

FoodBusiness

October 19, 2020

0.1 DATA ANALISIS

```
[1]: import pandas as pd
import numpy as np
!pip install geopy
%matplotlib inline
import matplotlib as mpl
import matplotlib.pyplot as plt
from geopy.geocoders import Nominatim
!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
!conda install -c anaconda seaborn --yes
# import library
import seaborn as sns
```

Collecting geopy

Downloading <https://files.pythonhosted.org/packages/07/e1/9c72de674d5c2b8fcb0738a5ceeb5424941fefa080bfe4e240d0bacb5a38/geopy-2.0.0-py3-none-any.whl>
(111kB)

| 112kB 5.2MB/s eta 0:00:01

Collecting geographiclib<2,>=1.49 (from geopy)

Downloading <https://files.pythonhosted.org/packages/8b/62/26ec95a98ba64299163199e95ad1b0e34ad3f4e176e221c40245f211e425/geographiclib-1.50-py3-none-any.whl>

Installing collected packages: geographiclib, geopy

Successfully installed geographiclib-1.50 geopy-2.0.0

Collecting package metadata (current_repodata.json): done

Solving environment: failed with initial frozen solve. Retrying with flexible solve.

Collecting package metadata (repodata.json): done

Solving environment: done

Package Plan

environment location: /home/jupyterlab/conda/envs/python

added / updated specs:

- folium=0.5.0

The following packages will be downloaded:

package	build		
altair-4.1.0	py_1	614 KB	conda-forge
branca-0.4.1	py_0	26 KB	conda-forge
brotlipy-0.7.0	py36he6145b8_1001	347 KB	conda-forge
certifi-2020.6.20	py36h9880bd3_2	151 KB	conda-forge
chardet-3.0.4	py36h9880bd3_1008	194 KB	conda-forge
cryptography-3.1.1	py36h5d711a5_1	623 KB	conda-forge
entrypoints-0.3	py36h9f0ad1d_1002	13 KB	conda-forge
folium-0.5.0	py_0	45 KB	conda-forge
importlib_metadata-2.0.0	1	3 KB	conda-forge
jsonschema-3.2.0	py_2	45 KB	conda-forge
markupsafe-1.1.1	py36he6145b8_2	27 KB	conda-forge
pandas-1.1.3	py36h7c3b610_2	10.6 MB	conda-forge
pyrsistent-0.17.3	py36h8c4c3a4_1	89 KB	conda-forge
pysocks-1.7.1	py36h9880bd3_2	27 KB	conda-forge
toolz-0.11.1	py_0	46 KB	conda-forge
vincent-0.4.4	py_1	28 KB	conda-forge
Total:		12.8 MB	

The following NEW packages will be INSTALLED:

altair	conda-forge/noarch::altair-4.1.0-py_1
attrs	conda-forge/noarch::attrs-20.2.0-pyh9f0ad1d_0
branca	conda-forge/noarch::branca-0.4.1-py_0
brotlipy	conda-forge/linux-64::brotlipy-0.7.0-py36he6145b8_1001
chardet	conda-forge/linux-64::chardet-3.0.4-py36h9880bd3_1008
cryptography	conda-forge/linux-64::cryptography-3.1.1-py36h5d711a5_1
entrypoints	conda-forge/linux-64::entrypoints-0.3-py36h9f0ad1d_1002
folium	conda-forge/noarch::folium-0.5.0-py_0
idna	conda-forge/noarch::idna-2.10-pyh9f0ad1d_0
importlib_metadata	conda-forge/noarch::importlib_metadata-2.0.0-1
jinja2	conda-forge/noarch::jinja2-2.11.2-pyh9f0ad1d_0
jsonschema	conda-forge/noarch::jsonschema-3.2.0-py_2
markupsafe	conda-forge/linux-64::markupsafe-1.1.1-py36he6145b8_2
pandas	conda-forge/linux-64::pandas-1.1.3-py36h7c3b610_2
pyopenssl	conda-forge/noarch::pyopenssl-19.1.0-py_1
pyrsistent	conda-forge/linux-64::pyrsistent-0.17.3-py36h8c4c3a4_1
pysocks	conda-forge/linux-64::pysocks-1.7.1-py36h9880bd3_2
pytz	conda-forge/noarch::pytz-2020.1-pyh9f0ad1d_0
requests	conda-forge/noarch::requests-2.24.0-pyh9f0ad1d_0
toolz	conda-forge/noarch::toolz-0.11.1-py_0
urllib3	conda-forge/noarch::urllib3-1.25.10-py_0

vincent conda-forge/noarch::vincent-0.4.4-py_1

The following packages will be UPDATED:

certifi 2020.6.20-py36h9f0ad1d_0 -->
2020.6.20-py36h9880bd3_2

Downloading and Extracting Packages

markupsafe-1.1.1	27 KB	#####	100%
certifi-2020.6.20	151 KB	#####	100%
pyrsistent-0.17.3	89 KB	#####	100%
cryptography-3.1.1	623 KB	#####	100%
importlib_metadata-2	3 KB	#####	100%
jsonschema-3.2.0	45 KB	#####	100%
entrypoints-0.3	13 KB	#####	100%
pandas-1.1.3	10.6 MB	#####	100%
folium-0.5.0	45 KB	#####	100%
pysocks-1.7.1	27 KB	#####	100%
brotlipy-0.7.0	347 KB	#####	100%
chardet-3.0.4	194 KB	#####	100%
branca-0.4.1	26 KB	#####	100%
altair-4.1.0	614 KB	#####	100%
toolz-0.11.1	46 KB	#####	100%
vincent-0.4.4	28 KB	#####	100%

Preparing transaction: done

Verifying transaction: done

Executing transaction: done

Collecting package metadata (current_repodata.json): done

Solving environment: done

Package Plan

environment location: /home/jupyterlab/conda/envs/python

added / updated specs:

- seaborn

The following packages will be downloaded:

package	build		
blas-1.0	openblas	48 KB	anaconda
ca-certificates-2020.10.14	0	128 KB	anaconda
certifi-2020.6.20	py36_0	160 KB	anaconda
dbus-1.13.16	hb2f20db_0	589 KB	anaconda

gst-plugins-base-1.14.0		hb8d80ab_1	4.8 MB	
gstreamer-1.14.0		hb453b48_1	3.1 MB	
matplotlib-3.3.1		0	24 KB	anaconda
matplotlib-base-3.3.1		py36h817c723_0	6.7 MB	anaconda
openssl-1.1.1h		h7b6447c_0	3.8 MB	anaconda
pyqt-5.9.2		py36h22d08a2_1	5.6 MB	anaconda
qt-5.9.7		h5867ecd_1	68.5 MB	
scipy-1.5.2		py36habc2bb6_0	18.5 MB	anaconda
seaborn-0.11.0		py_0	216 KB	anaconda
sip-4.19.24		py36he6710b0_0	297 KB	anaconda

Total:			112.5 MB	

The following NEW packages will be INSTALLED:

blas	anaconda/linux-64::blas-1.0-openblas
dbus	anaconda/linux-64::dbus-1.13.16-hb2f20db_0
gst-plugins-base	pkgs/main/linux-64::gst-plugins-base-1.14.0-hb8d80ab_1
gstreamer	pkgs/main/linux-64::gstreamer-1.14.0-hb453b48_1
matplotlib	anaconda/linux-64::matplotlib-3.3.1-0
pyqt	anaconda/linux-64::pyqt-5.9.2-py36h22d08a2_1
qt	pkgs/main/linux-64::qt-5.9.7-h5867ecd_1
scipy	anaconda/linux-64::scipy-1.5.2-py36habc2bb6_0
seaborn	anaconda/noarch::seaborn-0.11.0-py_0
sip	anaconda/linux-64::sip-4.19.24-py36he6710b0_0

The following packages will be UPDATED:

ca-certificates	conda-forge::ca-certificates-2020.6.2~ --> anaconda::ca-certificates-2020.10.14-0
-----------------	---

The following packages will be SUPERSEDED by a higher-priority channel:

certifi	conda-forge::certifi-2020.6.20-py36h9~ --> anaconda::certifi-2020.6.20-py36_0
matplotlib-base	conda-forge::matplotlib-base-3.3.2-py~ --> anaconda::matplotlib-base-3.3.1-py36h817c723_0
openssl	conda-forge::openssl-1.1.1h-h516909a_0 --> anaconda::openssl-1.1.1h-h7b6447c_0

Downloading and Extracting Packages

pyqt-5.9.2	5.6 MB	##### 100%
scipy-1.5.2	18.5 MB	##### 100%
sip-4.19.24	297 KB	##### 100%
blas-1.0	48 KB	##### 100%
dbus-1.13.16	589 KB	##### 100%

```

seaborn-0.11.0      | 216 KB      | ##### | 100%
gst-plugins-base-1.1 | 4.8 MB      | ##### | 100%
ca-certificates-2020 | 128 KB      | ##### | 100%
certifi-2020.6.20   | 160 KB      | ##### | 100%
matplotlib-3.3.1    | 24 KB       | ##### | 100%
openssl-1.1.1h      | 3.8 MB      | ##### | 100%
gststreamer-1.14.0   | 3.1 MB      | ##### | 100%
qt-5.9.7            | 68.5 MB     | ##### | 100%
matplotlib-base-3.3. | 6.7 MB      | ##### | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done

```

```
[2]: print("Instalacion completa")
```

Instalacion completa

0.2 LOADING DATA

```
[4]: coordinates= pd.read_csv(r'coordenadas.csv')
```

```
[20]: coordinates.dtypes
```

```

[20]: Distrito          int64
Macrodistrito         object
Latitude              float64
Longitude             float64
dtype: object

```

```
[21]: coordinates.head()
```

```

[21]:   Distrito Macrodistrito  Latitude  Longitude
0         1         Centro -16.496946 -68.133407
1         2         Centro -16.499426 -68.122380
2         3      Cotahuma -16.514952 -68.129473
3         4      Cotahuma -16.537604 -68.135559
4         5      Cotahuma -16.494808 -68.151444

```

```
[7]: growing= pd.read_csv(r'crecimiento.csv')
```

```
[22]: growing.dtypes
```

```

[22]: Actividad_Economica    object
Crecimiento                float64
Participacion              float64
dtype: object

```

```
[8]: growing.head()
```

```
[8]:
```

	Actividad_Economica	Crecimiento	Participacion
0	Agricultura-Silvicultura-Caza-Pezca	4.09	7.24
1	Extraccion de Minas y Canteras	5.36	6.15
2	Industrias Manufactureras	3.87	8.76
3	Electricidad Gas y Agua	3.50	2.29
4	Construccion	-2.76	1.68

```
[9]: population= pd.read_csv(r'poblacion_la_paz.csv')
```

```
[23]: population.dtypes
```

```
[23]:
```

Distrito	int64
Habitantes	int64
Superficie_km2	float64
Densidad_hab_km2	float64
Hombres	float64
Mujeres	float64
edad_0_14	float64
edad_15_64	float64
edad_65_mas	float64
Hogares	int64
dtype:	object

```
[10]: population.head()
```

```
[10]:
```

	Distrito	Habitantes	Superficie_km2	Densidad_hab_km2	Hombres	\
0	3	35944	2.362766	15212.67870	46.981416	
1	4	53461	12.471605	4286.61748	48.270702	
2	5	50716	1.579951	32099.72968	48.091332	
3	6	38916	1.288748	30196.74909	50.552472	
4	7	61887	1.577995	39218.75545	47.415451	

	Mujeres	edad_0_14	edad_15_64	edad_65_mas	Hogares
0	53.018584	19.878144	69.398654	10.723202	11963
1	51.729298	27.345168	67.251361	5.403472	15605
2	51.908668	27.299077	67.283962	5.416961	14945
3	49.447528	18.223867	72.212890	9.563243	12306
4	52.584549	25.213696	68.522326	6.263978	18783

```
[11]: business=pd.read_csv(r'unidades_economicas.csv')
```

```
[24]: business.dtypes
```

```
[24]:
```

DEPARTAMENTO	object
2019	int64
2020	int64
VARIACION_ABSOLUTA	int64

```
VARIACION_RELATIVA    float64
dtype: object
```

```
[12]: business.head()
```

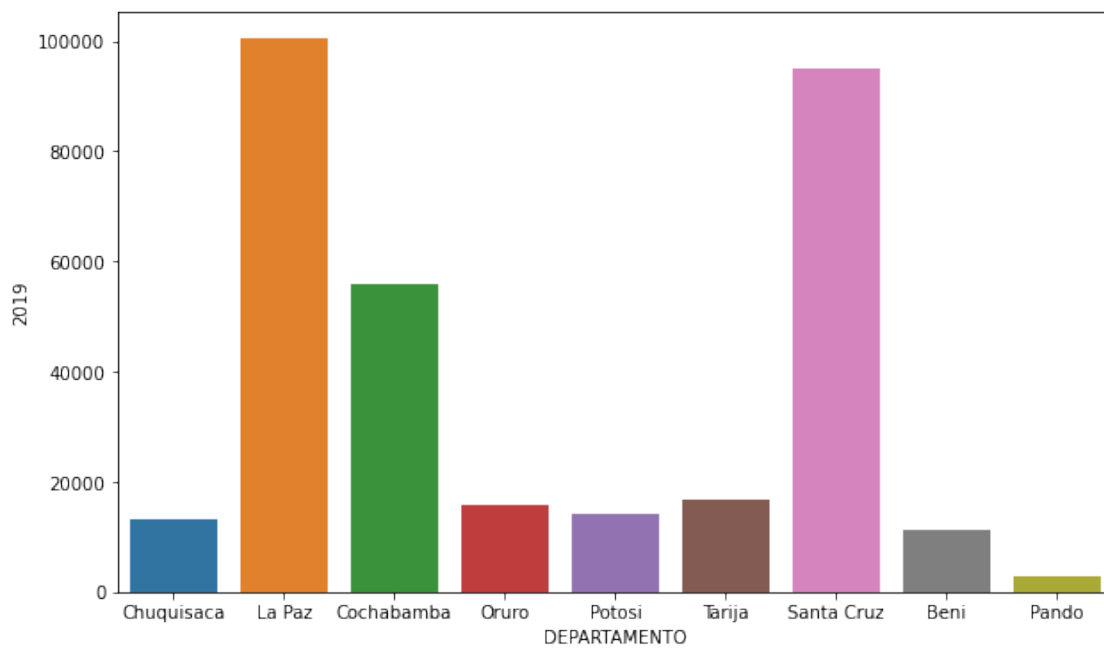
```
[12]:  DEPARTAMENTO    2019    2020  VARIACION_ABSOLUTA  VARIACION_RELATIVA
0   Chuquisaca   13344   13636             292             2.19
1     La Paz   100445  103395             2950             2.94
2   Cochabamba   55973   56863             890             1.59
3     Oruro    15735   16007             272             1.73
4     Potosi   14194   14578             384             2.71
```

0.3 ANALYSISNG DATA

Let's see the differences between cities in relation to the number of economic units

```
[30]: plt.figure(figsize=(10,6))
      sns.barplot(x="DEPARTAMENTO", y="2019", data=business)
```

```
[30]: <AxesSubplot:xlabel='DEPARTAMENTO', ylabel='2019'>
```



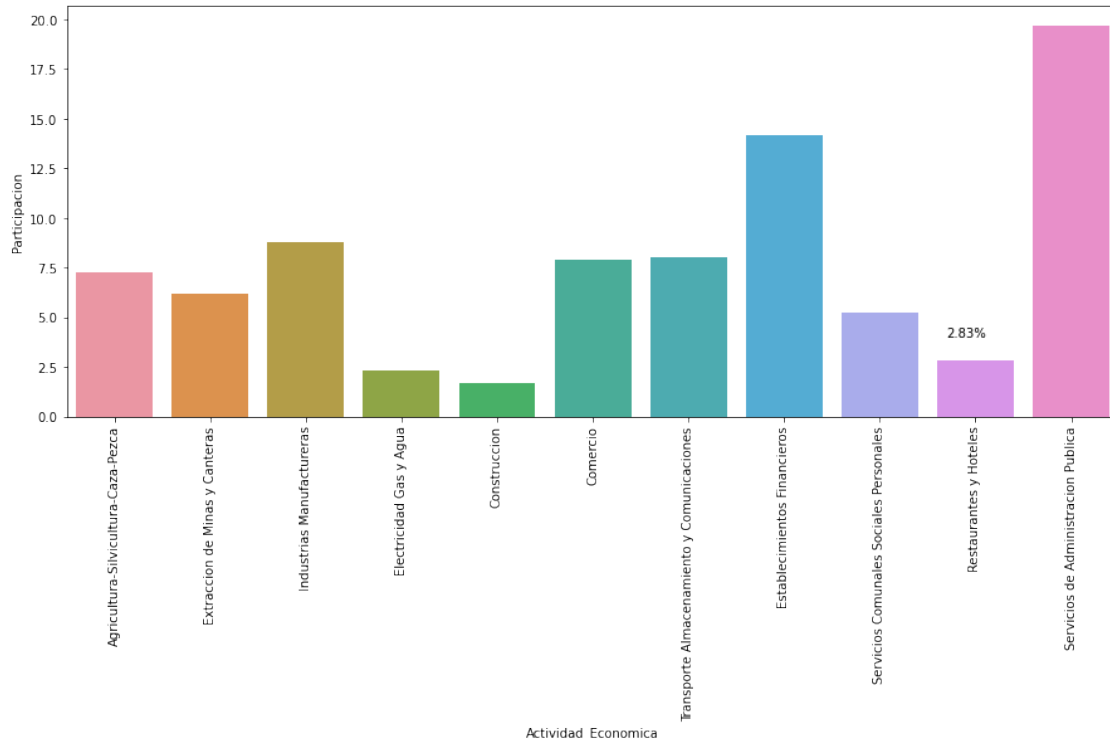
According to this plot, the cities of Santa Cruz and La Paz have the most businesses.

Now let's look at the comparison of productive sectors within the city of La Paz

```
[49]: plt.figure(figsize=(15,6))
      plt.xticks(rotation=90)
```

```
plt.text(8.7,4, str(growing.loc[9,"Participacion"])+"%")
sns.barplot(x="Actividad_Economica", y="Participacion", data=growing)
```

[49]: <AxesSubplot:xlabel='Actividad_Economica', ylabel='Participacion'>

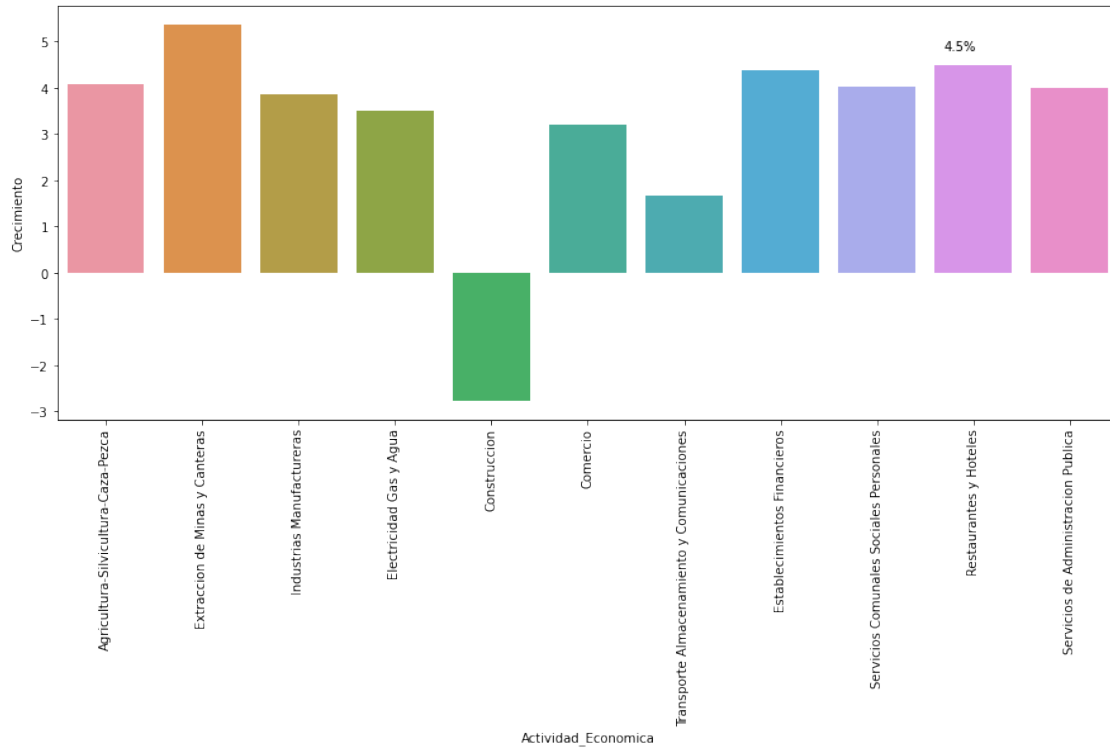


According to the data, the restaurant area has an approximate participation of 2.83% of the market

Now, Let's see the growth of the sector

```
[54]: plt.figure(figsize=(15,6))
plt.xticks(rotation=90)
plt.text(8.7,4.8, str(growing.loc[9,"Crecimiento"])+"%")
sns.barplot(x="Actividad_Economica", y="Crecimiento", data=growing)
```

[54]: <AxesSubplot:xlabel='Actividad_Economica', ylabel='Crecimiento'>

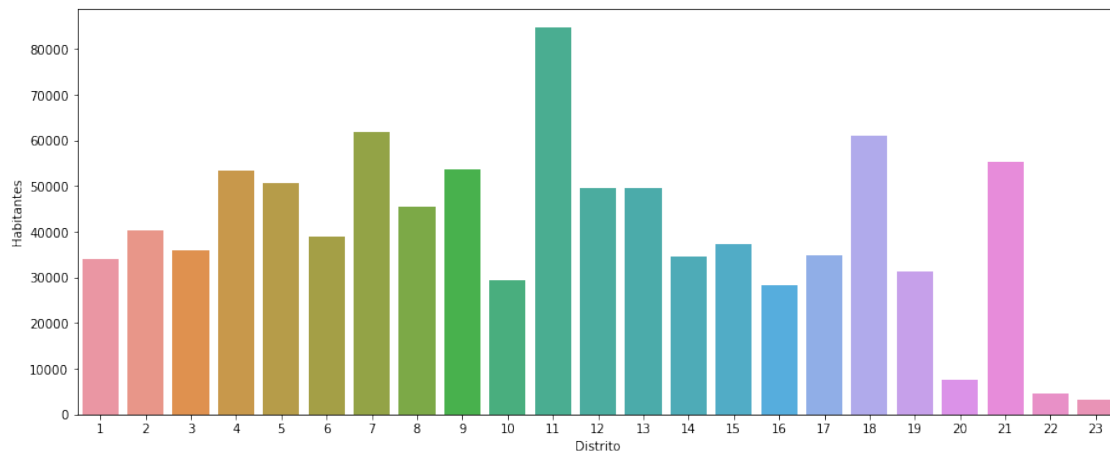


We see that although the market share is small, in growth it is in second place

Now let's focus on the city and its characteristics according to the inhabitants and their districts

```
[59]: plt.figure(figsize=(15,6))
      sns.barplot(x="Distrito", y="Habitantes", data=population)
```

```
[59]: <AxesSubplot:xlabel='Distrito', ylabel='Habitantes'>
```



```
[68]: df2=population[["Distrito","Habitantes"]]
df2.head()
```

```
[68]:   Distrito  Habitantes
0         3      35944
1         4      53461
2         5      50716
3         6      38916
4         7      61887
```

```
[70]: union= pd.merge(coordinates, df2, on="Distrito")
union.head()
```

```
[70]:   Distrito Macrodistrito  Latitude  Longitude  Habitantes
0         1          Centro -16.496946 -68.133407      33889
1         2          Centro -16.499426 -68.122380      40396
2         3      Cotahuma -16.514952 -68.129473      35944
3         4      Cotahuma -16.537604 -68.135559      53461
4         5      Cotahuma -16.494808 -68.151444      50716
```

```
[108]: LaPaz_data["Distrito"]= LaPaz_data["Distrito"].astype(str)
```

```
[110]: LaPaz_data.dtypes
```

```
[110]: Distrito          object
Macrodistrito         object
Latitude              float64
Longitude             float64
Habitantes            int64
dtype: object
```

```
[131]: LaPaz_data["Nombre"]="Macrodistrito " + LaPaz_data["Macrodistrito"]+", Distrito_
↪"+LaPaz_data["Distrito"]
LaPaz_data.head()
```

```
[131]:   Distrito Macrodistrito  Latitude  Longitude  Habitantes  \
0         1          Centro -16.496946 -68.133407      33889
1         2          Centro -16.499426 -68.122380      40396
2         3      Cotahuma -16.514952 -68.129473      35944
3         4      Cotahuma -16.537604 -68.135559      53461
4         5      Cotahuma -16.494808 -68.151444      50716

      Nombre
0  Macrodistrito Centro, Distrito 1
1  Macrodistrito Centro, Distrito 2
2  Macrodistrito Cotahuma, Distrito 3
3  Macrodistrito Cotahuma, Distrito 4
```

4 Macrodistrito Cotahuma, Distrito 5

```
[129]: #LaPaz_data.drop(['Nombre'], axis='columns', inplace=True)
#LaPaz_data.head()
```

0.4 PLOTTING DATA ON THE MAP USING FOLIUM

```
[115]: address = 'La Paz, Bolivia'

geolocator = Nominatim(user_agent="ny_explorer")
location = geolocator.geocode(address)
latitude = location.latitude
longitude = location.longitude
print('The geograpical coordinate of La Paz are {}, {}'.format(latitude,
↪longitude))
```

The geograpical coordinate of La Paz are -16.4955455, -68.1336229.

```
[132]: # create map of La Paz using latitude and longitude values
map_LaPaz = folium.Map(location=[latitude, longitude], zoom_start=12)

# add markers to map
for lat, lng, label in zip(LaPaz_data['Latitude'],
↪LaPaz_data['Longitude'], LaPaz_data['Nombre']+"", Habitantes:
↪"+LaPaz_data["Habitantes"].astype(str)):
    label = folium.Popup(label, parse_html=True)
    folium.CircleMarker(
        [lat, lng],
        radius=5,
        popup=label,
        color='blue',
        fill=True,
        fill_color='#3186cc',
        fill_opacity=0.7,
        parse_html=False).add_to(map_LaPaz)

map_LaPaz
```

```
[132]: <folium.folium.Map at 0x7fab04a3fbe0>
```

0.5 FINDING PLACES

```
[133]: CLIENT_ID = '1AQJMCFUOPJAS5JYZRTRGOKWGWXPEP5CUL1GRUKYS2JXDU41' # your
↪Foursquare ID
CLIENT_SECRET = '2ZAKMBIETWNQXTYZCKRZFIOZF4LO1EDTZUTSEV5PZF34WFNU' # your
↪Foursquare Secret
VERSION = '20180605' # Foursquare API version
```

```
LIMIT = 100 # A default Foursquare API limit value
```

```
print('Your credentials:')  
print('CLIENT_ID: ' + CLIENT_ID)  
print('CLIENT_SECRET:' + CLIENT_SECRET)
```

Your credentials:

CLIENT_ID: 1AQJMCFUOPJAS5JYZRTRGOKWGWXPEP5CUL1GRUKYS2JXDU41

CLIENT_SECRET:2ZAKMBIETWNQXTYZCKRZF1OZF4L01EDTZUTSEV5PZF34WFNU

```
[134]: LaPaz_data.loc[0, 'Nombre']
```

```
[134]: 'Macrodistrito Centro, Distrito 1'
```

```
[136]: neighborhood_latitude = LaPaz_data.loc[0, 'Latitude'] # neighborhood latitude_  
      ↪value  
neighborhood_longitude = LaPaz_data.loc[0, 'Longitude'] # neighborhood_  
      ↪longitude value  
  
neighborhood_name = LaPaz_data.loc[0, 'Nombre'] # neighborhood name  
  
print('Latitude and longitude values of {} are {}, {}.'.  
      ↪format(neighborhood_name,  
            ↪neighborhood_latitude,  
            ↪neighborhood_longitude))
```

Latitude and longitude values of Macrodistrito Centro, Distrito 1 are
-16.496945999999998, -68.13340699999999.

```
[150]: # type your answer here  
LIMIT = 100 # limit of number of venues returned by Foursquare API  
radius = 500 # define radius  
url = 'https://api.foursquare.com/v2/venues/search?  
      ↪categoryId=4d4b7105d754a06374d81259&client_id={}&client_secret={}&v={}&ll={},{}&radius={}&l  
      ↪format(  
          CLIENT_ID,  
          CLIENT_SECRET,  
          VERSION,  
          neighborhood_latitude,  
          neighborhood_longitude,  
          radius,  
          LIMIT)
```

```
[151]: import requests # library to handle requests
```

```

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

```

```
[152]: results = requests.get(url).json()
```

```
[153]: results
```

```

[153]: {'meta': {'code': 200, 'requestId': '5f8ceff10572497850ec1f2a'},
        'response': {'venues': [{'id': '5b6b5057a9e402002caff46b',
                                'name': 'Geisha Coffe House',
                                'location': {'lat': -16.495633,
                                             'lng': -68.133172,
                                             'labeledLatLngs': [{'label': 'display',
                                                                  'lat': -16.495633,
                                                                  'lng': -68.133172}],
                                             'distance': 148,
                                             'cc': 'BO',
                                             'city': 'La Paz',
                                             'state': 'La Paz',
                                             'country': 'Bolivia',
                                             'formattedAddress': ['La Paz', 'Bolivia']},
                                'categories': [{'id': '4bf58dd8d48988d1e0931735',
                                                'name': 'Coffee Shop',
                                                'pluralName': 'Coffee Shops',
                                                'shortName': 'Coffee Shop',
                                                'icon': {'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/coffeeshop_',
                                                'suffix': '.png'},
                                                'primary': True}],
                                                'referralId': 'v-1603071985',
                                                'hasPerk': False},
                                                {'id': '50f02696e4b0cd11854e7257',
                                                'name': 'Tomate Café',
                                                'location': {'address': 'Ayacucho',
                                                             'crossStreet': 'Potosí',
                                                             'lat': -16.49705930045442,
                                                             'lng': -68.13393939923414,
                                                             'labeledLatLngs': [{'label': 'display',
                                                                 'lat': -16.49705930045442,
                                                                 'lng': -68.13393939923414}],
                                                             'distance': 148,
                                                             'cc': 'BO',
                                                             'city': 'La Paz',
                                                             'state': 'La Paz',
                                                             'country': 'Bolivia',
                                                             'formattedAddress': ['La Paz', 'Bolivia']},
                                                'categories': [{'id': '4bf58dd8d48988d1e0931735',
                                                                'name': 'Coffee Shop',
                                                                'pluralName': 'Coffee Shops',
                                                                'shortName': 'Coffee Shop',
                                                                'icon': {'prefix':
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            'lat': -16.497768,
            'lng': -68.13704,
            'labeledLatLngs': [{ 'label': 'display',

```

```

    'lat': -16.497768,
    'lng': -68.13704}],
    'distance': 398,
    'cc': 'BO',
    'city': 'La Paz',
    'state': 'La Paz',
    'country': 'Bolivia',
    'formattedAddress': ['Murillo 993 (Cochabamba)', 'La Paz', 'Bolivia']],
    'categories': [{ 'id': '4bf58dd8d48988d10f941735',
        'name': 'Indian Restaurant',
        'pluralName': 'Indian Restaurants',
        'shortName': 'Indian',
        'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/indian_',
            'suffix': '.png' },
        'primary': True }],
    'referralId': 'v-1603071986',
    'hasPerk': False },
    { 'id': '4f37f825e4b0fc67a9c6e622',
        'name': 'Ayala',
        'location': { 'lat': -16.49772,
            'lng': -68.136582,
            'labeledLatLngs': [ { 'label': 'display',
                'lat': -16.49772,
                'lng': -68.136582 } ],
            'distance': 349,
            'cc': 'BO',
            'city': 'La Paz',
            'state': 'La Paz',
            'country': 'Bolivia',
            'formattedAddress': ['La Paz', 'Bolivia'] },
        'categories': [ { 'id': '4bf58dd8d48988d1c4941735',
            'name': 'Restaurant',
            'pluralName': 'Restaurants',
            'shortName': 'Restaurant',
            'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/default_',
                'suffix': '.png' },
            'primary': True } ],
        'referralId': 'v-1603071986',
        'hasPerk': False },
    { 'id': '4e0b6784a8097aad936e6073',
        'name': 'Pollo Frito Cochabamba',
        'location': { 'address': 'Av. 16 de Julio No. 1420',
            'lat': -16.50090394163535,
            'lng': -68.13360214233398,
            'labeledLatLngs': [ { 'label': 'display',
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                'lng': -68.13360214233398 } ],

```

```

'distance': 441,
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'state': 'La Paz Dept',
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'categories': [{ 'id': '4bf58dd8d48988d16e941735',
  'name': 'Fast Food Restaurant',
  'pluralName': 'Fast Food Restaurants',
  'shortName': 'Fast Food',
  'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/fastfood_',
  'suffix': '.png'},
  'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{'id': '5662eee3498e2afbdbb483c0',
'name': 'Cafe La Chola',
'location': { 'lat': -16.494976043701172,
'lng': -68.13641357421875,
'labeledLatLngs': [{ 'label': 'display',
  'lat': -16.494976043701172,
  'lng': -68.13641357421875}],
'distance': 388,
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'city': 'La Paz',
'state': 'La Paz',
'country': 'Bolivia',
'formattedAddress': ['La Paz', 'Bolivia']],
'categories': [{ 'id': '4bf58dd8d48988d16a941735',
  'name': 'Bakery',
  'pluralName': 'Bakeries',
  'shortName': 'Bakery',
  'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/bakery_',
  'suffix': '.png'},
  'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{'id': '4d0cde647d28721e1c78f520',
'name': 'Brosso',
'location': { 'address': 'Av. 16 de julio (El Prado) #1473',
'lat': -16.500951378128992,
'lng': -68.13308004977695,
'labeledLatLngs': [{ 'label': 'display',
  'lat': -16.500951378128992,
  'lng': -68.13308004977695}],
'distance': 447,

```

```

'cc': 'BO',
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'La Paz',
'Bolivia']],
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'name': 'Ice Cream Shop',
'pluralName': 'Ice Cream Shops',
'shortName': 'Ice Cream',
'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/icecream_',
'suffix': '.png'},
'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{ 'id': '4ee7cfa3722e4c7e7133aeb0',
'name': 'Cafe Del Mundo',
'location': { 'lat': -16.49756954789014,
'lng': -68.13861802176106,
'labeledLatLngs': [{ 'label': 'display',
'lat': -16.49756954789014,
'lng': -68.13861802176106}],
'distance': 560,
'cc': 'BO',
'city': 'La Paz',
'state': 'La Paz',
'country': 'Bolivia',
'formattedAddress': ['La Paz', 'Bolivia']],
'categories': [{ 'id': '4bf58dd8d48988d16d941735',
'name': 'Café',
'pluralName': 'Cafés',
'shortName': 'Café',
'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/cafe_',
'suffix': '.png'},
'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{ 'id': '4db774a693a096e4f5e1d79f',
'name': "Manolo's",
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'crossStreet': 'Ayacucho',
'lat': -16.49875184272793,
'lng': -68.13474286741274,
'labeledLatLngs': [{ 'label': 'display',
'lat': -16.49875184272793,

```

```

    'lng': -68.13474286741274]],
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    'city': 'La Paz',
    'state': 'La Paz',
    'country': 'Bolivia',
    'formattedAddress': ['Av Camacho (Ayacucho)', 'La Paz', 'Bolivia']],
    'categories': [{ 'id': '4bf58dd8d48988d1c4941735',
        'name': 'Restaurant',
        'pluralName': 'Restaurants',
        'shortName': 'Restaurant',
        'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/default_',
            'suffix': '.png' },
        'primary': True }],
    'referralId': 'v-1603071986',
    'hasPerk': False },
{ 'id': '52d2b9d211d24756f200be5e',
    'name': 'Capitol - Confiteria Restaurant',
    'location': { 'lat': -16.495695114135742,
        'lng': -68.13497924804688,
        'labeledLatLngs': [ { 'label': 'display',
            'lat': -16.495695114135742,
            'lng': -68.13497924804688 } ],
        'distance': 218,
        'cc': 'BO',
        'country': 'Bolivia',
        'formattedAddress': ['Bolivia'] },
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        'name': 'Tea Room',
        'pluralName': 'Tea Rooms',
        'shortName': 'Tea Room',
        'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/tearoom_',
            'suffix': '.png' },
        'primary': True }],
    'referralId': 'v-1603071986',
    'hasPerk': False },
{ 'id': '551ad263498e3548b3ae9b55',
    'name': 'Licius Way',
    'location': { 'address': 'Calle Potosí, Edificio Max Salzmann No. 1321',
        'lat': -16.497517126053356,
        'lng': -68.13290886416624,
        'labeledLatLngs': [ { 'label': 'display',
            'lat': -16.497517126053356,
            'lng': -68.13290886416624 } ],
        'distance': 82,
        'cc': 'BO',
        'city': 'La Paz',

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```

    'state': 'La Paz',
    'country': 'Bolivia',
    'formattedAddress': ['Calle Potosí, Edificio Max Salzmann No. 1321',
        'La Paz',
        'Bolivia']],
    'categories': [{ 'id': '4bf58dd8d48988d1bd941735',
        'name': 'Salad Place',
        'pluralName': 'Salad Places',
        'shortName': 'Salad',
        'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/salad_',
            'suffix': '.png' },
        'primary': True }],
    'referralId': 'v-1603071986',
    'hasPerk': False },
    { 'id': '56b504d138fac4ce2c89a59d',
    'name': 'El Cofre De Los Andes',
    'location': { 'address': 'Avenida Mariscal Santa Cruz',
        'lat': -16.501423,
        'lng': -68.13422,
        'labeledLatLngs': [ { 'label': 'display',
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            'lng': -68.13422 } ],
        'distance': 505,
        'cc': 'BO',
        'city': 'La Paz',
        'state': 'La Paz',
        'country': 'Bolivia',
        'formattedAddress': ['Avenida Mariscal Santa Cruz', 'La Paz', 'Bolivia'] },
    'categories': [{ 'id': '4bf58dd8d48988d1c4941735',
        'name': 'Restaurant',
        'pluralName': 'Restaurants',
        'shortName': 'Restaurant',
        'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/default_',
            'suffix': '.png' },
        'primary': True }],
    'referralId': 'v-1603071986',
    'hasPerk': False },
    { 'id': '531bc26c498e9762b7f59ddc',
    'name': "Wist'upiku",
    'location': { 'address': 'Av. Satélite',
        'lat': -16.495056401683705,
        'lng': -68.13471375624442,
        'labeledLatLngs': [ { 'label': 'display',
            'lat': -16.495056401683705,
            'lng': -68.13471375624442 } ],
        'distance': 252,
        'cc': 'BO',

```

```

'city': 'La Paz',
'state': 'La Paz',
'country': 'Bolivia',
'formattedAddress': ['Av. Satélite', 'La Paz', 'Bolivia']],
'categories': [{ 'id': '4bf58dd8d48988d143941735',
  'name': 'Breakfast Spot',
  'pluralName': 'Breakfast Spots',
  'shortName': 'Breakfast',
  'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/breakfast_',
  'suffix': '.png'},
  'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{ 'id': '50f30e51e4b050bf9c36a0f9',
  'name': "Pepe's Cafe",
  'location': { 'address': 'Jimenez 894',
    'crossStreet': 'Linares',
    'lat': -16.496855034112436,
    'lng': -68.13724642857068,
    'labeledLatLngs': [{ 'label': 'display',
      'lat': -16.496855034112436,
      'lng': -68.13724642857068}],
    'distance': 409,
    'cc': 'BO',
    'city': 'La Paz',
    'state': 'La Paz',
    'country': 'Bolivia',
    'formattedAddress': ['Jimenez 894 (Linares)', 'La Paz', 'Bolivia']],
  'categories': [{ 'id': '4bf58dd8d48988d16d941735',
    'name': 'Café',
    'pluralName': 'Cafés',
    'shortName': 'Café',
    'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/cafe_',
      'suffix': '.png'},
    'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
{ 'id': '53bde5db498e246c7d01b88c',
  'name': 'Milanesa FC',
  'location': { 'lat': -16.496551513671875,
    'lng': -68.1343765258789,
    'labeledLatLngs': [{ 'label': 'display',
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      'lng': -68.1343765258789}],
    'distance': 112,
    'cc': 'BO',

```

```

    'country': 'Bolivia',
    'formattedAddress': ['Bolivia']},
    'categories': [{ 'id': '4bf58dd8d48988d16e941735',
        'name': 'Fast Food Restaurant',
        'pluralName': 'Fast Food Restaurants',
        'shortName': 'Fast Food',
        'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/fastfood_',
        'suffix': '.png'},
        'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
    { 'id': '50a4f32fe4b0765db337a3b5',
        'name': 'Restorante Bella Vista',
        'location': { 'lat': -16.495665407164484,
            'lng': -68.13627411512401,
            'labeledLatLngs': [{ 'label': 'display',
                'lat': -16.495665407164484,
                'lng': -68.13627411512401}],
            'distance': 337,
            'cc': 'BO',
            'city': 'La Paz',
            'state': 'La Paz',
            'country': 'Bolivia',
            'formattedAddress': ['La Paz', 'Bolivia']},
        'categories': [{ 'id': '4bf58dd8d48988d1c4941735',
            'name': 'Restaurant',
            'pluralName': 'Restaurants',
            'shortName': 'Restaurant',
            'icon': { 'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/default_',
                'suffix': '.png'},
            'primary': True}],
        'referralId': 'v-1603071986',
        'hasPerk': False},
    { 'id': '4fb53d7de4b023886a7d0efc',
        'name': 'Del Sur',
        'location': { 'lat': -16.499107360839844,
            'lng': -68.1332015991211,
            'labeledLatLngs': [{ 'label': 'display',
                'lat': -16.499107360839844,
                'lng': -68.1332015991211}],
            'distance': 241,
            'cc': 'BO',
            'country': 'Bolivia',
            'formattedAddress': ['Bolivia']},
        'categories': [{ 'id': '4bf58dd8d48988d1be941735',
            'name': 'Latin American Restaurant',

```



```

    'pluralName': 'Latin American Restaurants',
    'shortName': 'Latin American',
    'icon': {'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/latinamerican_',
    'suffix': '.png'},
    'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
{'id': '532f4ad1498e281e3971142a',
 'name': 'Presto Pizza',
 'location': {'address': 'Calle Junin frente a la UTOP',
 'lat': -16.494809483123326,
 'lng': -68.13314757565864,
 'labeledLatLngs': [{'label': 'display',
 'lat': -16.494809483123326,
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 'distance': 239,
 'cc': 'BO',
 'city': 'La Paz',
 'state': 'La Paz',
 'country': 'Bolivia',
 'formattedAddress': ['Calle Junin frente a la UTOP',
 'La Paz',
 'Bolivia']},
 'categories': [{'id': '4bf58dd8d48988d1ca941735',
 'name': 'Pizza Place',
 'pluralName': 'Pizza Places',
 'shortName': 'Pizza',
 'icon': {'prefix': 'https://ss3.4sqi.net/img/categories_v2/food/pizza_',
 'suffix': '.png'},
 'primary': True}],
 'referralId': 'v-1603071986',
 'hasPerk': False},
{'id': '5657b68b498e715f6028b630',
 'name': '"Snack" - Adrianita',
 'location': {'address': 'Tarija',
 'crossStreet': 'Linares',
 'lat': -16.498628616333008,
 'lng': -68.13746643066406,
 'labeledLatLngs': [{'label': 'display',
 'lat': -16.498628616333008,
 'lng': -68.13746643066406}],
 'distance': 472,
 'cc': 'BO',
 'city': 'La Paz',
 'state': 'La Paz',
 'country': 'Bolivia',

```

```

    'formattedAddress': ['Tarija (Linares)', 'La Paz', 'Bolivia']],
    'categories': [{ 'id': '4bf58dd8d48988d1cd941735',
        'name': 'South American Restaurant',
        'pluralName': 'South American Restaurants',
        'shortName': 'South American',
        'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/argentinian_',
        'suffix': '.png'},
        'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
    { 'id': '5145e878e4b0dba1b5edd935',
        'name': 'Pollos Dona Betty',
        'location': { 'lat': -16.49684,
            'lng': -68.12904,
            'labeledLatLngs': [{ 'label': 'display',
                'lat': -16.49684,
                'lng': -68.12904}],
            'distance': 466,
            'cc': 'BO',
            'country': 'Bolivia',
            'formattedAddress': ['Bolivia']},
        'categories': [{ 'id': '4d4ae6fc7a7b7dea34424761',
            'name': 'Fried Chicken Joint',
            'pluralName': 'Fried Chicken Joints',
            'shortName': 'Fried Chicken',
            'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/friedchicken_',
            'suffix': '.png'},
            'primary': True}],
        'referralId': 'v-1603071986',
        'hasPerk': False},
    { 'id': '50f05374e4b005218be75dd5',
        'name': 'Palacio Del Pollo',
        'location': { 'lat': -16.499137,
            'lng': -68.137176,
            'labeledLatLngs': [{ 'label': 'display',
                'lat': -16.499137,
                'lng': -68.137176}],
            'distance': 470,
            'cc': 'BO',
            'city': 'La Paz',
            'state': 'La Paz',
            'country': 'Bolivia',
            'formattedAddress': ['La Paz', 'Bolivia']},
        'categories': [{ 'id': '4bf58dd8d48988d1be941735',
            'name': 'Latin American Restaurant',

```

```

    'pluralName': 'Latin American Restaurants',
    'shortName': 'Latin American',
    'icon': {'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/latinamerican_',
    'suffix': '.png'},
    'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
{'id': '520f835611d201a45e6861c4',
 'name': 'Nelly',
 'location': {'address': 'Mercado Lanza',
 'crossStreet': 'Evaristo Vallé',
 'lat': -16.49417,
 'lng': -68.137338,
 'labeledLatLngs': [{'label': 'display',
    'lat': -16.49417,
    'lng': -68.137338}],
 'distance': 521,
 'cc': 'BO',
 'city': 'La Paz',
 'state': 'La Paz',
 'country': 'Bolivia',
 'formattedAddress': ['Mercado Lanza (Evaristo Vallé)',
    'La Paz',
    'Bolivia']},
 'categories': [{'id': '4bf58dd8d48988d143941735',
    'name': 'Breakfast Spot',
    'pluralName': 'Breakfast Spots',
    'shortName': 'Breakfast',
    'icon': {'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/breakfast_',
    'suffix': '.png'},
    'primary': True}],
    'referralId': 'v-1603071986',
    'hasPerk': False},
{'id': '4f57bbdae4b0ffe1984fd0dc',
 'name': 'A Todo Chanco',
 'location': {'address': 'Zona Central',
 'crossStreet': 'Av. 16 de Julio',
 'lat': -16.502043,
 'lng': -68.132143,
 'labeledLatLngs': [{'label': 'display',
    'lat': -16.502043,
    'lng': -68.132143}],
 'distance': 583,
 'cc': 'BO',
 'city': 'La Paz',

```

```

'state': 'LP',
'country': 'Bolivia',
'formattedAddress': ['Zona Central (Av. 16 de Julio)',
'La Paz',
'Bolivia']},
'categories': [{ 'id': '4bf58dd8d48988d16e941735',
'name': 'Fast Food Restaurant',
'pluralName': 'Fast Food Restaurants',
'shortName': 'Fast Food',
'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/fastfood_',
'suffix': '.png'},
'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
{ 'id': '4eea2a16be7b7263da63f3c9',
'name': 'La Casona',
'location': { 'address': 'Av. Mariscal Santa Cruz',
'crossStreet': 'Sagarnaga',
'lat': -16.496900397534684,
'lng': -68.13654220167132,
'labeledLatLngs': [{ 'label': 'display',
'lat': -16.496900397534684,
'lng': -68.13654220167132}],
'distance': 334,
'cc': 'BO',
'city': 'La Paz',
'state': 'La Paz Dept',
'country': 'Bolivia',
'formattedAddress': ['Av. Mariscal Santa Cruz (Sagarnaga)',
'La Paz',
'Bolivia']},
'categories': [{ 'id': '4bf58dd8d48988d1cd941735',
'name': 'South American Restaurant',
'pluralName': 'South American Restaurants',
'shortName': 'South American',
'icon': { 'prefix':
'https://ss3.4sqi.net/img/categories_v2/food/argentinian_',
'suffix': '.png'},
'primary': True}],
'referralId': 'v-1603071986',
'hasPerk': False},
'confident': False}}

```

```

[154]: # function that extracts the category of the venue
def get_category_type(row):
    try:

```

```

        categories_list = row['categories']
    except:
        categories_list = row['venue.categories']

    if len(categories_list) == 0:
        return None
    else:
        return categories_list[0]['name']

```

```

[156]: venues = results['response']['venues']

nearby_venues = json_normalize(venues) # flatten JSON
nearby_venues.head()

```

/home/jupyterlab/conda/envs/python/lib/python3.6/site-packages/ipykernel_launcher.py:3: FutureWarning: pandas.io.json.json_normalize is deprecated, use pandas.json_normalize instead

This is separate from the ipykernel package so we can avoid doing imports until

```

[156]:

```

	id	name \
0	5b6b5057a9e402002caff46b	Geisha Coffe House
1	50f02696e4b0cd11854e7257	Tomate Café
2	4c0afe567e3fc9283aadf482	Burger King
3	58f6ae95237dee43d91f1505	Texas
4	506dced8e4b0f91938062541	Los lomititos del 6

	categories	referralId	hasPerk \
0	[{'id': '4bf58dd8d48988d1e0931735', 'name': 'C... v-1603071985		False
1	[{'id': '4bf58dd8d48988d1d3941735', 'name': 'V... v-1603071985		False
2	[{'id': '4bf58dd8d48988d16e941735', 'name': 'F... v-1603071985		False
3	[{'id': '4bf58dd8d48988d16e941735', 'name': 'F... v-1603071985		False
4	[{'id': '4bf58dd8d48988d107941735', 'name': 'A... v-1603071985		False

	location.lat	location.lng \
0	-16.495633	-68.133172
1	-16.497059	-68.133939
2	-16.497095	-68.135071
3	-16.497868	-68.133354
4	-16.496910	-68.134772

	location.labeledLatLngs	location.distance \
0	[{'label': 'display', 'lat': -16.495633, 'lng'...	148
1	[{'label': 'display', 'lat': -16.4970593004544...	58
2	[{'label': 'display', 'lat': -16.4970948085762...	178
3	[{'label': 'display', 'lat': -16.497868, 'lng'...	102
4	[{'label': 'display', 'lat': -16.4969103609642...	145

	location.cc	location.city	location.state	location.country	\
0	B0	La Paz	La Paz	Bolivia	
1	B0	La Paz	La Paz	Bolivia	
2	B0	La Paz	La Paz	Bolivia	
3	B0	Provincia Murillo	La Paz	Bolivia	
4	B0	La Paz	La Paz	Bolivia	

	location.formattedAddress	location.address	\
0	[La Paz, Bolivia]		NaN
1	[Ayacucho (Potosí), La Paz, Bolivia]		Ayacucho
2	[Socabaya 1500 (Entre Potosi y Mercado), La Pa...	Socabaya 1500	
3	[Colon (Mercado), La Paz 2174, Bolivia]		Colon
4	[La Paz, Bolivia]		NaN

	location.crossStreet	location.postalCode
0	NaN	NaN
1	Potosí	NaN
2	Entre Potosi y Mercado	NaN
3	Mercado	2174
4	NaN	NaN

```
[157]: venues = results['response']['venues']

nearby_venues = json_normalize(venues) # flatten JSON

# filter columns
filtered_columns = ['name', 'categories', 'location.lat', 'location.lng']
nearby_venues = nearby_venues.loc[:, filtered_columns]

# filter the category for each row
nearby_venues['categories'] = nearby_venues.apply(get_category_type, axis=1)

# clean columns
nearby_venues.columns = [col.split(".")[1] for col in nearby_venues.columns]

nearby_venues.head()
```

/home/jupyterlab/conda/envs/python/lib/python3.6/site-packages/ipykernel_launcher.py:3: FutureWarning: pandas.io.json.json_normalize is deprecated, use pandas.json_normalize instead

This is separate from the ipykernel package so we can avoid doing imports until

```
[157]:
```

	name	categories	lat	lng
0	Geisha Coffe House	Coffee Shop	-16.495633	-68.133172
1	Tomate Café	Vegetarian / Vegan Restaurant	-16.497059	-68.133939

2	Burger King	Fast Food Restaurant	-16.497095	-68.135071
3	Texas	Fast Food Restaurant	-16.497868	-68.133354
4	Los lomititos del 6	Argentinian Restaurant	-16.496910	-68.134772

```
[158]: print('{} venues were returned by Foursquare.'.format(nearby_venues.shape[0]))
```

47 venues were returned by Foursquare.

```
[159]: def getNearbyVenues(names, latitudes, longitudes, 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/search?
        categoryId=4d4b7105d754a06374d81259&client_id={} &client_secret={} &v={} &ll={}, {} &radius={} &limit=100
        format(
            CLIENT_ID,
            CLIENT_SECRET,
            VERSION,
            lat,
            lng,
            radius,
            LIMIT)

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

        # return only relevant information for each nearby venue
        venues_list.append([
            name,
            lat,
            lng,
            v['name'],
            v['location']['lat'],
            v['location']['lng'],
            v['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 = ['Nombre',
                            'Neighborhood Latitude',
                            'Neighborhood Longitude',
                            'Venue',
                            'Venue Latitude',
                            'Venue Longitude',
```

```
'Venue Category']
```

```
return(nearby_venues)
```

```
[160]: # type your answer here
LaPaz_venues = getNearbyVenues(names=LaPaz_data['Nombre'],
                                latitudes=LaPaz_data['Latitude'],
                                longitudes=LaPaz_data['Longitude']
                                )
```

```
Macrodistrito Centro, Distrito 1
Macrodistrito Centro, Distrito 2
Macrodistrito Cotahuma, Distrito 3
Macrodistrito Cotahuma, Distrito 4
Macrodistrito Cotahuma, Distrito 5
Macrodistrito Cotahuma, Distrito 6
Macrodistrito Max Paredes, Distrito 7
Macrodistrito Max Paredes, Distrito 8
Macrodistrito Max Paredes, Distrito 9
Macrodistrito Max Paredes, Distrito 10
Macrodistrito Periférica, Distrito 11
Macrodistrito Periférica, Distrito 12
Macrodistrito Periférica, Distrito 13
Macrodistrito San Antonio, Distrito 14
Macrodistrito San Antonio, Distrito 15
Macrodistrito San Antonio, Distrito 16
Macrodistrito San Antonio, Distrito 17
Macrodistrito Sur, Distrito 18
Macrodistrito Sur, Distrito 19
Macrodistrito Mallasa, Distrito 20
Macrodistrito Sur, Distrito 21
Macrodistrito Hampaturi, Distrito 22
Macrodistrito Zongo, Distrito 23
```

```
[161]: print(LaPaz_venues.shape)
LaPaz_venues.head()
```

```
(305, 7)
```

```
[161]:
```

	Nombre	Neighborhood	Latitude	\
0	Macrodistrito Centro, Distrito 1		-16.496946	
1	Macrodistrito Centro, Distrito 1		-16.496946	
2	Macrodistrito Centro, Distrito 1		-16.496946	
3	Macrodistrito Centro, Distrito 1		-16.496946	
4	Macrodistrito Centro, Distrito 1		-16.496946	

	Neighborhood	Longitude	Venue	Venue Latitude	\
--	--------------	-----------	-------	----------------	---

0	-68.133407	Geisha Coffe House	-16.495633
1	-68.133407	Tomate Café	-16.497059
2	-68.133407	Burger King	-16.497095
3	-68.133407	Texas	-16.497868
4	-68.133407	Los lomititos del 6	-16.496910

	Venue Longitude	Venue Category
0	-68.133172	Coffee Shop
1	-68.133939	Vegetarian / Vegan Restaurant
2	-68.135071	Fast Food Restaurant
3	-68.133354	Fast Food Restaurant
4	-68.134772	Argentinian Restaurant

```
[162]: LaPaz_venues.groupby('Nombre').count()
```

```
[162]:
```

	Neighborhood Latitude \
Nombre	
Macrodistrito Centro, Distrito 1	47
Macrodistrito Centro, Distrito 2	49
Macrodistrito Cotahuma, Distrito 3	46
Macrodistrito Cotahuma, Distrito 5	11
Macrodistrito Cotahuma, Distrito 6	47
Macrodistrito Max Paredes, Distrito 8	8
Macrodistrito Max Paredes, Distrito 9	1
Macrodistrito San Antonio, Distrito 14	1
Macrodistrito San Antonio, Distrito 15	6
Macrodistrito San Antonio, Distrito 16	1
Macrodistrito Sur, Distrito 18	49
Macrodistrito Sur, Distrito 21	39

	Neighborhood Longitude	Venue \
Nombre		
Macrodistrito Centro, Distrito 1	47	47
Macrodistrito Centro, Distrito 2	49	49
Macrodistrito Cotahuma, Distrito 3	46	46
Macrodistrito Cotahuma, Distrito 5	11	11
Macrodistrito Cotahuma, Distrito 6	47	47
Macrodistrito Max Paredes, Distrito 8	8	8
Macrodistrito Max Paredes, Distrito 9	1	1
Macrodistrito San Antonio, Distrito 14	1	1
Macrodistrito San Antonio, Distrito 15	6	6
Macrodistrito San Antonio, Distrito 16	1	1
Macrodistrito Sur, Distrito 18	49	49
Macrodistrito Sur, Distrito 21	39	39

	Venue Latitude	Venue Longitude \
Nombre		

Macrodistrito Centro, Distrito 1	47	47
Macrodistrito Centro, Distrito 2	49	49
Macrodistrito Cotahuma, Distrito 3	46	46
Macrodistrito Cotahuma, Distrito 5	11	11
Macrodistrito Cotahuma, Distrito 6	47	47
Macrodistrito Max Paredes, Distrito 8	8	8
Macrodistrito Max Paredes, Distrito 9	1	1
Macrodistrito San Antonio, Distrito 14	1	1
Macrodistrito San Antonio, Distrito 15	6	6
Macrodistrito San Antonio, Distrito 16	1	1
Macrodistrito Sur, Distrito 18	49	49
Macrodistrito Sur, Distrito 21	39	39

	Venue Category
Nombre	
Macrodistrito Centro, Distrito 1	47
Macrodistrito Centro, Distrito 2	49
Macrodistrito Cotahuma, Distrito 3	46
Macrodistrito Cotahuma, Distrito 5	11
Macrodistrito Cotahuma, Distrito 6	47
Macrodistrito Max Paredes, Distrito 8	8
Macrodistrito Max Paredes, Distrito 9	1
Macrodistrito San Antonio, Distrito 14	1
Macrodistrito San Antonio, Distrito 15	6
Macrodistrito San Antonio, Distrito 16	1
Macrodistrito Sur, Distrito 18	49
Macrodistrito Sur, Distrito 21	39

```
[163]: print('There are {} uniques categories.'.format(len(LaPaz_venues['Venue_
→Category'].unique())))
```

There are 52 uniques categories.

```
[164]: # one hot encoding
LaPaz_onehot = pd.get_dummies(LaPaz_venues[['Venue Category']], prefix="",
→prefix_sep="")

# add neighborhood column back to dataframe
LaPaz_onehot['Nombre'] = LaPaz_venues['Nombre']

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

LaPaz_onehot.head()
```

```
[164]:
```

	Nombre	Argentinian Restaurant	Asian Restaurant \
0	Macrodistrito Centro, Distrito 1	0	0
1	Macrodistrito Centro, Distrito 1	0	0
2	Macrodistrito Centro, Distrito 1	0	0
3	Macrodistrito Centro, Distrito 1	0	0
4	Macrodistrito Centro, Distrito 1	1	0

	BBQ Joint	Bakery	Brazilian Restaurant	Breakfast Spot	Burger Joint \
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

	Cafeteria	Café ...	Snack Place	Soup Place	South American Restaurant \
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

	Steakhouse	Sushi Restaurant	Taco Place	Tea Room \
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

	Vegetarian / Vegan Restaurant	Vietnamese Restaurant	Wings Joint
0	0	0	0
1	1	0	0
2	0	0	0
3	0	0	0
4	0	0	0

[5 rows x 53 columns]

```
[165]: LaPaz_onehot.shape
```

```
[165]: (305, 53)
```

```
[166]: LaPaz_grouped = LaPaz_onehot.groupby('Nombre').mean().reset_index()
LaPaz_grouped
```

```
[166]:
```

	Nombre	Argentinian Restaurant \
0	Macrodistrito Centro, Distrito 1	0.021277
1	Macrodistrito Centro, Distrito 2	0.000000

2	Macrodistrito Cotahuma, Distrito 3	0.000000
3	Macrodistrito Cotahuma, Distrito 5	0.000000
4	Macrodistrito Cotahuma, Distrito 6	0.000000
5	Macrodistrito Max Paredes, Distrito 8	0.000000
6	Macrodistrito Max Paredes, Distrito 9	0.000000
7	Macrodistrito San Antonio, Distrito 14	0.000000
8	Macrodistrito San Antonio, Distrito 15	0.000000
9	Macrodistrito San Antonio, Distrito 16	0.000000
10	Macrodistrito Sur, Distrito 18	0.000000
11	Macrodistrito Sur, Distrito 21	0.000000

	Asian Restaurant	BBQ Joint	Bakery	Brazilian Restaurant \
0	0.000000	0.000000	0.042553	0.000000
1	0.000000	0.102041	0.040816	0.040816
2	0.000000	0.065217	0.043478	0.000000
3	0.000000	0.000000	0.000000	0.000000
4	0.021277	0.106383	0.021277	0.000000
5	0.000000	0.000000	0.000000	0.000000
6	0.000000	0.000000	0.000000	0.000000
7	0.000000	0.000000	0.000000	0.000000
8	0.000000	0.166667	0.000000	0.000000
9	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.081633	0.102041	0.000000
11	0.000000	0.051282	0.051282	0.000000

	Breakfast Spot	Burger Joint	Cafeteria	Café ...	Snack Place \
0	0.042553	0.000000	0.000000	0.042553 ...	0.000000
1	0.020408	0.040816	0.020408	0.020408 ...	0.020408
2	0.043478	0.021739	0.000000	0.065217 ...	0.000000
3	0.090909	0.090909	0.000000	0.000000 ...	0.000000
4	0.042553	0.000000	0.000000	0.063830 ...	0.000000
5	0.125000	0.125000	0.000000	0.000000 ...	0.000000
6	0.000000	0.000000	0.000000	0.000000 ...	0.000000
7	0.000000	0.000000	0.000000	0.000000 ...	0.000000
8	0.000000	0.000000	0.000000	0.000000 ...	0.166667
9	0.000000	0.000000	0.000000	0.000000 ...	0.000000
10	0.000000	0.040816	0.000000	0.000000 ...	0.000000
11	0.025641	0.282051	0.000000	0.000000 ...	0.000000

	Soup Place	South American Restaurant	Steakhouse	Sushi Restaurant \
0	0.000000		0.063830	0.021277
1	0.000000		0.061224	0.000000
2	0.021739		0.021739	0.043478
3	0.090909		0.000000	0.000000
4	0.000000		0.000000	0.000000
5	0.125000		0.000000	0.000000
6	0.000000		0.000000	0.000000

7	0.000000	0.000000	0.000000	0.000000
8	0.000000	0.000000	0.000000	0.000000
9	0.000000	0.000000	0.000000	0.000000
10	0.000000	0.020408	0.040816	0.020408
11	0.000000	0.000000	0.000000	0.000000

	Taco Place	Tea Room	Vegetarian / Vegan Restaurant \
0	0.000000	0.021277	0.021277
1	0.020408	0.000000	0.020408
2	0.000000	0.000000	0.065217
3	0.000000	0.000000	0.000000
4	0.000000	0.000000	0.000000
5	0.000000	0.000000	0.000000
6	0.000000	0.000000	0.000000
7	0.000000	0.000000	0.000000
8	0.000000	0.000000	0.000000
9	0.000000	0.000000	0.000000
10	0.000000	0.000000	0.040816
11	0.025641	0.000000	0.000000

	Vietnamese Restaurant	Wings Joint
0	0.000000	0.000000
1	0.000000	0.020408
2	0.021739	0.021739
3	0.000000	0.000000
4	0.000000	0.021277
5	0.000000	0.000000
6	0.000000	0.000000
7	0.000000	0.000000
8	0.000000	0.000000
9	0.000000	0.000000
10	0.000000	0.020408
11	0.000000	0.000000

[12 rows x 53 columns]

```
[167]: LaPaz_grouped.shape
```

```
[167]: (12, 53)
```

0.6 TOP 10 RESTAURANTS

```
[172]: def return_most_common_venues(row, num_top_venues):
row_categories = row.iloc[1:]
row_categories_sorted = row_categories.sort_values(ascending=False)

return row_categories_sorted.index.values[0:num_top_venues]
```

```
[173]: num_top_venues = 10

indicators = ['st', 'nd', 'rd']

# create columns according to number of top venues
columns = ['Nombre']
for ind in np.arange(num_top_venues):
    try:
        columns.append('{}-{} Most Common Venue'.format(ind+1, indicators[ind]))
    except:
        columns.append('{}th Most Common Venue'.format(ind+1))

# create a new dataframe
neighborhoods_venues_sorted = pd.DataFrame(columns=columns)
neighborhoods_venues_sorted['Nombre'] = LaPaz_grouped['Nombre']

for ind in np.arange(LaPaz_grouped.shape[0]):
    neighborhoods_venues_sorted.iloc[ind, 1:] = \
    →return_most_common_venues(LaPaz_grouped.iloc[ind, :], num_top_venues)

neighborhoods_venues_sorted.head()
```

```
[173]:
```

	Nombre	1st Most Common Venue \
0	Macrodistrito Centro, Distrito 1	Restaurant
1	Macrodistrito Centro, Distrito 2	Restaurant
2	Macrodistrito Cotahuma, Distrito 3	Restaurant
3	Macrodistrito Cotahuma, Distrito 5	Latin American Restaurant
4	Macrodistrito Cotahuma, Distrito 6	Restaurant

	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue \
0	Fast Food Restaurant	Latin American Restaurant	Coffee Shop
1	BBQ Joint	Fast Food Restaurant	South American Restaurant
2	Fast Food Restaurant	BBQ Joint	Café
3	Seafood Restaurant	Ice Cream Shop	Burger Joint
4	BBQ Joint	Fried Chicken Joint	Latin American Restaurant

	5th Most Common Venue	6th Most Common Venue \
0	Chinese Restaurant	South American Restaurant
1	Chinese Restaurant	Diner
2	Vegetarian / Vegan Restaurant	Steakhouse
3	Fish & Chips Shop	Restaurant
4	Café	Seafood Restaurant

	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue \
0	Fried Chicken Joint	Bakery	Breakfast Spot
1	Bakery	Brazilian Restaurant	Fried Chicken Joint
2	Bakery	Breakfast Spot	Italian Restaurant

3	Soup Place	Fried Chicken Joint	Breakfast Spot
4	Pastry Shop	Italian Restaurant	Breakfast Spot

	10th Most Common Venue
0	Café
1	Burger Joint
2	Pizza Place
3	Cafeteria
4	Food Truck

0.7 Clustering Neighborhoods

```
[174]: # set number of clusters
kclusters = 5

LaPaz_grouped_clustering = LaPaz_grouped.drop('Nombre', 1)

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

# check cluster labels generated for each row in the dataframe
kmeans.labels_[0:10]
```

```
[174]: array([2, 2, 2, 0, 2, 0, 3, 1, 4, 1], dtype=int32)
```

```
[175]: # add clustering labels
neighborhoods_venues_sorted.insert(0, 'Cluster Labels', kmeans.labels_)

LaPaz_merged = LaPaz_data

# merge LaPaz_grouped with LaPaz_data to add latitude/longitude for each
    ↳neighborhood
LaPaz_merged = LaPaz_merged.join(neighborhoods_venues_sorted.
    ↳set_index('Nombre'), on='Nombre')

LaPaz_merged.head() # check the last columns!
```

```
[175]:
```

	Distrito	Macrodistrito	Latitude	Longitude	Habitantes	\
0	1	Centro	-16.496946	-68.133407	33889	
1	2	Centro	-16.499426	-68.122380	40396	
2	3	Cotahuma	-16.514952	-68.129473	35944	
3	4	Cotahuma	-16.537604	-68.135559	53461	
4	5	Cotahuma	-16.494808	-68.151444	50716	

	Nombre	Cluster Labels	\
--	--------	----------------	---

0	Macrodistrito Centro, Distrito 1	2.0
1	Macrodistrito Centro, Distrito 2	2.0
2	Macrodistrito Cotahuma, Distrito 3	2.0
3	Macrodistrito Cotahuma, Distrito 4	NaN
4	Macrodistrito Cotahuma, Distrito 5	0.0

	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue \
0	Restaurant	Fast Food Restaurant	Latin American Restaurant
1	Restaurant	BBQ Joint	Fast Food Restaurant
2	Restaurant	Fast Food Restaurant	BBQ Joint
3	NaN	NaN	NaN
4	Latin American Restaurant	Seafood Restaurant	Ice Cream Shop

	4th Most Common Venue	5th Most Common Venue \
0	Coffee Shop	Chinese Restaurant
1	South American Restaurant	Chinese Restaurant
2	Café	Vegetarian / Vegan Restaurant
3	NaN	NaN
4	Burger Joint	Fish & Chips Shop

	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue \
0	South American Restaurant	Fried Chicken Joint	Bakery
1	Diner	Bakery	Brazilian Restaurant
2	Steakhouse	Bakery	Breakfast Spot
3	NaN	NaN	NaN
4	Restaurant	Soup Place	Fried Chicken Joint

	9th Most Common Venue	10th Most Common Venue
0	Breakfast Spot	Café
1	Fried Chicken Joint	Burger Joint
2	Italian Restaurant	Pizza Place
3	NaN	NaN
4	Breakfast Spot	Cafeteria

0.8 Plotting Clustered Neighborhoods

```
[179]: # create map
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]
```

```
[180]: rainbow
```



```
[180]: ['#8000ff', '#00b5eb', '#80ffb4', '#ffb360', '#ff0000']
```

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

```
[204]: #LaPaz_merged['Cluster Labels'].replace(np.nan,0)
#LaPaz_merged['Cluster Labels'] = LaPaz_merged['Cluster Labels'].astype(int)
#LaPaz_data["Distrito"]= LaPaz_data["Distrito"].astype(str)
#LaPaz_merged['Cluster Labels'].dtypes
#LaPaz_merged['Cluster Labels'] = LaPaz_merged['Cluster Labels'].astype(int)
```

```
[214]: LaPaz_merged['Cluster Labels'].replace(np.nan,0, inplace=True)
```

```
[215]: LaPaz_merged['Cluster Labels'].unique()
```

```
[215]: array([2., 0., 3., 1., 4.])
```

```
[218]: # create map
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)))
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(LaPaz_merged['Latitude'],
↳LaPaz_merged['Longitude'], LaPaz_merged['Nombre'], LaPaz_merged['Cluster_
↳Labels'].astype(int)):
    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
```

```
[218]: <folium.folium.Map at 0x7faafb172208>
```

```
[219]: LaPaz_merged.loc[LaPaz_merged['Cluster Labels'] == 0, LaPaz_merged.columns[[1]]
↳+ list(range(5, LaPaz_merged.shape[1]))]
```

```
[219]: Macrodistrito      Nombre Cluster Labels \
3      Cotahuma      Macrodistrito Cotahuma, Distrito 4      0.0
4      Cotahuma      Macrodistrito Cotahuma, Distrito 5      0.0
6      Max Paredes   Macrodistrito Max Paredes, Distrito 7      0.0
7      Max Paredes   Macrodistrito Max Paredes, Distrito 8      0.0
9      Max Paredes   Macrodistrito Max Paredes, Distrito 10     0.0
10     Periférica    Macrodistrito Periférica, Distrito 11     0.0
11     Periférica    Macrodistrito Periférica, Distrito 12     0.0
12     Periférica    Macrodistrito Periférica, Distrito 13     0.0
16     San Antonio   Macrodistrito San Antonio, Distrito 17     0.0
18             Sur      Macrodistrito Sur, Distrito 19     0.0
19     Mallasa      Macrodistrito Mallasa, Distrito 20     0.0
21     Hampaturi    Macrodistrito Hampaturi, Distrito 22     0.0
22             Zongo      Macrodistrito Zongo, Distrito 23     0.0
```

```
      1st Most Common Venue 2nd Most Common Venue 3rd Most Common Venue \
3              NaN              NaN              NaN
4  Latin American Restaurant  Seafood Restaurant      Ice Cream Shop
6              NaN              NaN              NaN
7      Seafood Restaurant      Ice Cream Shop      Breakfast Spot
9              NaN              NaN              NaN
10             NaN              NaN              NaN
11             NaN              NaN              NaN
12             NaN              NaN              NaN
16             NaN              NaN              NaN
18             NaN              NaN              NaN
19             NaN              NaN              NaN
21             NaN              NaN              NaN
22             NaN              NaN              NaN
```

```
      4th Most Common Venue 5th Most Common Venue      6th Most Common Venue \
3              NaN              NaN              NaN
4      Burger Joint      Fish & Chips Shop      Restaurant
6              NaN              NaN              NaN
7      Burger Joint      Soup Place  Latin American Restaurant
9              NaN              NaN              NaN
10             NaN              NaN              NaN
11             NaN              NaN              NaN
12             NaN              NaN              NaN
16             NaN              NaN              NaN
18             NaN              NaN              NaN
19             NaN              NaN              NaN
21             NaN              NaN              NaN
22             NaN              NaN              NaN
```

	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	\
3	NaN	NaN	NaN	
4	Soup Place	Fried Chicken Joint	Breakfast Spot	
6	NaN	NaN	NaN	
7	Fish & Chips Shop	Deli / Bodega	French Restaurant	
9	NaN	NaN	NaN	
10	NaN	NaN	NaN	
11	NaN	NaN	NaN	
12	NaN	NaN	NaN	
16	NaN	NaN	NaN	
18	NaN	NaN	NaN	
19	NaN	NaN	NaN	
21	NaN	NaN	NaN	
22	NaN	NaN	NaN	

	10th Most Common Venue
3	NaN
4	Cafeteria
6	NaN
7	Food Truck
9	NaN
10	NaN
11	NaN
12	NaN
16	NaN
18	NaN
19	NaN
21	NaN
22	NaN

```
[220]: LaPaz_merged.loc[LaPaz_merged['Cluster Labels'] == 1, LaPaz_merged.columns[[1]]
↪+ list(range(5, LaPaz_merged.shape[1]))]
```

```
[220]: Macrodistrito      Nombre Cluster Labels \
13 San Antonio Macrodistrito San Antonio, Distrito 14      1.0
15 San Antonio Macrodistrito San Antonio, Distrito 16      1.0
```

	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	\
13	Fried Chicken Joint	Wings Joint	Vietnamese Restaurant	
15	Fried Chicken Joint	Wings Joint	Vietnamese Restaurant	

	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	\
13	Gluten-free Restaurant	French Restaurant	Food Truck	
15	Gluten-free Restaurant	French Restaurant	Food Truck	

	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	\
--	-----------------------	-----------------------	-----------------------	---

13	Food Stand	Food Court	Fish & Chips Shop
15	Food Stand	Food Court	Fish & Chips Shop

10th Most Common Venue

13	Fast Food Restaurant
15	Fast Food Restaurant

```
[221]: LaPaz_merged.loc[LaPaz_merged['Cluster Labels'] == 2, LaPaz_merged.columns[[1]]
      ↪+ list(range(5, LaPaz_merged.shape[1]))]
```

```
[221]: Macrodistrito      Nombre Cluster Labels \
0      Centro      Macrodistrito Centro, Distrito 1      2.0
1      Centro      Macrodistrito Centro, Distrito 2      2.0
2      Cotahuma     Macrodistrito Cotahuma, Distrito 3      2.0
5      Cotahuma     Macrodistrito Cotahuma, Distrito 6      2.0
17     Sur          Macrodistrito Sur, Distrito 18      2.0
20     Sur          Macrodistrito Sur, Distrito 21      2.0

      1st Most Common Venue 2nd Most Common Venue      3rd Most Common Venue \
0      Restaurant      Fast Food Restaurant      Latin American Restaurant
1      Restaurant      BBQ Joint      Fast Food Restaurant
2      Restaurant      Fast Food Restaurant      BBQ Joint
5      Restaurant      BBQ Joint      Fried Chicken Joint
17     Fast Food Restaurant      Bakery      Restaurant
20     Burger Joint      Restaurant      Fast Food Restaurant

      4th Most Common Venue      5th Most Common Venue \
0      Coffee Shop      Chinese Restaurant
1      South American Restaurant      Chinese Restaurant
2      Café      Vegetarian / Vegan Restaurant
5      Latin American Restaurant      Café
17     BBQ Joint      Seafood Restaurant
20     Fried Chicken Joint      Pizza Place

      6th Most Common Venue      7th Most Common Venue \
0      South American Restaurant      Fried Chicken Joint
1      Diner      Bakery
2      Steakhouse      Bakery
5      Seafood Restaurant      Pastry Shop
17     Pizza Place      Vegetarian / Vegan Restaurant
20     BBQ Joint      Bakery

      8th Most Common Venue 9th Most Common Venue      10th Most Common Venue
0      Bakery      Breakfast Spot      Café
1      Brazilian Restaurant      Fried Chicken Joint      Burger Joint
2      Breakfast Spot      Italian Restaurant      Pizza Place
5      Italian Restaurant      Breakfast Spot      Food Truck
```

17	Burger Joint	Steakhouse	Latin American Restaurant
20	Sandwich Place	Chinese Restaurant	Cupcake Shop

```
[222]: LaPaz_merged.loc[LaPaz_merged['Cluster Labels'] == 3, LaPaz_merged.columns[[1]]
↳+ list(range(5, LaPaz_merged.shape[1]))]
```

```
[222]: Macrodistrito                               Nombre Cluster Labels \
8   Max Paredes  Macrodistrito Max Paredes, Distrito 9          3.0

      1st Most Common Venue 2nd Most Common Venue 3rd Most Common Venue \
8   Latin American Restaurant      Wings Joint      Hot Dog Joint

      4th Most Common Venue 5th Most Common Venue 6th Most Common Venue \
8   Fried Chicken Joint      French Restaurant      Food Truck

      7th Most Common Venue 8th Most Common Venue 9th Most Common Venue \
8           Food Stand      Food Court      Fish & Chips Shop

      10th Most Common Venue
8   Fast Food Restaurant
```

```
[223]: LaPaz_merged.loc[LaPaz_merged['Cluster Labels'] == 4, LaPaz_merged.columns[[1]]
↳+ list(range(5, LaPaz_merged.shape[1]))]
```

```
[223]: Macrodistrito                               Nombre Cluster Labels \
14   San Antonio  Macrodistrito San Antonio, Distrito 15          4.0

      1st Most Common Venue 2nd Most Common Venue 3rd Most Common Venue \
14           Restaurant      BBQ Joint      Fast Food Restaurant

      4th Most Common Venue 5th Most Common Venue      6th Most Common Venue \
14           Snack Place      Seafood Restaurant      Comfort Food Restaurant

      7th Most Common Venue 8th Most Common Venue 9th Most Common Venue \
14           French Restaurant      Food Truck      Food Stand

      10th Most Common Venue
14           Food Court
```

```
[ ]:
```