

The Battle Of Neighborhoods

Capstone Project- IBM Data Science professional certificate

Opening new ethnic restaurant in Milan

1.Introduction

Background

Milan is widely considered Italy's most international city with banking, industrial and design sectors that draw employees from around the world. The culinary scene reflects the city's flair for exotic flavors and tastes, indeed, Milan is home to a multitude of restaurants that hail from the Asia, the Middle East, South America.

Business problem

The success of establishing a new restaurant depends on several factors: demand, brand loyalty, quality of food, competition, and so on. In most cases, a restaurant's location plays an essential determinant for its success. In this project we will try to find an optimal location for an ethnic restaurant. We will analyze the distribution of restaurants and surrounding businesses, in particular ratings and likes of potential competitors in the areas.

2.Data

Data sources

- Neighborhood data from Wikipedia: https://en.wikipedia.org/wiki/Category:Districts_of_Milan
- Geographical coordinates of neighborhoods from python geocoder library
- Venues of given neighborhoods from **Foursquare API venues explore**
- Ranks and likes of restaurants from **Foursquare API venues method**

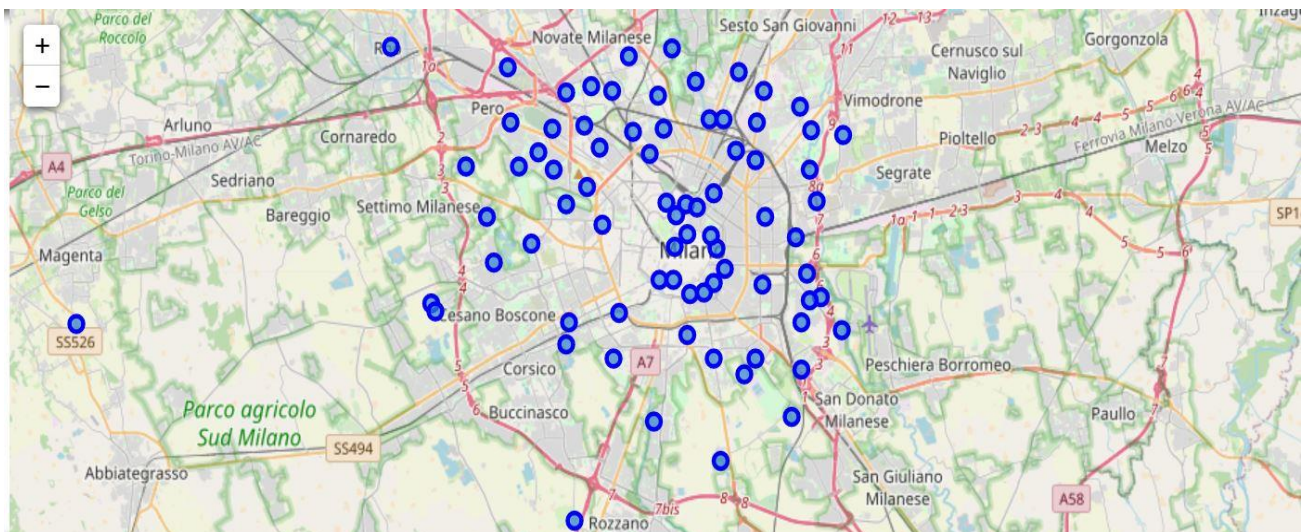
Data usage

We will use neighborhood location values to analyze Milan geographical structure. We will use folium library of python to draw maps by using given latitude and longitudes of neighborhoods. We will also classify neighborhoods by using venues distribution and counts in order to find similarities of neighborhoods. Ratings and likes of restaurants will help us to find areas with less competition.

3.Methodology

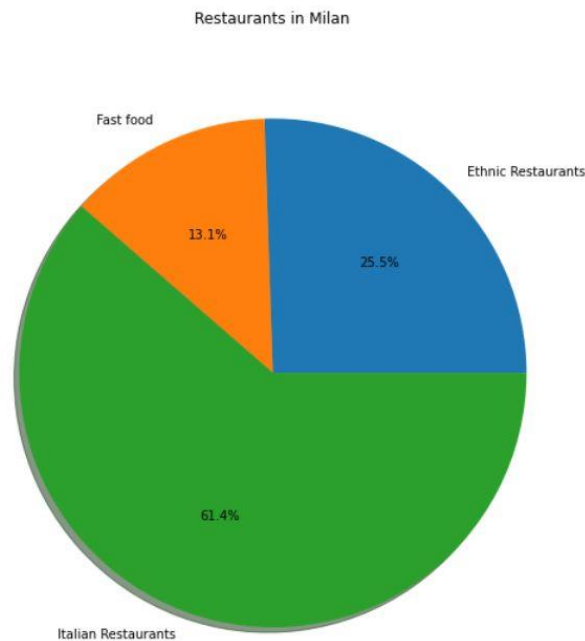
- ☐ Data scraping from wikipedia.
Information about neighborhoods in Milan are available [here](#)
- ☐ Location information (latitude and longitude) of neighborhoods are taken from geocoder library.
- ☐ Visualization of Neighborhoods.

The folium library was called to help visualize, geographically, the location of each neighbourhood centered around Milan.

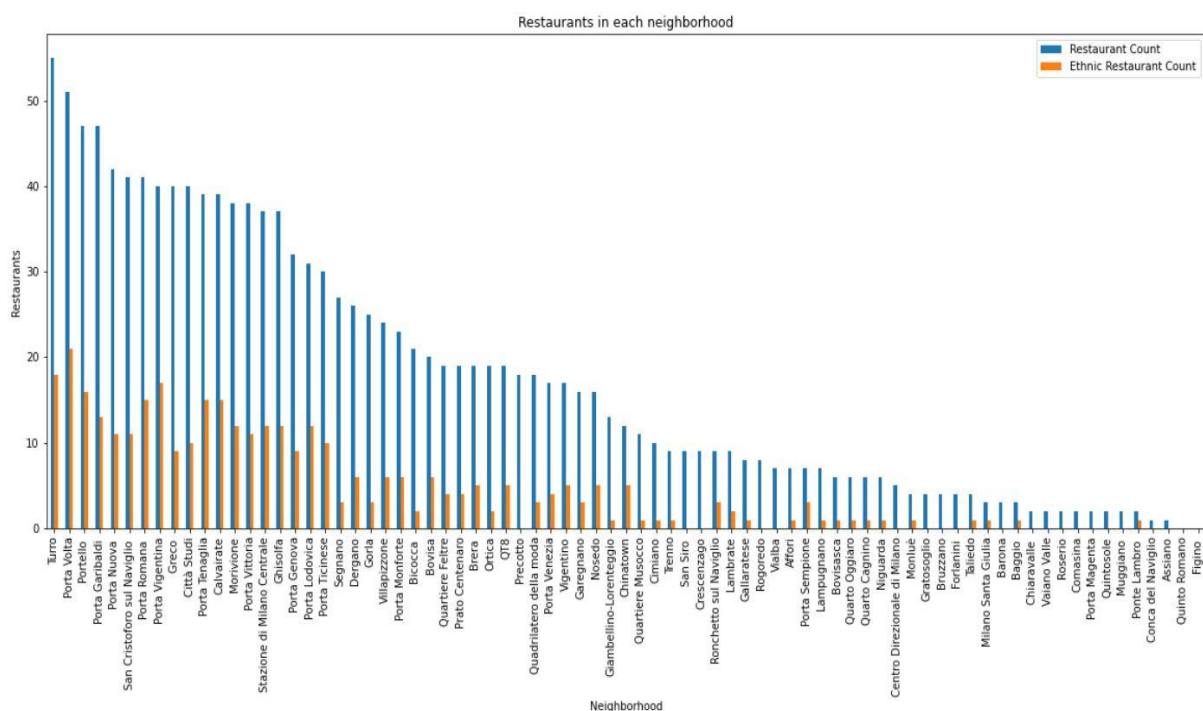


□ Exploring venues

Using the Foursquare API's explore function we could return the number and the type of venues located in Milan, then we focused on restaurants to find the percentage of ethnic restaurants.

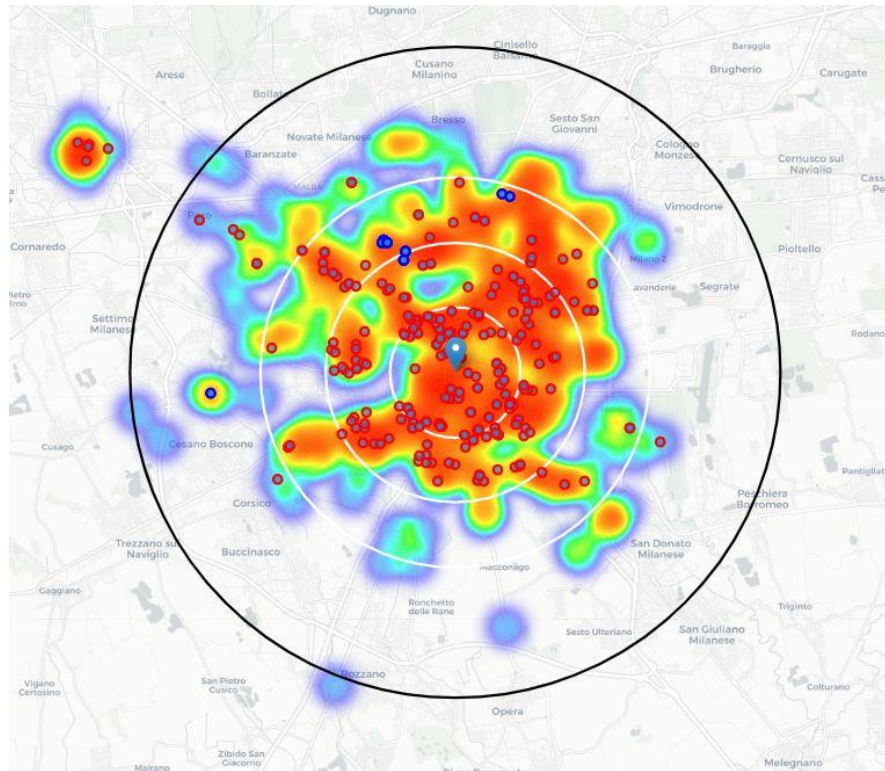


□ We found th distribution of ethnic restaurants in each neighborhood



- We used foursquare to identify ethnic restaurants with bad ratings and drew heatmap to visualize the distribution of restaurants around the center.

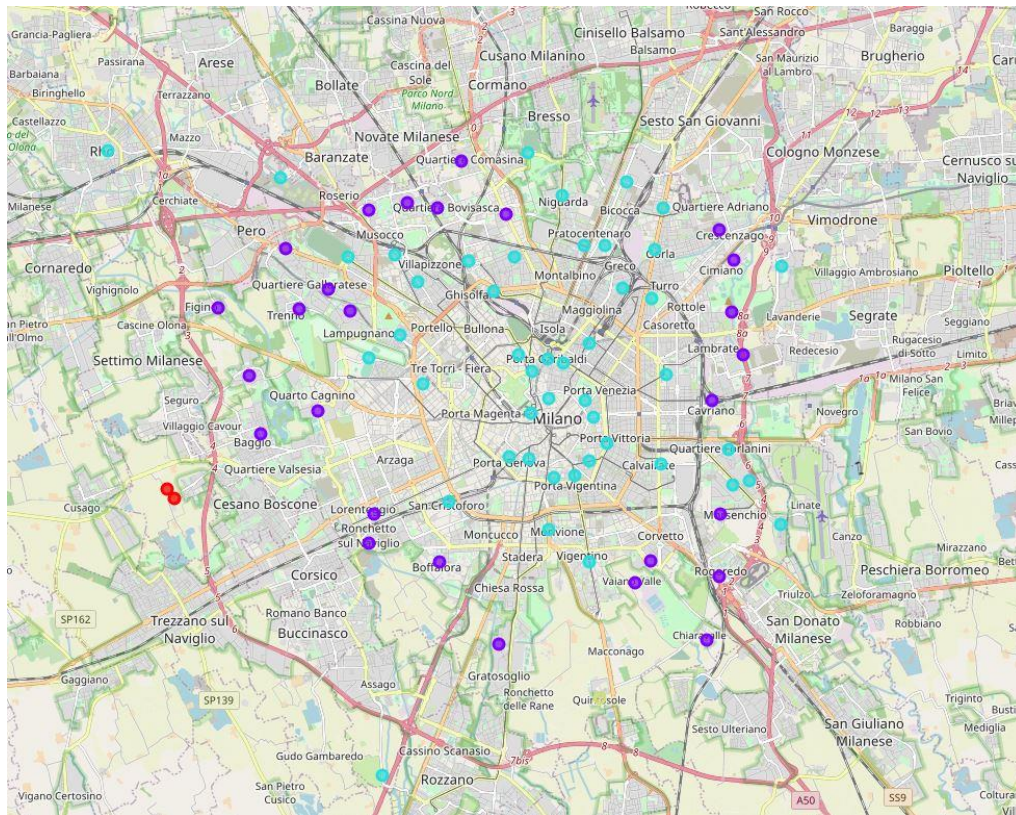
Ethnic restaurants are superimposed with **red** markers and **blue** markers as ethnic restaurants with rating less than 8.



Neighborhoods **without any** ethnic restaurant with **black** markers.



- We used k-means algorithm to cluster neighborhoods in 4 cluster according to count of venue categories in each neighborhood.



4.Results

- There are 340 ethnic restaurants, 174 fast food and 812 italian restaurants in Milan.
- 21 neighborhoods in Milan do not have any ethnic restaurants
- Most ethnic restaurants have good or excellent rating
- Cluster 0: neighborhoods in suburb area without ethnic restaurants
- Cluster 1: neighborhoods between 4 and 6 km from the center where there are mainly bar and italian restaurants
- Cluster 2: neighborhoods in the heart of the city, full of restaurants of all kinds
- Cluster 3: neighborhoods with few ethnic restaurants

5. Discussion

The majority of restaurants are situated at the center of the city as expected. The most promising neighborhoods for opening an ethnic restaurant are in cluster 1. In these neighborhoods the number of competitors is not as high as in the case of cluster 2, moreover these areas are more populated than the neighborhoods of cluster 0 and 3. There are also interesting location in few neighborhoods of cluster 2 that lack in ethnic restaurants

6. Conclusion

Possible neighborhoods to open an ethnic restaurant are:

Bicocca

- Cluster 2
- Has ethnic restaurants with low rating
- University neighborhood



Forlanini

- Cluster 2
- Has few ethnic restaurant
- 6 km from the historic center



Figino

- Cluster 1
- Has few restaurants
- Almost no ethnic restaurant



