REPORT ON OPENING POSSIBILITIES OF A COMMERCIAL ACTIVITY IN TARRAGONA

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CONTENT

I INTRODUCTION

1.1. Background

In this project, the most attractive meeting places for six of the neighbourhoods belonging to the province of Tarragona are studied. Specifically, the ten busiest locations in the neighbourhoods of Sant Pere and Sant Pau, Torreforta, Salou, La Pineda, Vila-Seca and Bonavista have been analyzed.

Figure 1 La Pineda, Salou, Vila-Seca, Torreforta, Sant Pere i Sant Pau y Bonavista, respectivamente.

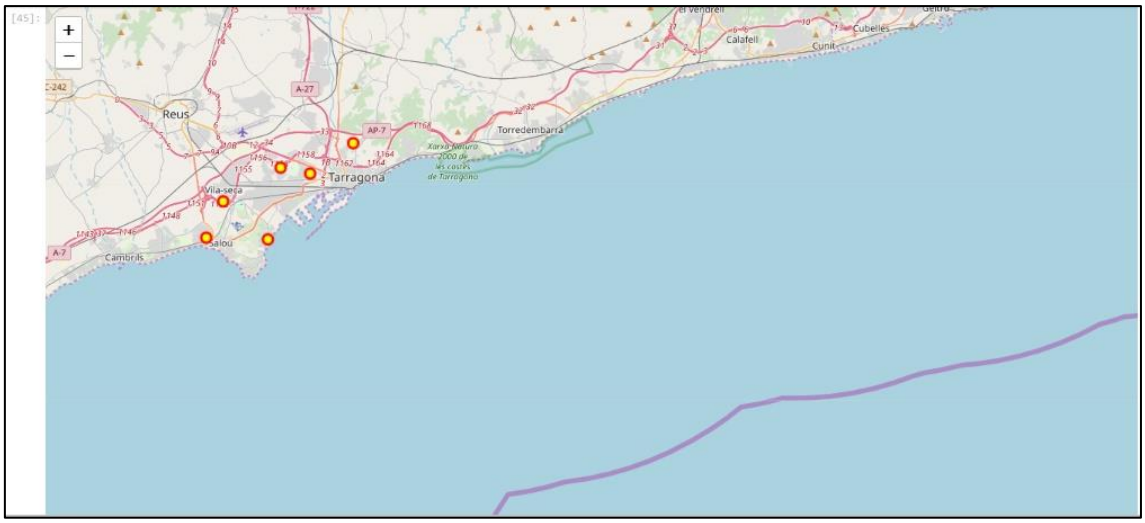


Figure 2 Mapa ampliado con los seis barrios marcados

1.2. Problem

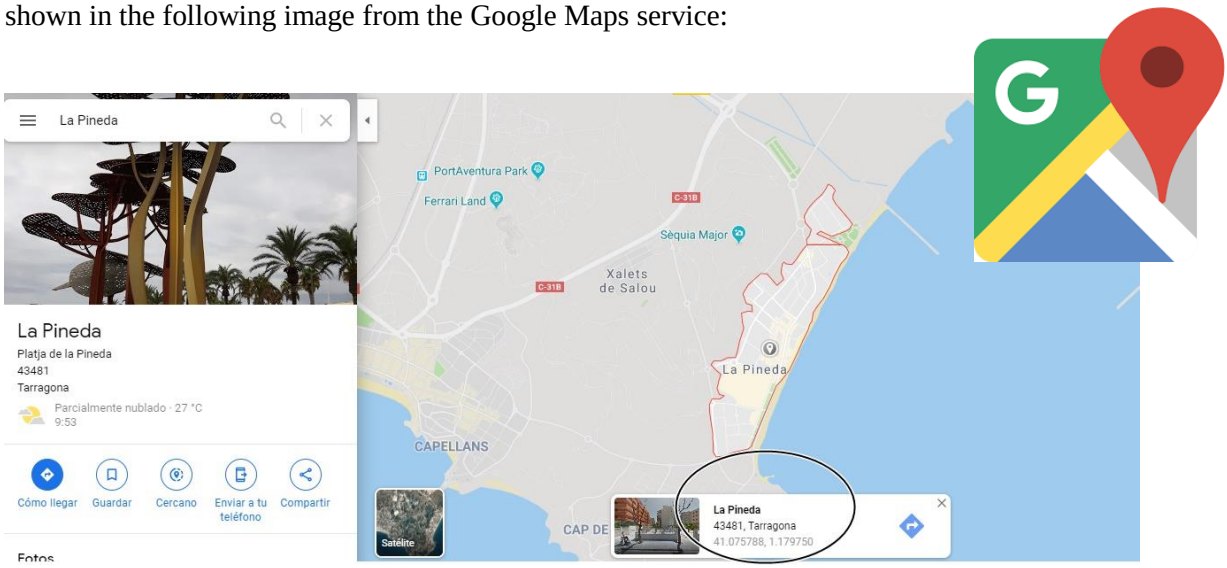
The problem is to know what is the commercial offer developed in the six selected neighbourhoods to computationally analyze the possibilities of opening a new business in the vicinity with commercial success.

1.3. Interest

The target group interested in the project belongs to an international business chain interested in investing in the Spanish coast.

II DATA

The coordinates of the different neighbourhoods have been collected in a CSV document as shown in the following image from the Google Maps service:



K15

	A	B	C	D	E
1	ciudad, barrio, latitud, longitud				
2	Tarragona, Sant Pere i Sant Pau, 41.137686, 1.252032				
3	Tarragona, Torreforta, 41.118950, 1.216849				
4	Tarragona, Salou, 41.080084, 1.132025				
5	Tarragona, La Pineda, 41.079023, 1.182240				
6	Tarragona, Vila Seca, 41.102044, 1.146068				
7	Tarragona, Bonavista, 41.122614, 1.192402				
8					
9					
10					
11					
12					

Figure 3 Documento CSV con el nombre de la ciudad, barrio, latitud y longitud

The data of the venues has been extracted using the Foursquare API (**https://developer.foursquare.com/docs**)

III METHODOLOGY

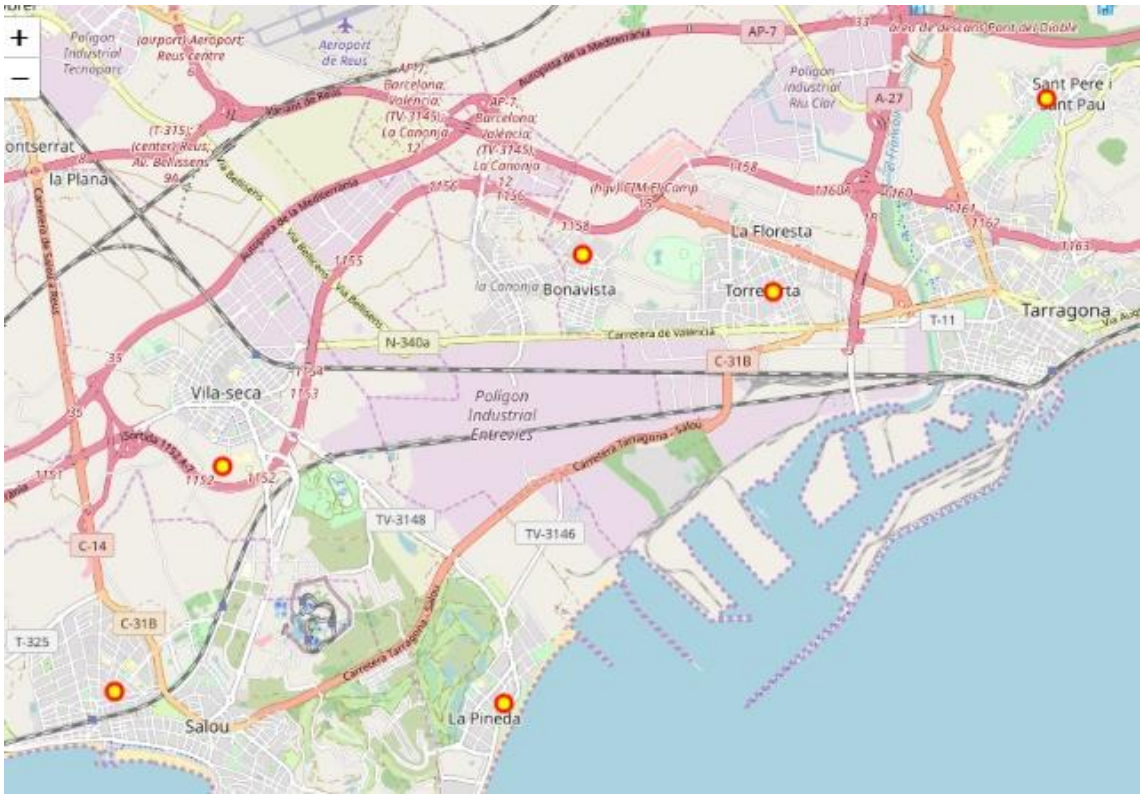
From the coordinates of the different neighbourhoods, a map of the Tarragona area has been drawn up with the six neighbourhoods compiled:

```
latitude = 41.123312
longitude = 1.248521
```

Create a map of Tarragona with neighbordhoods superimposed on top

```
In [35]: map_Tarragona = folium.Map(location=[latitude, longitude], zoom_start=13)
```

```
In [36]: map_Tarragona
```



The data of the venues has been extracted using the Foursquare API:

```
[61]: Limit = 100
radius= 500
url = 'https://api.foursquare.com/v2/venues/explore?&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(
    CLIENT_ID,
    CLIENT_SECRET,
    VERSION,
    barrio_latitude,
    barrio_longitude,
    radius,
    Limit)
url

[61]: 'https://api.foursquare.com/v2/venues/explore?&client_id=Y0P0PGSBLUDSIXYQ2451UJ2KBTVKHVRI4TSSFARE2PAO2BYP&client_secret=K5HAL5RSY340WZ3VPMUYGPPTSQ2SJBCOYQBTNFRLSRB4K4LS&v=2
41.080084,1.132025&radius=500&limit=100'

[62]: results = requests.get(url).json()
results

[62]: {'meta': {'code': 200, 'requestId': '5d5819dec53093002cefe85d'},
 'response': {'suggestedFilters': {'header': 'Tap to show:',
   'filters': [{'name': 'Open now', 'key': 'openNow'}]},
  'headerLocation': 'Vilafortuny',
  'headerFullLocation': 'Vilafortuny',
  'headerLocationGranularity': 'city',
  'totalResults': 32,
  'suggestedBounds': {'ne': {'lat': 41.0845840045, 'lng': 1.1379836774188945},
   'sw': {'lat': 41.0755839955, 'lng': 1.1260663225811056}},
  'groups': [{'type': 'Recommended Places',
    'name': 'recommended',
    'items': [{'reasons': {'count': 0,
       'items': [{'summary': 'This spot is popular',
         'type': 'general',
         'reasonName': 'globalInteractionReason'}]},
      'venue': {'id': '4e0f7aaffa76d62f4452e6c0',
       'name': 'La Morera de Pablo & Ester',
```

Then, we extract the 10th most visited venues from each neighbourhood and we applied a K-Means Cluster Algorithm to cluster the neighbourhoods in clusters with a similar commercial activity.

IV RESULTS SECTION

From the Foursquare's API we could extract 37 unique venues belonging to the analysed neighbourhoods.

```
In [86]: tarragona_venues.groupby('Barrio').count()
```

Out[86]:

	Barrio Latitude	Barrio Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Barrio						
Bonavista	5	5	5	5	5	5
La Pineda	21	21	21	21	21	21
Salou	32	32	32	32	32	32
Sant Pere i Sant Pau	4	4	4	4	4	4
Torreforta	6	6	6	6	6	6
Vila Seca	3	3	3	3	3	3

```
In [87]: print('There are {} uniques categories.'.format(len(tarragona_venues['Venue Category'].unique())))
```

```
There are 37 uniques categories.
```

Likewise, we could check the 10th places more visited from each neighbourhood.

```
neighborhoods_venues_sorted.head()
```

Out[94]:

	Barrio	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	1
0	Bonavista	Farmers Market	Tapas Restaurant	Bar	Spanish Restaurant	Gym	Cocktail Bar	Donut Shop	Diner	Department Store	C
1	La Pineda	Ice Cream Shop	Café	Hotel	Restaurant	Gastropub	Diner	Fish & Chips Shop	Tapas Restaurant	Cocktail Bar	I
2	Salou	Hotel	Mediterranean Restaurant	Spanish Restaurant	Café	Restaurant	Pizza Place	Donut Shop	Tapas Restaurant	Train Station	C
3	Sant Pere i Sant Pau	Bakery	Spanish Restaurant	Soccer Field	Brewery	Train Station	Cocktail Bar	Donut Shop	Diner	Department Store	C
4	Torreforta	Supermarket	Stadium	Department Store	Restaurant	Hotel	Train Station	Café	Diner	Concert Hall	C

V DISCUSSION AND CONCLUSION

We form 5 clusters with the following results:

Cluster 1

```
In [122]: tarragona_merged.loc[tarragona_merged['Cluster Labels'] == 0, tarragona_merged.columns[[1] + list(range(5, tarragona_merged.shape[1]))]]
```

Out[122]:

	barrio	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
1	Torreforta	Supermarket	Stadium	Department Store	Restaurant	Hotel	Train Station	Café	Diner	Concert Hall	Coffee Shop

Cluster 2

```
In [123]: tarragona_merged.loc[tarragona_merged['Cluster Labels'] == 1, tarragona_merged.columns[[1] + list(range(5, tarragona_merged.shape[1]))]]
```

Out[123]:

	barrio	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	Sant Pere i Sant Pau	Bakery	Spanish Restaurant	Soccer Field	Brewery	Train Station	Cocktail Bar	Donut Shop	Diner	Department Store	Concert Hall

Cluster 3

```
In [126]: tarragona_merged.loc[tarragona_merged['Cluster Labels'] == 2, tarragona_merged.columns[[1] + list(range(5, tarragona_merged.shape[1]))]]
```

Out[126]:

	barrio	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 Mos Common Venue
2	Salou	Hotel	Mediterranean Restaurant	Spanish Restaurant	Café	Restaurant	Pizza Place	Donut Shop	Tapas Restaurant	Train Station	Grocery Store
3	La Pineda	Ice Cream Shop	Café	Hotel	Restaurant	Gastropub	Diner	Fish & Chips Shop	Tapas Restaurant	Cocktail Bar	Italian Restaurar

Cluster 4

```
In [128]: tarragona_merged.loc[tarragona_merged['Cluster Labels'] == 3, tarragona_merged.columns[[1] + list(range(5, tarragona_merged.shape[1]))]]
```

Out[128]:

	barrio	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
5	Bonavista	Farmers Market	Tapas Restaurant	Bar	Spanish Restaurant	Gym	Cocktail Bar	Donut Shop	Diner	Department Store	Concert Hall

Cluster 5

```
In [129]: tarragona_merged.loc[tarragona_merged['Cluster Labels'] == 4, tarragona_merged.columns[[1] + list(range(5, tarragona_merged.shape[1]))]]
```

Out[129]:

	barrio	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
4	Vila Seca	Basketball Court	Restaurant	Pool	Train Station	Café	Donut Shop	Diner	Department Store	Concert Hall	Coffee Shop

```
In [ ]:
```

Then, we could conclude that the best business for each neighbourhood are the following:

1) Torreforta = Supermarket
2) Sant Pere i Sant Pau = Bakery
3) Salou = Hotel
4) La Pineda = Ice Cream Shop
5) Bonavista = Farmers Market
6) Vila-Seca = Basketball Shop