

C@pstone Project - IBM Data Science Professional Certificate

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Introduction

Rome (Latin and Italian: Roma) is the capital city and a special comune of Italy). Rome also serves as the capital of the Lazio region. With 2,872,800 residents in 1,285 km² (496.1 sq mi). It is the fourth most populous city in the European Union by population within city limits. It is the centre of the Metropolitan City of Rome, which has a population of 4,355,725 residents, thus making it the most populous metropolitan city in Italy. Rome is located in the central-western portion of the Italian Peninsula, within Lazio (Latium), along the shores of the Tiber. The Vatican City (the smallest country in the world) is an independent country inside the city boundaries of Rome, the only existing example of a country within a city: for this reason Rome has been often defined as capital of two states.

Rome's history spans 28 centuries. While Roman mythology dates the founding of Rome at around 753 BC, the site has been inhabited for much longer, making it one of the oldest continuously occupied sites in Europe. It was first called The Eternal City (Latin: Urbs Aeterna; Italian: La Città Eterna) by the Roman poet Tibullus in the 1st century BC, and the expression was also taken up by Ovid, Virgil, and Livy. Rome is also called the "Caput Mundi" (Capital of the World). After the fall of the Western Empire, which marked the beginning of the Middle Ages, Rome slowly fell under the political control of the Papacy, and in the 8th century it became the capital of the Papal States, which lasted until 1870. Beginning with the Renaissance, almost all the popes since Nicholas V (1447–1455) pursued over four hundred years a coherent architectural and urban programme aimed at making the city the artistic and cultural centre of the world. In this way, Rome became first one of the major centres of the Italian Renaissance, and then the birthplace of both the Baroque style and Neoclassicism. Famous artists, painters, sculptors and architects made Rome the centre of their activity, creating masterpieces throughout the city. In 1871, Rome became the capital of the Kingdom of Italy, which, in 1946, became the Italian Republic.

Business Problem

From consulting companies we are required by a group of tour operators to provide some well-defined program that allows these tourist agencies to create a series of tourist packages to be provided to their customers, in particular we are required to provide specific information about:

- Historical place to visit
- Restaurant for typical food
- Good accommodation Hotel
- Spa and Wealth center (Centro Benessere)

Data

The information will be extrapolated mainly from 3 sources:

- Foursquare api
- Wikipedia
- csv.dataframe

this data will be useful for finding the better solution for the client

we start with pre processing data installing all the necessary library as follow:

```
import requests # library to handle requests
import pandas as pd # library for data analysis
import numpy as np # library to handle data in a vectorized manner
import random # library for random number generation

!conda install -c conda-forge geopy --yes
from geopy.geocoders import Nominatim # module to convert an address into latitude and longitude values

# libraries for displaying images
from IPython.display import Image
from IPython.core.display import HTML

# transforming json file into a pandas dataframe library
from pandas.io.json import json_normalize

!conda install -c conda-forge folium=0.5.0 --yes
import folium # plotting library

print('Folium installed')
print('Libraries imported.')
```

```
import matplotlib.pyplot as plt # plotting library
# backend for rendering plots within the browser
%matplotlib inline

from sklearn.cluster import KMeans
from sklearn.datasets.samples_generator import make_blobs

print('Library II imported .')
```

Library II imported .

```
from bs4 import BeautifulSoup
print ("Done")
```

after that define the city target of our Analysis, in this case: Rome

Define City Target

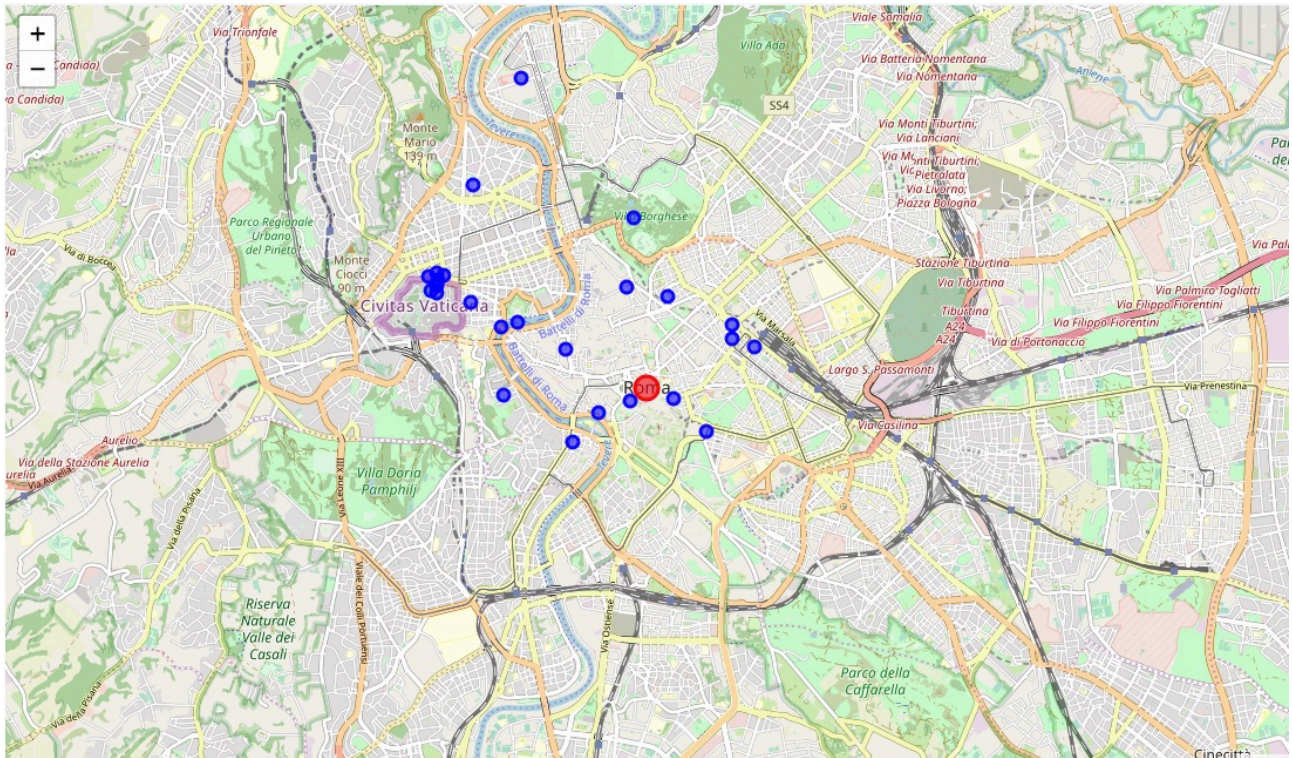
```
address = ', Roma, RM'

geolocator = Nominatim(user_agent="foursquare_agent")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print(latitude, longitude)

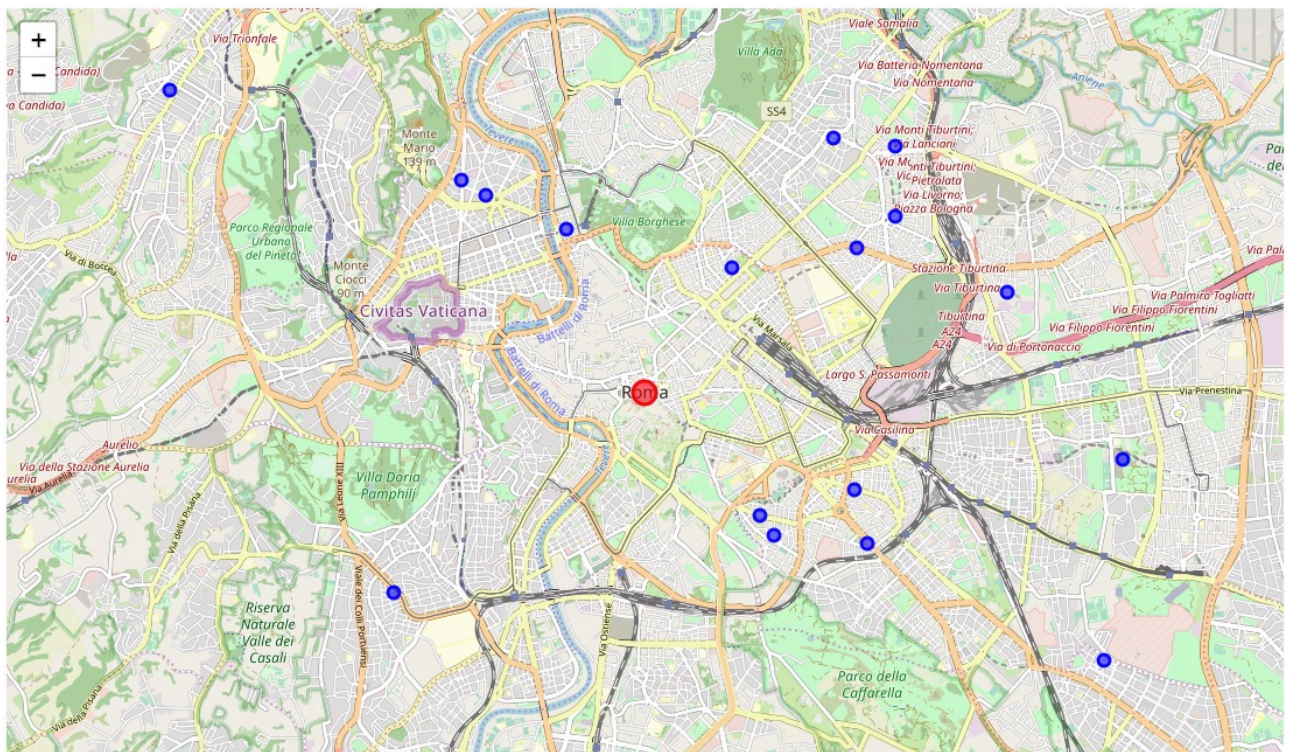
41.894802 12.4853384
```


From Foursquare API collect a series of geolocation data and information for every point of interest :

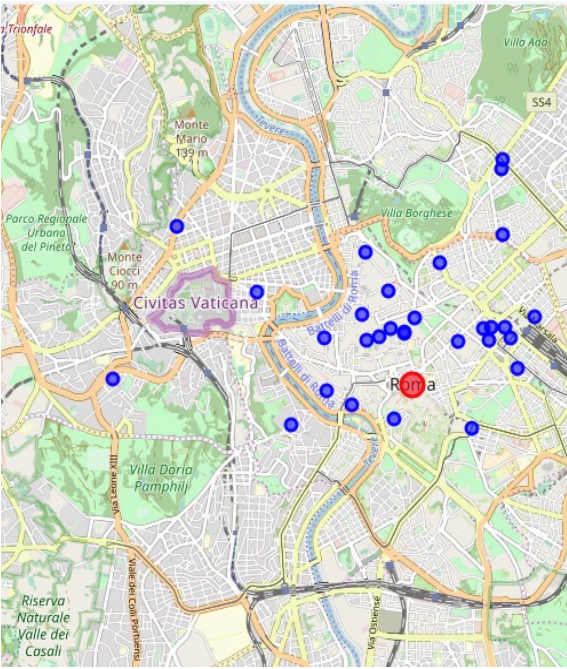
MUSEUM



SPA



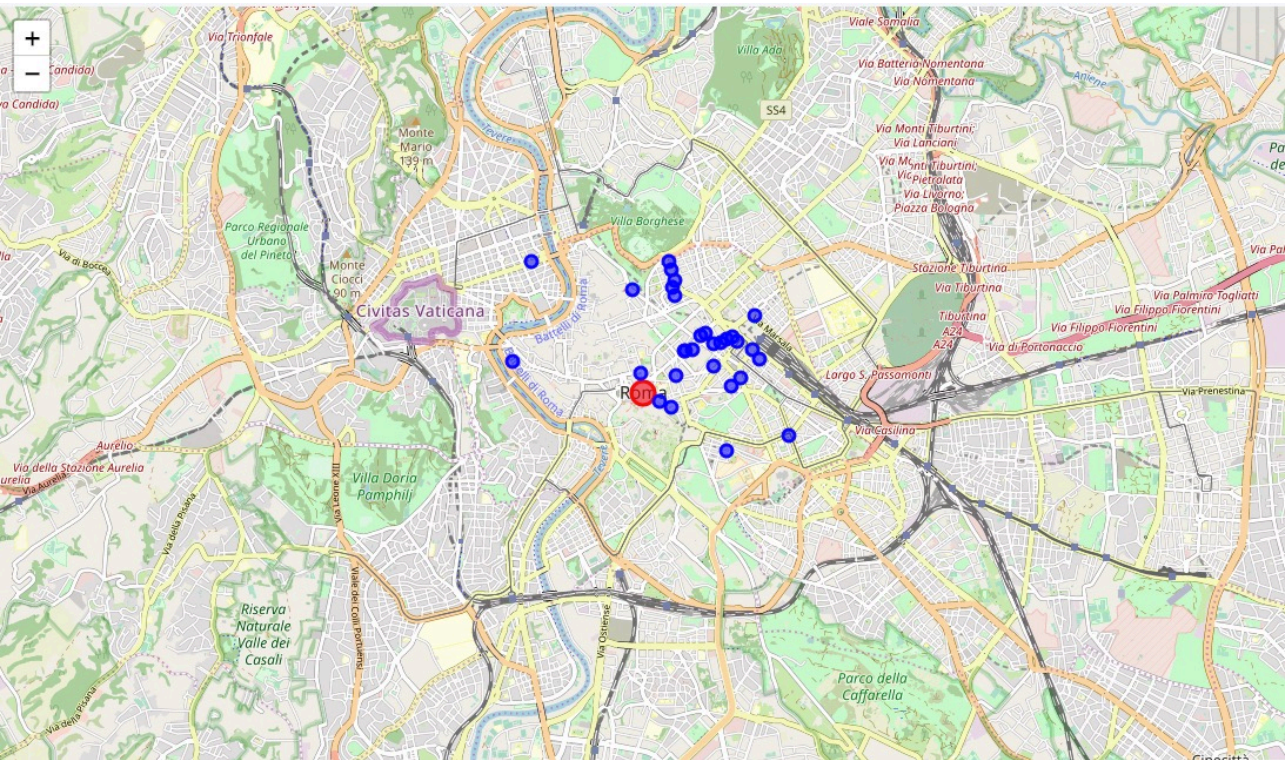
RESTAURANT



dataframeRestaurant_filtered.name	
0	Daruma Sushi Restaurant - Parlamento
1	Restaurant Roof Garden Les Étoiles
2	Rooftop Restaurant Raphaël Hotel
3	Wang Xiang Lou Chinese Restaurant (望乡楼中国饭店)
4	Kilo Restaurant
5	Marini Restaurant & Boutique
6	Royal Art Café Restaurant
7	da brunello restaurant
8	Restaurant Da Sergio
9	Bali Bar & Restaurant
10	Chopstick Restaurant
11	Restaurant Pipperno
12	Thai J Restaurant
13	InRoma Movie Stars Restaurant
14	Restaurant D'Este
15	Doney Restaurant
16	The Hive Restaurant
17	Restaurant Giglio
18	Restaurant "Leonardo"
19	Rotonda Restaurant
20	Mok Restaurant Club Roma
21	UNA Restaurant
22	Rome restaurant da Trani
23	Grill & Wine Restaurant
24	Bambù Restaurant 2 (Wok & Bambu 1) (Kung Fu Re...
25	restaurant due gi
26	Trevi Restaurant

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng	postalCode	state
0	Daruma Sushi Restaurant - Parlamento	Sushi Restaurant	Piazza del Parlamento 37	IT	Roma	Italia	NaN	1052	[Piazza del Parlamento 37, 00186 Roma Lazio, I...	[[{'label': 'display', 'lat': 41.90237766323422...	41.902378	12.477739	00186	Lazio
1	Restaurant Roof Garden Les Étoiles	Restaurant	34 Via Giovanni Vitelleschi	IT	Roma	Italia	Via dei Bastioni 1	2237	[34 Via Giovanni Vitelleschi (Via dei Bastioni...	[[{'label': 'display', 'lat': 41.90481579322807...	41.904816	12.461918	00193	Lazio
2	Rooftop Restaurant Raphaël Hotel	Italian Restaurant	NaN	IT	NaN	Italia	NaN	1234	[Italia]	[[{'label': 'display', 'lat': 41.899828, 'lng':...	41.899828	12.472054	NaN	NaN
3	Wang Xiang Lou Chinese Restaurant (望乡楼中国 饭店)	Chinese Restaurant	Via del viminale	IT	Roma	Italia	NaN	1189	[Via del viminale, 00184 Roma Lazio, Italia]	[[{'label': 'display', 'lat': 41.90098715522373...	41.900987	12.497052	00184	Lazio
4	Kilo Restaurant	Steakhouse	Via Tirso, 30	IT	Roma	Italia	Via Metauro	2832	[Via Tirso, 30 (Via Metauro), 00198 Roma Lazio...	[[{'label': 'display', 'lat': 41.91824510193424...	41.918245	12.498625	00198	Lazio
5	Marini Restaurant & Boutique	Caribbean Restaurant	Via Borgognona 11	IT	Roma	Italia	NaN	1178	[Via Borgognona 11, Roma Lazio, Italia]	[[{'label': 'display', 'lat': 41.90501403808594...	41.905014	12.481593	NaN	Lazio

HOTEL



Below a list with the main hotel in the center of Rome.

dataframe_filtered.name													
0	Hotel Pace Helvezia												
1	Hotel Fori Imperiali Cavalieri												
2	Hotel Forum												
3	Hotel Giolli												
4	Hotel Hassler Roma												
5	Hotel Indigo Rome - St. George												
6	Hotel Esposizione												
7	Aleph Rome Hotel, Curio Collection by Hilton												
8	Best Western Premier Hotel Royal Santina												
9	Hotel Miami Rome												
10	The Fifteen Keys Hotel												

	name	categories	address	cc	city	country	crossStreet	distance	formattedAddress	labeledLatLngs	lat	lng	postalCode	state
0	Hotel Pace Helvezia	Hotel	Via 4 Novembre 104	IT	Roma	Italia	NaN	233	[Via 4 Novembre 104, 00187 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.896887, 'lng': 12.484984]]	41.896887	12.484984	00187	Lazio
1	Hotel Fori Imperiali Cavalieri	Hotel	Via Frangipane 34	IT	Roma	Italia	NaN	387	[Via Frangipane 34, 00184 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.893165, 'lng': 12.489464]]	41.893165	12.489464	00184	Lazio
2	Hotel Forum	Hotel	Via Tor De' Conti, 25	IT	Roma	Italia	NaN	225	[Via Tor De' Conti, 25, 00184 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.89384, 'lng': 12.487730]]	41.893840	12.487730	00184	Lazio
3	Hotel Giolli	Hotel	Via Nazionale 69	IT	Roma	Italia	NaN	696	[Via Nazionale 69, 00184 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.899287, 'lng': 12.491204]]	41.899287	12.491204	00184	Lazio
4	Hotel Hassler Roma	Hotel	Piazza Trinità dei Monti 6	IT	Roma	Italia	NaN	1245	[Piazza Trinità dei Monti 6, 00187 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.905929, 'lng': 12.483732]]	41.905930	12.483732	00187	Lazio
5	Hotel Indigo Rome - St. George	Hotel	Via Giulia 62	IT	Roma	Italia	NaN	1629	[Via Giulia 62, 00186 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.898195, 'lng': 12.466205]]	41.898195	12.466205	00186	Lazio
6	Hotel Esposizione	Hotel	Via Nazionale, 66	IT	Roma	Italia	NaN	716	[Via Nazionale, 66, 00187 Roma Lazio, Italia]	[['label': 'display', 'lat': 41.899328, 'lng': 12.491482]]	41.899328	12.491482	00187	Lazio

CONCLUSION

This work is a simple example of what can be done by combining data from different sources and for .

Serves as a starting point for further analysis. in particular we could, using additional time, create personalized paths that take into account the distances between the places of interest and the time needed to visit them, optimizing timetables and routes, as well as classify the places of interest according to the visitors' opinions.