Selecting Best Location to open a new Sports Mall in Giza Governorate, Egypt

Capstone Project - The Battle of Neighborhoods

Introduction

- The study of selecting optimum location for opening a business is concerned with the optimal placement of facility depending on several criteria as;
  - Size of the city's trading area
  - Population and population trends
  - Total purchasing power and who has it
  - Total retail trade potential for different lines of trade
  - Number and size of competition
  - Quality and aggressiveness of competition
- Once you have a general idea of what city is selected , choose an area or type of location within that city by evaluating these:
  - Customer attraction power
  - Availability of access routes to the stores
  - Zoning regulations
  - Geographic direction of the city's expansion
  - Sales and traffic growth prospects of the trade area
  - Demographics of neighborhoods

Introduction

- "In this study we will focus on the location analysis using the following factors;
  - Customer attraction power, in other word the existing landmarks and traffic generator in the area
  - Availability of access routes to the stores
  - Demographics of neighborhoods

The above factors shall be the basis for achieving the business requirement

Business Requirement

"Select the best location for opening a Sports Mall"

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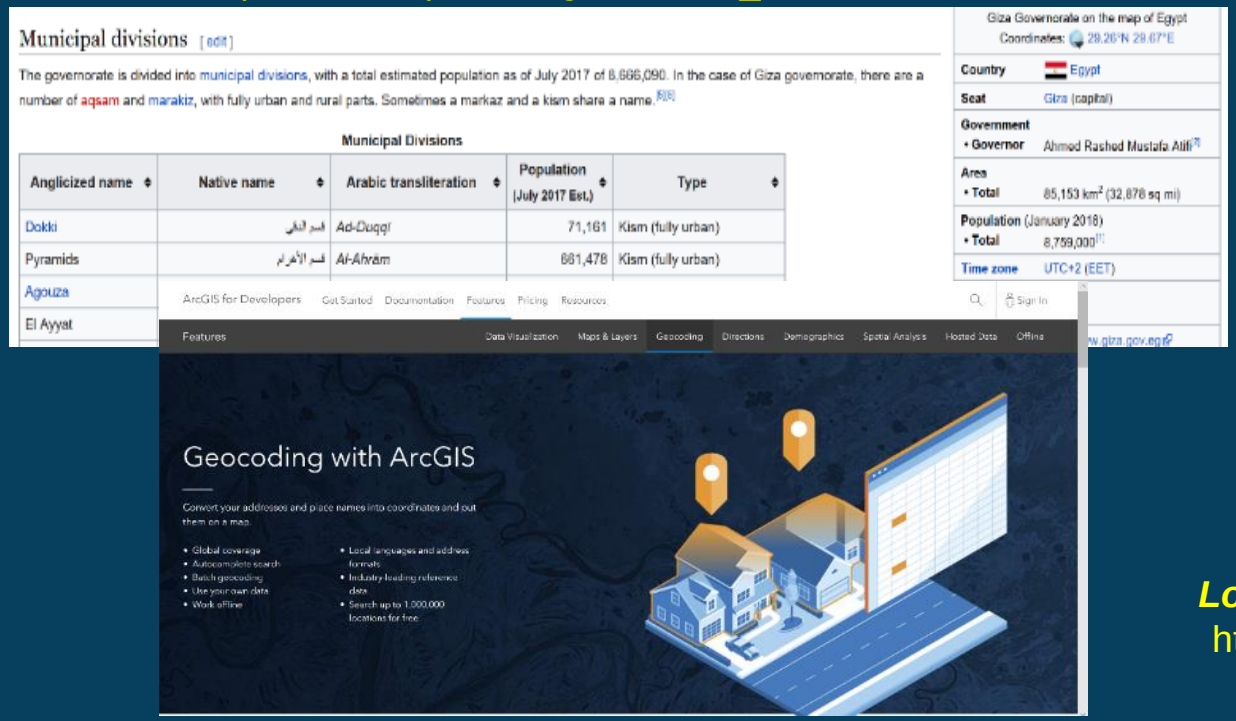
"Select the best location for opening a Sports Mall"

- Criteria:
  - Density of venues in the cluster, higher density means high potential
  - Density of Sports Facilities in each cluster, higher density means high potential
  - The existence of Sports Mall in cluster, lower density means high potential

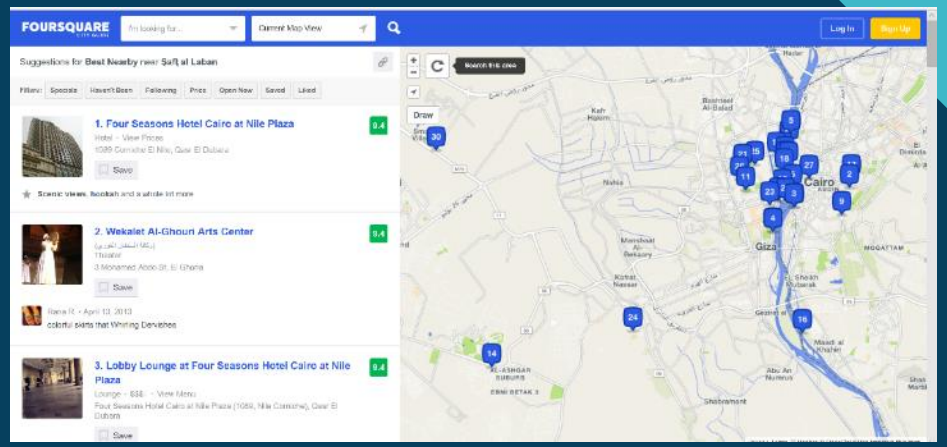
Data Requirements & Acquisition

- The required data to fulfil the above business requirements are as follows;
  - Municipal divisions of Giza Governorate
  - Longitude & Latitude coordinates for Municipal Divisions
  - Characteristics of each municipal division for existing venues and its categories

Municipal divisions
https://en.wikipedia.org/wiki/Giza_Governorate



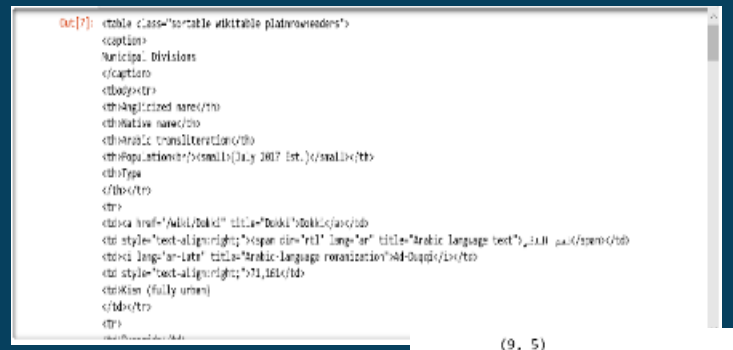
Characteristics of each municipal division
https://foursquare.com/explore?mode=url&ne=30.111276%2C31.307774&sw=29.927267%2C31.020069



Longitude & Latitude coordinates
https://geocode.arcgis.com/arcgis/

Data Preparation

- The required data is processed to be ready for the analysis;
  - Exploring Map for the study area.
  - Scraping wiki page and select urban areas only.
  - Acquiring the coordinates of the selected municipal divisions



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<caption>
Municipal Divisions
</caption>
<tbody><tr>
<th>Anglicized name</th>
<th>Native name</th>
<th>Arabic transliteration</th>
<th>Population<br /><small>(July 2017 Est.)</small></th>
<th>Type
</th></tr>
<tr>
<td><a href="/wiki/Dokki" title="Dokki">Dokki</a></td>
<td style="text-align:right;"><span dir="rtl" lang="ar" title="Arabic language text">الدقي</span></td>
<td><i lang="ar-Latn" title="Arabic-language romanization">Ad-Duqqi</i></td>
<td style="text-align:right;">71,161</td>
<td>Kism (fully urban)
</td></tr>
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Out[9]:
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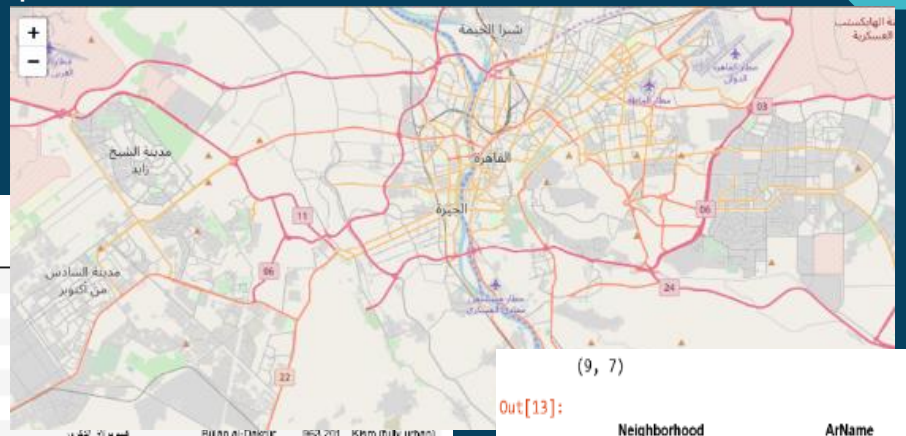
	Neighborhood					
0	Dokki					
1	Pyramids					
2	Agouza					
3	Giza					
4	El Omraniya					
5	Sheikh Zayed City					
6	Bulaq	قسم بولاق الدكرور	Būlāq al-Dakrūr	963,201	Kism (fully urban)	
7	Imbaba	قسم امبابة	Imbābah	634,686	Kism (fully urban)	
8	6th of October City (2)	قسم ثان 6 أكتوبر	Madinat Sittah Uktubar 2	197,019	Kism (fully urban)	
9	6 October City (1 & 3)	قسم ثالث 6 أكتوبر / قسم أول 6 أكتوبر	Madinat Sittah Uktūbar 1 & 3	152,999	Kism (fully urban)	

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Out[11]:
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	Neighborhood	ArName	ArTrans	Population	Category
0	Dokki	قسم الدقي	Ad-Duqqī	71,161	Kism (fully urban)
1	Pyramids	قسم الأهرام	Al-Ahrām	661,478	Kism (fully urban)
2	Agouza	قسم العجوزة	Al-'Ajūzah	279,400	Kism (fully urban)
3	Giza	قسم الجيزة	Al-Jīzah	286,668	Kism (fully urban)
4	El Omraniya	قسم العمرانية	Al-'Umrāniyah	367,274	Kism (fully urban)
5	Sheikh Zayed City	قسم الشيخ زايد	Madinat El Saikh Zaied	90,997	Kism (fully urban)
6	Bulaq	قسم بولاق الدكرور	Būlāq al-Dakrūr	963,201	Kism (fully urban)
7	Imbaba	قسم امبابة	Imbābah	634,686	Kism (fully urban)
9	Sixth of October	قسم أول 6 أكتوبر / قسم ثالث 6 أكتوبر	Sixth of October	152,999	Kism (fully urban)

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(9, 7)
Out[13]:
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	Neighborhood	ArName	ArTrans	Population	Category	Latitude	Longitude
0	Dokki	قسم الدقي	Ad-Duqqī	71,161	Kism (fully urban)	30.03512	31.21398
1	Pyramids	قسم الأهرام	Al-Ahrām	661,478	Kism (fully urban)	30.00636	31.12200
2	Agouza	قسم العجوزة	Al-'Ajūzah	279,400	Kism (fully urban)	30.05061	31.21090
3	Giza	قسم الجيزة	Al-Jīzah	286,668	Kism (fully urban)	30.00956	31.21381
4	El Omraniya	قسم العمرانية	Al-'Umrāniyah	367,274	Kism (fully urban)	30.00243	31.20188
5	Sheikh Zayed City	قسم الشيخ زايد	Madinat El Saikh Zaied	90,997	Kism (fully urban)	30.05339	31.00164
6	Bulaq	قسم بولاق الدكرور	Būlāq al-Dakrūr	963,201	Kism (fully urban)	30.03976	31.18943
7	Imbaba	قسم امبابة	Imbābah	634,686	Kism (fully urban)	30.07625	31.20666
9	Sixth of October	قسم أول 6 أكتوبر / قسم ثالث 6 أكتوبر	Sixth of October	152,999	Kism (fully urban)	29.96630	30.93550

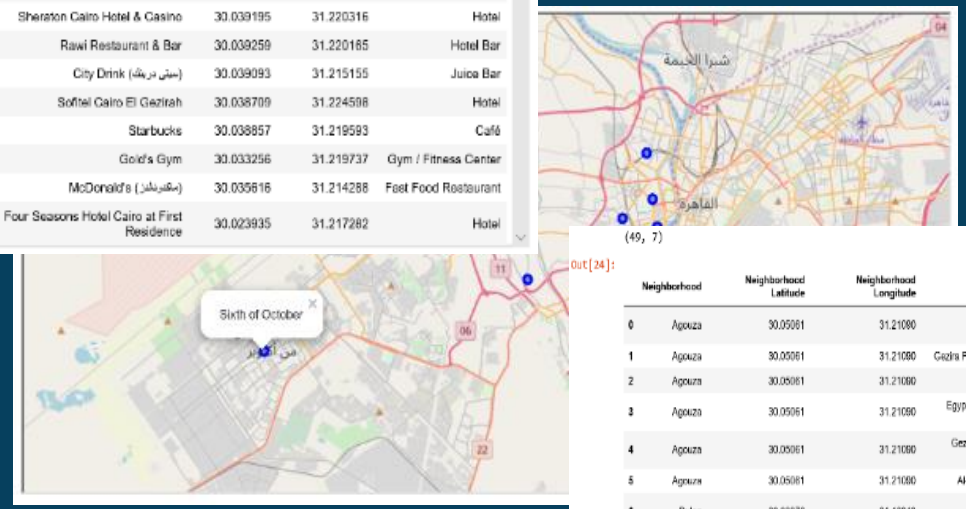
Data Preparation

- The required data is processed to be ready for the analysis;
  - Exploring the existing venues in each municipal division. The parameters used are searching radius of 5000 meter and limit of 500

(859, 7)

Out[20]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Dokki	30.03512	31.21398	Seoudi (سعودي)	30.038997	31.215685	Supermarket
1	Dokki	30.03512	31.21398	Sheraton Cairo Hotel & Casino	30.039195	31.220316	Hotel
2	Dokki	30.03512	31.21398	Rawi Restaurant & Bar	30.039259	31.220165	Hotel Bar
3	Dokki	30.03512	31.21398	City Drink (سيتي دريفك)	30.039093	31.215155	Juice Bar
4	Dokki	30.03512	31.21398	Sofitel Cairo El Gezirah	30.038709	31.224598	Hotel
5	Dokki	30.03512	31.21398	Starbucks	30.038857	31.219593	Café
6	Dokki	30.03512	31.21398	Gold's Gym	30.033256	31.219737	Gym / Fitness Center
7	Dokki	30.03512	31.21398	McDonald's (ماكدونالدز)	30.035616	31.214288	Fast Food Restaurant
8	Dokki	30.03512	31.21398	Four Seasons Hotel Cairo at First Residence	30.023935	31.217282	Hotel



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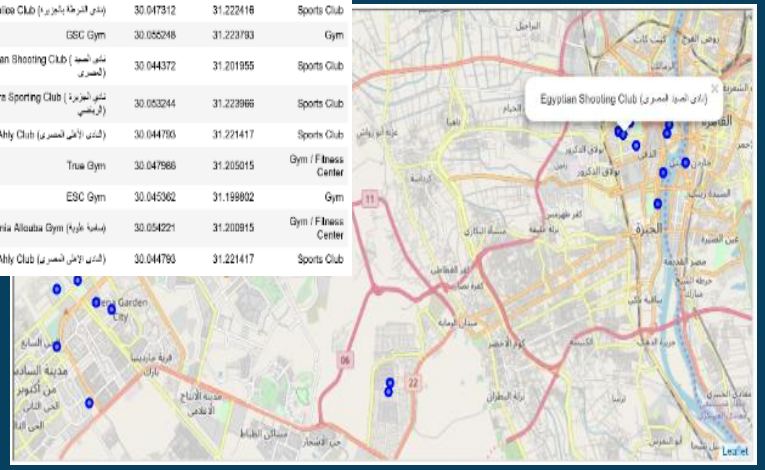
Out[24]:

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Agouza	30.05061	31.21080	True Gym	30.047986	31.205015	Gym / Fitness Center
1	Agouza	30.05061	31.21080	Gezira Police Club (نادي الشرطة بالجزيرة)	30.047312	31.222418	Sports Club
2	Agouza	30.05061	31.21080	GSC Gym	30.055248	31.223793	Gym
3	Agouza	30.05061	31.21080	Egyptian Shooting Club (نادي الصيد المصري)	30.044372	31.201955	Sports Club
4	Agouza	30.05061	31.21080	Gezira Sporting Club (نادي الجزيرة الرياضي)	30.053244	31.223986	Sports Club
5	Agouza	30.05061	31.21080	Al-Ahly Club (النادي الأهلي المصري)	30.044793	31.221417	Sports Club
6	Bulaq	30.03976	31.18943	True Gym	30.047986	31.205015	Gym / Fitness Center
7	Bulaq	30.03976	31.18943	ESC Gym	30.045362	31.199802	Gym
8	Bulaq	30.03976	31.18943	Samia Allouba Gym (نادي سامية علوبة)	30.054221	31.200915	Gym / Fitness Center
9	Bulaq	30.03976	31.18943	Al-Ahly Club (النادي الأهلي المصري)	30.044793	31.221417	Sports Club



  - Exploring the sports facilities in each municipal division.

Analysis & Results

The resulted data is grouped and taking the mean of the frequency of occurrence of each category. The top 10 most common venues are selected.

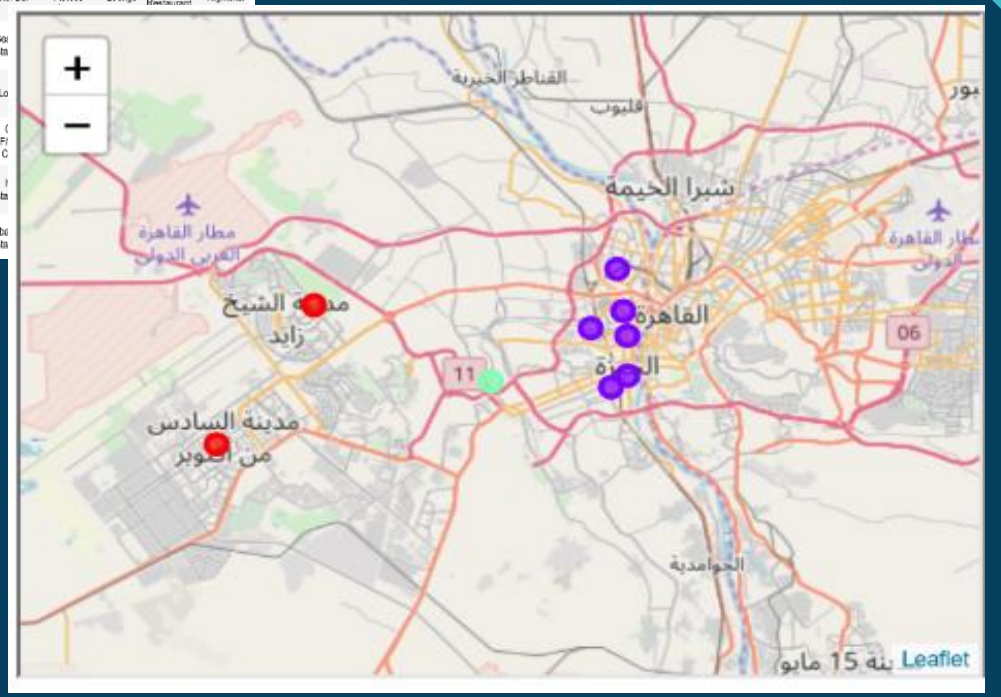
Out[37]:

	ArName	Latitude	Longitude	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
8	قسم الشيخ زايد	30.05339	31.00184	0	Cafe	Shopping Mall	Coffee Shop	Food Court	Sports Club	Bakery	Burger Joint	Middle Eastern Restaurant	Gym / Fitness Center	Convenience Store
9	قسم اول 6 اكتوبر / قسم ثالث 6 اكتوبر	29.99630	30.93550	0	Café	Syrian Restaurant	Middle Eastern Restaurant	Fast Food Restaurant	Sports Club	Coffee Shop	Shopping Mall	Supermarket	Kebab Restaurant	Restaurant

					Venue	Venue	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	قسم الشيخ زايد	30.03512	31.21398	1	Cafe	Hotel	Restaurant	Italian Restaurant	Sports Club	Hotel Bar	Gym / Fitness	Lounge	Lebanese Restaurant	Nightclub
2	قسم المعمورة	30.05081	31.21090	1	Cafe	Hotel	Italian Restaurant	Restaurant	Sports Club	Se... Resta...				
3	قسم الجيزة	30.00956	31.21381	1	Café	Hotel	Hotel Bar	Dessert Shop	Italian Restaurant	Lo...				
4	قسم العجمية	30.00243	31.20188	1	Café	Hotel Bar	Italian Restaurant	Hotel	Restaurant	C... Fi... C...				
6	قسم بولاق الدكرور	30.03976	31.18943	1	Cafe	Seafood Restaurant	Gym / Fitness Center	Dessert Shop	Hotel	Resta...				
7	قسم مدينة	30.07825	31.20686	1	Cafe	Hotel	Italian Restaurant	Sushi Restaurant	Middle Eastern Restaurant	Lebo... Resta...				

Out[39]:

	ArName	Latitude	Longitude	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	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
1	قسم الأهرام	30.00636	31.122	2	Café	Historic Site	Hotel	Falafel Restaurant	Convenience Store	Restaurant	Stables	History Museum	Scenic Lookout	Burger Joint



The map shows 3 cluster as follows;

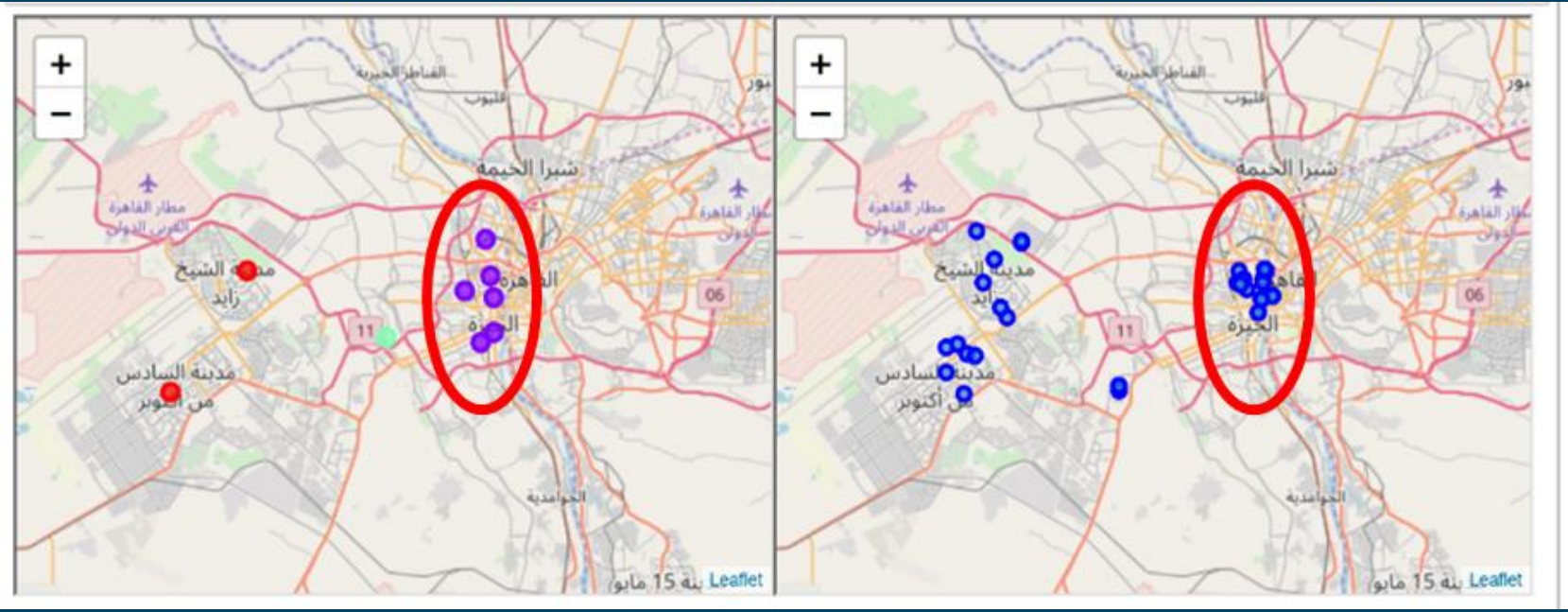
- Cluster (0) - Cyan; shows low number of venues
- Cluster (1) - Purple; show high number of venues
- Cluster (2) - Red; shows moderate number of venues

Conclusion

Map shows that Cluster (1) is showing higher density of venues which is considered high potential as per the main factors that will be used for selection of the best location “Density of venues in the cluster, higher density means high potential” while the other clusters show lower density.

In addition to, most of the sporting facilities are concentrated in Cluster (1).

The above 2 factors are considered traffic generator and potential for opening a new sports mall in Cluster (1).



Cluster 2 is the best location to establish a sports mall as it contains all potentials from existing sports facilities and other attractions as cafes & restaurants which will generate crowd in the cluster.

Thank You