

Settle down in Lyon, France

Segmentize districts using Python

The problem



I will move myself into Lyon, in order to pursue an MBA. The program will be on a campus located at Ecully district, which is placed outside of Lyon center.

So, in order to be around campus and have a full French experience, I need to segmentize districts based on their distance to campus and their trending places around.

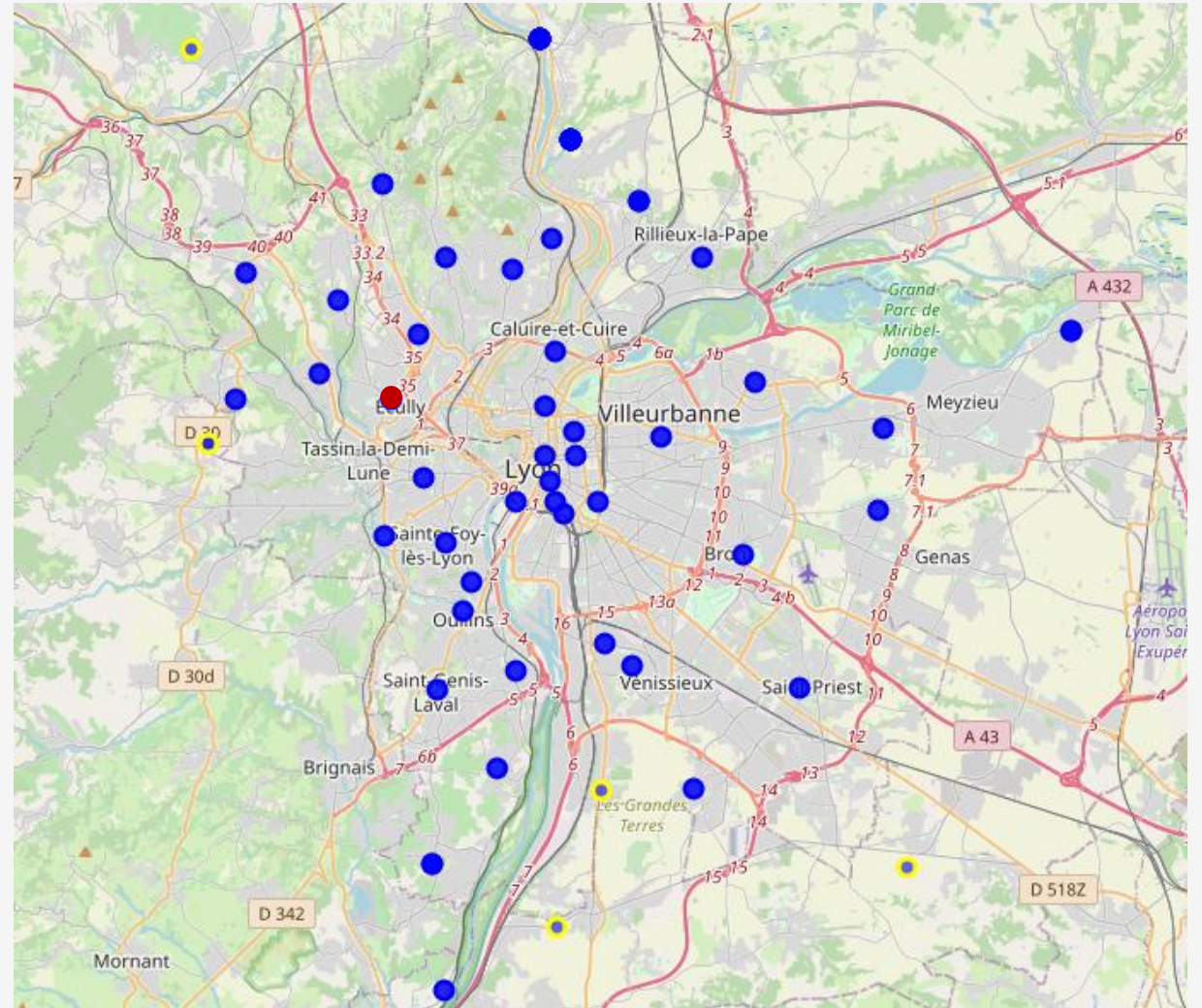


First overlook

Lyon has 66 districts

Ecully is located at the west of the center of the city, which it is supposed to have greater number of trending places.

The mission is to segregate these districts using kmeans in order to get a short list of district to look at to rent a place, that makes compatible studying and enjoying in Lyon



Methodology

- 1 Get the data from *Wikipedia* and then deploy it before using.
- 2 Use *pgeocode* to get the **coordinates** and **distance** to campus district for each district
- 3 Use *foursquare* query to rank each district with the **number of venues**.
- 4 Use *kmeans* to segmentize the district using **distance** and **number of venues**.
- 5 Map the results to analyze and conclude.



Data acquisition and cleaning



https://en.wikipedia.org/wiki/Communes_of_the_Lyon_Metropolis

Communes of the Lyon Metropolis

From Wikipedia, the free encyclopedia

The following is a list of the 58 communes of the Lyon Metropolis, France.

INSEE code	Postal code	Commune
69003	69250	Albigny-sur-Saône
69029	69500	Bron
69033	69270	Cailloux-sur-Fontaines
69034	69300	Caluire-et-Cuire
69040	69410	Champagne-au-Mont-d'Or
69044	69260	Charbonnières-les-Bains
69046	69390	Charly
69271	69680	Chassieu
69072	69570	Dardilly
69275	69150	Décines-Charpieu
69081	69130	Écully
69276	69320	Feyzin
69085	69250	Fleurieu-sur-Saône
69087	69270	Fontaines-Saint-Martin
69088	69270	Fontaines-sur-Saône
69089	69340	Francheville
69278	69730	Genay
69091	69700	Givors
69096	69520	Grigny
69100	69540	Igny
69279	69330	Jonaing
69116	69760	Limonest
69117	69380	Lissieu

INSEE code	Postal code	Commune
69123	69001	Lyon
	69002	
	69003	
	69004	
	69005	
	69006	
	69007	
	69008	
	69009	
69097	69000	Mermoz
69149	69500	Oullins
69152	69310	Pierre-Bénite
69153	69250	Poyrymieux-au-Mont-d'Or
69163	69650	Quincieux
69286	69140	Rillieux-la-Païe
69168	69270	Rochetaillée-sur-Saône
69191	69450	Saint-Cyr-au-Mont-d'Or
69194	69370	Saint-Denis-au-Mont-d'Or
69202	69110	Saint-Foy-lès-Lyon
69199	69190	Saint-Fons
69204	69230	Saint-Genis-Laval
69205	69290	Saint-Genis-les-Ollières
69207	69650	Saint-Germain-au-Mont-d'Or
69290	69800	Saint-Priest
69233	69270	Saint-Romain-au-Mont-d'Or
69292	69580	Sathonay-Camp
69293	69580	Sathonay-Village
69296	69360	Solaise
69244	69160	Tassin-la-Demi-Lune
69250	69890	La Tour-de-Salvagny
69256	69120	Vaulx-en-Velin
69259	69200	Ventec
69260	69390	Vernaison
69266	69100	Villeurbanne

Data deployment



In [87]: `df.head(10)`

Out[87]:

	Postal code	Commune
0	69250	Albigny-sur-Saône
1	69500	Bron
2	69270	Cailloux-sur-Fontaines
3	69300	Caluire-et-Cuire
4	69410	Champagne-au-Mont-d'Or
5	69260	Charbonnières-les-Bains
6	69390	Charly
7	69680	Chassieu
8	69660	Collonges-au-Mont-d'Or
9	69960	Corbas

Getting coordinates and distance using geocode

Old DataFrame

```
In [87]: df.head(10)
```

```
Out[87]:
```

	Postal code	Commune
0	69250	Albigny-sur-Saône
1	69500	Bron
2	69270	Cailloux-sur-Fontaines
3	69300	Caluire-et-Cuire
4	69410	Champagne-au-Mont-d'Or
5	69260	Charbonnières-les-Bains
6	69390	Charly
7	69680	Chassieu
8	69660	Collonges-au-Mont-d'Or
9	69960	Corbas

New DataFrame

```
In [92]: df.head(10)
```

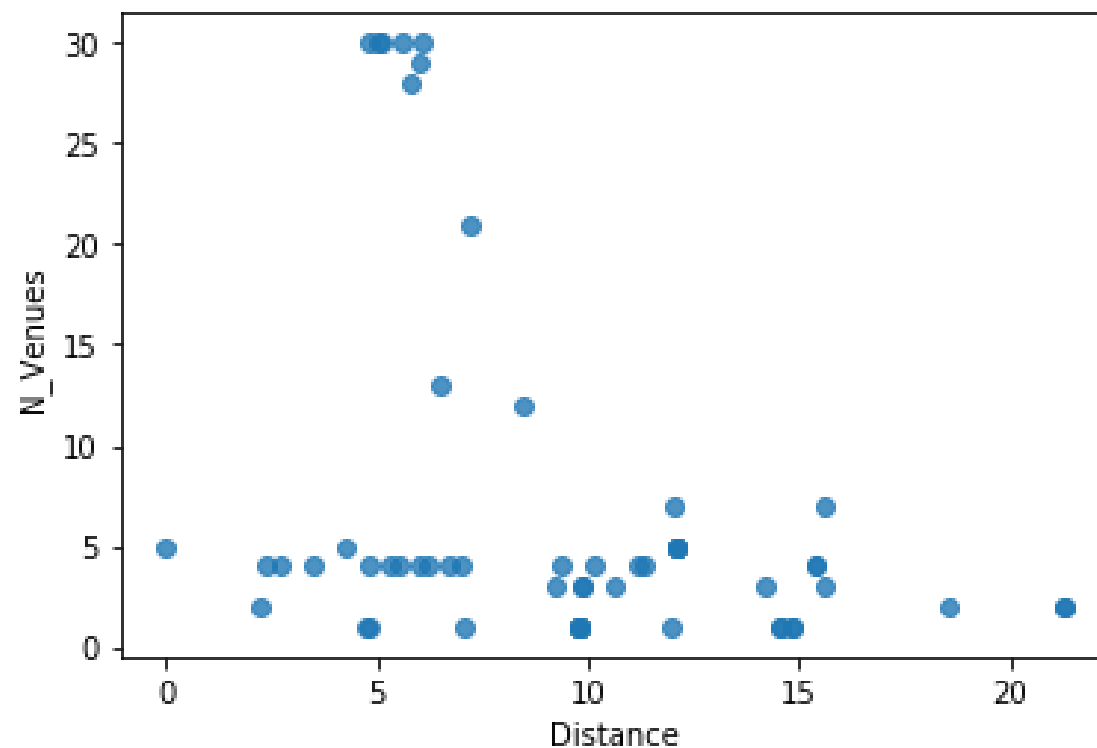
```
Out[92]:
```

	Postal code	Commune	latitude	longitude	Distance
0	69250	Albigny-sur-Saône	45.8782	4.834533	12.136730
1	69500	Bron	45.7333	4.916700	12.047306
2	69270	Cailloux-sur-Fontaines	45.8500	4.846833	9.824269
3	69300	Caluire-et-Cuire	45.7904	4.841100	5.343529
4	69410	Champagne-au-Mont-d'Or	45.7955	4.785700	2.193151
5	69260	Charbonnières-les-Bains	45.7842	4.746300	2.339509
6	69390	Charly	45.6469	4.791625	14.558567
7	69680	Chassieu	45.7458	4.970900	15.610449
8	69660	Collonges-au-Mont-d'Or	45.8220	4.839800	7.077836
9	69960	Corbas	45.6679	4.896300	15.392917

Variable for segmentizing

Use Foursquare to get the number of Venues of each district

	Postal code	Commune	latitude	longitude	Distance	N_Venues
0	69250	Albigny-sur-Saône	45.8782	4.834533	12.136730	5.0
1	69500	Bron	45.7333	4.916700	12.047306	7.0
2	69270	Cailloux-sur-Fontaines	45.8500	4.846833	9.824269	1.0
3	69300	Caluire-et-Cuire	45.7904	4.841100	5.343529	4.0
4	69410	Champagne-au-Mont-d'Or	45.7955	4.785700	2.193151	2.0
5	69260	Charbonnières-les-Bains	45.7842	4.746300	2.339509	4.0
6	69390	Charly	45.6469	4.791625	14.558567	1.0
7	69680	Chassieu	45.7458	4.970900	15.610449	3.0
8	69660	Collonges-au-Mont-d'Or	45.8220	4.839800	7.077836	1.0
9	69960	Corbas	45.6679	4.896300	15.392917	4.0
10	69270	Couzon-au-Mont-d'Or	45.8500	4.846833	9.824269	1.0
11	69290	Craponne	45.7647	4.701675	5.842184	NaN
12	69250	Curis-au-Mont-d'Or	45.8782	4.834533	12.136730	5.0
13	69570	Dardilly	45.8051	4.753400	3.508371	4.0
14	69150	Décines-Charpieu	45.7690	4.972800	15.384323	4.0
15	69130	Écully	45.7773	4.774800	0.000000	5.0
16	69320	Feyzin	45.6673	4.859700	13.894110	NaN
17	69250	Fleurieu-sur-Saône	45.8782	4.834533	12.136730	5.0
18	69270	Fontaines-Saint-Martin	45.8500	4.846833	9.824269	1.0
19	69270	Fontaines-sur-Saône	45.8500	4.846833	9.824269	1.0
20	69340	Francheville	45.7388	4.772200	4.285760	5.0
21	69730	Genay	45.8976	4.837300	14.226074	3.0
22	69700	Givors	45.5519	4.730812	25.295394	NaN
23	69520	Grigny	45.6113	4.795900	18.530990	2.0
24	69540	Irigny	45.6736	4.817500	11.997868	1.0



Exploring at the data, it will be prioritized the districts which have at least 3 venues and a distance lesser than 20 kilometers.