Unit_6_Python_APIs Melissa Morgan

WeatherPy

Note

- Instructions have been included for each segment. You do not have to follow them exactly, but they are included to help you think through the steps.

In [1]:
```
# Dependencies and Setup
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
import requests
import time

# Import API key
from api_keys import api_key

# Incorporated citipy to determine city based on latitude and longitude
from citipy import citipy

# Output File (CSV)
output_data_file = "output_data/cities.csv"

# Range of latitudes and longitudes
lat_range = (-90, 90)
lng_range = (-180, 180)
```

Generate Cities List

In [2]:
```
# List for holding lat_lngs and cities
lat_lngs = []
cities = []

# Create a set of random lat and lng combinations
lats = np.random.uniform(low=-90.000, high=90.000, size=1500)
lngs = np.random.uniform(low=-180.000, high=180.000, size=1500)
lat_lngs = zip(lats, lngs)

# Identify nearest city for each lat, lng combination
for lat_lng in lat_lngs:
    city = citipy.nearest_city(lat_lng[0], lat_lng[1]).city_name

    # If the city is unique, then add it to a our cities list
    if city not in cities:
        cities.append(city)

# Print the city count to confirm sufficient count
len(cities)
```

Out[2]: 587

Perform API Calls

- Perform a weather check on each city using a series of successive API calls.
- Include a print log of each city as it'sbeing processed (with the city number and city name).

In [3]:
```
# URL for get requests
base_url = "http://api.openweathermap.org/data/2.5/weather?"

# Create settings dictionary with information we're interested in
params = {"units": "imperial", "appid": api_key}

# Loop through the cities and perform request
counter = 0
for city in cities:
    params['q'] = city
    if counter == 5:
        break
    response = requests.get(base_url, params = params)
    print(response)
    counter = counter + 1
```

```
<Response [401]>
<Response [401]>
<Response [401]>
<Response [401]>
<Response [401]>
```

In [4]:
```
# Create DataFrame
data_df = pd.DataFrame(columns=['City','Cloudiness','Country','Date','Humidi
```

In [5]:

```
# Create loop
record_count = 1

for i, city in enumerate(cities):
    params["q"] = city

    # Create conditional
    # Create a set for every 60 cities
    if (i % 60 == 0 and i > 50):
        record_count = 1
    try:
        response = requests.get(base_url, params = params).json()
        data_df.loc[i, "City"] = city
        data_df.loc[i, "Cloudiness"] = response['clouds']['all']
        data_df.loc[i, "Country"] = response['sys']['country']
        data_df.loc[i, "Date"] = response['dt']
        data_df.loc[i, "Humidity"] = response['main']['humidity']
        data_df.loc[i, "Lat"] = response['coord']['lat']
        data_df.loc[i, "Lng"] = response['coord']['lon']
        data_df.loc[i, "Max Temp"] = response['main']['temp_max']
        data_df.loc[i, "Wind Speed"] = response['wind']['speed']
        print(f"Processing Record {record_count} | {city}")

    except:
        print(f"City not found. Skipping...")
    record_count += 1

# Print out when data retrieval completed
print("-----------------------------\nData Retrieval Complete\n-----------
```

```
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
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City not found. Skipping...
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City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
City not found. Skipping...
```

Convert Raw Data to DataFrame

- Export the city data into a .csv.
- Display the DataFrame

In [9]:
```
# Save as a csv
# Note to avoid any issues later, use encoding="utf-8"
weather_data_csv = weather_data.to_csv(r"C:\Users\Melissa Morgan\Documents\S
```

In [9]:
```
#### Display the DataFrame
data_df.head(15)
```

Out[9]:

	City	Cloudiness	Country	Date	Humidity	Lat	Lng	Max Temp	Wind Speed
0	tigil	100	RU	1570044291	95	57.8	158.67	41.78	12.21
1	ushuaia	75	AR	1570044291	75	-54.81	-68.31	46.4	26.4
2	talcahuano	20	CL	1570044292	62	-36.72	-73.12	55.4	13.87
3	namibe	50	AO	1570044292	84	-15.19	12.15	66.44	14.34
4	souillac	0	FR	1570044292	87	45.6	-0.6	61	3.36
5	surok	100	PH	1570044293	93	11.63	125.42	73.46	1.61
6	rikitea	100	PF	1570044185	86	-23.12	-134.97	61.58	14.25
7	saskylakh	25	RU	1570044293	87	71.97	114.09	15.68	3.13
8	damietta	0	EG	1570044293	73	31.42	31.81	77	5.82
9	bawku	68	GH	1570044294	73	11.06	-0.24	81.56	6.6
10	cazaje	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
11	taolanaro	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
12	damaturu	79	NG	1570044294	42	11.75	11.96	88.94	10.2
13	rocha	100	UY	1570044294	91	-34.48	-54.34	51.32	15.59
14	talaya	0	RU	1570044295	86	55.79	84.89	39.99	11.18

In [10]:
```
#### Display the DataFrame
data_df.count()
```

Out[10]:
```
City          641
Cloudiness    577
Country       577
Date          577
Humidity      577
Lat           577
Lng           577
Max Temp      577
Wind Speed    577
dtype: int64
```

In [11]:
```
# Ignoring the rows that include missing data
data_df.dropna(inplace= True)
data_df['Date'] = pd.to_datetime(data_df['Date'],unit='s')
data_df.head(15)
```

Out[11]:

	City	Cloudiness	Country	Date	Humidity	Lat	Lng	Max Temp	Wind Speed
0	tigil	100	RU	2019-10-02 19:24:51	95	57.8	158.67	41.78	12.21
1	ushuaia	75	AR	2019-10-02 19:24:51	75	-54.81	-68.31	46.4	26.4
2	talcahuano	20	CL	2019-10-02 19:24:52	62	-36.72	-73.12	55.4	13.87
3	namibe	50	AO	2019-10-02 19:24:52	84	-15.19	12.15	66.44	14.34
4	souillac	0	FR	2019-10-02 19:24:52	87	45.6	-0.6	61	3.36
5	surok	100	PH	2019-10-02 19:24:53	93	11.63	125.42	73.46	1.61
6	rikitea	100	PF	2019-10-02 19:23:05	86	-23.12	-134.97	61.58	14.25
7	saskylakh	25	RU	2019-10-02 19:24:53	87	71.97	114.09	15.68	3.13
8	damietta	0	EG	2019-10-02 19:24:53	73	31.42	31.81	77	5.82
9	bawku	68	GH	2019-10-02 19:24:54	73	11.06	-0.24	81.56	6.6
12	damaturu	79	NG	2019-10-02 19:24:54	42	11.75	11.96	88.94	10.2
13	rocha	100	UY	2019-10-02 19:24:54	91	-34.48	-54.34	51.32	15.59
14	talaya	0	RU	2019-10-02 19:24:55	86	55.79	84.89	39.99	11.18
16	carnarvon	46	ZA	2019-10-02 19:24:55	13	-30.97	22.13	64.82	10.16
17	hithadhoo	58	MV	2019-10-02 19:24:55	80	-0.6	73.08	82.46	16.55

In [12]:
```
# Display the DataFrame
data_df.count()
```

Out[12]:
```
City          577
Cloudiness    577
Country       577
Date          577
Humidity      577
Lat           577
Lng           577
Max Temp      577
Wind Speed    577
dtype: int64
```

Plotting the Data

- Use proper labeling of the plots using plot titles (including date of analysis) and axes labels.
- Save the plotted figures as .pngs.

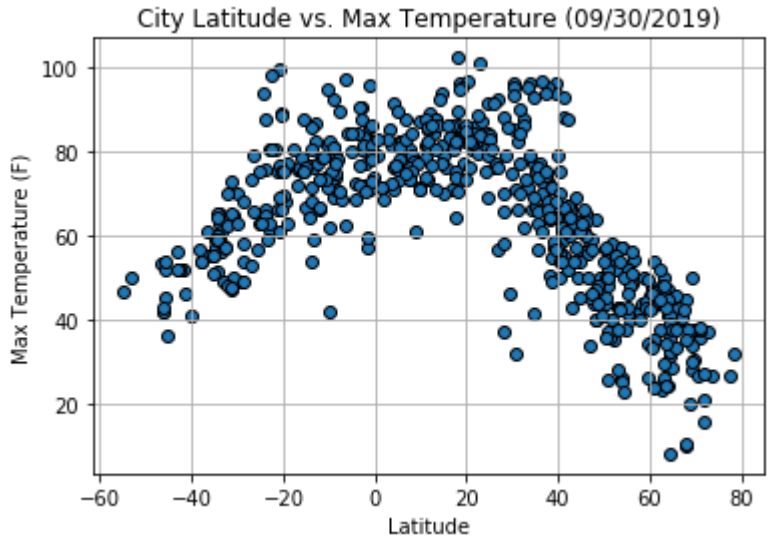
Latitude vs. Temperature Plot

In [13]:
```
# Build a scatter plot
plt.scatter(data_df["Lat"], data_df["Max Temp"], edgecolor = 'black')

# Incorporate other graph properties
plt.title("City Latitude vs. Max Temperature (09/30/2019)")
plt.xlabel("Latitude")
plt.ylabel("Max Temperature (F)")
plt.grid(True)

# Save an image of the chart to view in a folder
plt.savefig("Lat_vs_Temp.png")

# Show the Figure
plt.show()
```



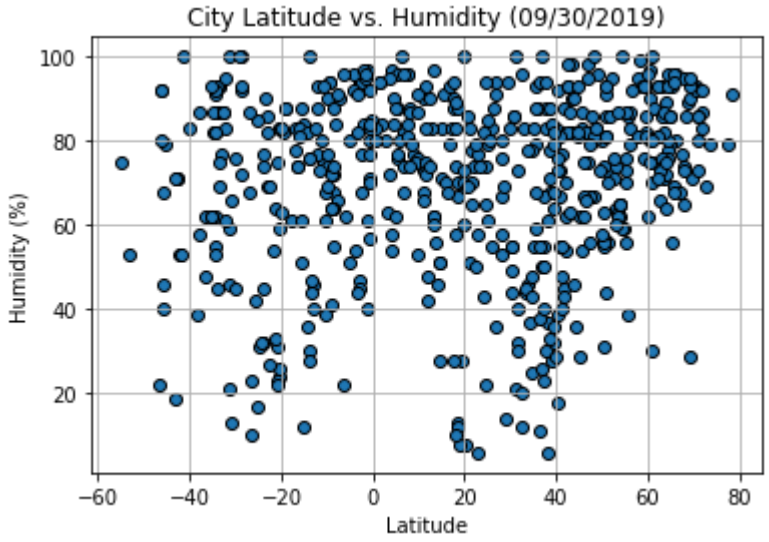
Latitude vs. Humidity Plot

In [14]:
```
# Build a scatter plot
plt.scatter(data_df["Lat"], data_df["Humidity"], edgecolor = 'black')

# Incorporate other graph properties
plt.title("City Latitude vs. Humidity (09/30/2019)")
plt.xlabel("Latitude")
plt.ylabel("Humidity (%)")
plt.grid(True)

# Save an image of the chart to view in a folder
plt.savefig("Lat_vs_Humidity.png")

# Show the Figure
plt.show()
```



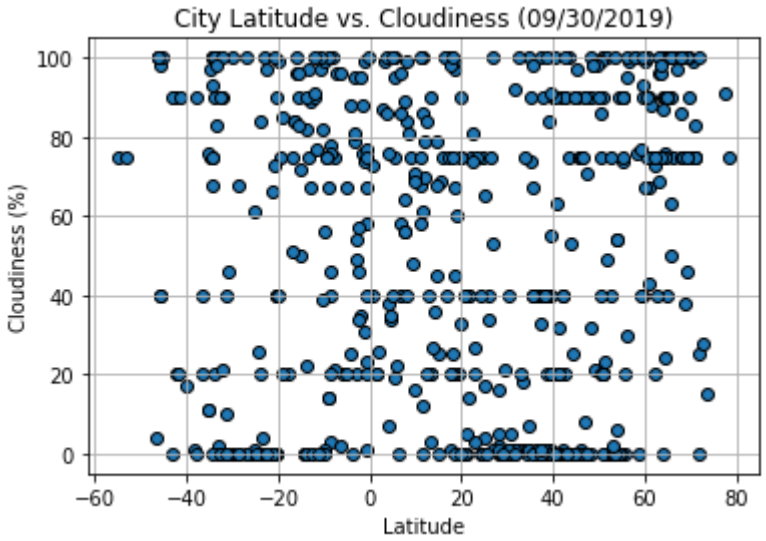
Latitude vs. Cloudiness Plot

In [15]:
```
# Build a scatter plot
plt.scatter(data_df["Lat"], data_df["Cloudiness"], edgecolor = 'black')

# Incorporate other graph properties
plt.title("City Latitude vs. Cloudiness (09/30/2019)")
plt.xlabel("Latitude")
plt.ylabel("Cloudiness (%)")
plt.grid(True)

# Save an image of the chart to view in a folder
plt.savefig("Lat_vs_Cloudiness.png")

# Show the Figure
plt.show()
```



Latitude vs. Wind Speed Plot

In [16]:

```
# Build a scatter plot
plt.scatter(data_df["Lat"], data_df["Wind Speed"], edgecolor = 'black')

# Incorporate other graph properties
plt.title("City Latitude vs. Wind Speed (mph) (09/30/2019)")
plt.xlabel("Latitude")
plt.ylabel("Wind Speed (mph)")
plt.grid(True)

# Save an image of the chart to view in a folder
plt.savefig("Lat_vs_Wind_Speed.png")

# Show the Figure
plt.show()
```