An African restaurant in Rome

A.1. Description & Discussion of the Background

Rome is one of the most attractive metropolis in the world. Founded according to the tradition in the 753 BC, during its three millennia of history, it has been the beating heart of one of the most ancient civilizations, which influenced society, culture, language, literature, art, architecture, philosophy, religion, law and customs of the following centuries. It is a city full of history that attracts millions of tourists every year.

I was able to discover various aspects of this city having lived here for 4 years, for this reason I have decided to use Rome for my project. The city has a population of about 3 million people divided in 15 Boroughs called "*Municipi*". With a surface of 1 287,36 km^2, it is the fifth largest city in Europe. The city, therefore, has a varied urban structure with the presence of different ethnic groups.

Rome can be the ideal place to open a shop like a restaurant but it can hide many pitfalls at the same time. Indeed, the splendor and monumentality of the old town is opposed to the suburbs characterized by a very different social condition. In such a complex scenario, in the present work I have tried to answer to the following question: ***"where could a typical African restaurant be located?"***

Many factors can guide this analysis. The location of the restaurant in a specific neighborhood with respect to another may depend on the cost of rentals, the presence of a large social density, the influx of tourists, the proximity to other activities of the same type or historic sites, the general situation of the neighborhood (comfort, reliability).

In the following a simple analysis using data science techniques have been carried out in order to find the best place to locate an African restaurant (with a medium budget). This work could therefore affect all people who intend to open a restaurant business.

A.2. Data description & methodology

A.2.1 Data description

In the project the following data will be considered:

- **Wikipedia.** From here it is possible to obtain general information on Rome in a reliable way **[1]** and at the same time, the administrative subdivision of the city **[2].** These data have been obtained manually from Wikipedia and disposed into a .xlsx datset. For simplicity, only the first entries of this dataframe have been displayed.

```
df_Rome = pd.read_excel('datasetRome.xlsx')
df_Rome.head()
```

	Borough	Population	Latitude	Longitude
0	I Centro Storico	186802	41.89306	12.48278
1	II Parioli/Nomentano	167736	41.92996	12.51889
2	III Monte Sacro	204514	41.93608	12.53512
3	IV Tiburtina	177084	41.93349	12.59875
4	V Prenestino/Centocelle	246471	41.89066	12.54849

FIG 1. An image showing a dataframe with the name of each borough, the coordinates and the population. (source: own elaboration)

- **Forsquare API** will allow to get the most common venues of a given Borough or Neighborhood of Rome **[3],** as shown in figure 2.

	Borough	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	I Centro Storico	Historic Site	Hotel	Italian Restaurant	Temple	Monument / Landmark	Pub	Plaza	Scenic Lookout	History Museum	Art Museum
1	II Parioli/Nomentano	Dessert Shop	Ice Cream Shop	Italian Restaurant	Pastry Shop	Plaza	Bookstore	Café	Japanese Restaurant	Clothing Store	Market
2	III Monte Sacro	Cocktail Bar	Café	Pizza Place	Pub	Hotel	Ice Cream Shop	Mexican Restaurant	Plaza	Fast Food Restaurant	Japanese Restaurant
3	IV Tiburtina	Café	American Restaurant	Hotel	Italian Restaurant	Fast Food Restaurant	Motorcycle Shop	Shoe Store	Wine Bar	Food	Department Store
4	IX Eur	Hotel	Pizza Place	Restaurant	Dessert Shop	Wine Bar	Fish Market	Cocktail Bar	Convention Center	Department Store	Falafel Restaurant
5	V Prenestino/Centocelle	Gym	Sandwich Place	Italian Restaurant	Market	Noodle House	Pizza Place	Chinese Restaurant	Café	African Restaurant	Beer Garden
6	VI Roma delle Torri	Supermarket	Pizza Place	Plaza	Theater	Hotel	Bus Station	Shopping Mall	Fish Market	Cocktail Bar	Convention Center
7	VII Appio-Latino/Tuscolana/Cinecittà	Plaza	Trattoria/Osteria	Italian Restaurant	Hotel	Pizza Place	Hostel	Fish Market	Bistro	Photography Lab	Asian Restaurant
8	VIII Appia Antica	Café	Italian Restaurant	Mexican Restaurant	Park	Plaza	Japanese Restaurant	Bistro	Salad Place	Wine Bar	Department Store
9	X Ostia/Acilia	Pizza Place	Italian Restaurant	Seafood Restaurant	Beach	Café	Cocktail Bar	Plaza	Restaurant	Ice Cream Shop	Hotel
10	XI Arvalia/Portuense	Pizza Place	Supermarket	Gym / Fitness Center	Café	Plaza	Burger Joint	Italian Restaurant	Fast Food Restaurant	Park	Cocktail Bar
11	XII Monte Verde	Pizza Place	Café	Ice Cream Shop	Italian Restaurant	Restaurant	Garden	Thai Restaurant	Plaza	Steakhouse	Food
12	XIII Aurelia	Hotel	Café	Italian Restaurant	Plaza	Supermarket	Steakhouse	Pizza Place	Gourmet Shop	Convention Center	Gastropub

FIG 2. The image shows the top ten venue for each borough in the city of Rome, for simplicity only some lines of the dataframe are displayed (source: own elaboration).


```
[
{
"cmunicipi":"1",
"carredo_stradale__mq_":"103,046",
"caree_di_sosta__mq_":"156,392",
"cverde_attrezzato_di_quartiere__mq_":"97,679",
"cverde_storico_archeologico__mq_":"750,322",
"cgrandi_parchi_urbani__mq_":"0",
"cverde_speciale__mq_":"100,700",
"caree_protette__mq_":"114,206",
"ctotale_verde_non_agricolo__mq_":"1,322,340",
"csuperficie_municipio__mq_":"14,306,900"
}
,
{
"cmunicipi":"10",
"carredo_stradale__mq_":"179,883",
"caree_di_sosta__mq_":"203,973",
"cverde_attrezzato_di_quartiere__mq_":"632,622",
"cverde_storico_archeologico__mq_":"850",
"cgrandi_parchi_urbani__mq_":"350,770",
"cverde_speciale__mq_":"0",
"caree_protette__mq_":"3,368,730",
"ctotale_verde_non_agricolo__mq_":"4,736,830",
"csuperficie_municipio__mq_":"37,659,000"
}
,
{
```


FIG 3. Example of Jason file containing data (source: own elaboration).

- **DatiOpen.it.** It is a site that provides data about the city of Rome through multiple formats (csv, json ...). These data relate to social information, green areas, historical sites and points of interest such as libraries **[4]**. An exemple of dataframe is shown in figure 3.

- **dati.comune.roma.it [5].** It a site that hosts many datasets about Rome for the following fields: environment, tourism, sport, transportation, culture, social environment, urban security and business.
- **Google Maps [6].** Unfortunately, not all geographic data can be retrieved directly from the web. Sometimes I will need to use google maps and manually search for coordinates of specific points.

A.2.2 Methodology

- The first step will be to identify the Boroughs of Rome (as shown in image 4) and to find those of greatest interest. Foursquare API will allow to get the most common venues of a given Borough. For instance, those for which data are insufficient or those that are less attractive (lack of points of interest that can attract tourists) could be discarded.
  In this phase, I will also use the other datasets presented in previous section.

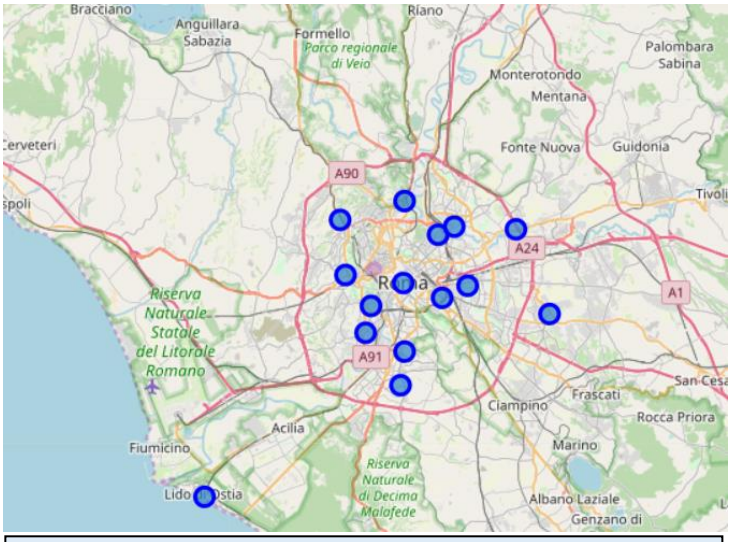

FIG 4. An image showing Rome's Boroughs. (source: own elaboration)

- Once the most interesting ones have been identified, each single Borough will be analyzed individually. A list of Neighborhoods with their coordinates will be produced for each Borough. Foursquare API will allow again to get the most common venues of a given Neighborhood.
- Thanks to unsupervised machine learning techniques such as the **K-means algorithm**, it will be possible to identify similarities between areas and further reduce uncertainty about the future location of the restaurant. Two aspects will be considered in particular: the average cost of rents in that area and the proximity to points of interest. It will also be important to take into consideration the proximity to activities of the same type which could be a factor of strong competition.
- In the end, ideally, the analysis conducted will allow us to identify great areas for launching our business!!!

References

[1] https://en.wikipedia.org/wiki/Rome

[2] https://en.wikipedia.org/wiki/Administrative_subdivision_of_Rome

[3] https://developer.foursquare.com/

[4] http://www.datiopen.it/it/catalogo-opendata/daticomuneromait

[5] https://dati.comune.roma.it/

[6] https://www.google.fr/maps