

# **Predicting best zones and districts for setting up Georgian restaurant in Doha, Qatar**

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# Introduction

- During the second half of the 20th century Qatar has witnessed its first urbanization period, which was linked to the rapidly increasing oil production. Today, new development strategies, which have been implemented to diversify its economy, have led to a second urban transformation process. Concomitantly, Doha has witnessed its rise from being a small fishing village community in the middle of the 20th century to an emerging regional urban center with more than 2.5 million inhabitants.

Recently Georgia introduced no visa entry for GCC residents as a result around 400 thousand tourist from GCC visited the country and tried it fabulous cosine. Starting a Georgian restaurant in Doha can be a great business opportunity, but you need to distinguish yourself from others to enjoy long-term success.

# Business Opportunity

In this project we investigated possibility to find an optimal location for a restaurant. Specifically, this report is targeting stakeholders interested in opening an Georgian restaurant in Doha, Qatar.

There are a lot of restaurants in Doha, so we will try to detect locations that are not already crowded with restaurants. We are also particularly interested in areas with no Georgian restaurants around. We would also prefer most populated locations, assuming that first two conditions are met.

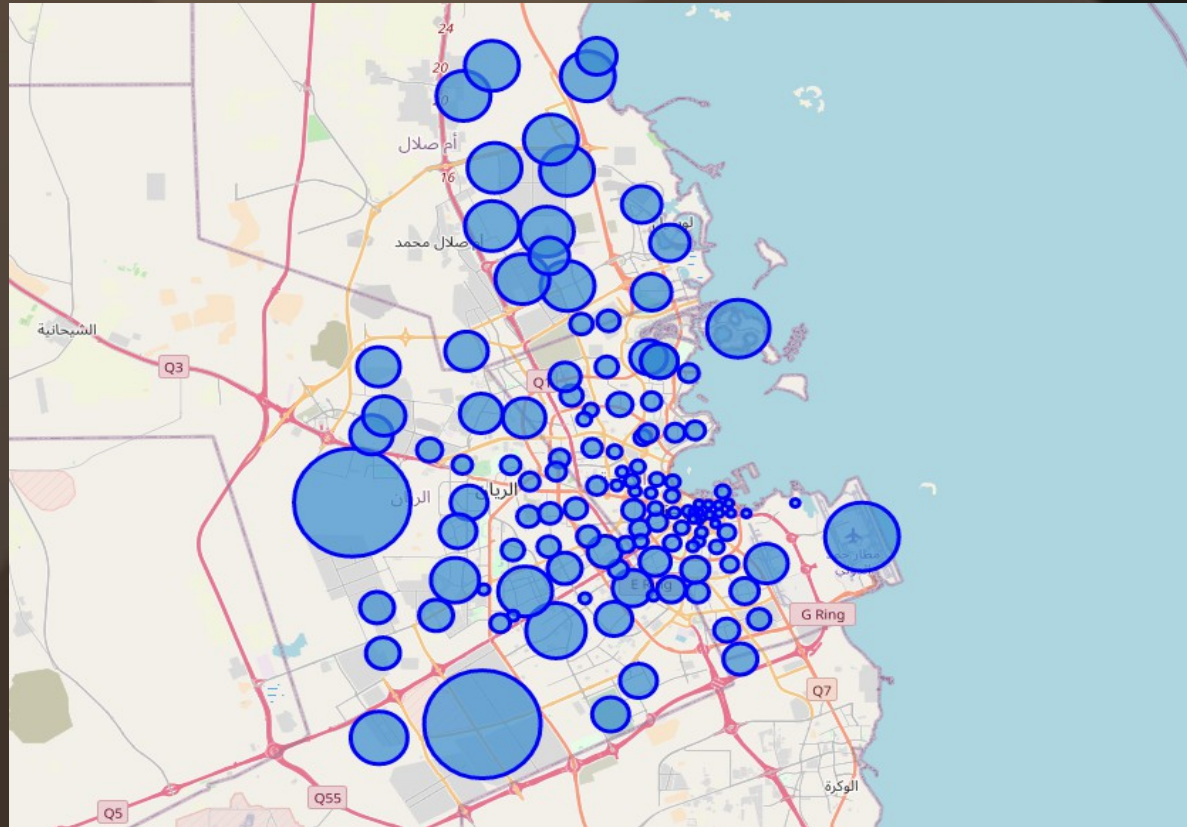
We used our data science powers to generate a few most promising neighborhoods based on this criteria. Advantages of each area will then be clearly expressed so that best possible final location can be chosen by stakeholders.

# Data Selection

- Existing zones and districts of Doha were used in this project. Centers of candidate areas were generated algorithmic and approximate addresses of centers of those areas was obtained using Wikipedia ([https://en.wikipedia.org/wiki/Zones\\_of\\_Qatar](https://en.wikipedia.org/wiki/Zones_of_Qatar)) and OpenStreetMap Nominatim API data
- Number of venues and their type and location in every neighborhood was obtained using Foursquare API
- Population of each neighborhood will be obtained from Wikipedia

# Data Selection

- Here are neighborhoods that were used to get venues from Foursquare API



# Data Selection

Foursquare API was used to explore neighborhoods in Doha and get all venues.

- It was established that there are no Georgian restaurants in Doha.

```
In [22]: Doha_venues_[Doha_venues_['Venue Category']=='Caucasian Restaurant'].count()
```

```
Out[22]: Neighborhood      0  
Neighborhood Latitude      0
```

# Methodology

- ▶ Once all data was collected it was normalized

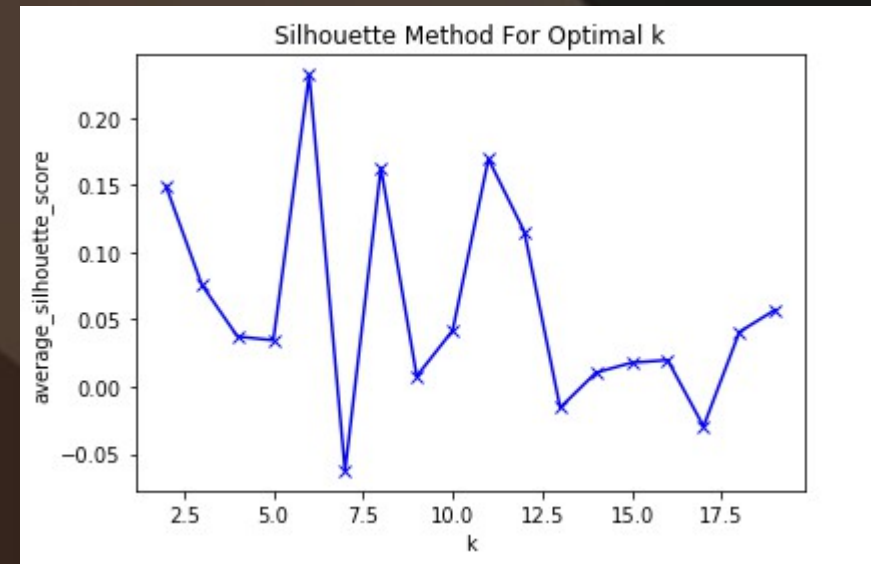
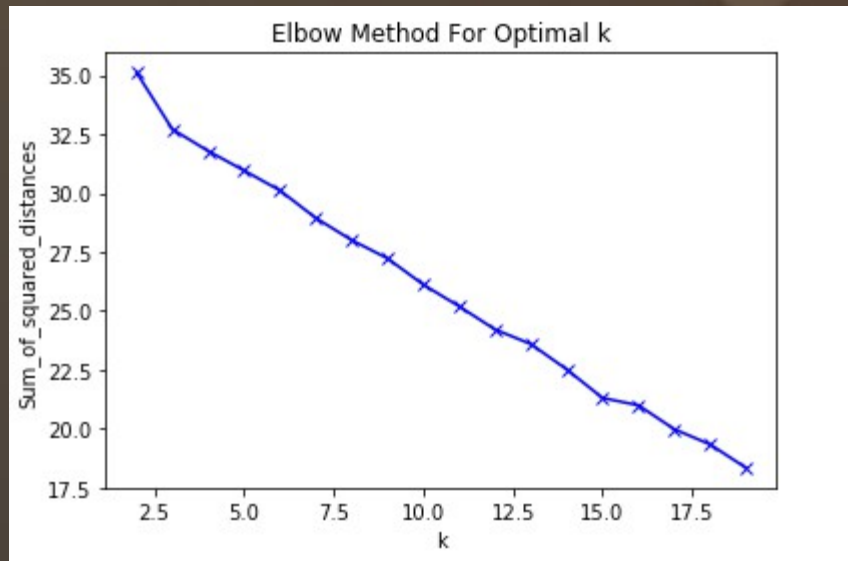
[illegible]



# Methodology

After normalization process we were ready to cluster our neighborhoods using k-mean method.

We used elbow and average silhouette score methods to decide number of clusters.

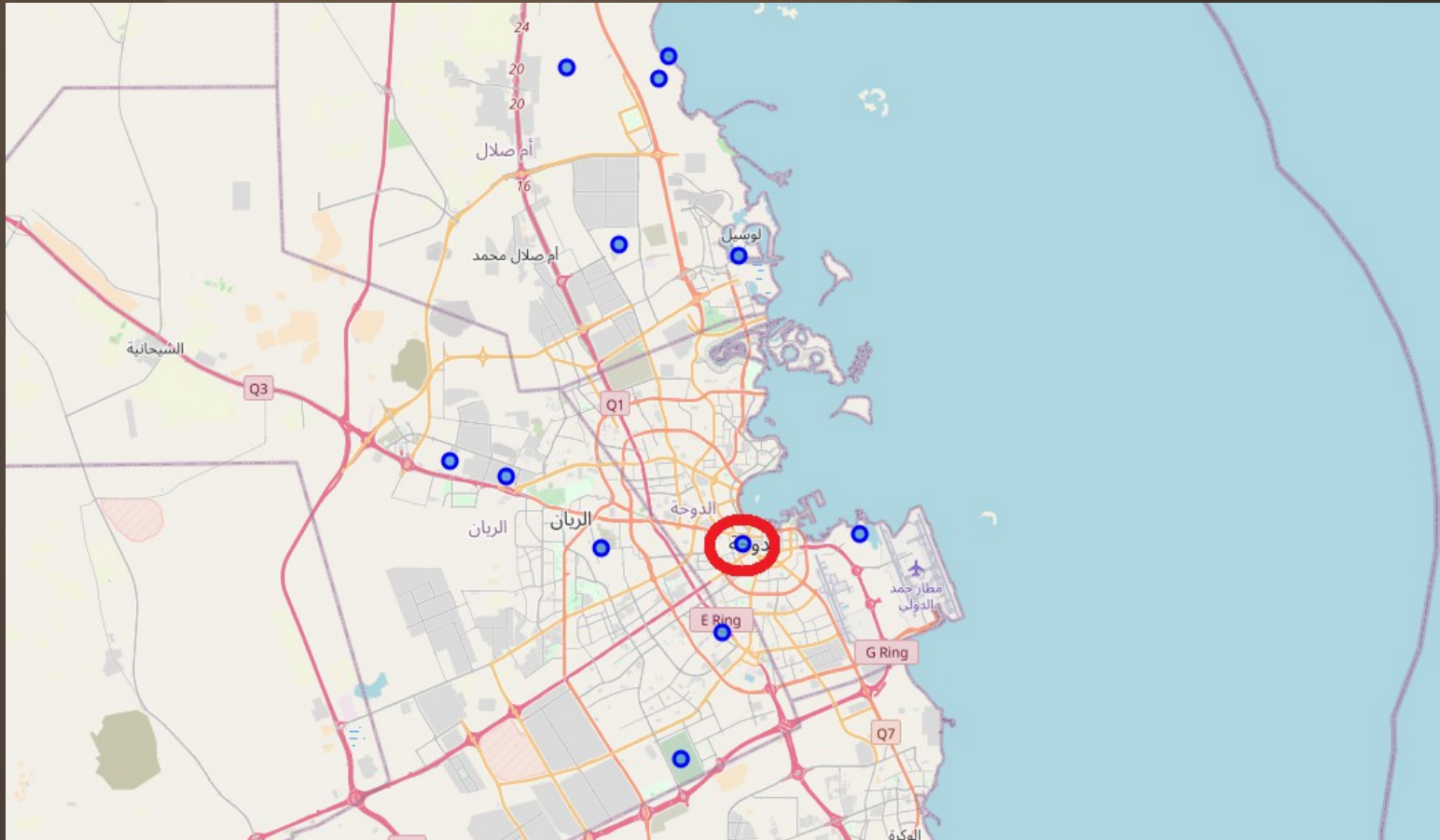


Optimal number of clusters was selected as 6



# Methodology

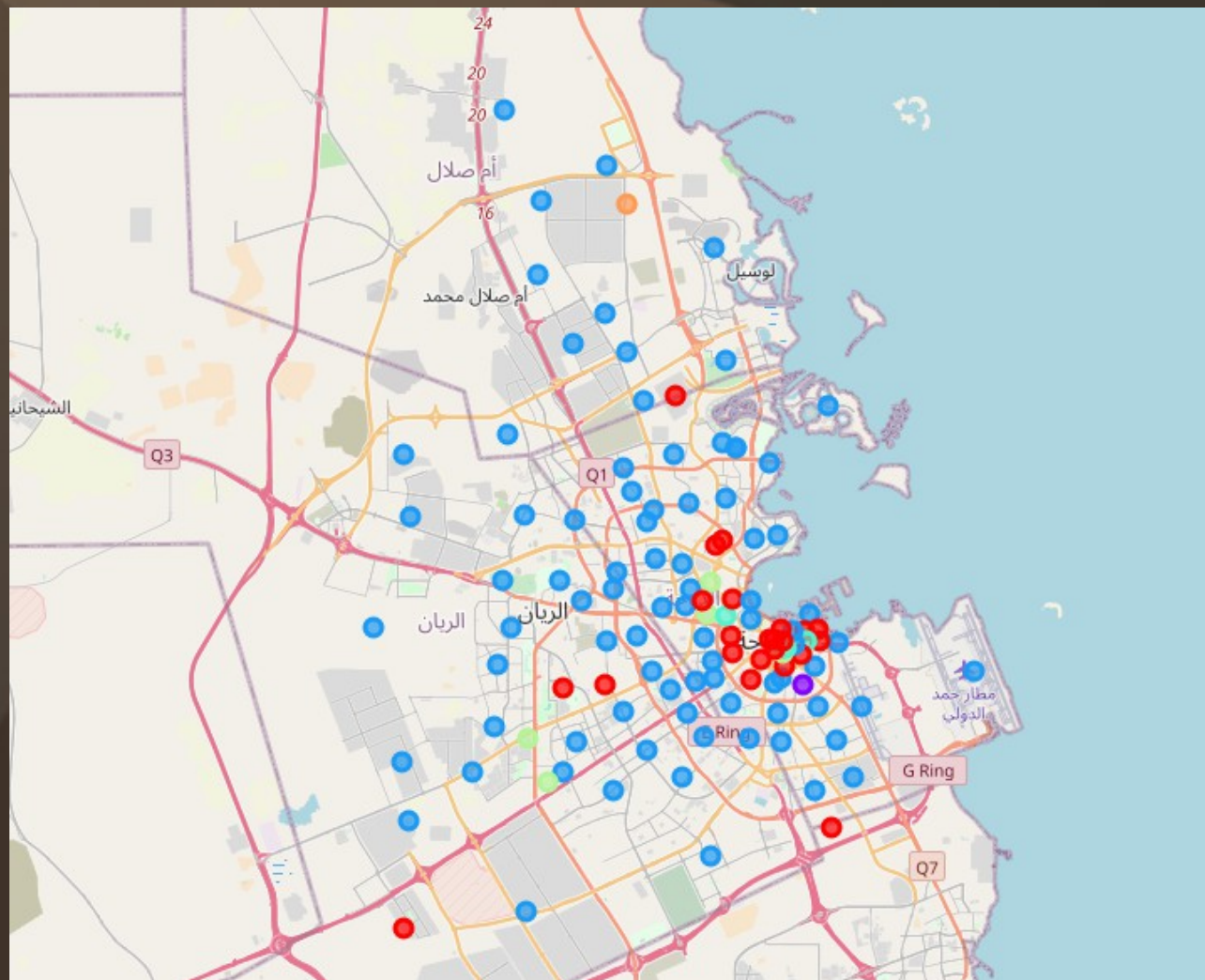
While preparing data for clustering we discover that there are number of neighborhoods with no venues at all



Note one neighborhood in downtown Doha that is Mushayrib, zone 13

# Result

## Clusters in Doha



# Result

## Cluster 1

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
48	Fereej Al Murra	28367.5	10	410.0	Fereej Al Murra,z55	0	Department Store	Asian Restaurant	Cafeteria	Farm
49	Fereej Al Manaseer	28367.5	10	250.0	Fereej Al Manaseer,z55	0	Athletics & Sports	Zoo	Dessert Shop	Farm
89	Hamad Medical City	8707	3	258.0	Hamad Medical City,z37	0	Asian Restaurant	Athletics & Sports	Pool Hall	Cafeteria
110	Wadi Al Sail	240	1	322.0	Wadi Al Sail,z20	0	Pharmacy	Asian Restaurant	Boutique	Cafeteria
125	Fereej Al Asmakh	695.333	3	73.0	Fereej Al Asmakh,z5	0	Asian Restaurant	Indonesian Restaurant	Zoo	Farm

# Result

## Cluster 2

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
4	Rawdat Al Hamama	4416.75	12	1259.0	Rawdat Al Hamama,z70	1	Diner	Zoo	Clothing Store	Farm

# Result

## Cluster 3

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
3	Mebaireek	12483	1	1350.0	Mebaireek,z81	2	Market	Restaurant	Department Store	Falafel Restaurant
23	Al Tarfa	1840.33	3	507.0	Al Tarfa,z68	2	Coffee Shop	Food Court	Zoo	Dessert Shop
30	Lejbailat	4151	1	334.0	Lejbailat,z64	2	Fast Food Restaurant	Coffee Shop	Hotel	Palace
54	Mehairja	4098.83	6	490.0	Mehairja,z54	2	Hotel	Park	Zoo	Department Store
55	Baaya	4098.83	6	490.0	Baaya,z54	2	Athletics & Sports	Hotel	Gym / Fitness Center	Turkish Restaurant
74	Zone 50	1137	1	778.0	Zone 50,z50	2	Gym / Fitness Center	Restaurant	Zoo	Department Store
95	Al Markhiya	6242	1	464.0	Al Markhiya,z33	2	Fast Food Restaurant	Flower Shop	Hotel	Café
106	Rawdat Al Khail	18200	1	368.0	Rawdat Al Khail,z24	2	Indian Restaurant	Gym	Hotel	Shop & Service
107	Fereej Bin Mahmoud	17086	1	400.0	Fereej Bin Mahmoud,z23	2	Hotel	Thai Restaurant	Korean Restaurant	Food & Drink Shop
108	Fereej Bin Mahmoud	11241	1	300.0	Fereej Bin Mahmoud,z22	2	Hotel	Fast Food Restaurant	Korean Restaurant	Gym / Fitness Center
112	Al Mirqab	346	2	155.0	Al Mirqab,z18	2	Hotel	Furniture / Home Store	Motel	Market
113	As Salatah	346	2	155.0	As Salatah,z18	2	Hotel	Restaurant	Middle Eastern Restaurant	Café
114	Old Al Hitmi	3013	2	126.0	Old Al Hitmi,z17	2	Turkish Restaurant	Hotel	Middle Eastern Restaurant	Sandwich Place
116	Old Al Ghanim	16334	1	178.0	Old Al Ghanim,z16	2	Hotel	Restaurant	Zoo	Department Store
117	Ad Dawhah al Jadidah	15920	1	199.0	Ad Dawhah al Jadidah,z15	2	Turkish Restaurant	Hotel	Bakery	Café
118	Fereej Abdel Aziz	15706	1	300.0	Fereej Abdel Aziz,z14	2	Hotel	Pakistani Restaurant	Shawarma Place	Furniture / Home Store
121	Rumeilah	63	1	282.0	Rumeilah,z11	2	Park	Middle Eastern Restaurant	Zoo	Department Store
122	Wadi Al Sail	8	1	282.0	Wadi Al Sail,z10	2	Coffee Shop	Pizza Place	Residential Building (Apartment / Condo)	Restaurant
127	Al Najada	695.333	3	73.0	Al Najada,z5	2	Hotel	Middle Eastern Restaurant	Zoo	Department Store
128	Mushayrib	9791	1	155.0	Mushayrib,z4	2	Asian Restaurant	Hotel	Bar	BBQ Joint
129	Mushayrib	2443	2	250.0	Mushayrib,z3	2	Coffee Shop	Hotel	Plaza	Currency Exchange
130	Fereej Mohamed Bin Jasim	2443	2	100.0	Fereej Mohamed Bin Jasim,z3	2	Coffee Shop	Hotel	Restaurant	Zoo
132	Al Jasrah	240	1	178.0	Al Jasrah,z1	2	Café	Coffee Shop	Middle Eastern Restaurant	Restaurant

# Results

## Cluster 4

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
103	Najma	28228	1	296.0	Najma,z26	3	Bed & Breakfast	Fast Food Restaurant	Farm	Falafel Restaurant



# Result

## Cluster 5

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
0	Sawda Natheel	100	1	6715.0	Sawda Natheel,z97	4	Campground	Zoo	Department Store	Falafel Restaurant
1	Abu Samra	984	1	7987.0	Abu Samra,z96	4	Border Crossing	Airport	Beach	American Restaurant
2	Al Karaana	2614	1	6642.0	Al Karaana,z83	4	Airport Service	Lake	Airport	Summer Camp
5	Leabaib	4416.75	12	1259.0	Leabaib,z70	4	Coffee Shop	Grocery Store	Athletics & Sports	Intersection
6	Jeryan Jenaihat	4416.75	12	1259.0	Jeryan Jenaihat,z70	4	Beach	Construction & Landscaping	Fast Food Restaurant	Zoo
8	Al Ebb	4416.75	12	1259.0	Al Ebb,z70	4	Coffee Shop	Ice Cream Shop	Clothing Store	Italian Restaurant
9	Al Sakhama	4416.75	12	1259.0	Al Sakhama,z70	4	Farm	Soccer Stadium	Boarding House	Dessert Shop
10	Al Masrouhiya	4416.75	12	1259.0	Al Masrouhiya,z70	4	Construction & Landscaping	Campground	Art Gallery	Zoo
14	Al Daayen	4416.75	12	1259.0	Al Daayen,z70	4	Beach	Turkish Restaurant	Cafeteria	Zoo
15	Wadi Al Wasaah	4416.75	12	1259.0	Wadi Al Wasaah,z70	4	Farm	Boat or Ferry	Cafeteria	Burger Joint
17	Wadi Al Banat	267.6	5	902.0	Wadi Al Banat,z69	4	Shopping Mall	Zoo	Farmers Market	Falafel Restaurant
18	Al Kharayej	267.6	5	902.0	Al Kharayej,z69	4	Pizza Place	Zoo	Department Store	Falafel Restaurant
20	Al Egla	267.6	5	902.0	Al Egla,z69	4	Lounge	Cricket Ground	Rugby Pitch	Bus Station
21	Jelaiah	1840.33	3	507.0	Jelaiah,z68	4	Cable Car	Zoo	Department Store	Falafel Restaurant
22	Jeryan Nejaima	1840.33	3	507.0	Jeryan Nejaima,z68	4	Fast Food Restaurant	Market	Castle	Coffee Shop



# Result

## Cluster 6

	District	Population	P	radius	Neighborhood	Cluster Labels	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue
109	Rumeilah	1590	1	252.0	Rumeilah,z21	5	Café	Zoo	Department Store	Falafel Restaurant
115	Al Rufaa	3013	2	126.0	Al Rufaa,z17	5	Café	Zoo	Department Store	Falafel Restaurant
126	Barahat Al Jufairi	695.333	3	73.0	Barahat Al Jufairi,z5	5	Café	Zoo	Department Store	Falafel Restaurant

# Discussion

Our analysis shows that even though there are plenty of venues in Doha there are still a lot of areas that could be used to open new Georgian restaurant.

- ♦ Starting with neighborhoods with no venues: We could see that there is big opportunity in Zone 70 which is constantly developing and have growing local population. Also we can see that Mushayrib in Zone 13 which is located in downtown Doha would be a great opportunity due to possible high tourist traffic
- ♦ Cluster 1 shows good potential as it has good volume of population on Zone 55
- ♦ Cluster 3 would be a good opportunity result as it has big local population as well as hotels as most common venue (indicating a lot of tourists). Note that Mushayrib districts are part of this cluster.
- ♦ Cluster 4 would be a great opportunity. There are 28 thousand population with almost no restaurants. I would recommend extra analysis on income before taking decision

Summarizing above data I would recommend Mushayrib district in downtown Doha as a place to be considered to open Georgian restaurant

# Conclusion

Purpose of this project was to identify Doha districts with low number of restaurants in order to help stakeholders in narrowing down the search for optimal location for a new Georgian restaurant. By using k-means cluster algorithm Doha districts were separated into nine different clusters based on venues available through Foursquare API. Presence of 7th cluster (districts with no venues) shows that there might be not enough data in Foursquare API for Doha in particular and final decision on optimal restaurant location should be made by stakeholders based on specific characteristics of neighborhoods and locations in every recommended zone, taking into consideration additional factors like housing pricing, income, pedestrian density, number of tourists, hotel occupancy, schools availability, traffic density, social and economic dynamics of every districts, etc.