Capstone Project

The battle of neighborhoods

Final project of **IBM Data Science Certificat Professionnel**

Pierre Beylard 13/05/2020

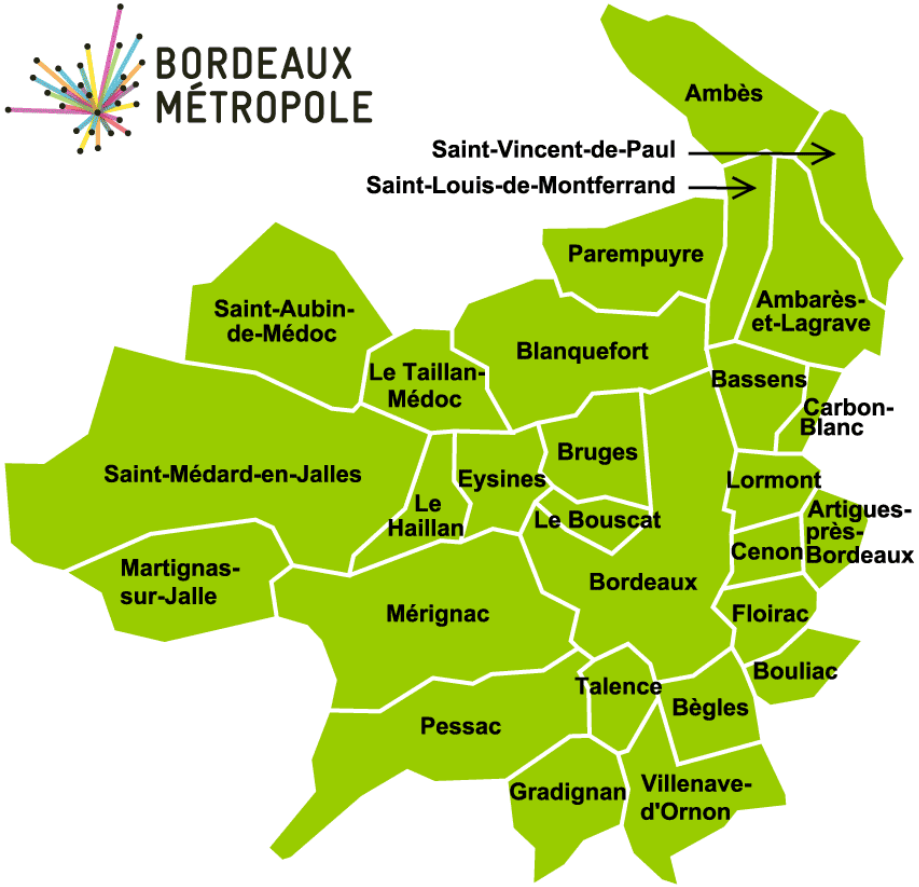
Introduction /Business Problem

Bordeaux Metropole **key figures** :

28 towns, many neighborhoods

+ 1,5% demographic growth per year

+ 2 000 jobs created per year



Introduction /Business Problem

Our objectives :

Help newcomers find the best place to move in based on their way of life

Understand real estates market structure

Clustering Bordeaux neighborhoods based on some preselected features to provide a decision tool for both newcomers & new companies

Data used to resolve our problem

2 dataset : providing information's on Bordeaux Metropole structure :

Town	Neighborhood	Latitude	Longitude	Polygon geometry	INSEE Code	Postal Code
Name of the town	Name of the neighborhood	Coordinates of neighborhood			Code of the town	Postal Code of the town

3 API :

1. Missing towns coordinates & postal code
2. Real estates data of the Metropol based on coordinates
3. Venues of the Metropol based on coordinates

OpenDataSoft

Micro-API DVF

FOURSQUARE

Data understanding and preparation

Geographical data

Bordeaux Neighborhoods

- Geosjson data of neighborhoods
- **Lack of 24 towns on 28**

Web scrapping

- Obtaining INSEE code of all Bordeaux metropole towns

Bordeaux towns

- Geojson data of county towns –no information on towns name
- Filter on Metropole towns thanks to INSEE code

API

- Obtaining missing towns name and coordinates

	INSEE	Latitude	Longitude	Geometry	postal_code	town	Neighborhood	ID
0	33318	44.766930	-0.733237	{'type': 'Polygon', 'coordinates': [[[-0.72364...	33600	PESSAC	TOCTOUCAU	0 TOCTOUCAU
1	33318	44.802887	-0.669208	{'type': 'Polygon', 'coordinates': [[[-0.67910...	33600	PESSAC	3M-BOURGAILH	1 3M-BOURGAILH

Data understanding and preparation

Real estate information

Dataset of the last 5 years

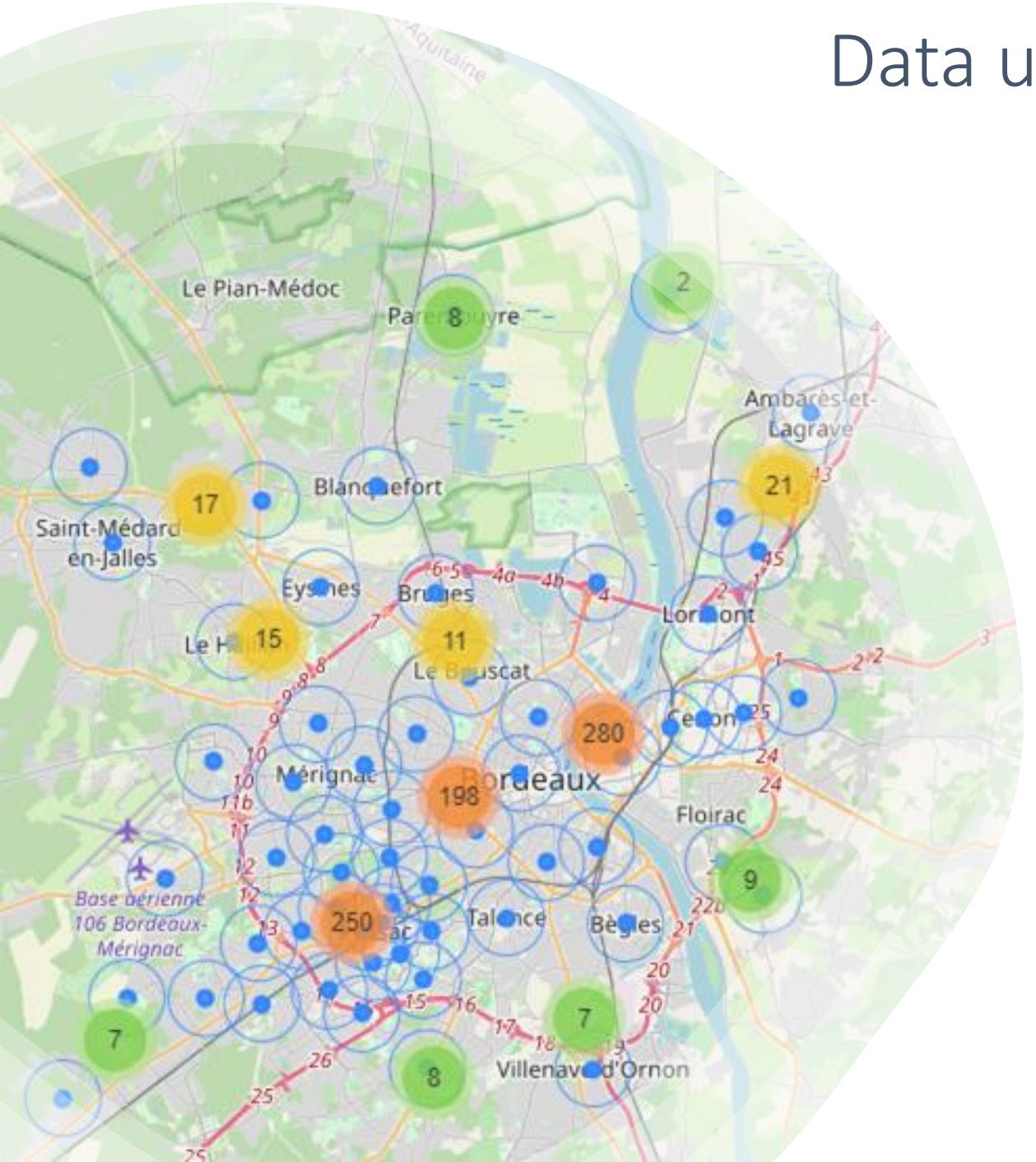
https://api.cquest.org/dvf?lat={(**latitude**)}&lon={ **longitude**}&dist={**RADIUS**}

Main data information returned in json format :

The value do not take into **account real estates agencies fees & Notary fees**

Average price per square meter added

- Value of the property: `['valeur_fonciere']`
- kind of property : `['type_local']`
- Area of the property : `['surface_relle_bati']`
- Number of rooms : `['nombre_pieces_principales']`
- latitute : `['lat']`
- longitude: `['lon']`
- surface of parcel: `['surface_terrain']`



Data understanding and preparation

Foursquare venues

More than **4000 results** from the Foursquare API

79% of the returned venues were duplicates

Returned venues mainly from city center

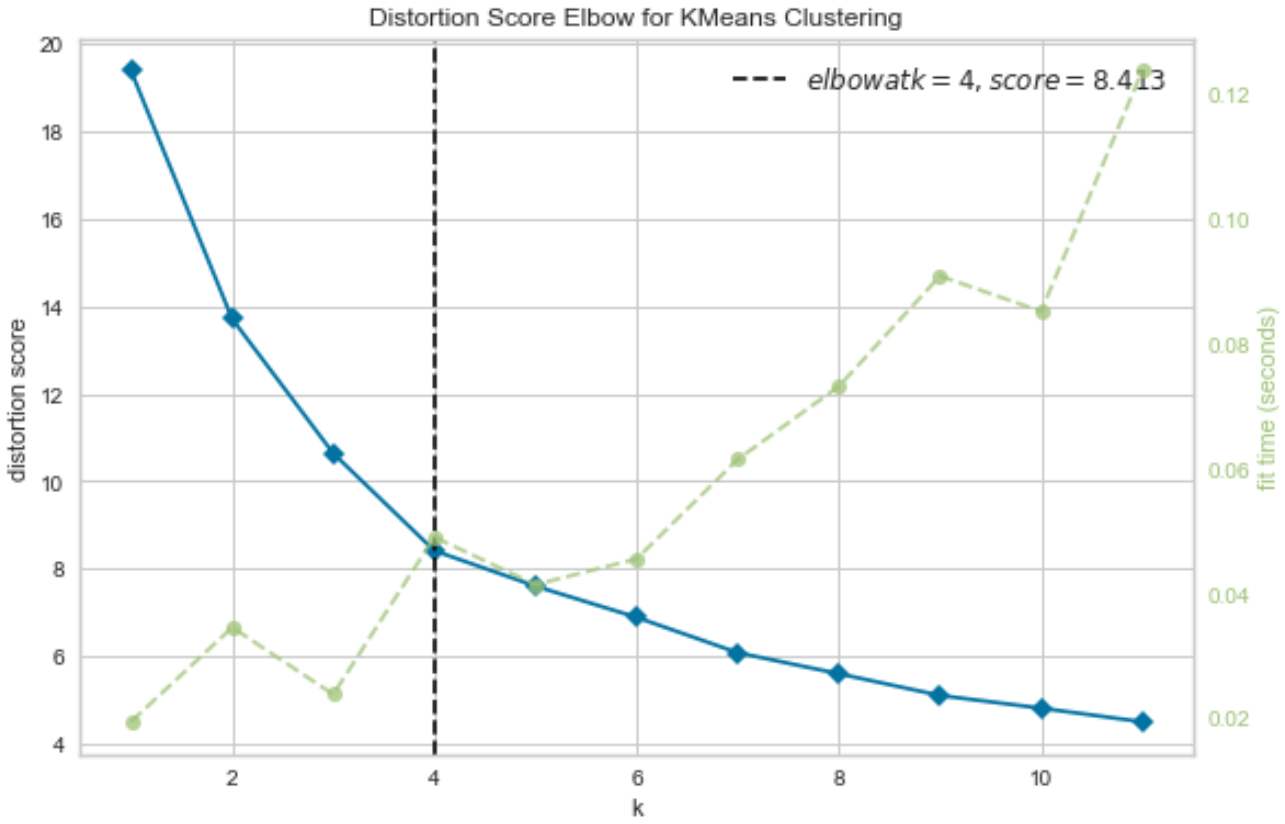
Suburban area lack of data **2 to 5 results** for more than **15 towns**

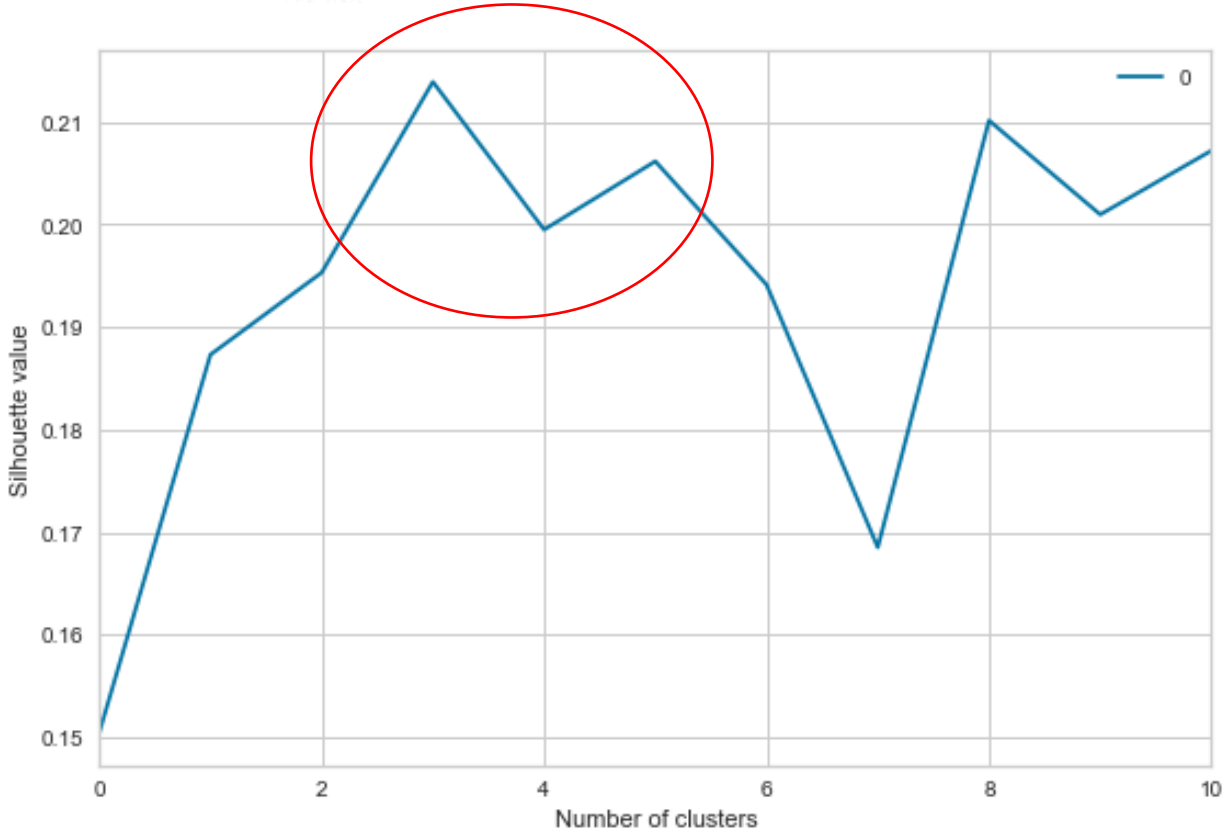
172 unique category venues transformed into **7 parent categories** to improve cluster efficiency

Food	275
Shop & Service	216
Travel & Transport	141
Outdoors & Recreation	99
Arts & Entertainment	65
Nightlife Spot	36
Professional & Other Places	11

Modeling

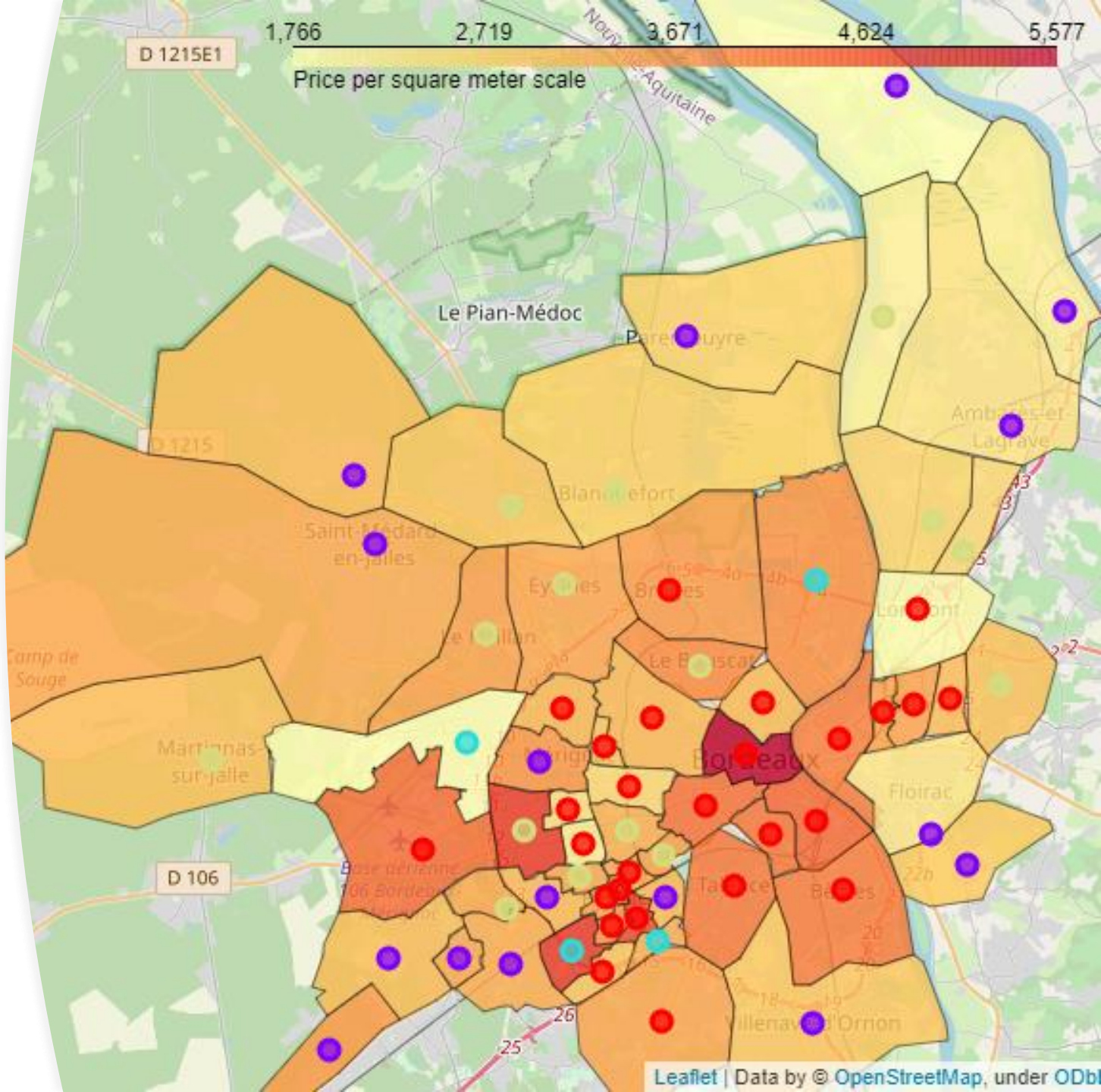
Determining the best number of clusters





Results and discussion

- **Family friendly**: For the people who wants a house and some shops arounds
- **Dynamic cities centers**: Best suits for people who like to live in apartments close to all commodities
- **Dynamic suburbs**: Suburban towns quite active with shops and activities
- **Business centers**: These neighborhoods are business centers, not the best place to live in but perfect to install professional premises



Conclusion

Good first insight of Bordeaux Metropole

Some limitations due to :

- No comprehensive source for neighbourhoods delimitations
- Low number of foursquare venues in suburban area
- Real estate market based on transactions and do not take into account in place business

To go further :

- Add population density
- Obtain new venues information

Sources

- API :
  - https://public.opendatasoft.com ➔ towns coordinates
  - https://api.foursquare.com ➔ Foursquare
  - http://api.cquest.org/dvf ➔ real estates data

- Datasets :
  - https://github.com/gregoiredavid/france-geojson/tree/master/departements/33-gironde ➔ towns of Bordeaux Metropole
  - https://www.data.gouv.fr/fr/datasets/quartiers-des-communes-sur-le-territoire-de-bordeaux-metropole/ ➔ Neighborhoods
- Web page :
  - https://www.insee.fr/fr/metadonnees/cog/intercommunalite-metropole/EPCI243300316-bordeaux-metropole ➔ INSEE Codes of Bordeaux Metropole towns