

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: branca>=0.3.0 in d:\mambaforge\lib\site-packages (from folium) (0.4.2)
Requirement already satisfied: Jinja2>=2.3 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: requests in d:\mambaforge\lib\site-packages (from folium) (2.26.0)
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: urllib3<1.27,>=1.21.1 in d:\mambaforge\lib\site-packages (from requests->folium) (1.26.6)
Requirement already satisfied: charset-normalizer<=2.0.0 in d:\mambaforge\lib\site-packages (from requests->folium) (2.0.0)
Requirement already satisfied: idna<4,>=2.5 in d:\mambaforge\lib\site-packages (from requests->folium) (3.1)
```

```
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
```



```
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
```



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

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

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

2 rows x 24 columns

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

```
<bound method NDFrame.describe of
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
```

```
0      y8zMac68WqA37d4IVYCtdw
1      eO55csoh_thLYu8boiP6iQ
2      -BImKAE7BXubGtBhIO9C9A
3      Uxr2owVxThOp_lsS0qxbFw
4      5WQ_McXD1URWSryfn9sCdw
...
7125      9DuYR-XIIIfYxfZhtTs7nTlA
7126      NSBctgOuL2IyN1klJO-vRg
7127      4UuF-UAInlq4ZzTBydbowK
7128      fpuwHANm7e6eVQQQuCNsKw
7129      XDscOpCuAW9_wNtdnVz-AQ
```

```
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-media3.fl.yelpcdn.com/bphoto/VzvTC...      False
7127      https://s3-media3.fl.yelpcdn.com/bphoto/ALEWL...      False
7128      https://s3-media3.fl.yelpcdn.com/bphoto/nMJ9vx...      False
7129      https://s3-media1.fl.yelpcdn.com/bphoto/vfj6ic...      False
```

```
0      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      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
```

```
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      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
```

```
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
```

```
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()
```

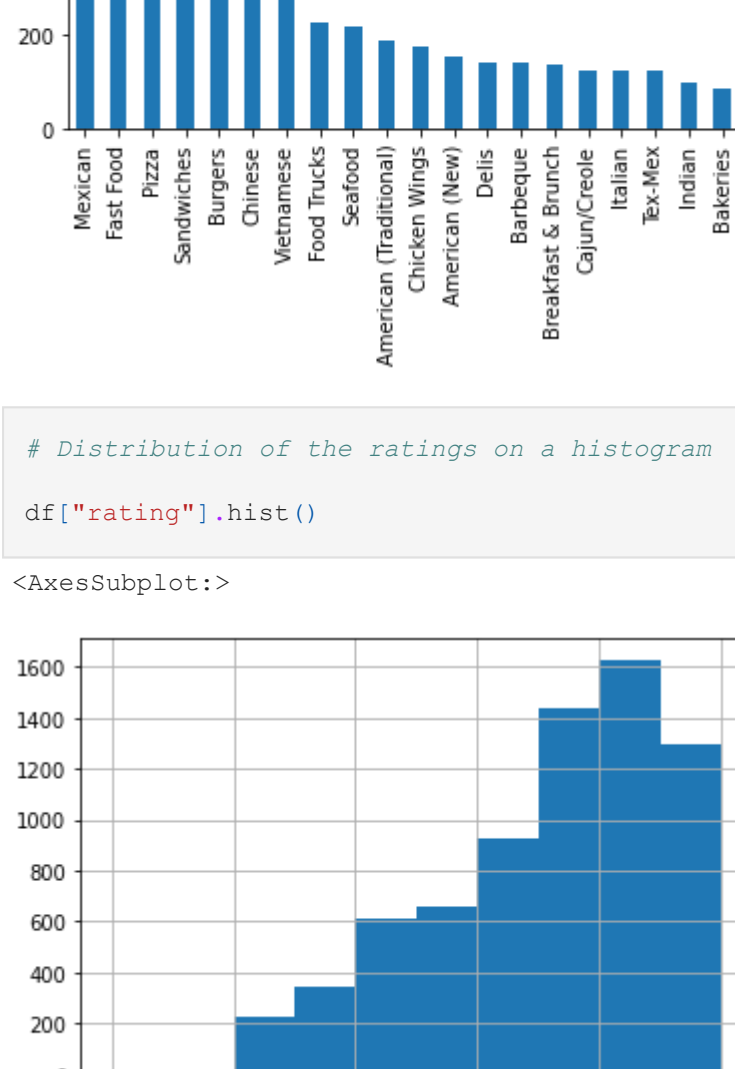
```
Out[8]: alias      0
display_phone    391
distance         0
id               0
image_url        284
is_closed        0
name             0
phone            391
price            1518
rating           0
review_count     0
transactions     0
url              0
latitude         4
longitude        4
address1        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
```

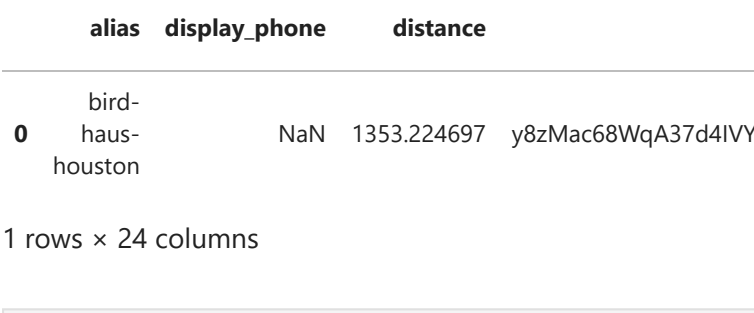
```
In [10]: # Plot the restaurant category data
import matplotlib.pyplot as plt
df["Restaurant Category"].value_counts()[ :20].plot(kind = "bar")
```

```
Out[10]: <AxesSubplot:>
```



```
In [11]: # Distribution of the ratings on a histogram
df["rating"].hist()
```

```
Out[11]: <AxesSubplot:>
```



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

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

1 rows x 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()
```

	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)
```

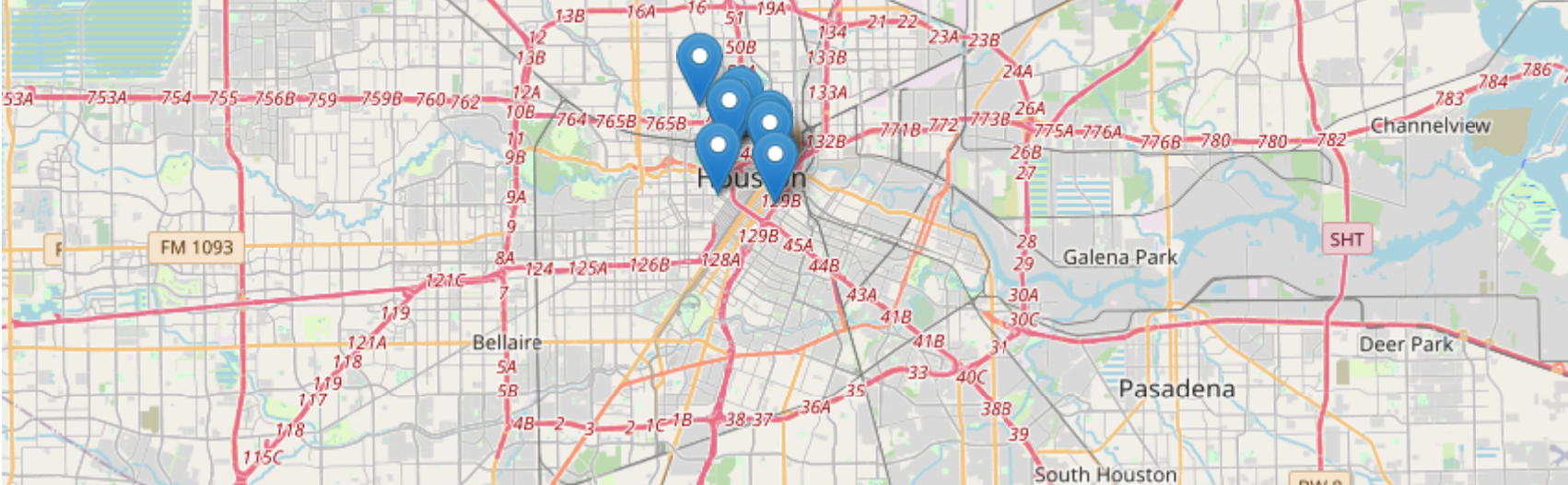
	rating	latitude	longitude	name	address1
0	4.5	29.76036	-95.361582	Bird Haus	1010 Prairie St

```
In [20]: # CREATE THE MAP. THIS PROCESS TAKES 1-2 MINUTES TO COMPLETE
# REPLACE THE MAP(10) 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(10):
    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
```



END OF CODE

