# ANALYSIS OF RESIDENTIAL NEIGHBORHOODS

# IN MADRID, SPAIN

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# Discovering residential neighborhoods is valuable for families

- All cities (especially the biggest ones) have different type of neighborhoods. Some of them are more suitable for tourist, other ones for shopping and some of them for setting a family.

- Families need to know which are the most suitable neighborhoods for living in a new city

- Madrid is the capital city of Spain. It has more than 100 neighborhoods with a total population of 3.334.730. It is pretty difficult for a new family that arrives to the city to know where to start living.

- The objective of this Project is to differentiate which are the residential neighborhoods in this city.

# Data acquisition and cleaning

- Information of every neighborhood in Madrid, such as the name and the Per Income Capita from: https://www.madrid.es/portales/munimadrid/es/Inicio/El-Ayuntamiento/Estadistica/?vgnextfmt=default&vgnextchannel=8156e39873674210VgnVCM1000000b205a0aRCRD.

- Geograpghical coordinates of every neighborhood using the Geopy library.

- Information of public schools in the city from : https://datos.madrid.es/portal/site/egob/

# METHODOLOGY

- **COLLECT THE MADRID CITY DATA IN DATAFRAMES:**

| | Neighborhood | Renta | Latitude | Longitude | Colegios |
|---|---|---|---|---|---|
| 0 | Abrantes | 10544.0 | 40.37980 | -3.72636 | 4 |
| 1 | Acacias | 19323.0 | 40.40137 | -3.70669 | 1 |
| 2 | Adelfas | 18991.0 | 40.40173 | -3.67288 | 1 |
| 3 | Aeropuerto | 9814.0 | 40.48337 | -3.55949 | 0 |
| 4 | Alameda de Osuna | 19871.0 | 40.45818 | -3.58953 | 1 |
| ... | ... | ... | ... | ... | ... |
| 126 | Ventas | 12072.0 | 40.42238 | -3.65020 | 3 |
| 127 | Villaverde Alto, C.H. Villaverde | 9354.0 | 40.34922 | -3.71211 | 0 |
| 128 | Vinateros | 12695.0 | 40.40444 | -3.64029 | 2 |
| 129 | Vista Alegre | 10775.0 | 40.38492 | -3.74635 | 2 |
| 130 | Zofio | 9601.0 | 40.37987 | -3.71495 | 2 |

131 rows × 5 columns

- USING FOURSQUARE API WE WILL FIND ALL VENUES FOR EACH NEIGHBORHOOD.
- CLUSTER THE NEIGHBORHOODS ACCORDING TO ITS VENUES.
- VISUALIZE THE CLUSTER AND COMPARING TO PUBLIC SCHOOLS DISTRIBUTION

# METHODOLOGY

- COLLECT THE MADRID CITY DATA IN DATAFRAMES:
- **USING FOURSQUARE API WE WILL FIND ALL VENUES FOR EACH NEIGHBORHOOD:**

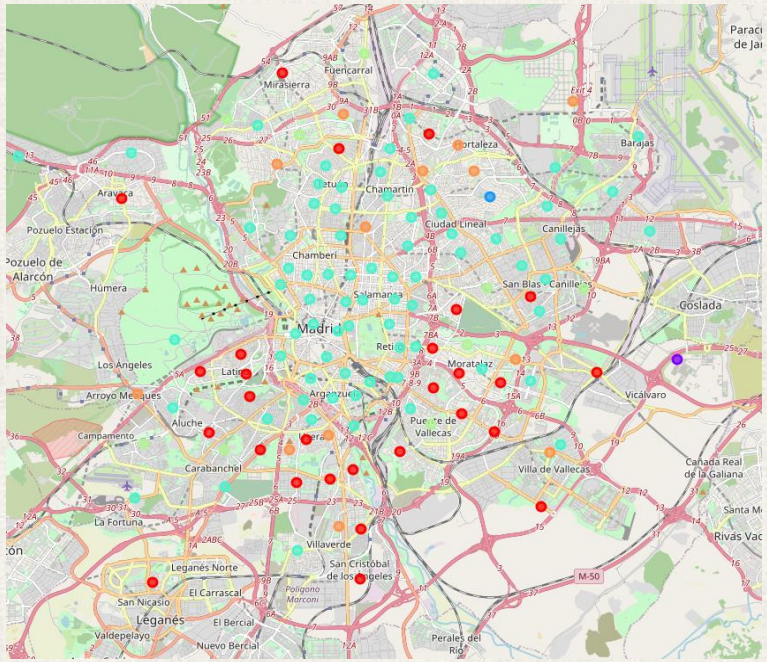
```
#create list with neighborhoods to exclude
neigh_to_exclude = Madrid_venues_count[Madrid_venues_count['Venue Category Count'] < 4]
#create filtered dataframe by excluding neighborhoods in above list
Madrid_venues_filt = Madrid_venues[~Madrid_venues['Neighborhood'].isin(neigh_to_exclude)]
#rename filtered dataframe back to toronto_venues
Madrid_venues = Madrid_venues_filt
#check counts after filtering
Madrid_venues.groupby('Neighborhood').count()
```

| Neighborhood | Neighborhood Latitude | Neighborhood Longitude | Venue | Venue Latitude | Venue |
|---|---|---|---|---|---|
| Abrantes | 7 | 7 | 7 | 7 | |
| Acacias | 54 | 54 | 54 | 54 | |
| Adelfas | 50 | 50 | 50 | 50 | |
| Alameda de Osuna | 23 | 23 | 23 | 23 | |
| Almagro | 100 | 100 | 100 | 100 | |
| ... | ... | ... | ... | ... | |
| Ventas | 11 | 11 | 11 | 11 | |
| Villaverde Alto, C.H. Villaverde | 4 | 4 | 4 | 4 | |
| Vinateros | 8 | 8 | 8 | 8 | |
| Vista Alegre | 17 | 17 | 17 | 17 | |
| Zofio | 7 | 7 | 7 | 7 | |

- CLUSTER THE NEIGHBORHOODS ACCORDING TO ITS VENUES.
- VISUALIZE THE CLUSTER AND COMPARING TO PUBLIC SCHOOLS DISTRIBUTION

# Methodology

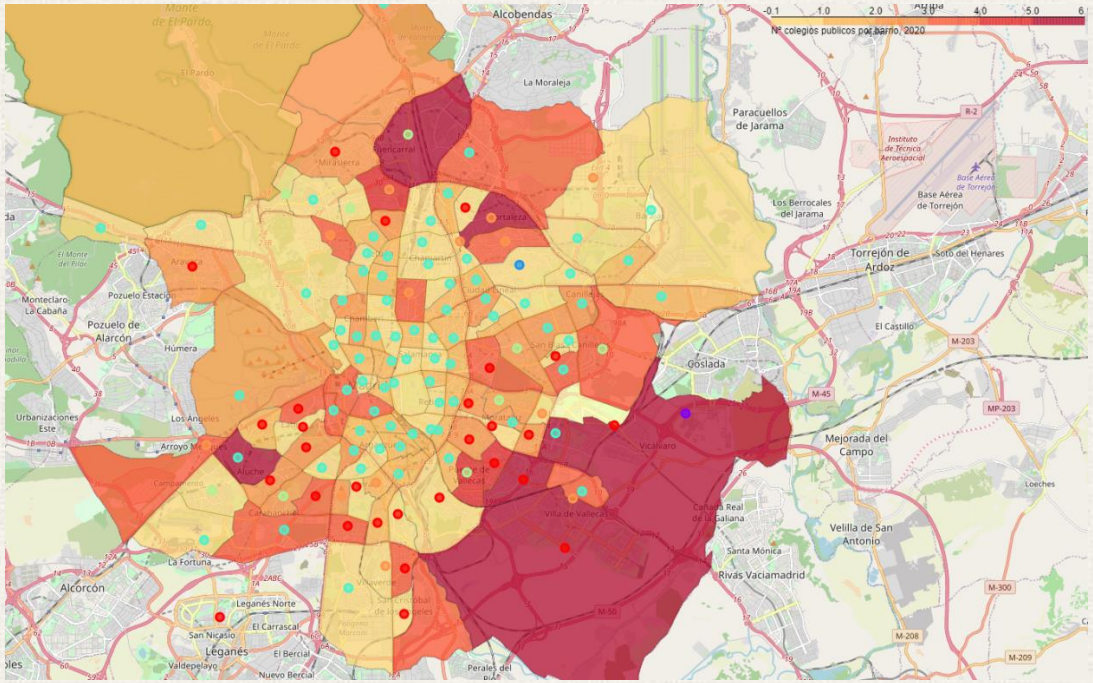
- Collect the Madrid city data in dataframes:
- Using FourSquare API we will find all venues for each neighborhood.
- **Cluster the neighborhoods according to its venues:**




- Visualize the cluster and comparing to public schools distribution

# METHODOLOGY

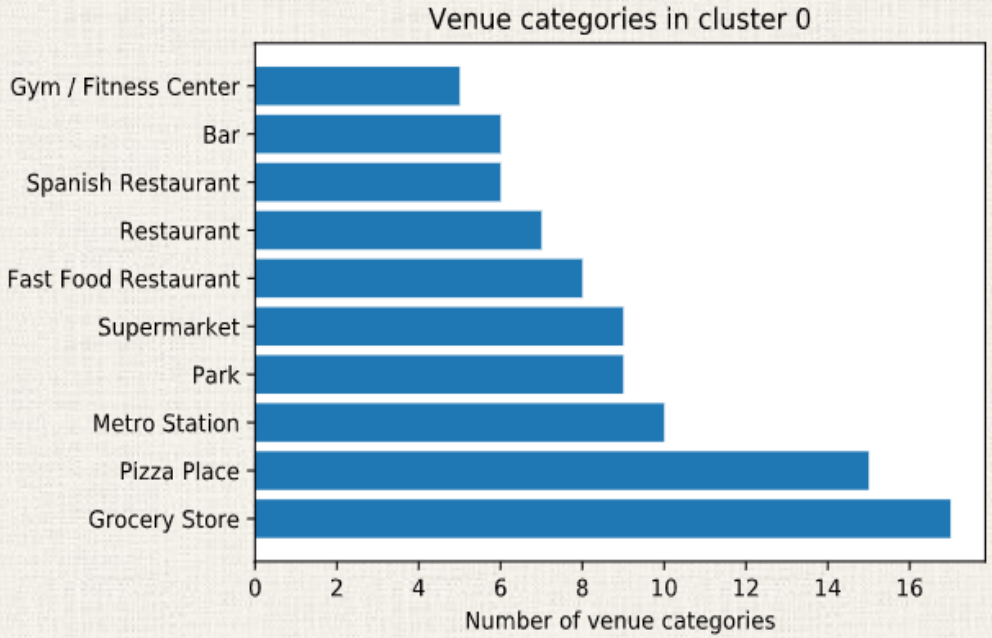
- COLLECT THE MADRID CITY DATA IN DATAFRAMES:
- USING FOURSQUARE API WE WILL FIND ALL VENUES FOR EACH NEIGHBORHOOD:
- CLUSTER THE NEIGHBORHOODS ACCORDING TO ITS VENUES.
- **VISUALIZE THE CLUSTER AND COMPARING TO PUBLIC SCHOOLS DISTRIBUTION:**



# RESULTS

- **MOST SUITABLE RESIDENTIAL NEIGHBORHOODS:**

***Cluster 0: Residential***



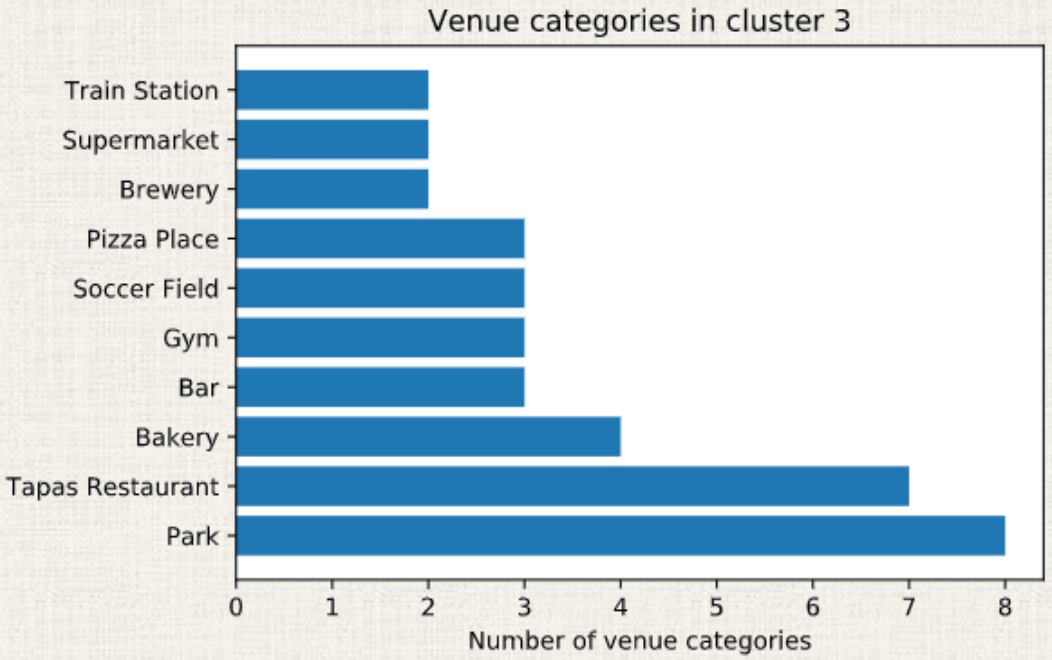

Plenty of useful services for a family like:

- *Grocery stores*
- *Metro stations*
- *Parks*
- *Supermarkets*
- *Gyms*

# RESULTS

- **MOST SUITABLE RESIDENTIAL NEIGHBORHOODS:**

***Cluster 3: Sport lovers residential area***



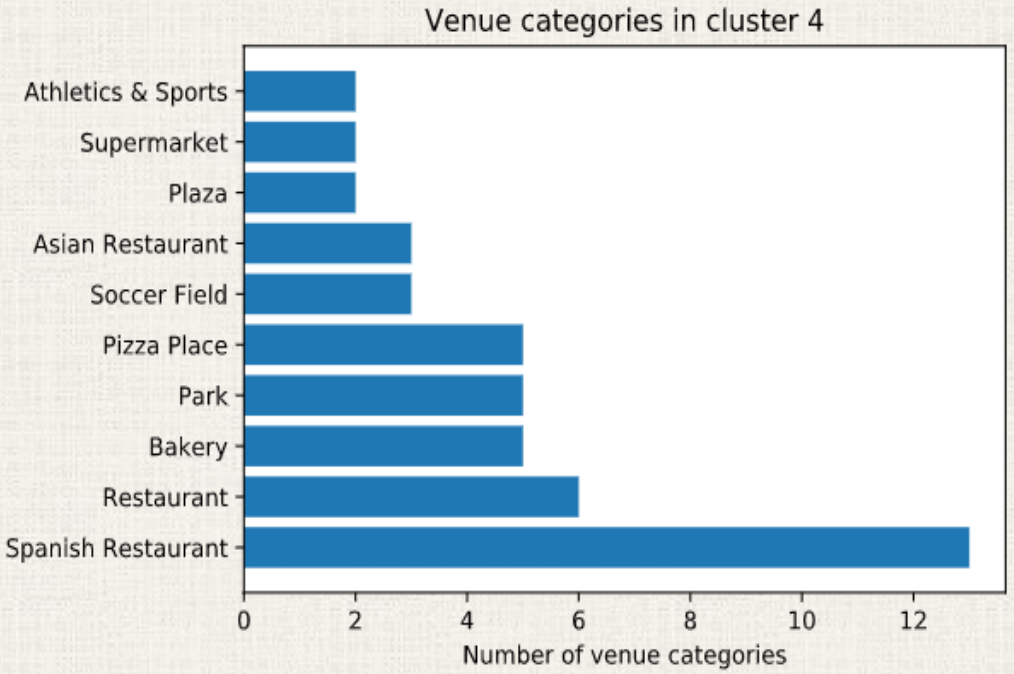

Interesting services for a sport lover family like:

- *Soccer fields*
- *Gyms*
- *Parks*
- *Supermarkets*
- *Train stations*

# RESULTS

- **MOST SUITABLE RESIDENTIAL NEIGHBORHOODS:**

***Cluster 4: Food lovers residential area***



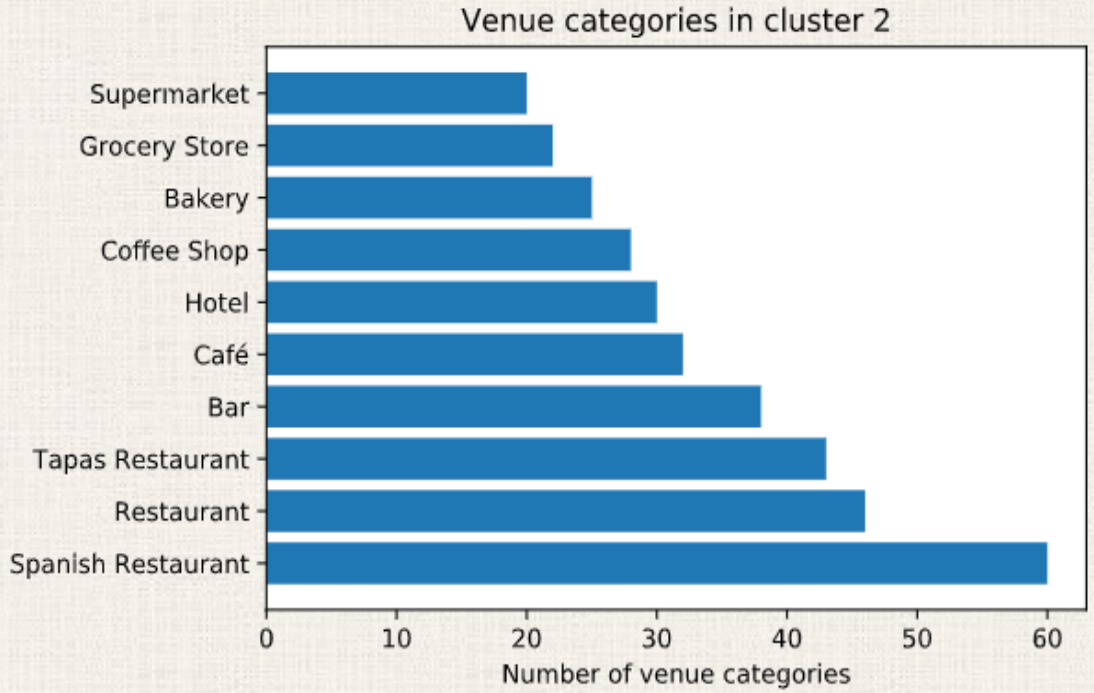

Plenty of useful services for a family like:

- *Restaurants*
- *Spanish restaurants*
- *Parks*
- *Supermarkets*
- *Plaza*

# RESULTS

- **LESS SUITABLE RESIDENTIAL NEIGHBORHOODS:**

***Cluster 2: Downtown***

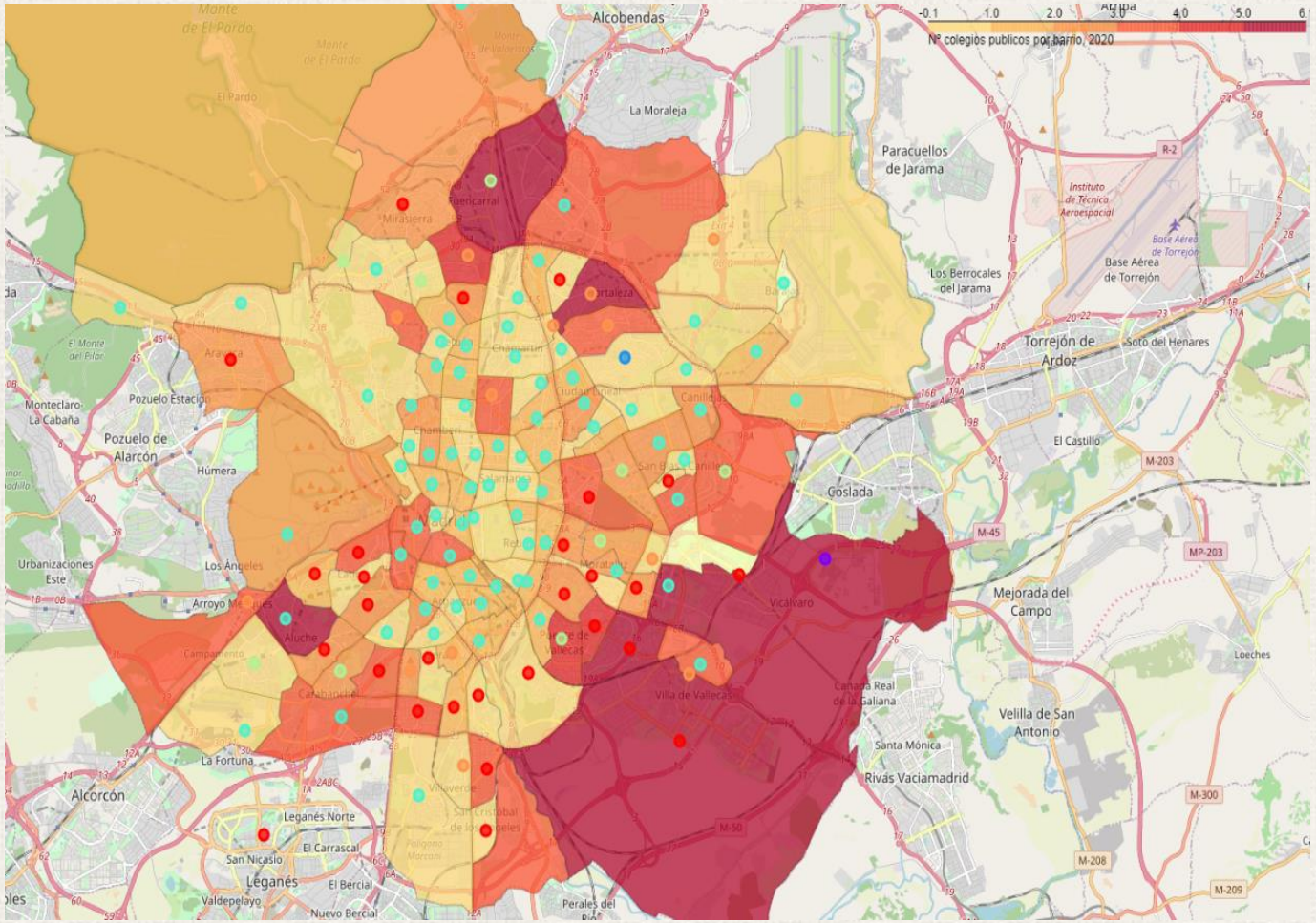



Plenty of useful services for a tourist like:

- *High end Restaurants*
- *Hotels*
- *Coffee shops*
- *Bar*

# CONCLUSION

- **COMPARING TO PUBLIC SCHOOLS DISTRIBUTION:**




We can see that the previous clusters ( , and ) are in those neighborhoods with a huge amount of public schools.

That is according to what is expected so its seems to be a pretty realiable Project.

As we have shown before, we can even decide among different type of residential neighborhoods.