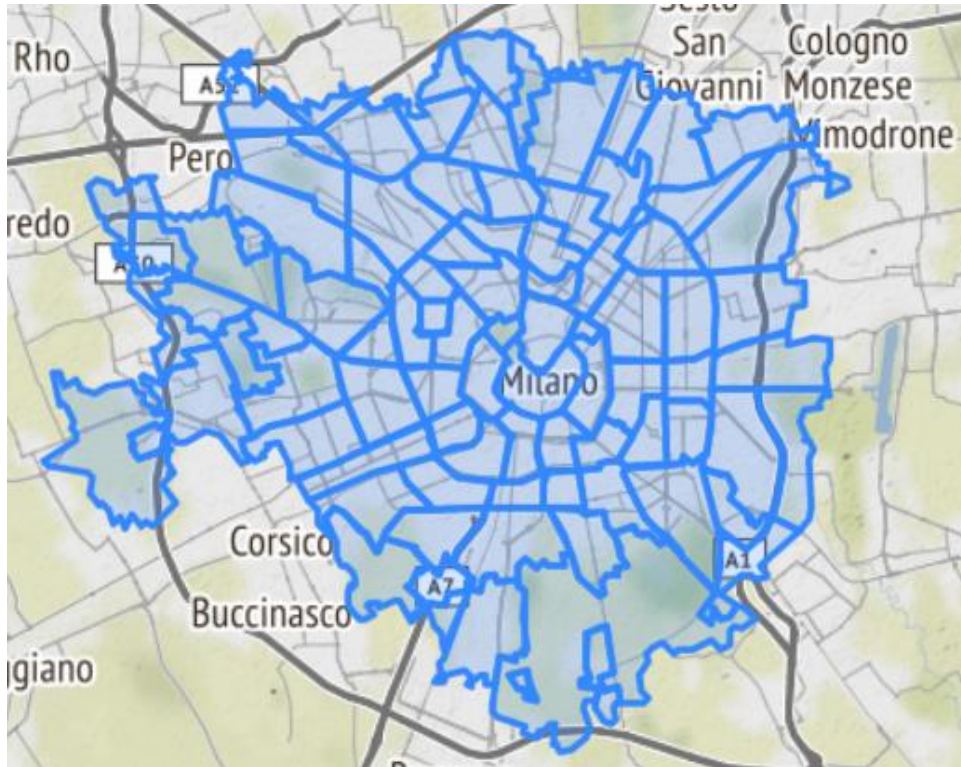# A new restaurant in MIlan

Analysis performed by Paolo Fornoni

Introduction

My audience is an American restaurant chain that decided to open a new restaurant in Milan. The stakeholders want to know in which neighborhoods is better to open a new restaurant. They want to open a restaurant for tourists so the chosen neighborhood need to be in a part of the city with many tourists and tourist attractions. Also, to be sure, they want a neighborhood already full of pub and restaurant: competition will be high but at least the area will be safe to start a new business.
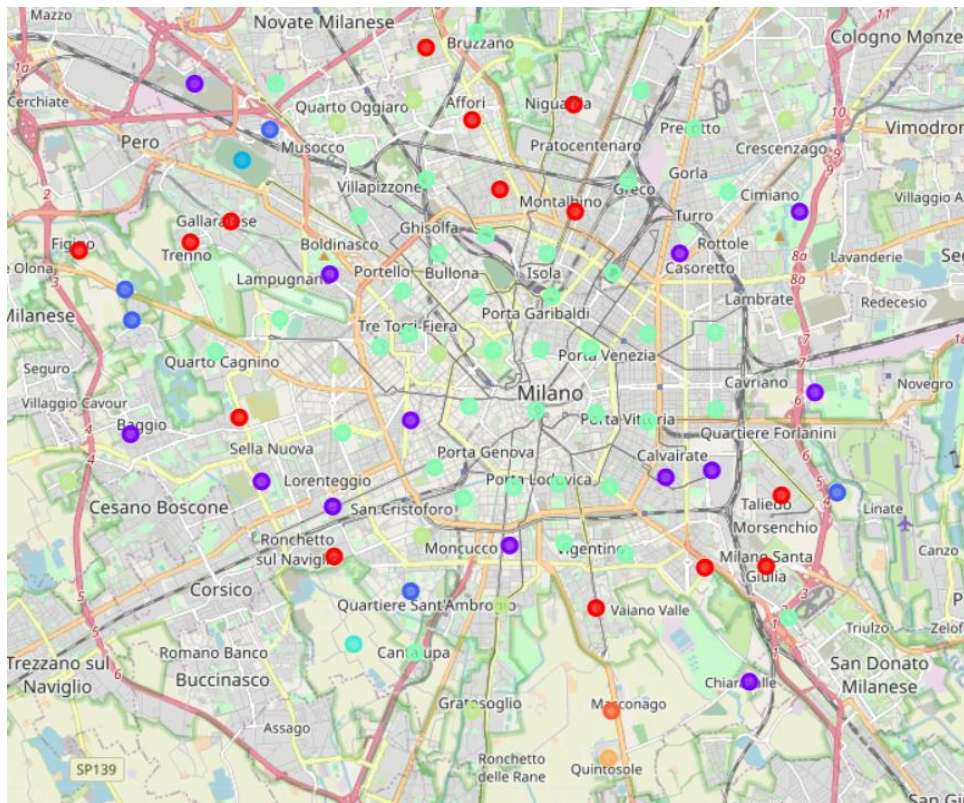

Img 1: Milan neighborhood

Data

I will take the data from Foursquare. To see wich neighborhood in Milan has the most tourist we will get the number of tourist attractions of every neighborhood. We will use a K-means. Probably just seen wich neighborhood has attractions will be more easier and quickly, but we had time so we used a machine learning technique. We will use a K-means clustering to get the neighborhood with more pub and restaurant. Then we will compare the results.

Methodology section

In this project we used just one machine learning technique the K-means, but we used that twice.

First we used it to clustering the neighborhood based on the data that we get from the Foursquare site. Doing that we found out that two neighborhood (id 87 and id 40) haven't tourist attraction and restaurant. We did some research and we found out that those are just section of the city with field and industry: we cancel them from our analisys.

Then we did the K-Means and we divided the neighborhood in 9 cluster.

Img 2: Neighborhoods divided by clusters

Only 4 cluster were relevant, the clusters 0, 1, 6 and 5. The others were just cluster with one or two district and, basically, they were all in the suburs where tourist probably will not going.

Cluster 0 is not good for us because it is full of 'Pizza place': this is not the type of food we wiil sell. For the same reason the cluster 1 is not good too: the neighborhoods in this cluster are full of 'Italian restaurant'.

	Neigh_name	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	RONCHETTO SUL NAVIGLIO - Q.RE LODOVICO IL MORO	Pizza Place	Supermarket	Gym / Fitness Center	Women's Store	Fish & Chips Shop	Event Space	Farm	Farmers Market	Fast Food Restaurant	Flower Shop
1	TRENNO	Pizza Place	Sandwich Place	Plaza	Park	Soccer Field	Bakery	Ice Cream Shop	Adult Education Center	Pub	Food & Drink Shop
5	FIGINO	Bakery	Volleyball Court	Stadium	Women's Store	Flower Shop	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market	Food & Drink Shop
15	COMASINA	Bus Station	Café	Gym / Fitness Center	Metro Station	Fast Food Restaurant	Pizza Place	Bar	General Entertainment	Convenience Store	Recreation Center
30	NIGUARDA - CA' GRANDA - PRATO CENTENARO - Q.RE...	Pizza Place	Sushi Restaurant	Bar	Hotel	Theater	Women's Store	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market
33	TALIEDO - MORSENCHIO - Q.RE FORLANINI	Pizza Place	Tram Station	Tennis Court	Spa	Recording Studio	Hotel	Flea Market	Bus Stop	Shipping Store	Fast Food Restaurant
38	VIGENTINO - Q.RE FATIMA	Pizza Place	Tram Station	Betting Shop	Café	Supermarket	Italian Restaurant	Seafood Restaurant	Food	Food & Drink Shop	Food Court

Img 3: Neighborhoods in cluster 0

	Neigh_name	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 M Comm Ver
6	LORETO - CASORETTO - NOLO	Italian Restaurant	Japanese Restaurant	Ice Cream Shop	Nightclub	Trattoria/Osteria	Pharmacy	Music Venue	Pub	Park	Chinese Restaurar
16	TIBALDI	Italian Restaurant	Japanese Restaurant	Pizza Place	Supermarket	Gym	Café	Bus Stop	Sushi Restaurant	Steakhouse	Brewery
21	QT 8	Italian Restaurant	Sandwich Place	Track	Soccer Field	Park	Restaurant	Fish & Chips Shop	Farm	Farmers Market	Fast Food Restaurar
40	ORTOMERCATO	Italian Restaurant	Farmers Market	Music Venue	Park	Soccer Field	Pizza Place	Flower Shop	Flea Market	Fast Food Restaurant	Fish & Ch Shop
44	UMBRIA - MOLISE - CALVAIRATE	Italian Restaurant	Pizza Place	Tram Station	Convenience Store	Sandwich Place	Sushi Restaurant	Supermarket	Beer Bar	Burger Joint	Bus Stop
51	PORTA MAGENTA	Italian Restaurant	Café	Supermarket	Hardware Store	Pizza Place	Restaurant	Pharmacy	Chinese Restaurant	Bus Stop	Bistro

Img 4: Neighborhoods in cluster 1

Cluster 6 instead is not good because those quarters didn't have the categories of food.

	Neigh_name	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 Mo Comm Venu
3	BOVISASCA	Soccer Field	Italian Restaurant	Restaurant	Bus Stop	Shopping Plaza	Supermarket	Park	Art Gallery	Gym / Fitness Center	Dive Bar
4	PARCO NORD	Women's Store	Football Stadium	Supermarket	Playground	Flower Shop	Farm	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market
7	QUARTO OGGIARO - VIALBA - MUSOCCO	Supermarket	Park	Pizza Place	Women's Store	Flower Shop	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market	Food
14	SAN SIRO	Bus Stop	Supermarket	Chinese Restaurant	Italian Restaurant	Tram Station	Flea Market	Movie Theater	Café	Farmers Market	Sushi Restaura
42	MUGGIANO	Juice Bar	Airport	Soccer Field	Food	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market	Flower Shop	Food Court

Img 5: Neighborhoods in cluster 6

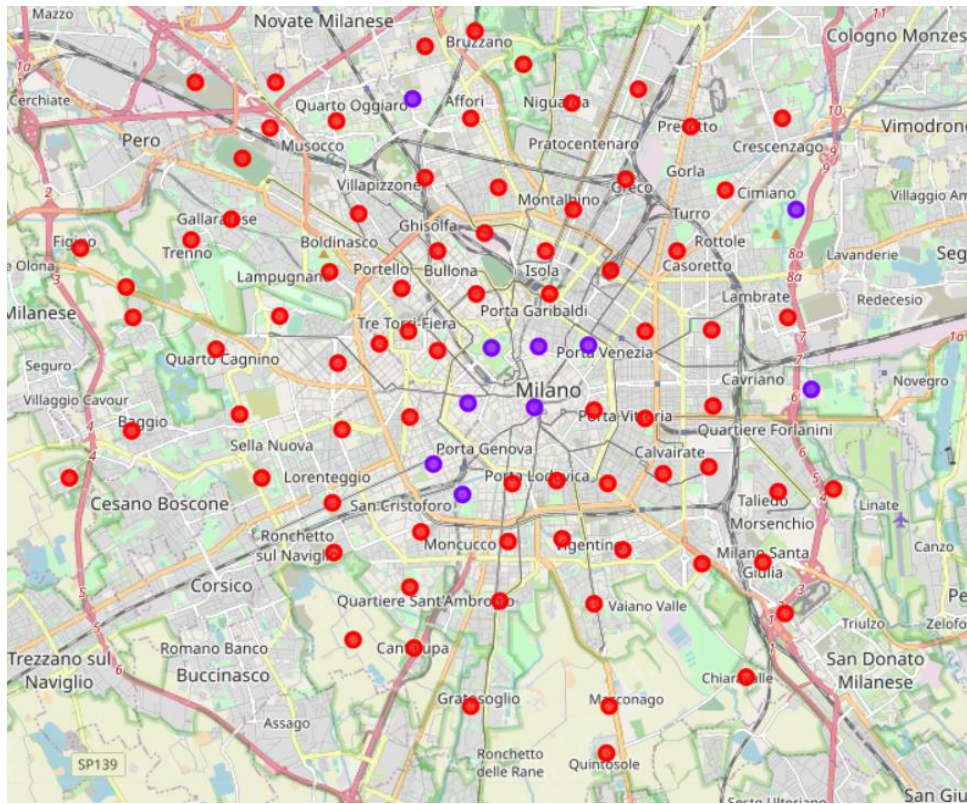Se we decided to consider only the the neighborhoods in cluster 5.

	Neigh_name	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 Mo Comm Venu
3	BOVISASCA	Soccer Field	Italian Restaurant	Restaurant	Bus Stop	Shopping Plaza	Supermarket	Park	Art Gallery	Gym / Fitness Center	Dive Bar
4	PARCO NORD	Women's Store	Football Stadium	Supermarket	Playground	Flower Shop	Farm	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market
7	QUARTO OGGIARO - VIALBA - MUSOCCO	Supermarket	Park	Pizza Place	Women's Store	Flower Shop	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market	Food
14	SAN SIRO	Bus Stop	Supermarket	Chinese Restaurant	Italian Restaurant	Tram Station	Flea Market	Movie Theater	Café	Farmers Market	Sushi Restaura
42	MUGGIANO	Juice Bar	Airport	Soccer Field	Food	Farmers Market	Fast Food Restaurant	Fish & Chips Shop	Flea Market	Flower Shop	Food Court

Img 6: Neighborhoods in cluster 5

Then we started the analysis to found out wich neighborhoods are touristic. We sum up all the categories with some key words on the name: art, monument and museum. Then we use this new category, called 'Tourist', in a new K-means algorithm. In this new algorithm we used a k=2 because

we wanted only two cluster, one for the touristics neighborhoods and one for the not touristcs neighborhoods.

As already told, using a machine learning technique could have been too much, but we had time.

Img 7: Touristic neighborhoods

Results

At the end we select the neighborhoods in the cluster 5. We will select also the touristic neighborhoods. We got 7 districts.

Neighborhood	Tourist	Neigh_Id	Neig_Lat	Neig_long	Cluster Labels	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
BRERA	0.072165	2	45.474252	9.188157	5	Italian Restaurant	Ice Cream Shop	Japanese Restaurant	Hotel	Wine Bar	Pizza Place	Café
DUOMO	0.154930	1	45.463707	9.186948	5	Hotel	Italian Restaurant	Plaza	Monument / Landmark	Ice Cream Shop	Boutique	Coffee Shop
GIARDINI P.TA VENEZIA	0.092784	3	45.474564	9.200231	5	Italian Restaurant	Hotel	Café	Gay Bar	Sushi Restaurant	Cocktail Bar	Art Gallery
MAGENTA - S. VITTORE	0.088235	7	45.464560	9.170394	5	Italian Restaurant	Café	Plaza	Sandwich Place	Ice Cream Shop	Hotel	Historic Site
PARCO SEMPIONE	0.076923	8	45.474131	9.176251	5	Cocktail Bar	Lounge	Wine Bar	Café	Pizza Place	Italian Restaurant	Pub
PORTA GENOVA	0.162791	50	45.453967	9.161885	5	Italian Restaurant	Art Gallery	Boutique	Café	Pizza Place	Hotel	Performing Arts Venue
PORTA TICINESE - CONCHETTA	0.066667	44	45.448517	9.169242	5	Italian Restaurant	Cocktail Bar	Café	Bar	Art Gallery	Tram Station	Gym

Img 8: Neighborhoods where is good to start a new restaurant

Discussion section

As told before, we will not sell italian food so, maybe we will also prefere to choose the two neighborhoods without 'Italian Restaurant' as first category: DUOMO or PARCO SEMPIONE.

Conclusion

From our elaboration we got 2 neighborhoods where we can start our new activity. Anyway, we could improve the analiysis if we find a better way to select which districts are touristics and which districts aren't.