Capstone Project: My restaurant in Granada
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# 1. Introduction: Business Problem

- Granada is a city full of students due to the importance of the University one of the oldest in Spain. I would like to open a new restaurant for young people but the problem is decide which would be the best place.

- Firstly I am going to collect data of different locations in Granada: Postal Codes, Streets, Neighborhoods, etc . I will look for at different websites to obtain data needed.

- Once I have the data I will analyse most common venues for different locations in Granada. At first I will look for University buildings and select those address where there are students.

- After this I will classify the top five locations in two groups with Clustering techniques and I will choose the best address attending to the most common venues and the distance to centre of the city.

# 2. Obtaining the data

- At first I look for Postal codes for Granada on Internet. For doing this I type directly in Google "postal codes Spain Excel" and I found this dataset https://postal.cat/index.es.html.

- I upload data in Python and I doing some changes regarding to the names of columns or formats among other to have the data prepared for Analysis:

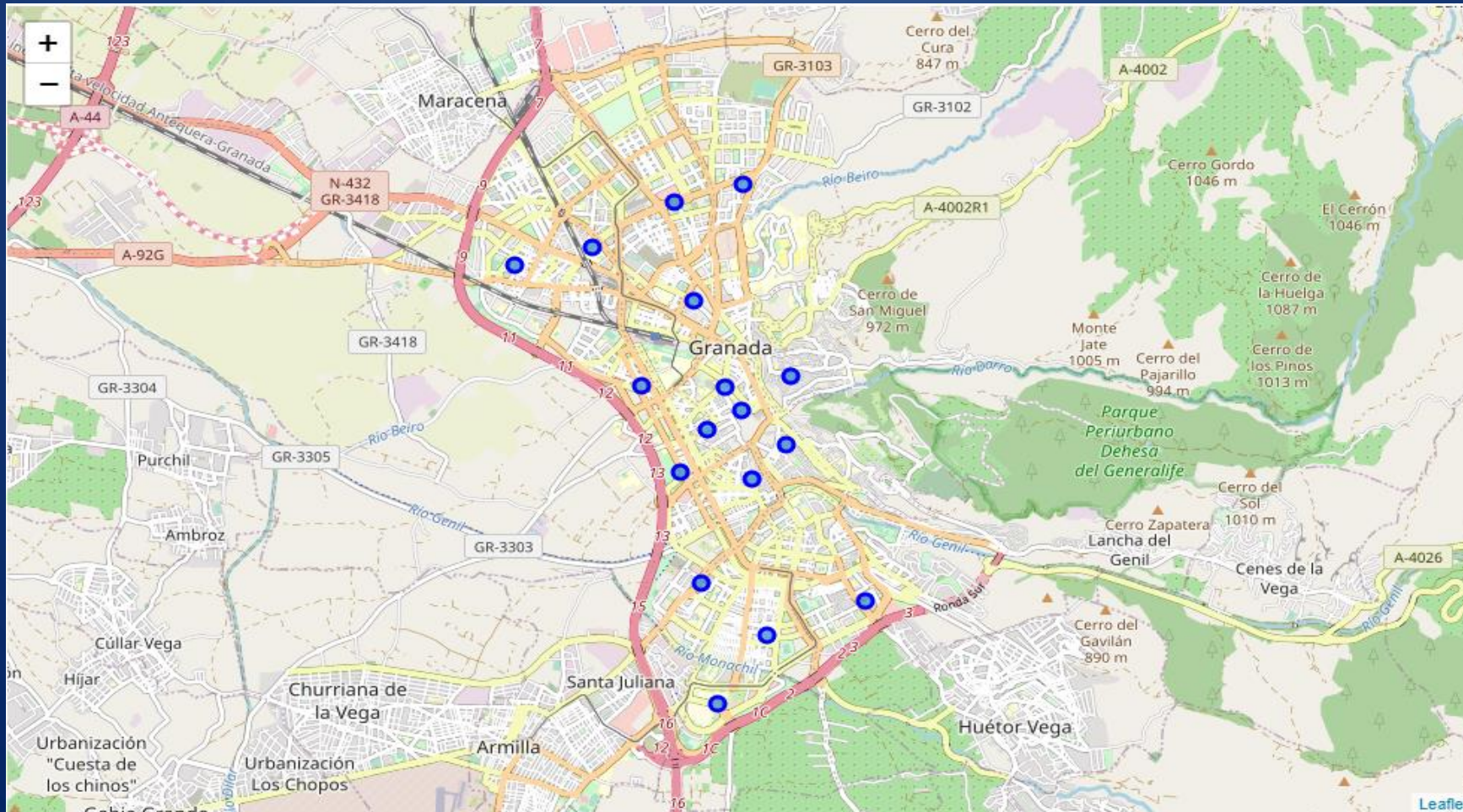| | cp | calle | poblacion | provinciaid | provincia | paisid | pais | direccion |
|---|---|---|---|---|---|---|---|---|
| 1853 | 18011 | Puerto Lumbreras | Granada | 18 | Granada | ES | España | Puerto Lumbreras, 18011, Granada |
| 2361 | 18015 | Virgen De La Fuensanta | Granada | 18 | Granada | ES | España | Virgen De La Fuensanta, 18015, Granada |
| 1344 | 18004 | Maria Moliner | Granada | 18 | Granada | ES | España | Maria Moliner, 18004, Granada |
| 1236 | 18015 | Leon Felipe | Granada | 18 | Granada | ES | España | Leon Felipe, 18015, Granada |
| 2185 | 18009 | Sor Cristina Mesa | Granada | 18 | Granada | ES | España | Sor Cristina Mesa, 18009, Granada |
| 384 | 18006 | Cadiz,avenida (pares Del 2 Al Final) | Granada | 18 | Granada | ES | España | Cadiz,avenida (pares Del 2 Al Final), 18006, G... |
| 1551 | 18010 | Ortegas,plaza | Granada | 18 | Granada | ES | España | Ortegas,plaza, 18010, Granada |
| 361 | 18001 | Boqueron,plaza | Granada | 18 | Granada | ES | España | Boqueron,plaza, 18001, Granada |
| 1732 | 18007 | Pingarron | Granada | 18 | Granada | ES | España | Pingarron, 18007, Granada |
| 2216 | 18013 | Tete Monteliu | Granada | 18 | Granada | ES | España | Tete Monteliu, 18013, Granada |

# 2. Obtaining  the data

- Secondly I create the table with different Addresses in Granada city, grouping grouped data by Postal Code to be more efficient in the analysis.

- Finally I look for different latitudes and longitudes for Granada Addresses. For this I used geolocator library of Python.

|   | cp | provincia | pais | direccion | latitude | longitude |
|---|---|---|---|---|---|---|
| 0 | 18001 | Granada | España | 18001, Granada, España | 37.176761 | -3.600920 |
| 1 | 18002 | Granada | España | 18002, Granada, España | 37.174797 | -3.604873 |
| 2 | 18003 | Granada | España | 18003, Granada, España | 37.179166 | -3.612516 |
| 3 | 18004 | Granada | España | 18004, Granada, España | 37.170560 | -3.607982 |
| 4 | 18005 | Granada | España | 18005, Granada, España | 37.169961 | -3.599788 |

# 2. Obtaining  the data

- To have more feeling on the data and locations for Granada I created a Folium map representig different Postal Codes in the city.
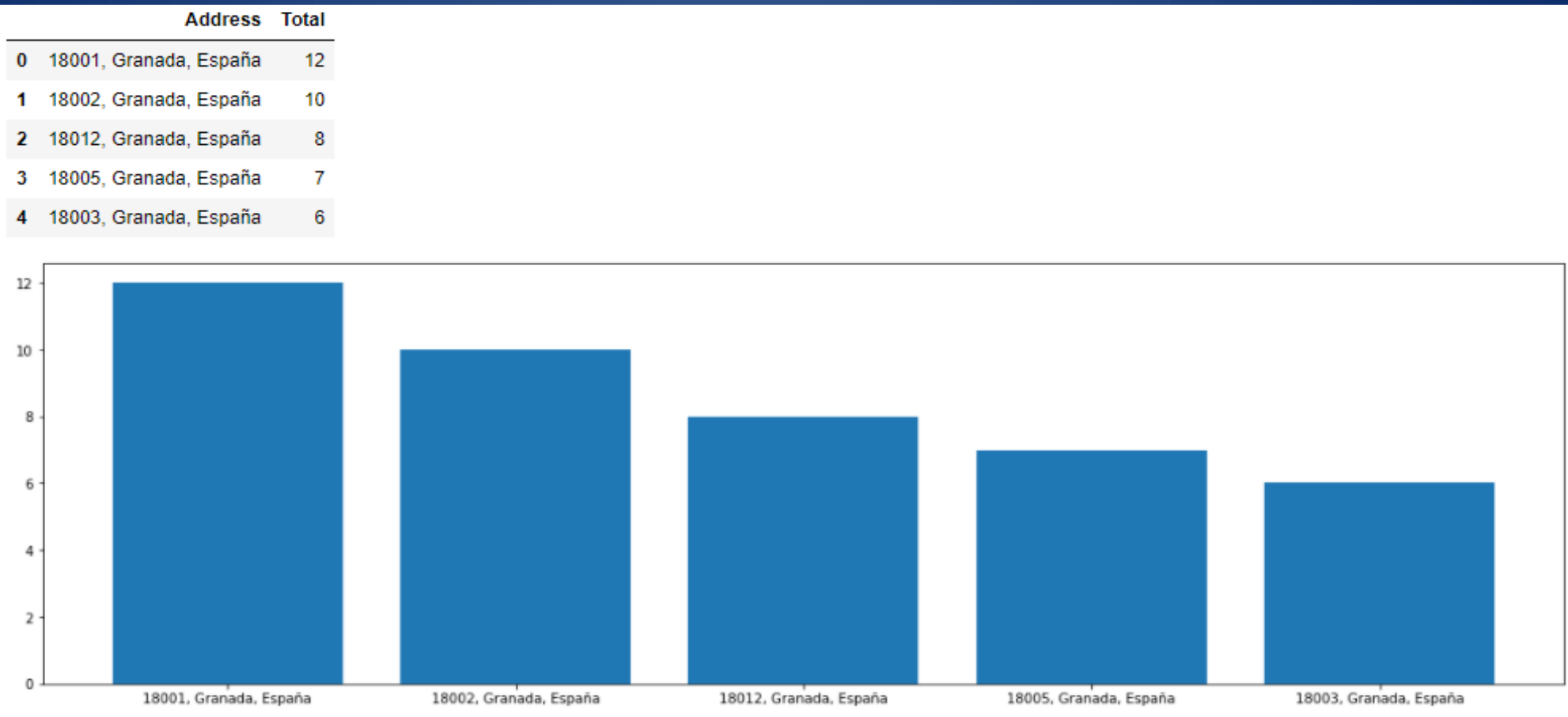
# 3. Analysis – Exploring data for student locations in Granada

- Taking into account that students and young people will be our customer objective I will be focus in locations with student buildings.

- After execute some general searches with Foursquare API I find out that list of student buildings for Granada have to include the next:

```
]: # I look for venues for this type of locations, in order to identify those places with students (customer objective)

locations = ['University','General College & University', 'Elementary School', 'College Academic Building']

LIMIT= 100
```

# 3. Analysis – Exploring data for student locations in Granada

- Granada is a city with a lot of students so for being more effcient in the analysis we will focus on locations with a large number students. I choose the top5 Addresses according with the highest number of buildings in the list.

| | Address | Total |
|---|---|---|
| 0 | 18001, Granada, España | 12 |
| 1 | 18002, Granada, España | 10 |
| 2 | 18012, Granada, España | 8 |
| 3 | 18005, Granada, España | 7 |
| 4 | 18003, Granada, España | 6 |

# 3. Analysis – Exploring most common venues in Granada

- At first I create another dataframe not only with Postal Codes for each Address, but also with all streets in Granada capital. The objective of this is to extract a good quantity of data to analyze.

| | cp | calle | poblacion | provinciaid | provincia | paisid | pais | Address | Address2 | latitude | longitude |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 18012 | Abanilla | Granada | 18 | Granada | ES | España | Abanilla, 18012, Granada | 18012, Granada, España | 37.187640 | -3.606435 |
| 1 | 18005 | Aben Humeya | Granada | 18 | Granada | ES | España | Aben Humeya, 18005, Granada | 18005, Granada, España | 37.169961 | -3.599788 |
| 2 | 18005 | Abu Isac | Granada | 18 | Granada | ES | España | Abu Isac, 18005, Granada | 18005, Granada, España | 37.169961 | -3.599788 |
| 3 | 18005 | Acequia Gorda,callejon | Granada | 18 | Granada | ES | España | Acequia Gorda,callejon, 18005, Granada | 18005, Granada, España | 37.169961 | -3.599788 |
| 4 | 18001 | Acera De Canasteros | Granada | 18 | Granada | ES | España | Acera De Canasteros, 18001, Granada | 18001, Granada, España | 37.176761 | -3.600920 |

# 3. Analysis – Exploring most common venues in Granada

- Once I have identified top5 student addresses in Granada I built a function to extract venues for each street using Forsquare. The number of venues extracted was of a total of **29.432** venues.

- The results obtained show that the most common venues in Granada, grouped by Postal Code, are all type of restaurants and bars.

| | CP | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 18001 | Tapas Restaurant | Spanish Restaurant | Plaza | Hotel | Bar | Café | Tea Room | Moroccan Restaurant | Gift Shop | Concert Hall |
| 1 | 18002 | Tapas Restaurant | Spanish Restaurant | Hotel | Plaza | Bar | Japanese Restaurant | Coffee Shop | Gift Shop | Café | Record Shop |
| 2 | 18003 | Tapas Restaurant | Bar | Pub | Hotel | Spanish Restaurant | Gym | Department Store | Restaurant | Food & Drink Shop | Italian Restaurant |
| 3 | 18005 | Tapas Restaurant | Spanish Restaurant | Hotel | Bistro | Restaurant | Plaza | Coffee Shop | Café | Pub | Italian Restaurant |
| 4 | 18012 | Tapas Restaurant | Bar | Café | Plaza | Restaurant | Pizza Place | Hotel | Italian Restaurant | Breakfast Spot | Spanish Restaurant |

# 3. Analysis – Clustering addresses for taking the decission

- I made a Cluster analysis for trying to group different student locations according to the most common venues. This will help me to choose the best place for my restaurant.

- The most common venue for all locations is Tapas Restaurant which give us an evidence of the importance of these type of business in Granada. The rest of the most common venues are more or less the same.
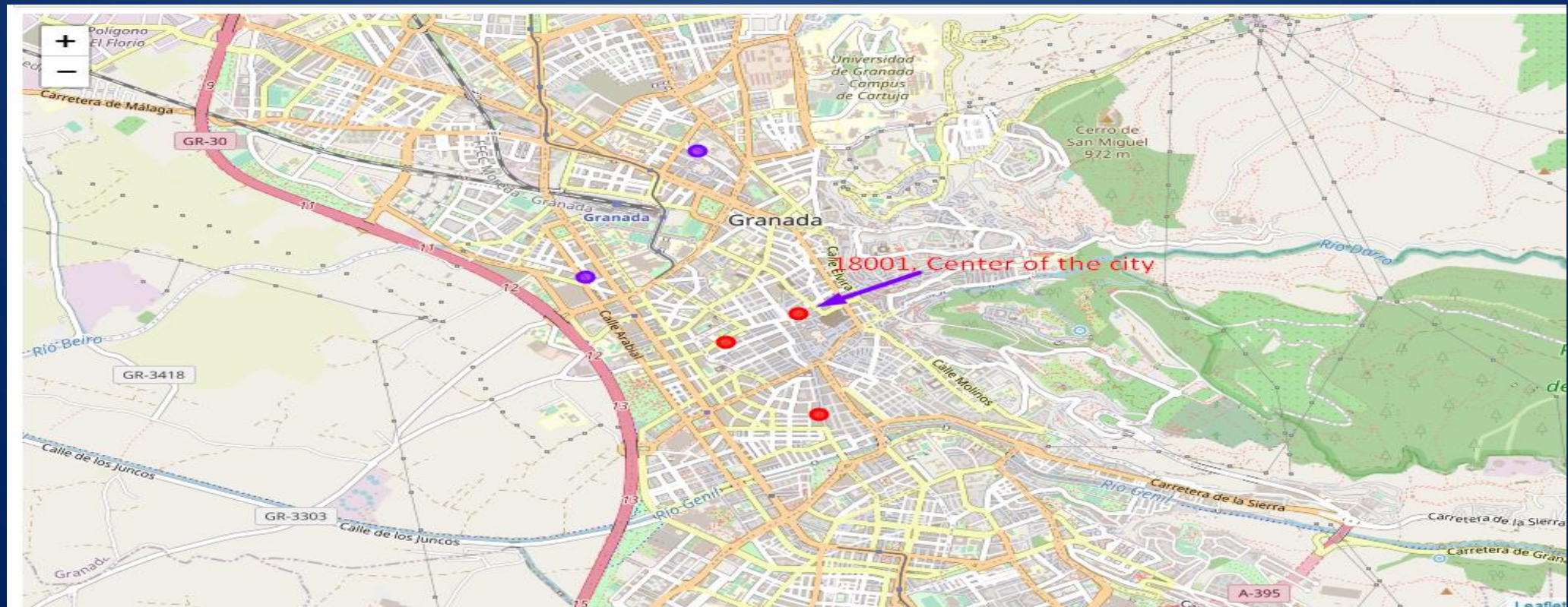
## Cluster 0 >> In the center of the city

| | direccion | 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 | ClusterLabels |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 18001, Granada, España | Tapas Restaurant | Spanish Restaurant | Plaza | Hotel | Bar | Café | Tea Room | Moroccan Restaurant | Gift Shop | Concert Hall | 0 |
| 1 | 18002, Granada, España | Tapas Restaurant | Spanish Restaurant | Hotel | Plaza | Bar | Japanese Restaurant | Coffee Shop | Gift Shop | Café | Record Shop | 0 |
| 3 | 18005, Granada, España | Tapas Restaurant | Spanish Restaurant | Hotel | Bistro | Restaurant | Plaza | Coffee Shop | Café | Pub | Italian Restaurant | 0 |

## Cluster 1 >> Not in the center of the city

| | direccion | 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 | ClusterLabels |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 18003, Granada, España | Tapas Restaurant | Bar | Pub | Hotel | Spanish Restaurant | Gym | Department Store | Restaurant | Food & Drink Shop | Italian Restaurant | 1 |
| 4 | 18012, Granada, España | Tapas Restaurant | Bar | Café | Plaza | Restaurant | Pizza Place | Hotel | Italian Restaurant | Breakfast Spot | Spanish Restaurant | 1 |

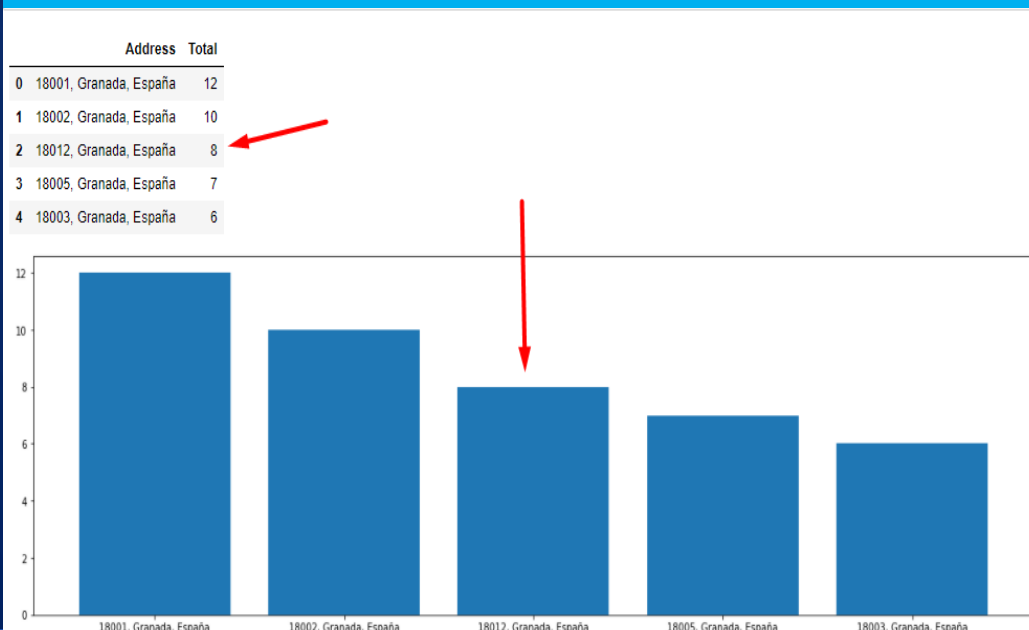# 3. Analysis – Clustering addresses for taking the decission

- The results obtained differentiate these locations in two groups, but continue being difficult to find differences and as consequence choose the best place for opening our restaurant.

- I analyse and the prices to rent a local in Granada are higher in the city center, so I decide that´s with more or less the same level of competitors the best places will be the cheapest.

# 4. Conclusion

- It is really difficult to determine which place could be the best location in Granada for opening a restaurant due to there are a lot of type of similar venues.

- However to conclude with this project and after analysing different features described in this report, I thinl the best place for opening a new restaurant is **"18012, Granada, España".**


Reason 1: 3rd location with more student buildings


Reason 2: Location with the cheapest rental prices