Map visualization - restaurants of Houston

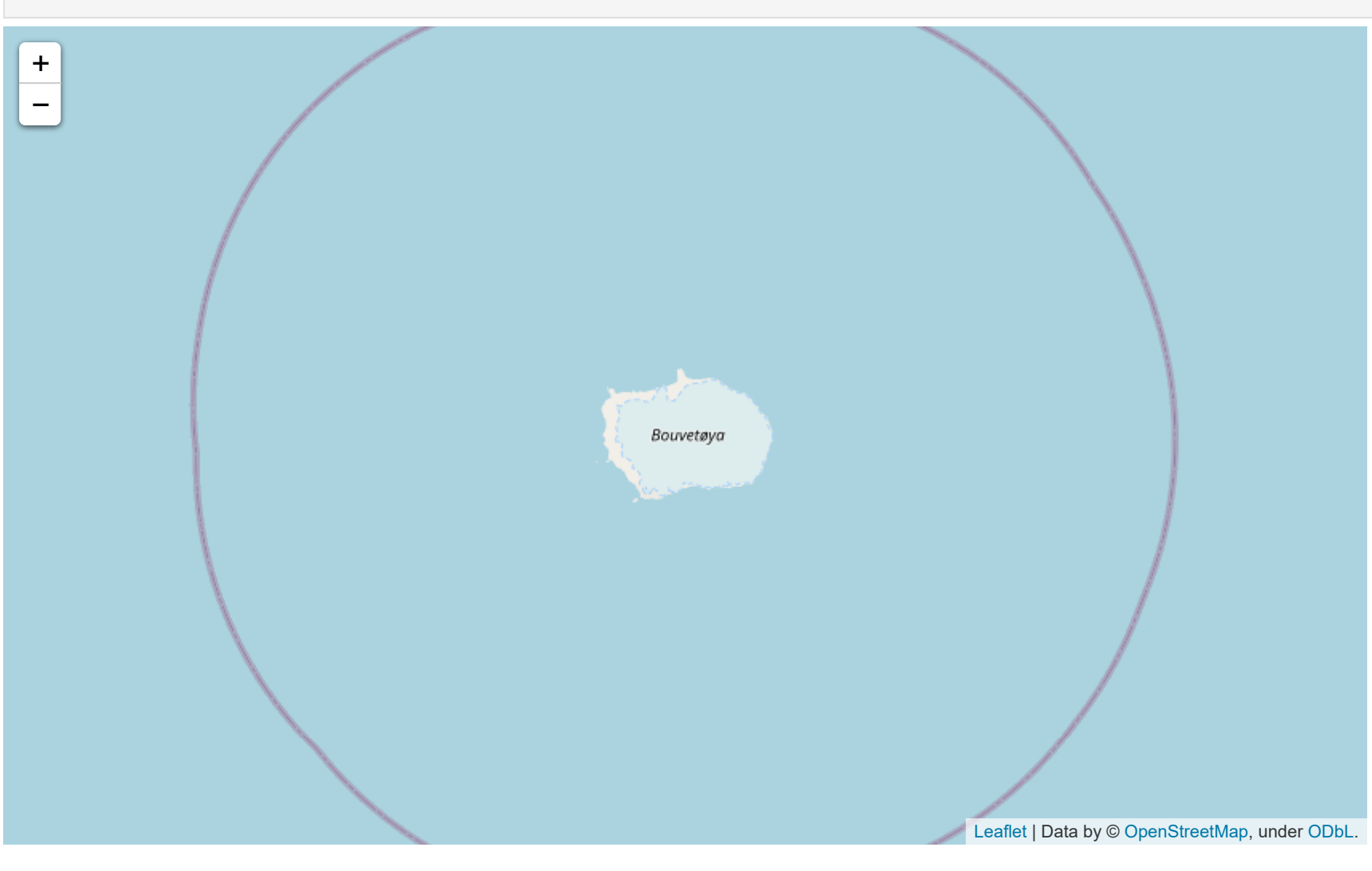
This project visualizes the locations of more than 7,000 restaurants in Houston, TX

In [1]:
```
# Install and import folium

!pip install folium
import folium
```

```
Requirement already satisfied: folium in d:\mambaforge\lib\site-packages (0.12.1)
Requirement already satisfied: requests in d:\mambaforge\lib\site-packages (from folium) (2.26.0)
Requirement already satisfied: jinja2>=2.9 in d:\mambaforge\lib\site-packages (from folium) (3.0.1)
Requirement already satisfied: numpy in d:\mambaforge\lib\site-packages (from folium) (1.21.2)
Requirement already satisfied: branca>=0.3.0 in d:\mambaforge\lib\site-packages (from folium) (0.4.2)
Requirement already satisfied: MarkupSafe>=2.0 in d:\mambaforge\lib\site-packages (from jinja2>=2.9->folium) (2.0.1)
Requirement already satisfied: certifi>=2017.4.17 in d:\mambaforge\lib\site-packages (from requests->folium) (2021.5.30)
Requirement already satisfied: idna<4,>=2.5 in d:\mambaforge\lib\site-packages (from requests->folium) (3.1)
Requirement already satisfied: charset-normalizer~=2.0.0 in d:\mambaforge\lib\site-packages (from requests->folium) (2.0.0)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in d:\mambaforge\lib\site-packages (from requests->folium) (1.26.6)
```

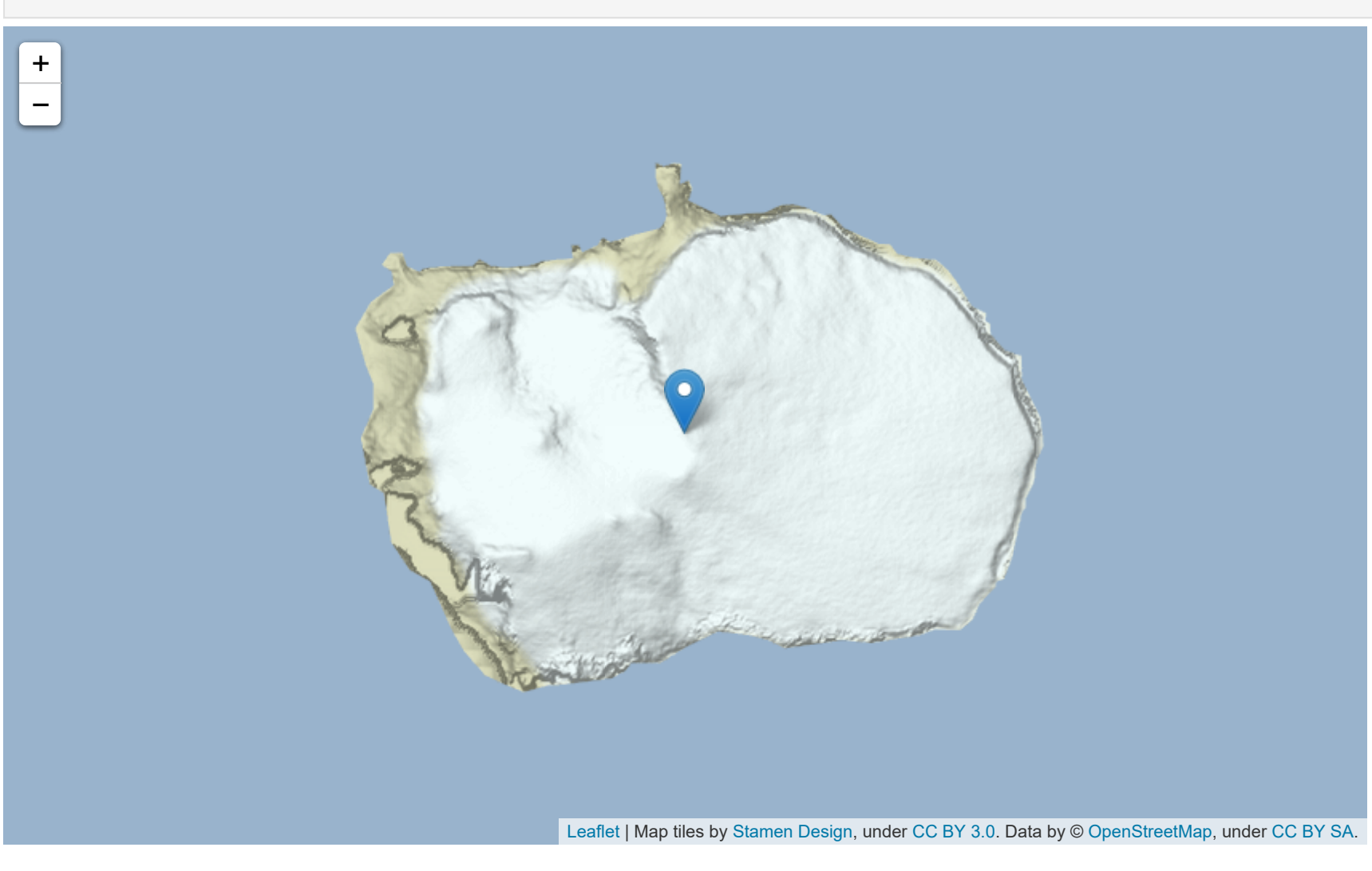
In [2]:
```
# A simple visualization of the most remote island (Bouvet Island - Norway) on earth.

test_coor = [-54.419992, 3.356570]
test_map = folium.Map(location=test_coor, zoom_start=10) # start at zoom level 10
test_map
```

Out[2]:



In [3]:
```
# Adding a marker saving the map as an html file

test_coor = [-54.419992, 3.356570]
test_map = folium.Map(location=test_coor, zoom_start=12,tiles="Stamen Terrain")
folium.Marker([-54.419992, 3.356570], popup = "Bouvet Island, Norway").add_to(test_map)
test_map.save("test_map.html")
test_map
```

Out[3]:



In [4]:
```
# Import the restaurants file

import pandas as pd
df = pd.read_csv(r"restaurants.csv")
df.head(2)
```

Out[4]:

	alias	display_phone	distance	id	image_url	is_closed	name	phone	pri
0	bird-haus-houston	NaN	1353.224697	y8zMac68WqA37d4IVYCtdw	https://s3-media4.fl.yelpcdn.com/bphoto/XcbSFu...	False	Bird Haus	NaN	
1	guss-world-famous-fried-chicken-houston-2	(832) 740-4022	679.718934	eO55csoh_thLYu8boiP6iQ	https://s3-media1.fl.yelpcdn.com/bphoto/MNgTNT...	False	Gus's World Famous Fried Chicken	1.832740e+10	

2 rows × 24 columns

In [5]:
```
df.describe
```

Out[5]:
```
<bound method NDFrame.describe of                                              alias   display_phone     distance  \
0                                bird-haus-houston             NaN  1353.224697
1        guss-world-famous-fried-chicken-houston-2  (832) 740-4022   679.718934
2                     stantons-city-bites-houston  (713) 227-4893   216.564140
3                                  ritual-houston  (832) 203-5180  2130.045112
4                 hearsay-market-square-houston-2  (713) 225-8079  1131.037009
...                                            ...             ...          ...
7125                       corner-bakery-houston-2             NaN    64.035310
7126                       murphys-deli-houston-85  (281) 494-1960  5029.136014
7127                 midtown-cafe-and-deli-houston  (713) 864-3535  1631.814204
7128                     luna-restaurant-houston  (281) 333-9300  3797.458644
7129                  jack-in-the-box-houston-59  (281) 955-0830   758.866814

                          id  \
0     y8zMac68WqA37d4IVYCtdw
1     eO55csoh_thLYu8boiP6iQ
2     -BImKAE7BXubGtBhIO9C9A
3     Uxr2owVxThOp_lsSOqxbPw
4     5MG_McXD1URWSryfn9sCdw
...                      ...
7125  9DuyR-XIIfYxfZhTs7nT1A
7126  NSBctgOuL2IyNlklJO-vRg
7127  4UuF-UAln1q4ZzTBydbowA
7128  fpwuHANm7e6eVQQQuCNsKw
7129  XDsCOpcuAW9_wNtdMVz-AQ

                                              image_url  is_closed  \
0     https://s3-media4.fl.yelpcdn.com/bphoto/XcbSFu...      False
1     https://s3-media1.fl.yelpcdn.com/bphoto/MNgTNT...      False
2     https://s3-media2.fl.yelpcdn.com/bphoto/54W-Qp...      False
3     https://s3-media2.fl.yelpcdn.com/bphoto/GuaDt2...      False
4     https://s3-media1.fl.yelpcdn.com/bphoto/pI-8mj...      False
...                                                 ...        ...
7125  https://s3-media3.fl.yelpcdn.com/bphoto/oDQT48...      False
7126  https://s3-media4.fl.yelpcdn.com/bphoto/V_2vFC...      False
7127  https://s3-media3.fl.yelpcdn.com/bphoto/AiLEWl...      False
7128  https://s3-media3.fl.yelpcdn.com/bphoto/mMJ9vx...      False
7129  https://s3-media1.fl.yelpcdn.com/bphoto/vfpI6c...      False

                                  name         phone price  rating  ...  \
0                            Bird Haus           NaN    $$     4.5  ...
1     Gus's World Famous Fried Chicken  1.832740e+10     $     4.0  ...
2                  Stanton's City Bites  1.713227e+10    $$     4.5  ...
3                               Ritual  1.832204e+10    $$     4.0  ...
4                Hearsay Market Square  1.713226e+10    $$     4.0  ...
...                                ...           ...   ...     ...  ...
7125                     Corner Bakery           NaN    $$     2.5  ...
7126                      Murphy's Deli  1.281494e+10     $     3.5  ...
7127               Midtown Cafe & Deli  1.713864e+10    $$     1.0  ...
7128                   Luna Restaurant  1.281334e+10    $$     1.5  ...
7129                    Jack in the Box  1.281955e+10     $     2.0  ...

      longitude             address1 address2  address3     city country  \
0    -95.361582      1010 Prairie St      NaN       NaN  Houston      US
1    -95.376550  1815 Washington Ave      NaN       NaN  Houston      US
2    -95.372068      1420 Edwards St      NaN       NaN  Houston      US
3    -95.387350     602 Studewood St      NaN       NaN  Houston      US
4    -95.361572        218 Travis St      NaN       NaN  Houston      US
...         ...                  ...      ...       ...      ...     ...
7125 -95.418388     2601-2641 Sw Fwy      NaN       NaN  Houston      US
7126 -95.603546  13134 Dairy Ashford      NaN       NaN  Houston      US
7127 -95.397697          55 Waugh Dr  Ste 520       NaN  Houston      US
7128 -95.075330       3000 Nasa Pkwy      NaN       NaN  Houston      US
7129 -95.553530    8603 Fm 1960 Rd W      NaN       NaN  Houston      US

                                   display_address state zip_code  \
0           ['1010 Prairie St', 'Houston, TX 77002']    TX  77002.0
1       ['1815 Washington Ave', 'Houston, TX 77007']    TX  77007.0
2           ['1420 Edwards St', 'Houston, TX 77007']    TX  77007.0
3          ['602 Studewood St', 'Houston, TX 77007']    TX  77007.0
4             ['218 Travis St', 'Houston, TX 77002']    TX  77002.0
...                                             ...   ...      ...
7125       ['2601-2641 Sw Fwy', 'Houston, TX 77098']    TX  77098.0
7126    ['13134 Dairy Ashford', 'Houston, TX 77478']    TX  77478.0
7127 ['55 Waugh Dr', 'Ste 520', 'Houston, TX 77007']    TX  77007.0
7128         ['3000 Nasa Pkwy', 'Houston, TX 77058']    TX  77058.0
7129      ['8603 Fm 1960 Rd W', 'Houston, TX 77070']    TX  77070.0

     Restaurant Category
0             Sandwiches
1               Southern
2                Burgers
3               Southern
4         American (New)
...                  ...
7125            Bakeries
7126          Sandwiches
7127               Delis
7128             Seafood
7129           Fast Food

[7130 rows x 24 columns]>
```

In [6]:
```
df.columns
```

Out[6]:
```
Index(['alias', 'display_phone', 'distance', 'id', 'image_url', 'is_closed',
       'name', 'phone', 'price', 'rating', 'review_count', 'transactions',
       'url', 'latitude', 'longitude', 'address1', 'address2', 'address3',
       'city', 'country', 'display_address', 'state', 'zip_code',
       'Restaurant Category'],
      dtype='object')
```

In [7]:
```
# Check for missing values
df.isnull().any()
```

Out[7]:
```
alias                  False
display_phone           True
distance               False
id                     False
image_url               True
is_closed              False
name                   False
phone                   True
price                   True
rating                 False
review_count           False
transactions           False
url                    False
latitude                True
longitude               True
address1                True
address2                True
address3                True
city                   False
country                False
display_address        False
state                  False
zip_code                True
Restaurant Category    False
dtype: bool
```

In [8]:
```
# Check for the sums of the missing values

df.isnull().sum()
```

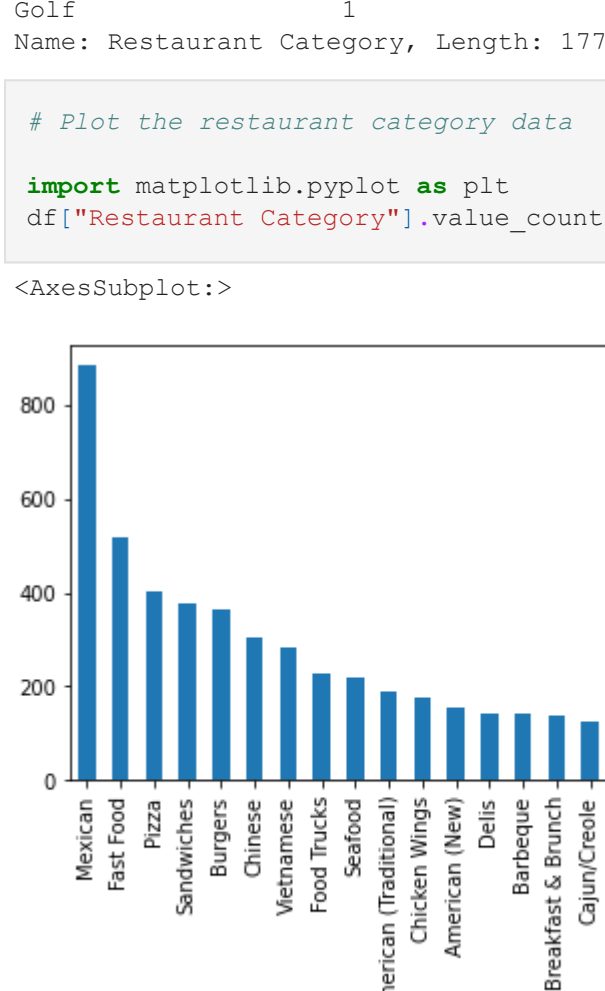
Out[8]:
```
alias                     0
display_phone           391
distance                  0
id                        0
image_url               284
is_closed                 0
name                      0
phone                   391
price                  1518
rating                    0
review_count              0
transactions              0
url                       0
latitude                  4
longitude                 4
address1                102
address2               5372
address3               6961
city                      0
country                   0
display_address           0
state                     0
zip_code                 10
Restaurant Category       0
dtype: int64
```

In [9]:
```
# Number of restaurants by category

df["Restaurant Category"].value_counts()
```

Out[9]:
```
Mexican             885
Fast Food           516
Pizza               402
Sandwiches          378
Burgers             362
                   ...
Irish Pub             1
Performing Arts       1
Unknown               1
Fondue                1
Golf                  1
Name: Restaurant Category, Length: 177, dtype: int64
```

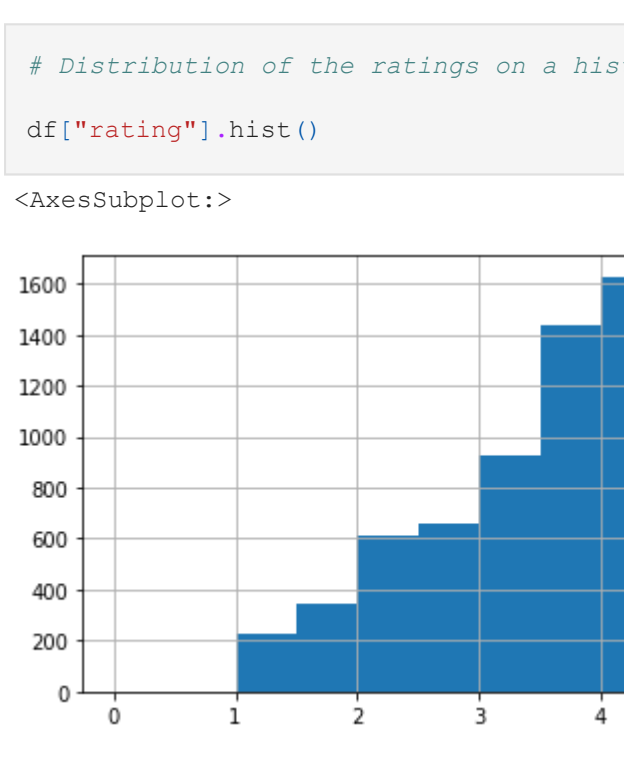
In [10]:
```
# Plot the restaurant category data

import matplotlib.pyplot as plt
df["Restaurant Category"].value_counts()[:20].plot(kind = "bar")
```

Out[10]: <AxesSubplot:>



In [11]:
```
# Distribution of the ratings on a histogram

df["rating"].hist()
```

Out[11]: <AxesSubplot:>



In [12]:
```
df.head(1)
```

Out[12]:

	alias	display_phone	distance	id	image_url	is_closed	name	phone	price	rating
0	bird-haus-houston	NaN	1353.224697	y8zMac68WqA37d4IVYCtdw	https://s3-media4.fl.yelpcdn.com/bphoto/XcbSFu...	False	Bird Haus	NaN	$$	4.5

1 rows × 24 columns

In [13]:
```
# Filter the columns that will be used in the visualization

rest = df[["rating","latitude","longitude","name","address1"]] # double brackets make a new data frame. if need
rest.head()
```

Out[13]:

	rating	latitude	longitude	name	address1
0	4.5	29.760360	-95.361582	Bird Haus	1010 Prairie St
1	4.0	29.767530	-95.376550	Gus's World Famous Fried Chicken	1815 Washington Ave
2	4.5	29.770945	-95.372068	Stanton's City Bites	1420 Edwards St
3	4.0	29.781930	-95.387350	Ritual	602 Studewood St
4	4.0	29.763046	-95.361572	Hearsay Market Square	218 Travis St

In [14]:
```
# Check for missing values in the filtered data frame

rest.isnull().sum()
```

Out[14]:
```
rating        0
latitude      4
longitude     4
name          0
address1    102
dtype: int64
```

In [15]:
```
# Check for any duplicates

rest.duplicated().sum()
```

Out[15]: 0

In [16]:
```
rest.shape
```

Out[16]: (7130, 5)

In [17]:
```
# Drop the rows with missing coordinates

rest.dropna(subset = ["latitude", "longitude"], axis=0, inplace=True) # axis=0 deletes the row, axis=1 deletes
rest.shape
```

```
d:\mambaforge\lib\site-packages\pandas\util\_decorators.py:311: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  return func(*args, **kwargs)
```

Out[17]: (7126, 5)

In [18]:
```
rest.isnull().sum()
# rest.isnull().any()
```

Out[18]:
```
rating       0
latitude     0
longitude    0
name         0
address1    98
dtype: int64
```

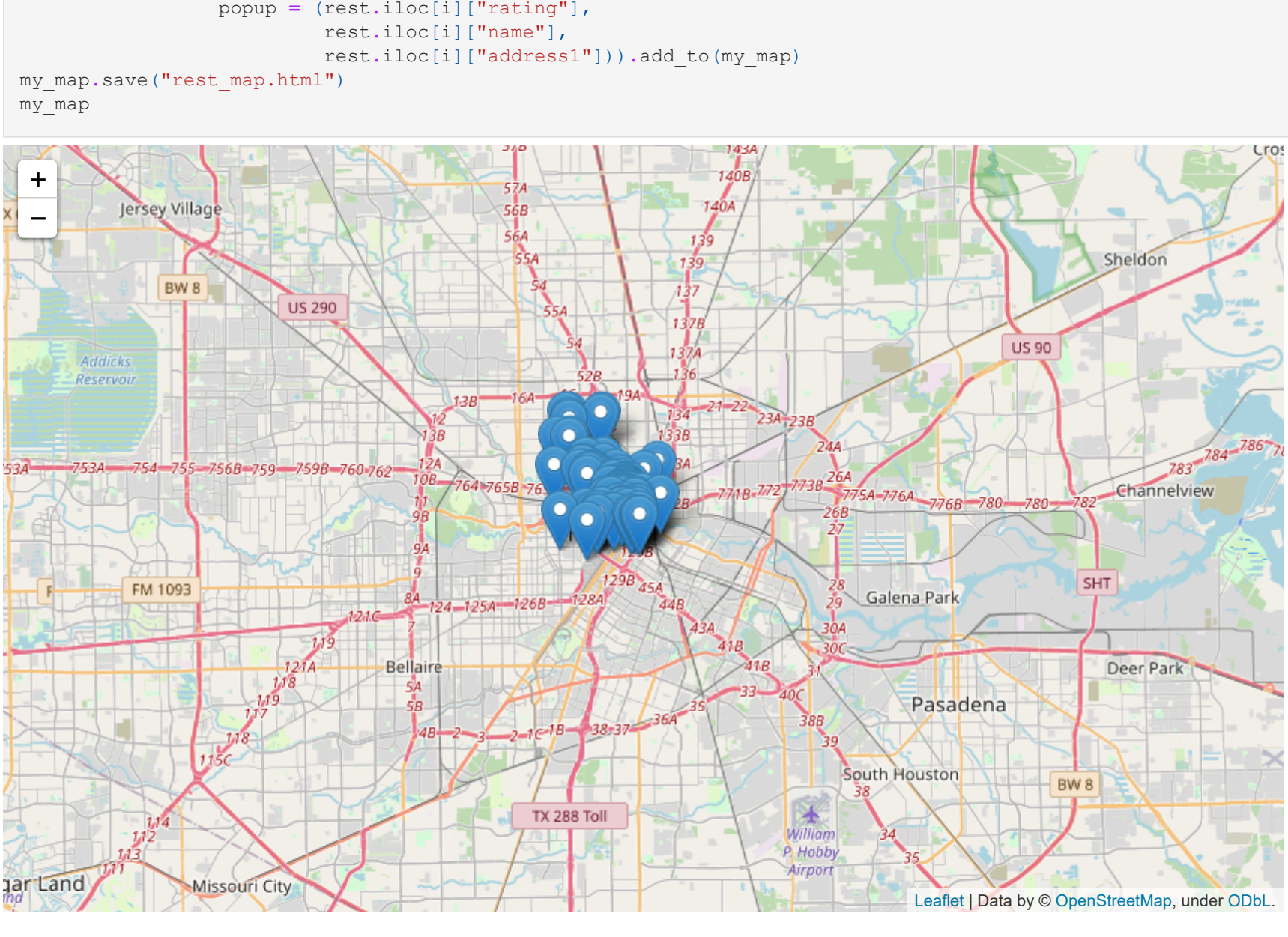
In [19]:
```
rest.head(1)
```

Out[19]:

	rating	latitude	longitude	name	address1
0	4.5	29.76036	-95.361582	Bird Haus	1010 Prairie St

In [20]:
```
# CREATE THE MAP. THIS PROCESS TAKES 1-2 MINUTES TO COMPLETE
# REPLACE range(100) WITH Range(len(rest["rating"])) TO SEE THE ENTIRE DATA

coor=[29.76087, -95.35462]
my_map = folium.Map(location=coor, zoom_start=11)

for i in range(100):
    folium.Marker([rest.iloc[i]["latitude"],
                   rest.iloc[i]["longitude"]],
                   popup = (rest.iloc[i]["rating"],
                            rest.iloc[i]["name"],
                            rest.iloc[i]["address1"])).add_to(my_map)
my_map.save("rest_map.html")
my_map
```

Out[20]:



END OF CODE