LADATA

May 29, 2020

0.0.1 Introduction

In this project we will use the geolospatial information of Los Angeles. The idea is to use the data to make suggestions regarding which districs are more suitable for opening a new restaurant. We will identify which districts have less restaurants than the rest, cluster them and make an appropriate suggestion. The fourquare database will be used to retrieve information for all the neighborhoods in our dataset. This step will be crucial when deciding to commence such an expensive procedure, like starting a new business. The same approach could be used to identify regions that are more suitable for opening new cafes. Of cource this is a simlified scenario. To address the question at each core, we should also take into account other factors, such as the average income in each neighborhood, the criminality levels, the average age of the citizens etc.. Obtaining this information for this project would be very hard to achieve, so we will restrict our analysis on the data we can retrieve from foursquare.

0.0.2 The dataset

The data for this study have been retrieved from: https://usc.data.socrata.com/dataset/Los-Angeles-Neighborhood-Map/r8qd-yxsr.

Let's first explore our data and plot a map of Los Angeles, highlighting with blue dots the neighborhoods of our dataset.

[1]:
```
import numpy as np # library to handle data in a vectorized manner

import pandas as pd # library for data analsysis
pd.set_option('display.max_columns', None)
pd.set_option('display.max_rows', None)

import json # library to handle JSON files

#!conda install -c conda-forge geopy --yes # uncomment this line if you haven't␣
↪completed the Foursquare API lab
from geopy.geocoders import Nominatim # convert an address into latitude and␣
↪longitude values

import requests # library to handle requests
```

```python
from pandas.io.json import json_normalize # tranform JSON file into a pandas␣
↪dataframe

# Matplotlib and associated plotting modules
import matplotlib.cm as cm
import matplotlib.colors as colors

# import k-means from clustering stage
from sklearn.cluster import KMeans

#!conda install -c conda-forge folium=0.5.0 --yes # uncomment this line if you␣
↪haven't completed the Foursquare API lab
import folium # map rendering library

print('Libraries imported.')
```

```
Libraries imported.
```

[2]:
```python
with open('/home/christos/Downloads/LosAngelesNeighborhoodMap.geojson') as␣
↪json_data:
    la_data = json.load(json_data)
```

[3]:
```python
neighborhoods_data = la_data['features']
```

[4]:
```python
neighborhoods_data[0]
```

[4]:

```
{'type': 'Feature',
 'properties': {'external_i': 'acton',
  'name': 'Acton',
  'location': 'POINT(34.497355239240846 -118.16981019229348)',
  'latitude': '-118.16981019229348',
  'slug_1': None,
  'sqmi': '39.3391089485',
  'display_na': 'Acton L.A. County Neighborhood (Current)',
  'set': 'L.A. County Neighborhoods (Current)',
  'slug': 'acton',
  'longitude': '34.497355239240846',
  'name_1': None,
  'kind': 'L.A. County Neighborhood (Current)',
  'type': 'unincorporated-area'},
 'geometry': {'type': 'MultiPolygon',
  'coordinates': [[[[-118.20261747920541, 34.53898972076929],
     [-118.18946958918568, 34.5385546636616],
     [-118.18950400422953, 34.5349457732411],
     [-118.185124836341, 34.53482956044709],
     [-118.18516440876348, 34.53124651970553],
     [-118.17601577983017, 34.531354702430015],
```

[-118.1761893084381, 34.523803185624594],
[-118.16702561365965, 34.52351227823281],
[-118.16294026595281, 34.523716853632315],
[-118.16298888279476, 34.52758691891819],
[-118.15426797766412, 34.527789861082844],
[-118.154027259229, 34.527320039393956],
[-118.15365520720269, 34.527429379780635],
[-118.15063530637565, 34.52459083233748],
[-118.15064418231482, 34.524313334147],
[-118.1503344972929, 34.52430740894222],
[-118.1485050801056, 34.52258602710374],
[-118.14850638270086, 34.52199529568578],
[-118.1478640542421, 34.521983357228365],
[-118.14301598797277, 34.51742182339587],
[-118.14300391540229, 34.51688741100935],
[-118.14243635370282, 34.51687554873165],
[-118.13292042712895, 34.5079196554126],
[-118.1315149885402, 34.50797105874297],
[-118.12342857629447, 34.500365923139725],
[-118.12284845735702, 34.49878370216131],
[-118.12242053861623, 34.49878438140744],
[-118.12277940488677, 34.498399398663054],
[-118.12246490434279, 34.497537010677036],
[-118.12274394249322, 34.4972209172346],
[-118.12209828447688, 34.49683022396537],
[-118.12209634940834, 34.4965295572172],
[-118.1209958853196, 34.49508309698031],
[-118.0797043916739, 34.49536813309862],
[-118.07985085316025, 34.48084042740588],
[-118.07970177853352, 34.473579517385176],
[-118.09672894180615, 34.47352001660662],
[-118.09679656118362, 34.48076701266776],
[-118.11862856604756, 34.480677896362835],
[-118.11862411128783, 34.47704643673872],
[-118.11823562296834, 34.4770468157905],
[-118.11785037094809, 34.476425875279766],
[-118.11866052023463, 34.47642461898611],
[-118.11872970749988, 34.46616923814347],
[-118.13164148693323, 34.466174605450966],
[-118.14048541107292, 34.466422355307934],
[-118.14962016986948, 34.46643908081293],
[-118.14960678145503, 34.45200987113323],
[-118.18470858752102, 34.45195843862283],
[-118.18474351055289, 34.45570100985002],
[-118.19719472198942, 34.45580246193274],
[-118.19752455957534, 34.45552458355188],
[-118.19726145537918, 34.455802353469466],

```
      [-118.19753094645866, 34.45567158380637],
      [-118.1975630775758, 34.45630908760043],
      [-118.19810239462434, 34.45584428851268],
      [-118.20630231208395, 34.45613571872994],
      [-118.20660896333821, 34.462886925156575],
      [-118.20784636484069, 34.46286485199525],
      [-118.20800446863117, 34.463656896194394],
      [-118.20789867089194, 34.46403864877573],
      [-118.20799261212716, 34.46605746521052],
      [-118.21968226190579, 34.465710534571],
      [-118.2196664686328, 34.46266753820351],
      [-118.23702710197352, 34.463398142499884],
      [-118.23702088651505, 34.46740281844628],
      [-118.24533641525987, 34.46732248905014],
      [-118.24503150669834, 34.47810800546601],
      [-118.246078309983, 34.47811289528655],
      [-118.24597834271934, 34.48170943206675],
      [-118.25773760650773, 34.48183679264869],
      [-118.25991860605343, 34.495903101058374],
      [-118.255544672136, 34.49588389204682],
      [-118.25567245743707, 34.510049171616565],
      [-118.25550542881398, 34.539292874673706],
      [-118.23788296951273, 34.53894795222954],
      [-118.22024775908258, 34.539088978245836],
      [-118.22018208969567, 34.542752039858854],
      [-118.2069864680491, 34.54269662617337],
      [-118.20702192802952, 34.53901218566977],
      [-118.20261747920541, 34.53898972076929]]]]}}
```

[5]:
```
column_names = ['City', 'Neighborhood', 'Latitude', 'Longitude']

# instantiate the dataframe
neighborhoods = pd.DataFrame(columns=column_names)

for data in neighborhoods_data:
    neighborhood_name = data['properties']['name']
    neighborhood_lon = data['properties']['latitude']
    neighborhood_lat = data['properties']['longitude']

    neighborhoods = neighborhoods.append({'City': 'L.A.',
                                          'Neighborhood': neighborhood_name,
                                          'Latitude': neighborhood_lat,
                                          'Longitude': neighborhood_lon},␣
 ↪ignore_index=True)
```

[6]:
```
neighborhoods.sort_values('Neighborhood')
```

[6]:

	City	Neighborhood	Latitude	\
0	L.A.	Acton	34.497355239240846	
1	L.A.	Adams-Normandie	34.031461499124156	
2	L.A.	Agoura Hills	34.146736499122795	
3	L.A.	Agua Dulce	34.504926999796837	
4	L.A.	Alhambra	34.085538999123571	
5	L.A.	Alondra Park	33.889617004889644	
7	L.A.	Altadena	34.193870502232173	
8	L.A.	Angeles Crest	34.313937005895312	
9	L.A.	Arcadia	34.133229999123017	
10	L.A.	Arleta	34.243099999121583	
11	L.A.	Arlington Heights	34.04491049912405	
6	L.A.	Artesia	33.866895999126271	
12	L.A.	Athens	33.9236925059352	
13	L.A.	Atwater Village	34.131066356759177	
14	L.A.	Avalon	33.336954499133086	
15	L.A.	Avocado Heights	34.040881003821966	
16	L.A.	Azusa	34.13746999912302	
18	L.A.	Baldwin Hills/Crenshaw	34.01197027055953	
19	L.A.	Baldwin Park	34.081109499123691	
20	L.A.	Bel-Air	34.102056999123342	
24	L.A.	Bell	33.981160999124889	
22	L.A.	Bell Gardens	33.965685999125014	
21	L.A.	Bellflower	33.88801349912606	
25	L.A.	Beverly Crest	34.106006999123245	
26	L.A.	Beverly Grove	34.076632999123618	
29	L.A.	Beverly Hills	34.082544499123699	
30	L.A.	Beverlywood	34.043509999124048	
31	L.A.	Boyle Heights	34.039168499124116	
32	L.A.	Bradbury	34.15423999912273	
33	L.A.	Brentwood	34.086240999123547	
34	L.A.	Broadway-Manchester	33.941223502886629	
27	L.A.	Burbank	34.182010499122441	
35	L.A.	Calabasas	34.136254499122948	
36	L.A.	Canoga Park	34.210854999122013	
37	L.A.	Carson	33.839519999126665	
38	L.A.	Carthay	34.057855624951706	
41	L.A.	Castaic	34.481749770319936	
39	L.A.	Castaic Canyons	34.564146288577305	
42	L.A.	Central-Alameda	34.006864031207506	
43	L.A.	Century City	34.055325502171065	
44	L.A.	Cerritos	33.86689249912628	
45	L.A.	Charter Oak	34.100075003109005	
40	L.A.	Chatsworth	34.256403499160569	
46	L.A.	Chatsworth Reservoir	34.233072499121761	
47	L.A.	Chesterfield Square	33.983762999124849	
48	L.A.	Cheviot Hills	34.04085349912404	

49	L.A.	Chinatown	34.063510499123652
50	L.A.	Citrus	34.11618000242531
51	L.A.	Claremont	34.122365138512784
53	L.A.	Commerce	33.995079230018334
54	L.A.	Compton	33.893251999125937
57	L.A.	Covina	34.087495499309327
58	L.A.	Cudahy	33.962620499125038
59	L.A.	Culver City	34.005899499124581
55	L.A.	Cypress Park	34.092139499123448
60	L.A.	Del Aire	33.915552004076844
61	L.A.	Del Rey	33.989292192016777
62	L.A.	Desert View Highlands	34.590877152916832
63	L.A.	Diamond Bar	34.000640999124634
64	L.A.	Downey	33.937676999125415
65	L.A.	Downtown	34.040008613525899
66	L.A.	Duarte	34.157855499122689
67	L.A.	Eagle Rock	34.133916999122917
68	L.A.	East Compton	33.894016822529835
69	L.A.	East Hollywood	34.089109499123481
70	L.A.	East La Mirada	33.924510501549975
72	L.A.	East Los Angeles	34.035168709861011
73	L.A.	East Pasadena	34.138563505391282
74	L.A.	East San Gabriel	34.110644492315856
75	L.A.	Echo Park	34.079533999123683
76	L.A.	El Monte	34.071169499123791
77	L.A.	El Segundo	33.916582999125737
78	L.A.	El Sereno	34.082242183204471
71	L.A.	Elizabeth Lake	34.657686037373047
79	L.A.	Elysian Park	34.081259999123489
80	L.A.	Elysian Valley	34.095759499123389
82	L.A.	Encino	34.1562244991227
83	L.A.	Exposition Park	34.018262499124305
84	L.A.	Fairfax	34.07893599912363
86	L.A.	Florence	33.974564000774492
85	L.A.	Florence-Firestone	33.966101520272787
87	L.A.	Gardena	33.891005999125994
88	L.A.	Glassell Park	34.114405499123208
91	L.A.	Glendale	34.192975499122355
92	L.A.	Glendora	34.142040999122969
93	L.A.	Gramercy Park	33.949062001923494
94	L.A.	Granada Hills	34.295682651151957
89	L.A.	Green Meadows	33.941634094823527
23	L.A.	Green Valley	34.620007457495149
95	L.A.	Griffith Park	34.136873999122869
96	L.A.	Hacienda Heights	34.002085506418773
97	L.A.	Hancock Park	34.072759499123613
98	L.A.	Hansen Dam	34.265706499121308

99	L.A.	Harbor City	33.797697296692832
100	L.A.	Harbor Gateway	33.868515499126232
101	L.A.	Harvard Heights	34.045060999124097
102	L.A.	Harvard Park	33.983762999124835
104	L.A.	Hasley Canyon	34.476199893867175
105	L.A.	Hawaiian Gardens	33.830603999126708
106	L.A.	Hawthorne	33.914028000717863
107	L.A.	Hermosa Beach	33.864771287924583
108	L.A.	Hidden Hills	34.16405683610931
110	L.A.	Highland Park	34.108758999123282
111	L.A.	Historic South-Central	34.019562499124277
114	L.A.	Hollywood	34.094408499999581
112	L.A.	Hollywood Hills	34.128088999122937
113	L.A.	Hollywood Hills West	34.111071499123213
115	L.A.	Huntington Park	33.978967499124934
116	L.A.	Hyde Park	33.985430999124816
120	L.A.	Industry	34.026835568749277
117	L.A.	Inglewood	33.954067500238899
118	L.A.	Irwindale	34.108874499123317
119	L.A.	Jefferson Park	34.028211499124154
28	L.A.	Koreatown	34.064510499123763
121	L.A.	La Canada Flintridge	34.210686999122075
122	L.A.	La Crescenta-Montrose	34.228709003122127
125	L.A.	La Habra Heights	33.96095113872326
56	L.A.	La Mirada	33.900793500197707
132	L.A.	La Puente	34.03313649750627
135	L.A.	La Verne	34.124883999123185
123	L.A.	Ladera Heights	33.996097001972416
126	L.A.	Lake Balboa	34.203703499122071
127	L.A.	Lake Hughes	34.671409020850533
128	L.A.	Lake Los Angeles	34.611038948416571
129	L.A.	Lake View Terrace	34.28376149912124
130	L.A.	Lakewood	33.844692999126622
131	L.A.	Lancaster	34.700066117404532
133	L.A.	Larchmont	34.079959499123596
136	L.A.	Lawndale	33.887710499125994
137	L.A.	Leimert Park	34.013050516583704
138	L.A.	Lennox	33.938174499912897
139	L.A.	Leona Valley	34.612528398823727
140	L.A.	Lincoln Heights	34.070410499123732
141	L.A.	Littlerock	34.521322425680587
142	L.A.	Lomita	33.791309499127209
143	L.A.	Long Beach	33.806580699978731
144	L.A.	Lopez/Kagel Canyons	34.300821499121156
145	L.A.	Los Feliz	34.10785849912326
146	L.A.	Lynwood	33.925213499125533
147	L.A.	Malibu	34.033895486545326

148	L.A.	Manchester Square	33.967165274809105
149	L.A.	Manhattan Beach	33.88950799912606
109	L.A.	Mar Vista	34.010242173076293
150	L.A.	Marina del Rey	33.975323504268417
151	L.A.	Mayflower Village	34.117318103307944
152	L.A.	Maywood	33.988338999124778
153	L.A.	Mid-City	34.041107499124067
154	L.A.	Mid-Wilshire	34.059609499123724
155	L.A.	Mission Hills	34.271661499121265
158	L.A.	Monrovia	34.148608345800739
159	L.A.	Montebello	34.010314998189017
160	L.A.	Montecito Heights	34.093658999123406
156	L.A.	Monterey Park	34.049427999124063
161	L.A.	Mount Washington	34.103158999123266
163	L.A.	North El Monte	34.102483231361113
164	L.A.	North Hills	34.238702499121729
165	L.A.	North Hollywood	34.177938499122348
168	L.A.	North Whittier	34.005714844032383
162	L.A.	Northeast Antelope Valley	34.637564309448457
52	L.A.	Northridge	34.238805499121611
166	L.A.	Northwest Antelope Valley	34.725569331170881
167	L.A.	Northwest Palmdale	34.625608953797482
169	L.A.	Norwalk	33.907168999125822
170	L.A.	Pacific Palisades	34.078366733694963
171	L.A.	Pacoima	34.26360659127154
174	L.A.	Palmdale	34.585421999117628
175	L.A.	Palms	34.024597526725373
172	L.A.	Palos Verdes Estates	33.783316814743465
173	L.A.	Panorama City	34.229502999121699
177	L.A.	Paramount	33.899154499125913
182	L.A.	Pasadena	34.18459099912242
178	L.A.	Pico Rivera	33.989604499124823
179	L.A.	Pico-Robertson	34.05373199912394
180	L.A.	Pico-Union	34.044161499124009
124	L.A.	Playa Vista	33.976925499124803
181	L.A.	Playa del Rey	33.945661530783255
183	L.A.	Pomona	34.065723499123862
184	L.A.	Porter Ranch	34.278216499201754
185	L.A.	Quartz Hill	34.654878150335279
187	L.A.	Ramona	34.060567999123897
188	L.A.	Rancho Dominguez	33.859875999126409
191	L.A.	Rancho Palos Verdes	33.75869892565828
192	L.A.	Rancho Park	34.034314999124099
186	L.A.	Redondo Beach	33.854633999126435
189	L.A.	Reseda	34.203603499122082
193	L.A.	Ridge Route	34.649657898094503
194	L.A.	Rolling Hills	33.762682999127549

190	L.A.	Rolling Hills Estates	33.776429999127444
195	L.A.	Rosemead	34.064645999123826
196	L.A.	Rowland Heights	33.973574999125063
198	L.A.	San Dimas	34.115259499123212
199	L.A.	San Fernando	34.288998499121206
202	L.A.	San Gabriel	34.093215999123494
203	L.A.	San Marino	34.121299999123188
204	L.A.	San Pasqual	34.139387218224641
206	L.A.	San Pedro	33.743377490636142
208	L.A.	Santa Clarita	34.408855499147847
197	L.A.	Santa Fe Springs	33.928934999496654
200	L.A.	Santa Monica	34.021860499124415
201	L.A.	Sawtelle	34.03506728275898
205	L.A.	Sepulveda Basin	34.17460099912239
209	L.A.	Shadow Hills	34.239428499121757
210	L.A.	Sherman Oaks	34.149005499122715
211	L.A.	Sierra Madre	34.168112999122641
212	L.A.	Signal Hill	33.804375999127039
213	L.A.	Silver Lake	34.094459499123445
214	L.A.	South Diamond Bar	33.960748576953293
216	L.A.	South El Monte	34.048729098531766
217	L.A.	South Gate	33.938158499185079
218	L.A.	South Park	33.996463999124586
219	L.A.	South Pasadena	34.11216899912327
220	L.A.	South San Gabriel	34.066492621729282
221	L.A.	South San Jose Hills	34.014947000828826
222	L.A.	South Whittier	33.936196000947831
215	L.A.	Southeast Antelope Valley	34.466085813776999
224	L.A.	Stevenson Ranch	34.394100486490998
225	L.A.	Studio City	34.137891999122886
227	L.A.	Sun Valley	34.22661749912173
207	L.A.	Sun Village	34.557696692382351
226	L.A.	Sunland	34.270730999121341
223	L.A.	Sylmar	34.308403858579155
228	L.A.	Tarzana	34.156454999122722
229	L.A.	Temple City	34.103177499123404
230	L.A.	Toluca Lake	34.15349309467193
231	L.A.	Topanga	34.092639152756504
233	L.A.	Torrance	33.833638999126677
235	L.A.	Tujunga	34.261340090064621
234	L.A.	Tujunga Canyons	34.36770541756718
236	L.A.	Unincorporated Catalina Island	33.388602475414189
241	L.A.	Unincorporated Santa Monica Mountains	34.087645747469352
245	L.A.	Unincorporated Santa Susana Mountains	34.361843886571933
232	L.A.	Universal City	34.137361499122974
237	L.A.	University Park	34.028113999124287
242	L.A.	Val Verde	34.44560168460962

238	L.A.	Valinda	34.038452502168049
239	L.A.	Valley Glen	34.189504499122229
240	L.A.	Valley Village	34.163355999122615
243	L.A.	Van Nuys	34.196505499122246
244	L.A.	Venice	33.986273217151727
246	L.A.	Vermont Knolls	33.967009999124997
81	L.A.	Vermont Square	34.002062999124533
90	L.A.	Vermont Vista	33.941708042365043
17	L.A.	Vermont-Slauson	33.983913999124709
247	L.A.	Vernon	33.999657999124722
248	L.A.	Veterans Administration	34.057383999123985
249	L.A.	View Park-Windsor Hills	33.995646003043063
250	L.A.	Vincent	34.09951050296921
251	L.A.	Walnut	34.033247999124256
103	L.A.	Walnut Park	33.966981503722153
134	L.A.	Watts	33.941619001308609
157	L.A.	West Adams	34.02886149912419
176	L.A.	West Carson	33.822072500607462
253	L.A.	West Compton	33.894136502499222
254	L.A.	West Covina	34.047182499124105
255	L.A.	West Hills	34.207253636931036
256	L.A.	West Hollywood	34.08721323709856
259	L.A.	West Los Angeles	34.047220499123917
261	L.A.	West Puente Valley	34.049860493908568
262	L.A.	West San Dimas	34.087431659884331
263	L.A.	West Whittier-Los Nietos	33.980559999939608
252	L.A.	Westchester	33.95599525987285
257	L.A.	Westlake	34.062360999123754
258	L.A.	Westlake Village	34.139191499123029
260	L.A.	Westmont	33.945207502436951
264	L.A.	Westwood	34.06523499912381
265	L.A.	Whittier	33.979441000624007
266	L.A.	Whittier Narrows	34.037074109844369
267	L.A.	Willowbrook	33.915710503828592
268	L.A.	Wilmington	33.79129350128175
269	L.A.	Windsor Square	34.069108499123722
270	L.A.	Winnetka	34.210459499121988
271	L.A.	Woodland Hills	34.159408692550485

	Longitude
0	-118.16981019229348
1	-118.30020800000011
2	-118.75988450000015
3	-118.3171036690717
4	-118.13651200000021
5	-118.33515598608159
7	-118.13623898201556

8	-117.9223952817848
9	-118.03041899311202
10	-118.4307575
11	-118.3234085
6	-118.08010100000017
12	-118.30465647554277
13	-118.26237347966236
14	-118.32733223477572
15	-118.0012614768012
16	-117.91246849999999
18	-118.35774600000005
19	-117.9751905000002
20	-118.45841550000007
24	-118.17916600000018
22	-118.1499360000002
21	-118.12903150000017
25	-118.42326299999999
26	-118.376102
29	-118.39953400000016
30	-118.39398199999999
31	-118.21078750000007
32	-117.96857400000013
33	-118.49218850000007
34	-118.27535153247453
27	-118.32521100000017
35	-118.67163173539396
36	-118.60151949999999
37	-118.24800950000022
38	-118.36891
41	-118.63334936248927
39	-118.45476897959236
42	-118.24721250000012
43	-118.41508300000005
44	-118.06863750000007
45	-117.85751998453503
40	-118.61235450000001
46	-118.62695325711778
47	-118.31320800000006
48	-118.41146150000006
49	-118.23700649999989
50	-117.89216399278311
51	-117.71876950000001
53	-118.1573625000002
54	-118.2218104930422
57	-117.88392199287892
58	-118.18557250000019
59	-118.40902450000016

55	-118.22415649999999
60	-118.36983198490955
61	-118.423993
62	-118.15455633368757
63	-117.81573066877161
64	-118.13042300000015
65	-118.24850990440491
66	-117.95762350000011
67	-118.20484450000001
68	-118.19598900000028
69	-118.2968085
70	-117.9907619882008
72	-118.1596383526979
73	-118.08087798337868
74	-118.07396450000032
75	-118.2590075
76	-118.03519600000016
77	-118.40223073369825
78	-118.1762975
71	-118.38621116359349
79	-118.23745650000001
80	-118.24195650000013
82	-118.49951500000012
83	-118.29887550000007
84	-118.35285800000005
86	-118.26860650000008
85	-118.24192048907494
87	-118.30862700000014
88	-118.23642729889393
91	-118.2449270000002
92	-117.84178450000023
93	-118.30898400000005
94	-118.50767050010745
89	-118.26148999301319
23	-118.41421658346756
95	-118.29715634932774
96	-117.97508050764819
97	-118.3350095
98	-118.37905350000011
99	-118.29516400000006
100	-118.29530900000007
101	-118.307658
102	-118.30455750000012
104	-118.66021608592953
105	-118.07219200000006
106	-118.34605599620926
107	-118.39714183223805

108	-118.65705600000015
110	-118.1911965
111	-118.26585700000012
114	-118.33555159977072
112	-118.33541000000008
113	-118.37025800000006
115	-118.2140149952952
116	-118.33775850000006
120	-117.93962100000014
117	-118.34611749302944
118	-117.96667800000012
119	-118.32205850000005
28	-118.3049585
121	-118.20046998596307
122	-118.23518197192418
125	-117.95562783562224
56	-118.00722099646512
132	-117.95309349690484
135	-117.7745250000001
123	-118.37410748609757
126	-118.50446700000006
127	-118.45933374872043
128	-117.83603921804665
129	-118.3618685
130	-118.11305100000018
131	-118.13179100000016
133	-118.317809
136	-118.3564764903399
137	-118.32633970815459
138	-118.35714748618386
139	-118.29122197531558
140	-118.2103055
141	-117.97827605507007
142	-118.31796600000017
143	-118.156064
144	-118.38555850000017
145	-118.2884085
146	-118.20282648482208
147	-118.7542537868066
148	-118.30898400000005
149	-118.40093919800572
109	-118.43668192517818
150	-118.44786948141424
151	-118.00229999282959
152	-118.18730300000013
153	-118.35880950000006
154	-118.3431095

155	-118.45716250000007
158	-117.98179100000009
159	-118.10833743364199
160	-118.19427049999999
156	-118.13161942411986
161	-118.21900650000001
163	-118.02354298857939
164	-118.47711700000006
165	-118.37966349999999
168	-118.02918914224676
162	-117.91515082345049
52	-118.52796900000007
166	-118.42772667494613
167	-118.17887478361382
169	-118.07693800000014
170	-118.54585899824386
171	-118.41890850000007
174	-118.10809351531806
175	-118.40902995476588
172	-118.39012200169401
173	-118.44521550000007
177	-118.16539050000017
182	-118.13180900000009
178	-118.08161950000004
179	-118.39132550000005
180	-118.28470750000005
124	-118.41364800000007
181	-118.44133951162496
183	-117.7699420000001
184	-118.54872950000006
185	-118.21863657473801
187	-117.83843450000029
188	-118.21829150000025
191	-118.35980750108605
192	-118.42312500000006
186	-118.37710100127826
189	-118.540368
193	-118.70332725511963
194	-118.34812650000021
190	-118.35453350000017
195	-118.08187550000011
196	-117.89399129564529
198	-117.81326850000013
199	-118.43598850000011
202	-118.09900700000023
203	-118.11505449283317
204	-118.10297194101678

206	-118.28508539395716
208	-118.49476193960714
197	-118.06368000000016
200	-118.48056671004807
201	-118.45059109758868
205	-118.49231650000006
209	-118.32881067473647
210	-118.441514
211	-118.04883650000005
212	-118.16716650000018
213	-118.2677075
214	-117.82609234720164
216	-118.04853200000019
217	-118.19381199294568
218	-118.26875699999999
219	-118.15623650000006
220	-118.08974290054033
221	-117.90184498555011
222	-118.0280174858583
215	-117.92981254313324
224	-118.58387954676732
225	-118.38747919966544
227	-118.3843172128845
207	-117.95659832063463
226	-118.31202250000007
223	-118.45205006616247
228	-118.54458900000007
229	-118.05489926123286
230	-118.35795100000007
231	-118.60842021657524
233	-118.35171088115038
235	-118.2818
234	-118.28843919025437
236	-118.45466051366508
241	-118.77026791367985
245	-118.61680047572341
232	-118.35278600000026
237	-118.28280750000005
242	-118.6656538804971
238	-117.93079549289092
239	-118.4145170000001
240	-118.39620200000005
243	-118.4639545
244	-118.46284569710343
246	-118.29050700000013
81	-118.29880750000001
90	-118.28545100000014

```
17   -118.29035750000011
247  -118.20343200000011
248  -118.45725850000031
249  -118.34855947912703
250   -117.9247939857519
251  -117.86012600000016
103  -118.22051147887569
134         -118.2399365
157  -118.35517858045984
176  -118.29227748370761
253  -118.26773698606382
254  -117.91269950000019
255  -118.63539850000006
256  -118.36961300000019
259         -118.4307445
261  -117.96992450000026
262  -117.83509899236435
263  -118.07001998587738
252  -118.39829259016352
257  -118.27222100000006
258  -118.82291200000014
260  -118.30463897559736
264  -118.44047994677246
265  -118.01891099569201
266  -118.06118827749373
267  -118.25231247908229
268  -118.25918700000008
269  -118.31990900000005
270  -118.57521950000014
271  -118.61521650000006
```

[7]:
```python
address = 'Los Angeles'

geolocator = Nominatim(user_agent="ny_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geographical coordinate of L.A are {}, {}.'.format(latitude,␣
 ↪longitude))
```

```
The geographical coordinate of L.A are 34.0536909, -118.2427666.
```

[8]:
```python
map_la = folium.Map(location=[latitude, longitude], zoom_start=10)

# add markers to map
for lat, lng, label in zip(neighborhoods['Latitude'],␣
 ↪neighborhoods['Longitude'], neighborhoods['Neighborhood']):
```

```
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.9,
        parse_html=False).add_to(map_la)

map_la
```

[8]: <folium.folium.Map at 0x7f5093ef9790>

0.0.3 Methodology

We are going to explore our data in order to reveal neighborhoods that are good targets for opening a new restaurant. We will identify which neighborhood have the least restaurants and make suggestions based on this observation. First, we can using basic plotting strategies, such as barplots, to compare the total number of restaurants in each neighborhoods, taking into account neighborhhods that have at least one restaurant. Next we will repeat the analysis taking into account all the available neighborhhods.

Since we are interested in the total number number of restaurants in each neighborhood and not on the type of the restaurant, we will have to modify the data reveived from foursquare. Foursquare originally returns the number of restaurants in each neighborhood, base on the type of the restaurant, i.e. Italian, Greek, Mexican etc. We will have to group our dataset based on the neighborhood name and estimate how many restaurants there are in total. This will also give us neighborhoods that do not have any restaurants (adding new information to the previous barplot).

Finally we are going to use the k-means clustering approach to make clusters of neighborhoods based on the venue information we have. Notice that we added a new venue that sums all the restaurants. You will notice that the map is not cleasr to make a proper decision. For this reason we are using a barplot to identify which labels correspond to neighborhoods with few or no restaurants. We can then suggest the appropriate neighborhoods based on this observation.

0.0.4 Analysis and results

[9]:
```
#time to use fousquare
CLIENT_ID = 'W3ZU1DV2Y5S1IAA1YLB4IZNNXCQXC4J4GTF1ON4DIVXUNJIV' # your␣
↪Foursquare ID
CLIENT_SECRET = 'FZB1RRL11JRXWRDHDBHZHSNSXQU4QPDKLFZ5LB4QFZUJII20' # your␣
↪Foursquare Secret
VERSION = '20180605' # Foursquare API versionb
```

[10]:
```
#explore neighborhoods in Toronto


def getNearbyVenues(names, latitudes, longitudes,LIMIT=100, radius=500):

    venues_list=[]
    for name, lat, lng in zip(names, latitudes, longitudes):
        print(name)

        # create the API request URL
        url = 'https://api.foursquare.com/v2/venues/explore?
↪&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}'.format(
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

        # make the GET request
        results = requests.get(url).json()["response"]['groups'][0]['items']

        # return only relevant information for each nearby venue
        venues_list.append([(
            name,
            lat,
            lng,
            v['venue']['name'],
            v['venue']['location']['lat'],
            v['venue']['location']['lng'],
            v['venue']['categories'][0]['name']) for v in results])

    nearby_venues = pd.DataFrame([item for venue_list in venues_list for item␣
↪in venue_list])
    nearby_venues.columns = ['Neighborhood',
                  'Neighborhood Latitude',
                  'Neighborhood Longitude',
```

```
                    'Venue',
                    'Venue Latitude',
                    'Venue Longitude',
                    'Venue Category']

    return(nearby_venues)
```

[11]:
```
la_venues = getNearbyVenues(names=neighborhoods['Neighborhood'],
                                   latitudes=neighborhoods['Latitude'],
                                   longitudes=neighborhoods['Longitude']
                                  )
```

```
Acton
Adams-Normandie
Agoura Hills
Agua Dulce
Alhambra
Alondra Park
Artesia
Altadena
Angeles Crest
Arcadia
Arleta
Arlington Heights
Athens
Atwater Village
Avalon
Avocado Heights
Azusa
Vermont-Slauson
Baldwin Hills/Crenshaw
Baldwin Park
Bel-Air
Bellflower
Bell Gardens
Green Valley
Bell
Beverly Crest
Beverly Grove
Burbank
Koreatown
Beverly Hills
Beverlywood
Boyle Heights
Bradbury
Brentwood
Broadway-Manchester
```

Calabasas
Canoga Park
Carson
Carthay
Castaic Canyons
Chatsworth
Castaic
Central-Alameda
Century City
Cerritos
Charter Oak
Chatsworth Reservoir
Chesterfield Square
Cheviot Hills
Chinatown
Citrus
Claremont
Northridge
Commerce
Compton
Cypress Park
La Mirada
Covina
Cudahy
Culver City
Del Aire
Del Rey
Desert View Highlands
Diamond Bar
Downey
Downtown
Duarte
Eagle Rock
East Compton
East Hollywood
East La Mirada
Elizabeth Lake
East Los Angeles
East Pasadena
East San Gabriel
Echo Park
El Monte
El Segundo
El Sereno
Elysian Park
Elysian Valley
Vermont Square
Encino

Exposition Park
Fairfax
Florence-Firestone
Florence
Gardena
Glassell Park
Green Meadows
Vermont Vista
Glendale
Glendora
Gramercy Park
Granada Hills
Griffith Park
Hacienda Heights
Hancock Park
Hansen Dam
Harbor City
Harbor Gateway
Harvard Heights
Harvard Park
Walnut Park
Hasley Canyon
Hawaiian Gardens
Hawthorne
Hermosa Beach
Hidden Hills
Mar Vista
Highland Park
Historic South-Central
Hollywood Hills
Hollywood Hills West
Hollywood
Huntington Park
Hyde Park
Inglewood
Irwindale
Jefferson Park
Industry
La Canada Flintridge
La Crescenta-Montrose
Ladera Heights
Playa Vista
La Habra Heights
Lake Balboa
Lake Hughes
Lake Los Angeles
Lake View Terrace
Lakewood

Lancaster
La Puente
Larchmont
Watts
La Verne
Lawndale
Leimert Park
Lennox
Leona Valley
Lincoln Heights
Littlerock
Lomita
Long Beach
Lopez/Kagel Canyons
Los Feliz
Lynwood
Malibu
Manchester Square
Manhattan Beach
Marina del Rey
Mayflower Village
Maywood
Mid-City
Mid-Wilshire
Mission Hills
Monterey Park
West Adams
Monrovia
Montebello
Montecito Heights
Mount Washington
Northeast Antelope Valley
North El Monte
North Hills
North Hollywood
Northwest Antelope Valley
Northwest Palmdale
North Whittier
Norwalk
Pacific Palisades
Pacoima
Palos Verdes Estates
Panorama City
Palmdale
Palms
West Carson
Paramount
Pico Rivera

Pico-Robertson
Pico-Union
Playa del Rey
Pasadena
Pomona
Porter Ranch
Quartz Hill
Redondo Beach
Ramona
Rancho Dominguez
Reseda
Rolling Hills Estates
Rancho Palos Verdes
Rancho Park
Ridge Route
Rolling Hills
Rosemead
Rowland Heights
Santa Fe Springs
San Dimas
San Fernando
Santa Monica
Sawtelle
San Gabriel
San Marino
San Pasqual
Sepulveda Basin
San Pedro
Sun Village
Santa Clarita
Shadow Hills
Sherman Oaks
Sierra Madre
Signal Hill
Silver Lake
South Diamond Bar
Southeast Antelope Valley
South El Monte
South Gate
South Park
South Pasadena
South San Gabriel
South San Jose Hills
South Whittier
Sylmar
Stevenson Ranch
Studio City
Sunland

```
Sun Valley
Tarzana
Temple City
Toluca Lake
Topanga
Universal City
Torrance
Tujunga Canyons
Tujunga
Unincorporated Catalina Island
University Park
Valinda
Valley Glen
Valley Village
Unincorporated Santa Monica Mountains
Val Verde
Van Nuys
Venice
Unincorporated Santa Susana Mountains
Vermont Knolls
Vernon
Veterans Administration
View Park-Windsor Hills
Vincent
Walnut
Westchester
West Compton
West Covina
West Hills
West Hollywood
Westlake
Westlake Village
West Los Angeles
Westmont
West Puente Valley
West San Dimas
West Whittier-Los Nietos
Westwood
Whittier
Whittier Narrows
Willowbrook
Wilmington
Windsor Square
Winnetka
Woodland Hills
```

[ ]:

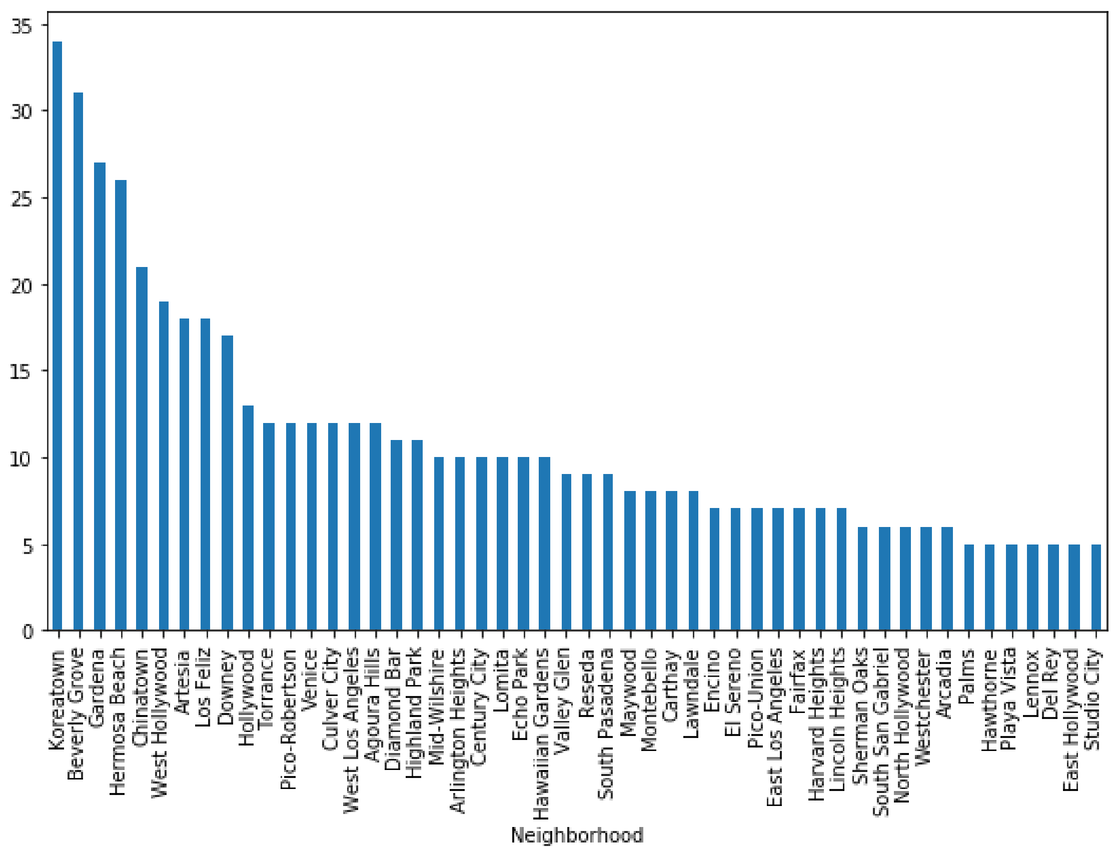
[13]:
```
##keep only restaurants
la_venues_forfood=la_venues[la_venues['Venue Category'].str.
↪contains("Restaurant")].reset_index(drop=True)
```

[ ]:
```

```

[153]:
```
#take total number of restaurants in each neighborhood
#doing this we ignore neighborhoods with no restaurants
```

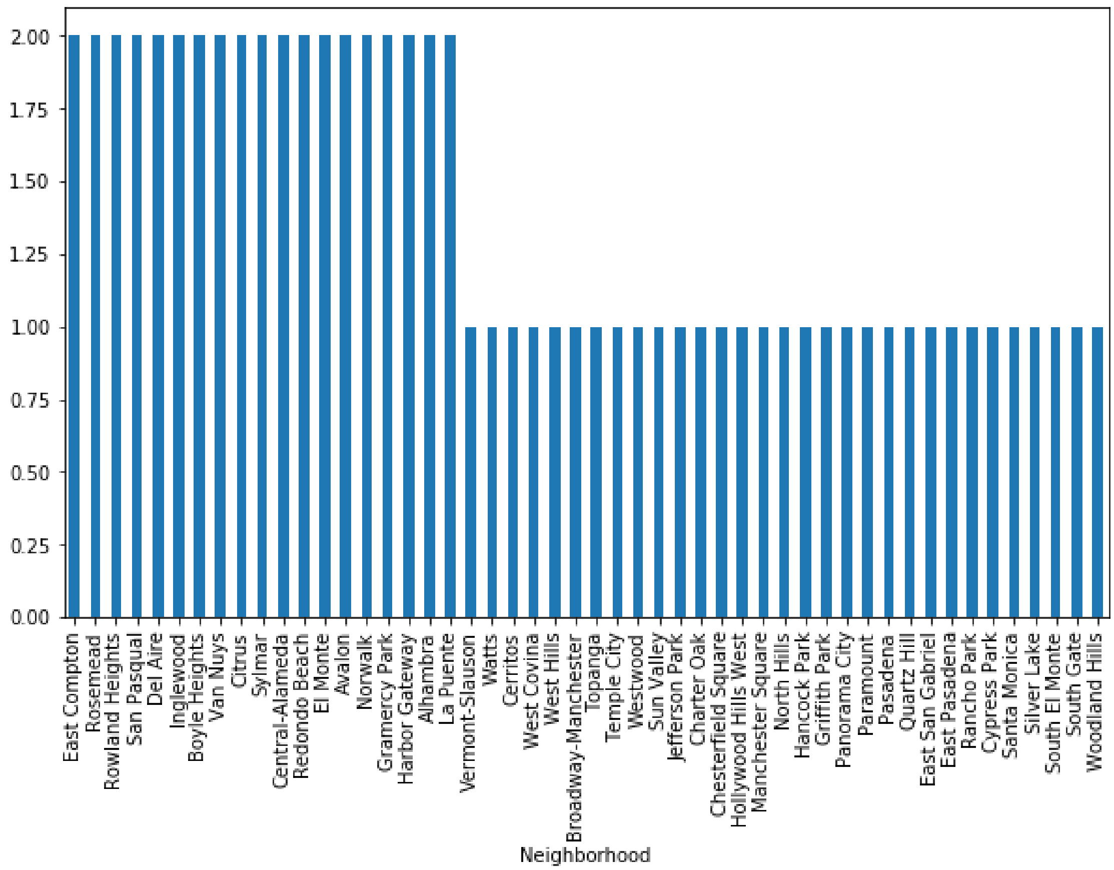
[228]:
```
#plot the top 50 neighborhoods with the most restaurants

la_venues_forfood.groupby('Neighborhood').count()['Venue Category'].
↪sort_values(ascending=False).head(50).plot(kind='bar', figsize=(10, 6))
```

[228]: <matplotlib.axes._subplots.AxesSubplot at 0x7f7405329b50>



[16]:
```
#plot the bottom 50 neighborhoods with the least restaurants

la_venues_forfood.groupby('Neighborhood').count()['Venue Category'].
↪sort_values(ascending=False).tail(50).plot(kind='bar', figsize=(10, 6))
```

[16]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x7f50916aa1d0>
```



0.0.5 From the plots above neighborhoods with no restaurants at all are missing. Lets try to include them in our analysis.

[ ]:

[18]:
```
# one hot encoding
la_hot = pd.get_dummies(la_venues[['Venue Category']], prefix="", prefix_sep="")

# add neighborhood column back to dataframe
la_hot['NeighborhoodName'] = la_venues['Neighborhood']

# move neighborhood column to the first column
fixed_columns = [la_hot.columns[-1]] + list(la_hot.columns[:-1])
la_hot = la_hot[fixed_columns]
```

[233]:
```
#la_hot.iloc[353:429,:][la_hot.columns[la_hot.columns.str.
↪contains("Restaurant")]].sum(axis=1).sum()
```

[233]: 33

[19]:
```
la_hotforfood=la_hot[la_hot.columns[la_hot.columns.str.contains("Restaurant")]]
la_hotforfood['NeighborhoodName']=la_hot['NeighborhoodName']
fixed_columns2 = [la_hotforfood.columns[-1]] + list(la_hotforfood.columns[:-1])
la_hotforfood = la_hotforfood[fixed_columns2]
```

```
/home/christos/anaconda3/lib/python3.7/site-packages/ipykernel_launcher.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
```

[ ]:

[21]:
```
la_hotforfood['TotalRestaurants']=la_hotforfood[la_hotforfood.
↪columns[la_hotforfood.columns.str.contains("Restaurant")]].sum(axis=1)
```

[ ]:

[23]:
```
la_hotforfoodTotal=la_hotforfood.groupby('NeighborhoodName').
↪sum()[['TotalRestaurants']]
```

[24]:
```
la_hotforfoodTotal.index.name = None
la_hotforfoodTotal['NeighborhoodName']=la_hotforfoodTotal.index.tolist()
```

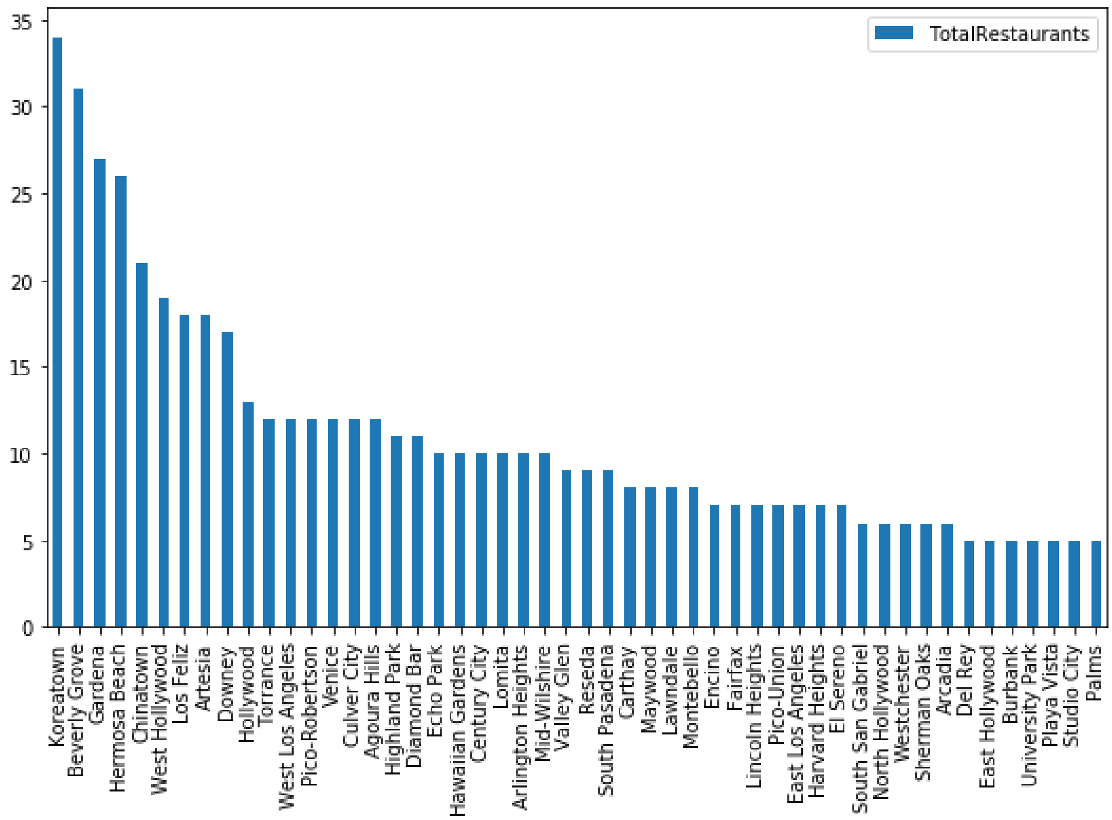
[26]:
```
la_hotforfoodTotal.head(10)
```

[26]:

	TotalRestaurants	NeighborhoodName
Acton	0	Acton
Adams-Normandie	3	Adams-Normandie
Agoura Hills	12	Agoura Hills
Agua Dulce	0	Agua Dulce
Alhambra	2	Alhambra
Alondra Park	0	Alondra Park
Altadena	0	Altadena
Arcadia	6	Arcadia
Arleta	0	Arleta
Arlington Heights	10	Arlington Heights

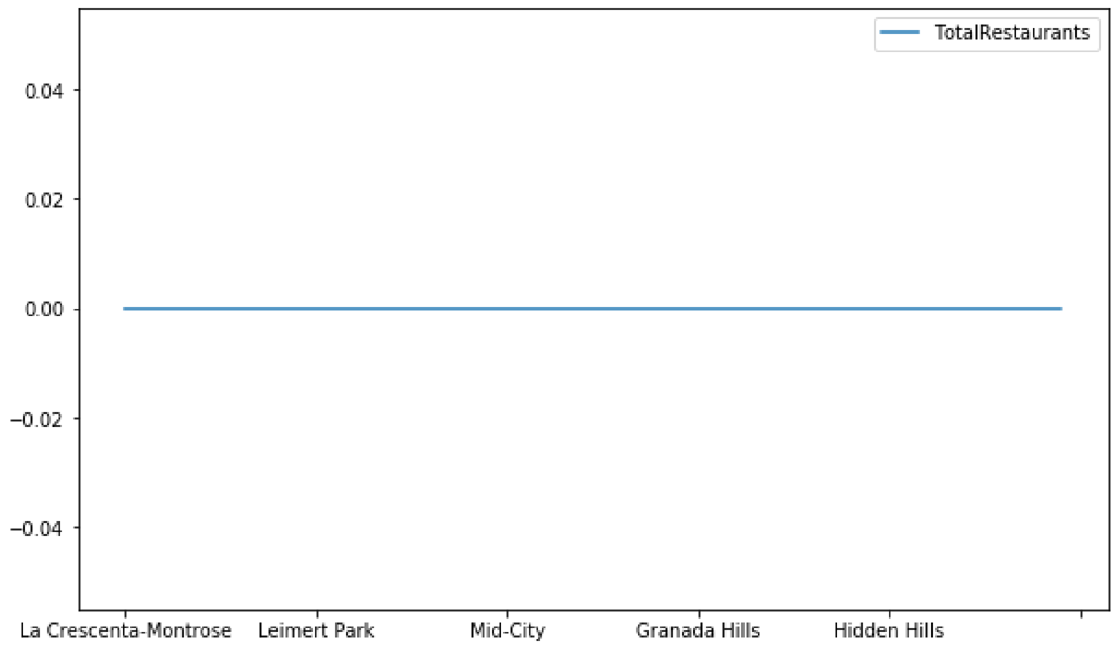
[27]:
```
#repeat the barplot analysis including neighborhoods that do not have any␣
↪restaurants

la_hotforfoodTotal.sort_values(by='TotalRestaurants',ascending=False).head(50).
↪plot(kind='bar',figsize=(10, 6))
```

[27]: <matplotlib.axes._subplots.AxesSubplot at 0x7f5090482150>



[28]:
```
la_hotforfoodTotal.sort_values(by='TotalRestaurants',ascending=False).tail(50).
↪plot(kind='line',figsize=(10, 6))
```

[28]: <matplotlib.axes._subplots.AxesSubplot at 0x7f5090370b90>



0.0.6 We see that there are many ares with no restaurants at all. Lets try to cluster the neighborhoods.

[29]:
```
#keep no-restaurant venues in a separate dataframe
la_hotnofood=la_hot[la_hot.columns[la_hot.columns.str.
 ↪contains("Restaurant")==False]]
```

[32]:
```
# now we have two dataframes, one that has information only for the␣
 ↪restaurants,
#and one that have information for the rest venues

print(la_hotnofood.shape,la_hotforfood.shape)
```

```
(2958, 264) (2958, 58)
```

[34]:
```
#let's merge the two datasets
# now we removed the differents types of restaurants and kept only the total␣
 ↪number of restaurants in each
#neighborhhod
la_hotTotal=pd.
 ↪concat([la_hotforfood[['TotalRestaurants']],la_hotnofood],axis=1, sort=False)
```

[35]:
```
la_hotTotal.head()
```

[35]:

```
   TotalRestaurants NeighborhoodName  ATM  Accessories Store  Airport  \
0                 0            Acton    0                  0        0
1                 0            Acton    0                  0        0
2                 1  Adams-Normandie    0                  0        0
3                 0  Adams-Normandie    0                  0        0
4                 1  Adams-Normandie    0                  0        0

   Airport Lounge  Amphitheater  Antique Shop  Arcade  Art Gallery  \
0               0             0             0       0            0
1               0             0             0       0            0
2               0             0             0       0            0
3               0             0             0       0            0
4               0             0             0       0            0

   Art Museum  Arts & Crafts Store  Arts & Entertainment  Athletics & Sports  \
0           0                    0                     0                   0
1           0                    0                     0                   0
2           0                    0                     0                   0
3           0                    0                     0                   0
4           0                    0                     0                   0

   Auto Garage  Auto Workshop  Automotive Shop  BBQ Joint  Baby Store  \
0            0              0                0          0           0
1            0              0                0          0           0
2            0              0                0          0           0
3            0              0                0          0           0
4            0              0                0          0           0

   Bagel Shop  Bakery  Bank  Bar  Baseball Field  Basketball Court  Beach  \
0           0       0     0    0               0                 0      0
1           0       0     0    0               0                 0      0
2           0       0     0    0               0                 0      0
3           0       0     0    0               0                 0      0
4           0       0     0    0               0                 0      0

   Big Box Store  Bike Rental / Bike Share  Bistro  Board Shop  Boat or Ferry  \
0              0                         0       0           0              0
1              0                         0       0           0              0
2              0                         0       0           0              0
3              0                         0       0           0              0
4              0                         0       0           0              0

   Bookstore  Boutique  Bowling Alley  Breakfast Spot  Brewery  Bridal Shop  \
0          0         0              0               0        0            0
1          0         0              0               0        0            0
2          0         0              0               0        0            0
3          0         0              0               0        0            0
```

```
4         0         0              0                0        0            0

   Bubble Tea Shop  Buffet  Building  Burger Joint  Burrito Place  Bus Line  \
0                0       0         0             0              0         0
1                0       0         0             0              0         0
2                0       0         0             0              0         0
3                0       0         0             0              0         0
4                0       0         0             0              0         0

   Bus Station  Bus Stop  Business Service  Butcher  Cafeteria  Café  \
0            0         0                 0        0          0     0
1            0         0                 0        0          0     0
2            0         0                 0        0          0     0
3            0         0                 0        0          0     0
4            0         0                 0        0          0     0

   Camera Store  Campground  Canal  Candy Store  Carpet Store  \
0             0           0      0            0             0
1             0           0      0            0             0
2             0           0      0            0             0
3             0           0      0            0             0
4             0           0      0            0             0

   Check Cashing Service  Chocolate Shop  Church  Clothing Store  \
0                      0               0       0               0
1                      0               0       0               0
2                      0               0       0               0
3                      0               0       0               0
4                      0               0       0               0

   Cocktail Bar  Coffee Shop  College Residence Hall  College Theater  \
0             0            0                       0                0
1             0            0                       0                0
2             0            0                       0                0
3             0            0                       0                0
4             0            0                       0                0

   Comedy Club  Comic Shop  Concert Hall  Construction & Landscaping  \
0            0           0             0                           1
1            0           0             0                           1
2            0           0             0                           0
3            0           0             0                           0
4            0           0             0                           0

   Convenience Store  Cosmetics Shop  Creperie  Cupcake Shop  Cycle Studio  \
0                  0               0         0             0             0
1                  0               0         0             0             0
```

```
2                 0                0         0             0              0
3                 0                0         0             0              0
4                 0                0         0             0              0

   Dance Studio  Deli / Bodega  Dentist's Office  Department Store  \
0             0              0                 0                 0
1             0              0                 0                 0
2             0              0                 0                 0
3             0              0                 0                 0
4             0              0                 0                 0

   Design Studio  Dessert Shop  Diner  Disc Golf  Discount Store  Distillery  \
0              0             0      0          0               0           0
1              0             0      0          0               0           0
2              0             0      0          0               0           0
3              0             0      0          0               0           0
4              0             0      0          0               0           0

   Dive Bar  Doctor's Office  Dog Run  Donut Shop  Drugstore  \
0         0                0        0           0          0
1         0                0        0           0          0
2         0                0        0           0          0
3         0                0        0           0          0
4         0                0        0           0          0

   Electronics Store  Fabric Shop  Farm  Farmers Market  Film Studio  \
0                  0            0     0               0            0
1                  0            0     0               0            0
2                  0            0     0               0            0
3                  0            0     0               0            0
4                  0            0     0               0            0

   Fish & Chips Shop  Flea Market  Flower Shop  Food  Food & Drink Shop  \
0                  0            0            0     0                  0
1                  0            0            0     0                  0
2                  0            0            0     0                  0
3                  0            0            0     0                  0
4                  0            0            0     0                  0

   Food Court  Food Service  Food Stand  Food Truck  Football Stadium  \
0           0             0           0           0                 0
1           0             0           0           0                 0
2           0             0           0           0                 0
3           0             0           0           0                 0
4           0             0           0           0                 0

   Fountain  Fraternity House  Fried Chicken Joint  Frozen Yogurt Shop  \
```

0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

	Furniture / Home Store	Garden	Garden Center	Gas Station	Gastropub \
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	1	0
4	0	0	0	0	0

	Gay Bar	General Entertainment	General Travel	Gift Shop	Go Kart Track \
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0

	Golf Course	Gourmet Shop	Government Building	Grocery Store	Gym \
0	0	0	0	0	0
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	0
4	0	0	0	0	0

	Gym / Fitness Center	Gym Pool	Gymnastics Gym	Harbor / Marina \
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

	Hardware Store	Health & Beauty Service	Health Food Store	High School \
0	0	0	0	0
1	0	0	0	0
2	0	0	0	0
3	0	0	0	0
4	0	0	0	0

	Historic Site	Hobby Shop	Home Service	Hookah Bar	Hot Dog Joint	Hotel \
0	0	0	0	0	0	0
1	0	0	0	0	0	0
2	0	0	0	0	0	0
3	0	0	0	0	0	0
4	0	0	0	0	0	0

	Hotel Bar	IT Services	Ice Cream Shop	Indie Movie Theater	Indie Theater	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Indoor Play Area	Insurance Office	Intersection	Jazz Club	Jewelry Store	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Juice Bar	Karaoke Bar	Kids Store	Lake	Laundromat	Lawyer	\
0	0	0	0	0	0	0	
1	0	0	0	0	0	0	
2	0	0	0	0	0	0	
3	0	0	0	0	0	0	
4	0	0	0	0	0	0	

	Light Rail Station	Lighting Store	Lingerie Store	Liquor Store	\
0	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	

	Locksmith	Lounge	Marijuana Dispensary	Market	Martial Arts Dojo	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Massage Studio	Men's Store	Mobile Phone Shop	Monument / Landmark	Motel	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Mountain	Movie Theater	Moving Target	Multiplex	Museum	Music Store	\
0	0	0	0	0	0	0	
1	0	0	0	0	0	0	
2	0	0	0	0	0	0	

```
3         0              0              0          0       0            0
4         0              0              0          0       0            0

   Music Venue  Nail Salon  Neighborhood  Nightclub  Nightlife Spot  \
0            0           0             0          0               0
1            0           0             0          0               0
2            0           0             0          0               0
3            0           0             0          0               0
4            0           0             0          0               0

   Noodle House  Office  Optical Shop  Organic Grocery  Other Great Outdoors  \
0             0       0             0                0                     0
1             0       0             0                0                     0
2             0       0             0                0                     0
3             0       0             0                0                     0
4             0       0             0                0                     0

   Other Nightlife  Other Repair Shop  Paper / Office Supplies Store  Park  \
0                0                  0                              0     0
1                0                  0                              0     0
2                0                  0                              0     0
3                0                  0                              0     0
4                0                  0                              0     0

   Performing Arts Venue  Pet Service  Pet Store  Pharmacy  Photography Lab  \
0                      0            0          0         0                0
1                      0            0          0         0                0
2                      0            0          0         0                0
3                      0            0          0         0                0
4                      0            0          0         0                0

   Photography Studio  Pier  Pilates Studio  Pizza Place  Platform  \
0                   0     0               0            0         0
1                   0     0               0            0         0
2                   0     0               0            0         0
3                   0     0               0            0         0
4                   0     0               0            0         0

   Playground  Plaza  Poke Place  Pool  Pub  Racetrack  Record Shop  \
0           0      0           0     0    0          0            0
1           0      0           0     0    0          0            0
2           0      0           0     0    0          0            0
3           0      0           0     0    0          0            0
4           0      0           0     0    0          0            0

   Recording Studio  Recreation Center  Rental Car Location  Rental Service  \
0                 0                  0                    0               0
```

```
1                0                  0                    0               0
2                0                  0                    0               0
3                0                  0                    0               0
4                0                  0                    0               0

   Reservoir  Residential Building (Apartment / Condo)  River  Road  \
0          0                                         0      0     0
1          0                                         0      0     0
2          0                                         0      0     0
3          0                                         0      0     0
4          0                                         0      0     0

   Rock Club  Sake Bar  Salad Place  Salon / Barbershop  Sandwich Place  \
0          0         0            0                   0               0
1          0         0            0                   0               0
2          0         0            0                   0               0
3          0         0            0                   0               0
4          0         0            0                   0               0

   Scenic Lookout  Sculpture Garden  Shipping Store  Shoe Store  \
0               0                 0               0           0
1               0                 0               0           0
2               0                 0               0           0
3               0                 0               0           0
4               0                 0               0           0

   Shop & Service  Shopping Mall  Shopping Plaza  Skate Park  Skating Rink  \
0               0              0               0           0             0
1               0              0               0           0             0
2               0              0               0           0             0
3               0              0               0           0             0
4               0              0               0           0             0

   Smoke Shop  Smoothie Shop  Snack Place  Soup Place  Souvenir Shop  Spa  \
0           0              0            0           0              0    0
1           0              0            0           0              0    0
2           0              0            0           0              0    0
3           0              0            0           0              0    0
4           0              0            0           0              0    0

   Speakeasy  Sporting Goods Shop  Sports Bar  Stables  \
0          0                    0           0        0
1          0                    0           0        0
2          0                    0           0        0
3          0                    0           0        0
4          0                    0           0        0
```

	State / Provincial Park	Steakhouse	Storage Facility	Strip Club	\
0	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	

	Supermarket	Supplement Shop	Surf Spot	Taco Place	Tattoo Parlor	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Tea Room	Tennis Court	Theater	Theme Park	Theme Park Ride / Attraction	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	
4	0	0	0	0	0	

	Thrift / Vintage Store	Tiki Bar	Tour Provider	\
0	0	0	0	
1	0	0	0	
2	0	0	0	
3	0	0	0	
4	0	0	0	

	Tourist Information Center	Toy / Game Store	Trail	\
0	0	0	0	
1	0	0	0	
2	0	0	0	
3	0	0	0	
4	0	0	0	

	Transportation Service	Travel & Transport	Video Game Store	Video Store	\
0	0	0	0	0	
1	0	0	0	0	
2	0	0	0	0	
3	0	0	0	0	
4	0	0	0	0	

	Warehouse Store	Watch Shop	Weight Loss Center	Wine Bar	Wine Shop	\
0	0	0	0	0	0	
1	0	0	0	0	0	
2	0	0	0	0	0	
3	0	0	0	0	0	

```
4                  0            0                    0          0           0

   Wings Joint  Women's Store  Yoga Studio
0            0              0            0
1            0              0            0
2            0              0            0
3            0              0            0
4            0              0            0
```

[36]:
```python
la_grouped = la_hotTotal.groupby('NeighborhoodName').mean()
la_grouped.head()
```

[36]:
```
                  TotalRestaurants  ATM  Accessories Store  Airport  \
NeighborhoodName
Acton                     0.000000  0.0                0.0      0.0
Adams-Normandie           0.333333  0.0                0.0      0.0
Agoura Hills              0.428571  0.0                0.0      0.0
Agua Dulce                0.000000  0.0                0.0      1.0
Alhambra                  0.153846  0.0                0.0      0.0

                  Airport Lounge  Amphitheater  Antique Shop  Arcade  \
NeighborhoodName
Acton                        0.0           0.0           0.0     0.0
Adams-Normandie              0.0           0.0           0.0     0.0
Agoura Hills                 0.0           0.0           0.0     0.0
Agua Dulce                   0.0           0.0           0.0     0.0
Alhambra                     0.0           0.0           0.0     0.0

                  Art Gallery  Art Museum  Arts & Crafts Store  \
NeighborhoodName
Acton                     0.0         0.0                  0.0
Adams-Normandie           0.0         0.0                  0.0
Agoura Hills              0.0         0.0                  0.0
Agua Dulce                0.0         0.0                  0.0
Alhambra                  0.0         0.0                  0.0

                  Arts & Entertainment  Athletics & Sports  Auto Garage  \
NeighborhoodName
Acton                              0.0                 0.0          0.0
Adams-Normandie                    0.0                 0.0          0.0
Agoura Hills                       0.0                 0.0          0.0
Agua Dulce                         0.0                 0.0          0.0
Alhambra                           0.0                 0.0          0.0

                  Auto Workshop  Automotive Shop  BBQ Joint  Baby Store  \
NeighborhoodName
Acton                       0.0              0.0   0.000000         0.0
```

```
Adams-Normandie            0.0              0.0  0.000000         0.0
Agoura Hills               0.0              0.0  0.035714         0.0
Agua Dulce                 0.0              0.0  0.000000         0.0
Alhambra                   0.0              0.0  0.000000         0.0

                  Bagel Shop    Bakery  Bank  Bar  Baseball Field  \
NeighborhoodName
Acton               0.000000  0.000000   0.0  0.0             0.0
Adams-Normandie     0.000000  0.000000   0.0  0.0             0.0
Agoura Hills        0.000000  0.071429   0.0  0.0             0.0
Agua Dulce          0.000000  0.000000   0.0  0.0             0.0
Alhambra            0.076923  0.000000   0.0  0.0             0.0

                  Basketball Court  Beach  Big Box Store  \
NeighborhoodName
Acton                          0.0    0.0            0.0
Adams-Normandie                0.0    0.0            0.0
Agoura Hills                   0.0    0.0            0.0
Agua Dulce                     0.0    0.0            0.0
Alhambra                       0.0    0.0            0.0

                  Bike Rental / Bike Share  Bistro  Board Shop  Boat or Ferry  \
NeighborhoodName
Acton                                  0.0     0.0         0.0            0.0
Adams-Normandie                        0.0     0.0         0.0            0.0
Agoura Hills                           0.0     0.0         0.0            0.0
Agua Dulce                             0.0     0.0         0.0            0.0
Alhambra                               0.0     0.0         0.0            0.0

                  Bookstore  Boutique  Bowling Alley  Breakfast Spot  \
NeighborhoodName
Acton                   0.0       0.0            0.0        0.000000
Adams-Normandie         0.0       0.0            0.0        0.000000
Agoura Hills            0.0       0.0            0.0        0.071429
Agua Dulce              0.0       0.0            0.0        0.000000
Alhambra                0.0       0.0            0.0        0.076923

                   Brewery  Bridal Shop  Bubble Tea Shop  Buffet  Building  \
NeighborhoodName
Acton             0.000000          0.0              0.0     0.0       0.0
Adams-Normandie   0.000000          0.0              0.0     0.0       0.0
Agoura Hills      0.035714          0.0              0.0     0.0       0.0
Agua Dulce        0.000000          0.0              0.0     0.0       0.0
Alhambra          0.000000          0.0              0.0     0.0       0.0

                  Burger Joint  Burrito Place  Bus Line  Bus Station  \
NeighborhoodName
```

```
Acton                 0.000000            0.0       0.0           0.0
Adams-Normandie       0.000000            0.0       0.0           0.0
Agoura Hills          0.035714            0.0       0.0           0.0
Agua Dulce            0.000000            0.0       0.0           0.0
Alhambra              0.000000            0.0       0.0           0.0

                  Bus Stop  Business Service  Butcher  Cafeteria      Café  \
NeighborhoodName
Acton                  0.0               0.0      0.0        0.0  0.000000
Adams-Normandie        0.0               0.0      0.0        0.0  0.000000
Agoura Hills           0.0               0.0      0.0        0.0  0.035714
Agua Dulce             0.0               0.0      0.0        0.0  0.000000
Alhambra               0.0               0.0      0.0        0.0  0.000000

                  Camera Store  Campground  Canal  Candy Store  Carpet Store  \
NeighborhoodName
Acton                      0.0         0.0    0.0          0.0           0.0
Adams-Normandie            0.0         0.0    0.0          0.0           0.0
Agoura Hills               0.0         0.0    0.0          0.0           0.0
Agua Dulce                 0.0         0.0    0.0          0.0           0.0
Alhambra                   0.0         0.0    0.0          0.0           0.0

                  Check Cashing Service  Chocolate Shop  Church  \
NeighborhoodName
Acton                               0.0             0.0     0.0
Adams-Normandie                     0.0             0.0     0.0
Agoura Hills                        0.0             0.0     0.0
Agua Dulce                          0.0             0.0     0.0
Alhambra                            0.0             0.0     0.0

                  Clothing Store  Cocktail Bar  Coffee Shop  \
NeighborhoodName
Acton                        0.0           0.0          0.0
Adams-Normandie              0.0           0.0          0.0
Agoura Hills                 0.0           0.0          0.0
Agua Dulce                   0.0           0.0          0.0
Alhambra                     0.0           0.0          0.0

                  College Residence Hall  College Theater  Comedy Club  \
NeighborhoodName
Acton                                0.0              0.0          0.0
Adams-Normandie                      0.0              0.0          0.0
Agoura Hills                         0.0              0.0          0.0
Agua Dulce                           0.0              0.0          0.0
Alhambra                             0.0              0.0          0.0

                  Comic Shop  Concert Hall  Construction & Landscaping  \
```

```
NeighborhoodName
Acton                        0.0           0.0                           1.0
Adams-Normandie              0.0           0.0                           0.0
Agoura Hills                 0.0           0.0                           0.0
Agua Dulce                   0.0           0.0                           0.0
Alhambra                     0.0           0.0                           0.0

                  Convenience Store  Cosmetics Shop  Creperie  Cupcake Shop  \
NeighborhoodName
Acton                      0.000000             0.0       0.0           0.0
Adams-Normandie            0.000000             0.0       0.0           0.0
Agoura Hills               0.000000             0.0       0.0           0.0
Agua Dulce                 0.000000             0.0       0.0           0.0
Alhambra                   0.307692             0.0       0.0           0.0

                  Cycle Studio  Dance Studio  Deli / Bodega  Dentist's Office  \
NeighborhoodName
Acton                      0.0           0.0       0.000000               0.0
Adams-Normandie            0.0           0.0       0.000000               0.0
Agoura Hills               0.0           0.0       0.035714               0.0
Agua Dulce                 0.0           0.0       0.000000               0.0
Alhambra                   0.0           0.0       0.000000               0.0

                  Department Store  Design Studio  Dessert Shop     Diner  \
NeighborhoodName
Acton                          0.0            0.0           0.0  0.000000
Adams-Normandie                0.0            0.0           0.0  0.000000
Agoura Hills                   0.0            0.0           0.0  0.035714
Agua Dulce                     0.0            0.0           0.0  0.000000
Alhambra                       0.0            0.0           0.0  0.000000

                  Disc Golf  Discount Store  Distillery  Dive Bar  \
NeighborhoodName
Acton                   0.0             0.0         0.0       0.0
Adams-Normandie         0.0             0.0         0.0       0.0
Agoura Hills            0.0             0.0         0.0       0.0
Agua Dulce              0.0             0.0         0.0       0.0
Alhambra                0.0             0.0         0.0       0.0

                  Doctor's Office  Dog Run  Donut Shop  Drugstore  \
NeighborhoodName
Acton                         0.0      0.0         0.0        0.0
Adams-Normandie               0.0      0.0         0.0        0.0
Agoura Hills                  0.0      0.0         0.0        0.0
Agua Dulce                    0.0      0.0         0.0        0.0
Alhambra                      0.0      0.0         0.0        0.0
```

NeighborhoodName	Electronics Store	Fabric Shop	Farm	Farmers Market	\
Acton	0.0	0.0	0.0	0.0	
Adams-Normandie	0.0	0.0	0.0	0.0	
Agoura Hills	0.0	0.0	0.0	0.0	
Agua Dulce	0.0	0.0	0.0	0.0	
Alhambra	0.0	0.0	0.0	0.0	

NeighborhoodName	Film Studio	Fish & Chips Shop	Flea Market	Flower Shop	\
Acton	0.0	0.0	0.0	0.0	
Adams-Normandie	0.0	0.0	0.0	0.0	
Agoura Hills	0.0	0.0	0.0	0.0	
Agua Dulce	0.0	0.0	0.0	0.0	
Alhambra	0.0	0.0	0.0	0.0	

NeighborhoodName	Food	Food & Drink Shop	Food Court	Food Service	\
Acton	0.0	0.0	0.0	0.0	
Adams-Normandie	0.0	0.0	0.0	0.0	
Agoura Hills	0.0	0.0	0.0	0.0	
Agua Dulce	0.0	0.0	0.0	0.0	
Alhambra	0.0	0.0	0.0	0.0	

NeighborhoodName	Food Stand	Food Truck	Football Stadium	Fountain	\
Acton	0.0	0.0	0.0	0.0	
Adams-Normandie	0.0	0.0	0.0	0.0	
Agoura Hills	0.0	0.0	0.0	0.0	
Agua Dulce	0.0	0.0	0.0	0.0	
Alhambra	0.0	0.0	0.0	0.0	

NeighborhoodName	Fraternity House	Fried Chicken Joint	Frozen Yogurt Shop	\
Acton	0.0	0.0	0.0	
Adams-Normandie	0.0	0.0	0.0	
Agoura Hills	0.0	0.0	0.0	
Agua Dulce	0.0	0.0	0.0	
Alhambra	0.0	0.0	0.0	

NeighborhoodName	Furniture / Home Store	Garden	Garden Center	Gas Station	\
Acton	0.0	0.0	0.0	0.000000	
Adams-Normandie	0.0	0.0	0.0	0.111111	
Agoura Hills	0.0	0.0	0.0	0.035714	
Agua Dulce	0.0	0.0	0.0	0.000000	
Alhambra	0.0	0.0	0.0	0.000000	

```
                 Gastropub  Gay Bar  General Entertainment  General Travel  \
NeighborhoodName
Acton                  0.0      0.0                    0.0             0.0
Adams-Normandie        0.0      0.0                    0.0             0.0
Agoura Hills           0.0      0.0                    0.0             0.0
Agua Dulce             0.0      0.0                    0.0             0.0
Alhambra               0.0      0.0                    0.0             0.0

                 Gift Shop  Go Kart Track  Golf Course  Gourmet Shop  \
NeighborhoodName
Acton                  0.0            0.0          0.0           0.0
Adams-Normandie        0.0            0.0          0.0           0.0
Agoura Hills           0.0            0.0          0.0           0.0
Agua Dulce             0.0            0.0          0.0           0.0
Alhambra               0.0            0.0          0.0           0.0

                 Government Building  Grocery Store  Gym  \
NeighborhoodName
Acton                            0.0       0.000000  0.0
Adams-Normandie                  0.0       0.111111  0.0
Agoura Hills                     0.0       0.035714  0.0
Agua Dulce                       0.0       0.000000  0.0
Alhambra                         0.0       0.000000  0.0

                 Gym / Fitness Center  Gym Pool  Gymnastics Gym  \
NeighborhoodName
Acton                             0.0       0.0             0.0
Adams-Normandie                   0.0       0.0             0.0
Agoura Hills                      0.0       0.0             0.0
Agua Dulce                        0.0       0.0             0.0
Alhambra                          0.0       0.0             0.0

                 Harbor / Marina  Hardware Store  Health & Beauty Service  \
NeighborhoodName
Acton                        0.0        0.000000                      0.0
Adams-Normandie              0.0        0.000000                      0.0
Agoura Hills                 0.0        0.000000                      0.0
Agua Dulce                   0.0        0.000000                      0.0
Alhambra                     0.0        0.076923                      0.0

                 Health Food Store  High School  Historic Site  Hobby Shop  \
NeighborhoodName
Acton                          0.0          0.0            0.0         0.0
Adams-Normandie                0.0          0.0            0.0         0.0
Agoura Hills                   0.0          0.0            0.0         0.0
Agua Dulce                     0.0          0.0            0.0         0.0
```

```
Alhambra                         0.0           0.0             0.0          0.0

                  Home Service  Hookah Bar  Hot Dog Joint     Hotel  \
NeighborhoodName
Acton                      0.0         0.0            0.0  0.000000
Adams-Normandie            0.0         0.0            0.0  0.000000
Agoura Hills               0.0         0.0            0.0  0.035714
Agua Dulce                 0.0         0.0            0.0  0.000000
Alhambra                   0.0         0.0            0.0  0.000000

                  Hotel Bar  IT Services  Ice Cream Shop  Indie Movie Theater  \
NeighborhoodName
Acton                   0.0          0.0             0.0                  0.0
Adams-Normandie         0.0          0.0             0.0                  0.0
Agoura Hills            0.0          0.0             0.0                  0.0
Agua Dulce              0.0          0.0             0.0                  0.0
Alhambra                0.0          0.0             0.0                  0.0

                  Indie Theater  Indoor Play Area  Insurance Office  \
NeighborhoodName
Acton                       0.0               0.0               0.0
Adams-Normandie             0.0               0.0               0.0
Agoura Hills                0.0               0.0               0.0
Agua Dulce                  0.0               0.0               0.0
Alhambra                    0.0               0.0               0.0

                  Intersection  Jazz Club  Jewelry Store  Juice Bar  \
NeighborhoodName
Acton                      0.0        0.0            0.0        0.0
Adams-Normandie            0.0        0.0            0.0        0.0
Agoura Hills               0.0        0.0            0.0        0.0
Agua Dulce                 0.0        0.0            0.0        0.0
Alhambra                   0.0        0.0            0.0        0.0

                  Karaoke Bar  Kids Store  Lake  Laundromat  Lawyer  \
NeighborhoodName
Acton                     0.0         0.0   0.0         0.0     0.0
Adams-Normandie           0.0         0.0   0.0         0.0     0.0
Agoura Hills              0.0         0.0   0.0         0.0     0.0
Agua Dulce                0.0         0.0   0.0         0.0     0.0
Alhambra                  0.0         0.0   0.0         0.0     0.0

                  Light Rail Station  Lighting Store  Lingerie Store  \
NeighborhoodName
Acton                            0.0             0.0             0.0
Adams-Normandie                  0.0             0.0             0.0
Agoura Hills                     0.0             0.0             0.0
```

```
Agua Dulce                      0.0             0.0             0.0
Alhambra                        0.0             0.0             0.0

                  Liquor Store  Locksmith    Lounge  Marijuana Dispensary  \
NeighborhoodName
Acton                      0.0   0.000000  0.000000                   0.0
Adams-Normandie            0.0   0.111111  0.000000                   0.0
Agoura Hills               0.0   0.000000  0.035714                   0.0
Agua Dulce                 0.0   0.000000  0.000000                   0.0
Alhambra                   0.0   0.000000  0.000000                   0.0

                  Market  Martial Arts Dojo  Massage Studio  Men's Store  \
NeighborhoodName
Acton                0.0                0.0             0.0          0.0
Adams-Normandie      0.0                0.0             0.0          0.0
Agoura Hills         0.0                0.0             0.0          0.0
Agua Dulce           0.0                0.0             0.0          0.0
Alhambra             0.0                0.0             0.0          0.0

                  Mobile Phone Shop  Monument / Landmark  Motel  Mountain  \
NeighborhoodName
Acton                           0.0                  0.0    0.0       0.0
Adams-Normandie                 0.0                  0.0    0.0       0.0
Agoura Hills                    0.0                  0.0    0.0       0.0
Agua Dulce                      0.0                  0.0    0.0       0.0
Alhambra                        0.0                  0.0    0.0       0.0

                  Movie Theater  Moving Target  Multiplex  Museum  \
NeighborhoodName
Acton                       0.0            0.0   0.000000     0.0
Adams-Normandie             0.0            0.0   0.000000     0.0
Agoura Hills                0.0            0.0   0.035714     0.0
Agua Dulce                  0.0            0.0   0.000000     0.0
Alhambra                    0.0            0.0   0.000000     0.0

                  Music Store  Music Venue  Nail Salon  Neighborhood  \
NeighborhoodName
Acton                     0.0          0.0         0.0           0.0
Adams-Normandie           0.0          0.0         0.0           0.0
Agoura Hills              0.0          0.0         0.0           0.0
Agua Dulce                0.0          0.0         0.0           0.0
Alhambra                  0.0          0.0         0.0           0.0

                  Nightclub  Nightlife Spot  Noodle House  Office  \
NeighborhoodName
Acton                   0.0             0.0           0.0     0.0
Adams-Normandie         0.0             0.0           0.0     0.0
```

```
Agoura Hills          0.0                0.0               0.0     0.0
Agua Dulce            0.0                0.0               0.0     0.0
Alhambra              0.0                0.0               0.0     0.0

                  Optical Shop  Organic Grocery  Other Great Outdoors  \
NeighborhoodName
Acton                      0.0              0.0                   0.0
Adams-Normandie            0.0              0.0                   0.0
Agoura Hills               0.0              0.0                   0.0
Agua Dulce                 0.0              0.0                   0.0
Alhambra                   0.0              0.0                   0.0

                  Other Nightlife  Other Repair Shop  \
NeighborhoodName
Acton                         0.0                0.0
Adams-Normandie               0.0                0.0
Agoura Hills                  0.0                0.0
Agua Dulce                    0.0                0.0
Alhambra                      0.0                0.0

                  Paper / Office Supplies Store      Park  \
NeighborhoodName
Acton                                       0.0  0.000000
Adams-Normandie                             0.0  0.111111
Agoura Hills                                0.0  0.000000
Agua Dulce                                  0.0  0.000000
Alhambra                                    0.0  0.000000

                  Performing Arts Venue  Pet Service  Pet Store  Pharmacy  \
NeighborhoodName
Acton                               0.0          0.0   0.000000       0.0
Adams-Normandie                     0.0          0.0   0.000000       0.0
Agoura Hills                        0.0          0.0   0.000000       0.0
Agua Dulce                          0.0          0.0   0.000000       0.0
Alhambra                            0.0          0.0   0.076923       0.0

                  Photography Lab  Photography Studio  Pier  Pilates Studio  \
NeighborhoodName
Acton                         0.0                 0.0   0.0             0.0
Adams-Normandie               0.0                 0.0   0.0             0.0
Agoura Hills                  0.0                 0.0   0.0             0.0
Agua Dulce                    0.0                 0.0   0.0             0.0
Alhambra                      0.0                 0.0   0.0             0.0

                  Pizza Place  Platform  Playground  Plaza  Poke Place  Pool  \
NeighborhoodName
Acton                0.000000       0.0    0.000000    0.0         0.0   0.0
```

```
Adams-Normandie      0.000000       0.0    0.111111    0.0          0.0   0.0
Agoura Hills         0.000000       0.0    0.000000    0.0          0.0   0.0
Agua Dulce           0.000000       0.0    0.000000    0.0          0.0   0.0
Alhambra             0.076923       0.0    0.000000    0.0          0.0   0.0

                 Pub  Racetrack  Record Shop  Recording Studio  \
NeighborhoodName
Acton            0.0        0.0          0.0               0.0
Adams-Normandie  0.0        0.0          0.0               0.0
Agoura Hills     0.0        0.0          0.0               0.0
Agua Dulce       0.0        0.0          0.0               0.0
Alhambra         0.0        0.0          0.0               0.0

                 Recreation Center  Rental Car Location  Rental Service  \
NeighborhoodName
Acton                          0.0                  0.0             0.0
Adams-Normandie                0.0                  0.0             0.0
Agoura Hills                   0.0                  0.0             0.0
Agua Dulce                     0.0                  0.0             0.0
Alhambra                       0.0                  0.0             0.0

                 Reservoir  Residential Building (Apartment / Condo)  River  \
NeighborhoodName
Acton                  0.0                                       0.0    0.0
Adams-Normandie        0.0                                       0.0    0.0
Agoura Hills           0.0                                       0.0    0.0
Agua Dulce             0.0                                       0.0    0.0
Alhambra               0.0                                       0.0    0.0

                 Road  Rock Club  Sake Bar  Salad Place  Salon / Barbershop  \
NeighborhoodName
Acton             0.0        0.0       0.0          0.0                 0.0
Adams-Normandie   0.0        0.0       0.0          0.0                 0.0
Agoura Hills      0.0        0.0       0.0          0.0                 0.0
Agua Dulce        0.0        0.0       0.0          0.0                 0.0
Alhambra          0.0        0.0       0.0          0.0                 0.0

                 Sandwich Place  Scenic Lookout  Sculpture Garden  \
NeighborhoodName
Acton                       0.0             0.0               0.0
Adams-Normandie             0.0             0.0               0.0
Agoura Hills                0.0             0.0               0.0
Agua Dulce                  0.0             0.0               0.0
Alhambra                    0.0             0.0               0.0

                 Shipping Store  Shoe Store  Shop & Service  Shopping Mall  \
NeighborhoodName
```

Acton	0.000000	0.0	0.0	0.0
Adams-Normandie	0.000000	0.0	0.0	0.0
Agoura Hills	0.035714	0.0	0.0	0.0
Agua Dulce	0.000000	0.0	0.0	0.0
Alhambra	0.000000	0.0	0.0	0.0

NeighborhoodName	Shopping Plaza	Skate Park	Skating Rink	Smoke Shop \
Acton	0.0	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0	0.0

NeighborhoodName	Smoothie Shop	Snack Place	Soup Place	Souvenir Shop	Spa \
Acton	0.0	0.0	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0	0.0	0.0

NeighborhoodName	Speakeasy	Sporting Goods Shop	Sports Bar	Stables \
Acton	0.0	0.000000	0.0	0.0
Adams-Normandie	0.0	0.000000	0.0	0.0
Agoura Hills	0.0	0.000000	0.0	0.0
Agua Dulce	0.0	0.000000	0.0	0.0
Alhambra	0.0	0.076923	0.0	0.0

NeighborhoodName	State / Provincial Park	Steakhouse	Storage Facility \
Acton	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0

NeighborhoodName	Strip Club	Supermarket	Supplement Shop	Surf Spot \
Acton	0.0	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0	0.0

	Taco Place	Tattoo Parlor	Tea Room	Tennis Court	Theater \

NeighborhoodName					
Acton	0.000000	0.0	0.0	0.0	0.0
Adams-Normandie	0.111111	0.0	0.0	0.0	0.0
Agoura Hills	0.000000	0.0	0.0	0.0	0.0
Agua Dulce	0.000000	0.0	0.0	0.0	0.0
Alhambra	0.000000	0.0	0.0	0.0	0.0

	Theme Park	Theme Park Ride / Attraction \
NeighborhoodName		
Acton	0.0	0.0
Adams-Normandie	0.0	0.0
Agoura Hills	0.0	0.0
Agua Dulce	0.0	0.0
Alhambra	0.0	0.0

	Thrift / Vintage Store	Tiki Bar	Tour Provider \
NeighborhoodName			
Acton	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0

	Tourist Information Center	Toy / Game Store	Trail \
NeighborhoodName			
Acton	0.0	0.0	0.0
Adams-Normandie	0.0	0.0	0.0
Agoura Hills	0.0	0.0	0.0
Agua Dulce	0.0	0.0	0.0
Alhambra	0.0	0.0	0.0

	Transportation Service	Travel & Transport \
NeighborhoodName		
Acton	0.0	0.0
Adams-Normandie	0.0	0.0
Agoura Hills	0.0	0.0
Agua Dulce	0.0	0.0
Alhambra	0.0	0.0

	Video Game Store	Video Store	Warehouse Store	Watch Shop \
NeighborhoodName				
Acton	0.0	0.000000	0.0	0.0
Adams-Normandie	0.0	0.000000	0.0	0.0
Agoura Hills	0.0	0.000000	0.0	0.0
Agua Dulce	0.0	0.000000	0.0	0.0
Alhambra	0.0	0.076923	0.0	0.0

```
                     Weight Loss Center  Wine Bar  Wine Shop  Wings Joint  \
NeighborhoodName
Acton                               0.0       0.0        0.0          0.0
Adams-Normandie                     0.0       0.0        0.0          0.0
Agoura Hills                        0.0       0.0        0.0          0.0
Agua Dulce                          0.0       0.0        0.0          0.0
Alhambra                            0.0       0.0        0.0          0.0

                     Women's Store  Yoga Studio
NeighborhoodName
Acton                          0.0          0.0
Adams-Normandie                0.0          0.0
Agoura Hills                   0.0          0.0
Agua Dulce                     0.0          0.0
Alhambra                       0.0          0.0
```

[76]:
```python
#perform clustering

# set number of clusters
kclusters = 10

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(la_grouped)

# check cluster labels generated for each row in the dataframe
kmeans.labels_.shape
```

[76]:
```
(239,)
```

[80]:
```python
indexx=la_grouped.index.tolist()
neighborhoods_new=neighborhoods.loc[indexx]

neighborhoods_new.insert(0, 'Cluster Labels', kmeans.labels_)
```

[81]:
```python
neighborhoods_new.head()
```

[81]:
```
                 Cluster Labels  City     Neighborhood            Latitude  \
Neighborhood
Acton                         5  L.A.            Acton  34.497355239240846
Adams-Normandie               0  L.A.  Adams-Normandie  34.031461499124156
Agoura Hills                  0  L.A.     Agoura Hills  34.146736499122795
Agua Dulce                    8  L.A.       Agua Dulce   34.50492699796837
Alhambra                      8  L.A.         Alhambra   34.085538999123571

                           Longitude
Neighborhood
Acton            -118.16981019229348
```

```
Adams-Normandie  -118.30020800000011
Agoura Hills     -118.75988450000015
Agua Dulce        -118.3171036690717
Alhambra         -118.13651200000021
```

[83]:
```
import matplotlib.cm as cm
import matplotlib.colors as colors

map_clusters = folium.Map(location=[latitude, longitude], zoom_start=11)

# set color scheme for the clusters
x = np.arange(kclusters)
ys = [i + x + (i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# add markers to the map
markers_colors = []
for lat, lon, poi, cluster in zip(neighborhoods_new['Latitude'],␣
↪neighborhoods_new['Longitude'], neighborhoods_new['Neighborhood'],␣
↪neighborhoods_new['Cluster Labels']):
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```

[83]: <folium.folium.Map at 0x7f508a755610>

0.0.7 We can clearly say that we cannot make a suggestion based on this map. Let's try again keeping only information regarding the restaurant number in each neighborhood.

[87]:
```
la_grouped_resta=la_grouped[['TotalRestaurants']]
```

[88]:
```
la_grouped_resta.head()
```

[88]:
```
                  TotalRestaurants
NeighborhoodName
Acton                     0.000000
```

```
Adams-Normandie            0.333333
Agoura Hills               0.428571
Agua Dulce                 0.000000
Alhambra                   0.153846
```

[89]:
```
#perform clustering

# set number of clusters
kclusters = 10

# run k-means clustering
kmeans = KMeans(n_clusters=kclusters, random_state=0).fit(la_grouped_resta)

# check cluster labels generated for each row in the dataframe
kmeans.labels_.shape
```

[89]:
```
(239,)
```

[90]:
```
indexx=la_grouped.index.tolist()
neighborhoods_resta=neighborhoods.loc[indexx]

neighborhoods_resta.insert(0, 'Cluster Labels', kmeans.labels_)
```

[91]:
```
import matplotlib.cm as cm
import matplotlib.colors as colors

map_clusters = folium.Map(location=[latitude, longitude], zoom_start=11)

# set color scheme for the clusters
x = np.arange(kclusters)
ys = [i + x + (i*x)**2 for i in range(kclusters)]
colors_array = cm.rainbow(np.linspace(0, 1, len(ys)))
rainbow = [colors.rgb2hex(i) for i in colors_array]

# add markers to the map
markers_colors = []
for lat, lon, poi, cluster in zip(neighborhoods_resta['Latitude'],␣
 ↪neighborhoods_resta['Longitude'], neighborhoods_resta['Neighborhood'],␣
 ↪neighborhoods_resta['Cluster Labels']):
    label = folium.Popup(str(poi) + ' Cluster ' + str(cluster), parse_html=True)
    folium.CircleMarker(
        [lat, lon],
        radius=5,
        popup=label,
        color=rainbow[cluster-1],
        fill=True,
        fill_color=rainbow[cluster-1],
```

```
        fill_opacity=0.7).add_to(map_clusters)

map_clusters
```

[91]: <folium.folium.Map at 0x7f508a462e10>

0.0.8 Slightly better. We have better cluster now, but still not clear. Let's try to make a barplot to see wch clusters correspond to neighborhoods with few restaurants.

[133]:
```
la_grouped_resta['Neighborhood']=la_grouped_resta.index.values.tolist()
la_grouped_resta2=la_grouped_resta.reset_index()
la_grouped_resta2.drop('NeighborhoodName',axis=1, inplace=True)
la_grouped_resta2.drop('Neighborhood',axis=1, inplace=True)
```

```
/home/christos/anaconda3/lib/python3.7/site-packages/ipykernel_launcher.py:1:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-
docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  """Entry point for launching an IPython kernel.
```

[113]:
```
neighborhoods_resta.index.name=None
```

[116]:
```
neighborhoods_resta2=neighborhoods_resta.reset_index()
```

[125]:
```
neighborhoods_resta2.drop('index', axis=1, inplace=True)
```

[126]:
```
neighborhoods_resta2.head()
```

[126]:
```
   Cluster Labels  City     Neighborhood           Latitude  \
0               0  L.A.            Acton  34.497355239240846
1               1  L.A.  Adams-Normandie  34.031461499124156
2               5  L.A.     Agoura Hills  34.146736499122795
3               0  L.A.       Agua Dulce  34.504926999796837
4               6  L.A.         Alhambra  34.085538999123571

            Longitude
0  -118.16981019229348
1  -118.30020800000011
2  -118.75988450000015
3   -118.3171036690717
4  -118.13651200000021
```

[124]:
```
la_grouped_resta2.head()
```

[124]:
```
   TotalRestaurants     Neighborhood
0          0.000000            Acton
1          0.333333  Adams-Normandie
2          0.428571     Agoura Hills
3          0.000000       Agua Dulce
4          0.153846         Alhambra
```

[134]:
```
final_dataset=pd.concat([la_grouped_resta2,neighborhoods_resta2],axis=1,␣
 ↪sort=False)
```

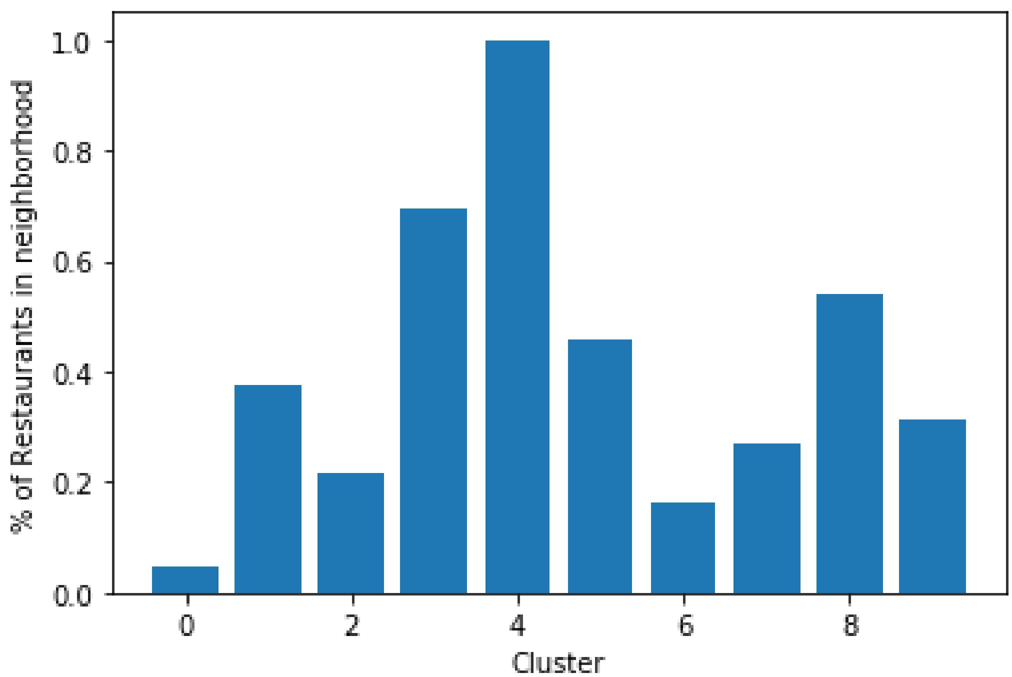
[135]:
```
final_dataset.head()[['']]
```

[135]:
```
   TotalRestaurants  Cluster Labels  City     Neighborhood  \
0          0.000000               0  L.A.            Acton
1          0.333333               1  L.A.  Adams-Normandie
2          0.428571               5  L.A.     Agoura Hills
3          0.000000               0  L.A.       Agua Dulce
4          0.153846               6  L.A.         Alhambra

             Latitude            Longitude
0  34.497355239240846  -118.16981019229348
1  34.031461499124156  -118.30020800000011
2  34.146736499122795  -118.75988450000015
3  34.504926999796837   -118.3171036690717
4  34.085538999123571  -118.13651200000021
```

[137]:
```
import matplotlib.pyplot as plt
```

[141]:
```
plt.bar(x=final_dataset['Cluster␣
 ↪Labels'],height=final_dataset['TotalRestaurants'])
plt.xlabel('Cluster')
plt.ylabel('% of Restaurants in neighborhood')
```

[141]:
```
Text(0, 0.5, '% of Restaurants in neighborhood')
```



0.0.9 We can say that neighborhoods with cluster labels 0 and 6 do not have may restaurants. Let's view these neighborhoods.

[152]:
```
final_dataset.loc[(final_dataset['Cluster Labels']==0) |␣
↪(final_dataset['Cluster Labels']==6) ,:]
```

[152]:

	TotalRestaurants	Cluster Labels	City \
0	4	0	L.A.
3	4	0	L.A.
4	4	6	L.A.
5	4	0	L.A.
6	4	0	L.A.
8	4	0	L.A.
11	4	6	L.A.
14	4	0	L.A.
15	4	0	L.A.
17	4	0	L.A.
18	4	0	L.A.
21	4	0	L.A.
23	4	0	L.A.
24	4	0	L.A.
26	4	0	L.A.
27	4	0	L.A.

28	4	6	L.A.
30	4	0	L.A.
34	4	6	L.A.
37	4	0	L.A.
39	4	0	L.A.
42	4	0	L.A.
48	4	6	L.A.
52	4	6	L.A.
53	4	0	L.A.
58	4	6	L.A.
61	4	0	L.A.
63	4	0	L.A.
64	4	0	L.A.
65	4	0	L.A.
67	4	0	L.A.
70	4	0	L.A.
72	4	0	L.A.
73	4	0	L.A.
74	4	0	L.A.
76	4	0	L.A.
77	4	0	L.A.
78	4	0	L.A.
80	4	0	L.A.
85	4	0	L.A.
86	4	0	L.A.
90	4	0	L.A.
94	4	0	L.A.
96	4	0	L.A.
97	4	0	L.A.
98	4	0	L.A.
100	4	0	L.A.
101	4	6	L.A.
103	4	0	L.A.
104	4	0	L.A.
105	4	0	L.A.
106	4	6	L.A.
108	4	0	L.A.
109	4	0	L.A.
111	4	0	L.A.
113	4	0	L.A.
116	4	0	L.A.
121	4	0	L.A.
123	4	0	L.A.
124	4	0	L.A.
125	4	6	L.A.
126	4	0	L.A.
127	4	0	L.A.

128	4	6	L.A.
129	4	0	L.A.
131	4	0	L.A.
133	4	0	L.A.
134	4	0	L.A.
136	4	0	L.A.
137	4	0	L.A.
138	4	0	L.A.
139	4	0	L.A.
142	4	0	L.A.
144	4	6	L.A.
145	4	0	L.A.
146	4	0	L.A.
148	4	0	L.A.
151	4	6	L.A.
152	4	0	L.A.
156	4	0	L.A.
158	4	0	L.A.
160	4	0	L.A.
161	4	0	L.A.
162	4	0	L.A.
166	4	0	L.A.
169	4	0	L.A.
172	4	0	L.A.
175	4	0	L.A.
176	4	0	L.A.
177	4	6	L.A.
178	4	6	L.A.
180	4	0	L.A.
181	4	6	L.A.
182	4	6	L.A.
185	4	0	L.A.
188	4	0	L.A.
189	4	0	L.A.
191	4	6	L.A.
192	4	0	L.A.
194	4	0	L.A.
196	4	0	L.A.
199	4	0	L.A.
200	4	0	L.A.
201	4	6	L.A.
203	4	0	L.A.
204	4	0	L.A.
207	4	6	L.A.
209	4	0	L.A.
210	4	0	L.A.
211	4	0	L.A.

```
212                 4               6  L.A.
213                 4               0  L.A.
214                 4               0  L.A.
215                 4               0  L.A.
217                 4               6  L.A.
219                 4               0  L.A.
220                 4               0  L.A.
222                 4               6  L.A.
226                 4               0  L.A.
227                 4               0  L.A.
228                 4               6  L.A.
232                 4               0  L.A.
233                 4               0  L.A.
234                 4               0  L.A.
236                 4               0  L.A.

                 Neighborhood            Latitude  \
0                       Acton  34.497355239240846
3                  Agua Dulce  34.504926999796837
4                    Alhambra  34.085538999123571
5                Alondra Park  33.889617004889644
6                    Altadena  34.193870502232173
8                      Arleta  34.243099999121583
11            Atwater Village  34.131066356759177
14                      Azusa   34.13746999912302
15    Baldwin Hills/Crenshaw    34.01197027055953
17                    Bel-Air  34.102056999123342
18                       Bell  33.981160999124889
21              Beverly Crest  34.106006999123245
23              Beverly Hills  34.082544499123699
24                Beverlywood  34.043509999124048
26                   Bradbury   34.15423999912273
27                  Brentwood  34.086240999123547
28       Broadway-Manchester  33.941223502886629
30                  Calabasas  34.136254499122948
34               Century City  34.055325502171065
37                 Chatsworth  34.256403499160569
39              Cheviot Hills   34.04085349912404
42                   Commerce  33.995079230018334
48                   Del Aire  33.915552004076844
52                   Downtown  34.040008613525899
53                 Eagle Rock  34.133916999122917
58           East San Gabriel  34.110644492315856
61                 El Segundo  33.916582999125737
63             Elizabeth Lake  34.657686037373047
64               Elysian Park  34.081259999123489
65             Elysian Valley  34.095759499123389
```

67	Exposition Park	34.018262499124305
70	Florence-Firestone	33.966101520272787
72	Glassell Park	34.114405499123208
73	Glendale	34.192975499122355
74	Glendora	34.142040999122969
76	Granada Hills	34.295682651151957
77	Green Meadows	33.941634094823527
78	Green Valley	34.620007457495149
80	Hacienda Heights	34.002085506418773
85	Harvard Park	33.983762999124835
86	Hasley Canyon	34.476199893867175
90	Hidden Hills	34.16405683610931
94	Hollywood Hills	34.128088999122937
96	Huntington Park	33.978967499124934
97	Hyde Park	33.985430999124816
98	Industry	34.026835568749277
100	Irwindale	34.108874499123317
101	Jefferson Park	34.028211499124154
103	La Canada Flintridge	34.210686999122075
104	La Crescenta-Montrose	34.228709003122127
105	La Habra Heights	33.96095113872326
106	La Mirada	33.900793500197707
108	La Verne	34.124883999123185
109	Ladera Heights	33.996097001972416
111	Lake Los Angeles	34.611038948416571
113	Lancaster	34.700066117404532
116	Leimert Park	34.013050516583704
121	Long Beach	33.806580699978731
123	Lynwood	33.925213499125533
124	Malibu	34.033895486545326
125	Manchester Square	33.967165274809105
126	Manhattan Beach	33.88950799912606
127	Mar Vista	34.010242173076293
128	Marina del Rey	33.975323504268417
129	Mayflower Village	34.117318103307944
131	Mid-City	34.041107499124067
133	Mission Hills	34.271661499121265
134	Monrovia	34.148608345800739
136	Montecito Heights	34.093658999123406
137	Monterey Park	34.049427999124063
138	Mount Washington	34.103158999123266
139	North El Monte	34.102483231361113
142	North Whittier	34.005714844032383
144	Norwalk	33.907168999125822
145	Pacific Palisades	34.078366733694963
146	Pacoima	34.26360659127154
148	Palos Verdes Estates	33.783316814743465

151	Pasadena	34.18459099912242
152	Pico Rivera	33.989604499124823
156	Playa del Rey	33.945661530783255
158	Porter Ranch	34.278216499201754
160	Ramona	34.060567999123897
161	Rancho Dominguez	33.859875999126409
162	Rancho Palos Verdes	33.75869892565828
166	Rolling Hills	33.762682999127549
169	San Dimas	34.115259499123212
172	San Marino	34.121299999123188
175	Santa Clarita	34.408855499147847
176	Santa Fe Springs	33.928934999496654
177	Santa Monica	34.021860499124415
178	Sawtelle	34.03506728275898
180	Sierra Madre	34.168112999122641
181	Signal Hill	33.804375999127039
182	Silver Lake	34.094459499123445
185	South Park	33.996463999124586
188	South San Jose Hills	34.014947000828826
189	South Whittier	33.936196000947831
191	Sun Valley	34.22661749912173
192	Sunland	34.270730999121341
194	Tarzana	34.156454999122722
196	Toluca Lake	34.15349309467193
199	Tujunga	34.261340090064621
200	Unincorporated Santa Monica Mountains	34.087645747469352
201	Universal City	34.137361499122974
203	Val Verde	34.44560168460962
204	Valinda	34.038452502168049
207	Van Nuys	34.196505499122246
209	Vermont Knolls	33.967009999124997
210	Vermont Square	34.002062999124533
211	Vermont Vista	33.941708042365043
212	Vermont-Slauson	33.983913999124709
213	Vernon	33.999657999124722
214	Veterans Administration	34.057383999123985
215	Walnut	34.033247999124256
217	Watts	33.941619001308609
219	West Carson	33.822072500607462
220	West Compton	33.894136502499222
222	West Hills	34.207253636931036
226	West San Dimas	34.087431659884331
227	West Whittier-Los Nietos	33.980559999939608
228	Westchester	33.95599525987285
232	Westwood	34.06523499912381
233	Whittier Narrows	34.037074109844369
234	Willowbrook	33.915710503828592

236 Windsor Square 34.069108499123722

	Longitude
0	-118.16981019229348
3	-118.3171036690717
4	-118.13651200000021
5	-118.33515598608159
6	-118.13623898201556
8	-118.4307575
11	-118.26237347966236
14	-117.91246849999999
15	-118.35774600000005
17	-118.45841550000007
18	-118.17916600000018
21	-118.42326299999999
23	-118.39953400000016
24	-118.39398199999999
26	-117.96857400000013
27	-118.49218850000007
28	-118.27535153247453
30	-118.67163173539396
34	-118.41508300000005
37	-118.61235450000001
39	-118.41146150000006
42	-118.1573625000002
48	-118.36983198490955
52	-118.24850990440491
53	-118.20484450000001
58	-118.07396450000032
61	-118.40223073369825
63	-118.38621116359349
64	-118.23745650000001
65	-118.24195650000013
67	-118.29887550000007
70	-118.24192048907494
72	-118.23642729889393
73	-118.2449270000002
74	-117.84178450000023
76	-118.50767050010745
77	-118.26148999301319
78	-118.41421658346756
80	-117.97508050764819
85	-118.30455750000012
86	-118.66021608592953
90	-118.65705600000015
94	-118.33541000000008
96	-118.2140149952952

97	-118.33775850000006
98	-117.93962100000014
100	-117.96667800000012
101	-118.32205850000005
103	-118.20046998596307
104	-118.23518197192418
105	-117.95562783562224
106	-118.00722099646512
108	-117.7745250000001
109	-118.37410748609757
111	-117.83603921804665
113	-118.13179100000016
116	-118.32633970815459
121	-118.156064
123	-118.20282648482208
124	-118.7542537868066
125	-118.30898400000005
126	-118.40093919800572
127	-118.43668192517818
128	-118.44786948141424
129	-118.00229999282959
131	-118.35880950000006
133	-118.45716250000007
134	-117.98179100000009
136	-118.19427049999999
137	-118.13161942411986
138	-118.21900650000001
139	-118.02354298857939
142	-118.02918914224676
144	-118.07693800000014
145	-118.54585899824386
146	-118.41890850000007
148	-118.39012200169401
151	-118.13180900000009
152	-118.08161950000004
156	-118.44133951162496
158	-118.54872950000006
160	-117.83843450000029
161	-118.21829150000025
162	-118.35980750108605
166	-118.34812650000021
169	-117.81326850000013
172	-118.11505449283317
175	-118.49476193960714
176	-118.06368000000016
177	-118.48056671004807
178	-118.45059109758868

```
180   -118.04883650000005
181   -118.16716650000018
182          -118.2677075
185   -118.26875699999999
188   -117.90184498555011
189    -118.0280174858583
191    -118.3843172128845
192   -118.31202250000007
194   -118.54458900000007
196   -118.35795100000007
199              -118.2818
200   -118.77026791367985
201   -118.35278600000026
203    -118.6656538804971
204   -117.93079549289092
207          -118.4639545
209   -118.29050700000013
210   -118.29880750000001
211   -118.28545100000014
212   -118.29035750000011
213   -118.20343200000011
214   -118.45725850000031
215   -117.86012600000016
217          -118.2399365
219   -118.29227748370761
220   -118.26773698606382
222   -118.63539850000006
226   -117.83509899236435
227   -118.07001998587738
228   -118.39829259016352
232   -118.44047994677246
233   -118.06118827749373
234   -118.25231247908229
236   -118.31990900000005
```

0.0.10 Discussion

Using the k-means clustering approach we identied neighborhoods that cluster together, based only on the number of restaurants in each neighborhood. We found that neighborhoods labeled with 0 and 6 do not have many restaurants and subsequently would be the best options to start a new restaurant.

0.0.11 Conclusion

Trying to make suggestion about carrer opportunities is not easy. Here, we combined basic plotting startegies with clustering methods to obtain a basic intuition about which neighborhood in L.A is appropriate for opening a new restaurant. We based our analysis only on the number of restaurants in each area. To complete this analysis many more parameters must be taken into account. This would be just the first step trying to answer a real-world reseach question.