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1. Introduction:

Cairo, the city of lively nights and coffee shops.

Establishing a business plan for a Coffee shop in Cairo is a very challenging Project. The city has a Population of more than 20 Million People, an extensive selection of tastes, a Diversity of Social classes and variety of Population density as its main features and attributes, which must be considered before selecting the location of your Coffee Shop.

This Project is to guide those interested in opening a coffee shop Business in Cairo, as they can find the suitable location among different locations in Cairo taking in consideration the density of population and number of available Coffee shops.

2. Data Scraping and Analysis:

2.1 Data Scraping:

Scraping Data using “Beautiful Soap” from WEKEPEDIA to get the regions in Cairo and Giza in Egypt:

url 1= https://en.wikipedia.org/wiki/Cairo_Governorate

url2 = https://en.wikipedia.org/wiki/Giza_Governorate#Overview

Anglicized name ⇄	Native name ⇄	Arabic transliteration ⇄	Population (July 2017 Est.) ⇄	Type ⇄
15 May City	قسم 15 مايو	<i>Māyū</i>	93,879	Kism (fully urban)
Abdeen	قسم عابدين	<i>ʿĀbidīn</i>	40,450	Kism (fully urban)
El Darb El Ahmar	قسم الدرب الأحمر	<i>Al-Darb Al-Aḥmar</i> ^[10]	58,677	Kism (fully urban)
Ain Shams	قسم عين شمس	<i>'Ain Schams</i>	616,374	Kism (fully urban)
Amreya	قسم الاميرية	<i>Al-Amīriyah</i>	153,046	Kism (fully urban)
Azbakeya	قسم الأزبكية	<i>Al-Azbakiyah</i>	19,826	Kism (fully urban)
El Basatin	قسم البساتين	<i>Al-Basāṭīn</i>	497,041	Kism (fully urban)
El Gamaliya	قسم الجمالية	<i>Al-Jamāliyah</i>	36,485	Kism (fully urban)
El Khalifa	قسم الخليفة	<i>Al-Khalīfah</i>	105,578	Kism (fully urban)
Maadi	قسم المعادي	<i>Al-Ma'ādī</i>	88,869	Kism (fully urban)
El Marg	قسم المرج	<i>Al-Marj</i>	801,222	Kism (fully urban)
El Masara	قسم المعصره	<i>Al-Ma'sarah</i>	270,907	Kism (fully urban)
El Matareya	قسم المطرية	<i>Al-Maṭariyah</i>	604,428	Kism (fully urban)
El Mokattam	قسم المقطم	<i>Al-Muqaṭṭam</i>	224,860	Kism (fully urban)
El Muski	قسم الموسكي	<i>Al-Mūsķī</i>	16,715	Kism (fully urban)
New Cairo 1	قسم أول القاهرة الجديدة	<i>Al-Qāhirah al-Jadīdah 1</i>	136,271	Kism (fully urban)
New Cairo 2	قسم ثان القاهرة الجديدة	<i>Al-Qāhirah al-Jadīdah 2</i>	90,960	Kism (fully urban)
New Cairo 3	قسم ثالث القاهرة الجديدة	<i>Al-Qāhirah al-Jadīdah 3</i>	71,112	Kism (fully urban)
El Weili	قسم الوايلي	<i>Al-Waylī</i>	79,548	Kism (fully urban)
El Nozha	قسم النزهة	<i>An-Nuzhah</i>	231,987	Kism (fully urban)
El Sahel	قسم الساحل	<i>Al-sahel</i>	187,806	Kism (fully urban)
El Sharabiya	قسم الشرايبة	<i>Ash-Sharābiyah</i>	187,806	Kism (fully urban)
El Shorouk	قسم الشروق	<i>Ash-Shurūq</i>	87,565	Kism (fully urban)
El Segil	قسم الساحل	<i>As-Sāḥil</i>	317,442	Kism (fully urban)
El Salam	قسم أول السلام	<i>As-Salām 1</i>	482,271	Kism (fully urban)
El Salam	قسم ثان السلام	<i>As-Salām 2</i>	154,267	Kism (fully urban)
El Sayeda Zeinab	قسم السيدة زينب	<i>As-Sayyidah Zaynab</i>	136,722	Kism (fully urban)
El Tebbin	قسم التبين	<i>At-Tibbīn</i>	72,276	Kism (fully urban)
El Zaher	قسم الظاهر	<i>Az-Ẓāhir</i>	72,101	Kism (fully urban)
Zamalek	قسم الزمالك	<i>Az-Zamālik</i>	14,993	Kism (fully urban)
El Zawya El Hamra	قسم الزاوية الحمراء	<i>Az-Zāwiyah al-Ḥamrā'</i>	319,198	Kism (fully urban)
Zeitoun	قسم الزيتون	<i>Az-Zaytūn</i>	174,738	Kism (fully urban)
Bab El Sharia	قسم باب الشعريه	<i>Bāb ash-Sha'riyah</i>	46,823	Kism (fully urban)
Bulaq	قسم بولاق	<i>Būlāq</i>	48,301	Kism (fully urban)
Dar El Salam	قسم دار السلام	<i>Dār as-Salām</i>	527,335	Kism (fully urban)
Hada'iq El Qobbah	قسم حدائق القبة	<i>Hada'iq al-Qubbah</i>	317,092	Kism (fully urban)
Helwan	قسم حلوان	<i>Ḥulwān</i>	522,927	Kism (fully urban)
Nasr City 1	قسم مدينة نصر أول	<i>Madīnat an-Naṣr 1</i>	636,864	Kism (fully urban)

Anglicized name ⇅	Native name ⇅	Arabic transliteration ⇅	Population (July 2017 Est.) ⇅	Type ⇅
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Amreya	قسم الاميرية	<i>Al-Amīriyah</i>	153,046	Kism (fully urban)
Azbakeya	قسم الأزبكية	<i>Al-Azbakiyah</i>	19,826	Kism (fully urban)
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Helwan	قسم حلوان	<i>Ḥulwān</i>	522,927	Kism (fully urban)
Nasr City 1	قسم مدينة نصر أول	<i>Madīnat an-Naṣr 1</i>	636,864	Kism (fully urban)

Then we will get the Coordinates for the aforementioned location like below:

	Anglicized name	Native name	Arabic transliteration	Population(July 2017 Est.)	Type	Latitude	Longitude
0	Dokki	قسم الدقي	Ad-Duqqī	71,161	Kism (fully urban)	30.050070	31.271920
1	Pyramids	قسم الأهرام	Al-Ahrām	661,478	Kism (fully urban)	29.846980	31.332810
2	Agouza	قسم الجيزة	Al-'Ajūzah	279,400	Kism (fully urban)	29.893120	31.303190
3	El Ayyat	مركز العياط	Al-'Ayyāt	494,548	Markaz	30.040050	31.255300
4	El Badrashein	مركز البرشين	Al-Badrasḥayn	539,656	Markaz	30.036720	31.241910
5	El Hawamdeya	قسم الحوامدية	Al-Ḥawāmidīyah	191,552	Kism (urban and rural parts)	29.900000	31.250000
6	Giza	قسم الجيزة	Al-Jīzah	286,668	Kism (fully urban)	29.989460	31.216890
7	Giza	مركز الجيزة	Al-Jīzah	369,351	Markaz	29.989460	31.216890
8	El Omraniya	قسم العمرانية	Al-'Umrānīyah	367,274	Kism (fully urban)	29.990180	31.190570
9	El Wahat El Bahariya	قسم الواحات البحرية	Al-Wāḥāt al-Baḥariyah	39,415	Kism (urban and rural parts)	28.938505	29.471383
10	El Warraq	قسم الوراق	Al-Warrāq	724,963	Kism (urban and rural parts)	30.138270	31.386710
11	Sheikh Zayed City	قسم الشيخ زايد	Ash-Shaykh Zāyid	90,997	Kism (fully urban)	30.047330	30.986790
12	El Saff	مركز الصف	Aṣ-Ṣaff	420,306	Markaz	30.112211	31.614588
13	Atfeh	مركز أطفيح	Aṭfīḥ	370,079	Markaz	30.049920	31.248600
14		قسم المطايبه	Aṭ-Tālibīyah	459,178	Kism (fully urban)	30.049920	31.248600
15	Ossim	مركز أوسيم	Awṣīm	384,527	Markaz	30.049920	31.248600
16	Bulaq	قسم بولاق الدكرور	Būlāq al-Dakrūr	963,201	Kism (fully urban)	30.049920	31.248600
17	Imbaba	قسم إمبابة	Imbābah	634,686	Kism (fully urban)	30.073545	31.230050
18	Imbaba	مركز إمبابة	Imbābah	518,036	Markaz	30.073545	31.230050
19	Kerdasa	مركز كرداسة	Kirdāsah	449,596	Markaz	29.940770	31.276960
20	6th of October City (2)	قسم ثان 6 أكتوبر	Madīnat Sittah Uktūbar 2	197,019	Kism (fully urban)	29.854000	31.334540
21	6 October City (1 & 3)	قسم أول 6 أكتوبر / قسم ثالث 6 أكتوبر	Madīnat Sittah Uktūbar 1 & 3	152,999	Kism (fully urban)	30.052846	31.398814

2.1 Data Cleaning:

We will keep only the region, Lat., Long. And the Population as below:

	region	Population	Latitude	Longitude
0	15 May City	93,879	29.829830	31.369650
1	Abdeen	40,450	30.045420	31.242100
2	El Darb El Ahmar	58,677	29.977690	31.263610
3	Ain Shams	616,374	30.135420	31.323890
4	Amreya	153,046	30.112380	31.291330
5	Azbakeya	19,826	30.049920	31.248600
6	El Basatin	497,041	29.893630	31.295180
7	El Gamaliya	36,485	30.098950	31.289440
8	El Khalifa	105,578	29.964960	31.251520
9	Maadi	88,869	29.984160	31.271630
10	El Marg	801,222	30.156510	31.344590
11	El Masara	270,907	29.904410	31.298840
12	El Matareya	604,428	30.093450	31.292990
13	El Mokattam	224,860	30.012930	31.338090
14	El Muski	16,715	30.048749	31.256511
15	New Cairo 1	136,271	30.082930	31.261069
16	New Cairo 2	90,960	30.049920	31.248600
17	New Cairo 3	71,112	30.082849	31.261051
18	El Weili	79,548	30.072060	31.283490
19	El Nozha	231,987	30.111000	31.347490
20	El Sahel	187,806	30.089260	31.236870
21	El Sharabiya	187,806	30.070050	31.259640
22	El Shorouk	87,565	30.106880	31.288040
23	El Segil	317,442	30.049920	31.248600
24	El Salam	482,271	30.157800	31.402070
25	El Salam	154,267	30.157800	31.402070
26	El Sayeda Zeinab	136,722	30.032409	31.239037
27	El Tebbin	72,276	29.773240	31.325970
28	El Zaher	72,101	30.062530	31.254790
29	Zamalek	14,993	30.055860	31.223900

3. Methodology:

Getting the venues from foursquare website for radius 1000 m and Limit 400 :

	Latitude	Longitude	VenueName	VenueLatitude	VenueLongitude	VenueCategory	
region							
15 May City	7	7	7	7	7	7	
6 October City (1 & 3)	8	8	8	8	8	8	
6th of October City (2)	10	10	10	10	10	10	
Abdeen	100	100	100	100	100	100	
Agouza	4	4	4	4	4	4	
Ain Shams	9	9	9	9	9	9	
Amreya	4	4	4	4	4	4	
Atfeh	81	81	81	81	81	81	
Azbakeya	81	81	81	81	81	81	
Bab El Sharia	24	24	24	24	24	24	
Badr City	1	1	1	1	1	1	
Bulaq	162	162	162	162	162	162	
Dar El Salam	5	5	5	5	5	5	
Dokki	21	21	21	21	21	21	
El Ayyat	29	29	29	29	29	29	
El Badrashein	56	56	56	56	56	56	
El Basatin	7	7	7	7	7	7	
El Darb El Ahmar	9	9	9	9	9	9	•
El Gamaliya	11	11	11	11	11	11	•
El Khalifa	38	38	38	38	38	38	•
El Marg	4	4	4	4	4	4	•
El Masara	1	1	1	1	1	1	•
El Matareya	7	7	7	7	7	7	•
El Mokattam	5	5	5	5	5	5	•
El Muski	47	47	47	47	47	47	•
El Nozha	59	59	59	59	59	59	•
El Omraniya	6	6	6	6	6	6	•
El Saff	6	6	6	6	6	6	•
El Sahel	13	13	13	13	13	13	•
El Salam	12	12	12	12	12	12	•
...	•
El Segil	81	81	81	81	81	81	•
El Sharabiya	8	8	8	8	8	8	•
El Shorouk	4	4	4	4	4	4	•
El Warraq	6	6	6	6	6	6	•
El Weili	8	8	8	8	8	8	•

Then, we will apply one hot encoding for the venues categories as below:

	region	Accessories Store	American Restaurant	Aquarium	Art Gallery	Art Museum	Arts & Crafts Store	Arts & Entertainment	Asian Restaurant	Athletics & Sports	...	Tex-Mex Restaurant	Thai Restaurant	Theater	Theme Park Ride / Attraction	Track	Tunnel	Turkish Restaurant	Used Bookstore	Waterfront	Yoga Studio
0	15 May City	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
1	6 October City (1 & 3)	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
2	6th of October City (2)	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
3	Abdeen	0	0	0	3	0	1	0	0	0	...	0	0	4	0	0	1	0	0	0	0
4	Agouza	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
5	Ain Shams	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
6	Amreya	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
7	Atfeh	1	0	0	1	1	0	0	0	0	...	0	0	5	0	0	1	0	1	0	0
8	Azbakeya	1	0	0	1	1	0	0	0	0	...	0	0	5	0	0	1	0	1	0	0
9	Bab El Sharia	1	0	0	0	0	0	1	0	0	...	0	0	0	0	0	0	0	0	0	0
10	Badr City	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
11	Bulaq	2	0	0	2	2	0	0	0	0	...	0	0	10	0	0	2	0	2	0	0
12	Dar El Salam	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
13	Dokki	0	0	0	0	0	0	1	0	0	...	0	0	0	0	0	0	0	0	0	0
14	El Ayyat	0	0	0	0	1	0	0	0	0	...	0	0	1	0	0	0	0	0	0	0
15	El Badrashein	0	0	0	1	0	0	0	0	0	...	0	0	1	0	0	0	0	0	0	0
16	El Basatin	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
17	El Darb El Ahmar	0	0	0	0	0	0	0	0	1	...	0	0	0	0	0	0	0	0	0	0
18	El Gamaliya	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
19	El Khalifa	0	0	0	0	0	0	0	0	1	...	0	1	0	0	1	0	0	0	0	0
20	El Marg	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
21	El Masara	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
22	El Matareya	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
23	El Mokattam	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
24	El Muski	0	0	0	0	1	0	1	0	0	...	0	0	3	0	0	1	0	1	0	0
25	El Nozha	0	0	0	0	0	0	0	0	0	...	0	0	0	0	1	0	0	0	0	0
26	El Omraniya	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
27	El Saff	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
28	El Sahel	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	0	0	0	1	0
29	El Salam	0	0	0	2	0	0	0	0	0	...	0	0	0	0	0	0	0	0	0	0
...
31	El Segil	1	0	0	1	1	0	0	0	0	...	0	0	5	0	0	1	0	1	0	0
33	El Chirashkous	0	0	0	0	0	0	0	0	0	...	0	0	0	0	0	1	0	0	0	0

The calculating the weightage for each venue category in each region as below:

	Accessories Store	American Restaurant	Aquarium	Art Gallery	Art Museum	Arts & Crafts Store	Arts & Entertainment	Asian Restaurant	Athletics & Sports	Auto Garage	Thai Restaurant	Theater	Theme Park Ride / Attraction	Track	Tunnel	Turkish Restaurant	Used Bookstore	Waterfront
0	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
1	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
2	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
3	0.000	0.0	0.0	0.166667	0.0	0.333333	0.000000	0.000000	0.0	0.0	0.0	0.085106	0.0	0.00	0.076923	0.000000	0.000	0.00
4	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
5	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
6	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
7	0.125	0.0	0.0	0.055556	0.1	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.106383	0.0	0.00	0.076923	0.000000	0.125	0.00
8	0.125	0.0	0.0	0.055556	0.1	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.106383	0.0	0.00	0.076923	0.000000	0.125	0.00
9	0.125	0.0	0.0	0.000000	0.0	0.000000	0.333333	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
10	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
11	0.250	0.0	0.0	0.111111	0.2	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.212766	0.0	0.00	0.153846	0.000000	0.250	0.00
12	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
13	0.000	0.0	0.0	0.000000	0.0	0.000000	0.333333	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
14	0.000	0.0	0.0	0.000000	0.1	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.021277	0.0	0.00	0.000000	0.000000	0.000	0.00
15	0.000	0.0	0.0	0.055556	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.021277	0.0	0.00	0.000000	0.000000	0.000	0.00
16	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
17	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.5	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
18	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
19	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.5	0.0	0.5	0.000000	0.0	0.25	0.000000	0.000000	0.000	0.00
20	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
21	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
22	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
23	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
24	0.000	0.0	0.0	0.000000	0.1	0.000000	0.333333	0.000000	0.0	0.0	0.0	0.063830	0.0	0.00	0.076923	0.000000	0.125	0.00
25	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.25	0.000000	0.000000	0.000	0.00
26	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
27	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
28	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.25
29	0.000	0.0	0.0	0.111111	0.0	0.000000	0.000000	0.000000	0.0	1.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
...
31	0.125	0.0	0.0	0.055556	0.1	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.106383	0.0	0.00	0.076923	0.000000	0.125	0.00
32	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.076923	0.000000	0.000	0.00
33	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
34	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00
35	0.000	0.0	0.0	0.000000	0.0	0.000000	0.000000	0.000000	0.0	0.0	0.0	0.000000	0.0	0.00	0.000000	0.000000	0.000	0.00

Then we select Coffee Shop from venue categories and Preparing clusters and we select Three Clusters:

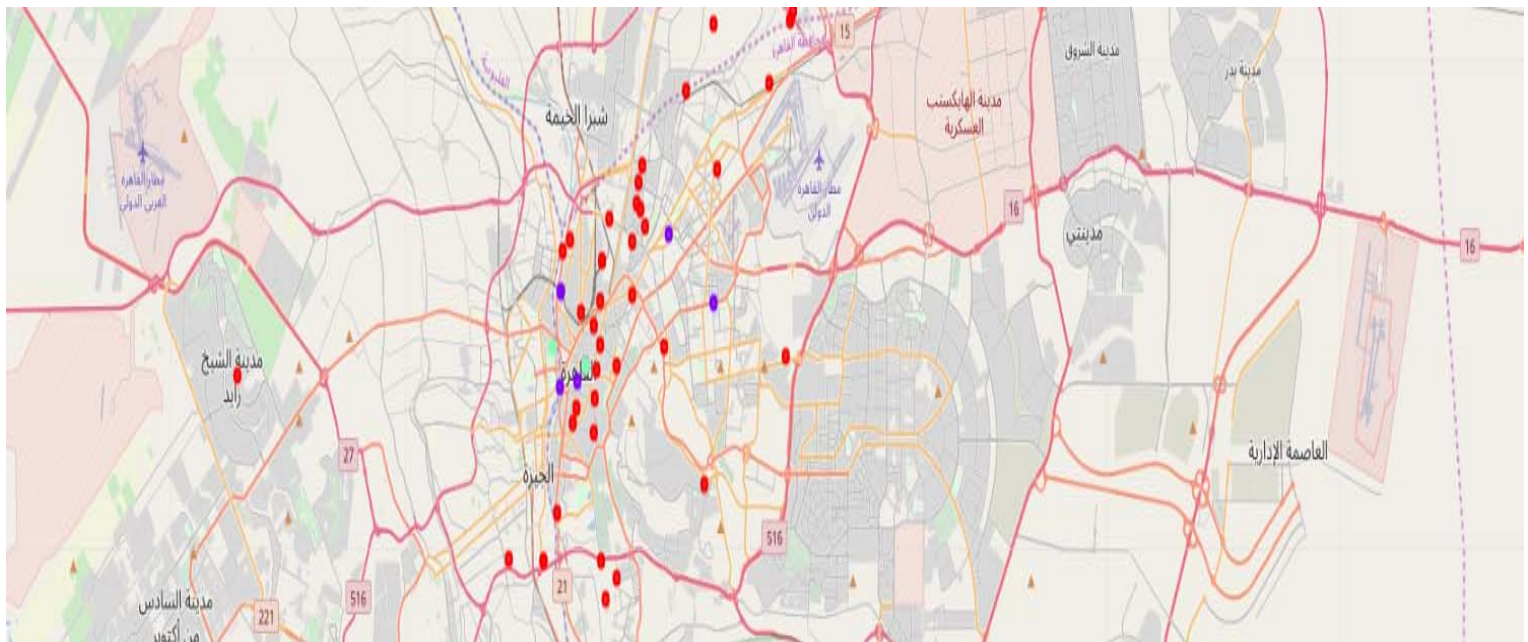
region	Coffee Shop	Cluster Labels	Population	Latitude	Longitude
Zamalek	0.100000	0	14,993	30.055860	31.223900
Bulaq	0.114286	0	48,301	30.049920	31.248600
Bulaq	0.114286	0	963,201	30.049920	31.248600
El Salam	0.000000	1	154,267	30.157800	31.402070
El Sayeda Zeinab	0.014286	1	136,722	30.032409	31.239037
El Sharabiya	0.000000	1	187,806	30.070050	31.259640
El Shorouk	0.000000	1	87,565	30.106880	31.288040
El Warraq	0.000000	1	724,963	30.138270	31.386710
El Weili	0.014286	1	79,548	30.072060	31.283490
El Zaher	0.000000	1	72,101	30.062530	31.254790
El Zawya El Hamra	0.000000	1	319,198	30.096000	31.266340
Giza	0.000000	1	369,351	29.989460	31.216890
Hada'iq El Qobbah	0.000000	1	317,092	30.088430	31.283510
Helwan	0.000000	1	522,927	29.846340	31.309780
Kerdasa	0.000000	1	449,596	29.940770	31.276960
Maadi	0.014286	1	88,869	29.984160	31.271630
Manshiyat Naser	0.000000	1	259,205	30.042040	31.283050
Nasr City 2	0.000000	1	72,414	30.056210	31.307350
New Cairo 1	0.000000	1	136,271	30.082930	31.261069
New Cairo 3	0.000000	1	71,112	30.082849	31.261051
Old Cairo	0.000000	1	251,125	30.004520	31.227000
Pyramids	0.000000	1	661,478	29.846980	31.332810
Qasr El Nil	0.014286	1	10,596	30.043712	31.229530
Rod El Farag	0.000000	1	146,102	30.085615	31.231344
Sheikh Zayed City	0.000000	1	90,997	30.047330	30.986790
Shubra	0.000000	1	76,942	30.066961	31.245032
Tura	0.000000	1	231,154	29.933330	31.266670
El Salam	0.000000	1	482,271	30.157800	31.402070
El Sahel	0.000000	1	187,806	30.089260	31.236870
Zeitoun	0.000000	1	174,738	30.100851	31.286824
...
Ain Shams	0.014286	1	616,374	30.135420	31.323890
Amreya	0.000000	1	153,046	30.112380	31.291330
Bab El Sharia	0.000000	1	46,823	30.056520	31.259540
Badr City	0.000000	1	31,398	30.134916	31.742897
Dar El Salam	0.000000	1	527,335	29.989280	31.260200
Dokki	0.014286	1	71,161	30.050070	31.271920
El Basatin	0.000000	1	497,041	29.893630	31.295180
El Ayyat	0.000000	1	494,548	30.040050	31.255300

region	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	...	139th Most Common Venue	140th Most Common Venue	141th Most Common Venue	142th Most Common Venue	143th Most Common Venue	144th Most Common Venue	145th Most Common Venue	146th Most Common Venue	147th Most Common Venue
15 May City	Pharmacy	Sports Club	Coffee Shop	Flea Market	Frozen Yogurt Shop	Fried Chicken Joint	French Restaurant	Food Truck	Food Stand	...	Park	Optical Shop	Multiplex	Opera House	Nightclub	New American Restaurant	Neighborhood	Music Venue	Museum
6 October City (1 & 3)	Juice Bar	Shopping Mall	Sports Club	Dessert Shop	Falafel Restaurant	Café	Ice Cream Shop	Flea Market	French Restaurant	...	Park	Optical Shop	Multiplex	Opera House	Nightclub	New American Restaurant	Neighborhood	Music Venue	Museum
6th of October City (2)	Pharmacy	Gym	Supermarket	Metro Station	Yoga Studio	Flea Market	French Restaurant	Food Truck	Food Stand	...	Park	Optical Shop	Multiplex	Opera House	Nightclub	New American Restaurant	Neighborhood	Music Venue	Museum
Abdeen	Hostel	Beer Garden	Herbs & Spices Store	Arts & Crafts Store	Pie Shop	Music Venue	Roof Deck	Bistro	Art Gallery	...	Mosque	Museum	New American Restaurant	Nightclub	Opera House	Optical Shop	Palace	Park	Pedestrian Plaza
Agouza	Soccer Field	Creperie	Supermarket	Mobile Phone Shop	Fast Food Restaurant	Pastry Shop	Kebab Restaurant	Café	Yoga Studio	...	Park	Optical Shop	Multiplex	Opera House	Nightclub	New American Restaurant	Neighborhood	Music Venue	Museum

3. Results:

We divided the results to three clusters as below:

Cluster 0 (in red):the regions with least number of Coffee Shops and the highest Population Density



	region	Coffee Shop	Cluster Labels	Population	Latitude	Longitude
28	El Sayeda Zeinab	0.021277	0	136,722	30.032409	31.239037
27	El Salam	0.000000	0	154,267	30.157800	31.402070
30	El Sharabiya	0.000000	0	187,806	30.070050	31.259640
31	El Shorouk	0.021277	0	87,565	30.106880	31.288040
32	El Warraq	0.000000	0	724,963	30.138270	31.386710
33	El Weili	0.000000	0	79,548	30.072060	31.283490
34	El Zaher	0.000000	0	72,101	30.062530	31.254790
35	El Zawya El Hamra	0.000000	0	319,198	30.096000	31.266340
36	Giza	0.000000	0	286,668	29.989460	31.216890
36	Giza	0.000000	0	369,351	29.989460	31.216890
37	Hada'iq El Qobbah	0.000000	0	317,092	30.088430	31.283510
39	Helwan	0.000000	0	522,927	29.846340	31.309780
41	Kerdasa	0.000000	0	449,596	29.940770	31.276960
42	Maadi	0.000000	0	88,869	29.984160	31.271630
44	Nasr City 2	0.000000	0	72,414	30.056210	31.307350
45	New Cairo 1	0.000000	0	136,271	30.082930	31.261069
46	New Cairo 2	0.000000	0	90,960	30.160286	31.404182
47	New Cairo 3	0.000000	0	71,112	30.082849	31.261051
48	Old Cairo	0.000000	0	251,125	30.004520	31.227000
50	Pyramids	0.000000	0	661,478	29.846980	31.332810
52	Rod El Farag	0.000000	0	146,102	30.085615	31.231344
53	Sheikh Zayed City	0.000000	0	90,997	30.047330	30.986790
54	Shubra	0.000000	0	76,942	30.066961	31.245032
55	Tura	0.000000	0	231,154	29.933330	31.266670
27	El Salam	0.000000	0	482,271	30.157800	31.402070
26	El Sahel	0.000000	0	187,806	30.089260	31.236870
57	Zeitoun	0.000000	0	174,738	30.100851	31.286824
24	El Nozha	0.000000	0	231,987	30.111000	31.347490
5	Ain Shams	0.000000	0	616,374	30.135420	31.323890
11	Dar El Salam	0.000000	0	527,335	29.989280	31.260200
25	El Omraniya	0.000000	0	367,274	29.990180	31.190570
4	Agouza	0.000000	0	279,400	29.893120	31.303190
12	Dokki	0.000000	0	71,161	30.050070	31.271920
13	El Ayyat	0.000000	0	494,548	30.040050	31.255300
14	El Badrashein	0.021277	0	539,656	30.036720	31.241910
9	Bab El Sharia	0.000000	0	46,823	30.056520	31.259540
16	El Darb El Ahmar	0.000000	0	58,677	29.977690	31.263610

Cluster 1 (in purple): the regions with Moderate number of Coffee Shops and the high Population Density

region	Coffee Shop	Cluster Labels	Population	Latitude	Longitude
Abdeen	0.085106	1	40,450	30.045420	31.24210
Qasr El Nil	0.042553	1	10,596	30.043712	31.22953
Ossim	0.063830	1	384,527	30.049920	31.24860
Imbaba	0.085106	1	518,036	30.073545	31.23005
Azbakeya	0.063830	1	19,826	30.049920	31.24860
Nasr City 1	0.063830	1	636,864	30.069660	31.34495
Imbaba	0.085106	1	634,686	30.073545	31.23005
Heliopolis	0.063830	1	134,549	30.091020	31.31137
El Segil	0.063830	1	317,442	30.049920	31.24860
Atfeh	0.063830	1	370,079	30.049920	31.24860
15 May City	0.042553	1	93,879	29.829830	31.36965

Cluster 2 (in green): the regions with highest number of Coffee Shops and the lowest Population Density

region	Coffee Shop	Cluster Labels	Population	Latitude	Longitude
Bulaq	0.127660	2	963,201	30.04992	31.2486
Zamalek	0.148936	2	14,993	30.05586	31.2239

4. Discussion and Conclusion:

As shown in the aforementioned figures that the Cluster 0 is the best choice according to the Population density and the number of Coffee shops.