

## 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
```



```
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	y8zMac68WqA37d4IVVCtdw	media4.fl.yelpcdn.com/bphoto/Xcb5Fu...	False	Bird Haus	NaN	\$\$	4.5
1	guss-world-famous-fried-chicken-houston-2	(832) 740-4022	679.718934	eO55csoh_thLYu8boiP6iQ	media1.fl.yelpcdn.com/bphoto/MNgTNT...	False	Gus's World Famous Fried Chicken	1.832740e+10	\$	4.0

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

id \
0      y8zMac68WqA37d4IVVCtdw
1      eO55csoh_thLYu8boiP6iQ
2      -BtmKAE7EXubGtBhIO9C9A
3      Uxr2owVxThOp_lsS0qxbPw
4      5Mc_WcXD1URWSryfn9sCdw
...
7125      9DuyR-XiIFyxf2hTs7nTlA
7126      NSBctgOuL2iYn1klJO-vRg
7127      4UuF-UAIn1q4ZzTBydbowA
7128      fpwuHAnM7e6eVQQQuCnsKw
7129      XDScOpCuAW9_wNtdnVz-AQ

image_url is_closed \
0      https://s3-media4.fl.yelpcdn.com/bphoto/Xcb5Fu...      False
1      https://s3-media1.fl.yelpcdn.com/bphoto/MNgTNT...      False
2      https://s3-media2.fl.yelpcdn.com/bphoto/54W-Op...      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_2vPC...      False
7127      https://s3-media3.fl.yelpcdn.com/bphoto/AiLEW1...      False
7128      https://s3-media3.fl.yelpcdn.com/bphoto/nMJ9Wx...      False
7129      https://s3-media1.fl.yelpcdn.com/bphoto/vfPfic...      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
```

```
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()
```

```
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
```

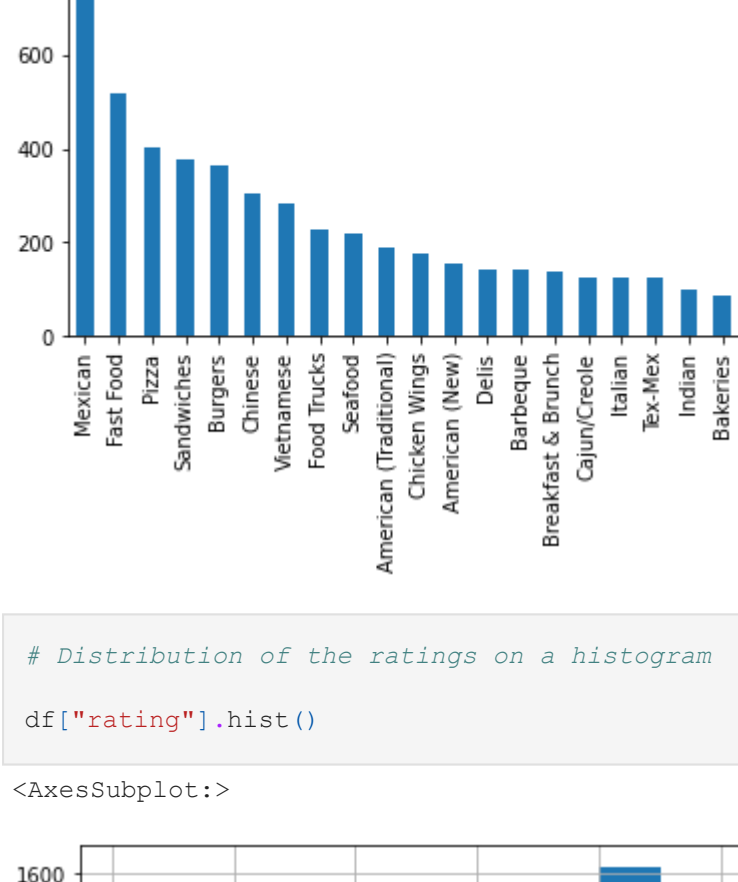
```
In [8]: # Check for the sums of the missing values
df.isnull().sum()
```

```
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
```

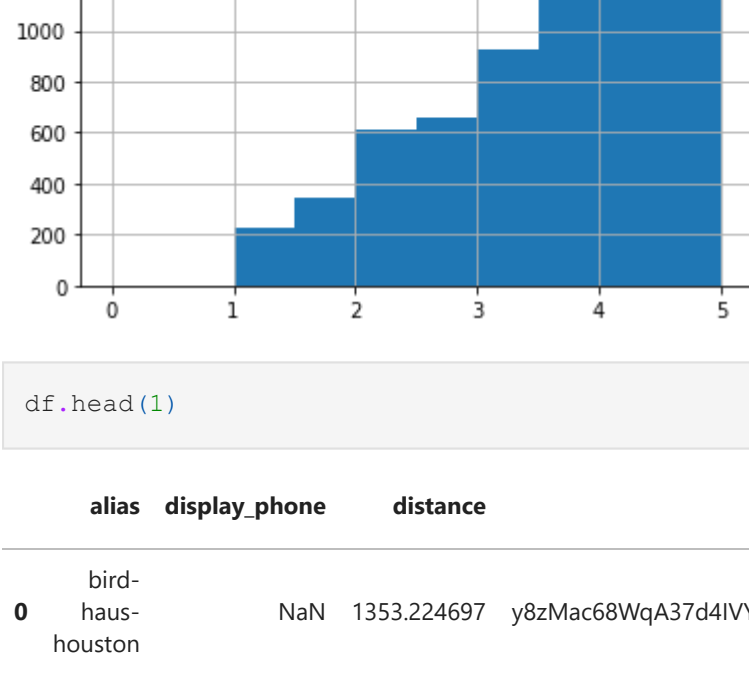
```
In [9]: # Number of restaurants by category
df["Restaurant Category"].value_counts()
```

```
Mexican      885
Fast Food      516
Pizza      402
Sandwiches      378
Burgers      362
Irish Pub      1
Performing Arts      1
Unknown      0
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")
```



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



```
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	y8zMac68WqA37d4IVVCtdw	media4.fl.yelpcdn.com/bphoto/Xcb5Fu...	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()
```

```
rating      0
latitude      4
longitude      4
name      0
address1      102
dtype: int64
```

```
In [15]: # Check for any duplicates
rest.duplicated().sum()
```

0

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

(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 being assigned to be set on a copy of 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)
(7126, 5)

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

```
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 range(100) WITH Range(len(rest["rating"])) TO SEE THE ENTIRE DATA
```

