Capstone Project - The Battle of Neighborhoods

# Assignment

Now that you have been equipped with the skills and the tools to use location data to explore a geographical location, over the course of two weeks, you will have the opportunity to be as creative as you want and come up with an idea to leverage the Foursquare location data to explore or compare neighborhoods or cities of your choice or to come up with a problem that you can use the Foursquare location data to solve. If you cannot think of an idea or a problem, here are some ideas to get you started:

1. In Module 3, we explored New York City and the city of Toronto and segmented and clustered their neighborhoods. Both cities are very diverse and are the financial capitals of their respective countries. One interesting idea would be to compare the neighborhoods of the two cities and determine how similar or dissimilar they are. Is New York City more like Toronto or Paris or some other multicultural city? I will leave it to you to refine this idea.
2. In a city of your choice, if someone is looking to open a restaurant, where would you recommend that they open it? Similarly, if a contractor is trying to start their own business, where would you recommend that they setup their office?

These are just a couple of many ideas and problems that can be solved using location data in addition to other datasets. No matter what you decide to do, make sure to provide sufficient justification of why you think what you want to do or solve is important and why would a client or a group of people be interested in your project.

# INTRODUCTION

## Description of the problem and discussion of the backgroundhttps://upload.wikimedia.org/wikipedia/commons/e/e4/Bologna-view.jpg

Our main goal in this project is to analyze the different neighborhoods from the city of Bologna (Italy). Bologna is also knows as the motor valley of Italy but when it comes to food culture and restaurants motors take a back seat.



For this reason I decided to do this analysis with the aim of defining which is the best neighborhood in case we decide to open a restaurant in this city.

# DATA Data Scraping and Documentation

I’ve started my research from Wikipedia <https://it.wikipedia.org/wiki/Quartieri_di_Bologna> where I easily found the following table:



Location data have been recovered thanks to the library “Nominatim“ and “geopy.geocoders”.

Commercial activities location and their respective ratings have been obtained thanks to **FOURSQUARE API**

([https://api.foursquare.com/v2/venues/explore?client\_id={}&client\_secret={}&v={}&ll={},{}&radius={}&limit={}](https://api.foursquare.com/v2/venues/explore?client_id=%7b%7d&client_secret=%7b%7d&v=%7b%7d&ll=%7b%7d,%7b%7d&radius=%7b%7d&limit=%7b%7d) )

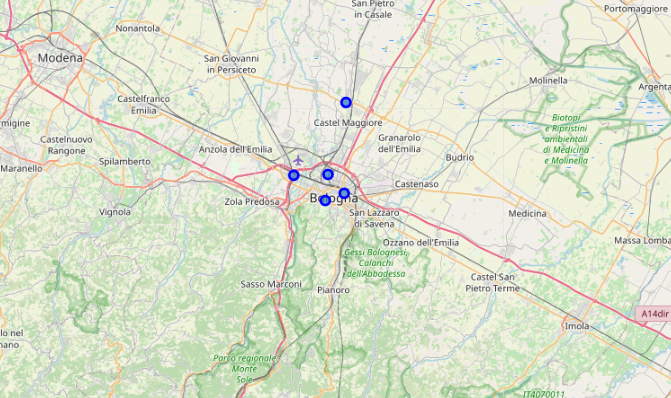
# METHODOLOGY

## ANALYSIS AND EVALUATION

I’ve started the analysis defining some basis variables:

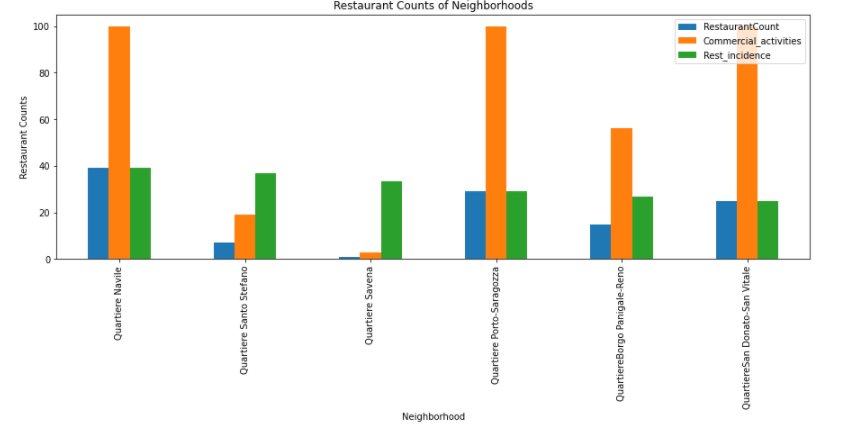
* number of competitors in the neighborhood
* average rating of the competitors in the neighborhood
* incidence of the restaurants over the commercial activities in the neighborhood
* distance from the city center

I used **folium** library to create an interactive map of Bologna as follows:

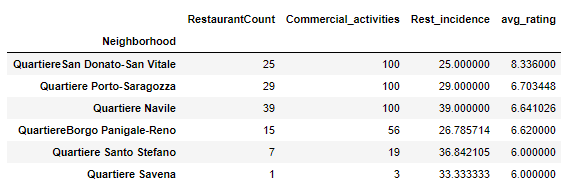


I’ve than used the Foursquare API to explore the neighborhood and segment them. I designed the limit as **400 venues** and the radius **2000 meter** for each neighborhood from their given latitude and longitude informations.

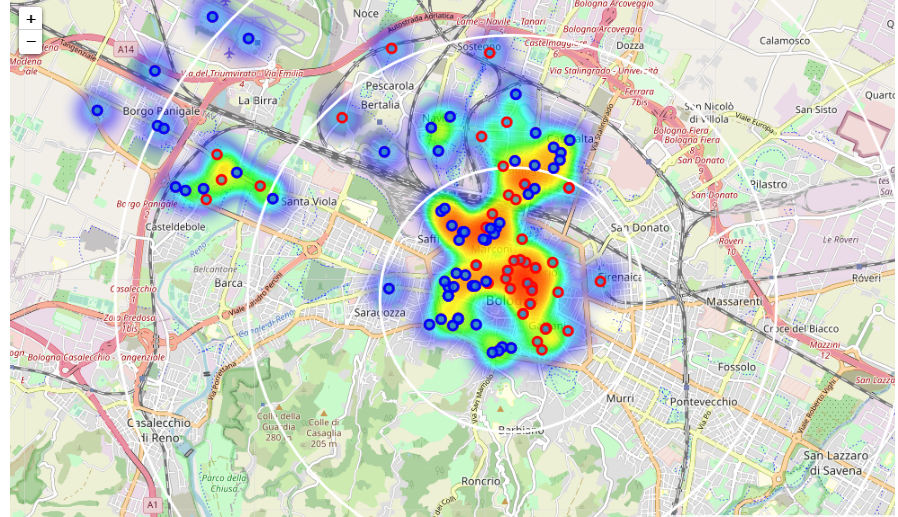
# RESULTS and DISCUSSION



I want to have an overview of the neighborhoods and fot this purpose I’ve desiged this histogram where we can see that “San Vitale”, “Saragozza” and “San Donato” are the neighborhoods with the higher number of commercial activities (restaurants included).



„San Donato“ is the neighborhood with the highest average rating for his restaurants and this can be seen as an indicator of a high quality competitive neighborhood.



In this heat map we can see how is concentrated the number of restaurants inside 2 km from the city center, but also that there is a high concentration of restaurants with a bad rating (red circles).

We can also note that the higher number of restaurants is located in the north of the city also due to the geographic conformation of the city.

I suggest to take in analysis cities with I higher number of neighborhoods and probably a bigger city.

# CONCLUSIONS

Based on our results we can affirm that if our strategy is to place the restaurant in an area with a high incidence of restaurants and commercial activities to gain advantage from the greater passage of possible customers then we will open our restaurant in the neighborhood "Quartiere Navile". Otherwise, if we decided to open in an area with a small number of restaurants to take advantage of the limited competition, then we would open in district "Santo Stefano" or "Quartiere Savena"