import matplotlib.pyplot as plt

import pandas as pd

import numpy as np

import requests

import time

import urllib

# 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

# 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)

620

Perform API Calls

# OpenWeatherMap API Key

api\_key = "AIzaSyBE8agJg9JOUC6w8cIo4aaTavQ-DnoY34o

"

# Starting URL for Weather Map API Call

url = "http://api.openweathermap.org/data/2.5/weather?units=Imperial&APPID=" + AIzaSyBE8agJg9JOUC6w8cIo4aaTavQ-DnoY34o

# List of city data

city\_data = []

# Print to logger

print("Beginning Data Retrieval ")

print("-----------------------------")

# Create counters

record\_count = 1

set\_count = 1

# Loop through all the cities in our list

for i, city in enumerate(cities):

# Group cities in sets of 50 for logging purposes

if (i % 50 == 0 and i >= 50):

set\_count += 1

record\_count = 0

# Create endpoint URL with each city

city\_url = url + "&q=" + urllib.request.pathname2url(city)

# Log the url, record, and set numbers

print("Processing Record %s of Set %s | %s" % (record\_count, set\_count, city))

# Add 1 to the record count

record\_count += 1

# Run an API request for each of the cities

try:

# Parse the JSON and retrieve data

city\_weather = requests.get(city\_url).json()

# Parse out the max temp, humidity, and cloudiness

city\_lat = city\_weather["coord"]["lat"]

city\_lng = city\_weather["coord"]["lon"]

city\_max\_temp = city\_weather["main"]["temp\_max"]

city\_humidity = city\_weather["main"]["humidity"]

city\_clouds = city\_weather["clouds"]["all"]

city\_wind = city\_weather["wind"]["speed"]

city\_country = city\_weather["sys"]["country"]

city\_date = city\_weather["dt"]

# Append the City information into city\_data list

city\_data.append({"City": city,

"Lat": city\_lat,

"Lng": city\_lng,

"Max Temp": city\_max\_temp,

"Humidity": city\_humidity,

"Cloudiness": city\_clouds,

"Wind Speed": city\_wind,

"Country": city\_country,

"Date": city\_date})

# If an error is experienced, skip the city

except:

print("City not found. Skipping...")

pass

# Indicate that Data Loading is complete

print("-----------------------------")

print("Data Retrieval Complete ")

print("-----------------------------")

Beginning Data Retrieval

-----------------------------

Processing Record 1 of Set 1 | lompoc

Processing Record 2 of Set 1 | klaksvik

Processing Record 3 of Set 1 | bisignano

Processing Record 4 of Set 1 | bengkulu

City not found. Skipping...

Processing Record 5 of Set 1 | hilo

Processing Record 6 of Set 1 | rikitea

Processing Record 7 of Set 1 | ahipara

Processing Record 8 of Set 1 | lebu

Processing Record 9 of Set 1 | hamilton

Processing Record 10 of Set 1 | castro

Processing Record 11 of Set 1 | ashland

Processing Record 12 of Set 1 | ushuaia

Processing Record 13 of Set 1 | haines junction

Processing Record 14 of Set 1 | punta arenas

Processing Record 15 of Set 1 | salalah

Processing Record 16 of Set 1 | port macquarie

Processing Record 17 of Set 1 | mataura

Processing Record 18 of Set 1 | saint-philippe

Processing Record 19 of Set 1 | kaitangata

Processing Record 20 of Set 1 | souillac

Processing Record 21 of Set 1 | srednekolymsk

Processing Record 22 of Set 1 | busselton

Processing Record 23 of Set 1 | severo-kurilsk

Processing Record 24 of Set 1 | belushya guba

City not found. Skipping...

Processing Record 25 of Set 1 | ivaipora

City not found. Skipping...

Processing Record 26 of Set 1 | cape town

Processing Record 27 of Set 1 | ambilobe

Processing Record 28 of Set 1 | yellowknife

Processing Record 29 of Set 1 | talnakh

Processing Record 30 of Set 1 | namatanai

Processing Record 31 of Set 1 | scottsburgh

City not found. Skipping...

Processing Record 32 of Set 1 | leningradskiy

Processing Record 33 of Set 1 | khormuj

City not found. Skipping...

Processing Record 34 of Set 1 | kodiak

Processing Record 35 of Set 1 | muros

Processing Record 36 of Set 1 | tamandare

Processing Record 37 of Set 1 | taolanaro

City not found. Skipping...

Processing Record 38 of Set 1 | albany

Processing Record 39 of Set 1 | lumut

Processing Record 40 of Set 1 | sukumo

Processing Record 41 of Set 1 | chapais

Processing Record 42 of Set 1 | khatanga

Processing Record 43 of Set 1 | ordzhonikidze

Processing Record 44 of Set 1 | jiangyou

Processing Record 45 of Set 1 | ancud

Processing Record 46 of Set 1 | vila franca do campo

Processing Record 47 of Set 1 | shchelkun

Processing Record 48 of Set 1 | vanimo

Processing Record 49 of Set 1 | kalmanhaza

Processing Record 50 of Set 1 | butaritari

Processing Record 0 of Set 2 | codrington

Processing Record 1 of Set 2 | ayolas

Processing Record 2 of Set 2 | kapaa

Processing Record 3 of Set 2 | east london

Processing Record 4 of Set 2 | vaini

Processing Record 5 of Set 2 | tessalit

Processing Record 6 of Set 2 | panguna

Processing Record 7 of Set 2 | cockburn town

Processing Record 8 of Set 2 | valerianovsk

Processing Record 9 of Set 2 | tingrela

City not found. Skipping...

Processing Record 10 of Set 2 | novobirilyussy

Processing Record 11 of Set 2 | krasnoborsk

Processing Record 12 of Set 2 | mar del plata

Processing Record 13 of Set 2 | new norfolk

Processing Record 14 of Set 2 | khonuu

City not found. Skipping...

Processing Record 15 of Set 2 | vila do maio

Processing Record 16 of Set 2 | dikson

Processing Record 17 of Set 2 | tsihombe

City not found. Skipping...

Processing Record 18 of Set 2 | toliary

City not found. Skipping...

Processing Record 19 of Set 2 | kazalinsk

City not found. Skipping...

Processing Record 20 of Set 2 | livani

Processing Record 21 of Set 2 | urucui

Processing Record 22 of Set 2 | ribeira grande

Processing Record 23 of Set 2 | qaanaaq

Processing Record 24 of Set 2 | sentyabrskiy

City not found. Skipping...

Processing Record 25 of Set 2 | tuatapere

Processing Record 26 of Set 2 | bocaiuva

Processing Record 27 of Set 2 | jiexiu

Processing Record 28 of Set 2 | quelimane

Processing Record 29 of Set 2 | rujewa

Processing Record 30 of Set 2 | cherskiy

Processing Record 31 of Set 2 | port elizabeth

Processing Record 32 of Set 2 | yanchukan

City not found. Skipping...

Processing Record 33 of Set 2 | fortuna

Processing Record 34 of Set 2 | belyy yar

Processing Record 35 of Set 2 | venezuela

Processing Record 36 of Set 2 | bambous virieux

Processing Record 37 of Set 2 | illoqqortoormiut

City not found. Skipping...

Processing Record 38 of Set 2 | barrow

Processing Record 39 of Set 2 | mitsamiouli

Processing Record 40 of Set 2 | hunza

City not found. Skipping...

Processing Record 41 of Set 2 | bunia

Processing Record 42 of Set 2 | boa vista

Processing Record 43 of Set 2 | kudahuvadhoo

Processing Record 44 of Set 2 | mys shmidta

City not found. Skipping...

Processing Record 45 of Set 2 | bluff

Processing Record 46 of Set 2 | okhotsk

Processing Record 47 of Set 2 | muzaffarabad

Processing Record 48 of Set 2 | avarua

Processing Record 49 of Set 2 | esperance

Processing Record 0 of Set 3 | arenapolis

Processing Record 1 of Set 3 | tuktoyaktuk

Processing Record 2 of Set 3 | nemuro

Processing Record 3 of Set 3 | attawapiskat

City not found. Skipping...

Processing Record 4 of Set 3 | rio gallegos

Processing Record 5 of Set 3 | svetlaya

Processing Record 6 of Set 3 | nome

Processing Record 7 of Set 3 | caravelas

Processing Record 8 of Set 3 | karamea

City not found. Skipping...

Processing Record 9 of Set 3 | mandalgovi

Processing Record 10 of Set 3 | carnarvon

Processing Record 11 of Set 3 | atuona

Processing Record 12 of Set 3 | pemangkat

City not found. Skipping...

Processing Record 13 of Set 3 | karaul

City not found. Skipping...

Processing Record 14 of Set 3 | qiqihar

Processing Record 15 of Set 3 | cabo san lucas

Processing Record 16 of Set 3 | jamestown

Processing Record 17 of Set 3 | komsomolskiy

Processing Record 18 of Set 3 | arraial do cabo

Processing Record 19 of Set 3 | tiksi

Processing Record 20 of Set 3 | amnat charoen

Processing Record 21 of Set 3 | provideniya

Processing Record 22 of Set 3 | luang prabang

Processing Record 23 of Set 3 | hami

Processing Record 24 of Set 3 | saskylakh

Processing Record 25 of Set 3 | kyren

Processing Record 26 of Set 3 | yuanping

Processing Record 27 of Set 3 | dukat

Processing Record 28 of Set 3 | barentsburg

City not found. Skipping...

Processing Record 29 of Set 3 | chuy

Processing Record 30 of Set 3 | dorfen

Processing Record 31 of Set 3 | ayan

Processing Record 32 of Set 3 | port alfred

Processing Record 33 of Set 3 | nanortalik

Processing Record 34 of Set 3 | nizhneyansk

City not found. Skipping...

Processing Record 35 of Set 3 | vertientes

Processing Record 36 of Set 3 | charters towers

Processing Record 37 of Set 3 | nenjiang

Processing Record 38 of Set 3 | hermanus

Processing Record 39 of Set 3 | saleaula

City not found. Skipping...

Processing Record 40 of Set 3 | puerto del rosario

Processing Record 41 of Set 3 | husavik

Processing Record 42 of Set 3 | maldonado

Processing Record 43 of Set 3 | bintulu

Processing Record 44 of Set 3 | warqla

City not found. Skipping...

Processing Record 45 of Set 3 | luderitz

Processing Record 46 of Set 3 | vardo

Processing Record 47 of Set 3 | faanui

Processing Record 48 of Set 3 | muzhi

Processing Record 49 of Set 3 | zhangye

Processing Record 0 of Set 4 | nouadhibou

Processing Record 1 of Set 4 | oussouye

Processing Record 2 of Set 4 | agaro

Processing Record 3 of Set 4 | samusu

City not found. Skipping...

Processing Record 4 of Set 4 | tasiilaq

Processing Record 5 of Set 4 | amderma

City not found. Skipping...

Processing Record 6 of Set 4 | bathsheba

Processing Record 7 of Set 4 | pacific grove

Processing Record 8 of Set 4 | half moon bay

Processing Record 9 of Set 4 | goderich

Processing Record 10 of Set 4 | severnyy

City not found. Skipping...

Processing Record 11 of Set 4 | erenhot

Processing Record 12 of Set 4 | hasaki

Processing Record 13 of Set 4 | agadez

Processing Record 14 of Set 4 | hobart

Processing Record 15 of Set 4 | drummondville

Processing Record 16 of Set 4 | selfoss

Processing Record 17 of Set 4 | carman

Processing Record 18 of Set 4 | kurumkan

Processing Record 19 of Set 4 | rawson

Processing Record 20 of Set 4 | osakarovka

Processing Record 21 of Set 4 | sitka

Processing Record 22 of Set 4 | pec

Processing Record 23 of Set 4 | nacala

Processing Record 24 of Set 4 | vaitupu

City not found. Skipping...

Processing Record 25 of Set 4 | ewo

Processing Record 26 of Set 4 | alihe

Processing Record 27 of Set 4 | felipe carrillo puerto

Processing Record 28 of Set 4 | sept-iles

Processing Record 29 of Set 4 | anzio

Processing Record 30 of Set 4 | abeche

Processing Record 31 of Set 4 | chokurdakh

Processing Record 32 of Set 4 | sao filipe

Processing Record 33 of Set 4 | yatou

Processing Record 34 of Set 4 | pangkalanbuun

Processing Record 35 of Set 4 | namibe

Processing Record 36 of Set 4 | caltagirone

Processing Record 37 of Set 4 | araguacu

City not found. Skipping...

Processing Record 38 of Set 4 | atuntaqui

Processing Record 39 of Set 4 | marshfield

Processing Record 40 of Set 4 | saint-joseph

Processing Record 41 of Set 4 | chambas

Processing Record 42 of Set 4 | mahebourg

Processing Record 43 of Set 4 | abadan

Processing Record 44 of Set 4 | lagoa

Processing Record 45 of Set 4 | axim

Processing Record 46 of Set 4 | sioux lookout

Processing Record 47 of Set 4 | voh

Processing Record 48 of Set 4 | puerto ayora

Processing Record 49 of Set 4 | sinnamary

Processing Record 0 of Set 5 | duz

City not found. Skipping...

Processing Record 1 of Set 5 | upernavik

Processing Record 2 of Set 5 | port hardy

Processing Record 3 of Set 5 | vieste

Processing Record 4 of Set 5 | dalvik

Processing Record 5 of Set 5 | tual

Processing Record 6 of Set 5 | novopokrovka

Processing Record 7 of Set 5 | soyo

Processing Record 8 of Set 5 | broken hill

Processing Record 9 of Set 5 | columbia

Processing Record 10 of Set 5 | sao joao da barra

Processing Record 11 of Set 5 | lumphat

Processing Record 12 of Set 5 | ciudad bolivar

Processing Record 13 of Set 5 | san quintin

Processing Record 14 of Set 5 | bredasdorp

Processing Record 15 of Set 5 | torbay

Processing Record 16 of Set 5 | hithadhoo

Processing Record 17 of Set 5 | tabarqah

City not found. Skipping...

Processing Record 18 of Set 5 | vila velha

Processing Record 19 of Set 5 | samaniego

Processing Record 20 of Set 5 | kruisfontein

Processing Record 21 of Set 5 | tumannyy

City not found. Skipping...

Processing Record 22 of Set 5 | dunedin

Processing Record 23 of Set 5 | nikolskoye

Processing Record 24 of Set 5 | geraldton

Processing Record 25 of Set 5 | sarangani

Processing Record 26 of Set 5 | bontang

Processing Record 27 of Set 5 | jacareacanga

Processing Record 28 of Set 5 | palabuhanratu

City not found. Skipping...

Processing Record 29 of Set 5 | raudeberg

Processing Record 30 of Set 5 | terrenate

Processing Record 31 of Set 5 | vao

Processing Record 32 of Set 5 | asau

City not found. Skipping...

Processing Record 33 of Set 5 | hovd

Processing Record 34 of Set 5 | bure

Processing Record 35 of Set 5 | ranot

Processing Record 36 of Set 5 | barawe

City not found. Skipping...

Processing Record 37 of Set 5 | merauke

Processing Record 38 of Set 5 | prichard

Processing Record 39 of Set 5 | gravelbourg

Processing Record 40 of Set 5 | searcy

Processing Record 41 of Set 5 | chagda

City not found. Skipping...

Processing Record 42 of Set 5 | victoria

Processing Record 43 of Set 5 | sisimiut

Processing Record 44 of Set 5 | trelew

Processing Record 45 of Set 5 | aban

City not found. Skipping...

Processing Record 46 of Set 5 | vakhrushev

Processing Record 47 of Set 5 | pierre

Processing Record 48 of Set 5 | ilulissat

Processing Record 49 of Set 5 | lorengau

Processing Record 0 of Set 6 | mokrousovo

Processing Record 1 of Set 6 | baltay

Processing Record 2 of Set 6 | kainantu

Processing Record 3 of Set 6 | goulburn

Processing Record 4 of Set 6 | lincoln

Processing Record 5 of Set 6 | harnosand

Processing Record 6 of Set 6 | camana

City not found. Skipping...

Processing Record 7 of Set 6 | pleshanovo

Processing Record 8 of Set 6 | ostrovnoy

Processing Record 9 of Set 6 | porto novo

Processing Record 10 of Set 6 | kawana waters

City not found. Skipping...

Processing Record 11 of Set 6 | quatre cocos

Processing Record 12 of Set 6 | marzuq

Processing Record 13 of Set 6 | prince george

Processing Record 14 of Set 6 | grand river south east

City not found. Skipping...

Processing Record 15 of Set 6 | sorsk

Processing Record 16 of Set 6 | port blair

Processing Record 17 of Set 6 | shihezi

Processing Record 18 of Set 6 | coffs harbour

Processing Record 19 of Set 6 | rasova

Processing Record 20 of Set 6 | dingle

Processing Record 21 of Set 6 | la primavera

Processing Record 22 of Set 6 | tezu

Processing Record 23 of Set 6 | qasigiannguit

Processing Record 24 of Set 6 | westport

Processing Record 25 of Set 6 | peleduy

Processing Record 26 of Set 6 | yei

City not found. Skipping...

Processing Record 27 of Set 6 | dakar

Processing Record 28 of Set 6 | temaraia

City not found. Skipping...

Processing Record 29 of Set 6 | pisco

Processing Record 30 of Set 6 | buzuluk

Processing Record 31 of Set 6 | jahrom

City not found. Skipping...

Processing Record 32 of Set 6 | ponferrada

Processing Record 33 of Set 6 | kaeo

Processing Record 34 of Set 6 | chimbote

Processing Record 35 of Set 6 | rocha

Processing Record 36 of Set 6 | kurkino

Processing Record 37 of Set 6 | kavaratti

Processing Record 38 of Set 6 | puri

Processing Record 39 of Set 6 | maues

Processing Record 40 of Set 6 | kapit

Processing Record 41 of Set 6 | sinegorye

Processing Record 42 of Set 6 | thompson

Processing Record 43 of Set 6 | kadykchan

City not found. Skipping...

Processing Record 44 of Set 6 | itaueira

Processing Record 45 of Set 6 | georgetown

Processing Record 46 of Set 6 | parana

Processing Record 47 of Set 6 | govindgarh

Processing Record 48 of Set 6 | laguna

Processing Record 49 of Set 6 | tura

Processing Record 0 of Set 7 | nhulunbuy

Processing Record 1 of Set 7 | buala

Processing Record 2 of Set 7 | ngunguru

Processing Record 3 of Set 7 | abu zabad

Processing Record 4 of Set 7 | katete

Processing Record 5 of Set 7 | flin flon

Processing Record 6 of Set 7 | fayaoue

Processing Record 7 of Set 7 | umzimvubu

City not found. Skipping...

Processing Record 8 of Set 7 | port hedland

Processing Record 9 of Set 7 | omsukchan

Processing Record 10 of Set 7 | la asuncion

Processing Record 11 of Set 7 | hambantota

Processing Record 12 of Set 7 | matagami

Processing Record 13 of Set 7 | palmer

Processing Record 14 of Set 7 | dzhebariki-khaya

Processing Record 15 of Set 7 | shitanjing

Processing Record 16 of Set 7 | ixtapa

Processing Record 17 of Set 7 | bethel

Processing Record 18 of Set 7 | khani

Processing Record 19 of Set 7 | saint george

Processing Record 20 of Set 7 | whitehorse

Processing Record 21 of Set 7 | isiolo

Processing Record 22 of Set 7 | sao paulo de olivenca

Processing Record 23 of Set 7 | buckeye

Processing Record 24 of Set 7 | wewak

Processing Record 25 of Set 7 | huarmey

Processing Record 26 of Set 7 | satitoa

City not found. Skipping...

Processing Record 27 of Set 7 | la libertad

Processing Record 28 of Set 7 | norman wells

Processing Record 29 of Set 7 | dicabisagan

Processing Record 30 of Set 7 | kavieng

Processing Record 31 of Set 7 | wladyslawowo

Processing Record 32 of Set 7 | kemin

Processing Record 33 of Set 7 | coolum beach

Processing Record 34 of Set 7 | rosetta

Processing Record 35 of Set 7 | bermeo

Processing Record 36 of Set 7 | turtas

Processing Record 37 of Set 7 | mount gambier

Processing Record 38 of Set 7 | key west

Processing Record 39 of Set 7 | aklavik

Processing Record 40 of Set 7 | tikapur

Processing Record 41 of Set 7 | oranjestad

Processing Record 42 of Set 7 | calvinia

Processing Record 43 of Set 7 | kahului

Processing Record 44 of Set 7 | gaziantep

Processing Record 45 of Set 7 | port augusta

Processing Record 46 of Set 7 | turukhansk

Processing Record 47 of Set 7 | roma

Processing Record 48 of Set 7 | buraydah

Processing Record 49 of Set 7 | andenes

City not found. Skipping...

Processing Record 0 of Set 8 | coihaique

Processing Record 1 of Set 8 | surt

Processing Record 2 of Set 8 | rawannawi

City not found. Skipping...

Processing Record 3 of Set 8 | nanjangud

Processing Record 4 of Set 8 | saravan

Processing Record 5 of Set 8 | penzance

Processing Record 6 of Set 8 | mehamn

Processing Record 7 of Set 8 | baherden

Processing Record 8 of Set 8 | minbu

Processing Record 9 of Set 8 | hamina

Processing Record 10 of Set 8 | mackay

Processing Record 11 of Set 8 | omaruru

Processing Record 12 of Set 8 | roald

Processing Record 13 of Set 8 | tashtyp

Processing Record 14 of Set 8 | kyra

City not found. Skipping...

Processing Record 15 of Set 8 | walvis bay

Processing Record 16 of Set 8 | kloulklubed

Processing Record 17 of Set 8 | le port

Processing Record 18 of Set 8 | hokitika

Processing Record 19 of Set 8 | guapi

Processing Record 20 of Set 8 | manyana

Processing Record 21 of Set 8 | airai

Processing Record 22 of Set 8 | wajid

Processing Record 23 of Set 8 | mumford

Processing Record 24 of Set 8 | labuhan

Processing Record 25 of Set 8 | sabang

Processing Record 26 of Set 8 | batagay-alyta

Processing Record 27 of Set 8 | ambodifototra

City not found. Skipping...

Processing Record 28 of Set 8 | gouyave

Processing Record 29 of Set 8 | avera

Processing Record 30 of Set 8 | zonguldak

Processing Record 31 of Set 8 | tokur

Processing Record 32 of Set 8 | pyay

Processing Record 33 of Set 8 | ulladulla

Processing Record 34 of Set 8 | grand-santi

Processing Record 35 of Set 8 | urusha

Processing Record 36 of Set 8 | lata

Processing Record 37 of Set 8 | anar darreh

City not found. Skipping...

Processing Record 38 of Set 8 | tazovskiy

Processing Record 39 of Set 8 | kefamenanu

Processing Record 40 of Set 8 | agva

City not found. Skipping...

Processing Record 41 of Set 8 | kysyl-syr

Processing Record 42 of Set 8 | wajima

Processing Record 43 of Set 8 | kargopol

Processing Record 44 of Set 8 | tubruq

City not found. Skipping...

Processing Record 45 of Set 8 | ovalle

Processing Record 46 of Set 8 | wadi musa

Processing Record 47 of Set 8 | iguape

Processing Record 48 of Set 8 | san juan

Processing Record 49 of Set 8 | vinh

Processing Record 0 of Set 9 | kuminskiy

Processing Record 1 of Set 9 | samalaeulu

City not found. Skipping...

Processing Record 2 of Set 9 | honningsvag

Processing Record 3 of Set 9 | harper

Processing Record 4 of Set 9 | batasan

Processing Record 5 of Set 9 | yumen

Processing Record 6 of Set 9 | tutoia

Processing Record 7 of Set 9 | tazmalt

Processing Record 8 of Set 9 | lavrentiya

Processing Record 9 of Set 9 | sarmanovo

Processing Record 10 of Set 9 | edgewater

Processing Record 11 of Set 9 | gushikawa

Processing Record 12 of Set 9 | kalmunai

Processing Record 13 of Set 9 | houma

Processing Record 14 of Set 9 | vila

Processing Record 15 of Set 9 | umba

Processing Record 16 of Set 9 | pevek

Processing Record 17 of Set 9 | adrar

Processing Record 18 of Set 9 | termiz

Processing Record 19 of Set 9 | luanda

Processing Record 20 of Set 9 | maniitsoq

Processing Record 21 of Set 9 | yuncheng

Processing Record 22 of Set 9 | port shepstone

Processing Record 23 of Set 9 | truth or consequences

Processing Record 24 of Set 9 | acapulco

Processing Record 25 of Set 9 | necochea

Processing Record 26 of Set 9 | broome

Processing Record 27 of Set 9 | laredo

Processing Record 28 of Set 9 | paradwip

City not found. Skipping...

Processing Record 29 of Set 9 | fort smith

Processing Record 30 of Set 9 | comodoro rivadavia

Processing Record 31 of Set 9 | ferme-neuve

Processing Record 32 of Set 9 | dengzhou

Processing Record 33 of Set 9 | kamennogorsk

Processing Record 34 of Set 9 | padang

Processing Record 35 of Set 9 | sorvag

City not found. Skipping...

Processing Record 36 of Set 9 | sorland

Processing Record 37 of Set 9 | huangchuan

Processing Record 38 of Set 9 | alofi

Processing Record 39 of Set 9 | sur

Processing Record 40 of Set 9 | tocopilla

Processing Record 41 of Set 9 | rudbar

City not found. Skipping...

Processing Record 42 of Set 9 | galesong

Processing Record 43 of Set 9 | paamiut

Processing Record 44 of Set 9 | narsaq

Processing Record 45 of Set 9 | sungaipenuh

Processing Record 46 of Set 9 | papara

Processing Record 47 of Set 9 | kuche

City not found. Skipping...

Processing Record 48 of Set 9 | isangel

Processing Record 49 of Set 9 | kamyshlov

Processing Record 0 of Set 10 | ponta do sol

Processing Record 1 of Set 10 | lengshuitan

Processing Record 2 of Set 10 | thinadhoo

Processing Record 3 of Set 10 | saint anthony

Processing Record 4 of Set 10 | yulara

Processing Record 5 of Set 10 | kokopo

Processing Record 6 of Set 10 | iqaluit

Processing Record 7 of Set 10 | longyearbyen

Processing Record 8 of Set 10 | los llanos de aridane

Processing Record 9 of Set 10 | hayden

Processing Record 10 of Set 10 | erzurum

Processing Record 11 of Set 10 | bonthe

Processing Record 12 of Set 10 | ketchikan

Processing Record 13 of Set 10 | barkhan

Processing Record 14 of Set 10 | euclides da cunha

Processing Record 15 of Set 10 | sanghar

Processing Record 16 of Set 10 | te anau

Processing Record 17 of Set 10 | valleyview

Processing Record 18 of Set 10 | cidreira

Processing Record 19 of Set 10 | banda aceh

Processing Record 20 of Set 10 | tagusao

Processing Record 21 of Set 10 | terrace

Processing Record 22 of Set 10 | el chichicaste

Processing Record 23 of Set 10 | gberia fotombu

Processing Record 24 of Set 10 | ranir bazar

Processing Record 25 of Set 10 | grindsted

Processing Record 26 of Set 10 | katsuura

Processing Record 27 of Set 10 | qaqortoq

Processing Record 28 of Set 10 | pontes e lacerda

Processing Record 29 of Set 10 | bata

Processing Record 30 of Set 10 | kingston

Processing Record 31 of Set 10 | aleksandrovka

Processing Record 32 of Set 10 | vostok

Processing Record 33 of Set 10 | puerto madryn

Processing Record 34 of Set 10 | yuzhnyy

Processing Record 35 of Set 10 | bulungu

Processing Record 36 of Set 10 | kollam

Processing Record 37 of Set 10 | progreso

Processing Record 38 of Set 10 | visby

Processing Record 39 of Set 10 | ilebo

Processing Record 40 of Set 10 | ajdabiya

Processing Record 41 of Set 10 | maine-soroa

Processing Record 42 of Set 10 | sayreville

Processing Record 43 of Set 10 | palana

Processing Record 44 of Set 10 | acajutiba

Processing Record 45 of Set 10 | lakatoro

Processing Record 46 of Set 10 | solsvik

City not found. Skipping...

Processing Record 47 of Set 10 | lakes entrance

Processing Record 48 of Set 10 | ludza

Processing Record 49 of Set 10 | zvishavane

Processing Record 0 of Set 11 | mao

Processing Record 1 of Set 11 | seaham

Processing Record 2 of Set 11 | kaa-khem

Processing Record 3 of Set 11 | grindavik

Processing Record 4 of Set 11 | pangody

Processing Record 5 of Set 11 | zhuzhou

Processing Record 6 of Set 11 | clyde river

Processing Record 7 of Set 11 | estelle

Processing Record 8 of Set 11 | ulaanbaatar

Processing Record 9 of Set 11 | victoria point

Processing Record 10 of Set 11 | flores

Processing Record 11 of Set 11 | cairns

Processing Record 12 of Set 11 | beyneu

Processing Record 13 of Set 11 | hoquiam

Processing Record 14 of Set 11 | kurilsk

Processing Record 15 of Set 11 | albuquerque

Processing Record 16 of Set 11 | tomatlan

Processing Record 17 of Set 11 | blackfoot

Processing Record 18 of Set 11 | anito

Processing Record 19 of Set 11 | meybod

Processing Record 20 of Set 11 | muscat

Processing Record 21 of Set 11 | san patricio

Processing Record 22 of Set 11 | pali

Processing Record 23 of Set 11 | atambua

Processing Record 24 of Set 11 | mocambique

City not found. Skipping...

Processing Record 25 of Set 11 | kuytun

Processing Record 26 of Set 11 | lamu

Processing Record 27 of Set 11 | bandarbeyla

Processing Record 28 of Set 11 | eenhana

Processing Record 29 of Set 11 | newburn

Processing Record 30 of Set 11 | changli

Processing Record 31 of Set 11 | toowoomba

Processing Record 32 of Set 11 | banjar

Processing Record 33 of Set 11 | hohhot

Processing Record 34 of Set 11 | debre birhan

Processing Record 35 of Set 11 | nelson bay

Processing Record 36 of Set 11 | sibu

Processing Record 37 of Set 11 | black river

City not found. Skipping...

Processing Record 38 of Set 11 | thaba-tseka

Processing Record 39 of Set 11 | hobyo

Processing Record 40 of Set 11 | bela vista de goias

Processing Record 41 of Set 11 | ugoofaaru

Processing Record 42 of Set 11 | dali

Processing Record 43 of Set 11 | kadaya

Processing Record 44 of Set 11 | kensington

Processing Record 45 of Set 11 | zhigansk

Processing Record 46 of Set 11 | merritt island

Processing Record 47 of Set 11 | yamada

Processing Record 48 of Set 11 | kamenskoye

City not found. Skipping...

Processing Record 49 of Set 11 | baghdad

Processing Record 0 of Set 12 | havre-saint-pierre

Processing Record 1 of Set 12 | alta floresta

Processing Record 2 of Set 12 | rio grande

Processing Record 3 of Set 12 | wuwei

Processing Record 4 of Set 12 | arman

Processing Record 5 of Set 12 | salamiyah

Processing Record 6 of Set 12 | vestmannaeyjar

Processing Record 7 of Set 12 | dondo

Processing Record 8 of Set 12 | gallup

Processing Record 9 of Set 12 | micheweni

Processing Record 10 of Set 12 | yanam

Processing Record 11 of Set 12 | nipawin

Processing Record 12 of Set 12 | jalu

Processing Record 13 of Set 12 | brae

Processing Record 14 of Set 12 | alappuzha

City not found. Skipping...

Processing Record 15 of Set 12 | leonidovo

Processing Record 16 of Set 12 | krasnyy yar

Processing Record 17 of Set 12 | nyimba

Processing Record 18 of Set 12 | simao

Processing Record 19 of Set 12 | kharsia

Processing Record 20 of Set 12 | asekeyevo

Processing Record 21 of Set 12 | haibowan

City not found. Skipping...

Processing Record 22 of Set 12 | les herbiers

Processing Record 23 of Set 12 | bonavista

Processing Record 24 of Set 12 | belaya gora

Processing Record 25 of Set 12 | gao

Processing Record 26 of Set 12 | yerbogachen

Processing Record 27 of Set 12 | porechye-rybnoye

Processing Record 28 of Set 12 | san andres

Processing Record 29 of Set 12 | fairbanks

Processing Record 30 of Set 12 | george

Processing Record 31 of Set 12 | bradford

Processing Record 32 of Set 12 | lago da pedra

City not found. Skipping...

Processing Record 33 of Set 12 | jomalig

City not found. Skipping...

Processing Record 34 of Set 12 | port lincoln

Processing Record 35 of Set 12 | carutapera

Processing Record 36 of Set 12 | awjilah

Processing Record 37 of Set 12 | naryan-mar

Processing Record 38 of Set 12 | la ronge

Processing Record 39 of Set 12 | natal

Processing Record 40 of Set 12 | nevsehir

Processing Record 41 of Set 12 | turayf

Processing Record 42 of Set 12 | temiscaming

Processing Record 43 of Set 12 | gardan diwal

City not found. Skipping...

Processing Record 44 of Set 12 | kupang

Processing Record 45 of Set 12 | port-cartier

Processing Record 46 of Set 12 | storm lake

Processing Record 47 of Set 12 | manokwari

Processing Record 48 of Set 12 | julich

Processing Record 49 of Set 12 | makung

City not found. Skipping...

Processing Record 0 of Set 13 | viedma

Processing Record 1 of Set 13 | dolbeau

City not found. Skipping...

Processing Record 2 of Set 13 | sarkand

Processing Record 3 of Set 13 | jhang

Processing Record 4 of Set 13 | naze

Processing Record 5 of Set 13 | zory

Processing Record 6 of Set 13 | labuan

Processing Record 7 of Set 13 | luwuk

Processing Record 8 of Set 13 | sao felix do xingu

Processing Record 9 of Set 13 | fonte boa

Processing Record 10 of Set 13 | mahibadhoo

Processing Record 11 of Set 13 | loukhi

Processing Record 12 of Set 13 | mount isa

Processing Record 13 of Set 13 | kargasok

Processing Record 14 of Set 13 | mandera

Processing Record 15 of Set 13 | praya

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Data Retrieval Complete

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# Convert array of JSONs into Pandas DataFrame

city\_data\_pd = pd.DataFrame(city\_data)

# Extract relevant fields from the data frame

lats = city\_data\_pd["Lat"]

max\_temps = city\_data\_pd["Max Temp"]

humidity = city\_data\_pd["Humidity"]

cloudiness = city\_data\_pd["Cloudiness"]

wind\_speed = city\_data\_pd["Wind Speed"]

# Export the City\_Data into a csv

city\_data\_pd.to\_csv(output\_data\_file, index\_label="City\_ID")

# Show Record Count

city\_data\_pd.count()

City 616

Cloudiness 616

Country 616

Date 616

Humidity 616

Lat 616

Lng 616

Max Temp 616

Wind Speed 616

dtype: int64

# Display the City Data Frame

city\_data\_pd.head()

|  | City | Cloudiness | Country | Date | Humidity | Lat | Lng | Max Temp | Wind Speed |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 | longyearbyen | 75 | SJ | 1483588200 | 73 | 78.22 | 15.64 | 26.6 | 19.46 |
| 1 | asau | 0 | RO | 1483592400 | 59 | 46.43 | 26.40 | 37.4 | 14.99 |
| 2 | hartselle | 1 | US | 1483592280 | 86 | 34.44 | -86.94 | 32.0 | 3.36 |
| 3 | komsomolskiy | 40 | UZ | 1483592400 | 80 | 40.43 | 71.72 | 37.4 | 3.36 |
| 4 | kapaa | 90 | US | 1483592160 | 88 | 22.08 | -159.32 | 71.6 | 17.22 |

Latitude vs. Temperature Plot

# Build scatter plot for latitude vs. temperature

plt.scatter(lats,

max\_temps,

edgecolor="black", linewidths=1, marker="o",

alpha=0.8, label="Cities")

# Incorporate the other graph properties

plt.title("City Latitude vs. Max Temperature (%s)" % time.strftime("%x"))

plt.ylabel("Max Temperature (F)")

plt.xlabel("Latitude")

plt.grid(True)

# Save the figure

plt.savefig("output\_data/Fig1.png")

# Show plot

plt.show()

https://github.com/RutgersCodingBootcamp/RUTJER201809DATA3/blob/master/06-Python-APIs/Homework/Solutions/output\_data/Fig2.png

Latitude vs. Humidity Plot

# Build the scatter plots for latitude vs. humidity plot

plt.scatter(lats,

humidity,

edgecolor="black", linewidths=1, marker="o",

alpha=0.8, label="Cities")

# Incorporate the other graph properties

plt.title("City Latitude vs. Humidity (%s)" % time.strftime("%x"))

plt.ylabel("Humidity (%)")

plt.xlabel("Latitude")

plt.grid(True)

# Save the figure

plt.savefig("output\_data/Fig2.png")

# Show plot

plt.show()

https://github.com/RutgersCodingBootcamp/RUTJER201809DATA3/blob/master/06-Python-APIs/Homework/Solutions/output\_data/Fig2.png

Latitude vs. Cloudiness Plot

# Build the scatter plots for latitude vs. cloudiness plot

plt.scatter(lats,

cloudiness,

edgecolor="black", linewidths=1, marker="o",

alpha=0.8, label="Cities")

# Incorporate the other graph properties

plt.title("City Latitude vs. Cloudiness (%s)" % time.strftime("%x"))

plt.ylabel("Cloudiness (%)")

plt.xlabel("Latitude")

plt.grid(True)

# Save the figure

plt.savefig("output\_data/Fig3.png")

# Show plot

plt.show()

https://github.com/RutgersCodingBootcamp/RUTJER201809DATA3/blob/master/06-Python-APIs/Homework/Solutions/output\_data/Fig2.png

Latitude vs. Wind Speed Plot

# Build the scatter plots for latitude vs. wind speed plot

plt.scatter(lats,

wind\_speed,

edgecolor="black", linewidths=1, marker="o",

alpha=0.8, label="Cities")

# Incorporate the other graph properties

plt.title("City Latitude vs. Wind Speed (%s)" % time.strftime("%x"))

plt.ylabel("Wind Speed (mph)")

plt.xlabel("Latitude")

plt.grid(True)

# Save the figure

plt.savefig("output\_data/Fig4.png")

# Show plot

plt.show()

https://github.com/RutgersCodingBootcamp/RUTJER201809DATA3/blob/master/06-Python-APIs/Homework/Solutions/output\_data/Fig2.png