

WeatherPy-SEngeling-Final

Analysis

- The weather is warmer the closer a city is to the equator (0 degrees Latitude), but at this time of year the areas of the southern hemisphere are already very warm while there is a dramatic drop in temperature the farther into the northern hemisphere.
- There isn't a clear relationship between latitude and cloudiness. However, there are strong bands of cities at 0, 75, and 90% cloudiness.
- There isn't a clear relationship between latitude and wind speed. However, in both hemispheres there are a smattering of cities that have winds over 20 mph.

```
In [1]: from datetime import datetime
```

```
In [2]: # Dependencies and Setup
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
import requests
import time
from datetime import date

# Import API key
from config import api_key

# Incorporated citipy to determine city based on Latitude and Longitude
from citipy import citipy
```

```
In [3]: # 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 [4]: # 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 our cities list
    if city not in cities:
        cities.append(city)

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

Out[4]: 615

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's being processed (with the city number and city name).

```

In [5]: # base url for open weather map
url = "http://api.openweathermap.org/data/2.5/weather?"
# define the units as imperial to get fahrenheit data
units = "imperial"

# build a function to iterate through "cities" list and return data from open
weather map
def find_weather(city):

    #query url with api_key, units and the city from the "cities" list
    query_url = f"{url}appid={api_key}&units={units}&q={city}&cnt=50"

    # request the response from openweathermap.com
    response = requests.get(query_url).json()
    # print a response that lets the user know it is collecting weather data f
or the city in "cities" list
    print(f"Locating data for {city}.")

    # try to pull various pieces of data out of open weather map
    try:
        country = response['sys']['country']
        latitude = response['coord']['lat']
        longitude = response['coord']['lon']
        max_temp = response['main']['temp_max']
        humid = response['main']['humidity']
        cloud = response['clouds']['all']
        wind = response['wind']['speed']
        date = response['dt']

        # if the data is found, return the variables and put them in a diction
ary
        return {
            'city': city,
            'country': country,
            'latitude': latitude,
            'longitude': longitude,
            'max_temp': max_temp,
            'humidity': humid,
            'cloudiness': cloud,
            'wind_speed': wind,
            'date': date
        }

    # handle exceptions for key or index errors and print a message to let the
user know that the city is being skipped
    except (KeyError, IndexError):
        print(f"data for {city} not found... skipping.")

    # if data is not found, return NaN from numpy
    return {
        'city': city,
        'country': np.nan,
        'latitude': np.nan,
        'longitude': np.nan,
        'max_temp': np.nan,
        'humidity': np.nan,
        'cloudiness': np.nan,

```

```
        'wind_speed': np.nan,  
        'date': np.nan  
    }  
    # create an exception to handle any timeout or connection errors thrown wh  
en pulling the city data  
    except Exception:  
        print(f"Timed out trying to find {city}. :(")  
        pass  
  
# use the above function to find the weather data for each city in "cities" li  
st and assign it to a variable  
weather_records = [find_weather(city) for city in cities]
```

Locating data for myaundzha.
Locating data for albany.
Locating data for ushuaia.
Locating data for buala.
Locating data for hermanus.
Locating data for turukhansk.
Locating data for port elizabeth.
Locating data for kaeo.
Locating data for soure.
Locating data for novaya malykla.
Locating data for cape town.
Locating data for namatanai.
Locating data for lebu.
Locating data for xichang.
Locating data for bredasdorp.
Locating data for sioux lookout.
Locating data for marsh harbour.
Locating data for bosaso.
Locating data for kapaa.
Locating data for mvangue.
Locating data for mar del plata.
Locating data for rikitea.
Locating data for punta arenas.
Locating data for yanam.
Locating data for mapiripan.
Locating data for sao filipe.
Locating data for seevetal.
Locating data for pathein.
Locating data for komsomolskiy.
Locating data for new norfolk.
Locating data for carnarvon.
Locating data for taolanaro.
data for taolanaro not found... skipping.
Locating data for castro.
Locating data for hobart.
Locating data for hithadhoo.
Locating data for bluff.
Locating data for margate.
Locating data for noumea.
Locating data for mataura.
Locating data for busselton.
Locating data for jiroft.
data for jiroft not found... skipping.
Locating data for barrow.
Locating data for san patricio.
Locating data for upernavik.
Locating data for butaritari.
Locating data for codrington.
Locating data for provideniya.
Locating data for yarmouth.
Locating data for dikson.
Locating data for halifax.
Locating data for avarua.
Locating data for mednogorsk.
Locating data for illoqqortoormiut.
data for illoqqortoormiut not found... skipping.
Locating data for mys shmidta.

data for mys shmidta not found... skipping.
Locating data for east london.
Locating data for sentyabrskiy.
data for sentyabrskiy not found... skipping.
Locating data for saleaula.
data for saleaula not found... skipping.
Locating data for port alfred.
Locating data for ardakan.
Locating data for ulladulla.
Locating data for mahebourg.
Locating data for chokurdakh.
Locating data for bilma.
Locating data for turan.
Locating data for baculin.
Locating data for antipovka.
Locating data for barentsburg.
data for barentsburg not found... skipping.
Locating data for paradise.
Locating data for port-gentil.
Locating data for victoria.
Locating data for tuy hoa.
Locating data for atuona.
Locating data for amderma.
data for amderma not found... skipping.
Locating data for koumra.
Locating data for nanortalik.
Locating data for airai.
Locating data for ancud.
Locating data for lagoa.
Locating data for hilo.
Locating data for lasa.
Locating data for brae.
Locating data for samarai.
Locating data for saint george.
Locating data for sitka.
Locating data for san juan.
Locating data for saskylakh.
Locating data for yellowknife.
Locating data for neiafu.
Locating data for kesennuma.
data for kesennuma not found... skipping.
Locating data for hamilton.
Locating data for geresk.
data for geresk not found... skipping.
Locating data for geraldton.
Locating data for bambous virieux.
Locating data for dien bien.
data for dien bien not found... skipping.
Locating data for zemio.
Locating data for rio grande.
Locating data for armacao de pera.
Locating data for simplicio mendes.
Locating data for arbazh.
Locating data for coahuayana.
Locating data for taseyevo.
Locating data for khatanga.
Locating data for fort nelson.

Locating data for tankhoy.
Locating data for matagami.
Locating data for bosobolo.
Locating data for namibe.
Locating data for bongandanga.
Locating data for samusu.
data for samusu not found... skipping.
Locating data for okha.
Locating data for nome.
Locating data for paamiut.
Locating data for qaqortoq.
Locating data for norman wells.
Locating data for tocopilla.
Locating data for honningsvag.
Locating data for lata.
Locating data for makakilo city.
Locating data for thompson.
Locating data for cidreira.
Locating data for vanimo.
Locating data for zmievka.
data for zmievka not found... skipping.
Locating data for leningradskiy.
Locating data for bengkulu.
data for bengkulu not found... skipping.
Locating data for viedma.
Locating data for cherskiy.
Locating data for jiaocheng.
Locating data for santa isabel.
Locating data for fillan.
Locating data for gorontalo.
Locating data for clyde river.
Locating data for bay-khaak.
Locating data for kaputa.
Locating data for puerto ayora.
Locating data for belinskiy.
Locating data for louisville.
Locating data for aksu.
Locating data for caledon.
Locating data for matay.
Locating data for ahipara.
Locating data for guerrero negro.
Locating data for aswan.
Locating data for tiksi.
Locating data for zhaocheng.
data for zhaocheng not found... skipping.
Locating data for utrera.
Locating data for arraial do cabo.
Locating data for attawapiskat.
data for attawapiskat not found... skipping.
Locating data for dukat.
Locating data for ahome.
Locating data for marzuq.
Locating data for rosetta.
Locating data for jamestown.
Locating data for pindiga.
Locating data for qaanaaq.
Locating data for belcesti.

Locating data for biak.
Locating data for camabatela.
Locating data for belmonte.
Locating data for utiroa.
data for utiroa not found... skipping.
Locating data for severo-kurilsk.
Locating data for cairns.
Locating data for torbay.
Locating data for san julian.
Locating data for jiwani.
Locating data for tokur.
Locating data for ardistan.
data for ardistan not found... skipping.
Locating data for coolum beach.
Locating data for hanmer springs.
Locating data for port hardy.
Locating data for solnechnyy.
Locating data for aranos.
Locating data for nantucket.
Locating data for ponta do sol.
Locating data for bowen.
Locating data for meulaboh.
Locating data for nouadhibou.
Locating data for pravia.
Locating data for kargasok.
Locating data for poum.
Locating data for bethel.
Locating data for veraval.
Locating data for beruwala.
Locating data for uusikaupunki.
Locating data for husavik.
Locating data for methven.
Locating data for mayo.
Locating data for nikolskoye.
Locating data for talnakh.
Locating data for xingyi.
Locating data for tsihombe.
data for tsihombe not found... skipping.
Locating data for port blair.
Locating data for paka.
Locating data for finnsnes.
Locating data for warqla.
data for warqla not found... skipping.
Locating data for faya.
Locating data for vaini.
Locating data for rio gallegos.
Locating data for bafq.
Locating data for dubbo.
Locating data for dergachi.
Locating data for marawi.
Locating data for canitas.
data for canitas not found... skipping.
Locating data for chuy.
Locating data for safwah.
data for safwah not found... skipping.
Locating data for kapit.
Locating data for les cayes.

Locating data for parabel.
Locating data for ilinsko-podonskoye.
data for ilinsko-podonskoye not found... skipping.
Locating data for road town.
Locating data for luderitz.
Locating data for tuatapere.
Locating data for la asuncion.
Locating data for mergui.
data for mergui not found... skipping.
Locating data for marcona.
data for marcona not found... skipping.
Locating data for tasiilaq.
Locating data for arroyo.
Locating data for ribeira grande.
Locating data for shingu.
Locating data for luanda.
Locating data for bairiki.
data for bairiki not found... skipping.
Locating data for sungairaya.
Locating data for mount isa.
Locating data for tabiauea.
data for tabiauea not found... skipping.
Locating data for envira.
data for envira not found... skipping.
Locating data for chamarel.
data for chamarel not found... skipping.
Locating data for west milford.
Locating data for kolondieba.
Locating data for westport.
Locating data for teguise.
Locating data for nizhneyansk.
data for nizhneyansk not found... skipping.
Locating data for kununurra.
Locating data for lyuban.
Locating data for cabra.
Locating data for seoul.
Locating data for zhezkazgan.
Locating data for formosa do rio preto.
Locating data for malakal.
data for malakal not found... skipping.
Locating data for tsogni.
Locating data for grindavik.
Locating data for abu samrah.
Locating data for tongzi.
Locating data for lakes entrance.
Locating data for longyearbyen.
Locating data for bandarbeyla.
Locating data for emba.
Locating data for omboue.
Locating data for faanui.
Locating data for blagoyevo.
Locating data for georgetown.
Locating data for praia da vitoria.
Locating data for dobryanka.
Locating data for constitucion.
Locating data for bahia blanca.
Locating data for bathsheba.

Locating data for yeppoon.
Locating data for chapais.
Locating data for jasper.
Locating data for tuktoyaktuk.
Locating data for belushya guba.
data for belushya guba not found... skipping.
Locating data for saint-philippe.
Locating data for pestovo.
Locating data for langsa.
Locating data for guelengdeng.
data for guelengdeng not found... skipping.
Locating data for los llanos de aridane.
Locating data for umm durman.
data for umm durman not found... skipping.
Locating data for iqaluit.
Locating data for leshukonskoye.
Locating data for blythe.
Locating data for vao.
Locating data for maghama.
data for maghama not found... skipping.
Locating data for isangel.
Locating data for berlevag.
Locating data for tilichiki.
Locating data for kusti.
data for kusti not found... skipping.
Locating data for pangnirtung.
Locating data for igarka.
Locating data for newberg.
Locating data for warmbad.
Locating data for kudahuvadhoo.
Locating data for general roca.
Locating data for gallup.
Locating data for mitchell.
Locating data for arona.
Locating data for lavrentiya.
Locating data for esperance.
Locating data for rovenki.
Locating data for zhigansk.
Locating data for tiarei.
Locating data for havoyund.
Locating data for acapulco.
Locating data for nhulunbuy.
Locating data for cockburn town.
Locating data for kaspiyskiy.
Locating data for hervey bay.
Locating data for san andres.
Locating data for bilibino.
Locating data for padang.
Locating data for puerto leguizamo.
Locating data for lancaster.
Locating data for choma.
Locating data for pevek.
Locating data for dhamtari.
Locating data for omsukchan.
Locating data for kaitangata.
Locating data for cabo san lucas.
Locating data for imelda.

Locating data for emerald.
Locating data for pombas.
Locating data for altamira.
Locating data for utiel.
Locating data for beidao.
Locating data for kastamonu.
Locating data for buenos aires.
Locating data for lolua.
data for lolua not found... skipping.
Locating data for paro.
Locating data for ust-kuyga.
Locating data for puerto escondido.
Locating data for riyadh.
Locating data for chara.
Locating data for nemuro.
Locating data for palabuhanratu.
data for palabuhanratu not found... skipping.
Locating data for middelburg.
Locating data for parana.
Locating data for alamos.
Locating data for lakewood.
Locating data for sri aman.
Locating data for atherton.
Locating data for beloha.
Locating data for san jose.
Locating data for conakry.
Locating data for santa cruz.
Locating data for kodiak.
Locating data for deputatskiy.
Locating data for tigzirt.
Locating data for pinyug.
Locating data for french harbor.
Locating data for ovalle.
Locating data for la rioja.
Locating data for otradnoye.
Locating data for santa maria.
Locating data for atambua.
Locating data for ishigaki.
Locating data for yulara.
Locating data for aketi.
Locating data for asbestos.
Locating data for portland.
Locating data for harper.
Locating data for bulungu.
Locating data for olinda.
Locating data for dakoro.
Locating data for waldoboro.
Locating data for vaitupu.
data for vaitupu not found... skipping.
Locating data for batagay-alyta.
Locating data for inhambane.
Locating data for erzin.
Locating data for high level.
Locating data for arlit.
Locating data for lompoc.
Locating data for balimo.
data for balimo not found... skipping.

Locating data for mayumba.
Locating data for touros.
Locating data for the valley.
Locating data for kirakira.
Locating data for tabas.
Locating data for sydney.
Locating data for katsuura.
Locating data for shu.
Locating data for turmalina.
Locating data for gornopravdinsk.
Locating data for fez.
Locating data for saint-joseph.
Locating data for palembang.
Locating data for haines junction.
Locating data for kawalu.
Locating data for hailar.
Locating data for narayangarh.
Locating data for saint-francois.
Locating data for patos de minas.
Locating data for kasongo-lunda.
Locating data for vastervik.
data for vastervik not found... skipping.
Locating data for luganville.
Locating data for riohacha.
Locating data for jucurutu.
Locating data for chernyshevskiy.
Locating data for quatre cocos.
Locating data for gogrial.
data for gogrial not found... skipping.
Locating data for flinders.
Locating data for hirara.
Locating data for atikokan.
Locating data for huarmey.
Locating data for pandan.
Locating data for manggar.
Locating data for puerto colombia.
Locating data for sorland.
Locating data for boryslav.
Locating data for trofors.
Locating data for jalu.
Locating data for strezhevoy.
Locating data for cururupu.
Locating data for tahoua.
Locating data for vila franca do campo.
Locating data for tanout.
Locating data for mahur.
Locating data for beinamar.
Locating data for alofi.
Locating data for we.
data for we not found... skipping.
Locating data for rudnogorsk.
Locating data for saldanha.
Locating data for playas.
Locating data for praya.
Locating data for gamba.
Locating data for klaksvik.
Locating data for tiruvottiyur.

data for tiruvottiyur not found... skipping.
Locating data for hailey.
Locating data for dingle.
Locating data for severo-yeniseyskiy.
Locating data for carutapera.
Locating data for dakar.
Locating data for kruisfontein.
Locating data for la ronge.
Locating data for laguna.
Locating data for mae hong son.
Locating data for labuhan.
Locating data for adre.
Locating data for olafsvik.
data for olafsvik not found... skipping.
Locating data for oktyabrskiy.
Locating data for evensk.
Locating data for falealupo.
data for falealupo not found... skipping.
Locating data for erenhot.
Locating data for porto novo.
Locating data for moron.
Locating data for lambarene.
Locating data for gravdal.
Locating data for guapiacu.
Locating data for achisay.
data for achisay not found... skipping.
Locating data for ngukurr.
data for ngukurr not found... skipping.
Locating data for piacabucu.
Locating data for vestmannaeyjar.
Locating data for kungurtug.
Locating data for deming.
Locating data for port macquarie.
Locating data for donskoye.
Locating data for khilok.
Locating data for sao joao do piaui.
Locating data for cayenne.
Locating data for fortuna.
Locating data for petatlan.
Locating data for la paz.
Locating data for maine-soroa.
Locating data for homer.
Locating data for agboville.
Locating data for narsaq.
Locating data for erithrai.
data for erithrai not found... skipping.
Locating data for sao joao da barra.
Locating data for ypsilanti.
Locating data for fuerte olimpo.
Locating data for umm lajj.
Locating data for katherine.
Locating data for nata.
Locating data for synya.
Locating data for challapata.
Locating data for lingu.
Locating data for ilulissat.
Locating data for jackson.

Locating data for kurchum.
Locating data for xining.
Locating data for kaniama.
Locating data for santander.
Locating data for dongning.
Locating data for goderich.
Locating data for adrar.
Locating data for mrirt.
data for mrirt not found... skipping.
Locating data for nouna.
Locating data for kavieng.
Locating data for karasjok.
Locating data for kawambwa.
Locating data for egvekinot.
Locating data for melfi.
Locating data for kampot.
Locating data for marshall.
Locating data for liling.
Locating data for mbigou.
Locating data for maltahohe.
Locating data for virginia beach.
Locating data for sun city west.
Locating data for benalla.
Locating data for anadyr.
Locating data for athabasca.
Locating data for pozo colorado.
Locating data for oksfjord.
Locating data for kamenskoye.
data for kamenskoye not found... skipping.
Locating data for yazd.
Locating data for khvorostyanka.
Locating data for puerto maldonado.
Locating data for russell.
Locating data for escanaba.
Locating data for grand river south east.
data for grand river south east not found... skipping.
Locating data for matara.
Locating data for praia.
Locating data for terney.
Locating data for mangai.
Locating data for ambon.
Locating data for gushikawa.
Locating data for lazaro cardenas.
Locating data for muyezerkiy.
Locating data for gaoua.
Locating data for pisco.
Locating data for wad rawah.
Locating data for grand gaube.
Locating data for souillac.
Locating data for mogadouro.
Locating data for tezu.
Locating data for orimattila.
Locating data for comodoro rivadavia.
Locating data for tokonou.
Locating data for yenagoa.
Locating data for darovskoy.
Locating data for port hawkesbury.

Locating data for tandil.
Locating data for ponazyrevo.
Locating data for dunedin.
Locating data for kourou.
Locating data for vallenar.
Locating data for gurskoye.
data for gurskoye not found... skipping.
Locating data for nabire.
Locating data for el balyana.
data for el balyana not found... skipping.
Locating data for najran.
Locating data for warrnambool.
Locating data for mokokchung.
Locating data for kachikau.
data for kachikau not found... skipping.
Locating data for roald.
Locating data for biloela.
Locating data for port lincoln.
Locating data for sabla.
Locating data for baykit.
Locating data for loei.
Locating data for marsa matruh.
Locating data for lebedinyy.
Locating data for nadym.
Locating data for rocha.
Locating data for aykhal.
Locating data for calama.
Locating data for dondaicha.
Locating data for amazar.
Locating data for mocambique.
data for mocambique not found... skipping.
Locating data for blonduos.
data for blonduos not found... skipping.
Locating data for waverly.
Locating data for okhotsk.
Locating data for coos bay.
Locating data for bergen.
data for bergen not found... skipping.
Locating data for bubaque.
Locating data for vanavara.
Locating data for hofn.
Locating data for trapani.
Locating data for auki.
Locating data for juba.
Locating data for maceio.
Locating data for paita.
Locating data for oriximina.
Locating data for madang.
Locating data for hasaki.
Locating data for sur.
Locating data for villa vazquez.
data for villa vazquez not found... skipping.
Locating data for pacov.
Locating data for katunayaka.
data for katunayaka not found... skipping.
Locating data for turtas.
Locating data for te anau.

Locating data for puerto madryn.
Locating data for ovre ardal.
Locating data for saint anthony.
Locating data for little current.
Locating data for aktash.
data for aktash not found... skipping.
Locating data for hare bay.
Locating data for qixingtai.
Locating data for hovd.
Locating data for taltal.
Locating data for kavaratti.
Locating data for traverse city.
Locating data for plettenberg bay.
Locating data for boyolangu.
Locating data for suhbaatar.
Locating data for snyder.
Locating data for jahrom.
data for jahrom not found... skipping.
Locating data for floro.
Locating data for quelimane.
Locating data for tautira.
Locating data for sijunjung.
Locating data for naftah.
data for naftah not found... skipping.
Locating data for martapura.
Locating data for sault sainte marie.
Locating data for pingliang.
Locating data for poronaysk.
Locating data for lorengau.
Locating data for butembo.
Locating data for sechura.
Locating data for juegang.
Locating data for george.
Locating data for santiago de cao.
Locating data for miahuatlan.
data for miahuatlan not found... skipping.
Locating data for stornoway.
data for stornoway not found... skipping.
Locating data for givors.
Locating data for loa janan.
Locating data for atar.
Locating data for maragogi.
Locating data for burica.
data for burica not found... skipping.
Locating data for kazerun.
Locating data for hami.
Locating data for sibolga.
Locating data for vostok.
Locating data for karoï.
Locating data for progreso.
Locating data for novyye burasy.
Locating data for denpasar.
Locating data for hobyo.
Locating data for barawe.
data for barawe not found... skipping.

Convert Raw Data to DataFrame

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

```
In [6]: # create a data frame out of the data
df = pd.DataFrame(weather_records)

#df.columns

# give the columns of the dataframe an order and index and print the df
df = df[['city', 'country', 'latitude', 'longitude', 'max_temp', 'humidity',
'cloudiness', 'wind_speed', 'date']].set_index('city')
df['date'] = pd.to_datetime(df['date'], unit='s')
date = str(datetime.now()).split(' ')[0]
date
df
```

Out[6]:

city	country	latitude	longitude	max_temp	humidity	cloudiness	wind_speed	date
myaundzha	RU	63.05	147.18	-11.75	67.0	56.0	3.60	2010-03-01 00:00:00
albany	US	42.65	-73.75	26.01	48.0	90.0	5.82	2010-03-01 23:57:00
ushuaia	AR	-54.81	-68.31	42.80	75.0	40.0	29.97	2010-03-01 23:00:00
buala	SB	-8.15	159.59	85.91	80.0	80.0	8.41	2010-03-01 00:00:00
hermanus	ZA	-34.42	19.24	69.01	80.0	0.0	10.00	2010-03-01 23:46:00
turukhansk	RU	65.80	87.96	13.46	91.0	80.0	14.00	2010-03-01 00:00:00
port elizabeth	US	39.31	-74.98	34.00	58.0	1.0	4.70	2010-03-01 00:00:00
kaeo	NZ	-35.10	173.78	73.99	61.0	0.0	1.99	2010-03-01 23:38:00
soure	PT	40.06	-8.63	57.99	93.0	75.0	19.46	2010-03-01 00:00:00
novaya malykla	RU	54.21	49.93	35.15	93.0	92.0	21.05	2010-03-01 00:00:00
cape town	ZA	-33.93	18.42	70.00	88.0	0.0	6.93	2010-03-01 23:56:00
namatanai	PG	-3.66	152.44	84.87	94.0	8.0	7.52	2010-03-01 00:00:00
lebu	ET	8.96	38.73	45.63	89.0	0.0	1.81	2010-03-01 00:00:00
xichang	CN	27.88	102.25	37.71	95.0	100.0	1.70	2010-03-01 00:00:00
bredasdorp	ZA	-34.53	20.04	69.01	88.0	0.0	1.12	2010-03-01 23:46:00
sioux lookout	CA	50.10	-91.92	5.00	50.0	40.0	8.05	2010-03-01 23:00:00

	country	latitude	longitude	max_temp	humidity	cloudiness	wind_speed	da
city								
marsh harbour	BS	26.54	-77.06	77.76	96.0	44.0	14.45	201 03- 23:58:
bosaso	SO	11.28	49.18	77.58	100.0	92.0	4.94	201 03- 00:00:
kapaa	US	22.08	-159.32	77.00	53.0	75.0	18.34	201 03- 23:58:
mvangue	CM	2.97	11.50	69.26	97.0	80.0	2.15	201 03- 00:00:
mar del plata	AR	-46.43	-67.52	61.83	54.0	76.0	24.63	201 03- 00:00:
rikitea	PF	-23.12	-134.97	80.82	97.0	76.0	15.12	201 03- 23:59:
punta arenas	CL	-53.16	-70.91	48.20	52.0	75.0	6.93	201 03- 23:53:
yanam	IN	16.73	82.22	77.76	89.0	44.0	1.25	201 03- 00:00:
mapiripan	CO	2.89	-72.13	87.21	46.0	36.0	6.62	201 03- 23:58:
sao filipe	CV	14.90	-24.50	70.38	97.0	0.0	17.81	201 03- 00:00:
seevetal	DE	53.40	10.02	37.00	87.0	8.0	7.40	201 03- 00:00:
pathein	MM	16.78	94.73	66.65	93.0	68.0	2.59	201 03- 23:56:
komsomolskiy	RU	67.55	63.78	-5.36	53.0	8.0	13.00	201 03- 00:00:
new norfolk	AU	-42.78	147.06	57.20	50.0	75.0	6.93	201 03- 23:59:
...	
tautira	PF	-17.73	-149.15	87.80	66.0	40.0	9.17	201 03- 00:03:
sijunjung	ID	-0.69	100.95	67.23	87.0	44.0	1.25	201 03- 00:03:
naftah	NaN	NaN	NaN	NaN	NaN	NaN	NaN	N:

	country	latitude	longitude	max_temp	humidity	cloudiness	wind_speed	da
city								
martapura	ID	-3.41	114.85	75.20	100.0	40.0	2.24	201 03- 23:00:
sault sainte marie	CA	46.49	-84.36	10.40	84.0	90.0	9.17	201 03- 23:34:
pingliang	CN	35.54	106.68	23.40	70.0	12.0	2.71	201 03- 00:04:
poronaysk	RU	49.22	143.10	17.64	70.0	12.0	4.05	201 03- 00:04:
lorengau	PG	-2.02	147.27	83.34	99.0	20.0	3.83	201 03- 00:04:
butembo	CD	0.12	29.29	59.58	91.0	20.0	2.15	201 03- 00:04:
sechura	PE	-5.56	-80.82	78.98	75.0	32.0	7.40	201 03- 00:04:
juegang	CN	32.31	121.18	46.99	91.0	0.0	8.86	201 03- 00:03:
george	NG	6.63	3.35	82.40	88.0	20.0	2.24	201 03- 23:00:
santiago de cao	PE	-7.96	-79.24	77.00	83.0	75.0	9.17	201 03- 23:00:
miahuatlan	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
stornoway	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
givors	FR	45.58	4.77	50.00	53.0	0.0	11.41	201 03- 00:04:
loa janan	ID	-0.58	117.09	79.02	84.0	20.0	3.04	201 03- 00:04:
atar	MR	20.52	-13.05	55.58	25.0	0.0	5.06	201 03- 23:59:
maragogi	BR	-9.01	-35.22	77.63	95.0	88.0	7.07	201 03- 00:04:
burica	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN
kazerun	IR	29.62	51.65	39.24	74.0	0.0	3.94	201 03- 00:04:

	country	latitude	longitude	max_temp	humidity	cloudiness	wind_speed	date
city								
hami	CN	42.84	93.51	42.21	46.0	76.0	14.00	2010-03-04
sibolga	ID	1.74	98.78	65.34	100.0	0.0	2.15	2010-03-04
vostok	RU	46.45	135.83	23.22	71.0	0.0	3.15	2010-03-04
karoi	ZW	-16.82	29.68	65.21	90.0	36.0	5.73	2010-03-04
progreso	UY	-34.68	-56.22	73.00	78.0	0.0	13.87	2010-03-01
novyye burasy	RU	52.13	46.08	36.00	96.0	0.0	13.42	2010-03-04
denpasar	ID	-8.65	115.22	82.40	83.0	20.0	4.70	2010-03-23
hoby	SO	5.35	48.53	75.78	93.0	32.0	12.77	2010-03-04
barawe	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

615 rows × 8 columns



In [7]: `export_csv = df.to_csv(r'weather.csv', index=None, header=True)`

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.

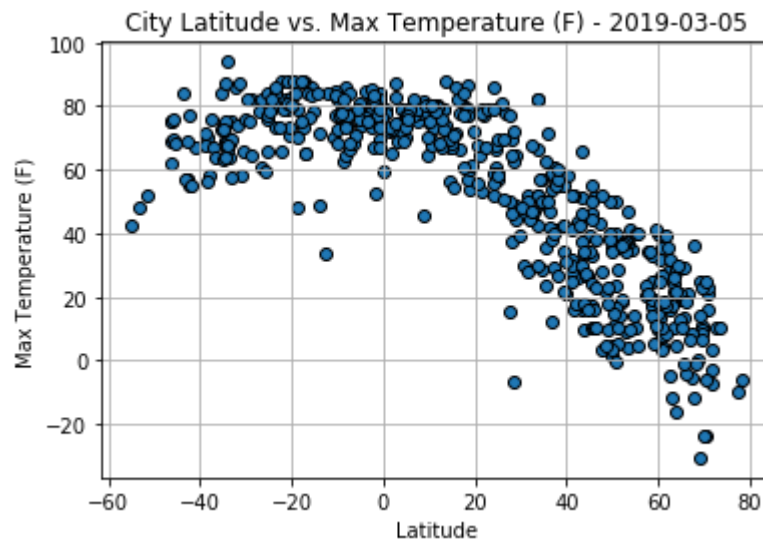
Latitude vs. Temperature Plot

```
In [8]: # Scatter plot for Latitude and maximum temperature
plt.scatter(df["latitude"], df["max_temp"], marker="o", edgecolors="black")

# define the graph properties, title, xlabel, ylabel, and show the grid
plt.title(f"City Latitude vs. Max Temperature (F) - {date}")
plt.ylabel("Max Temperature (F)")
plt.xlabel("Latitude")
plt.grid(True)

# save the figure to a png
plt.savefig("TemperatureInWorldCities.png")

# show the plot
plt.show()
```



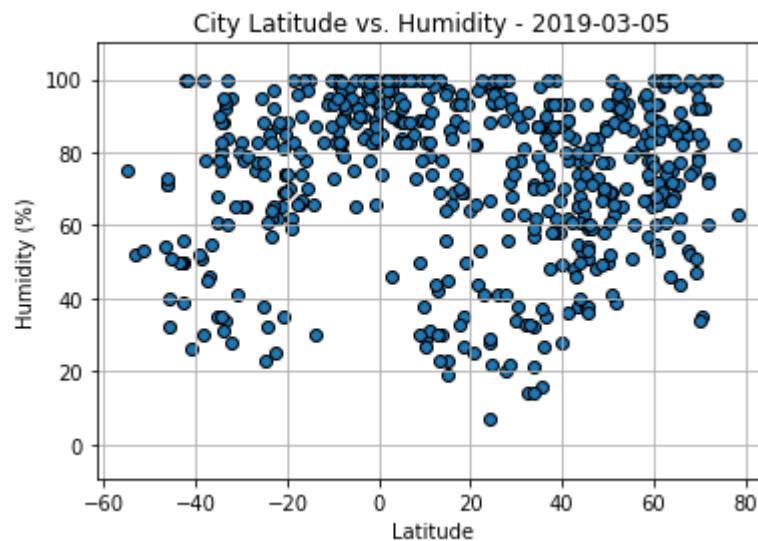
Latitude vs. Humidity Plot

```
In [9]: # Scatter plot for Latitude and humidity
plt.scatter(df["latitude"], df["humidity"], marker="o", edgecolors="black")
plt.ylim(top=110)

# define the graph properties, title, xlabel, ylabel, and show the grid
plt.title(f"City Latitude vs. Humidity - {date}")
plt.ylabel("Humidity (%)")
plt.xlabel("Latitude")
plt.grid(True)

# save the figure to a png
plt.savefig("HumidityInWorldCities.png")

# show the plot
plt.show()
```



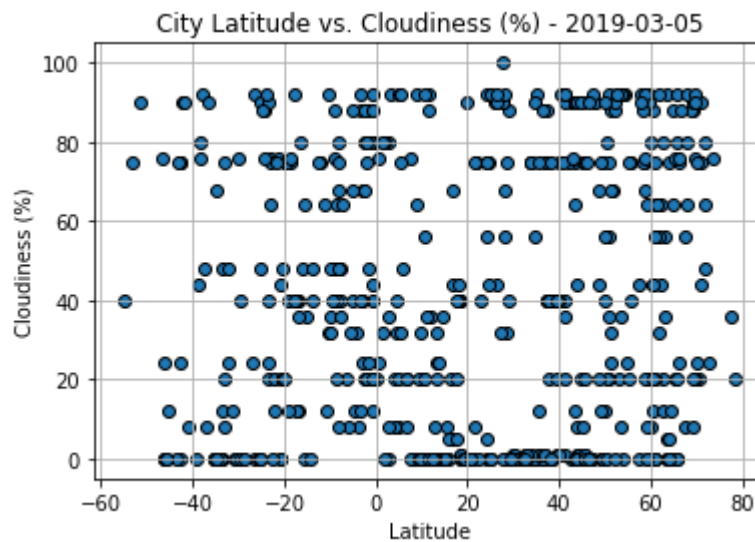
Latitude vs. Cloudiness Plot


```
In [10]: # Scatter plot for Latitude and cloudiness
plt.scatter(df["latitude"], df["cloudiness"], marker="o", edgecolors="black")

# define the graph properties, title, xlabel, ylabel, and show the grid
plt.title(f"City Latitude vs. Cloudiness (%) - {date}")
plt.ylabel("Cloudiness (%)")
plt.xlabel("Latitude")
plt.grid(True)

# save the figure to a png
plt.savefig("CloudinessInWorldCities.png")

# show the plot
plt.show()
```



Latitude vs. Wind Speed Plot

```
In [11]: # Scatter plot for Latitude and wind speed
plt.scatter(df["latitude"], df["wind_speed"], marker="o", edgecolors="black")

# define the graph properties, title, xlabel, ylabel, and show the grid
plt.title(f"City Latitude vs. Wind Speed - {date}")
plt.ylabel("Wind Speed (mph) (%)")
plt.xlabel("Latitude")
plt.grid(True)

# save the figure to a png
plt.savefig("WindSpeedInWorldCities.png")

# show the plot
plt.show()
```

