In [1]:
```
import pandas as pd
import numpy as np
```

In [2]:
```
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
```

In [3]:
```
df=pd.read_csv('zomato.csv')
df.head()
```

Out[3]:

	url	address	name	online_order	book_table	rat
0	https://www.zomato.com/bangalore/jalsa-banasha...	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	Yes	Yes	4.1/
1	https://www.zomato.com/bangalore/spice-elephan...	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	Yes	No	4.1/
2	https://www.zomato.com/SanchurroBangalore?cont...	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	Yes	No	3.8/
3	https://www.zomato.com/bangalore/addhuri-udupi...	1st Floor, Annakuteera, 3rd Stage, Banashankar...	Addhuri Udupi Bhojana	No	No	3.7/
4	https://www.zomato.com/bangalore/grand-village...	10, 3rd Floor, Lakshmi Associates, Gandhi Baza...	Grand Village	No	No	3.8/

In [4]:
```
df.isna().sum()
```

Out[4]:
```
url              0
address          0
name             0
online_order     0
book_table       0
rate          7775
votes            0
phone         1208
location        21
rest_type      227
dish_liked   28078
```

```
cuisines                        45
approx_cost(for two people)    346
reviews_list                     0
menu_item                        0
listed_in(type)                  0
listed_in(city)                  0
dtype: int64
```

In [5]:
```
df.dropna(axis=0,subset=['location'],inplace= True)
```

In [6]:
```
df.isna().sum()
```

Out[6]:
```
url                             0
address                         0
name                            0
online_order                    0
book_table                      0
rate                         7754
votes                           0
phone                        1187
location                        0
rest_type                     206
dish_liked                  28057
cuisines                       24
approx_cost(for two people)   325
reviews_list                    0
menu_item                       0
listed_in(type)                 0
listed_in(city)                 0
dtype: int64
```

In [7]:
```
len(df['location'].unique())
```

Out[7]:
```
93
```

In [8]:
```
locations = pd.DataFrame()
```

In [9]:
```
locations['name']=df['location'].unique()
```

In [10]:
```
locations.head()
```

Out[10]:

	name
0	Banashankari
1	Basavanagudi
2	Mysore Road
3	Jayanagar
4	Kumaraswamy Layout

In [11]:
```
import geopy
```

In [12]:
```
from geopy.geocoders import Nominatim
```

In [13]:
```
geolocator = Nominatim(user_agent='app')
```

In [14]:
```
# creating latitude and longitude from location string
```

In [15]:
```
lat=[]
lon=[]

for location in locations['name']:
    location=geolocator.geocode(location)
    if location is None:
        lat.append(np.nan)
        lon.append(np.nan)
    else:
        lat.append(location.latitude)
        lon.append(location.longitude)
```

In [16]:
```
locations['latitude']=lat
locations['longitude']=lon
```

In [17]:
```
locations.head()
```

Out[17]:

	name	latitude	longitude
0	Banashankari	15.887678	75.704678
1	Basavanagudi	12.941726	77.575502
2	Mysore Road	12.387214	76.666963
3	Jayanagar	27.643927	83.052805
4	Kumaraswamy Layout	12.908149	77.555318

In [18]:
```
locations.to_csv('zomato_location, index = False')
```

In [19]:
```
locations.count()
```

Out[19]:
```
name         93
latitude     92
longitude    92
dtype: int64
```

In [20]:
```
df['location'].value_counts()
```

Out[20]:
```
BTM                    5124
HSR                    2523
Koramangala 5th Block  2504
JP Nagar               2235
Whitefield             2144
                       ...
West Bangalore            6
Yelahanka                 6
Jakkur                    3
Rajarajeshwari Nagar      2
```

```
Peenya                          1
Name: location, Length: 93, dtype: int64
```

In [21]:
```
location
```

Out[21]:
```
Location(Peenya, HMT Ward, Rajarajeshwari Nagar Zone, Bengaluru, Bangalore North, Ba
ngalore Urban, Karnataka, 560058, India, (13.0329419, 77.5273253, 0.0))
```

In [22]:
```
rest_loc = df['location'].value_counts().reset_index()
```

In [23]:
```
rest_loc
```

Out[23]:

	index	location
0	BTM	5124
1	HSR	2523
2	Koramangala 5th Block	2504
3	JP Nagar	2235
4	Whitefield	2144
...	...	...
88	West Bangalore	6
89	Yelahanka	6
90	Jakkur	3
91	Rajarajeshwari Nagar	2
92	Peenya	1

93 rows × 2 columns

In [24]:
```
# rest_loc['coloumn']=['name','count']
```

In [25]:
```
# rest_loc
```

In [26]:
```
rest_loc.columns=['name','count']
```

In [27]:
```
rest_loc
```

Out[27]:

	name	count
0	BTM	5124
1	HSR	2523
2	Koramangala 5th Block	2504
3	JP Nagar	2235
4	Whitefield	2144
...	...	...

	name	count
88	West Bangalore	6
89	Yelahanka	6
90	Jakkur	3
91	Rajarajeshwari Nagar	2
92	Peenya	1

93 rows × 2 columns

In [28]:
```
merging=locations.merge(rest_loc,on='name',how='left').dropna()
```

In [29]:
```
merging
```

Out[29]:

	name	latitude	longitude	count
0	Banashankari	15.887678	75.704678	906
1	Basavanagudi	12.941726	77.575502	684
2	Mysore Road	12.387214	76.666963	22
3	Jayanagar	27.643927	83.052805	1926
4	Kumaraswamy Layout	12.908149	77.555318	195
...	...	...	...	...
88	West Bangalore	13.001129	77.632562	6
89	Magadi Road	12.945048	77.263004	34
90	Yelahanka	13.100698	77.596345	6
91	Sahakara Nagar	13.062147	77.580061	53
92	Peenya	13.032942	77.527325	1

92 rows × 4 columns

In [30]:
```
merging
```

Out[30]:

	name	latitude	longitude	count
0	Banashankari	15.887678	75.704678	906
1	Basavanagudi	12.941726	77.575502	684
2	Mysore Road	12.387214	76.666963	22
3	Jayanagar	27.643927	83.052805	1926
4	Kumaraswamy Layout	12.908149	77.555318	195
...	...	...	...	...
88	West Bangalore	13.001129	77.632562	6
89	Magadi Road	12.945048	77.263004	34

	name	latitude	longitude	count
90	Yelahanka	13.100698	77.596345	6
91	Sahakara Nagar	13.062147	77.580061	53
92	Peenya	13.032942	77.527325	1

92 rows × 4 columns

In [31]:
```
!pip install folium
```

```
Requirement already satisfied: folium in c:\users\deepu\appdata\local\programs\pytho
n\python39\lib\site-packages (0.12.1)
WARNING: You are using pip version 21.1.3; however, version 21.2.4 is available.
You should consider upgrading via the 'c:\users\deepu\appdata\local\programs\python
\python39\python.exe -m pip install --upgrade pip' command.
Requirement already satisfied: branca>=0.3.0 in c:\users\deepu\appdata\local\program
s\python\python39\lib\site-packages (from folium) (0.4.2)
Requirement already satisfied: requests in c:\users\deepu\appdata\local\programs\pyt
hon\python39\lib\site-packages (from folium) (2.26.0)
Requirement already satisfied: jinja2>=2.9 in c:\users\deepu\appdata\local\programs
\python\python39\lib\site-packages (from folium) (3.0.1)
Requirement already satisfied: numpy in c:\users\deepu\appdata\local\programs\python
\python39\lib\site-packages (from folium) (1.21.1)
Requirement already satisfied: MarkupSafe>=2.0 in c:\users\deepu\appdata\local\progr
ams\python\python39\lib\site-packages (from jinja2>=2.9->folium) (2.0.1)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\deepu\appdata\local
\programs\python\python39\lib\site-packages (from requests->folium) (1.26.6)
Requirement already satisfied: certifi>=2017.4.17 in c:\users\deepu\appdata\local\pr
ograms\python\python39\lib\site-packages (from requests->folium) (2021.5.30)
Requirement already satisfied: charset-normalizer~=2.0.0 in c:\users\deepu\appdata\l
ocal\programs\python\python39\lib\site-packages (from requests->folium) (2.0.3)
Requirement already satisfied: idna<4,>=2.5 in c:\users\deepu\appdata\local\programs
\python\python39\lib\site-packages (from requests->folium) (3.2)
```

In [32]:
```
def generate_basemap(default_location=[12.94,77.57],default_zoom_start=12):
    basemap=folium.Map(location=default_location,zoom_start=default_zoom_start)
    return basemap
```

In [33]:
```
import folium
basemap = generate_basemap()
```

In [34]:
```
basemap
```

Out[34]: Make this Notebook Trusted to load map: File -> Trust Notebook

In [35]:
```
from folium.plugins import HeatMap
```

In [36]:
```
HeatMap(merging[['latitude','longitude','count']],zoom=20).add_to(basemap)
```

Out[36]:
```
<folium.plugins.heat_map.HeatMap at 0x2288739d0d0>
```

In [37]:
```
basemap
```

Out[37]: Make this Notebook Trusted to load map: File -> Trust Notebook

In [38]:
```
from folium.plugins import FastMarkerCluster
```

In [39]:
```
FastMarkerCluster(merging[['latitude','longitude','count']],zoom=20).add_to(basemap)
basemap
```

Out[39]: Make this Notebook Trusted to load map: File -> Trust Notebook

In [40]:
```
df['rate'].unique()
```

Out[40]:
```
array(['4.1/5', '3.8/5', '3.7/5', '3.6/5', '4.6/5', '4.0/5', '4.2/5',
       '3.9/5', '3.1/5', '3.0/5', '3.2/5', '3.3/5', '2.8/5', '4.4/5',
       '4.3/5', 'NEW', '2.9/5', '3.5/5', nan, '2.6/5', '3.8 /5', '3.4/5',
       '4.5/5', '2.5/5', '2.7/5', '4.7/5', '2.4/5', '2.2/5', '2.3/5',
       '3.4 /5', '-', '3.6 /5', '4.8/5', '3.9 /5', '4.2 /5', '4.0 /5',
       '4.1 /5', '3.7 /5', '3.1 /5', '2.9 /5', '3.3 /5', '2.8 /5',
       '3.5 /5', '2.7 /5', '2.5 /5', '3.2 /5', '2.6 /5', '4.5 /5',
       '4.3 /5', '4.4 /5', '4.9/5', '2.1/5', '2.0/5', '1.8/5', '4.6 /5',
       '4.9 /5', '3.0 /5', '4.8 /5', '2.3 /5', '4.7 /5', '2.4 /5',
       '2.1 /5', '2.2 /5', '2.0 /5', '1.8 /5'], dtype=object)
```

In [41]:
```
df.dropna(axis=0,subset=['rate'],inplace= True)
```

In [42]:
```
df['rate'].unique()
```

Out[42]:
```
array(['4.1/5', '3.8/5', '3.7/5', '3.6/5', '4.6/5', '4.0/5', '4.2/5',
       '3.9/5', '3.1/5', '3.0/5', '3.2/5', '3.3/5', '2.8/5', '4.4/5',
       '4.3/5', 'NEW', '2.9/5', '3.5/5', '2.6/5', '3.8 /5', '3.4/5',
       '4.5/5', '2.5/5', '2.7/5', '4.7/5', '2.4/5', '2.2/5', '2.3/5',
       '3.4 /5', '-', '3.6 /5', '4.8/5', '3.9 /5', '4.2 /5', '4.0 /5',
       '4.1 /5', '3.7 /5', '3.1 /5', '2.9 /5', '3.3 /5', '2.8 /5',
       '3.5 /5', '2.7 /5', '2.5 /5', '3.2 /5', '2.6 /5', '4.5 /5',
       '4.3 /5', '4.4 /5', '4.9/5', '2.1/5', '2.0/5', '1.8/5', '4.6 /5',
       '4.9 /5', '3.0 /5', '4.8 /5', '2.3 /5', '4.7 /5', '2.4 /5',
       '2.1 /5', '2.2 /5', '2.0 /5', '1.8 /5'], dtype=object)
```

In [43]:
```
def split(x):
    return x.split('/')[0]
```

In [44]:
```
df['rating']=df['rate'].apply(split)
```

In [61]:
```
df.head()
```

Out[61]:

	url	address	name	online_order	book_table	rat
0	https://www.zomato.com/bangalore/jalsa-banasha...	942, 21st Main Road, 2nd Stage, Banashankari, ...	Jalsa	Yes	Yes	4.1/

	url	address	name	online_order	book_table	rat
1	https://www.zomato.com/bangalore/spice-elephan...	2nd Floor, 80 Feet Road, Near Big Bazaar, 6th ...	Spice Elephant	Yes	No	4.1/
2	https://www.zomato.com/SanchurroBangalore?cont...	1112, Next to KIMS Medical College, 17th Cross...	San Churro Cafe	Yes	No	3.8/
3	https://www.zomato.com/bangalore/addhuri-udupi...	1st Floor, Annakuteera, 3rd Stage, Banashankar...	Addhuri Udupi Bhojana	No	No	3.7/
4	https://www.zomato.com/bangalore/grand-village...	10, 3rd Floor, Lakshmi Associates, Gandhi Baza...	Grand Village	No	No	3.8/

In [46]:
```
df.replace('NEW',0,inplace= True)
```

In [47]:
```
df.replace('-',0,inplace= True)
```

In [48]:
```
df['rating'].unique()
```

Out[48]:
```
array(['4.1', '3.8', '3.7', '3.6', '4.6', '4.0', '4.2', '3.9', '3.1',
       '3.0', '3.2', '3.3', '2.8', '4.4', '4.3', 0, '2.9', '3.5', '2.6',
       '3.8 ', '3.4', '4.5', '2.5', '2.7', '4.7', '2.4', '2.2', '2.3',
       '3.4 ', '3.6 ', '4.8', '3.9 ', '4.2 ', '4.0 ', '4.1 ', '3.7 ',
       '3.1 ', '2.9 ', '3.3 ', '2.8 ', '3.5 ', '2.7 ', '2.5 ', '3.2 ',
       '2.6 ', '4.5 ', '4.3 ', '4.4 ', '4.9', '2.1', '2.0', '1.8', '4.6 ',
       '4.9 ', '3.0 ', '4.8 ', '2.3 ', '4.7 ', '2.4 ', '2.1 ', '2.2 ',
       '2.0 ', '1.8 '], dtype=object)
```

In [49]:
```
df['rating'] = pd.to_numeric(df['rating'])
```

In [50]:
```
df.dtypes
```

Out[50]:
```
url             object
address         object
name            object
online_order    object
book_table      object
rate            object
votes            int64
phone           object
location        object
rest_type       object
dish_liked      object
cuisines        object
```

```
approx_cost(for two people)     object
reviews_list                    object
menu_item                       object
listed_in(type)                 object
listed_in(city)                 object
rating                         float64
dtype: object
```

In [51]:
```
df.groupby('location')['rating'].mean().sort_values(ascending=False)
```

Out[51]:
```
location
Lavelle Road              4.042886
St. Marks Road            4.017201
Koramangala 3rd Block     3.978756
Sankey Road               3.965385
Church Street             3.963091
                              ...
Electronic City           3.041909
Bommanahalli              2.926752
Hebbal                    2.880000
North Bangalore           2.385714
West Bangalore            2.020000
Name: rating, Length: 92, dtype: float64
```

In [52]:
```
avg_rating=df.groupby('location')['rating'].mean().sort_values(ascending=False).valu
```

In [56]:
```
location=df.groupby('location')['rating'].mean().sort_values(ascending=False).index
```

In [60]:
```
# Location
```

Out[60]:
```
Index(['Lavelle Road', 'St. Marks Road', 'Koramangala 3rd Block',
       'Sankey Road', 'Church Street', 'Koramangala 5th Block',
       'Cunningham Road', 'Rajarajeshwari Nagar', 'Residency Road',
       'Sadashiv Nagar', 'Koramangala 4th Block', 'Langford Town',
       'Infantry Road', 'Koramangala 7th Block', 'MG Road', 'Race Course Road',
       'Kengeri', 'Seshadripuram', 'Richmond Road', 'Hosur Road',
       'Malleshwaram', 'Koramangala 6th Block', 'Indiranagar', 'Yelahanka',
       'Central Bangalore', 'Jayanagar', 'Koramangala 8th Block',
       'Koramangala', 'Brigade Road', 'New BEL Road', 'Vasanth Nagar',
       'Frazer Town', 'Koramangala 2nd Block', 'Ulsoor', 'Kalyan Nagar',
       'Uttarahalli', 'Yeshwantpur', 'Kammanahalli', 'Shivajinagar',
       'Jalahalli', 'HSR', 'Kanakapura Road', 'Sahakara Nagar', 'Basavanagudi',
       'Kaggadasapura', 'Sarjapur Road', 'Mysore Road', 'City Market',
       'Basaveshwara Nagar', 'Magadi Road', 'Jeevan Bhima Nagar',
       'Rajajinagar', 'South Bangalore', 'JP Nagar', 'Marathahalli',
       'Nagarbhavi', 'Old Airport Road', 'Domlur', 'Whitefield', 'Brookefield',
       'Banashankari', 'Banaswadi', 'Sanjay Nagar', 'Nagawara', 'Shanti Nagar',
       'ITPL Main Road, Whitefield', 'Kumaraswamy Layout', 'Bellandur',
       'Varthur Main Road, Whitefield', 'BTM', 'Majestic', 'HBR Layout',
       'RT Nagar', 'Bannerghatta Road', 'Koramangala 1st Block',
       'Wilson Garden', 'Vijay Nagar', 'East Bangalore', 'KR Puram',
       'CV Raman Nagar', 'Peenya', 'Old Madras Road', 'Commercial Street',
       'Rammurthy Nagar', 'Thippasandra', 'Hennur', 'Ejipura',
       'Electronic City', 'Bommanahalli', 'Hebbal', 'North Bangalore',
       'West Bangalore'],
      dtype='object', name='location')
```

In [91]:
```
rating=pd.DataFrame()
rating.dropna(inplace=True)
```

In [92]:
```
lat=[]
lon=[]

for loc in location:
    loc=geolocator.geocode(loc)
    if loc is None:
        lat.append(np.nan)
        lon.append(np.nan)
    else:
        lat.append(loc.latitude)
        lon.append(loc.longitude)
```

In [93]:
```
rating['location']=location
rating['lat']=lat
rating['lon']=lon
rating['avg_rating']=avg_rating
```

In [103…
```
location.dropna()
```

Out[103…
```
Index(['Lavelle Road', 'St. Marks Road', 'Koramangala 3rd Block',
       'Sankey Road', 'Church Street', 'Koramangala 5th Block',
       'Cunningham Road', 'Rajarajeshwari Nagar', 'Residency Road',
       'Sadashiv Nagar', 'Koramangala 4th Block', 'Langford Town',
       'Infantry Road', 'Koramangala 7th Block', 'MG Road', 'Race Course Road',
       'Kengeri', 'Seshadripuram', 'Richmond Road', 'Hosur Road',
       'Malleshwaram', 'Koramangala 6th Block', 'Indiranagar', 'Yelahanka',
       'Central Bangalore', 'Jayanagar', 'Koramangala 8th Block',
       'Koramangala', 'Brigade Road', 'New BEL Road', 'Vasanth Nagar',
       'Frazer Town', 'Koramangala 2nd Block', 'Ulsoor', 'Kalyan Nagar',
       'Uttarahalli', 'Yeshwantpur', 'Kammanahalli', 'Shivajinagar',
       'Jalahalli', 'HSR', 'Kanakapura Road', 'Sahakara Nagar', 'Basavanagudi',
       'Kaggadasapura', 'Sarjapur Road', 'Mysore Road', 'City Market',
       'Basaveshwara Nagar', 'Magadi Road', 'Jeevan Bhima Nagar',
       'Rajajinagar', 'South Bangalore', 'JP Nagar', 'Marathahalli',
       'Nagarbhavi', 'Old Airport Road', 'Domlur', 'Whitefield', 'Brookefield',
       'Banashankari', 'Banaswadi', 'Sanjay Nagar', 'Nagawara', 'Shanti Nagar',
       'ITPL Main Road, Whitefield', 'Kumaraswamy Layout', 'Bellandur',
       'Varthur Main Road, Whitefield', 'BTM', 'Majestic', 'HBR Layout',
       'RT Nagar', 'Bannerghatta Road', 'Koramangala 1st Block',
       'Wilson Garden', 'Vijay Nagar', 'East Bangalore', 'KR Puram',
       'CV Raman Nagar', 'Peenya', 'Old Madras Road', 'Commercial Street',
       'Rammurthy Nagar', 'Thippasandra', 'Hennur', 'Ejipura',
       'Electronic City', 'Bommanahalli', 'Hebbal', 'North Bangalore',
       'West Bangalore'],
      dtype='object', name='location')
```

In [104…
```
rating
```

Out[104…

	location	lat	lon	avg_rating
0	Lavelle Road	40.765284	-76.373824	4.042886
1	St. Marks Road	51.523078	-0.737442	4.017201
2	Koramangala 3rd Block	12.927187	77.626625	3.978756
3	Sankey Road	38.780108	-121.505644	3.965385
4	Church Street	40.711523	-74.010430	3.963091
...	...	...	...	...

	location	lat	lon	avg_rating
87	Electronic City	-6.265929	106.784256	3.041909
88	Bommanahalli	12.908945	77.623904	2.926752
89	Hebbal	13.038218	77.591900	2.880000
90	North Bangalore	13.021715	77.766055	2.385714
91	West Bangalore	13.001129	77.632562	2.020000

92 rows × 4 columns

In [106…
```
rating.dropna(inplace=True)
```

In [ ]:
```
```

In [108…
```
# automatin by creating a function which will just need to call a function and thus
```

In [107…
```
HeatMap(rating[['lat','lon','avg_rating']],zoom=20).add_to(basemap)
basemap
```

Out[107… Make this Notebook Trusted to load map: File -> Trust Notebook

In [135…
```
def map_zone(zone):
    filter=df['cuisines']==zone
    df2 = df[filter]
    df_zone = df2.groupby('location')['url'].count().reset_index()
    df_zone.columns=['name','count']
    df_zone = df_zone.merge(locations,on='name',how='left').dropna()
    HeatMap(df_zone[['latitude','longitude','count']],zoom=20).add_to(basemap)
    return basemap
```

In [136…
```
map_zone('North Indian')
```

Out[136… Make this Notebook Trusted to load map: File -> Trust Notebook

In [134…

```
---------------------------------------------------------------------------
NameError                                 Traceback (most recent call last)
~\AppData\Local\Temp/ipykernel_4484/3747905683.py in <module>
----> 1 df_zone()

NameError: name 'df_zone' is not defined
```

In [ ]:

In [ ]:

In [ ]: