



Analyzing neighborhoods for an opening restaurant in Milan

IBM Data Science Professional Certificate – Capstone Project

Business Problem

The objective is to find the best location to open a new restaurant in Milan.

- Looking for neighborhoods with fewer restaurants, since there is less competition
- Finding which type of cuisine is less present in every location
- Determining the best neighborhood, based on popularity of the missing cuisine and distance from the city center

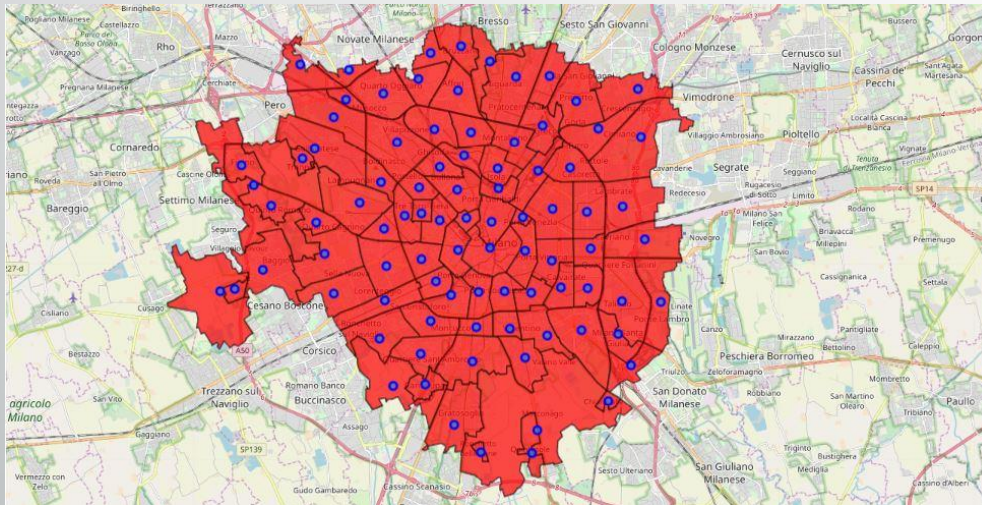
Data

Data sources will be the following:

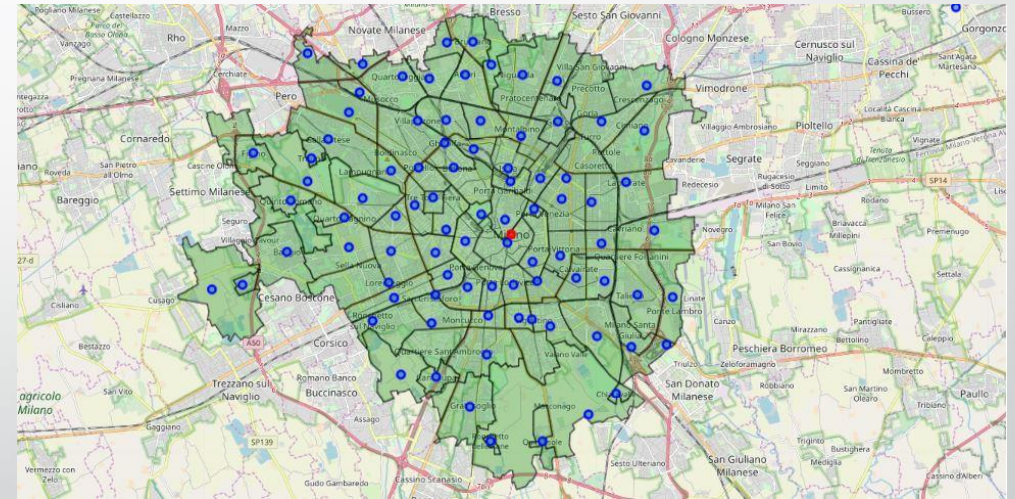
- Geojson file containing the neighborhoods of Milan and their borders
<http://dati.comune.milano.it/dataset/e5aod956-2eff-454d-boea-659cb7b55cob/resource/af78bd3f-ea45-403a-8882-91cca05087fo/download/nilzone.geojson>
- Foursquare API to retrieve the restaurants and their type in each neighborhood

Plot of Milan neighborhoods

Plot using spatial mean of border coordinates

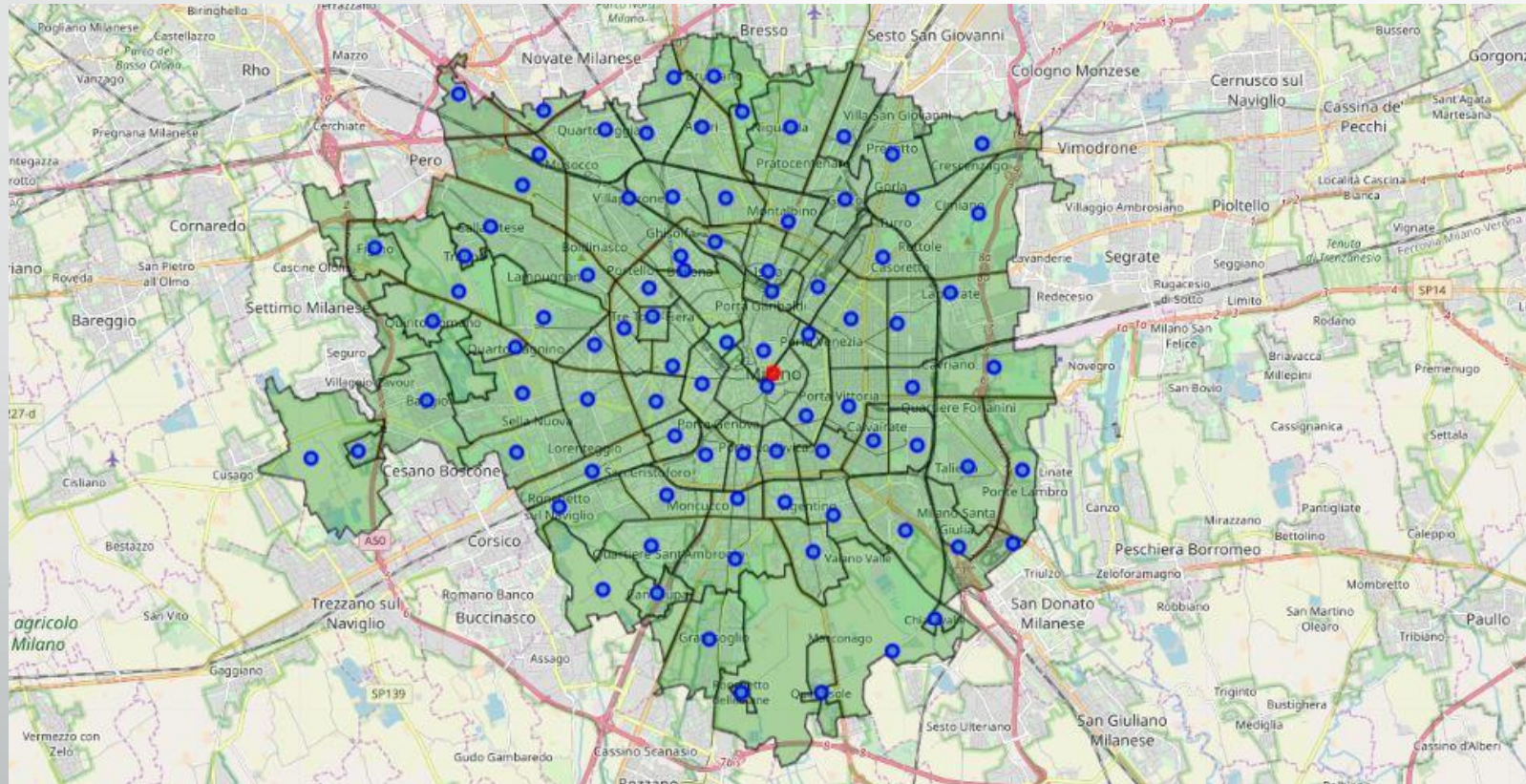


Plot using geopy



Plot of Milan neighborhoods

Choosing the best value from the two methods for each neighborhood



Calculation of the distance from the city center

	Neighborhood	Latitude	Longitude	Dist_from_center
0	SACCO	45.460146	9.123899	5.260875
1	COMASINA	45.460146	9.161565	2.380538
2	STEPHENSON	45.460146	9.122565	5.364142
3	QT 8	45.460146	9.136660	4.275062
4	ORTOMERCATO	45.460146	9.232368	3.356946
5	MAGGIORE - MUSOCCO	45.460146	9.117462	5.759688
6	PARCO LAMBRO - CIMIANO	45.460146	9.250219	4.728826
7	GALLARATESE	45.460146	9.108251	6.474792
8	S. SIRO	45.460146	9.123964	5.255810
9	GHISOLFA	45.460146	9.160657	2.448132
10	BAGGIO	45.460146	9.089843	7.906750
11	QUARTO CAGNINO	45.460146	9.115668	5.898915
12	LORENTEGGIO	45.460146	9.135620	4.355129
13	GIAMBELLINO	45.460146	9.137871	4.181792
14	S. CRISTOFORO	45.460146	9.156440	2.764360
15	RONCHETTO SUL NAVIGLIO	45.460146	9.128216	4.926809
16	TIBALDI	45.460146	9.180175	1.094696
17	CASCINA TRIULZA - EXPO	45.460146	9.099068	7.188747
18	QUARTO OGGIARO	45.460146	9.141661	3.890415
19	AFFORI	45.460146	9.169653	1.790041

Starting from the values of latitude and longitude, it is possible to determine the distance from the city center, in km

Neighborhoods and their distances from the city center

Using Foursquare

Retrieving the restaurants and their type in each neighborhood, using Foursquare API

	Neighborhood	Venue	Venue Category
0	SACCO	Shi So Restaurant Sushi	Japanese Restaurant
1	COMASINA	McDonald's	Fast Food Restaurant
2	COMASINA	McDonald's	Fast Food Restaurant
3	STEPHENSON	Rossopomodoro	Italian Restaurant
4	QT 8	Ristorante Ribot	Italian Restaurant
5	QT 8	Unico Restaurant	Italian Restaurant
6	QT 8	Ristorante Pizzeria Monte Stella	Italian Restaurant
7	QT 8	McDonald's	Fast Food Restaurant
8	QT 8	L'Arca	Italian Restaurant
9	ORTOMERCATO	Oste Italiano	Italian Restaurant
10	ORTOMERCATO	Piccolo Sogno	Italian Restaurant
11	ORTOMERCATO	Trattoria del Nuovo Macello	Italian Restaurant
12	ORTOMERCATO	Syderfood	Italian Restaurant
13	MAGGIORE - MUSOCCO	Osteria da Salvo	Seafood Restaurant
14	PARCO LAMBRO - CIMIANO	Angolo nascosto	Italian Restaurant
15	PARCO LAMBRO - CIMIANO	El magna gatt	Italian Restaurant
16	GALLARATESE	Yun Quick Fusion Cuisine	Asian Restaurant
17	GALLARATESE	McCafé	Fast Food Restaurant
18	GALLARATESE	McDonald's	Fast Food Restaurant
19	GALLARATESE	Mishi-Mishi	Sushi Restaurant

Example of neighborhoods and their venues

Determining the recommended restaurant

Steps to follow:

- Assuming the popularity of a type of restaurant based on the total number of already existing restaurants of the same type
- Determining the top ten type of restaurants in each neighborhood, and from the popularity results, obtain the recommended type

Determining the recommended restaurant

	Category	Popularity
0	Italian Restaurant	738
1	Japanese Restaurant	138
2	Seafood Restaurant	111
3	Sushi Restaurant	100
4	Chinese Restaurant	81
5	Asian Restaurant	42
6	Kebab Restaurant	37
7	Indian Restaurant	33
8	Vegetarian / Vegan Restaurant	30
9	Mediterranean Restaurant	25
10	Fast Food Restaurant	25
11	American Restaurant	13
12	Argentinian Restaurant	13
13	Ramen Restaurant	13
14	Mexican Restaurant	12

Getting the popularity of each type of restaurant, having assumed the popularity as proportional to the number of already existing restaurant of the same type

Restaurant types and their popularity

Determining the recommended restaurant

Calculating the frequency of occurrence of each type of restaurant in each neighborhood, and determining the top ten restaurant types in every location

	Neighborhood	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	ADRIANO	Italian Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
1	AFFORI	Italian Restaurant	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
2	BAGGIO	Italian Restaurant	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
3	BANDE NERE	Italian Restaurant	Sushi Restaurant	Japanese Restaurant	Seafood Restaurant	Falafel Restaurant	Fast Food Restaurant	German Restaurant	Filipino Restaurant	French Restaurant	Vietnamese Restaurant
4	BARONA	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Italian Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant
5	BICOCCA	Italian Restaurant	Sushi Restaurant	Kebab Restaurant	Seafood Restaurant	American Restaurant	Sardinian Restaurant	Vietnamese Restaurant	French Restaurant	Falafel Restaurant	Fast Food Restaurant
6	BOVISA	Italian Restaurant	Vegetarian / Vegan Restaurant	Fast Food Restaurant	Kebab Restaurant	Doner Restaurant	Sicilian Restaurant	German Restaurant	Filipino Restaurant	French Restaurant	Hawaiian Restaurant
7	BOVISASCA	Italian Restaurant	Chinese Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant
8	BRERA	Italian Restaurant	Japanese Restaurant	Seafood Restaurant	Asian Restaurant	Mediterranean Restaurant	Sushi Restaurant	Modern European Restaurant	Shabu-Shabu Restaurant	French Restaurant	Puglia Restaurant
9	BRUZZANO	Italian Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant

Top ten existing location for each neighborhood

Determining the recommended restaurant

Once popularity and ten top locations are available, one can derive the recommended type of restaurant, by looking at the first item not available in the top ten of each neighborhood

	Neighborhood	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	Recommendation
0	ADRIANO	Italian Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	Seafood Restaurant
1	AFFORI	Italian Restaurant	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	Seafood Restaurant
2	BAGGIO	Italian Restaurant	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	Seafood Restaurant
3	BANDE NERE	Italian Restaurant	Sushi Restaurant	Japanese Restaurant	Seafood Restaurant	Falafel Restaurant	Fast Food Restaurant	German Restaurant	Filipino Restaurant	French Restaurant	Vietnamese Restaurant	Chinese Restaurant
4	BARONA	Japanese Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Italian Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Greek Restaurant	Seafood Restaurant
5	BICOCCA	Italian Restaurant	Sushi Restaurant	Kebab Restaurant	Seafood Restaurant	American Restaurant	Sardinian Restaurant	Vietnamese Restaurant	French Restaurant	Falafel Restaurant	Fast Food Restaurant	Japanese Restaurant
6	BOVISA	Italian Restaurant	Vegetarian / Vegan Restaurant	Fast Food Restaurant	Kebab Restaurant	Doner Restaurant	Sicilian Restaurant	German Restaurant	Filipino Restaurant	French Restaurant	Hawaiian Restaurant	Japanese Restaurant
7	BOVISASCA	Italian Restaurant	Chinese Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Ethiopian Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant	Seafood Restaurant
8	BRERA	Italian Restaurant	Japanese Restaurant	Seafood Restaurant	Asian Restaurant	Mediterranean Restaurant	Sushi Restaurant	Modern European Restaurant	Shabu-Shabu Restaurant	French Restaurant	Puglia Restaurant	Chinese Restaurant
9	BRUZZANO	Italian Restaurant	Fast Food Restaurant	Vietnamese Restaurant	Latin American Restaurant	Korean Restaurant	Kebab Restaurant	Japanese Restaurant	Indian Restaurant	Himalayan Restaurant	Hawaiian Restaurant	Seafood Restaurant

	Category	Popularity
0	Italian Restaurant	738
1	Japanese Restaurant	138
2	Seafood Restaurant	111
3	Sushi Restaurant	100
4	Chinese Restaurant	81
5	Asian Restaurant	42
6	Kebab Restaurant	37
7	Indian Restaurant	33
8	Vegetarian / Vegan Restaurant	30
9	Mediterranean Restaurant	25
10	Fast Food Restaurant	25
11	American Restaurant	13
12	Argentinian Restaurant	13
13	Ramen Restaurant	13
14	Mexican Restaurant	12

Neighborhoods and their Recommended restaurant

Selecting the candidate neighborhood

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues
0	ADRIANO	Seafood Restaurant	45.513572	9.251202	7.038687	3
1	AFFORI	Seafood Restaurant	45.517029	9.169653	5.815828	4
2	BAGGIO	Seafood Restaurant	45.461384	9.089843	7.894986	3
3	BANDE NERE	Chinese Restaurant	45.461504	9.136484	4.265065	13
4	BARONA	Seafood Restaurant	45.431686	9.155134	4.783389	1
5	BICOCCA	Japanese Restaurant	45.514917	9.211138	5.586139	15
6	BOVISA	Japanese Restaurant	45.502770	9.161264	4.605204	13
7	BOVISASCA	Seafood Restaurant	45.515842	9.153778	6.160506	4
8	BRERA	Chinese Restaurant	45.471519	9.187735	0.567514	56
9	BRUZZANO	Seafood Restaurant	45.527369	9.173292	6.865102	4
10	BUENOS AIRES - VENEZIA	Asian Restaurant	45.477892	9.212902	2.142291	61
11	CANTALUPA	Seafood Restaurant	45.421965	9.156848	5.635435	1
12	CASCINA TRIULZA - EXPO	Seafood Restaurant	45.523592	9.099068	9.535147	1
13	CENTRALE	Asian Restaurant	45.484352	9.203372	2.195455	54
14	CHIARAVALLE	Seafood Restaurant	45.416697	9.237421	6.669467	1
15	CITTA' STUDI	Asian Restaurant	45.477056	9.226575	3.042737	29
16	COMASINA	Seafood Restaurant	45.526930	9.161565	7.055480	2
17	CORSICA	Asian Restaurant	45.463909	9.230802	3.168273	13
18	DE ANGELI - MONTE ROSA	Kebab Restaurant	45.476130	9.147302	3.533522	24
19	DERGANO	Sushi Restaurant	45.502513	9.176784	4.111718	19

The decision about the best neighborhood will look at:

- distance from the center
- number of existing restaurant

Number of existing restaurant obtained by counting all the venues returned for each neighborhood

Neighborhoods and all their necessary information

Selecting the candidate neighborhood

It is difficult to choose based on the previous dataframe → clustering the dataframe into 4 clusters

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
0	ADRIANO	Seafood Restaurant	45.460146	9.251202	4.804740	3	0
1	AFFORI	Seafood Restaurant	45.460146	9.169653	1.790041	4	0
2	BAGGIO	Seafood Restaurant	45.460146	9.089843	7.906750	3	0
3	BANDE NERE	Chinese Restaurant	45.460146	9.136484	4.288545	13	3
4	BARONA	Seafood Restaurant	45.460146	9.154670	2.897954	1	0
5	BICOCCA	Japanese Restaurant	45.460146	9.211138	1.775423	15	3
6	BOVISA	Japanese Restaurant	45.460146	9.161264	2.402933	13	3
7	BOVISASCA	Seafood Restaurant	45.460146	9.153778	2.965476	4	0
8	BRERA	Chinese Restaurant	45.460146	9.187735	0.770184	56	2
9	BRUZZANO	Seafood Restaurant	45.460146	9.173292	1.535396	4	0
10	BUENOS AIRES - VENEZIA	Asian Restaurant	45.460146	9.212902	1.901684	61	2
11	CANTALUPA	Seafood Restaurant	45.460146	9.156848	2.733604	1	0
12	CASCINA TRIULZA - EXPO	Seafood Restaurant	45.460146	9.099068	7.188747	1	0
13	CENTRALE	Asian Restaurant	45.460146	9.203372	1.249052	54	2
14	CHIARAVALLE	Seafood Restaurant	45.460146	9.237421	3.743452	1	0

Neighborhoods and their clusters

Selecting the candidate neighborhood

Cluster o

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
0	ADRIANO	Seafood Restaurant	45.513572	9.251202	7.038687	3	0
1	AFFORI	Seafood Restaurant	45.517029	9.169653	5.815828	4	0
2	BAGGIO	Seafood Restaurant	45.461384	9.089843	7.894986	3	0
4	BARONA	Seafood Restaurant	45.431686	9.155134	4.783389	1	0
7	BOVISASCA	Seafood Restaurant	45.515842	9.153778	6.160506	4	0
9	BRUZZANO	Seafood Restaurant	45.527369	9.173292	6.865102	4	0
11	CANTALUPA	Seafood Restaurant	45.421965	9.156848	5.635435	1	0
12	CASCINA TRIULZA - EXPO	Seafood Restaurant	45.523592	9.099068	9.535147	1	0
14	CHIARAVALLE	Seafood Restaurant	45.416697	9.237421	6.669467	1	0
16	COMASINA	Seafood Restaurant	45.526930	9.161565	7.055480	2	0
23	FIGINO	Seafood Restaurant	45.492287	9.074819	9.477839	1	0
24	GALLARATESE	Italian Restaurant	45.496641	9.108251	7.235443	4	0
29	GRATOSOGGIO - TICINELLO	Seafood Restaurant	45.412666	9.171992	6.187957	1	0
34	LODI - CORVETTO	Seafood Restaurant	45.434814	9.228742	4.646016	6	0
35	LORENTEGGIO	Seafood Restaurant	45.450799	9.115979	6.093701	7	0
39	MAGGIORE - MUSOCCO	Italian Restaurant	45.505177	9.117462	7.127205	1	0
40	MECENATE	Seafood Restaurant	45.447779	9.247091	4.905244	3	0
41	MUGGIANO	Seafood Restaurant	45.451031	9.069758	9.604874	1	0
43	NIGUARDA - CA' GRANDA	Japanese Restaurant	45.516961	9.195574	5.589422	3	0
44	ORTOMERCATO	Seafood Restaurant	45.452223	9.232368	3.653469	4	0
47	PARCO BOSCO IN CITTÀ	Japanese Restaurant	45.483447	9.099050	7.386161	3	0
48	PARCO DEI NAVIGLI	Seafood Restaurant	45.422774	9.140946	6.242434	1	0
49	PARCO FORLANINI - ORTICA	Seafood Restaurant	45.467985	9.254705	5.022883	5	0
50	PARCO LAMBRO - CIMIANO	Seafood Restaurant	45.499372	9.250219	5.908261	2	0
51	PARCO MONLUE' - PONTE LAMBRO	Seafood Restaurant	45.447044	9.262690	6.058418	3	0
52	PARCO NORD	Seafood Restaurant	45.519945	9.181313	5.950382	1	0
56	QT 8	Seafood Restaurant	45.486940	9.136660	4.767919	5	0
57	QUARTO CAGNINO	Sushi Restaurant	45.472079	9.115668	5.881169	6	0
58	QUARTO OGGIARO	Seafood Restaurant	45.516567	9.141661	6.720965	3	0
59	QUINTO ROMANO	Seafood Restaurant	45.477421	9.091601	7.823020	1	0
60	QUINTOSOLE	Seafood Restaurant	45.401867	9.204357	7.297329	3	0
61	RIPAMONTI	Japanese Restaurant	45.430404	9.202077	4.144944	8	0
62	ROGOREDO	Italian Restaurant	45.431573	9.244480	5.758400	3	0
63	RONCHETTO DELLE RANE	Seafood Restaurant	45.401890	9.181023	7.251771	3	0
64	RONCHETTO SUL NAVIGLIO	Japanese Restaurant	45.439712	9.128216	5.726894	9	0
66	S. SIRO	Italian Restaurant	45.478200	9.123964	5.354870	5	0
67	SACCO	Seafood Restaurant	45.520365	9.123899	7.908696	1	0
71	STADERA	Seafood Restaurant	45.429045	9.179334	4.285763	6	0
72	STEPHENSON	Seafood Restaurant	45.511392	9.122565	7.264144	1	0
77	TRIULZO SUPERIORE	Italian Restaurant	45.432155	9.260206	6.675305	3	0
81	VILLAPIZZONE	Seafood Restaurant	45.502553	9.148469	5.156383	7	0

Selecting the candidate neighborhood

Cluster 1

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
15	CITTA' STUDI	Asian Restaurant	45.477056	9.226575	3.042737	29	1
26	GHISOLFA	Indian Restaurant	45.490783	9.163536	3.398630	41	1
36	LORETO	Indian Restaurant	45.490510	9.222467	3.632286	44	1
38	MAGENTA - S. VITTORE	Seafood Restaurant	45.464689	9.169665	1.646077	32	1
46	PAGANO	Seafood Restaurant	45.468285	9.161100	2.304995	41	1
55	PORTELLO	Asian Restaurant	45.484139	9.154279	3.425705	43	1
73	TIBALDI	Seafood Restaurant	45.441302	9.180175	2.946347	36	1
76	TRE TORRI	Chinese Restaurant	45.478374	9.155361	3.033995	27	1
78	UMBRIA - MOLISE	Seafood Restaurant	45.453199	9.219422	2.720618	33	1
80	VIGENTINA	Vegetarian / Vegan Restaurant	45.451087	9.191564	1.748021	35	1
82	WASHINGTON	Kebab Restaurant	45.461206	9.156310	2.745026	35	1

Selecting the candidate neighborhood

Cluster 2

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
8	BRERA	Chinese Restaurant	45.471519	9.187735	0.567514	56	2
10	BUENOS AIRES - VENEZIA	Asian Restaurant	45.477892	9.212902	2.142291	61	2
13	CENTRALE	Asian Restaurant	45.484352	9.203372	2.195455	54	2
20	DUOMO	Seafood Restaurant	45.464138	9.188555	0.332283	54	2
25	GARIBALDI REPUBBLICA	Sushi Restaurant	45.483527	9.189933	1.859916	63	2
28	GIARDINI PORTA VENEZIA	Asian Restaurant	45.474727	9.200750	1.191326	53	2
31	GUASTALLA	Chinese Restaurant	45.458252	9.200023	1.206977	48	2
32	ISOLA	Asian Restaurant	45.487565	9.188972	2.311273	52	2
42	NAVIGLI	Asian Restaurant	45.450176	9.170897	2.400625	61	2
53	PARCO SEMPIONE	Seafood Restaurant	45.473033	9.176970	1.264677	50	2
54	PORTA ROMANA	Chinese Restaurant	45.451098	9.204923	2.077810	53	2
68	SARPI	Asian Restaurant	45.487855	9.164604	3.094640	48	2
74	TICINESE	Chinese Restaurant	45.450596	9.181951	1.920714	53	2
75	TORTONA	Fast Food Restaurant	45.454124	9.162046	2.633599	55	2
83	XXII MARZO	Kebab Restaurant	45.460146	9.212421	1.867083	49	2

Selecting the candidate neighborhood

Cluster 3

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
3	BANDE NERE	Chinese Restaurant	45.461504	9.136484	4.265065	13	3
5	BICOCCA	Japanese Restaurant	45.514917	9.211138	5.586139	15	3
6	BOVISA	Japanese Restaurant	45.502770	9.161264	4.605204	13	3
17	CORSICA	Asian Restaurant	45.463909	9.230802	3.168273	13	3
18	DE ANGELI - MONTE ROSA	Kebab Restaurant	45.476130	9.147302	3.533522	24	3
19	DERGANO	Sushi Restaurant	45.502513	9.176784	4.111718	19	3
21	EX OM - MORIVIONE	Japanese Restaurant	45.440539	9.193754	2.929383	18	3
22	FARINI	Sushi Restaurant	45.493650	9.173480	3.267605	20	3
27	GIAMBELLINO	Seafood Restaurant	45.446969	9.137871	4.669172	10	3
30	GRECO	Japanese Restaurant	45.502184	9.211233	4.253921	10	3
33	LAMBRATE	Japanese Restaurant	45.483148	9.241998	4.417985	16	3
37	MACIACHINI - MAGGIOLINA	Asian Restaurant	45.497704	9.194891	3.452164	25	3
45	PADOVA	Japanese Restaurant	45.502142	9.230765	5.034007	14	3
65	S. CRISTOFORO	Sushi Restaurant	45.441999	9.159403	3.675857	14	3
69	SCALO ROMANA	Seafood Restaurant	45.438067	9.208088	3.476935	20	3
70	SELINUNTE	Seafood Restaurant	45.472688	9.138665	4.105937	15	3
79	VIALE MONZA	Chinese Restaurant	45.511446	9.225178	5.654620	13	3

Results

Cluster 1 includes the ideal neighborhoods. These neighborhoods are:

- not so far from the city center as Cluster 3
- not so crowded with already existing restaurants as Cluster 2

Considering just those neighborhoods with distance $< 3\text{km}$ and number of existing location ≤ 40

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
0	MAGENTA - S. VITTORE	Seafood Restaurant	45.464689	9.169665	1.646077	32	1
1	TIBALDI	Seafood Restaurant	45.441302	9.180175	2.946347	36	1
2	UMBRIA - MOLISE	Seafood Restaurant	45.453199	9.219422	2.720618	33	1
3	VIGENTINA	Vegetarian / Vegan Restaurant	45.451087	9.191564	1.748021	35	1
4	WASHINGTON	Kebab Restaurant	45.461206	9.156310	2.745026	35	1

Cluster 1 with restrictions

Results

Best neighborhoods are 'MAGENTA – S.VITTORE' and 'VIGENTINA'. These are the closest to the city center with a similar distance.

	Neighborhood	Recommendation	Latitude	Longitude	Dist_from_center	Number_venues	Cluster
0	MAGENTA - S. VITTORE	Seafood Restaurant	45.464689	9.169665	1.646077	32	1
1	TIBALDI	Seafood Restaurant	45.441302	9.180175	2.946347	36	1
2	UMBRIA - MOLISE	Seafood Restaurant	45.453199	9.219422	2.720618	33	1
3	VIGENTINA	Vegetarian / Vegan Restaurant	45.451087	9.191564	1.748021	35	1
4	WASHINGTON	Kebab Restaurant	45.461206	9.156310	2.745026	35	1

The recommended restaurant for 'MAGENTA – S.VITTORE' is more popular than the one recommended for 'VIGENTINA' → 'MAGENTA – S.VITTORE' is the best location.

Discussion and Conclusion

- Simplifications in the results, popularity of a type of restaurant assumed equal to total number of corresponding existing locations
- Presence of other places where to spend time before and after eating should be accounted
- Safety of the neighborhood should also be accounted
- Land prices vary, so the costs for opening the new restaurant in each neighborhood vary
- Decisions can be made by simply looking at distance from the center and number of existing restaurants