Veg restaurant in Bologna

1   Problem definition

The problem is presented by a corporation that wants to open a new veg restaurant in Bologna, a city of about 400,000 inhabitants in Northern Italy.

The initial target costumers of the restaurant are people with medium – high income and 30-50 aged.
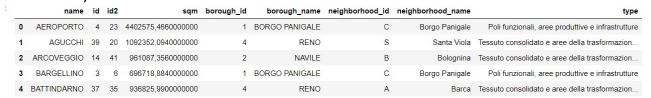
The aim of this work is to divide the areas into group and find the main characteristics of each group. Depending on the output it would be possible to discuss about which characteristics the restaurant should fulfil in order to work with the customers of a zone or of a group of zones. The output could also lead to a redefinition of the characteristics of the restaurant or to a redefinition of the target.

2   Data description

Bologna is divided into 90 'Statistical Areas'. Information on these and other data can be found in the open data site of the Municipality (http://dati.comune.bologna.it/).

The data we have at disposal are:

- Statistical Areas - Three levels: Borough, Neighborood, Stat area
  Source: http://dati.comune.bologna.it/download/file/fid/1275 (headers are translated)

	name	id	id2	sqm	borough_id	borough_name	neighborhood_id	neighborhood_name	type
0	AEROPORTO	4	23	4402575,4660000000	1	BORGO PANIGALE	C	Borgo Panigale	Poli funzionali, aree produttive e infrastrutture
1	AGUCCHI	39	20	1092352,0940000000	4	RENO	S	Santa Viola	Tessuto consolidato e aree della trasformazion...
2	ARCOVEGGIO	14	41	961087,3560000000	2	NAVILE	B	Bolognina	Tessuto consolidato e aree della trasformazion...
3	BARGELLINO	3	6	696718,8840000000	1	BORGO PANIGALE	C	Borgo Panigale	Poli funzionali, aree produttive e infrastrutture
4	BATTINDARNO	37	35	936825,9900000000	4	RENO	A	Barca	Tessuto consolidato e aree della trasformazion...

- Income in 2017 per Statistical Area
  Source: http://dati.comune.bologna.it/download/file/fid/5066

	stat_area_name	tax_payer_nr	total_income_for_state_taxation	total_income_for_coucil_taxation
0	Aeroporto	324	7306571	7130548
1	Agucchi	3203	68382532	65810791
2	Arcoveggio	7819	165245894	159182761
3	Bargellino	68	1483171	1477482
4	Battindarno	6835	150912113	145989868

- Families per Statistical Area
- Source: http://dati.comune.bologna.it/file/dataset/12_famiglie_sezioni_aree_qze_ses

so_annuale_1.csv

	year	census_area_id	stat_area_id	stat_area_name	borough_name	neighborood_name	nr_of_family_members	nr_of_families
29394	2018	8888	99	non indicata	Senza fissa dimora	Senza fissa dimora	1	449
29395	2018	8888	99	non indicata	Senza fissa dimora	Senza fissa dimora	2	12
29396	2018	8888	99	non indicata	Senza fissa dimora	Senza fissa dimora	3	2
29397	2018	8888	99	non indicata	Senza fissa dimora	Senza fissa dimora	4	1
29398	2018	8888	99	non indicata	Senza fissa dimora	Senza fissa dimora	5	2

- Age per Statistical Area - 2018 (12/31?)
  Source: http://dati.comune.bologna.it/download/file/fid/5094

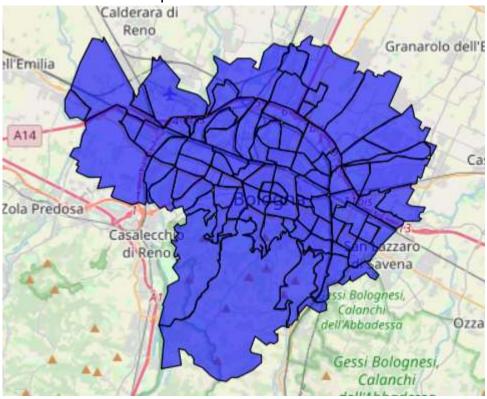|	year	census_2011_section_id	stat_area_id	stat_area_name	borough_name	neighborood_name	sex	age_different_intervals	age_equal_intervals	citizenship	nr_of_residents
0	2018	1	2	Via del Vivaio	Borgo Panigale - Reno	Borgo Panigale	F	02 and before	00-04	Italian	2
1	2018	1	2	Via del Vivaio	Borgo Panigale - Reno	Borgo Panigale	F	03-05	00-04	Italian	1
2	2018	1	2	Via del Vivaio	Borgo Panigale - Reno	Borgo Panigale	F	03-05	00-04	Foreign	1
3	2018	1	2	Via del Vivaio	Borgo Panigale - Reno	Borgo Panigale	F	03-05	05-09	Italian	2
4	2018	1	2	Via del Vivaio	Borgo Panigale - Reno	Borgo Panigale	F	06-14	05-09	Italian	3

- Statistical area cartography
  Source: http://dati.comune.bologna.it/download/file/fid/5161
  This is a shp file. I converted it in geojson using
  https://mygeodata.cloud/converter/shp-to-geojson
  The result on the map is

  From the map I take the coordinates of the polygons of each area in order to

query Foursquare

	stat_area	coords
0	VILLAGGIO DELLA BARCA	[[11.28887243687619, 44.493839678171874], [11....
1	BATTINDARNO	[[11.304354670908275, 44.502231153585114], [11....
2	CANALE DI RENO	[[11.301304394939708, 44.490825007457346], [11....
3	CASERME ROSSE-MANIFATTURA	[[11.364140469163491, 44.52279866578613], [11....
4	CNR	[[11.34781923054498, 44.524232532194105], [11....