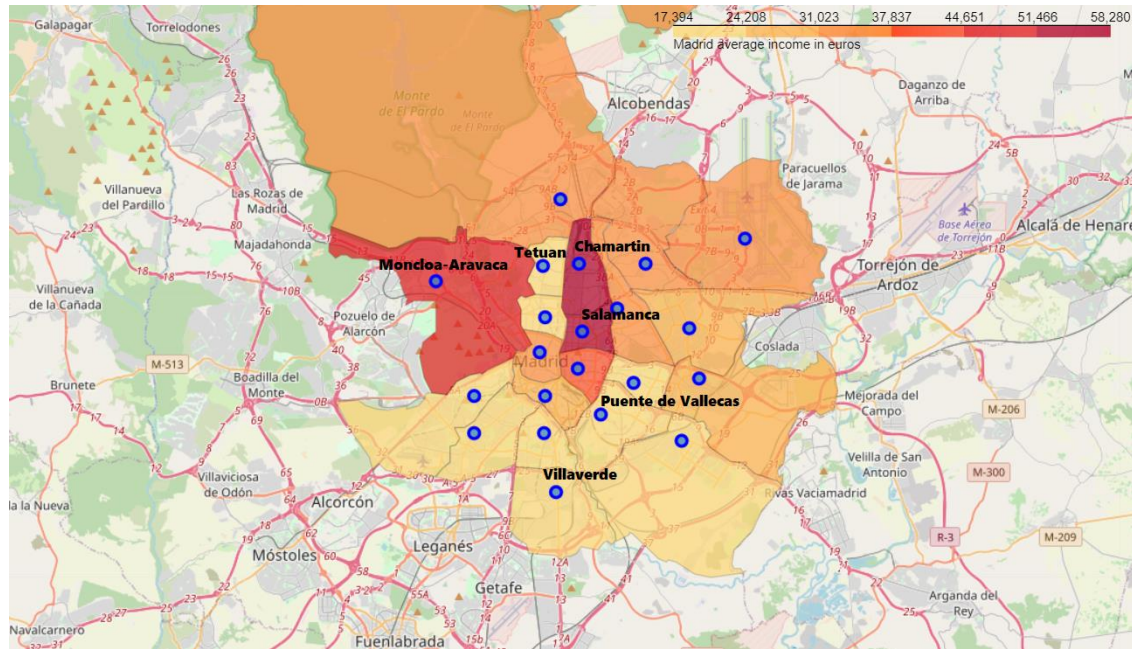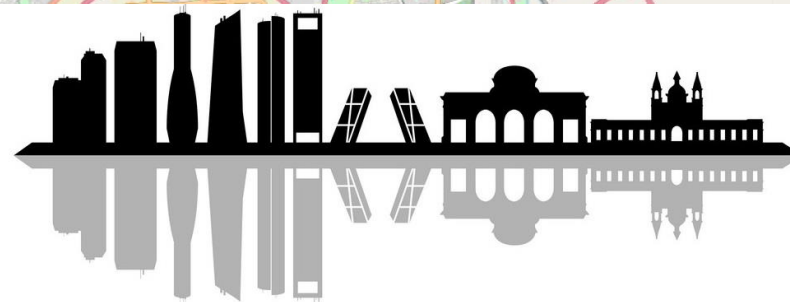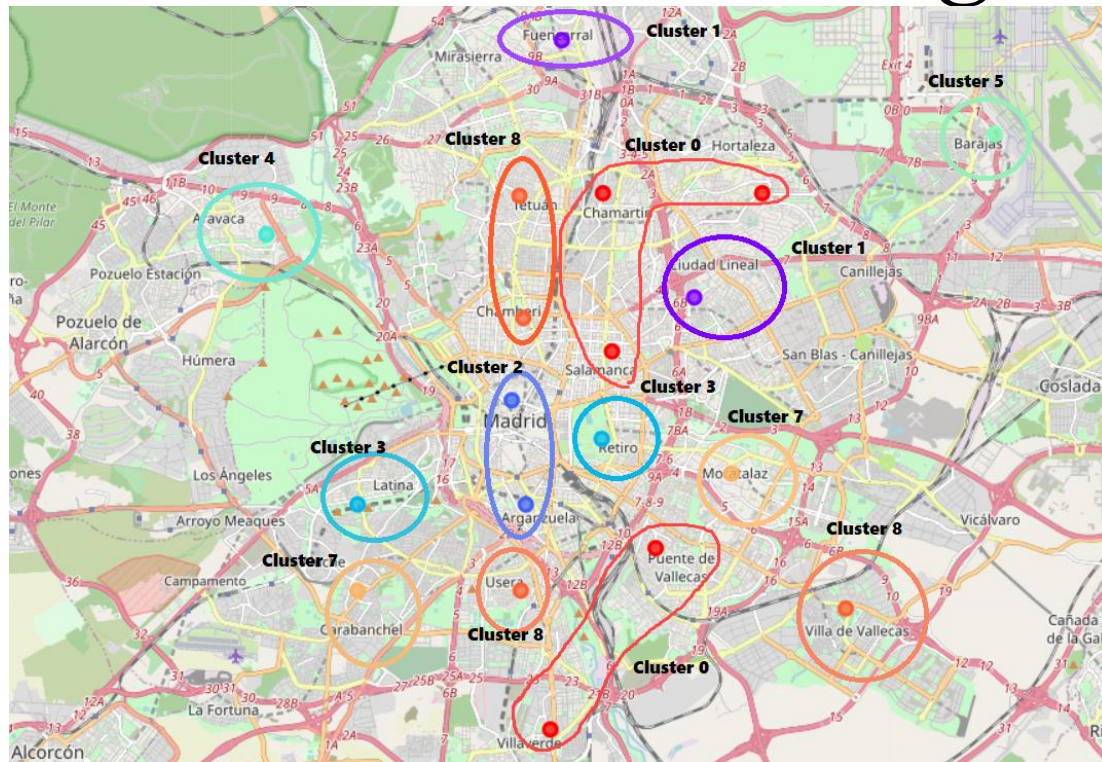
Neighbourhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
Eixample	Medical Center	Event Space	Art Gallery	Gym / Fitness Center	Gym	Park	Language School	Hospital	Yoga Studio	Theater
Sarria Sant Gervasi	Medical Center	Doctor's Office	Event Space	Park	Dentist's Office	Cultural Center	Music School	Gym / Fitness Center	Hospital	Language School

Neighbourhood	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
Horta Guinardo	Park	Cultural Center	Language School	Event Space	Medical Center	Dentist's Office	Music School	Gym / Fitness Center	Athletics & Sports	Doctor's Office
Nou Barris	Event Space	Park	Medical Center	Gym	Cultural Center	Language School	Gym / Fitness Center	Gym Pool	Escape Room	Doctor's Office
Sant Andreu	Park	Event Space	Medical Center	Language School	Cultural Center	Gym	Soccer Field	Dentist's Office	Music School	Veterinarian

Lack of health care services on the poorest districts

Top ten venues (II)

Neighbourhood	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
Chamartin	Medical Center	Event Space	Doctor's Office	Park	Hospital	Gym / Fitness Center	Gym	Language School	Dentist's Office	Cultural Center
Salamanca	Medical Center	Gym / Fitness Center	Doctor's Office	Event Space	Gym	Hospital	Language School	Music School	Cultural Center	Dentist's Office

Neighbourhood	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
Puente de Vallecas	Medical Center	Gym	Event Space	Park	Athletics & Sports	Dentist's Office	Language School	Rock Club	Doctor's Office	Concert Hall
Tetuan	Gym	Medical Center	Dentist's Office	Gym / Fitness Center	Doctor's Office	Dance Studio	Park	Event Space	Veterinarian	Gymnastics Gym
Villaverde	Medical Center	Park	Dance Studio	Art Gallery	Event Space	Doctor's Office	Dentist's Office	Veterinarian	Basketball Court	Athletics & Sports
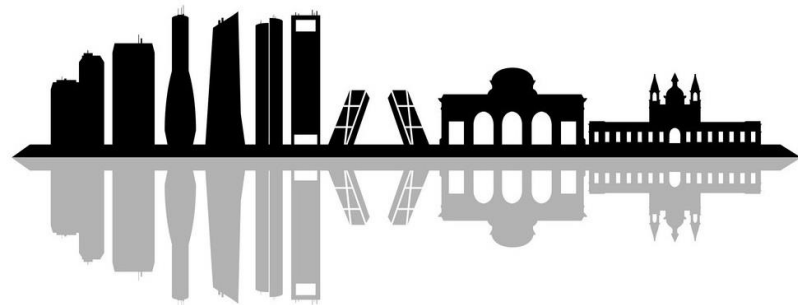
Lack of cultural and educational services on poorest districts

Conclusions

- **Madrid and Barcelona districts** are quite **different** especially the poorest ones.
- **Only the city centers of both cities seem to share a strong similarity**.
- **A common strategy cannot be defined between the two cities**.
- The **poorest districts of Barcelona can be grouped together**.
- **Common actions for the poorest districts of Barcelona** can be taken.
- Madrid's poorest districts seem to **lack similar kind of venues**.
- A solution for **Barcelona** poorest districts' can be to **increase the health care services.**
- A solution for **Madrid** could be to **increase cultural and educational venues.**