

WeatherPy

Starter Code to Generate Random Geographic Coordinates and a List of Cities

```
In [76]: # Dependencies and Setup
import matplotlib.pyplot as plt
import pandas as pd
import numpy as np
import requests
import time
from scipy.stats import linregress

# Import the OpenWeatherMap API key
from api_keys import weather_api_key

# Import citipy to determine the cities based on Latitude and Longitude
from citipy import citipy
```

Generate the Cities List by Using the `citipy` Library

```
In [77]: # Empty list for holding the Latitude and Longitude combinations
lat_lngs = []

# Empty list for holding the cities names
cities = []

# Range of Latitudes and Longitudes
lat_range = (-90, 90)
lng_range = (-180, 180)

# Create a set of random Lat and Lng combinations
lats = np.random.uniform(lat_range[0], lat_range[1], size=1500)
lngs = np.random.uniform(lng_range[0], lng_range[1], 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
print(f"Number of cities in the list: {len(cities)}")
```

Number of cities in the list: 590

Requirement 1: Create Plots to Showcase the Relationship Between Weather Variables and Latitude

Use the OpenWeatherMap API to retrieve weather data from the cities list generated in the started code

```
In [78]: f"https://api.openweathermap.org/data/2.5/weather?appid={weather_api_key}&units=imperial&q=albany"
```

```
Out[78]: 'https://api.openweathermap.org/data/2.5/weather?appid=f882bf6f23c374511086f491b39e096b&units=imperial&q=albany'
```

```
In [79]: city=cities[0]
city
```

```
Out[79]: 'albany'
```

```
In [80]: city_url=f"https://api.openweathermap.org/data/2.5/weather?q={city}&appid={weather_api_key}"
response=requests.get(city_url)
```

```
city_weather=response.json()
```

```
city_weather
```

```
Out[80]: {'coord': {'lon': -73.9662, 'lat': 42.6001},
'weather': [{"id": 802,
'main': 'Clouds',
'description': 'scattered clouds',
'icon': '03d"}],
'base': 'stations',
'main': {'temp': 40.37,
'feels_like': 38.79,
'temp_min': 37.58,
'temp_max': 43.21,
'pressure': 1005,
'humidity': 60},
'vesibility': 10000,
'wind': {'speed': 3, 'deg': 300, 'gust': 5.01},
'clouds': {'all': 27},
'dt': 1701116451,
'sys': {'type': 2,
'id': 19530,
'country': 'US',
'sunrise': 1701086497,
'sunset': 1701120337},
'timezone': -18000,
'id': 5106841,
'name': 'Albany',
'cod': 200}
```

```
In [81]: # Parse out Latitude, Longitude, max temp, humidity, cloudiness, wind speed, country,
city_lat = city_weather["coord"]["lat"]
#city_lat = city_weather.get("coord",{}).get("lat",None)
```

```
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"]
```

In [82]:

```
# Append the City information into city_data list
{"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}
```

Out[82]:

```
{'City': 'albany',
 'Lat': 42.6001,
 'Lng': -73.9662,
 'Max Temp': 43.21,
 'Humidity': 60,
 'Cloudiness': 27,
 'Wind Speed': 3,
 'Country': 'US',
 'Date': 1701116451}
```

In [83]:

```
city_weather.keys()
```

Out[83]:

```
dict_keys(['coord', 'weather', 'base', 'main', 'visibility', 'wind', 'clouds', 'dt', 'sys', 'timezone', 'id', 'name', 'cod'])
```

In [84]:

```
city_weather["coord"]
```

Out[84]:

```
{'lon': -73.9662, 'lat': 42.6001}
```

In [85]:

```
# Set the API base URL
url = "https://api.openweathermap.org/data/2.5/weather"

# Define an empty list to fetch the weather data for each city
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 to fetch weather data
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=f"{url}?q={city}&appid={weather_api_key}&units=imperial"

    # 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
response=requests.get(city_url)

try:
    # Parse the JSON and retrieve data
    city_weather=response.json()

    # Parse out latitude, longitude, max temp, humidity, cloudiness, wind speed, etc.
    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 Exception as e:
    print(e)
    print("City {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 | albany
Processing Record 2 of Set 1 | waitangi
Processing Record 3 of Set 1 | puerto ayacucho
Processing Record 4 of Set 1 | ilulissat
Processing Record 5 of Set 1 | andovoranto
Processing Record 6 of Set 1 | lihue
Processing Record 7 of Set 1 | fale old settlement
Processing Record 8 of Set 1 | wailua homesteads
Processing Record 9 of Set 1 | mikomeseng
Processing Record 10 of Set 1 | ad dabbah
Processing Record 11 of Set 1 | edinburgh of the seven seas
Processing Record 12 of Set 1 | igrim
Processing Record 13 of Set 1 | qaqortoq
Processing Record 14 of Set 1 | adamstown
Processing Record 15 of Set 1 | puerto san carlos
'coord'
City {city} not found. Skipping...
Processing Record 16 of Set 1 | badger
Processing Record 17 of Set 1 | tangalle
Processing Record 18 of Set 1 | urbano santos
Processing Record 19 of Set 1 | vorgashor
Processing Record 20 of Set 1 | georgetown
Processing Record 21 of Set 1 | grytviken
Processing Record 22 of Set 1 | talnakh
Processing Record 23 of Set 1 | port-aux-francais
Processing Record 24 of Set 1 | santo antonio
Processing Record 25 of Set 1 | kargasok
Processing Record 26 of Set 1 | port mathurin
Processing Record 27 of Set 1 | baise city
Processing Record 28 of Set 1 | tarakan
Processing Record 29 of Set 1 | hithadhoo
Processing Record 30 of Set 1 | lebu
Processing Record 31 of Set 1 | souillac
Processing Record 32 of Set 1 | tiksi
Processing Record 33 of Set 1 | yellowknife
Processing Record 34 of Set 1 | opuwo
Processing Record 35 of Set 1 | mugia
Processing Record 36 of Set 1 | tura
Processing Record 37 of Set 1 | carnarvon
Processing Record 38 of Set 1 | huinca renanco
Processing Record 39 of Set 1 | alotau
'coord'
City {city} not found. Skipping...
Processing Record 40 of Set 1 | ambon
Processing Record 41 of Set 1 | leognan
Processing Record 42 of Set 1 | vorkuta
Processing Record 43 of Set 1 | solnechnyy
Processing Record 44 of Set 1 | jieshi
Processing Record 45 of Set 1 | meadow lakes
Processing Record 46 of Set 1 | jamaame
Processing Record 47 of Set 1 | songling
Processing Record 48 of Set 1 | bilibino
Processing Record 49 of Set 1 | kununurra
Processing Record 50 of Set 1 | nemuro
Processing Record 0 of Set 2 | pacific grove
Processing Record 1 of Set 2 | puerto natales
Processing Record 2 of Set 2 | constantia
Processing Record 3 of Set 2 | bredasdorp
```

```
Processing Record 4 of Set 2 | atafu village
Processing Record 5 of Set 2 | karratha
Processing Record 6 of Set 2 | weno
Processing Record 7 of Set 2 | north bend
Processing Record 8 of Set 2 | lodja
Processing Record 9 of Set 2 | hilo
Processing Record 10 of Set 2 | alice springs
Processing Record 11 of Set 2 | tanumah
Processing Record 12 of Set 2 | hawaiian paradise park
Processing Record 13 of Set 2 | saipan
Processing Record 14 of Set 2 | mumbwa
Processing Record 15 of Set 2 | chonchi
Processing Record 16 of Set 2 | kapa'a
Processing Record 17 of Set 2 | piranhas
Processing Record 18 of Set 2 | olonkinbyen
Processing Record 19 of Set 2 | west island
Processing Record 20 of Set 2 | anadyr
Processing Record 21 of Set 2 | yelizovo
Processing Record 22 of Set 2 | gualaceo
Processing Record 23 of Set 2 | ribeira grande
Processing Record 24 of Set 2 | puerto baquerizo moreno
Processing Record 25 of Set 2 | klyuchi
Processing Record 26 of Set 2 | geraldton
Processing Record 27 of Set 2 | st. john's
Processing Record 28 of Set 2 | korsakov
Processing Record 29 of Set 2 | kisangani
Processing Record 30 of Set 2 | stanley
Processing Record 31 of Set 2 | afaahiti
Processing Record 32 of Set 2 | cockburn town
Processing Record 33 of Set 2 | yatou
Processing Record 34 of Set 2 | sao gabriel da cachoeira
Processing Record 35 of Set 2 | black point
Processing Record 36 of Set 2 | hasaki
Processing Record 37 of Set 2 | mandimba
'coord'
City {city} not found. Skipping...
Processing Record 38 of Set 2 | mont-laurier
Processing Record 39 of Set 2 | quellon
Processing Record 40 of Set 2 | ust'-ordynskiy
Processing Record 41 of Set 2 | bowen
Processing Record 42 of Set 2 | minas de marcona
Processing Record 43 of Set 2 | saint-joseph
Processing Record 44 of Set 2 | tralee
Processing Record 45 of Set 2 | cape coast
Processing Record 46 of Set 2 | namibe
Processing Record 47 of Set 2 | papatowai
Processing Record 48 of Set 2 | puerto ayora
Processing Record 49 of Set 2 | yanchep
Processing Record 0 of Set 3 | margaret river
Processing Record 1 of Set 3 | noosa heads
Processing Record 2 of Set 3 | bethel
Processing Record 3 of Set 3 | kittila
Processing Record 4 of Set 3 | udachny
Processing Record 5 of Set 3 | coquimbo
Processing Record 6 of Set 3 | luderitz
Processing Record 7 of Set 3 | avarua
Processing Record 8 of Set 3 | phek
Processing Record 9 of Set 3 | lata
Processing Record 10 of Set 3 | longyearbyen
Processing Record 11 of Set 3 | pokhara
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|-------------------------------|------------------------|
| Processing Record 12 of Set 3 | bel ombre |
| Processing Record 13 of Set 3 | saint-philippe |
| Processing Record 14 of Set 3 | iskateley |
| Processing Record 15 of Set 3 | isafjordur |
| Processing Record 16 of Set 3 | santiago |
| Processing Record 17 of Set 3 | iqaluit |
| Processing Record 18 of Set 3 | glace bay |
| Processing Record 19 of Set 3 | huilong |
| Processing Record 20 of Set 3 | kailua-kona |
| Processing Record 21 of Set 3 | blackmans bay |
| Processing Record 22 of Set 3 | punta arenas |
| Processing Record 23 of Set 3 | enewetak |
| Processing Record 24 of Set 3 | terranoova bracciolini |
| Processing Record 25 of Set 3 | taoudenni |
| Processing Record 26 of Set 3 | conception bay south |
| Processing Record 27 of Set 3 | uturoa |
| Processing Record 28 of Set 3 | diego de almagro |
| Processing Record 29 of Set 3 | korla |
| Processing Record 30 of Set 3 | selfoss |
| Processing Record 31 of Set 3 | ardestan |
| Processing Record 32 of Set 3 | newman |
| Processing Record 33 of Set 3 | malpica |
| Processing Record 34 of Set 3 | kiruna |
| Processing Record 35 of Set 3 | invercargill |
| Processing Record 36 of Set 3 | embrun |
| Processing Record 37 of Set 3 | nogliki |
| Processing Record 38 of Set 3 | argo |
| Processing Record 39 of Set 3 | westport |
| Processing Record 40 of Set 3 | vila velha |
| Processing Record 41 of Set 3 | saldanha |
| Processing Record 42 of Set 3 | belyy yar |
| Processing Record 43 of Set 3 | port blair |
| Processing Record 44 of Set 3 | page |
| Processing Record 45 of Set 3 | raton |
| Processing Record 46 of Set 3 | yoloten |
| Processing Record 47 of Set 3 | acapulco de juarez |
| Processing Record 48 of Set 3 | luneville |
| Processing Record 49 of Set 3 | utrik |
| Processing Record 0 of Set 4 | delta |
| Processing Record 1 of Set 4 | la'ie |
| Processing Record 2 of Set 4 | menaka |
| Processing Record 3 of Set 4 | kodiak |
| Processing Record 4 of Set 4 | baardheere |
| Processing Record 5 of Set 4 | tupiza |
| Processing Record 6 of Set 4 | hadibu |
| Processing Record 7 of Set 4 | mossel bay |
| Processing Record 8 of Set 4 | richards bay |
| Processing Record 9 of Set 4 | yamada |
| Processing Record 10 of Set 4 | dakoro |
| Processing Record 11 of Set 4 | tazovsky |
| Processing Record 12 of Set 4 | inhambane |
| Processing Record 13 of Set 4 | bathsheba |
| Processing Record 14 of Set 4 | sinop |
| Processing Record 15 of Set 4 | east london |
| Processing Record 16 of Set 4 | sao vicente |
| Processing Record 17 of Set 4 | wanxian |
| Processing Record 18 of Set 4 | borgarnes |
| Processing Record 19 of Set 4 | gobabis |
| Processing Record 20 of Set 4 | kavieng |
| Processing Record 21 of Set 4 | bafata |

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Processing Record 22 of Set 4 | mercedes
Processing Record 23 of Set 4 | tutoia
Processing Record 24 of Set 4 | natal
Processing Record 25 of Set 4 | porbandar
Processing Record 26 of Set 4 | puerto leguizamo
Processing Record 27 of Set 4 | huron
Processing Record 28 of Set 4 | hamilton
Processing Record 29 of Set 4 | whakatane
Processing Record 30 of Set 4 | camocim
Processing Record 31 of Set 4 | walvis bay
Processing Record 32 of Set 4 | tofol
Processing Record 33 of Set 4 | dunedin
Processing Record 34 of Set 4 | pisco
Processing Record 35 of Set 4 | lompoc
Processing Record 36 of Set 4 | antsiranana
Processing Record 37 of Set 4 | pervomayskoye
Processing Record 38 of Set 4 | segou
Processing Record 39 of Set 4 | muli
Processing Record 40 of Set 4 | sirte
Processing Record 41 of Set 4 | ankazoabo
Processing Record 42 of Set 4 | whitehorse
Processing Record 43 of Set 4 | nadi
Processing Record 44 of Set 4 | robore
Processing Record 45 of Set 4 | petropavlovsk-kamchatsky
Processing Record 46 of Set 4 | iturama
Processing Record 47 of Set 4 | fortuna
Processing Record 48 of Set 4 | kargopol'
Processing Record 49 of Set 4 | taiohae
'coord'
City {city} not found. Skipping...
Processing Record 0 of Set 5 | ust-nera
Processing Record 1 of Set 5 | jamestown
Processing Record 2 of Set 5 | as sulayyil
Processing Record 3 of Set 5 | port lincoln
Processing Record 4 of Set 5 | hayma'
'coord'
City {city} not found. Skipping...
Processing Record 5 of Set 5 | pangody
Processing Record 6 of Set 5 | vorotynets
Processing Record 7 of Set 5 | anloga
Processing Record 8 of Set 5 | wewak
Processing Record 9 of Set 5 | homer
Processing Record 10 of Set 5 | khorixas
Processing Record 11 of Set 5 | yerkoy
Processing Record 12 of Set 5 | chongqing
Processing Record 13 of Set 5 | thompson
Processing Record 14 of Set 5 | kapuskasing
Processing Record 15 of Set 5 | ingeniero guillermo n. juarez
Processing Record 16 of Set 5 | revda
Processing Record 17 of Set 5 | kirillov
Processing Record 18 of Set 5 | ghat
Processing Record 19 of Set 5 | new plymouth
Processing Record 20 of Set 5 | nar'yan-mar
Processing Record 21 of Set 5 | ushuaia
Processing Record 22 of Set 5 | itoman
Processing Record 23 of Set 5 | portland
Processing Record 24 of Set 5 | kiffa
Processing Record 25 of Set 5 | koulikoro
Processing Record 26 of Set 5 | belle fourche
Processing Record 27 of Set 5 | harar
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Processing Record 28 of Set 5 | salinopolis
Processing Record 29 of Set 5 | vilyuchinsk
Processing Record 30 of Set 5 | gizo
Processing Record 31 of Set 5 | prineville
Processing Record 32 of Set 5 | strezhevoy
Processing Record 33 of Set 5 | umm kaddadah
Processing Record 34 of Set 5 | caleta de carquin
Processing Record 35 of Set 5 | nilsia
Processing Record 36 of Set 5 | grand falls-windsor
Processing Record 37 of Set 5 | al bardiyah
Processing Record 38 of Set 5 | arraial do cabo
Processing Record 39 of Set 5 | hassi messaoud
Processing Record 40 of Set 5 | okhotsk
Processing Record 41 of Set 5 | rabo de peixe
Processing Record 42 of Set 5 | luanda
Processing Record 43 of Set 5 | hermanus
Processing Record 44 of Set 5 | panji
Processing Record 45 of Set 5 | baiyin
Processing Record 46 of Set 5 | barentu
Processing Record 47 of Set 5 | castlegar
Processing Record 48 of Set 5 | new norfolk
Processing Record 49 of Set 5 | at taj
Processing Record 0 of Set 6 | chulakkurgan
Processing Record 1 of Set 6 | sao jose da coroa grande
Processing Record 2 of Set 6 | fort mcmurray
Processing Record 3 of Set 6 | roma
Processing Record 4 of Set 6 | nishon tumani
Processing Record 5 of Set 6 | 'ohonua
'coord'
City {city} not found. Skipping...
Processing Record 6 of Set 6 | pechora
Processing Record 7 of Set 6 | palikir - national government center
Processing Record 8 of Set 6 | acarau
Processing Record 9 of Set 6 | lagoa
Processing Record 10 of Set 6 | tosontsengel
Processing Record 11 of Set 6 | mount pearl
Processing Record 12 of Set 6 | kerikeri
Processing Record 13 of Set 6 | tromso
Processing Record 14 of Set 6 | zavetnoye
Processing Record 15 of Set 6 | lensk
Processing Record 16 of Set 6 | queenstown
Processing Record 17 of Set 6 | neftcala
Processing Record 18 of Set 6 | igarka
Processing Record 19 of Set 6 | touros
Processing Record 20 of Set 6 | bubaque
Processing Record 21 of Set 6 | mvurwi
Processing Record 22 of Set 6 | dunda
Processing Record 23 of Set 6 | kinana
Processing Record 24 of Set 6 | san luis
Processing Record 25 of Set 6 | codrington
Processing Record 26 of Set 6 | college
Processing Record 27 of Set 6 | ilam
Processing Record 28 of Set 6 | moapa valley
Processing Record 29 of Set 6 | howard springs
Processing Record 30 of Set 6 | alta
Processing Record 31 of Set 6 | vaux-le-penil
Processing Record 32 of Set 6 | kitimat
Processing Record 33 of Set 6 | colonia
Processing Record 34 of Set 6 | aasiaat
Processing Record 35 of Set 6 | saynshand

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|-------------------------------|---------------------|
| Processing Record 36 of Set 6 | dakhla |
| Processing Record 37 of Set 6 | gamba |
| Processing Record 38 of Set 6 | levelland |
| Processing Record 39 of Set 6 | joao pinheiro |
| Processing Record 40 of Set 6 | raja |
| Processing Record 41 of Set 6 | tartagal |
| Processing Record 42 of Set 6 | brookings |
| Processing Record 43 of Set 6 | east end |
| Processing Record 44 of Set 6 | malanville |
| Processing Record 45 of Set 6 | lerwick |
| Processing Record 46 of Set 6 | saint-denis |
| Processing Record 47 of Set 6 | dudinka |
| Processing Record 48 of Set 6 | berdigestyakh |
| Processing Record 49 of Set 6 | qaisumah |
| Processing Record 0 of Set 7 | namdrik |
| Processing Record 1 of Set 7 | lieksa |
| Processing Record 2 of Set 7 | moose jaw |
| Processing Record 3 of Set 7 | broken hill |
| Processing Record 4 of Set 7 | plattling |
| Processing Record 5 of Set 7 | lodwar |
| Processing Record 6 of Set 7 | torghay |
| Processing Record 7 of Set 7 | manturovo |
| Processing Record 8 of Set 7 | tual |
| Processing Record 9 of Set 7 | kavaratti |
| Processing Record 10 of Set 7 | cururupu |
| Processing Record 11 of Set 7 | hegang |
| Processing Record 12 of Set 7 | pajapan |
| Processing Record 13 of Set 7 | akrehamn |
| Processing Record 14 of Set 7 | lepsy |
| Processing Record 15 of Set 7 | launceston |
| Processing Record 16 of Set 7 | mirny |
| Processing Record 17 of Set 7 | port elizabeth |
| Processing Record 18 of Set 7 | tamanrasset |
| Processing Record 19 of Set 7 | usogorsk |
| Processing Record 20 of Set 7 | fort bragg |
| Processing Record 21 of Set 7 | morehead city |
| Processing Record 22 of Set 7 | pishva |
| Processing Record 23 of Set 7 | noumea |
| Processing Record 24 of Set 7 | robertsport |
| Processing Record 25 of Set 7 | pandan |
| Processing Record 26 of Set 7 | aykhal |
| Processing Record 27 of Set 7 | arno |
| Processing Record 28 of Set 7 | hemsby |
| Processing Record 29 of Set 7 | lazaro cardenas |
| Processing Record 30 of Set 7 | bahir dar |
| Processing Record 31 of Set 7 | abhar |
| Processing Record 32 of Set 7 | forde |
| Processing Record 33 of Set 7 | popondetta |
| Processing Record 34 of Set 7 | umluj |
| Processing Record 35 of Set 7 | illizi |
| Processing Record 36 of Set 7 | floresta |
| Processing Record 37 of Set 7 | modimolle |
| Processing Record 38 of Set 7 | kolwezi |
| Processing Record 39 of Set 7 | san julian |
| Processing Record 40 of Set 7 | san antonio de pale |
| Processing Record 41 of Set 7 | holualoa |
| Processing Record 42 of Set 7 | arish |
| Processing Record 43 of Set 7 | galesong |
| Processing Record 44 of Set 7 | kendallville |
| Processing Record 45 of Set 7 | anisoc |

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Processing Record 46 of Set 7 | bella vista
Processing Record 47 of Set 7 | aleksandrov gay
Processing Record 48 of Set 7 | chibougamau
Processing Record 49 of Set 7 | qiryat shemona
Processing Record 0 of Set 8 | quezon
Processing Record 1 of Set 8 | leava
Processing Record 2 of Set 8 | hammerfest
Processing Record 3 of Set 8 | funafuti
Processing Record 4 of Set 8 | fisterra
Processing Record 5 of Set 8 | letpandan
Processing Record 6 of Set 8 | ndele
Processing Record 7 of Set 8 | taroa
Processing Record 8 of Set 8 | salinas
Processing Record 9 of Set 8 | faya-largeau
Processing Record 10 of Set 8 | carroll
Processing Record 11 of Set 8 | dar naim
'coord'
City {city} not found. Skipping...
Processing Record 12 of Set 8 | ubinskoye
Processing Record 13 of Set 8 | sisimiut
Processing Record 14 of Set 8 | carolina beach
Processing Record 15 of Set 8 | arapgir
Processing Record 16 of Set 8 | uzundere
Processing Record 17 of Set 8 | sochi
Processing Record 18 of Set 8 | kingston
Processing Record 19 of Set 8 | colares
Processing Record 20 of Set 8 | keflavik
Processing Record 21 of Set 8 | parkville
Processing Record 22 of Set 8 | grootfontein
Processing Record 23 of Set 8 | yeed
Processing Record 24 of Set 8 | sitka
Processing Record 25 of Set 8 | herriman
Processing Record 26 of Set 8 | sao joao da barra
Processing Record 27 of Set 8 | saint-pierre
Processing Record 28 of Set 8 | labrador city
Processing Record 29 of Set 8 | san pedro pochutla
Processing Record 30 of Set 8 | ordynskoye
Processing Record 31 of Set 8 | uchiza
Processing Record 32 of Set 8 | cabo san lucas
Processing Record 33 of Set 8 | bedum
Processing Record 34 of Set 8 | ishigaki
Processing Record 35 of Set 8 | nuuk
Processing Record 36 of Set 8 | belmonte
Processing Record 37 of Set 8 | khanapur
Processing Record 38 of Set 8 | barra de santo antonio
Processing Record 39 of Set 8 | sungailiat
Processing Record 40 of Set 8 | kristiansund
Processing Record 41 of Set 8 | xudat
Processing Record 42 of Set 8 | flying fish cove
Processing Record 43 of Set 8 | aginskoye
Processing Record 44 of Set 8 | bougouni
Processing Record 45 of Set 8 | jiaojiang
Processing Record 46 of Set 8 | key west
Processing Record 47 of Set 8 | tieli
Processing Record 48 of Set 8 | kayangel
Processing Record 49 of Set 8 | labytnangi
Processing Record 0 of Set 9 | kalix
Processing Record 1 of Set 9 | lorengau
Processing Record 2 of Set 9 | kosum phisai
Processing Record 3 of Set 9 | culpeper
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Processing Record 4 of Set 9 | san luis de la loma
Processing Record 5 of Set 9 | kone
Processing Record 6 of Set 9 | buka
Processing Record 7 of Set 9 | belsand
Processing Record 8 of Set 9 | santa rosa
Processing Record 9 of Set 9 | port augusta
Processing Record 10 of Set 9 | genova
Processing Record 11 of Set 9 | krasnoarmeysk
Processing Record 12 of Set 9 | mount isa
Processing Record 13 of Set 9 | beberibe
Processing Record 14 of Set 9 | axim
Processing Record 15 of Set 9 | ermoupolis
Processing Record 16 of Set 9 | jeddah
Processing Record 17 of Set 9 | zhuanghe
Processing Record 18 of Set 9 | bayan nur
'coord'
City {city} not found. Skipping...
Processing Record 19 of Set 9 | flin flon
Processing Record 20 of Set 9 | jinka
Processing Record 21 of Set 9 | ilhabela
Processing Record 22 of Set 9 | asbe teferi
Processing Record 23 of Set 9 | yinchuan
Processing Record 24 of Set 9 | waingapu
Processing Record 25 of Set 9 | chita
Processing Record 26 of Set 9 | mazouna
Processing Record 27 of Set 9 | nuku'alofa
Processing Record 28 of Set 9 | tobi village
'coord'
City {city} not found. Skipping...
Processing Record 29 of Set 9 | kargat
Processing Record 30 of Set 9 | le port
Processing Record 31 of Set 9 | klaksvik
Processing Record 32 of Set 9 | muisne
Processing Record 33 of Set 9 | crane
Processing Record 34 of Set 9 | el bauga
Processing Record 35 of Set 9 | prince rupert
Processing Record 36 of Set 9 | nova sintra
Processing Record 37 of Set 9 | sandnessjoen
Processing Record 38 of Set 9 | gadzhiyev
Processing Record 39 of Set 9 | yaren
Processing Record 40 of Set 9 | al ghayzah
Processing Record 41 of Set 9 | darnah
Processing Record 42 of Set 9 | dryden
Processing Record 43 of Set 9 | wenchang
Processing Record 44 of Set 9 | kourou
Processing Record 45 of Set 9 | ebon
Processing Record 46 of Set 9 | bereznik
Processing Record 47 of Set 9 | hiliar
Processing Record 48 of Set 9 | los lunas
Processing Record 49 of Set 9 | al kharijah
Processing Record 0 of Set 10 | masterton
Processing Record 1 of Set 10 | ancud
Processing Record 2 of Set 10 | singaraja
Processing Record 3 of Set 10 | clinton
Processing Record 4 of Set 10 | ovalle
Processing Record 5 of Set 10 | yankton
Processing Record 6 of Set 10 | nikol'sk
Processing Record 7 of Set 10 | palmer
Processing Record 8 of Set 10 | zelenogorskiy
Processing Record 9 of Set 10 | mogadishu
```

```
Processing Record 10 of Set 10 | timbuktu
Processing Record 11 of Set 10 | ormara
Processing Record 12 of Set 10 | kawm umbu
Processing Record 13 of Set 10 | bridgewater
Processing Record 14 of Set 10 | haiku-pauwela
Processing Record 15 of Set 10 | palangkaraya
Processing Record 16 of Set 10 | mitha tiwana
Processing Record 17 of Set 10 | terrace
Processing Record 18 of Set 10 | alaghlas
Processing Record 19 of Set 10 | nova vicosa
Processing Record 20 of Set 10 | sahavato
'coord'
City {city} not found. Skipping...
Processing Record 21 of Set 10 | greenville
Processing Record 22 of Set 10 | vicuna
Processing Record 23 of Set 10 | toga village
'coord'
City {city} not found. Skipping...
Processing Record 24 of Set 10 | broome
Processing Record 25 of Set 10 | tillaberi
Processing Record 26 of Set 10 | mandera
Processing Record 27 of Set 10 | al qubbah
Processing Record 28 of Set 10 | tindouf
Processing Record 29 of Set 10 | kampene
Processing Record 30 of Set 10 | ascencion de guarayos
'coord'
City {city} not found. Skipping...
Processing Record 31 of Set 10 | maceio
Processing Record 32 of Set 10 | khandyga
Processing Record 33 of Set 10 | burang
Processing Record 34 of Set 10 | pangai
Processing Record 35 of Set 10 | ilebo
Processing Record 36 of Set 10 | steamboat springs
Processing Record 37 of Set 10 | mananjary
Processing Record 38 of Set 10 | nizhnesortymskiy
Processing Record 39 of Set 10 | nadym
Processing Record 40 of Set 10 | warmbad
Processing Record 41 of Set 10 | rawson
Processing Record 42 of Set 10 | zherdevka
Processing Record 43 of Set 10 | solleftea
Processing Record 44 of Set 10 | yanam
Processing Record 45 of Set 10 | san patricio
Processing Record 46 of Set 10 | nizhneangarsk
Processing Record 47 of Set 10 | arhribs
Processing Record 48 of Set 10 | susuman
Processing Record 49 of Set 10 | bikin
Processing Record 0 of Set 11 | jalqani
Processing Record 1 of Set 11 | selma
Processing Record 2 of Set 11 | bamboo flat
Processing Record 3 of Set 11 | steinbach
Processing Record 4 of Set 11 | mana
Processing Record 5 of Set 11 | plettenberg bay
Processing Record 6 of Set 11 | fortaleza
Processing Record 7 of Set 11 | happy valley-goose bay
Processing Record 8 of Set 11 | villa regina
Processing Record 9 of Set 11 | quesnel
Processing Record 10 of Set 11 | varadero
Processing Record 11 of Set 11 | sabha
Processing Record 12 of Set 11 | vingt cinq
'coord'
```

```
City {city} not found. Skipping...
Processing Record 13 of Set 11 | tweed heads
Processing Record 14 of Set 11 | turkmenbasy
Processing Record 15 of Set 11 | we
'coord'
City {city} not found. Skipping...
Processing Record 16 of Set 11 | yung shue wan
Processing Record 17 of Set 11 | el hamma
Processing Record 18 of Set 11 | rikaze
Processing Record 19 of Set 11 | jeypore
Processing Record 20 of Set 11 | mary
Processing Record 21 of Set 11 | cefalu
Processing Record 22 of Set 11 | rio grande
Processing Record 23 of Set 11 | laguna
Processing Record 24 of Set 11 | seydi
Processing Record 25 of Set 11 | villamontes
Processing Record 26 of Set 11 | malmberget
Processing Record 27 of Set 11 | lock haven
Processing Record 28 of Set 11 | dalianwan
Processing Record 29 of Set 11 | cargados carajos
'coord'
City {city} not found. Skipping...
Processing Record 30 of Set 11 | turpan
Processing Record 31 of Set 11 | kotlas
Processing Record 32 of Set 11 | vrangel'
Processing Record 33 of Set 11 | obidos
Processing Record 34 of Set 11 | korem
Processing Record 35 of Set 11 | whiteville
Processing Record 36 of Set 11 | tazacorte
Processing Record 37 of Set 11 | brisas de zicatela
Processing Record 38 of Set 11 | harstad
Processing Record 39 of Set 11 | nema
Processing Record 40 of Set 11 | devinuwara
'coord'
City {city} not found. Skipping...
Processing Record 41 of Set 11 | general acha
Processing Record 42 of Set 11 | foumban
Processing Record 43 of Set 11 | nizao
Processing Record 44 of Set 11 | essau
Processing Record 45 of Set 11 | kawthoung
'coord'
City {city} not found. Skipping...
Processing Record 46 of Set 11 | yen vinh
Processing Record 47 of Set 11 | vershino-darasunskiy
Processing Record 48 of Set 11 | fall river
Processing Record 49 of Set 11 | amga
Processing Record 0 of Set 12 | corner brook
Processing Record 1 of Set 12 | tatal
Processing Record 2 of Set 12 |tolanaro
Processing Record 3 of Set 12 | callao
Processing Record 4 of Set 12 | sishilichengzi
'coord'
City {city} not found. Skipping...
Processing Record 5 of Set 12 | sonsorol village
'coord'
City {city} not found. Skipping...
Processing Record 6 of Set 12 | lame
Processing Record 7 of Set 12 | greymouth
Processing Record 8 of Set 12 | ishim
Processing Record 9 of Set 12 | zabol
```

```

Processing Record 10 of Set 12 | kupang
Processing Record 11 of Set 12 | sao francisco de assis
Processing Record 12 of Set 12 | solikamsk
Processing Record 13 of Set 12 | abraham's bay
'coord'
City {city} not found. Skipping...
Processing Record 14 of Set 12 | letlhakane
Processing Record 15 of Set 12 | kruisfontein
Processing Record 16 of Set 12 | the pas
Processing Record 17 of Set 12 | salvador
Processing Record 18 of Set 12 | vila franca do campo
Processing Record 19 of Set 12 | charters towers
Processing Record 20 of Set 12 | mejit
Processing Record 21 of Set 12 | turnov
Processing Record 22 of Set 12 | durban
Processing Record 23 of Set 12 | nguruka
Processing Record 24 of Set 12 | karibib
Processing Record 25 of Set 12 | constitucion
Processing Record 26 of Set 12 | merizo village
Processing Record 27 of Set 12 | vadso
Processing Record 28 of Set 12 | parkes
Processing Record 29 of Set 12 | zemio
Processing Record 30 of Set 12 | miles city
Processing Record 31 of Set 12 | sinabang
Processing Record 32 of Set 12 | kati
Processing Record 33 of Set 12 | okha
Processing Record 34 of Set 12 | kon tum
Processing Record 35 of Set 12 | itapecuru mirim
Processing Record 36 of Set 12 | thurso
Processing Record 37 of Set 12 | padang
Processing Record 38 of Set 12 | graham
Processing Record 39 of Set 12 | oltinko'l
-----
Data Retrieval Complete
-----
```

```
In [86]: # Convert the cities weather data into a Pandas DataFrame
city_data_df = pd.DataFrame(city_data)

# Show Record Count
city_data_df.count()
```

```
Out[86]: City      570
Lat       570
Lng       570
Max Temp  570
Humidity  570
Cloudiness 570
Wind Speed 570
Country   570
Date      570
dtype: int64
```

```
In [87]: # Display sample data
city_data_df.head()
```

Out[87]:

| | City | Lat | Lng | Max Temp | Humidity | Cloudiness | Wind Speed | Country | Date |
|---|-----------------|----------|-----------|----------|----------|------------|------------|---------|------------|
| 0 | albany | 42.6001 | -73.9662 | 43.21 | 60 | 27 | 3.00 | US | 1701116451 |
| 1 | waitangi | -43.9535 | -176.5597 | 53.82 | 90 | 100 | 3.00 | NZ | 1701116511 |
| 2 | puerto ayacucho | 5.6639 | -67.6236 | 87.06 | 68 | 49 | 2.10 | VE | 1701116512 |
| 3 | ilulissat | 69.2167 | -51.1000 | 26.62 | 80 | 75 | 12.66 | GL | 1701116513 |
| 4 | andoveranto | -18.9500 | 49.1000 | 74.46 | 89 | 13 | 6.04 | MG | 1701116514 |

In [88]:

```
# Export the City_Data into a csv
city_data_df.to_csv("output_data/cities.csv", index_label="City_ID")
```

In [89]:

```
# Read saved data
city_data_df = pd.read_csv("output_data/cities.csv", index_col="City_ID")

# Display sample data
city_data_df.head()
```

Out[89]:

| | City | Lat | Lng | Max Temp | Humidity | Cloudiness | Wind Speed | Country | Date |
|---------|-----------------|----------|-----------|----------|----------|------------|------------|---------|------------|
| City_ID | | | | | | | | | |
| 0 | albany | 42.6001 | -73.9662 | 43.21 | 60 | 27 | 3.00 | US | 1701116451 |
| 1 | waitangi | -43.9535 | -176.5597 | 53.82 | 90 | 100 | 3.00 | NZ | 1701116511 |
| 2 | puerto ayacucho | 5.6639 | -67.6236 | 87.06 | 68 | 49 | 2.10 | VE | 1701116512 |
| 3 | ilulissat | 69.2167 | -51.1000 | 26.62 | 80 | 75 | 12.66 | GL | 1701116513 |
| 4 | andoveranto | -18.9500 | 49.1000 | 74.46 | 89 | 13 | 6.04 | MG | 1701116514 |

Create the Scatter Plots Requested

Latitude Vs. Temperature

In [90]:

```
# Build scatter plot for Latitude vs. temperature
# YOUR CODE HERE

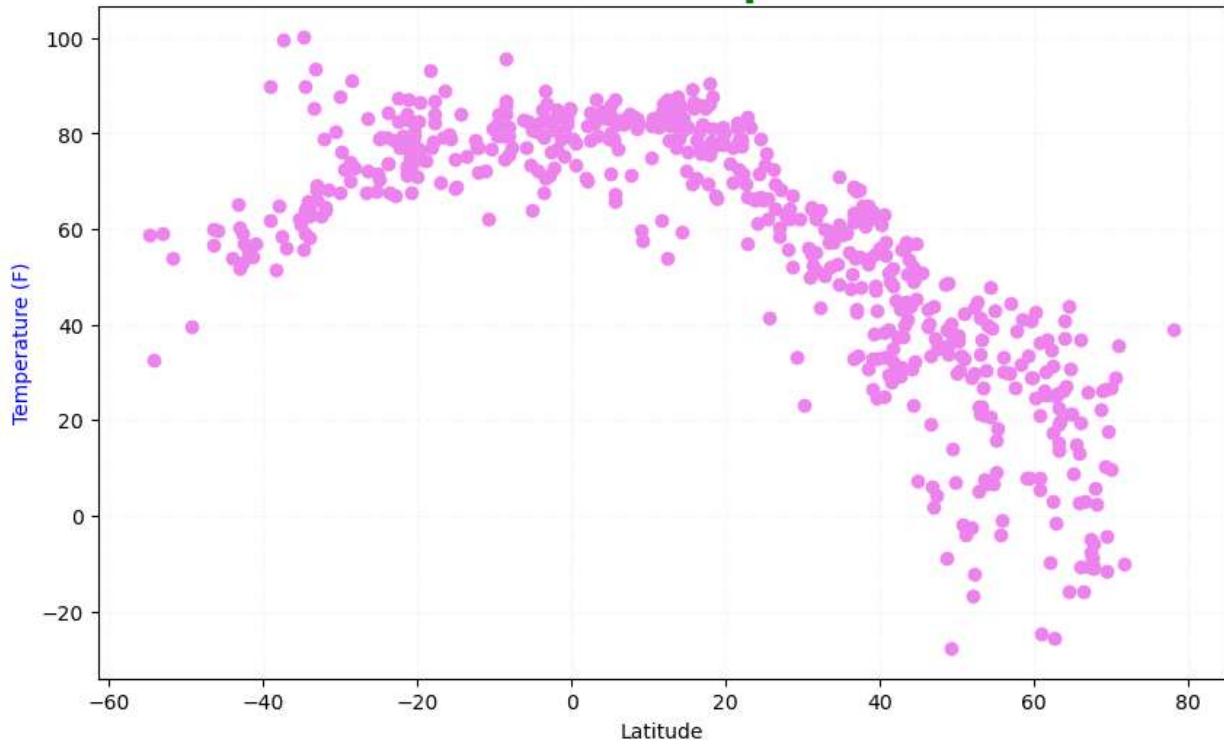
# Incorporate the other graph properties
# YOUR CODE HERE

# plot
plt.figure(figsize=(10,6))
plt.scatter(city_data_df.Lat, city_data_df["Max Temp"], color="violet",)
plt.xlabel("Latitude")
plt.ylabel("Temperature (F)",color="blue")
plt.title("Latitude vs Temperature", fontweight="bold", fontsize=20, color="green")
plt.grid(color="lightgrey", alpha=0.2, linestyle="--")
```

```
# Save the figure
plt.savefig("output_data/Fig1.png")

# Show plot
plt.show()
```

Latitude vs Temperature



Latitude Vs. Humidity

```
In [91]: # Build the scatter plots for Latitude vs. humidity
# YOUR CODE HERE

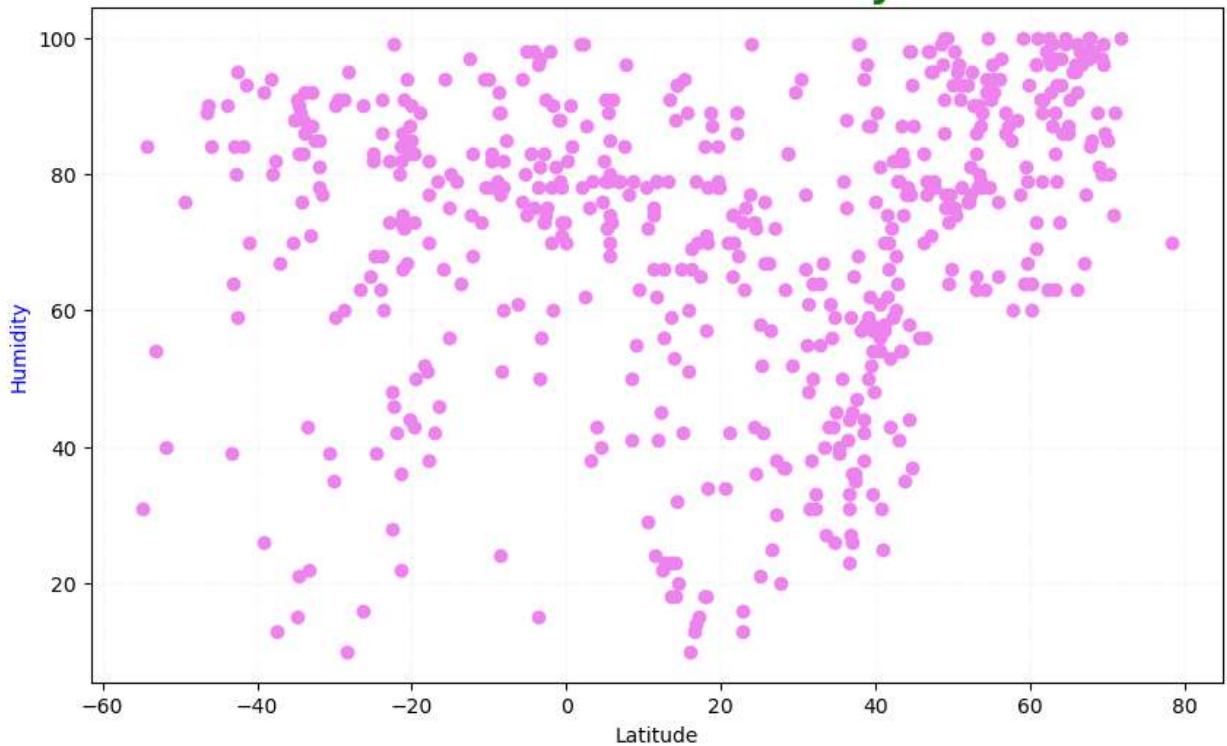
# Incorporate the other graph properties
# YOUR CODE HERE

# plot
plt.figure(figsize=(10,6))
plt.scatter(city_data_df.Lat, city_data_df["Humidity"], color="violet")
plt.xlabel("Latitude")
plt.ylabel("Humidity",color="blue")
plt.title("Latitude vs Humidity", fontweight="bold", fontsize=20, color="green")
plt.grid(color="lightgrey", alpha=0.2, linestyle="--")

# Save the figure
plt.savefig("output_data/Fig2.png")

# Show plot
plt.show()
```

Latitude vs Humidity



Latitude Vs. Cloudiness

```
In [92]: # Build the scatter plots for Latitude vs. cloudiness
# YOUR CODE HERE

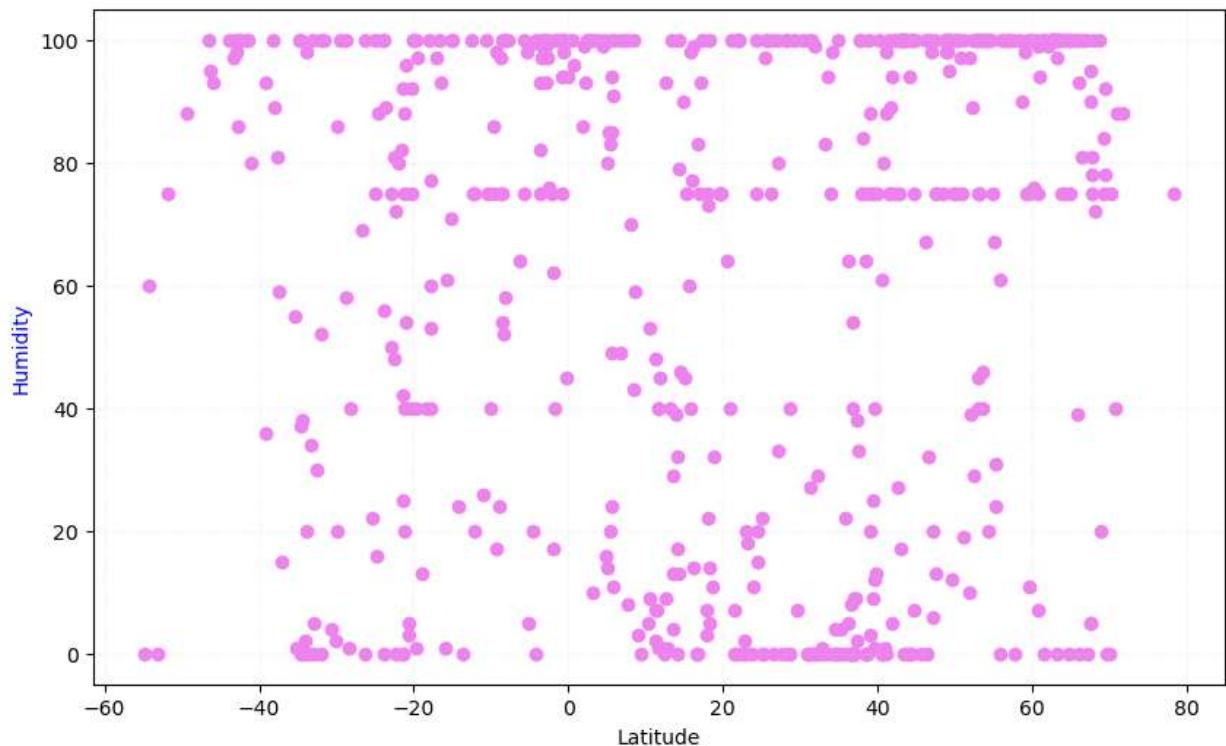
# Incorporate the other graph properties
# YOUR CODE HERE

# plot
plt.figure(figsize=(10,6))
plt.scatter(city_data_df.Lat, city_data_df["Cloudiness"], color="violet")
plt.xlabel("Latitude")
plt.ylabel("Humidity",color="blue")
plt.title("Latitude vs Cloudiness", fontweight="bold", fontsize=20, color="green")
plt.grid(color="lightgrey", alpha=0.2, linestyle="--")

# Save the figure
plt.savefig("output_data/Fig3.png")

# Show plot
plt.show()
```

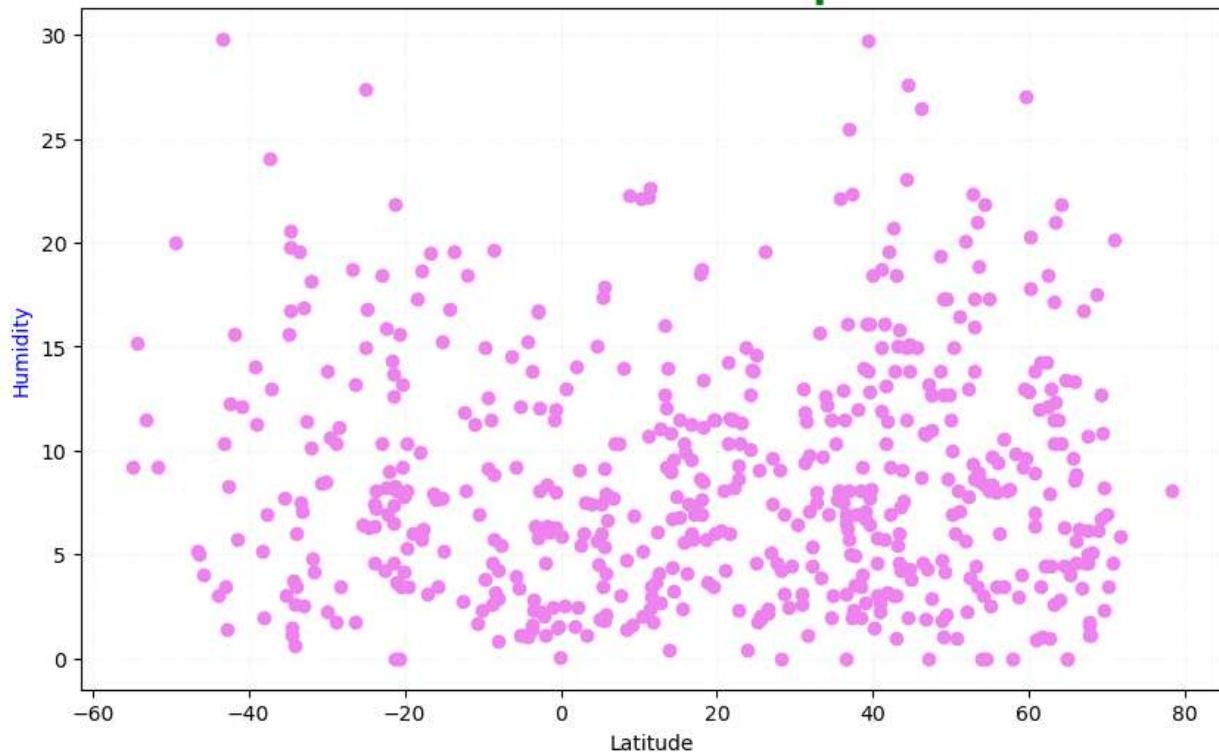
Latitude vs Cloudiness



Latitude vs. Wind Speed Plot

```
In [93]: # Build the scatter plots for Latitude vs. wind speed  
# YOUR CODE HERE  
  
# Incorporate the other graph properties  
# YOUR CODE HERE  
  
# plot  
plt.figure(figsize=(10,6))  
plt.scatter(city_data_df.Lat, city_data_df["Wind Speed"], color="violet")  
plt.xlabel("Latitude")  
plt.ylabel("Humidity",color="blue")  
plt.title("Latitude vs Wind Speed", fontweight="bold", fontsize=20, color="green")  
plt.grid(color="lightgrey", alpha=0.2, linestyle="--")  
  
# Save the figure  
plt.savefig("output_data/Fig4.png")  
  
# Show plot  
plt.show()
```

Latitude vs Wind Speed



Requirement 2: Compute Linear Regression for Each Relationship

In [94]:

```
# Define a function to create Linear Regression plots
def makeLinearRegressionPlot(x_values, y_values, y_col, hemi, annot_loc):
    (slope, intercept, rvalue, pvalue, stderr) = linregress(x_values, y_values)
    regress_values = x_values * slope + intercept
    line_eq = "y = " + str(round(slope,2)) + "x + " + str(round(intercept,2))

    # make plot
    plt.scatter(x_values,y_values)
    plt.plot(x_values,regress_values,"r-")
    plt.annotate(line_eq,annot_loc,fontsize=15,color="red")
    plt.xlabel('Latitude')
    plt.ylabel(f'{y_col}')
    plt.title(f'Lat vs {y_col} ({hemi} Hemi)')
    print(f"The r-squared is: {rvalue**2}")
    plt.show()
```

In [95]:

```
# Create a DataFrame with the Northern Hemisphere data (Latitude >= 0)
northern_hemi_df = city_data_df.loc[city_data_df.Lat>= 0]

# Display sample data
northern_hemi_df.head()
```

Out[95]:

| | City | Lat | Lng | Max Temp | Humidity | Cloudiness | Wind Speed | Country | Date |
|---------|----------------------|---------|-----------|----------|----------|------------|------------|---------|------------|
| City_ID | | | | | | | | | |
| 0 | albany | 42.6001 | -73.9662 | 43.21 | 60 | 27 | 3.00 | US | 1701116451 |
| 2 | puerto ayacucho | 5.6639 | -67.6236 | 87.06 | 68 | 49 | 2.10 | VE | 1701116512 |
| 3 | ilulissat | 69.2167 | -51.1000 | 26.62 | 80 | 75 | 12.66 | GL | 1701116513 |
| 5 | lihue | 21.9789 | -159.3672 | 78.04 | 86 | 100 | 11.50 | US | 1701116258 |
| 7 | wailua homesteads | 22.0669 | -159.3780 | 77.43 | 89 | 100 | 11.50 | US | 1701116516 |

◀ ▶

In [96]: `northern_hemi_df.count()`

Out[96]:

```
City      394
Lat       394
Lng       394
Max Temp 394
Humidity 394
Cloudiness 394
Wind Speed 394
Country 394
Date     394
dtype: int64
```

In [97]: `# Create a DataFrame with the Southern Hemisphere data (Latitude < 0)
YOUR CODE HERE
southern_hemi_df = city_data_df.loc[city_data_df.Lat < 0]
Display sample data
southern_hemi_df.head()`

Out[97]:

| | City | Lat | Lng | Max Temp | Humidity | Cloudiness | Wind Speed | Country | Date |
|---------|-----------------------------------|----------|-----------|----------|----------|------------|------------|---------|------------|
| City_ID | | | | | | | | | |
| 1 | waitangi | -43.9535 | -176.5597 | 53.82 | 90 | 100 | 3.00 | NZ | 1701116511 |
| 4 | andovoranto | -18.9500 | 49.1000 | 74.46 | 89 | 13 | 6.04 | MG | 1701116514 |
| 6 | fale old settlement | -9.3852 | -171.2468 | 83.97 | 78 | 98 | 12.57 | TK | 1701116515 |
| 10 | edinburgh of the seven seas | -37.0676 | -12.3116 | 56.10 | 67 | 15 | 13.00 | SH | 1701116392 |
| 13 | adamstown | -25.0660 | -130.1015 | 71.56 | 82 | 100 | 27.38 | PN | 1701116388 |

◀ ▶

In [98]: `southern_hemi_df.count()`

```
Out[98]:
```

| City | 176 |
|------------|-------|
| Lat | 176 |
| Lng | 176 |
| Max Temp | 176 |
| Humidity | 176 |
| Cloudiness | 176 |
| Wind Speed | 176 |
| Country | 168 |
| Date | 176 |
| dtype: | int64 |

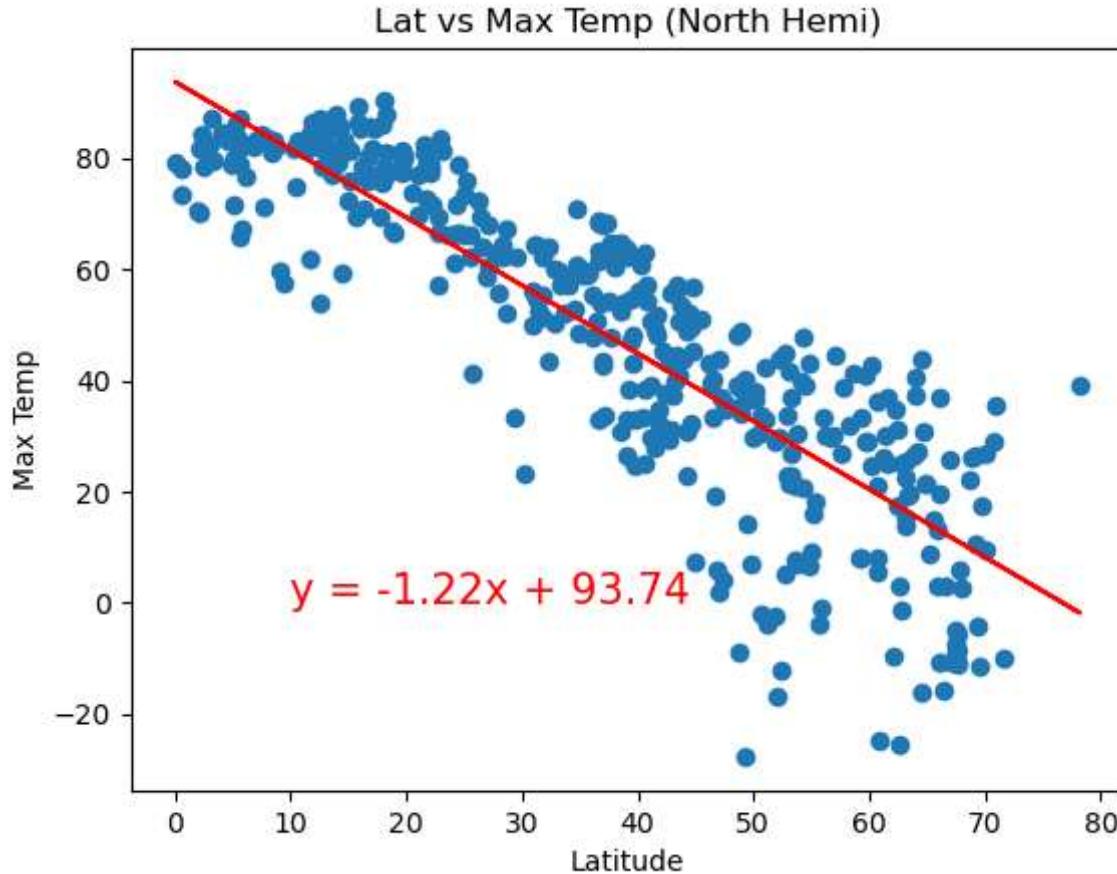
Temperature vs. Latitude Linear Regression Plot

```
In [107...]
```

```
# Linear regression on Northern Hemisphere
# Print out the r-squared value along with the plot.
x_values = northern_hemi_df['Lat']
y_values = northern_hemi_df['Max Temp']

makeLinearRegressionPlot(x_values,y_values, "Max Temp", "North", (10,0))
```

The r-squared is: 0.7451304643693895

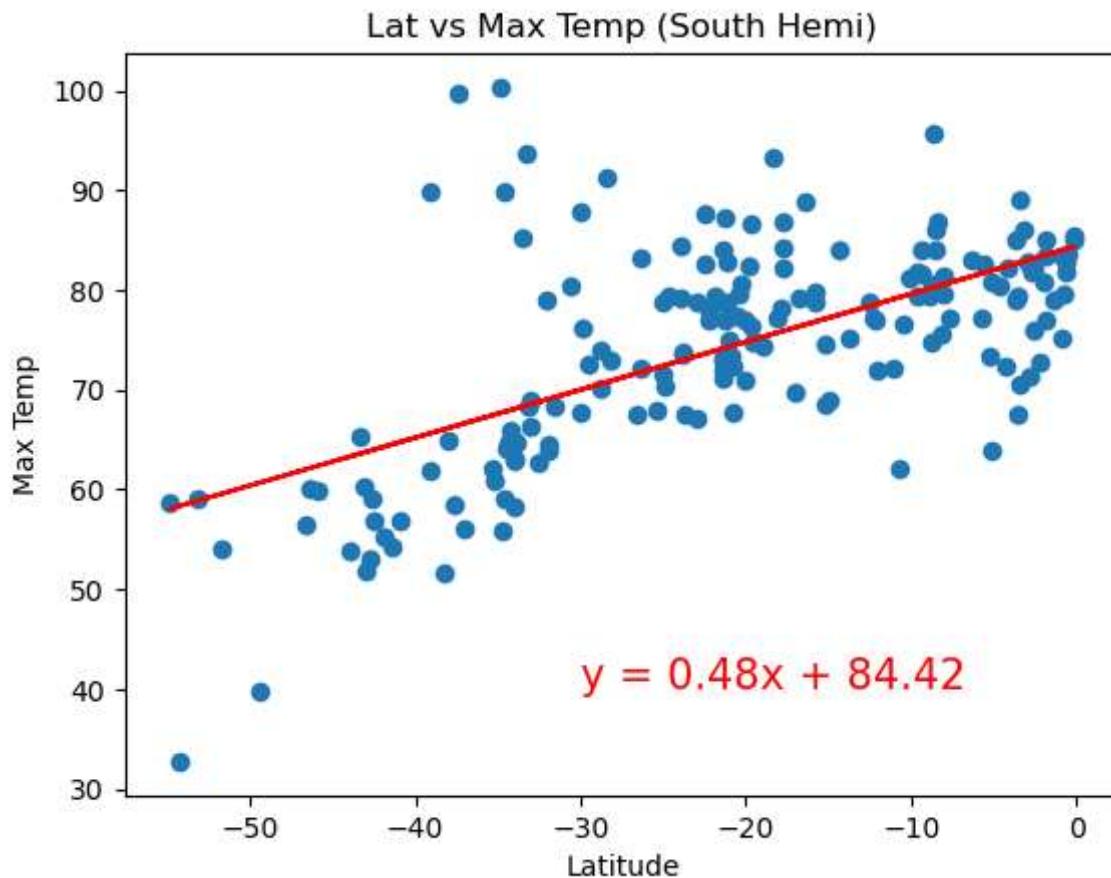


```
In [108...]
```

```
# Linear regression on Southern Hemisphere
x_values = southern_hemi_df['Lat']
y_values = southern_hemi_df['Max Temp']

makeLinearRegressionPlot(x_values,y_values, "Max Temp", "South", (-30,40))
```

The r-squared is: 0.37583946802353374



Discussion about the linear relationship: There is a correlation between Temperature and Latitude. The closer you are to the Ecuator Line, the higher the temperatures will be and this is the case for both the Northern and Southern Hemispheres. On an additional note, the Northern Hmi has a stronger correlation with an r square value of 0.75

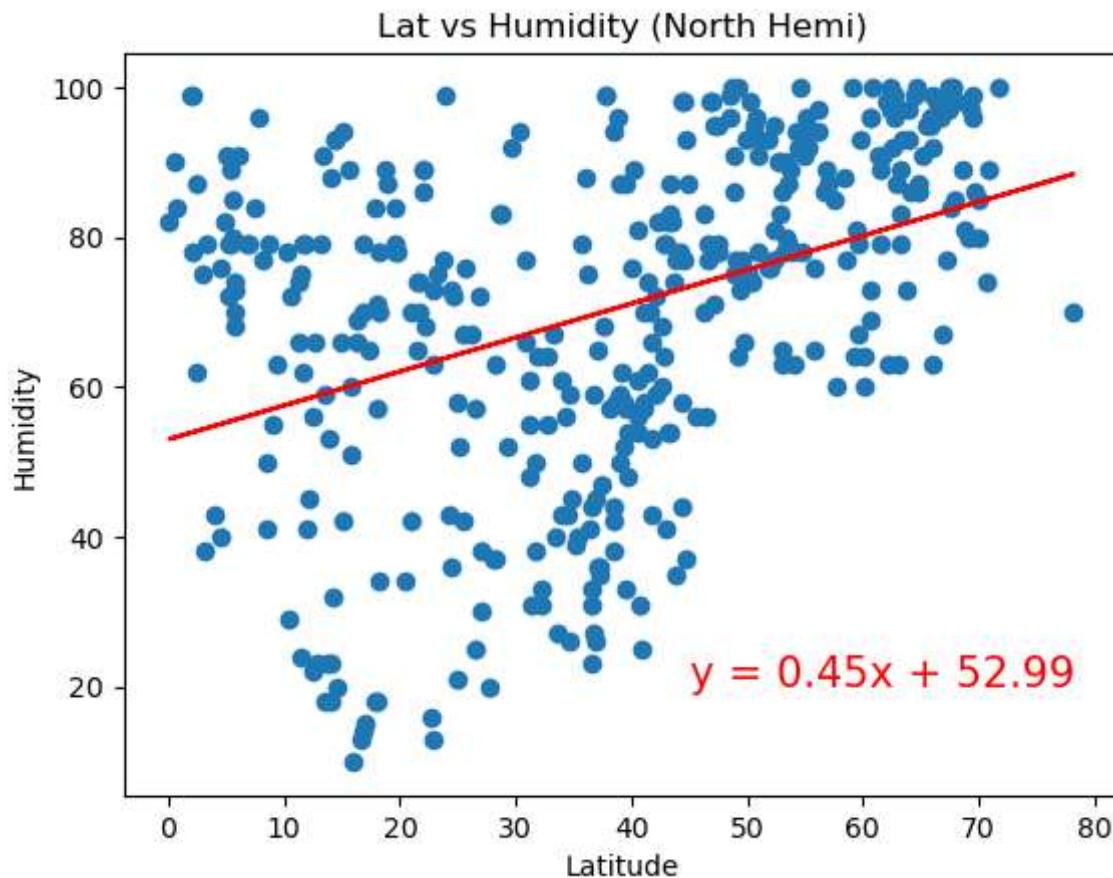
Humidity vs. Latitude Linear Regression Plot

In [110]:

```
# Northern Hemisphere
x_values = northern_hemi_df['Lat']
y_values = northern_hemi_df['Humidity']

makeLinearRegressionPlot(x_values,y_values, "Humidity", "North", (45,20))
```

The r-squared is: 0.15551306425952918

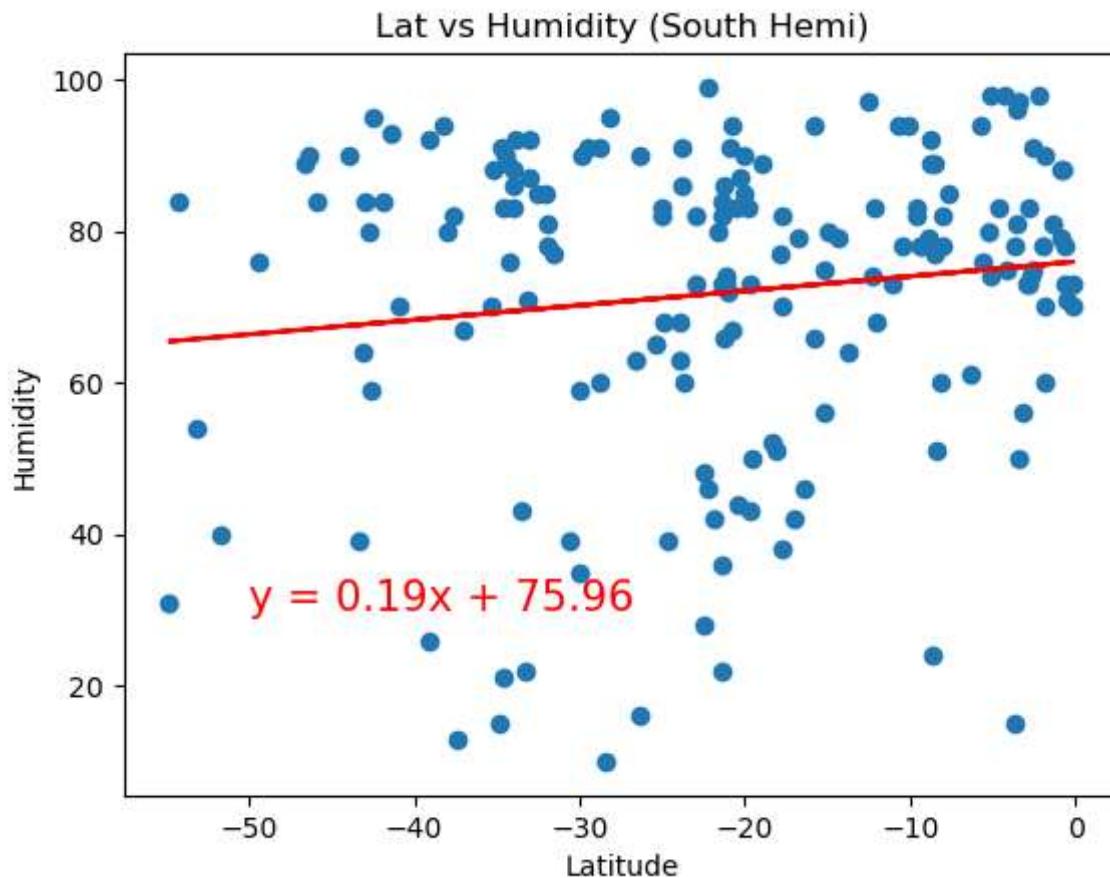


In [112...]

```
# Southern Hemisphere
x_values = southern_hemi_df['Lat']
y_values = southern_hemi_df['Humidity']

makeLinearRegressionPlot(x_values,y_values, "Humidity", "South", (-50,30))
```

The r-squared is: 0.016565448219430692



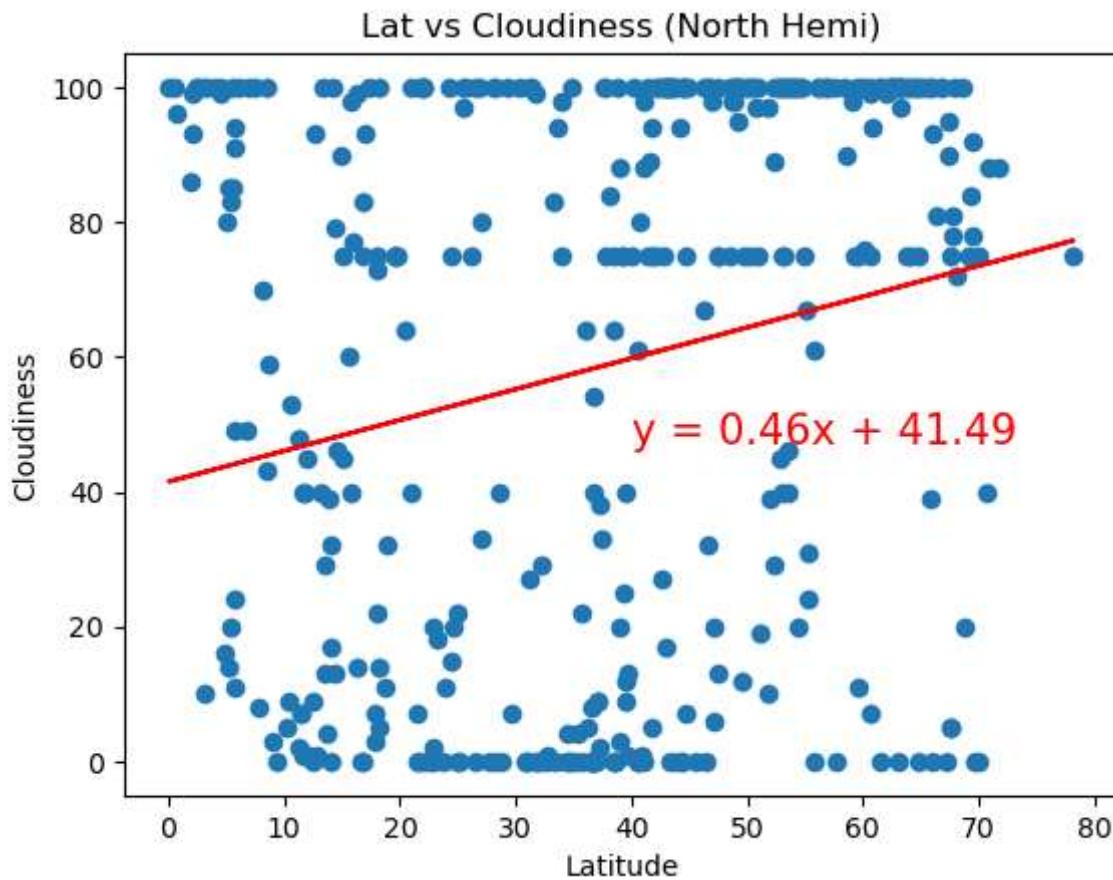
Discussion about the linear relationship: There is no significant correlation between the Humidity and Latitude. Both the Northern and Southern Hemispheres have rather flat regression lines and small r square values

Cloudiness vs. Latitude Linear Regression Plot

```
In [115...]: # Northern Hemisphere
x_values = northern_hemi_df['Lat']
y_values = northern_hemi_df['Cloudiness']

makeLinearRegressionPlot(x_values,y_values, "Cloudiness","North", (40,47))

The r-squared is: 0.04790629294734402
```

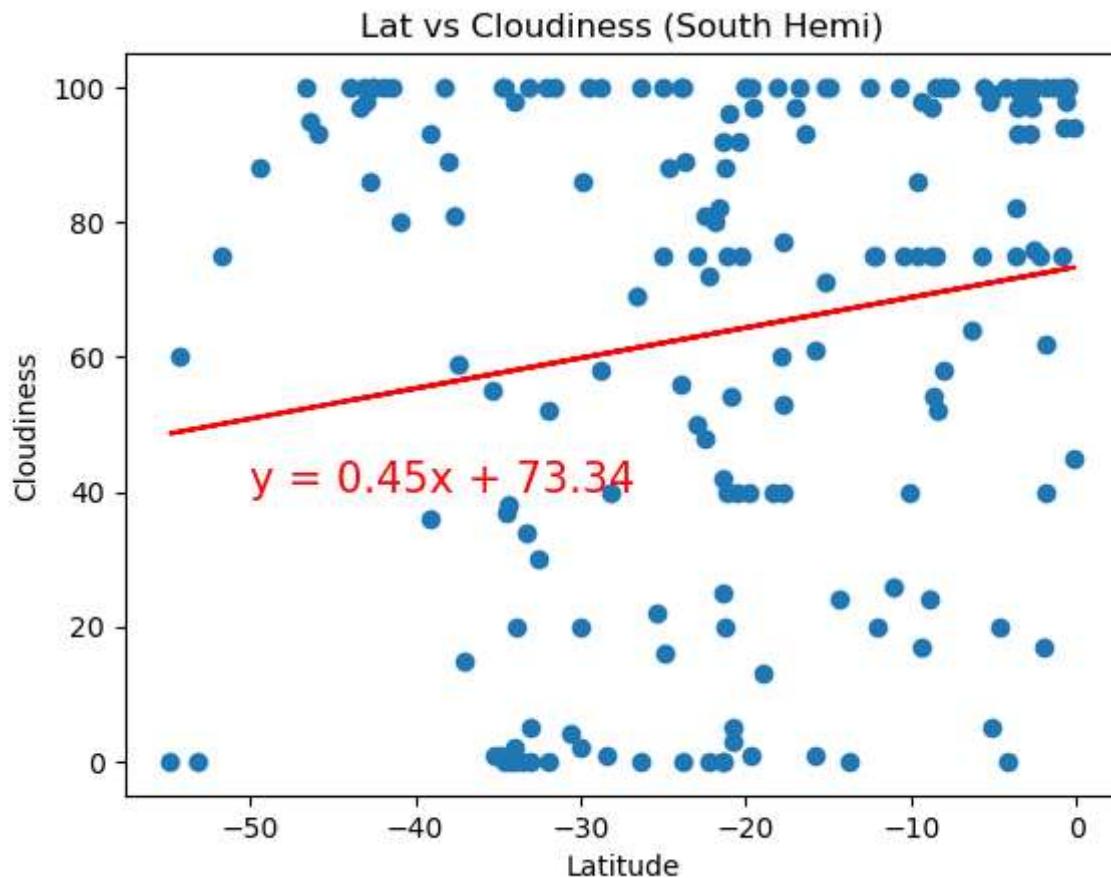


In [104...]

```
# Southern Hemisphere
x_values = southern_hemi_df['Lat']
y_values = southern_hemi_df['Cloudiness']

makeLinearRegressionPlot(x_values,y_values, "Cloudiness","South",(-50,40))
```

The r-squared is: 0.028757350972220694



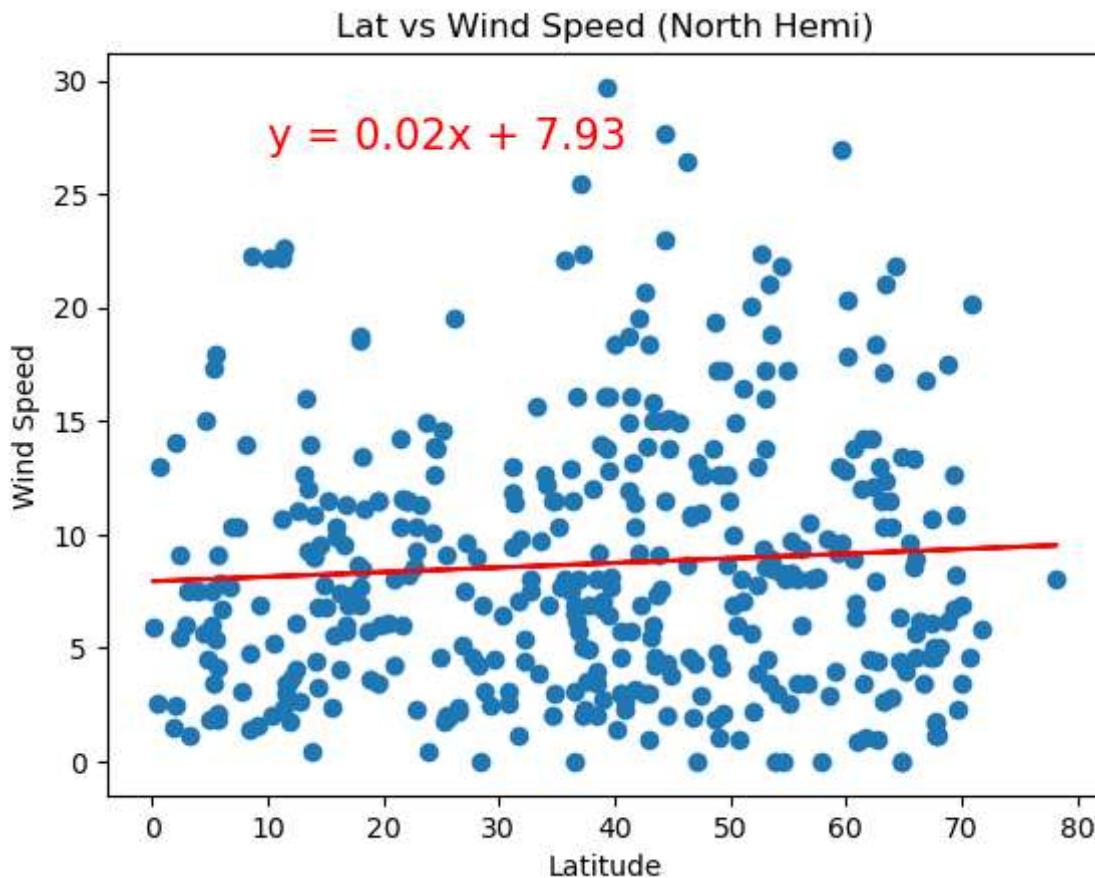
Discussion about the linear relationship: There is no significant correlation between the Cloudiness and Latitude. Both the Northern and Southern Hemispheres have r square values close to zero

Wind Speed vs. Latitude Linear Regression Plot

```
In [117...]: # Northern Hemisphere
x_values = northern_hemi_df['Lat']
y_values = northern_hemi_df['Wind Speed']

makeLinearRegressionPlot(x_values,y_values, "Wind Speed","North", (10,27))

The r-squared is: 0.004718209608683815
```

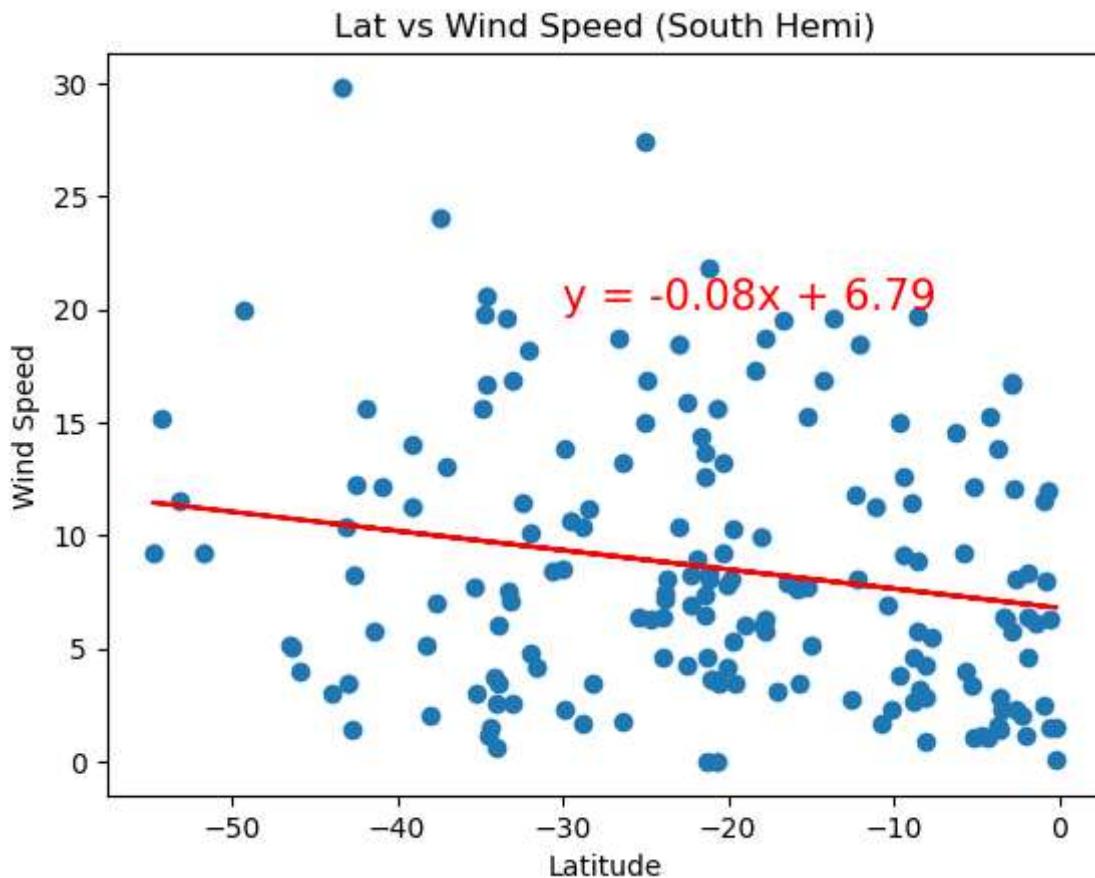


In [118...]

```
# Southern Hemisphere
x_values = southern_hemi_df['Lat']
y_values = southern_hemi_df['Wind Speed']

makeLinearRegressionPlot(x_values,y_values, "Wind Speed", "South",(-30,20))
```

The r-squared is: 0.03872481036818382



Discussion about the linear relationship: There is no significant correlation between the Wind Speed and Latitude. Both the Northern and Southern Hemispheres have r square values close to zero and very flat regresion lines

In []: