Dataset of pm2.5 with lat and lon only

1. Load the modules

In [1]:
```
import requests
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
```

Get API from OpenWeather Webpage

https://openweathermap.org/api

In [2]:
```
# API Key and City Information
api_key = 'a693b748d40c2a70d69295b2caad893a'
city_name = 'Bangkok,TH'
```

2. Get Pollution Dataset API and convert to dataframe

In [3]:
```
# Get coordinates from city name (Geocoding API)
geocode_url = f'http://api.openweathermap.org/geo/1.0/direct?q={city_name}&limit=1&
response = requests.get(geocode_url)
location_data = response.json()

if not location_data:
    raise ValueError("Invalid city name or no location data available.")

# List of monitoring stations with their coordinates
stations = [
    {'name': '3T', 'lat': 13.7563, 'lon': 100.5018}, #Ratchathewi Station
    {'name': '5T', 'lat': 13.7367, 'lon': 100.5231}, #Suppose to be T54 Pathum Wan
    {'name': '10T', 'lat': 13.7291, 'lon': 100.7750}, #Ladkrabang Station
    {'name': '11T', 'lat': 13.7898, 'lon': 100.4486}, #Taling Chan Station
    {'name': '12T', 'lat': 13.8225, 'lon': 100.5147}, # Bang Sue Station
    {'name': '15T', 'lat': 13.7083, 'lon': 100.3728}, #Bang Khae Station
    {'name': '61T', 'lat': 13.6796, 'lon': 100.6067}, #Bang Na Station
]
```

In [4]:
```
# Define the time range (from April 1, 2024, to now)
start_date = int(pd.Timestamp("2024-04-05 00:00:00").timestamp())
end_date = int(pd.Timestamp.now().timestamp())

# Fetch air pollution data
pollution_data = []
```

In [5]:
```
#Pull all the Variables
for station in stations:
    lat = station['lat']
    lon = station['lon']
    pollution_url = (
        f'http://api.openweathermap.org/data/2.5/air_pollution/history?'
        f'lat={lat}&lon={lon}&start={start_date}&end={end_date}&appid={api_key}'
    )

    response = requests.get(pollution_url)
    data = response.json()

    if 'list' in data:
        for entry in data['list']:
            dt = pd.to_datetime(entry['dt'], unit='s')
            components = entry['components']
            pollution_data.append({
                'datetime': dt,
                'station': station['name'],
                'lat': lat,
                'lon': lon,
                'pm2_5': components.get('pm2_5', None),
                'pm10': components.get('pm10', None),
                'so2': components.get('so2', None),
                'no2': components.get('no2', None),
                'o3': components.get('o3', None),
                'co': components.get('co', None),
            })
    else:
        print(f"No data available for station {station['name']} (lat={lat}, lon={lo

# Convert to DataFrame
pollution_df = pd.DataFrame(pollution_data)
```

In [6]:
```
#Check DataFrame Shape
pollution_df.shape
```

Out[6]: (60466, 10)

In [7]:
```
#Check Sample Data first five row
pollution_df.head()
```

Out[7]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
0	2024-04-05 00:00:00	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	1588.82
1	2024-04-05 01:00:00	3T	13.7563	100.5018	63.50	110.15	46.25	44.55	0.93	1869.20
2	2024-04-05 02:00:00	3T	13.7563	100.5018	64.57	110.58	47.68	45.24	1.79	1869.20
3	2024-04-05 03:00:00	3T	13.7563	100.5018	62.25	106.34	45.30	43.53	1.99	1615.52
4	2024-04-05 04:00:00	3T	13.7563	100.5018	53.40	88.52	36.24	43.18	5.14	1241.68

In [8]:

```
#Check All Sample Data
pollution_df
```

Out[8]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
0	2024-04-05 00:00:00	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	1588.82
1	2024-04-05 01:00:00	3T	13.7563	100.5018	63.50	110.15	46.25	44.55	0.93	1869.20
2	2024-04-05 02:00:00	3T	13.7563	100.5018	64.57	110.58	47.68	45.24	1.79	1869.20
3	2024-04-05 03:00:00	3T	13.7563	100.5018	62.25	106.34	45.30	43.53	1.99	1615.52
4	2024-04-05 04:00:00	3T	13.7563	100.5018	53.40	88.52	36.24	43.18	5.14	1241.68
...	...	...	...	...	...	...	...	...	...	...
60461	2025-04-12 17:00:00	61T	13.6796	100.6067	1.57	2.11	0.27	1.22	12.95	116.50
60462	2025-04-12 18:00:00	61T	13.6796	100.6067	1.59	2.07	0.23	1.12	12.80	118.82
60463	2025-04-12 19:00:00	61T	13.6796	100.6067	1.65	2.06	0.22	1.09	12.47	121.14
60464	2025-04-12 20:00:00	61T	13.6796	100.6067	1.73	2.11	0.24	1.13	11.94	123.10
60465	2025-04-12 21:00:00	61T	13.6796	100.6067	1.83	2.21	0.27	1.19	11.53	125.59

60466 rows × 10 columns

In [9]:
```
pollution_df .tail()
```

Out[9]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
60461	2025-04-12 17:00:00	61T	13.6796	100.6067	1.57	2.11	0.27	1.22	12.95	116.50
60462	2025-04-12 18:00:00	61T	13.6796	100.6067	1.59	2.07	0.23	1.12	12.80	118.82
60463	2025-04-12 19:00:00	61T	13.6796	100.6067	1.65	2.06	0.22	1.09	12.47	121.14
60464	2025-04-12 20:00:00	61T	13.6796	100.6067	1.73	2.11	0.24	1.13	11.94	123.10
60465	2025-04-12 21:00:00	61T	13.6796	100.6067	1.83	2.21	0.27	1.19	11.53	125.59

2. Pre-Processing

In [10]:
```
pollution_df['datetime'].diff().value_counts()
```

Out[10]:
```
datetime
0 days 01:00:00        60403
1 days 01:00:00           42
2 days 01:00:00            7
5 days 01:00:00            7
-373 days +03:00:00        6
Name: count, dtype: int64
```

Handling gaps

In [11]:
```
actual_range = pd.date_range(start=pollution_df ['datetime'].min(), end=pollution_d
actual_range
```

Out[11]:
```
DatetimeIndex(['2024-04-05 00:00:00', '2024-04-05 01:00:00',
               '2024-04-05 02:00:00', '2024-04-05 03:00:00',
               '2024-04-05 04:00:00', '2024-04-05 05:00:00',
               '2024-04-05 06:00:00', '2024-04-05 07:00:00',
               '2024-04-05 08:00:00', '2024-04-05 09:00:00',
               ...
               '2025-04-12 12:00:00', '2025-04-12 13:00:00',
               '2025-04-12 14:00:00', '2025-04-12 15:00:00',
               '2025-04-12 16:00:00', '2025-04-12 17:00:00',
               '2025-04-12 18:00:00', '2025-04-12 19:00:00',
               '2025-04-12 20:00:00', '2025-04-12 21:00:00'],
              dtype='datetime64[ns]', length=8950, freq='h')
```

Creating New DataFrame

In [12]:
```
# Create a new DataFrame with all datetime and station combinations
stations = pollution_df [['lat', 'lon']].drop_duplicates()
```

```
# Create full cartesian product of stations × timestamps
full_index = pd.MultiIndex.from_product([actual_range, stations.itertuples(index=Fa
                                        names=["datetime", "station_info"])
```

In [13]:
```
# Convert station lat/lon to tuples for merging
pollution_df ["station_info"] = list(zip(pollution_df ["lat"], pollution_df ["lon"]

# Merge with full datetime-station grid to fill missing timestamps per station
full_df = pd.DataFrame(index=full_index).reset_index().merge(pollution_df , on=["da

# Split 'station_info' back into separate lat/lon columns
full_df[["lat", "lon"]] = pd.DataFrame(full_df["station_info"].tolist(), index=full

# Drop redundant column
full_df.drop(columns=["station_info"], inplace=True)
```

In [14]:
```
# Check for missing timestamps
print(full_df["datetime"].diff().value_counts())

print('\n')
print('-'*50)
print('There can be a duplicate timestamp due to many stations are being recorded a
```

```
datetime
0 days 00:00:00    53700
0 days 01:00:00     8949
Name: count, dtype: int64


--------------------------------------------------
There can be a duplicate timestamp due to many stations are being recorded at the sa
me time
```

Check missing values

In [15]:
```
#Check Missing Values
full_df.isna().sum()
```

Out[15]:
```
datetime       0
station     2184
lat            0
lon            0
pm2_5       2184
pm10        2184
so2         2184
no2         2184
o3          2184
co          2184
dtype: int64
```

Check unique values of Latitide and Longtitude

In [16]:
```
#Check Latitude unique Value
full_df['lat'].unique()
```

Out[16]:
```
array([13.7563, 13.7367, 13.7291, 13.7898, 13.8225, 13.7083, 13.6796])
```

In [17]:
```
#Check Longitude unique Value
full_df['lon'].unique()
```

Out[17]:
```
array([100.5018, 100.5231, 100.775 , 100.4486, 100.5147, 100.3728,
       100.6067])
```

In [18]:
```
full_df['station'].unique()
```

Out[18]:
```
array(['3T', '5T', '10T', '11T', '12T', '15T', '61T', nan], dtype=object)
```

In [19]:
```
full_df.isna().sum()
```

Out[19]:
```
datetime       0
station     2184
lat            0
lon            0
pm2_5       2184
pm10        2184
so2         2184
no2         2184
o3          2184
co          2184
dtype: int64
```

In [20]:
```
full_df.groupby(['lat', 'lon'])['station'].nunique()
```

Out[20]:
```
lat      lon
13.6796  100.6067    1
13.7083  100.3728    1
13.7291  100.7750    1
13.7367  100.5231    1
13.7563  100.5018    1
13.7898  100.4486    1
13.8225  100.5147    1
Name: station, dtype: int64
```

In [21]:
```
full_df[full_df['station'].isna()]
```

Out[21]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
175	2024-04-06 01:00:00	NaN	13.7563	100.5018	NaN	NaN	NaN	NaN	NaN	NaN
176	2024-04-06 01:00:00	NaN	13.7367	100.5231	NaN	NaN	NaN	NaN	NaN	NaN
177	2024-04-06 01:00:00	NaN	13.7291	100.7750	NaN	NaN	NaN	NaN	NaN	NaN
178	2024-04-06 01:00:00	NaN	13.7898	100.4486	NaN	NaN	NaN	NaN	NaN	NaN
179	2024-04-06 01:00:00	NaN	13.8225	100.5147	NaN	NaN	NaN	NaN	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...
61490	2025-04-06 00:00:00	NaN	13.7291	100.7750	NaN	NaN	NaN	NaN	NaN	NaN
61491	2025-04-06 00:00:00	NaN	13.7898	100.4486	NaN	NaN	NaN	NaN	NaN	NaN
61492	2025-04-06 00:00:00	NaN	13.8225	100.5147	NaN	NaN	NaN	NaN	NaN	NaN
61493	2025-04-06 00:00:00	NaN	13.7083	100.3728	NaN	NaN	NaN	NaN	NaN	NaN
61494	2025-04-06 00:00:00	NaN	13.6796	100.6067	NaN	NaN	NaN	NaN	NaN	NaN

2184 rows × 10 columns

In [22]:
```
full_df['station'].value_counts()
```

Out[22]:
```
station
3T     8638
5T     8638
10T    8638
11T    8638
12T    8638
15T    8638
61T    8638
Name: count, dtype: int64
```

In [23]:
```
isna = full_df['station'].isna().value_counts()
```

In [24]:
```
missing_stations = full_df[full_df['station'].isna()]
missing_stations
```

Out[24]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
175	2024-04-06 01:00:00	NaN	13.7563	100.5018	NaN	NaN	NaN	NaN	NaN	NaN
176	2024-04-06 01:00:00	NaN	13.7367	100.5231	NaN	NaN	NaN	NaN	NaN	NaN
177	2024-04-06 01:00:00	NaN	13.7291	100.7750	NaN	NaN	NaN	NaN	NaN	NaN
178	2024-04-06 01:00:00	NaN	13.7898	100.4486	NaN	NaN	NaN	NaN	NaN	NaN
179	2024-04-06 01:00:00	NaN	13.8225	100.5147	NaN	NaN	NaN	NaN	NaN	NaN
...	...	...	...	...	...	...	...	...	...	...
61490	2025-04-06 00:00:00	NaN	13.7291	100.7750	NaN	NaN	NaN	NaN	NaN	NaN
61491	2025-04-06 00:00:00	NaN	13.7898	100.4486	NaN	NaN	NaN	NaN	NaN	NaN
61492	2025-04-06 00:00:00	NaN	13.8225	100.5147	NaN	NaN	NaN	NaN	NaN	NaN
61493	2025-04-06 00:00:00	NaN	13.7083	100.3728	NaN	NaN	NaN	NaN	NaN	NaN
61494	2025-04-06 00:00:00	NaN	13.6796	100.6067	NaN	NaN	NaN	NaN	NaN	NaN

2184 rows × 10 columns

In [25]:
```
full_df.groupby('station')[['lat', 'lon']].nunique()
```

Out[25]:

	lat	lon
station		
10T	1	1
11T	1	1
12T	1	1
15T	1	1
3T	1	1
5T	1	1
61T	1	1

In [26]:
```
full_df.groupby(['lat', 'lon'])['station'].nunique()
```

Out[26]:
```
lat      lon
13.6796  100.6067    1
13.7083  100.3728    1
13.7291  100.7750    1
13.7367  100.5231    1
13.7563  100.5018    1
13.7898  100.4486    1
13.8225  100.5147    1
Name: station, dtype: int64
```

Remove the (Roadside, Bangkok) emtries that shared the same lat, lon

In [27]:
```
full_df.groupby(['lat', 'lon'])['station'].unique()
```

Out[27]:
```
lat      lon
13.6796  100.6067    [61T, nan]
13.7083  100.3728    [15T, nan]
13.7291  100.7750    [10T, nan]
13.7367  100.5231     [5T, nan]
13.7563  100.5018     [3T, nan]
13.7898  100.4486    [11T, nan]
13.8225  100.5147    [12T, nan]
Name: station, dtype: object
```

In [28]:
```
full_df.head()
```

Out[28]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
0	2024-04-05	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	1588.82
1	2024-04-05	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17	1588.82
2	2024-04-05	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84	487.33
3	2024-04-05	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63	961.30
4	2024-04-05	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17	1588.82

In [29]:
```
pd.Series(full_df.index).diff().value_counts()
```

Out[29]:
```
1.0    62649
Name: count, dtype: int64
```

In [30]:
```
full_df.isna().sum()
```

Out[30]:
```
datetime       0
station     2184
lat            0
lon            0
pm2_5       2184
pm10        2184
so2         2184
no2         2184
o3          2184
co          2184
dtype: int64
```

3. Save the dataframe

In [31]:
```
import os
print(os.getcwd())
```

```
c:\Users\Legion 5 Pro\OneDrive\Documents\web_v3\Project PM2.5 code(11-4-25)\source_c
ode
```

In [32]:
```
full_df.to_csv('../datasets/pm25_bangkok_2025_lat_lon_.csv', index=True)
```

In [33]:
```
full_df
```

Out[33]:

	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3	co
0	2024-04-05 00:00:00	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	1588.82
1	2024-04-05 00:00:00	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17	1588.82
2	2024-04-05 00:00:00	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84	487.33
3	2024-04-05 00:00:00	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63	961.30
4	2024-04-05 00:00:00	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17	1588.82
...	...	...	...	...	...	...	...	...	...	...
62645	2025-04-12 21:00:00	10T	13.7291	100.7750	1.83	2.21	0.27	1.19	11.53	125.59
62646	2025-04-12 21:00:00	11T	13.7898	100.4486	3.05	3.48	0.25	1.57	6.27	149.25
62647	2025-04-12 21:00:00	12T	13.8225	100.5147	4.75	5.61	0.59	2.80	6.24	200.72
62648	2025-04-12 21:00:00	15T	13.7083	100.3728	4.27	4.74	0.23	1.94	1.04	172.77
62649	2025-04-12 21:00:00	61T	13.6796	100.6067	1.83	2.21	0.27	1.19	11.53	125.59

62650 rows × 10 columns

In [34]:
```
pd.Series(full_df.index).diff().value_counts()
```

Out[34]:
```
1.0    62649
Name: count, dtype: int64
```

4. Loading the saved dataset and start analysis

In [35]:
```
df = pd.read_csv('../datasets/pm25_bangkok_2025_lat_lon_.csv', parse_dates=['dateti
df.head()
```

Out[35]:

	Unnamed: 0	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3
0	0	2024-04-05	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	15
1	1	2024-04-05	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17	15
2	2	2024-04-05	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84	4
3	3	2024-04-05	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63	9
4	4	2024-04-05	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17	15

Validate the loaded dataframe

In [36]:
```
df.isna().sum()
```

Out[36]:
```
Unnamed: 0       0
datetime         0
station       2184
lat              0
lon              0
pm2_5         2184
pm10          2184
so2           2184
no2           2184
o3            2184
co            2184
dtype: int64
```

In [37]:
```
df.set_index('datetime', inplace=True)
```

In [38]:
```
pd.Series(df.index).diff().value_counts()
```

Out[38]:
```
datetime
0 days 00:00:00    53700
0 days 01:00:00     8949
Name: count, dtype: int64
```

In [39]:
```
df.head()
```

Out[39]:

	Unnamed: 0	station	lat	lon	pm2_5	pm10	so2	no2	o3	c
datetime										
2024-04-05	0	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17	1588.8
2024-04-05	1	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17	1588.8
2024-04-05	2	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84	487.3
2024-04-05	3	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63	961.3
2024-04-05	4	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17	1588.8

In [40]:

```
df.reset_index(inplace=True)
df
```

Out[40]:

	datetime	Unnamed: 0	station	lat	lon	pm2_5	pm10	so2	no2	o3
0	2024-04-05 00:00:00	0	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17
1	2024-04-05 00:00:00	1	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17
2	2024-04-05 00:00:00	2	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84
3	2024-04-05 00:00:00	3	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63
4	2024-04-05 00:00:00	4	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17
...	...	...	...	...	...	...	...	...	...	...
62645	2025-04-12 21:00:00	62645	10T	13.7291	100.7750	1.83	2.21	0.27	1.19	11.53
62646	2025-04-12 21:00:00	62646	11T	13.7898	100.4486	3.05	3.48	0.25	1.57	6.27
62647	2025-04-12 21:00:00	62647	12T	13.8225	100.5147	4.75	5.61	0.59	2.80	6.24
62648	2025-04-12 21:00:00	62648	15T	13.7083	100.3728	4.27	4.74	0.23	1.94	1.04
62649	2025-04-12 21:00:00	62649	61T	13.6796	100.6067	1.83	2.21	0.27	1.19	11.53

62650 rows × 11 columns

5. API request for historical weather data

In [41]:

```
# Import additional modules
import time
from datetime import datetime, timedelta
```

In [42]:
```
# OpenWeather API Key (Replace with your actual API key)
API_KEY = "45ec5c0e59ce5937572ea6e6629eabb3"

# List of monitoring stations with coordinates
stations = [
    {'name': '3T', 'lat': 13.7563, 'lon': 100.5018},
    {'name': '5T', 'lat': 13.7367, 'lon': 100.5231},
    {'name': '10T', 'lat': 13.7291, 'lon': 100.7750},
    {'name': '11T', 'lat': 13.7898, 'lon': 100.4486},
    {'name': '12T', 'lat': 13.8225, 'lon': 100.5147},
    {'name': '15T', 'lat': 13.7083, 'lon': 100.3728},
    {'name': '61T', 'lat': 13.6796, 'lon': 100.6067},
]

# Define the time range (From 2024-04-01 to now)
start_date = datetime(2024, 4, 5)
end_date = datetime.now()
delta = timedelta(days=30)  # Fetch 30 days at a time

# Base URL for OpenWeather History API
BASE_URL = "https://history.openweathermap.org/data/2.5/history/city"
```

In [43]:
```
# Data storage
all_data = []

# Fetch weather data for each station
for station in stations:
    print(f"Fetching data for {station['name']}...")

    temp_start_date = start_date  # Keep track of moving start date

    while temp_start_date < end_date:
        # Convert to Unix timestamp
        start_timestamp = int(temp_start_date.timestamp())
        end_timestamp = int((temp_start_date + delta).timestamp())

        # Construct API request URL
        url = (
            f"{BASE_URL}?lat={station['lat']}&lon={station['lon']}"
            f"&type=hour&start={start_timestamp}&end={end_timestamp}&appid={API_KEY
        )

        # Send request
        response = requests.get(url)

        # Check response status
        if response.status_code == 200:
            data = response.json()

            # Extract required fields
            for entry in data.get("list", []):
                record = {
                    "station": station["name"],
                    "timestamp": pd.to_datetime(entry["dt"], unit="s"),
                    "temp": entry["main"].get("temp", None),
```

```
                "pressure": entry["main"].get("pressure", None),
                "grnd_level": entry["main"].get("grnd_level", None),
                "humidity": entry["main"].get("humidity", None),
                "windspeed": entry["wind"].get("speed", None),
                "winddeg": entry["wind"].get("deg", None),
                "cloudall": entry["clouds"].get("all", None),
                "weathermain": entry["weather"][0].get("main", None) if entry["
            }
            all_data.append(record)

        print(f"Data retrieved for {temp_start_date} - {temp_start_date + delta

    else:
        print(f"API failed for {temp_start_date} - {temp_start_date + delta}. S

    # Move to the next time window
    temp_start_date += delta

    # Avoid API rate limits
    time.sleep(1)
```

```
Fetching data for 3T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
Fetching data for 5T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
Fetching data for 10T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
Fetching data for 11T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
```

```
Fetching data for 12T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
Fetching data for 15T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
Fetching data for 61T...
API failed for 2024-04-05 00:00:00 - 2024-05-05 00:00:00. Status Code: 400
Data retrieved for 2024-05-05 00:00:00 - 2024-06-04 00:00:00
Data retrieved for 2024-06-04 00:00:00 - 2024-07-04 00:00:00
Data retrieved for 2024-07-04 00:00:00 - 2024-08-03 00:00:00
Data retrieved for 2024-08-03 00:00:00 - 2024-09-02 00:00:00
Data retrieved for 2024-09-02 00:00:00 - 2024-10-02 00:00:00
Data retrieved for 2024-10-02 00:00:00 - 2024-11-01 00:00:00
Data retrieved for 2024-11-01 00:00:00 - 2024-12-01 00:00:00
Data retrieved for 2024-12-01 00:00:00 - 2024-12-31 00:00:00
Data retrieved for 2024-12-31 00:00:00 - 2025-01-30 00:00:00
Data retrieved for 2025-01-30 00:00:00 - 2025-03-01 00:00:00
Data retrieved for 2025-03-01 00:00:00 - 2025-03-31 00:00:00
Data retrieved for 2025-03-31 00:00:00 - 2025-04-30 00:00:00
```

In [44]:

```
#Check data after being pulled throught API
all_data
```

Out[44]:

```
[{'station': '3T',
  'timestamp': Timestamp('2024-05-04 17:00:00'),
  'temp': 305.44,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 6.57,
  'winddeg': 181,
  'cloudall': 63,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-04 18:00:00'),
  'temp': 304.42,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 6.04,
  'winddeg': 179,
  'cloudall': 68,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-04 19:00:00'),
  'temp': 304.42,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 5.53,
  'winddeg': 176,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-04 20:00:00'),
  'temp': 304.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 5.03,
  'winddeg': 174,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-04 21:00:00'),
  'temp': 304.52,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 4.84,
  'winddeg': 168,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-04 22:00:00'),
  'temp': 304.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 69,
```

```
 'windspeed': 4.65,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-04 23:00:00'),
 'temp': 304.52,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 3.92,
 'winddeg': 180,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 00:00:00'),
 'temp': 304.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 2.99,
 'winddeg': 183,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 01:00:00'),
 'temp': 305.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 2.71,
 'winddeg': 185,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 02:00:00'),
 'temp': 308.06,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 52,
 'windspeed': 2.93,
 'winddeg': 174,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 03:00:00'),
 'temp': 310.19,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 43,
 'windspeed': 2.7,
 'winddeg': 173,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 04:00:00'),
```

```
  'temp': 310.59,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 39,
  'windspeed': 3.31,
  'winddeg': 170,
  'cloudall': 88,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 05:00:00'),
  'temp': 311.21,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 38,
  'windspeed': 4.48,
  'winddeg': 168,
  'cloudall': 71,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 06:00:00'),
  'temp': 310.56,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 39,
  'windspeed': 5.25,
  'winddeg': 175,
  'cloudall': 75,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 07:00:00'),
  'temp': 311.29,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 44,
  'windspeed': 6.54,
  'winddeg': 175,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 08:00:00'),
  'temp': 312.22,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 45,
  'windspeed': 6.33,
  'winddeg': 179,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 09:00:00'),
  'temp': 311.55,
  'pressure': 1002,
  'grnd_level': None,
  'humidity': 44,
  'windspeed': 5.57,
  'winddeg': 175,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 10:00:00'),
  'temp': 311.89,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 43,
  'windspeed': 7.83,
  'winddeg': 152,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 11:00:00'),
  'temp': 309.99,
  'pressure': 1002,
  'grnd_level': None,
  'humidity': 48,
  'windspeed': 6.86,
  'winddeg': 162,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 12:00:00'),
  'temp': 308.21,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 53,
  'windspeed': 6.84,
  'winddeg': 169,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 13:00:00'),
  'temp': 306.99,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 61,
  'windspeed': 7.25,
  'winddeg': 184,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 14:00:00'),
  'temp': 306.79,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 6.7,
  'winddeg': 180,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 15:00:00'),
  'temp': 306.56,
  'pressure': 1007,
```

```
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 6.39,
  'winddeg': 177,
  'cloudall': 96,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 16:00:00'),
  'temp': 305.54,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 67,
  'windspeed': 6.09,
  'winddeg': 175,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 17:00:00'),
  'temp': 305.44,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 5.84,
  'winddeg': 169,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 18:00:00'),
  'temp': 305.34,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 5.48,
  'winddeg': 176,
  'cloudall': 36,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 19:00:00'),
  'temp': 304.3,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 51,
  'windspeed': 5.27,
  'winddeg': 174,
  'cloudall': 3,
  'weathermain': 'Clear'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-05 20:00:00'),
  'temp': 304.68,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 53,
  'windspeed': 5.33,
  'winddeg': 171,
  'cloudall': 7,
  'weathermain': 'Clear'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 21:00:00'),
 'temp': 304.68,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 5.04,
 'winddeg': 175,
 'cloudall': 7,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 22:00:00'),
 'temp': 305.07,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 4.93,
 'winddeg': 169,
 'cloudall': 7,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-05 23:00:00'),
 'temp': 305.07,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 4.89,
 'winddeg': 170,
 'cloudall': 7,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 00:00:00'),
 'temp': 305.07,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 4.86,
 'winddeg': 182,
 'cloudall': 19,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 01:00:00'),
 'temp': 305.01,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 56,
 'windspeed': 4.06,
 'winddeg': 185,
 'cloudall': 7,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 02:00:00'),
 'temp': 307.7,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 58,
```

```
 'windspeed': 3.99,
 'winddeg': 187,
 'cloudall': 3,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 03:00:00'),
 'temp': 308.74,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 57,
 'windspeed': 4.29,
 'winddeg': 186,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 04:00:00'),
 'temp': 309.47,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 53,
 'windspeed': 4.54,
 'winddeg': 184,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 05:00:00'),
 'temp': 310.61,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 47,
 'windspeed': 4.69,
 'winddeg': 185,
 'cloudall': 1,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 06:00:00'),
 'temp': 312.19,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 40,
 'windspeed': 5.11,
 'winddeg': 185,
 'cloudall': 3,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 07:00:00'),
 'temp': 311.37,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 39,
 'windspeed': 5.49,
 'winddeg': 184,
 'cloudall': 21,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 08:00:00'),
```

```
  'temp': 312.01,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 38,
  'windspeed': 6.02,
  'winddeg': 173,
  'cloudall': 38,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 09:00:00'),
  'temp': 310.65,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 42,
  'windspeed': 6.54,
  'winddeg': 162,
  'cloudall': 55,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 10:00:00'),
  'temp': 311.22,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 40,
  'windspeed': 5.6,
  'winddeg': 173,
  'cloudall': 44,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 11:00:00'),
  'temp': 310.17,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 41,
  'windspeed': 6.44,
  'winddeg': 177,
  'cloudall': 51,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 12:00:00'),
  'temp': 305.79,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 45,
  'windspeed': 6.94,
  'winddeg': 181,
  'cloudall': 33,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 13:00:00'),
  'temp': 305.42,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 49,
  'windspeed': 6.45,
  'winddeg': 157,
```

```
  'cloudall': 37,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 14:00:00'),
  'temp': 305.42,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 50,
  'windspeed': 6.25,
  'winddeg': 140,
  'cloudall': 32,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 15:00:00'),
  'temp': 305.24,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 50,
  'windspeed': 4.94,
  'winddeg': 131,
  'cloudall': 23,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 16:00:00'),
  'temp': 305.34,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 52,
  'windspeed': 4.92,
  'winddeg': 173,
  'cloudall': 19,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 17:00:00'),
  'temp': 305.34,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 54,
  'windspeed': 5.56,
  'winddeg': 177,
  'cloudall': 16,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 18:00:00'),
  'temp': 305.3,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 5.35,
  'winddeg': 177,
  'cloudall': 16,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-06 19:00:00'),
  'temp': 305.13,
  'pressure': 1008,
```

```
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 4.9,
 'winddeg': 184,
 'cloudall': 3,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 20:00:00'),
 'temp': 305.07,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 58,
 'windspeed': 4.76,
 'winddeg': 187,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 21:00:00'),
 'temp': 304.63,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 57,
 'windspeed': 3.88,
 'winddeg': 187,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 22:00:00'),
 'temp': 304.63,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 57,
 'windspeed': 3.45,
 'winddeg': 176,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-06 23:00:00'),
 'temp': 304.41,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 58,
 'windspeed': 3.47,
 'winddeg': 180,
 'cloudall': 1,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 00:00:00'),
 'temp': 304.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 58,
 'windspeed': 3.56,
 'winddeg': 185,
 'cloudall': 14,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 01:00:00'),
  'temp': 305.35,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 61,
  'windspeed': 3.32,
  'winddeg': 187,
  'cloudall': 94,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 02:00:00'),
  'temp': 304.49,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 67,
  'windspeed': 3.37,
  'winddeg': 204,
  'cloudall': 96,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 03:00:00'),
  'temp': 303.37,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 3.05,
  'winddeg': 195,
  'cloudall': 89,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 04:00:00'),
  'temp': 303.96,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 5.34,
  'winddeg': 181,
  'cloudall': 90,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 05:00:00'),
  'temp': 303.68,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 6.58,
  'winddeg': 180,
  'cloudall': 87,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 06:00:00'),
  'temp': 303.3,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 62,
```

```
 'windspeed': 6.48,
 'winddeg': 179,
 'cloudall': 84,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 07:00:00'),
 'temp': 303.56,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 5.06,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 08:00:00'),
 'temp': 303.14,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 4.54,
 'winddeg': 179,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 09:00:00'),
 'temp': 303.1,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 4.4,
 'winddeg': 199,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 10:00:00'),
 'temp': 302.85,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.88,
 'winddeg': 165,
 'cloudall': 95,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 11:00:00'),
 'temp': 302.69,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 4.82,
 'winddeg': 155,
 'cloudall': 95,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-07 12:00:00'),
```

```
  'temp': 302.81,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 4.26,
  'winddeg': 136,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 13:00:00'),
  'temp': 302.29,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 3.08,
  'winddeg': 145,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 14:00:00'),
  'temp': 301.56,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.9,
  'winddeg': 162,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 15:00:00'),
  'temp': 301.78,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.18,
  'winddeg': 160,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 16:00:00'),
  'temp': 301.77,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 2.38,
  'winddeg': 149,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 17:00:00'),
  'temp': 301.79,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 1.7,
  'winddeg': 184,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 18:00:00'),
  'temp': 301.16,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 1.92,
  'winddeg': 147,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 19:00:00'),
  'temp': 301.06,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 1.64,
  'winddeg': 162,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 20:00:00'),
  'temp': 301.05,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 1.23,
  'winddeg': 183,
  'cloudall': 88,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 21:00:00'),
  'temp': 301.55,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 1.04,
  'winddeg': 203,
  'cloudall': 91,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 22:00:00'),
  'temp': 301.63,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 0.5,
  'winddeg': 200,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-07 23:00:00'),
  'temp': 301.44,
  'pressure': 1009,
```

```
  'grnd_level': None,
  'humidity': 73,
  'windspeed': 0.56,
  'winddeg': 74,
  'cloudall': 94,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 00:00:00'),
  'temp': 301.11,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.02,
  'winddeg': 57,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 01:00:00'),
  'temp': 302.78,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 1.96,
  'winddeg': 63,
  'cloudall': 84,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 02:00:00'),
  'temp': 303.45,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 1.17,
  'winddeg': 48,
  'cloudall': 87,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 03:00:00'),
  'temp': 305.63,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 0.96,
  'winddeg': 56,
  'cloudall': 91,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 04:00:00'),
  'temp': 306.89,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 0.81,
  'winddeg': 120,
  'cloudall': 93,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 05:00:00'),
 'temp': 308.3,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 48,
 'windspeed': 1.55,
 'winddeg': 149,
 'cloudall': 92,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 06:00:00'),
 'temp': 310.27,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 42,
 'windspeed': 1.33,
 'winddeg': 153,
 'cloudall': 80,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 07:00:00'),
 'temp': 309.54,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 33,
 'windspeed': 2.1,
 'winddeg': 184,
 'cloudall': 69,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 08:00:00'),
 'temp': 311.18,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 39,
 'windspeed': 3.46,
 'winddeg': 195,
 'cloudall': 73,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 09:00:00'),
 'temp': 309.61,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 43,
 'windspeed': 4.73,
 'winddeg': 191,
 'cloudall': 72,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 10:00:00'),
 'temp': 309.51,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 45,
```

```
 'windspeed': 5.96,
 'winddeg': 185,
 'cloudall': 73,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 11:00:00'),
 'temp': 309.07,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 41,
 'windspeed': 5.8,
 'winddeg': 178,
 'cloudall': 62,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 12:00:00'),
 'temp': 307.27,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 43,
 'windspeed': 4.69,
 'winddeg': 181,
 'cloudall': 74,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 13:00:00'),
 'temp': 307.32,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 42,
 'windspeed': 4.68,
 'winddeg': 189,
 'cloudall': 19,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 14:00:00'),
 'temp': 306.95,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 44,
 'windspeed': 5.5,
 'winddeg': 193,
 'cloudall': 30,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 15:00:00'),
 'temp': 305.97,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 41,
 'windspeed': 5.53,
 'winddeg': 194,
 'cloudall': 43,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 16:00:00'),
```

```
  'temp': 304.19,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 5.39,
  'winddeg': 192,
  'cloudall': 50,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 17:00:00'),
  'temp': 305.97,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 42,
  'windspeed': 5.28,
  'winddeg': 189,
  'cloudall': 56,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 18:00:00'),
  'temp': 302.98,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 4.9,
  'winddeg': 191,
  'cloudall': 63,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 19:00:00'),
  'temp': 304.86,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 4.52,
  'winddeg': 192,
  'cloudall': 55,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 20:00:00'),
  'temp': 302.58,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 3.81,
  'winddeg': 188,
  'cloudall': 63,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-08 21:00:00'),
  'temp': 304.25,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 3.4,
  'winddeg': 183,
```

```
 'cloudall': 73,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 22:00:00'),
 'temp': 304.19,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.42,
 'winddeg': 178,
 'cloudall': 79,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-08 23:00:00'),
 'temp': 304.19,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.24,
 'winddeg': 178,
 'cloudall': 82,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 00:00:00'),
 'temp': 303.98,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.37,
 'winddeg': 188,
 'cloudall': 73,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 01:00:00'),
 'temp': 305.75,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 3.42,
 'winddeg': 183,
 'cloudall': 92,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 02:00:00'),
 'temp': 306.31,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 3.5,
 'winddeg': 184,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 03:00:00'),
 'temp': 306.78,
 'pressure': 1010,
```

```
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 3.45,
  'winddeg': 192,
  'cloudall': 60,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-09 04:00:00'),
  'temp': 307.27,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 3.84,
  'winddeg': 184,
  'cloudall': 49,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-09 05:00:00'),
  'temp': 308.88,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 4.36,
  'winddeg': 178,
  'cloudall': 42,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-09 06:00:00'),
  'temp': 309.88,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 56,
  'windspeed': 4.5,
  'winddeg': 173,
  'cloudall': 40,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-09 07:00:00'),
  'temp': 309.3,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 57,
  'windspeed': 5.65,
  'winddeg': 173,
  'cloudall': 84,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-09 08:00:00'),
  'temp': 307.91,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 57,
  'windspeed': 5.44,
  'winddeg': 175,
  'cloudall': 82,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 09:00:00'),
 'temp': 308.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 54,
 'windspeed': 5.53,
 'winddeg': 175,
 'cloudall': 79,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 10:00:00'),
 'temp': 307.44,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 54,
 'windspeed': 6.39,
 'winddeg': 172,
 'cloudall': 62,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 11:00:00'),
 'temp': 306.72,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 6.28,
 'winddeg': 175,
 'cloudall': 51,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 12:00:00'),
 'temp': 306.39,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 6.38,
 'winddeg': 179,
 'cloudall': 43,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 13:00:00'),
 'temp': 305.47,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 57,
 'windspeed': 5.12,
 'winddeg': 184,
 'cloudall': 2,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 14:00:00'),
 'temp': 305.34,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 58,
```

```
 'windspeed': 4.4,
 'winddeg': 183,
 'cloudall': 5,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 15:00:00'),
 'temp': 305.1,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 4.44,
 'winddeg': 187,
 'cloudall': 9,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 16:00:00'),
 'temp': 304.56,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 4.8,
 'winddeg': 184,
 'cloudall': 26,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 17:00:00'),
 'temp': 305.03,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 5.09,
 'winddeg': 181,
 'cloudall': 41,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 18:00:00'),
 'temp': 304.03,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 4.01,
 'winddeg': 178,
 'cloudall': 69,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 19:00:00'),
 'temp': 304.58,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 3.5,
 'winddeg': 179,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 20:00:00'),
```

```
 'temp': 304.13,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 2.87,
 'winddeg': 201,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 21:00:00'),
 'temp': 304.06,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 2.46,
 'winddeg': 209,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 22:00:00'),
 'temp': 303.71,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 2.19,
 'winddeg': 215,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-09 23:00:00'),
 'temp': 303.16,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 1.91,
 'winddeg': 225,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 00:00:00'),
 'temp': 304.24,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 1.77,
 'winddeg': 223,
 'cloudall': 87,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 01:00:00'),
 'temp': 304.61,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 1.5,
 'winddeg': 207,
```

```
 'cloudall': 89,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 02:00:00'),
 'temp': 305.99,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 1.49,
 'winddeg': 180,
 'cloudall': 63,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 03:00:00'),
 'temp': 306.16,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 57,
 'windspeed': 2.41,
 'winddeg': 173,
 'cloudall': 52,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 04:00:00'),
 'temp': 306.97,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 52,
 'windspeed': 3.22,
 'winddeg': 176,
 'cloudall': 57,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 05:00:00'),
 'temp': 308.37,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 50,
 'windspeed': 4.57,
 'winddeg': 180,
 'cloudall': 58,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 06:00:00'),
 'temp': 310.1,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 48,
 'windspeed': 5.33,
 'winddeg': 179,
 'cloudall': 55,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 07:00:00'),
 'temp': 308.61,
 'pressure': 1007,
```

```
 'grnd_level': None,
 'humidity': 48,
 'windspeed': 6.23,
 'winddeg': 183,
 'cloudall': 82,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 08:00:00'),
 'temp': 309.54,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 43,
 'windspeed': 6.24,
 'winddeg': 180,
 'cloudall': 77,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 09:00:00'),
 'temp': 308.5,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 49,
 'windspeed': 6.32,
 'winddeg': 175,
 'cloudall': 84,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 10:00:00'),
 'temp': 308.28,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 6.74,
 'winddeg': 184,
 'cloudall': 88,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 11:00:00'),
 'temp': 306.03,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 44,
 'windspeed': 6.87,
 'winddeg': 185,
 'cloudall': 90,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-10 12:00:00'),
 'temp': 304.87,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 41,
 'windspeed': 6.17,
 'winddeg': 183,
 'cloudall': 77,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 13:00:00'),
  'temp': 304,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 49,
  'windspeed': 5.68,
  'winddeg': 185,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 14:00:00'),
  'temp': 304.04,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 45,
  'windspeed': 4.62,
  'winddeg': 201,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 15:00:00'),
  'temp': 303.98,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 46,
  'windspeed': 5.04,
  'winddeg': 190,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 16:00:00'),
  'temp': 305.59,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 47,
  'windspeed': 3.78,
  'winddeg': 204,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 17:00:00'),
  'temp': 304.79,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 44,
  'windspeed': 2.3,
  'winddeg': 212,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 18:00:00'),
  'temp': 304.22,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 47,
```

```
  'windspeed': 2.35,
  'winddeg': 218,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 19:00:00'),
  'temp': 302.21,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 44,
  'windspeed': 1.93,
  'winddeg': 235,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 20:00:00'),
  'temp': 302.5,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 47,
  'windspeed': 1.79,
  'winddeg': 240,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 21:00:00'),
  'temp': 303.95,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 1.4,
  'winddeg': 236,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 22:00:00'),
  'temp': 304.38,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 0.61,
  'winddeg': 242,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-10 23:00:00'),
  'temp': 304.36,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 1.36,
  'winddeg': 208,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 00:00:00'),
```

```
 'temp': 304.26,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 1.13,
 'winddeg': 18,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 01:00:00'),
 'temp': 305.03,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 1.05,
 'winddeg': 348,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 02:00:00'),
 'temp': 305.86,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 0.37,
 'winddeg': 6,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 03:00:00'),
 'temp': 306.71,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 1.48,
 'winddeg': 89,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 04:00:00'),
 'temp': 307.7,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 1.98,
 'winddeg': 95,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 05:00:00'),
 'temp': 307.38,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 2.52,
 'winddeg': 112,
```

```
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 06:00:00'),
 'temp': 307.25,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 2.48,
 'winddeg': 107,
 'cloudall': 98,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 07:00:00'),
 'temp': 306.18,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 2.46,
 'winddeg': 126,
 'cloudall': 80,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 08:00:00'),
 'temp': 306.87,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 2.53,
 'winddeg': 149,
 'cloudall': 82,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 09:00:00'),
 'temp': 308,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 3.68,
 'winddeg': 184,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 10:00:00'),
 'temp': 308.12,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 56,
 'windspeed': 4.95,
 'winddeg': 187,
 'cloudall': 85,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-05-11 11:00:00'),
 'temp': 308.04,
 'pressure': 1008,
```

```
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 5.21,
  'winddeg': 211,
  'cloudall': 87,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 12:00:00'),
  'temp': 306.72,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 3.99,
  'winddeg': 168,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 13:00:00'),
  'temp': 305.97,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3.67,
  'winddeg': 185,
  'cloudall': 98,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 14:00:00'),
  'temp': 306.26,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3.62,
  'winddeg': 194,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 15:00:00'),
  'temp': 306.03,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 3.32,
  'winddeg': 199,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 16:00:00'),
  'temp': 306.03,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 2.76,
  'winddeg': 201,
  'cloudall': 83,
  'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-05-11 17:00:00'),
  'temp': 305.73,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 3,
  'winddeg': 193,
  'cloudall': 80,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 17:00:00'),
  'temp': 301.92,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 2.57,
  'winddeg': 269,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 18:00:00'),
  'temp': 301.9,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.23,
  'winddeg': 267,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 19:00:00'),
  'temp': 301.29,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 2.18,
  'winddeg': 275,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 20:00:00'),
  'temp': 300.83,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.1,
  'winddeg': 264,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 21:00:00'),
  'temp': 301.29,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 92,
```

```
  'windspeed': 1.74,
  'winddeg': 259,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 22:00:00'),
  'temp': 300.67,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 1.65,
  'winddeg': 250,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-03 23:00:00'),
  'temp': 300.65,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 1.33,
  'winddeg': 241,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 00:00:00'),
  'temp': 302.02,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 1.88,
  'winddeg': 224,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 01:00:00'),
  'temp': 303.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 2.41,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 02:00:00'),
  'temp': 304.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 2.84,
  'winddeg': 227,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 03:00:00'),
```

```
  'temp': 306.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 57,
  'windspeed': 3.17,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 04:00:00'),
  'temp': 306.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 3.63,
  'winddeg': 238,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 05:00:00'),
  'temp': 307.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 3.57,
  'winddeg': 238,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 06:00:00'),
  'temp': 308.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 61,
  'windspeed': 2.98,
  'winddeg': 250,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 07:00:00'),
  'temp': 308.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 3.11,
  'winddeg': 246,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 08:00:00'),
  'temp': 308.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 3,
  'winddeg': 249,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 09:00:00'),
 'temp': 308.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 2.39,
 'winddeg': 257,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 10:00:00'),
 'temp': 308.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 2.98,
 'winddeg': 262,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 11:00:00'),
 'temp': 308.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 2.52,
 'winddeg': 260,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 12:00:00'),
 'temp': 305.52,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 2.59,
 'winddeg': 285,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 13:00:00'),
 'temp': 304.98,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 2.95,
 'winddeg': 277,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 14:00:00'),
 'temp': 304.36,
 'pressure': 1009,
```

```
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.93,
 'winddeg': 276,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 15:00:00'),
 'temp': 303.91,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.71,
 'winddeg': 277,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 16:00:00'),
 'temp': 302.79,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 2.59,
 'winddeg': 286,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 17:00:00'),
 'temp': 303.23,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.37,
 'winddeg': 272,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 18:00:00'),
 'temp': 303.21,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.97,
 'winddeg': 254,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-04 19:00:00'),
 'temp': 302.55,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.71,
 'winddeg': 253,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 20:00:00'),
  'temp': 302.29,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 2.35,
  'winddeg': 253,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 21:00:00'),
  'temp': 301.96,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 1.68,
  'winddeg': 261,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 22:00:00'),
  'temp': 301.52,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 1.61,
  'winddeg': 246,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-04 23:00:00'),
  'temp': 301.52,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 1.49,
  'winddeg': 236,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 00:00:00'),
  'temp': 302,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 1.53,
  'winddeg': 248,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 01:00:00'),
  'temp': 304.3,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 79,
```

```
 'windspeed': 1.55,
 'winddeg': 255,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 02:00:00'),
 'temp': 303.99,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 1.79,
 'winddeg': 266,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 03:00:00'),
 'temp': 305.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 1.81,
 'winddeg': 270,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 04:00:00'),
 'temp': 305.99,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 51,
 'windspeed': 2.13,
 'winddeg': 244,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 05:00:00'),
 'temp': 309.11,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 3.06,
 'winddeg': 227,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 06:00:00'),
 'temp': 309.28,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 5.65,
 'winddeg': 231,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 07:00:00'),
```

```
  'temp': 308.53,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 4.53,
  'winddeg': 236,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 08:00:00'),
  'temp': 307.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 47,
  'windspeed': 4.54,
  'winddeg': 233,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 09:00:00'),
  'temp': 307.99,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 50,
  'windspeed': 5.93,
  'winddeg': 252,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 10:00:00'),
  'temp': 306.54,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 6.09,
  'winddeg': 259,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 11:00:00'),
  'temp': 305,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 79,
  'windspeed': 6.25,
  'winddeg': 259,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 12:00:00'),
  'temp': 303.91,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 3.45,
  'winddeg': 235,
```

```
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 13:00:00'),
  'temp': 302.66,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 71,
  'windspeed': 2.66,
  'winddeg': 215,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 14:00:00'),
  'temp': 302.3,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 2.76,
  'winddeg': 222,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 15:00:00'),
  'temp': 303.24,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 2.94,
  'winddeg': 225,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 16:00:00'),
  'temp': 303.29,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 2.65,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 17:00:00'),
  'temp': 302.83,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 2.67,
  'winddeg': 239,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-05 18:00:00'),
  'temp': 302.2,
  'pressure': 1010,
```

```
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 3.2,
 'winddeg': 234,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 19:00:00'),
 'temp': 301.74,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 2.92,
 'winddeg': 238,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 20:00:00'),
 'temp': 301.13,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.88,
 'winddeg': 243,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 21:00:00'),
 'temp': 300.2,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.69,
 'winddeg': 244,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 22:00:00'),
 'temp': 299.58,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 93,
 'windspeed': 2.26,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-05 23:00:00'),
 'temp': 299.56,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 94,
 'windspeed': 2.12,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 00:00:00'),
  'temp': 303.67,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 2.5,
  'winddeg': 217,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 01:00:00'),
  'temp': 303.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 3.06,
  'winddeg': 210,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 02:00:00'),
  'temp': 304.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 3.2,
  'winddeg': 222,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 03:00:00'),
  'temp': 305.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 51,
  'windspeed': 3.27,
  'winddeg': 225,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 04:00:00'),
  'temp': 305.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 49,
  'windspeed': 3.48,
  'winddeg': 221,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 05:00:00'),
  'temp': 305.99,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 48,
```

```
 'windspeed': 3.94,
 'winddeg': 215,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 06:00:00'),
 'temp': 308.8,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 4.18,
 'winddeg': 194,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 07:00:00'),
 'temp': 308.37,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 3.78,
 'winddeg': 190,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 08:00:00'),
 'temp': 308.37,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 2.52,
 'winddeg': 192,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 09:00:00'),
 'temp': 306.84,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 1.98,
 'winddeg': 201,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 10:00:00'),
 'temp': 306.36,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.24,
 'winddeg': 187,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 11:00:00'),
```

```
 'temp': 304.9,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 4.68,
 'winddeg': 189,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 12:00:00'),
 'temp': 304.04,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 3.86,
 'winddeg': 185,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 13:00:00'),
 'temp': 303.43,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 3.66,
 'winddeg': 185,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 14:00:00'),
 'temp': 303.29,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 3.38,
 'winddeg': 188,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 15:00:00'),
 'temp': 301.01,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.63,
 'winddeg': 194,
 'cloudall': 78,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 16:00:00'),
 'temp': 301.19,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.83,
 'winddeg': 212,
```

```
 'cloudall': 80,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 17:00:00'),
 'temp': 299.92,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.84,
 'winddeg': 229,
 'cloudall': 84,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 18:00:00'),
 'temp': 300.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.8,
 'winddeg': 233,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 19:00:00'),
 'temp': 300.22,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.8,
 'winddeg': 231,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 20:00:00'),
 'temp': 299.76,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.49,
 'winddeg': 229,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 21:00:00'),
 'temp': 299.74,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.43,
 'winddeg': 237,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-06 22:00:00'),
 'temp': 299.13,
 'pressure': 1008,
```

```
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.1,
  'winddeg': 233,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-06 23:00:00'),
  'temp': 299.11,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.06,
  'winddeg': 230,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 00:00:00'),
  'temp': 301.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 2.32,
  'winddeg': 223,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 01:00:00'),
  'temp': 303.2,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3,
  'winddeg': 215,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 02:00:00'),
  'temp': 304.2,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 3.12,
  'winddeg': 217,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 03:00:00'),
  'temp': 305.2,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 3.52,
  'winddeg': 233,
  'cloudall': 100,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 04:00:00'),
 'temp': 306.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 50,
 'windspeed': 3.97,
 'winddeg': 247,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 05:00:00'),
 'temp': 309.04,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 46,
 'windspeed': 3.98,
 'winddeg': 248,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 06:00:00'),
 'temp': 306.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 51,
 'windspeed': 4.06,
 'winddeg': 226,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 07:00:00'),
 'temp': 306.11,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 4.49,
 'winddeg': 217,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 08:00:00'),
 'temp': 307.58,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 4.64,
 'winddeg': 218,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 09:00:00'),
 'temp': 305.2,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 52,
```

```
  'windspeed': 4.61,
  'winddeg': 236,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 10:00:00'),
  'temp': 307.27,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 3.88,
  'winddeg': 253,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 11:00:00'),
  'temp': 305.29,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 3.4,
  'winddeg': 259,
  'cloudall': 90,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 12:00:00'),
  'temp': 303.93,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 4.74,
  'winddeg': 265,
  'cloudall': 92,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 13:00:00'),
  'temp': 303.91,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 3.74,
  'winddeg': 249,
  'cloudall': 54,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 14:00:00'),
  'temp': 303.43,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 3.7,
  'winddeg': 242,
  'cloudall': 39,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 15:00:00'),
```

```
  'temp': 302.64,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 4.03,
  'winddeg': 249,
  'cloudall': 58,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 16:00:00'),
  'temp': 301.01,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 4.09,
  'winddeg': 260,
  'cloudall': 69,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 17:00:00'),
  'temp': 300.83,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 4.04,
  'winddeg': 257,
  'cloudall': 75,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 18:00:00'),
  'temp': 300.83,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 3.48,
  'winddeg': 253,
  'cloudall': 77,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 19:00:00'),
  'temp': 300.67,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 3.28,
  'winddeg': 249,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-07 20:00:00'),
  'temp': 300.67,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 3.03,
  'winddeg': 244,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 21:00:00'),
 'temp': 300.22,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 2.85,
 'winddeg': 227,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 22:00:00'),
 'temp': 300.2,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 2.74,
 'winddeg': 219,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-07 23:00:00'),
 'temp': 300.2,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.92,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 00:00:00'),
 'temp': 301.64,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.24,
 'winddeg': 231,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 01:00:00'),
 'temp': 303.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 59,
 'windspeed': 3.58,
 'winddeg': 241,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 02:00:00'),
 'temp': 304.09,
 'pressure': 1008,
```

```
 'grnd_level': None,
 'humidity': 54,
 'windspeed': 3.29,
 'winddeg': 248,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 03:00:00'),
 'temp': 307.5,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 47,
 'windspeed': 3.47,
 'winddeg': 255,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 04:00:00'),
 'temp': 309.17,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 53,
 'windspeed': 3.72,
 'winddeg': 255,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 05:00:00'),
 'temp': 309.28,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 47,
 'windspeed': 3.69,
 'winddeg': 254,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 06:00:00'),
 'temp': 309.54,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 54,
 'windspeed': 3.97,
 'winddeg': 244,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 07:00:00'),
 'temp': 309.46,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 53,
 'windspeed': 4.24,
 'winddeg': 213,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 08:00:00'),
  'temp': 306.99,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 54,
  'windspeed': 5.13,
  'winddeg': 196,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 09:00:00'),
  'temp': 306.99,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 4.56,
  'winddeg': 183,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 10:00:00'),
  'temp': 307.02,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3.9,
  'winddeg': 198,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 11:00:00'),
  'temp': 305.93,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 2.77,
  'winddeg': 184,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 12:00:00'),
  'temp': 304.46,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 71,
  'windspeed': 2.92,
  'winddeg': 208,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 13:00:00'),
  'temp': 303.93,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 74,
```

```
 'windspeed': 2.55,
 'winddeg': 252,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 14:00:00'),
 'temp': 303.31,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 3.09,
 'winddeg': 266,
 'cloudall': 83,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 15:00:00'),
 'temp': 302.85,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 3.13,
 'winddeg': 255,
 'cloudall': 85,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 16:00:00'),
 'temp': 302.83,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 3.79,
 'winddeg': 249,
 'cloudall': 83,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 17:00:00'),
 'temp': 302.52,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.92,
 'winddeg': 256,
 'cloudall': 85,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 18:00:00'),
 'temp': 301.57,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 3.86,
 'winddeg': 240,
 'cloudall': 89,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-08 19:00:00'),
```

```
  'temp': 301.29,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 3.95,
  'winddeg': 245,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 20:00:00'),
  'temp': 301.13,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 3.6,
  'winddeg': 243,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 21:00:00'),
  'temp': 301.58,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 3.5,
  'winddeg': 245,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 22:00:00'),
  'temp': 301.66,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 3.13,
  'winddeg': 249,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-08 23:00:00'),
  'temp': 301.59,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.77,
  'winddeg': 238,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 00:00:00'),
  'temp': 301.64,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 2.52,
  'winddeg': 231,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 01:00:00'),
  'temp': 301.89,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 2.9,
  'winddeg': 234,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 02:00:00'),
  'temp': 302.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 3.61,
  'winddeg': 228,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 03:00:00'),
  'temp': 304.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 3.58,
  'winddeg': 225,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 04:00:00'),
  'temp': 304.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 4.22,
  'winddeg': 224,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 05:00:00'),
  'temp': 305.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 4.68,
  'winddeg': 225,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-09 06:00:00'),
  'temp': 305.09,
  'pressure': 1006,
```

```
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 5.04,
 'winddeg': 232,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 07:00:00'),
 'temp': 306.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 4.69,
 'winddeg': 237,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 08:00:00'),
 'temp': 306.09,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 4.02,
 'winddeg': 238,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 09:00:00'),
 'temp': 306.09,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 56,
 'windspeed': 6.44,
 'winddeg': 230,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 10:00:00'),
 'temp': 306.52,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 5.1,
 'winddeg': 246,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 11:00:00'),
 'temp': 304.54,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.1,
 'winddeg': 244,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 12:00:00'),
 'temp': 303.75,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.6,
 'winddeg': 215,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 13:00:00'),
 'temp': 304.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 3.22,
 'winddeg': 233,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 14:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 3.92,
 'winddeg': 250,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 15:00:00'),
 'temp': 305.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 4.06,
 'winddeg': 238,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 16:00:00'),
 'temp': 304.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 3.47,
 'winddeg': 232,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 17:00:00'),
 'temp': 304.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 67,
```

```
 'windspeed': 3.38,
 'winddeg': 226,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 18:00:00'),
 'temp': 303.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 3.05,
 'winddeg': 226,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 19:00:00'),
 'temp': 303.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.78,
 'winddeg': 229,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 20:00:00'),
 'temp': 303.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.3,
 'winddeg': 231,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 21:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.97,
 'winddeg': 225,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 22:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.39,
 'winddeg': 226,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-09 23:00:00'),
```

```
  'temp': 302.2,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 3.22,
  'winddeg': 219,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-10 00:00:00'),
  'temp': 303.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 3.89,
  'winddeg': 251,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-10 01:00:00'),
  'temp': 303.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 4.53,
  'winddeg': 264,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-10 02:00:00'),
  'temp': 303.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 5.33,
  'winddeg': 261,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-10 03:00:00'),
  'temp': 304.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 5.25,
  'winddeg': 240,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-06-10 04:00:00'),
  'temp': 303.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 4.99,
  'winddeg': 235,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 05:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.53,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 06:00:00'),
 'temp': 304.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 6.41,
 'winddeg': 225,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 07:00:00'),
 'temp': 304.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 6.41,
 'winddeg': 235,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 08:00:00'),
 'temp': 303.88,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 6.63,
 'winddeg': 241,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 09:00:00'),
 'temp': 303.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 7.05,
 'winddeg': 235,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 10:00:00'),
 'temp': 304.09,
 'pressure': 1005,
```

```
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 6.13,
 'winddeg': 222,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 11:00:00'),
 'temp': 304.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 6.08,
 'winddeg': 222,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 12:00:00'),
 'temp': 304.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 4.88,
 'winddeg': 213,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 13:00:00'),
 'temp': 303.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.93,
 'winddeg': 202,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 14:00:00'),
 'temp': 302.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 4.88,
 'winddeg': 211,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 15:00:00'),
 'temp': 303.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 4.34,
 'winddeg': 209,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 16:00:00'),
 'temp': 303.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 3.91,
 'winddeg': 210,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-06-10 17:00:00'),
 'temp': 303.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 3.57,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-03 17:00:00'),
 'temp': 300.45,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.23,
 'winddeg': 174,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-03 18:00:00'),
 'temp': 300.71,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 96,
 'windspeed': 2.18,
 'winddeg': 175,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-03 19:00:00'),
 'temp': 298.92,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 2.15,
 'winddeg': 170,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-03 20:00:00'),
 'temp': 298.62,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
```

```
  'windspeed': 2.04,
  'winddeg': 173,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-03 21:00:00'),
  'temp': 298.65,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.03,
  'winddeg': 171,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-03 22:00:00'),
  'temp': 298.46,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.19,
  'winddeg': 169,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-03 23:00:00'),
  'temp': 298.57,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.04,
  'winddeg': 176,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-04 00:00:00'),
  'temp': 299.41,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.5,
  'winddeg': 178,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-04 01:00:00'),
  'temp': 300.59,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 97,
  'windspeed': 2.52,
  'winddeg': 169,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-04 02:00:00'),
```

```
 'temp': 302.19,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.37,
 'winddeg': 164,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 03:00:00'),
 'temp': 301.35,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 1.97,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 04:00:00'),
 'temp': 302.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.13,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 05:00:00'),
 'temp': 299.21,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.4,
 'winddeg': 197,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 06:00:00'),
 'temp': 299.24,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.45,
 'winddeg': 205,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 07:00:00'),
 'temp': 300.35,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 3.37,
 'winddeg': 199,
```

```
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 08:00:00'),
 'temp': 301.41,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 94,
 'windspeed': 4.16,
 'winddeg': 197,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 09:00:00'),
 'temp': 302.14,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 4.41,
 'winddeg': 189,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 10:00:00'),
 'temp': 302.51,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 4.33,
 'winddeg': 176,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 11:00:00'),
 'temp': 301.63,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 4.19,
 'winddeg': 173,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 12:00:00'),
 'temp': 301.12,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 3.23,
 'winddeg': 173,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 13:00:00'),
 'temp': 300.62,
 'pressure': 1009,
```

```
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.9,
 'winddeg': 172,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 14:00:00'),
 'temp': 300.62,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.59,
 'winddeg': 170,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 15:00:00'),
 'temp': 300.67,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.89,
 'winddeg': 167,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 16:00:00'),
 'temp': 300.15,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 2.68,
 'winddeg': 170,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 17:00:00'),
 'temp': 298.85,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 2.78,
 'winddeg': 178,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 18:00:00'),
 'temp': 297.08,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 4.02,
 'winddeg': 177,
 'cloudall': 100,
 'weathermain': 'Rain'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 19:00:00'),
 'temp': 296.63,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.93,
 'winddeg': 170,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 20:00:00'),
 'temp': 297,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.37,
 'winddeg': 171,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 21:00:00'),
 'temp': 297.14,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.68,
 'winddeg': 204,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 22:00:00'),
 'temp': 297.27,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.41,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-04 23:00:00'),
 'temp': 297.22,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.4,
 'winddeg': 221,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 00:00:00'),
 'temp': 298.34,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
```

```
  'windspeed': 1.56,
  'winddeg': 220,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 01:00:00'),
  'temp': 299.21,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 97,
  'windspeed': 1.48,
  'winddeg': 203,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 02:00:00'),
  'temp': 301.1,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 95,
  'windspeed': 1.54,
  'winddeg': 207,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 03:00:00'),
  'temp': 302.02,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 2.32,
  'winddeg': 184,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 04:00:00'),
  'temp': 303.1,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.66,
  'winddeg': 179,
  'cloudall': 95,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 05:00:00'),
  'temp': 303.97,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 3.35,
  'winddeg': 177,
  'cloudall': 96,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 06:00:00'),
```

```
 'temp': 303.3,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.42,
 'winddeg': 180,
 'cloudall': 97,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 07:00:00'),
 'temp': 303.32,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 3.91,
 'winddeg': 180,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 08:00:00'),
 'temp': 304.3,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.27,
 'winddeg': 186,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 09:00:00'),
 'temp': 304.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 4.03,
 'winddeg': 186,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 10:00:00'),
 'temp': 303.34,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 3.66,
 'winddeg': 187,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 11:00:00'),
 'temp': 303.04,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 3.93,
 'winddeg': 192,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 12:00:00'),
  'temp': 301.85,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 3.03,
  'winddeg': 189,
  'cloudall': 92,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 13:00:00'),
  'temp': 300.75,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 3.12,
  'winddeg': 199,
  'cloudall': 37,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 14:00:00'),
  'temp': 300.38,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 89,
  'windspeed': 3.14,
  'winddeg': 236,
  'cloudall': 38,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 15:00:00'),
  'temp': 299.62,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 1.97,
  'winddeg': 249,
  'cloudall': 54,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 16:00:00'),
  'temp': 299.12,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.24,
  'winddeg': 230,
  'cloudall': 59,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-05 17:00:00'),
  'temp': 299.99,
  'pressure': 1007,
```

```
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.45,
 'winddeg': 236,
 'cloudall': 67,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 18:00:00'),
 'temp': 298.61,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 1.64,
 'winddeg': 237,
 'cloudall': 61,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 19:00:00'),
 'temp': 299.85,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.57,
 'winddeg': 249,
 'cloudall': 34,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 20:00:00'),
 'temp': 298.46,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 97,
 'windspeed': 1.33,
 'winddeg': 258,
 'cloudall': 27,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 21:00:00'),
 'temp': 298.33,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 97,
 'windspeed': 1.12,
 'winddeg': 252,
 'cloudall': 25,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 22:00:00'),
 'temp': 298.33,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 97,
 'windspeed': 1.43,
 'winddeg': 240,
 'cloudall': 37,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-05 23:00:00'),
 'temp': 298.84,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 1.3,
 'winddeg': 265,
 'cloudall': 47,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 00:00:00'),
 'temp': 300.25,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 1.15,
 'winddeg': 268,
 'cloudall': 77,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 01:00:00'),
 'temp': 301.99,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 1.39,
 'winddeg': 278,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 02:00:00'),
 'temp': 302.02,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 1.97,
 'winddeg': 269,
 'cloudall': 60,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 03:00:00'),
 'temp': 303.49,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 2.54,
 'winddeg': 263,
 'cloudall': 73,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 04:00:00'),
 'temp': 304.17,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
```

```
 'windspeed': 2.85,
 'winddeg': 260,
 'cloudall': 77,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 05:00:00'),
 'temp': 305.25,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 2.88,
 'winddeg': 265,
 'cloudall': 82,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 06:00:00'),
 'temp': 306.31,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 2.34,
 'winddeg': 242,
 'cloudall': 88,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 07:00:00'),
 'temp': 307.48,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 2.41,
 'winddeg': 236,
 'cloudall': 89,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 08:00:00'),
 'temp': 305.81,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 3.19,
 'winddeg': 214,
 'cloudall': 74,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 09:00:00'),
 'temp': 306.29,
 'pressure': 1002,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 4.03,
 'winddeg': 195,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 10:00:00'),
```

```
  'temp': 304.78,
  'pressure': 1002,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 4.48,
  'winddeg': 184,
  'cloudall': 85,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 11:00:00'),
  'temp': 304.74,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 79,
  'windspeed': 5.11,
  'winddeg': 189,
  'cloudall': 88,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 12:00:00'),
  'temp': 302.05,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 4.14,
  'winddeg': 177,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 13:00:00'),
  'temp': 301.32,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 3.88,
  'winddeg': 189,
  'cloudall': 95,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 14:00:00'),
  'temp': 300.81,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.84,
  'winddeg': 197,
  'cloudall': 96,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 15:00:00'),
  'temp': 300.82,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.29,
  'winddeg': 199,
```

```
  'cloudall': 96,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 16:00:00'),
  'temp': 301.26,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 2.43,
  'winddeg': 196,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 17:00:00'),
  'temp': 301.24,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.51,
  'winddeg': 195,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 18:00:00'),
  'temp': 300.67,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.23,
  'winddeg': 189,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 19:00:00'),
  'temp': 300.75,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.03,
  'winddeg': 203,
  'cloudall': 84,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 20:00:00'),
  'temp': 300.3,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 1.54,
  'winddeg': 213,
  'cloudall': 85,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-06 21:00:00'),
  'temp': 300.94,
  'pressure': 1005,
```

```
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 1.56,
 'winddeg': 246,
 'cloudall': 70,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 22:00:00'),
 'temp': 299.71,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 1.65,
 'winddeg': 262,
 'cloudall': 68,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-06 23:00:00'),
 'temp': 300.92,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 1.91,
 'winddeg': 262,
 'cloudall': 65,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 00:00:00'),
 'temp': 301.31,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 1.72,
 'winddeg': 272,
 'cloudall': 80,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 01:00:00'),
 'temp': 302.8,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 1.77,
 'winddeg': 273,
 'cloudall': 92,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 02:00:00'),
 'temp': 303.36,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 1.88,
 'winddeg': 277,
 'cloudall': 62,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 03:00:00'),
 'temp': 303.71,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 1.74,
 'winddeg': 264,
 'cloudall': 51,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 04:00:00'),
 'temp': 305.47,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 1.23,
 'winddeg': 261,
 'cloudall': 57,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 05:00:00'),
 'temp': 306.33,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 1.57,
 'winddeg': 259,
 'cloudall': 66,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 06:00:00'),
 'temp': 306.86,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 1.49,
 'winddeg': 218,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 07:00:00'),
 'temp': 307.21,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 63,
 'windspeed': 2.12,
 'winddeg': 191,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 08:00:00'),
 'temp': 307.1,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 65,
```

```
 'windspeed': 3.53,
 'winddeg': 187,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 09:00:00'),
 'temp': 306.16,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 4.34,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 10:00:00'),
 'temp': 305.73,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 4.47,
 'winddeg': 174,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 11:00:00'),
 'temp': 304.07,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 3.88,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 12:00:00'),
 'temp': 303.32,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.64,
 'winddeg': 170,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 13:00:00'),
 'temp': 302.81,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 3.74,
 'winddeg': 174,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 14:00:00'),
```

```
 'temp': 302.73,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 3.66,
 'winddeg': 176,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 15:00:00'),
 'temp': 302.73,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 3.67,
 'winddeg': 179,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 16:00:00'),
 'temp': 302.23,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 3.65,
 'winddeg': 174,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 17:00:00'),
 'temp': 302.14,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 3.57,
 'winddeg': 168,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 18:00:00'),
 'temp': 302,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.28,
 'winddeg': 163,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-07 19:00:00'),
 'temp': 301.86,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.2,
 'winddeg': 161,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-07 20:00:00'),
  'temp': 301.05,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.94,
  'winddeg': 160,
  'cloudall': 95,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-07 21:00:00'),
  'temp': 300.91,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.66,
  'winddeg': 158,
  'cloudall': 94,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-07 22:00:00'),
  'temp': 300.31,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 96,
  'windspeed': 2.44,
  'winddeg': 156,
  'cloudall': 94,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-07 23:00:00'),
  'temp': 300.17,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 98,
  'windspeed': 1.87,
  'winddeg': 145,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 00:00:00'),
  'temp': 300.66,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 95,
  'windspeed': 2.06,
  'winddeg': 137,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 01:00:00'),
  'temp': 302,
  'pressure': 1007,
```

```
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 2.29,
 'winddeg': 138,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 02:00:00'),
 'temp': 302.3,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.66,
 'winddeg': 140,
 'cloudall': 95,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 03:00:00'),
 'temp': 302.99,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.86,
 'winddeg': 157,
 'cloudall': 78,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 04:00:00'),
 'temp': 305.03,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 3.03,
 'winddeg': 161,
 'cloudall': 66,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 05:00:00'),
 'temp': 306.47,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.35,
 'winddeg': 162,
 'cloudall': 59,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 06:00:00'),
 'temp': 305.57,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.77,
 'winddeg': 179,
 'cloudall': 96,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 07:00:00'),
 'temp': 306.82,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 4.02,
 'winddeg': 174,
 'cloudall': 98,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 08:00:00'),
 'temp': 306.08,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.03,
 'winddeg': 172,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 09:00:00'),
 'temp': 305.68,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 4.01,
 'winddeg': 170,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 10:00:00'),
 'temp': 305.21,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 4.27,
 'winddeg': 163,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 11:00:00'),
 'temp': 304.06,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 4.98,
 'winddeg': 161,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 12:00:00'),
 'temp': 303.31,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 80,
```

```
 'windspeed': 4.47,
 'winddeg': 159,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 13:00:00'),
 'temp': 302.72,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 4.56,
 'winddeg': 167,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 14:00:00'),
 'temp': 302.36,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 4.94,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 15:00:00'),
 'temp': 302.28,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 5.2,
 'winddeg': 169,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 16:00:00'),
 'temp': 302.41,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 5.01,
 'winddeg': 174,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 17:00:00'),
 'temp': 301.4,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 4.56,
 'winddeg': 177,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-08 18:00:00'),
```

```
  'temp': 300.6,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 3.97,
  'winddeg': 179,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 19:00:00'),
  'temp': 300.43,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 4.2,
  'winddeg': 177,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 20:00:00'),
  'temp': 300.3,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 4.37,
  'winddeg': 175,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 21:00:00'),
  'temp': 300.15,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 4.05,
  'winddeg': 175,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 22:00:00'),
  'temp': 301.35,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 89,
  'windspeed': 4.18,
  'winddeg': 173,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-08 23:00:00'),
  'temp': 301.33,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 89,
  'windspeed': 3.84,
  'winddeg': 191,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 00:00:00'),
  'temp': 301.33,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 3.33,
  'winddeg': 181,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 01:00:00'),
  'temp': 302.8,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 3.1,
  'winddeg': 179,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 02:00:00'),
  'temp': 303.05,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 3.47,
  'winddeg': 179,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 03:00:00'),
  'temp': 303.35,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 3.76,
  'winddeg': 181,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 04:00:00'),
  'temp': 304.92,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3.7,
  'winddeg': 183,
  'cloudall': 99,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-07-09 05:00:00'),
  'temp': 303.24,
  'pressure': 1008,
```

```
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 3.85,
 'winddeg': 184,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 06:00:00'),
 'temp': 304.35,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 52,
 'windspeed': 2.9,
 'winddeg': 191,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 07:00:00'),
 'temp': 306.94,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.16,
 'winddeg': 178,
 'cloudall': 97,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 08:00:00'),
 'temp': 307.08,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 3.75,
 'winddeg': 166,
 'cloudall': 98,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 09:00:00'),
 'temp': 307.81,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.77,
 'winddeg': 156,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 10:00:00'),
 'temp': 306.79,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 4.17,
 'winddeg': 157,
 'cloudall': 99,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 11:00:00'),
 'temp': 304.73,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 4.57,
 'winddeg': 164,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 12:00:00'),
 'temp': 303.47,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 3.87,
 'winddeg': 172,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 13:00:00'),
 'temp': 303.1,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.65,
 'winddeg': 181,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 14:00:00'),
 'temp': 302.73,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 2.99,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 15:00:00'),
 'temp': 302.36,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.62,
 'winddeg': 181,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 16:00:00'),
 'temp': 301.92,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 84,
```

```
 'windspeed': 3.93,
 'winddeg': 172,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 17:00:00'),
 'temp': 301.05,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 3.86,
 'winddeg': 172,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 18:00:00'),
 'temp': 300.25,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 2.14,
 'winddeg': 157,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 19:00:00'),
 'temp': 300.39,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.11,
 'winddeg': 147,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 20:00:00'),
 'temp': 300.38,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 2.75,
 'winddeg': 163,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 21:00:00'),
 'temp': 300.3,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 96,
 'windspeed': 3.07,
 'winddeg': 163,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 22:00:00'),
```

```
 'temp': 300.02,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 97,
 'windspeed': 2.98,
 'winddeg': 161,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-09 23:00:00'),
 'temp': 300.31,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 2.45,
 'winddeg': 158,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 00:00:00'),
 'temp': 300.32,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 96,
 'windspeed': 2.36,
 'winddeg': 149,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 01:00:00'),
 'temp': 303.03,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 3.37,
 'winddeg': 154,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 02:00:00'),
 'temp': 302.63,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 3.77,
 'winddeg': 165,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 03:00:00'),
 'temp': 302.99,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 4.21,
 'winddeg': 169,
```

```
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 04:00:00'),
 'temp': 305.08,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 5,
 'winddeg': 174,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 05:00:00'),
 'temp': 303.42,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 5.23,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 06:00:00'),
 'temp': 305.55,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 4.44,
 'winddeg': 192,
 'cloudall': 94,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 07:00:00'),
 'temp': 308.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 4.47,
 'winddeg': 191,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 08:00:00'),
 'temp': 303.87,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 3.8,
 'winddeg': 184,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 09:00:00'),
 'temp': 305.4,
 'pressure': 1005,
```

```
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.59,
 'winddeg': 175,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 10:00:00'),
 'temp': 304.71,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 3.93,
 'winddeg': 162,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 11:00:00'),
 'temp': 303.88,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 4.69,
 'winddeg': 173,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 12:00:00'),
 'temp': 302.73,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 3.88,
 'winddeg': 185,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 13:00:00'),
 'temp': 302.59,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 3.76,
 'winddeg': 164,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 14:00:00'),
 'temp': 302.28,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 3.79,
 'winddeg': 180,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 15:00:00'),
 'temp': 299.69,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 3.33,
 'winddeg': 185,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 16:00:00'),
 'temp': 299.77,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 3.17,
 'winddeg': 187,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-07-10 17:00:00'),
 'temp': 300.46,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 2.63,
 'winddeg': 202,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-02 17:00:00'),
 'temp': 301.65,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 1.7,
 'winddeg': 166,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-02 18:00:00'),
 'temp': 301.65,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.35,
 'winddeg': 183,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-02 19:00:00'),
 'temp': 301.51,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 90,
```

```
  'windspeed': 2.54,
  'winddeg': 180,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-02 20:00:00'),
  'temp': 300.22,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 1.74,
  'winddeg': 161,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-02 21:00:00'),
  'temp': 299.96,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2,
  'winddeg': 123,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-02 22:00:00'),
  'temp': 300.28,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.22,
  'winddeg': 101,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-02 23:00:00'),
  'temp': 299.8,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.86,
  'winddeg': 89,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 00:00:00'),
  'temp': 299.86,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 1.68,
  'winddeg': 64,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 01:00:00'),
```

```
 'temp': 300.25,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.09,
 'winddeg': 86,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 02:00:00'),
 'temp': 301.39,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 3.12,
 'winddeg': 85,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 03:00:00'),
 'temp': 302.67,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 2.07,
 'winddeg': 98,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 04:00:00'),
 'temp': 303.71,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 1.14,
 'winddeg': 176,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 05:00:00'),
 'temp': 303.81,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 1.05,
 'winddeg': 187,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 06:00:00'),
 'temp': 304.79,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 2.31,
 'winddeg': 252,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 07:00:00'),
  'temp': 304.4,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 2.8,
  'winddeg': 265,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 08:00:00'),
  'temp': 302.08,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 2.62,
  'winddeg': 275,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 09:00:00'),
  'temp': 300.55,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 95,
  'windspeed': 2.63,
  'winddeg': 304,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 10:00:00'),
  'temp': 302.2,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.25,
  'winddeg': 350,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 11:00:00'),
  'temp': 301.3,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.07,
  'winddeg': 32,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 12:00:00'),
  'temp': 302.2,
  'pressure': 1009,
```

```
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 1.51,
 'winddeg': 10,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 13:00:00'),
 'temp': 301.78,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 0.97,
 'winddeg': 67,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 14:00:00'),
 'temp': 300.9,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 0.8,
 'winddeg': 45,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 15:00:00'),
 'temp': 297.68,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 96,
 'windspeed': 0.38,
 'winddeg': 325,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 16:00:00'),
 'temp': 297.31,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 97,
 'windspeed': 0.31,
 'winddeg': 153,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-03 17:00:00'),
 'temp': 297.68,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 0.84,
 'winddeg': 210,
 'cloudall': 100,
 'weathermain': 'Rain'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 18:00:00'),
  'temp': 297.72,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 0.52,
  'winddeg': 317,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 19:00:00'),
  'temp': 297.31,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 0.2,
  'winddeg': 220,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 20:00:00'),
  'temp': 297.56,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 0.43,
  'winddeg': 216,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 21:00:00'),
  'temp': 297.06,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 0.77,
  'winddeg': 12,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 22:00:00'),
  'temp': 297.02,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.51,
  'winddeg': 39,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-03 23:00:00'),
  'temp': 297.06,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
```

```
 'windspeed': 1.37,
 'winddeg': 10,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 00:00:00'),
 'temp': 297.08,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.11,
 'winddeg': 80,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 01:00:00'),
 'temp': 297.43,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.65,
 'winddeg': 107,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 02:00:00'),
 'temp': 299.63,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 1.67,
 'winddeg': 107,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 03:00:00'),
 'temp': 300.7,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 0.7,
 'winddeg': 58,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 04:00:00'),
 'temp': 303.05,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 0.65,
 'winddeg': 346,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 05:00:00'),
```

```
 'temp': 303.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 0.49,
 'winddeg': 338,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 06:00:00'),
 'temp': 305.25,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 1.06,
 'winddeg': 196,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 07:00:00'),
 'temp': 305.16,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 0.97,
 'winddeg': 198,
 'cloudall': 90,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 08:00:00'),
 'temp': 304.77,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.15,
 'winddeg': 226,
 'cloudall': 90,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 09:00:00'),
 'temp': 303.84,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.16,
 'winddeg': 256,
 'cloudall': 93,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 10:00:00'),
 'temp': 302.87,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.87,
 'winddeg': 274,
```

```
  'cloudall': 95,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 11:00:00'),
  'temp': 302.13,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 2.51,
  'winddeg': 269,
  'cloudall': 96,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 12:00:00'),
  'temp': 301.91,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.38,
  'winddeg': 209,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 13:00:00'),
  'temp': 301.4,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 2.27,
  'winddeg': 212,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 14:00:00'),
  'temp': 299.29,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 98,
  'windspeed': 2.18,
  'winddeg': 189,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 15:00:00'),
  'temp': 297.66,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 1.96,
  'winddeg': 196,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 16:00:00'),
  'temp': 298.52,
  'pressure': 1010,
```

```
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 1.79,
  'winddeg': 201,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 17:00:00'),
  'temp': 297.68,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.1,
  'winddeg': 210,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 18:00:00'),
  'temp': 297.71,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.61,
  'winddeg': 237,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 19:00:00'),
  'temp': 297.37,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.41,
  'winddeg': 245,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 20:00:00'),
  'temp': 297.7,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.3,
  'winddeg': 250,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-04 21:00:00'),
  'temp': 298.02,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.94,
  'winddeg': 250,
  'cloudall': 100,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 22:00:00'),
 'temp': 298.02,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.64,
 'winddeg': 249,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-04 23:00:00'),
 'temp': 297.72,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.45,
 'winddeg': 263,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 00:00:00'),
 'temp': 297.73,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.86,
 'winddeg': 171,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 01:00:00'),
 'temp': 298.42,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.19,
 'winddeg': 181,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 02:00:00'),
 'temp': 300.66,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 1.23,
 'winddeg': 207,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 03:00:00'),
 'temp': 302.41,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 78,
```

```
 'windspeed': 1.5,
 'winddeg': 216,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 04:00:00'),
 'temp': 303.83,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 1.16,
 'winddeg': 240,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 05:00:00'),
 'temp': 304.42,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 1.02,
 'winddeg': 209,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 06:00:00'),
 'temp': 304.24,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 2.25,
 'winddeg': 191,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 07:00:00'),
 'temp': 304.66,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 2.58,
 'winddeg': 187,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 08:00:00'),
 'temp': 304.66,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 1.54,
 'winddeg': 221,
 'cloudall': 85,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 09:00:00'),
```

```
 'temp': 304.87,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.24,
 'winddeg': 247,
 'cloudall': 87,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 10:00:00'),
 'temp': 305.18,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 1.88,
 'winddeg': 215,
 'cloudall': 90,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 11:00:00'),
 'temp': 304.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 3.58,
 'winddeg': 218,
 'cloudall': 92,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 12:00:00'),
 'temp': 302,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.8,
 'winddeg': 183,
 'cloudall': 74,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 13:00:00'),
 'temp': 301.73,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.5,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-05 14:00:00'),
 'temp': 301.94,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.18,
 'winddeg': 174,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 15:00:00'),
  'temp': 301.58,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.07,
  'winddeg': 170,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 16:00:00'),
  'temp': 301.24,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 83,
  'windspeed': 2.07,
  'winddeg': 182,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 17:00:00'),
  'temp': 301.26,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.29,
  'winddeg': 196,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 18:00:00'),
  'temp': 300.17,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.74,
  'winddeg': 230,
  'cloudall': 96,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 19:00:00'),
  'temp': 298.8,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 98,
  'windspeed': 2.21,
  'winddeg': 244,
  'cloudall': 99,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 20:00:00'),
  'temp': 299.2,
  'pressure': 1007,
```

```
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.11,
  'winddeg': 256,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 21:00:00'),
  'temp': 299.49,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.04,
  'winddeg': 246,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 22:00:00'),
  'temp': 299.46,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.68,
  'winddeg': 253,
  'cloudall': 92,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-05 23:00:00'),
  'temp': 299.17,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.72,
  'winddeg': 250,
  'cloudall': 94,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 00:00:00'),
  'temp': 299.47,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.66,
  'winddeg': 271,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 01:00:00'),
  'temp': 300.81,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 2.12,
  'winddeg': 285,
  'cloudall': 100,
  'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 02:00:00'),
  'temp': 302.29,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 2.51,
  'winddeg': 291,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 03:00:00'),
  'temp': 303.7,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 73,
  'windspeed': 3.06,
  'winddeg': 284,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 04:00:00'),
  'temp': 304.84,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 3.29,
  'winddeg': 283,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 05:00:00'),
  'temp': 305.47,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 67,
  'windspeed': 3.7,
  'winddeg': 278,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 06:00:00'),
  'temp': 305.95,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 3.94,
  'winddeg': 279,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 07:00:00'),
  'temp': 306.55,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 64,
```

```
  'windspeed': 2.97,
  'winddeg': 265,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 08:00:00'),
  'temp': 306.28,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 2.99,
  'winddeg': 266,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 09:00:00'),
  'temp': 306.16,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 3.03,
  'winddeg': 268,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 10:00:00'),
  'temp': 306.32,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 2.8,
  'winddeg': 266,
  'cloudall': 78,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 11:00:00'),
  'temp': 306.18,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 71,
  'windspeed': 2.36,
  'winddeg': 240,
  'cloudall': 68,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 12:00:00'),
  'temp': 305.02,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 3.62,
  'winddeg': 208,
  'cloudall': 65,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 13:00:00'),
```

```
 'temp': 301.9,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 3.67,
 'winddeg': 197,
 'cloudall': 46,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-06 14:00:00'),
 'temp': 303.33,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 3.08,
 'winddeg': 188,
 'cloudall': 73,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-06 15:00:00'),
 'temp': 297.82,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.8,
 'winddeg': 186,
 'cloudall': 82,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-06 16:00:00'),
 'temp': 298.16,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.4,
 'winddeg': 194,
 'cloudall': 86,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-06 17:00:00'),
 'temp': 298.49,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.09,
 'winddeg': 212,
 'cloudall': 89,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-06 18:00:00'),
 'temp': 298.48,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.04,
 'winddeg': 235,
```

```
  'cloudall': 88,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 19:00:00'),
  'temp': 298.45,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.14,
  'winddeg': 255,
  'cloudall': 99,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 20:00:00'),
  'temp': 298.84,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.12,
  'winddeg': 272,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 21:00:00'),
  'temp': 298.45,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 2.05,
  'winddeg': 271,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 22:00:00'),
  'temp': 298.8,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.77,
  'winddeg': 270,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-06 23:00:00'),
  'temp': 298.8,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.64,
  'winddeg': 282,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 00:00:00'),
  'temp': 298.8,
  'pressure': 1009,
```

```
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 1.59,
 'winddeg': 287,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 01:00:00'),
 'temp': 299.58,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 1.91,
 'winddeg': 277,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 02:00:00'),
 'temp': 301.74,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 2.2,
 'winddeg': 272,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 03:00:00'),
 'temp': 303.47,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.15,
 'winddeg': 267,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 04:00:00'),
 'temp': 303.77,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 2.46,
 'winddeg': 271,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 05:00:00'),
 'temp': 305.21,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 2.62,
 'winddeg': 269,
 'cloudall': 96,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 06:00:00'),
 'temp': 305.54,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 2.73,
 'winddeg': 251,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 07:00:00'),
 'temp': 304.83,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.96,
 'winddeg': 247,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 08:00:00'),
 'temp': 305.03,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 3.29,
 'winddeg': 236,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 09:00:00'),
 'temp': 305.7,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 2.91,
 'winddeg': 210,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 10:00:00'),
 'temp': 305.65,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 2.77,
 'winddeg': 176,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 11:00:00'),
 'temp': 304.67,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 87,
```

```
 'windspeed': 2.95,
 'winddeg': 168,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 12:00:00'),
 'temp': 303.1,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 3.86,
 'winddeg': 182,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 13:00:00'),
 'temp': 303.1,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.97,
 'winddeg': 185,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 14:00:00'),
 'temp': 301.11,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 3.38,
 'winddeg': 184,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 15:00:00'),
 'temp': 300.26,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 3.09,
 'winddeg': 183,
 'cloudall': 97,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 16:00:00'),
 'temp': 299.95,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 3.4,
 'winddeg': 183,
 'cloudall': 94,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-07 17:00:00'),
```

```
  'temp': 299.58,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 3.32,
  'winddeg': 182,
  'cloudall': 91,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 18:00:00'),
  'temp': 299.58,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.21,
  'winddeg': 195,
  'cloudall': 99,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 19:00:00'),
  'temp': 299.58,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 95,
  'windspeed': 1.78,
  'winddeg': 192,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 20:00:00'),
  'temp': 299.58,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 96,
  'windspeed': 1.32,
  'winddeg': 189,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 21:00:00'),
  'temp': 299.2,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 97,
  'windspeed': 0.87,
  'winddeg': 187,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 22:00:00'),
  'temp': 299.2,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 98,
  'windspeed': 0.9,
  'winddeg': 195,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-07 23:00:00'),
  'temp': 299.17,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 98,
  'windspeed': 0.81,
  'winddeg': 217,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 00:00:00'),
  'temp': 299.17,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 97,
  'windspeed': 0.88,
  'winddeg': 255,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 01:00:00'),
  'temp': 300.24,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 1.25,
  'winddeg': 273,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 02:00:00'),
  'temp': 300.96,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 89,
  'windspeed': 1.43,
  'winddeg': 286,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 03:00:00'),
  'temp': 303.48,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 79,
  'windspeed': 1.11,
  'winddeg': 282,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 04:00:00'),
  'temp': 304.55,
  'pressure': 1010,
```

```
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 1.77,
 'winddeg': 283,
 'cloudall': 95,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 05:00:00'),
 'temp': 305.63,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 2.1,
 'winddeg': 274,
 'cloudall': 96,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 06:00:00'),
 'temp': 306.33,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 2.19,
 'winddeg': 272,
 'cloudall': 94,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 07:00:00'),
 'temp': 305.17,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 2.39,
 'winddeg': 254,
 'cloudall': 57,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 08:00:00'),
 'temp': 308.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 2.31,
 'winddeg': 241,
 'cloudall': 74,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 09:00:00'),
 'temp': 307.21,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 2.12,
 'winddeg': 231,
 'cloudall': 65,
 'weathermain': 'Rain'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 10:00:00'),
 'temp': 306.86,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.49,
 'winddeg': 208,
 'cloudall': 70,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 11:00:00'),
 'temp': 304.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 3.15,
 'winddeg': 186,
 'cloudall': 72,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 12:00:00'),
 'temp': 303.77,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.02,
 'winddeg': 163,
 'cloudall': 89,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 13:00:00'),
 'temp': 303.1,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 4.04,
 'winddeg': 171,
 'cloudall': 14,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 14:00:00'),
 'temp': 302.72,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 3.65,
 'winddeg': 182,
 'cloudall': 17,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 15:00:00'),
 'temp': 302.72,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 85,
```

```
 'windspeed': 3.52,
 'winddeg': 187,
 'cloudall': 36,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 16:00:00'),
 'temp': 302.02,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.69,
 'winddeg': 190,
 'cloudall': 45,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 17:00:00'),
 'temp': 302.02,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 4.03,
 'winddeg': 184,
 'cloudall': 42,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 18:00:00'),
 'temp': 302.02,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.22,
 'winddeg': 185,
 'cloudall': 54,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 19:00:00'),
 'temp': 302.03,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 2.71,
 'winddeg': 189,
 'cloudall': 10,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 20:00:00'),
 'temp': 301.65,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.12,
 'winddeg': 194,
 'cloudall': 10,
 'weathermain': 'Clear'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-08 21:00:00'),
```

```
  'temp': 301.32,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 2.02,
  'winddeg': 172,
  'cloudall': 10,
  'weathermain': 'Clear'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 22:00:00'),
  'temp': 301.32,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.01,
  'winddeg': 181,
  'cloudall': 10,
  'weathermain': 'Clear'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-08 23:00:00'),
  'temp': 300.98,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 96,
  'windspeed': 1.54,
  'winddeg': 184,
  'cloudall': 11,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 00:00:00'),
  'temp': 301.99,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 2.21,
  'winddeg': 191,
  'cloudall': 90,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 01:00:00'),
  'temp': 302.77,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 3.04,
  'winddeg': 194,
  'cloudall': 91,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 02:00:00'),
  'temp': 304.73,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 2.79,
  'winddeg': 207,
```

```
  'cloudall': 60,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 03:00:00'),
  'temp': 305.25,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 2.63,
  'winddeg': 222,
  'cloudall': 54,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 04:00:00'),
  'temp': 305.99,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 2.24,
  'winddeg': 213,
  'cloudall': 47,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 05:00:00'),
  'temp': 307.1,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 2.27,
  'winddeg': 218,
  'cloudall': 45,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 06:00:00'),
  'temp': 307.4,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 1.91,
  'winddeg': 242,
  'cloudall': 34,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 07:00:00'),
  'temp': 308.48,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 56,
  'windspeed': 2.09,
  'winddeg': 229,
  'cloudall': 42,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 08:00:00'),
  'temp': 307.73,
  'pressure': 1005,
```

```
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 2.65,
  'winddeg': 201,
  'cloudall': 68,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 09:00:00'),
  'temp': 307.34,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 3.67,
  'winddeg': 177,
  'cloudall': 79,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 10:00:00'),
  'temp': 306.41,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 4.12,
  'winddeg': 161,
  'cloudall': 84,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 11:00:00'),
  'temp': 304.77,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 4.54,
  'winddeg': 163,
  'cloudall': 85,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 12:00:00'),
  'temp': 304.76,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 4.4,
  'winddeg': 170,
  'cloudall': 72,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-08-09 13:00:00'),
  'temp': 304.06,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 4.27,
  'winddeg': 173,
  'cloudall': 96,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-08-09 14:00:00'),
 'temp': 303.39,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 4.21,
 'winddeg': 183,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-09 15:00:00'),
 'temp': 303.39,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 4.83,
 'winddeg': 182,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-09 16:00:00'),
 'temp': 302.72,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 4.41,
 'winddeg': 179,
 'cloudall': 98,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-08-09 17:00:00'),
 'temp': 302.68,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 4.12,
 'winddeg': 179,
 'cloudall': 96,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 17:00:00'),
 'temp': 298.13,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 98,
 'windspeed': 2.63,
 'winddeg': 282,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 18:00:00'),
 'temp': 297.75,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 98,
```

```
 'windspeed': 2.09,
 'winddeg': 297,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 19:00:00'),
 'temp': 297.72,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.9,
 'winddeg': 335,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 20:00:00'),
 'temp': 298.1,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.35,
 'winddeg': 343,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 21:00:00'),
 'temp': 298.39,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.86,
 'winddeg': 308,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 22:00:00'),
 'temp': 298.77,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.22,
 'winddeg': 301,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-01 23:00:00'),
 'temp': 298.77,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 99,
 'windspeed': 2.18,
 'winddeg': 310,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 00:00:00'),
```

```
  'temp': 298.8,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 99,
  'windspeed': 1.86,
  'winddeg': 331,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 01:00:00'),
  'temp': 299.46,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 92,
  'windspeed': 2.64,
  'winddeg': 318,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 02:00:00'),
  'temp': 299.87,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.23,
  'winddeg': 315,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 03:00:00'),
  'temp': 301.99,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.65,
  'winddeg': 273,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 04:00:00'),
  'temp': 302.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 1.64,
  'winddeg': 288,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 05:00:00'),
  'temp': 303.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.54,
  'winddeg': 314,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 06:00:00'),
  'temp': 303.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 2.59,
  'winddeg': 310,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 07:00:00'),
  'temp': 304.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 2.43,
  'winddeg': 307,
  'cloudall': 80,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 08:00:00'),
  'temp': 303.99,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 2.07,
  'winddeg': 291,
  'cloudall': 90,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 09:00:00'),
  'temp': 302.63,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 2.31,
  'winddeg': 255,
  'cloudall': 93,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 10:00:00'),
  'temp': 303.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 74,
  'windspeed': 2.22,
  'winddeg': 224,
  'cloudall': 95,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 11:00:00'),
  'temp': 302.99,
  'pressure': 1004,
```

```
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.53,
 'winddeg': 190,
 'cloudall': 96,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 12:00:00'),
 'temp': 302.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 3.5,
 'winddeg': 196,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 13:00:00'),
 'temp': 302.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.89,
 'winddeg': 189,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 14:00:00'),
 'temp': 302.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.26,
 'winddeg': 192,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 15:00:00'),
 'temp': 302.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 1.76,
 'winddeg': 200,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 16:00:00'),
 'temp': 302.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 1.86,
 'winddeg': 214,
 'cloudall': 100,
 'weathermain': 'Rain'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 17:00:00'),
 'temp': 301.37,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.68,
 'winddeg': 255,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 18:00:00'),
 'temp': 301.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.04,
 'winddeg': 248,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 19:00:00'),
 'temp': 300.88,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.2,
 'winddeg': 250,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 20:00:00'),
 'temp': 299.99,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.4,
 'winddeg': 252,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 21:00:00'),
 'temp': 299.99,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.37,
 'winddeg': 274,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-02 22:00:00'),
 'temp': 299.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 90,
```

```
  'windspeed': 2.31,
  'winddeg': 284,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-02 23:00:00'),
  'temp': 300.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.34,
  'winddeg': 259,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 00:00:00'),
  'temp': 300.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.58,
  'winddeg': 227,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 01:00:00'),
  'temp': 300.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 3.22,
  'winddeg': 227,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 02:00:00'),
  'temp': 301.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 3.41,
  'winddeg': 233,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 03:00:00'),
  'temp': 302.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 3.08,
  'winddeg': 234,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 04:00:00'),
```

```
 'temp': 302.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 3.07,
 'winddeg': 223,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 05:00:00'),
 'temp': 301.88,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 93,
 'windspeed': 2.98,
 'winddeg': 219,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 06:00:00'),
 'temp': 301.88,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 2.49,
 'winddeg': 195,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 07:00:00'),
 'temp': 301.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 93,
 'windspeed': 4.16,
 'winddeg': 229,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 08:00:00'),
 'temp': 304.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 3.5,
 'winddeg': 231,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 09:00:00'),
 'temp': 304.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 3.48,
 'winddeg': 227,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 10:00:00'),
  'temp': 304.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 2.99,
  'winddeg': 218,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 11:00:00'),
  'temp': 303.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 2.3,
  'winddeg': 212,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 12:00:00'),
  'temp': 300.9,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 54,
  'windspeed': 1.69,
  'winddeg': 189,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 13:00:00'),
  'temp': 302.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 1.41,
  'winddeg': 220,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 14:00:00'),
  'temp': 302.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 1.66,
  'winddeg': 257,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-03 15:00:00'),
  'temp': 302.09,
  'pressure': 1009,
```

```
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 2.28,
 'winddeg': 262,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 16:00:00'),
 'temp': 299.99,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.28,
 'winddeg': 252,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 17:00:00'),
 'temp': 299.99,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.65,
 'winddeg': 251,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 18:00:00'),
 'temp': 299.99,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.86,
 'winddeg': 245,
 'cloudall': 96,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 19:00:00'),
 'temp': 300.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.68,
 'winddeg': 245,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 20:00:00'),
 'temp': 300.88,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.67,
 'winddeg': 244,
 'cloudall': 100,
 'weathermain': 'Rain'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 21:00:00'),
 'temp': 299.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.84,
 'winddeg': 237,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 22:00:00'),
 'temp': 299.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 3.16,
 'winddeg': 223,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-03 23:00:00'),
 'temp': 299.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.58,
 'winddeg': 222,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 00:00:00'),
 'temp': 299.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 2.39,
 'winddeg': 220,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 01:00:00'),
 'temp': 299.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.92,
 'winddeg': 206,
 'cloudall': 99,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 02:00:00'),
 'temp': 301.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 77,
```

```
  'windspeed': 3.74,
  'winddeg': 204,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 03:00:00'),
  'temp': 302.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 4.48,
  'winddeg': 209,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 04:00:00'),
  'temp': 303.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 4.68,
  'winddeg': 208,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 05:00:00'),
  'temp': 303.99,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 5.22,
  'winddeg': 214,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 06:00:00'),
  'temp': 304.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 4.65,
  'winddeg': 220,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 07:00:00'),
  'temp': 305.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 4.75,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 08:00:00'),
```

```
  'temp': 305.09,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 5.4,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 09:00:00'),
  'temp': 305.09,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 4,
  'winddeg': 231,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 10:00:00'),
  'temp': 306.09,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 3.14,
  'winddeg': 230,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 11:00:00'),
  'temp': 305.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 77,
  'windspeed': 3.53,
  'winddeg': 242,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 12:00:00'),
  'temp': 304.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 3.56,
  'winddeg': 238,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-04 13:00:00'),
  'temp': 304.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 79,
  'windspeed': 3.57,
  'winddeg': 236,
```

```
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 14:00:00'),
 'temp': 304.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.96,
 'winddeg': 239,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 15:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.91,
 'winddeg': 251,
 'cloudall': 72,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 16:00:00'),
 'temp': 300.86,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 2.87,
 'winddeg': 238,
 'cloudall': 68,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 17:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.02,
 'winddeg': 238,
 'cloudall': 66,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 18:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.4,
 'winddeg': 250,
 'cloudall': 83,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 19:00:00'),
 'temp': 302.09,
 'pressure': 1005,
```

```
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 3.09,
 'winddeg': 247,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 20:00:00'),
 'temp': 301.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.96,
 'winddeg': 245,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 21:00:00'),
 'temp': 301.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.66,
 'winddeg': 238,
 'cloudall': 94,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 22:00:00'),
 'temp': 301.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.3,
 'winddeg': 234,
 'cloudall': 83,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-04 23:00:00'),
 'temp': 300.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.11,
 'winddeg': 240,
 'cloudall': 75,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 00:00:00'),
 'temp': 300.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 2.4,
 'winddeg': 242,
 'cloudall': 89,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 01:00:00'),
  'temp': 301.2,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 2.98,
  'winddeg': 242,
  'cloudall': 87,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 02:00:00'),
  'temp': 303.11,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 3.86,
  'winddeg': 249,
  'cloudall': 85,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 03:00:00'),
  'temp': 304.11,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 4.74,
  'winddeg': 258,
  'cloudall': 88,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 04:00:00'),
  'temp': 306.61,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 50,
  'windspeed': 5.32,
  'winddeg': 261,
  'cloudall': 77,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 05:00:00'),
  'temp': 307.25,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 49,
  'windspeed': 5.96,
  'winddeg': 269,
  'cloudall': 70,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-05 06:00:00'),
  'temp': 307.91,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 48,
```

```
 'windspeed': 5.68,
 'winddeg': 278,
 'cloudall': 86,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 07:00:00'),
 'temp': 308.15,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 47,
 'windspeed': 5.1,
 'winddeg': 284,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 08:00:00'),
 'temp': 306.99,
 'pressure': 1002,
 'grnd_level': None,
 'humidity': 58,
 'windspeed': 3.75,
 'winddeg': 277,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 09:00:00'),
 'temp': 306.09,
 'pressure': 1002,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 2.68,
 'winddeg': 285,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 10:00:00'),
 'temp': 303.99,
 'pressure': 1002,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 2.81,
 'winddeg': 254,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 11:00:00'),
 'temp': 304.88,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 4.17,
 'winddeg': 250,
 'cloudall': 92,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 12:00:00'),
```

```
 'temp': 304.88,
 'pressure': 1003,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 6,
 'winddeg': 251,
 'cloudall': 80,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 13:00:00'),
 'temp': 303.99,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 5.09,
 'winddeg': 257,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 14:00:00'),
 'temp': 303.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 4.49,
 'winddeg': 261,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 15:00:00'),
 'temp': 303.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 4.04,
 'winddeg': 262,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 16:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 3.32,
 'winddeg': 267,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 17:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.26,
 'winddeg': 260,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 18:00:00'),
 'temp': 302.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.89,
 'winddeg': 268,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 19:00:00'),
 'temp': 302.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.45,
 'winddeg': 259,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 20:00:00'),
 'temp': 301.99,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.45,
 'winddeg': 260,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 21:00:00'),
 'temp': 301.09,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.28,
 'winddeg': 265,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 22:00:00'),
 'temp': 301.09,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.46,
 'winddeg': 267,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-05 23:00:00'),
 'temp': 301.09,
 'pressure': 1005,
```

```
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 2.41,
 'winddeg': 263,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 00:00:00'),
 'temp': 301.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.76,
 'winddeg': 254,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 01:00:00'),
 'temp': 301.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 2.84,
 'winddeg': 265,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 02:00:00'),
 'temp': 303.88,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 3.99,
 'winddeg': 264,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 03:00:00'),
 'temp': 304.12,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 67,
 'windspeed': 4.49,
 'winddeg': 261,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 04:00:00'),
 'temp': 306.99,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 4.12,
 'winddeg': 259,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 05:00:00'),
  'temp': 306.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 68,
  'windspeed': 3.97,
  'winddeg': 253,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 06:00:00'),
  'temp': 306.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 3.36,
  'winddeg': 277,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 07:00:00'),
  'temp': 306.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 3.98,
  'winddeg': 301,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 08:00:00'),
  'temp': 306.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 4.7,
  'winddeg': 303,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 09:00:00'),
  'temp': 306.09,
  'pressure': 1003,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 4.08,
  'winddeg': 282,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 10:00:00'),
  'temp': 306.09,
  'pressure': 1004,
  'grnd_level': None,
  'humidity': 81,
```

```
 'windspeed': 3.12,
 'winddeg': 268,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 11:00:00'),
 'temp': 305.09,
 'pressure': 1004,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 3.42,
 'winddeg': 257,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 12:00:00'),
 'temp': 305.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 4.03,
 'winddeg': 252,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 13:00:00'),
 'temp': 304.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 3.29,
 'winddeg': 255,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 14:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 4.24,
 'winddeg': 261,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 15:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 3.43,
 'winddeg': 256,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 16:00:00'),
```

```
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.65,
 'winddeg': 247,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 17:00:00'),
 'temp': 302.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 2.08,
 'winddeg': 239,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 18:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.53,
 'winddeg': 244,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 19:00:00'),
 'temp': 302.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.36,
 'winddeg': 243,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 20:00:00'),
 'temp': 302.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.41,
 'winddeg': 235,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-06 21:00:00'),
 'temp': 301.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 2.15,
 'winddeg': 239,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 22:00:00'),
  'temp': 301.2,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.42,
  'winddeg': 231,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-06 23:00:00'),
  'temp': 300.2,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.38,
  'winddeg': 234,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 00:00:00'),
  'temp': 301.09,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.13,
  'winddeg': 234,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 01:00:00'),
  'temp': 302.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 2.49,
  'winddeg': 234,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 02:00:00'),
  'temp': 303.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 2.33,
  'winddeg': 233,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 03:00:00'),
  'temp': 305.09,
  'pressure': 1007,
```

```
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 2.32,
  'winddeg': 227,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 04:00:00'),
  'temp': 305.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 2.85,
  'winddeg': 239,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 05:00:00'),
  'temp': 306.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 4.98,
  'winddeg': 261,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 06:00:00'),
  'temp': 306.99,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 4.6,
  'winddeg': 269,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 07:00:00'),
  'temp': 306.88,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 7.06,
  'winddeg': 258,
  'cloudall': 72,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 08:00:00'),
  'temp': 306.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 6.7,
  'winddeg': 261,
  'cloudall': 72,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 09:00:00'),
 'temp': 305.99,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 5.67,
 'winddeg': 260,
 'cloudall': 81,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 10:00:00'),
 'temp': 306.09,
 'pressure': 1005,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 5.11,
 'winddeg': 258,
 'cloudall': 86,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 11:00:00'),
 'temp': 306.09,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 5,
 'winddeg': 250,
 'cloudall': 89,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 12:00:00'),
 'temp': 303.99,
 'pressure': 1006,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 4.73,
 'winddeg': 250,
 'cloudall': 80,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 13:00:00'),
 'temp': 303.88,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 4.17,
 'winddeg': 240,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 14:00:00'),
 'temp': 303.88,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 72,
```

```
  'windspeed': 4,
  'winddeg': 235,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 15:00:00'),
  'temp': 303.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 4.08,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 16:00:00'),
  'temp': 303.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 4.11,
  'winddeg': 232,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 17:00:00'),
  'temp': 302.99,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 73,
  'windspeed': 3.89,
  'winddeg': 237,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 18:00:00'),
  'temp': 302.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 74,
  'windspeed': 3.49,
  'winddeg': 236,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 19:00:00'),
  'temp': 302.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 2.89,
  'winddeg': 238,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-07 20:00:00'),
```

```
 'temp': 302.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 2.28,
 'winddeg': 239,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 21:00:00'),
 'temp': 302.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.95,
 'winddeg': 212,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 22:00:00'),
 'temp': 301.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 2.05,
 'winddeg': 206,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-07 23:00:00'),
 'temp': 301.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 2.63,
 'winddeg': 215,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 00:00:00'),
 'temp': 301.21,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 2.86,
 'winddeg': 213,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 01:00:00'),
 'temp': 302.98,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.78,
 'winddeg': 223,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 02:00:00'),
 'temp': 303.97,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 3.77,
 'winddeg': 222,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 03:00:00'),
 'temp': 304.97,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 4.07,
 'winddeg': 227,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 04:00:00'),
 'temp': 305.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 4.66,
 'winddeg': 229,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 05:00:00'),
 'temp': 306.03,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 5.26,
 'winddeg': 240,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 06:00:00'),
 'temp': 306.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 4.85,
 'winddeg': 251,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 07:00:00'),
 'temp': 307.09,
 'pressure': 1006,
```

```
  'grnd_level': None,
  'humidity': 57,
  'windspeed': 5.5,
  'winddeg': 258,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-08 08:00:00'),
  'temp': 306.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 4.36,
  'winddeg': 260,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-08 09:00:00'),
  'temp': 305.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 4.32,
  'winddeg': 278,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-08 10:00:00'),
  'temp': 303.2,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 60,
  'windspeed': 4.74,
  'winddeg': 275,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-08 11:00:00'),
  'temp': 304.99,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 4.38,
  'winddeg': 274,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-09-08 12:00:00'),
  'temp': 303.88,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 67,
  'windspeed': 4.07,
  'winddeg': 258,
  'cloudall': 100,
  'weathermain': 'Rain'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 13:00:00'),
 'temp': 303.88,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 3.48,
 'winddeg': 249,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 14:00:00'),
 'temp': 303.88,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 3.45,
 'winddeg': 235,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 15:00:00'),
 'temp': 303.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.71,
 'winddeg': 229,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 16:00:00'),
 'temp': 303.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 3.67,
 'winddeg': 223,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-09-08 17:00:00'),
 'temp': 302.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 3.61,
 'winddeg': 222,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 17:00:00'),
 'temp': 298.51,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 83,
```

```
 'windspeed': 0.87,
 'winddeg': 197,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 18:00:00'),
 'temp': 299.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 0.98,
 'winddeg': 305,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 19:00:00'),
 'temp': 298.2,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 1.86,
 'winddeg': 356,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 20:00:00'),
 'temp': 299.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 1.94,
 'winddeg': 8,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 21:00:00'),
 'temp': 300.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.93,
 'winddeg': 9,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 22:00:00'),
 'temp': 299.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.55,
 'winddeg': 360,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-01 23:00:00'),
```

```
 'temp': 299.2,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.16,
 'winddeg': 358,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 00:00:00'),
 'temp': 299.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 1.71,
 'winddeg': 19,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 01:00:00'),
 'temp': 300.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 2.07,
 'winddeg': 28,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 02:00:00'),
 'temp': 301.3,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 1.92,
 'winddeg': 40,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 03:00:00'),
 'temp': 302.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 1.71,
 'winddeg': 54,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 04:00:00'),
 'temp': 303.23,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 71,
 'windspeed': 2.3,
 'winddeg': 91,
```

```
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 05:00:00'),
  'temp': 304.11,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 2.4,
  'winddeg': 128,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 06:00:00'),
  'temp': 305.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 65,
  'windspeed': 5.31,
  'winddeg': 163,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 07:00:00'),
  'temp': 307.44,
  'pressure': 1006,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 4.68,
  'winddeg': 179,
  'cloudall': 95,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 08:00:00'),
  'temp': 306.13,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 61,
  'windspeed': 4.36,
  'winddeg': 181,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 09:00:00'),
  'temp': 305.09,
  'pressure': 1005,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 4.08,
  'winddeg': 177,
  'cloudall': 98,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 10:00:00'),
  'temp': 305.88,
  'pressure': 1006,
```

```
 'grnd_level': None,
 'humidity': 65,
 'windspeed': 4.04,
 'winddeg': 176,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 11:00:00'),
 'temp': 303.09,
 'pressure': 1007,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 3.6,
 'winddeg': 179,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 12:00:00'),
 'temp': 302.2,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 3.68,
 'winddeg': 171,
 'cloudall': 99,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 13:00:00'),
 'temp': 301.3,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 3.59,
 'winddeg': 175,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 14:00:00'),
 'temp': 301.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 3.66,
 'winddeg': 184,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 15:00:00'),
 'temp': 300.2,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 85,
 'windspeed': 3.37,
 'winddeg': 196,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 16:00:00'),
  'temp': 300.2,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 2.46,
  'winddeg': 206,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 17:00:00'),
  'temp': 300.2,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 3.04,
  'winddeg': 228,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 18:00:00'),
  'temp': 300.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 90,
  'windspeed': 3.47,
  'winddeg': 250,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 19:00:00'),
  'temp': 300.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 3.35,
  'winddeg': 263,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 20:00:00'),
  'temp': 299.2,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 2.33,
  'winddeg': 282,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-02 21:00:00'),
  'temp': 299.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 91,
```

```
 'windspeed': 2.71,
 'winddeg': 286,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 22:00:00'),
 'temp': 299.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.2,
 'winddeg': 309,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-02 23:00:00'),
 'temp': 299.99,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.18,
 'winddeg': 313,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 00:00:00'),
 'temp': 299.99,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 1.91,
 'winddeg': 334,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 01:00:00'),
 'temp': 299.2,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 92,
 'windspeed': 2.73,
 'winddeg': 25,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 02:00:00'),
 'temp': 300.2,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 2.42,
 'winddeg': 21,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 03:00:00'),
```

```
  'temp': 301.09,
  'pressure': 1012,
  'grnd_level': None,
  'humidity': 84,
  'windspeed': 2.48,
  'winddeg': 3,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 04:00:00'),
  'temp': 302.09,
  'pressure': 1012,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 2.52,
  'winddeg': 355,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 05:00:00'),
  'temp': 303.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 2.6,
  'winddeg': 360,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 06:00:00'),
  'temp': 304.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 2.66,
  'winddeg': 15,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 07:00:00'),
  'temp': 306.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 78,
  'windspeed': 2.26,
  'winddeg': 17,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 08:00:00'),
  'temp': 305.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 2.09,
  'winddeg': 9,
```

```
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 09:00:00'),
  'temp': 305.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 71,
  'windspeed': 2.27,
  'winddeg': 350,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 10:00:00'),
  'temp': 304.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 75,
  'windspeed': 2.31,
  'winddeg': 352,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 11:00:00'),
  'temp': 303.98,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 2.24,
  'winddeg': 22,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 12:00:00'),
  'temp': 298.17,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 63,
  'windspeed': 2.13,
  'winddeg': 64,
  'cloudall': 99,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 13:00:00'),
  'temp': 298.88,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 88,
  'windspeed': 2.44,
  'winddeg': 72,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-03 14:00:00'),
  'temp': 298.09,
  'pressure': 1011,
```

```
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.79,
 'winddeg': 81,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 15:00:00'),
 'temp': 299.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 87,
 'windspeed': 3.53,
 'winddeg': 84,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 16:00:00'),
 'temp': 299.2,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 3.23,
 'winddeg': 91,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 17:00:00'),
 'temp': 299.2,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 3.11,
 'winddeg': 90,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 18:00:00'),
 'temp': 299.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 2.65,
 'winddeg': 165,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 19:00:00'),
 'temp': 299.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 89,
 'windspeed': 2.65,
 'winddeg': 196,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 20:00:00'),
 'temp': 299.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 2.15,
 'winddeg': 208,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 21:00:00'),
 'temp': 299.2,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.33,
 'winddeg': 209,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 22:00:00'),
 'temp': 299.32,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 1.32,
 'winddeg': 195,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-03 23:00:00'),
 'temp': 298.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 91,
 'windspeed': 0.26,
 'winddeg': 132,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 00:00:00'),
 'temp': 297.99,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 90,
 'windspeed': 1.32,
 'winddeg': 43,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 01:00:00'),
 'temp': 298.4,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 88,
```

```
 'windspeed': 2.13,
 'winddeg': 44,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 02:00:00'),
 'temp': 298.82,
 'pressure': 1013,
 'grnd_level': None,
 'humidity': 86,
 'windspeed': 1.9,
 'winddeg': 41,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 03:00:00'),
 'temp': 302.28,
 'pressure': 1013,
 'grnd_level': None,
 'humidity': 62,
 'windspeed': 1.25,
 'winddeg': 17,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 04:00:00'),
 'temp': 303.55,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 61,
 'windspeed': 0.99,
 'winddeg': 2,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 05:00:00'),
 'temp': 299.2,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.03,
 'winddeg': 347,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 06:00:00'),
 'temp': 304.51,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 58,
 'windspeed': 1.4,
 'winddeg': 321,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 07:00:00'),
```

```
  'temp': 302.2,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 1.75,
  'winddeg': 315,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 08:00:00'),
  'temp': 306.15,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 1.97,
  'winddeg': 318,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 09:00:00'),
  'temp': 304.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 3.02,
  'winddeg': 6,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 10:00:00'),
  'temp': 304.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 3.51,
  'winddeg': 29,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 11:00:00'),
  'temp': 303.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 91,
  'windspeed': 1.42,
  'winddeg': 327,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 12:00:00'),
  'temp': 302.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 3.29,
  'winddeg': 265,
```

```
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 13:00:00'),
 'temp': 301.99,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 94,
 'windspeed': 3.43,
 'winddeg': 251,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 14:00:00'),
 'temp': 299.2,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 94,
 'windspeed': 2.63,
 'winddeg': 223,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 15:00:00'),
 'temp': 299.2,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 96,
 'windspeed': 3.42,
 'winddeg': 212,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 16:00:00'),
 'temp': 299.99,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 95,
 'windspeed': 3.17,
 'winddeg': 219,
 'cloudall': 100,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 17:00:00'),
 'temp': 299.99,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 93,
 'windspeed': 2.05,
 'winddeg': 226,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-04 18:00:00'),
 'temp': 299.99,
 'pressure': 1011,
```

```
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 2.4,
  'winddeg': 223,
  'cloudall': 100,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 19:00:00'),
  'temp': 299.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 95,
  'windspeed': 1.88,
  'winddeg': 219,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 20:00:00'),
  'temp': 299.99,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 0.52,
  'winddeg': 259,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 21:00:00'),
  'temp': 299.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 93,
  'windspeed': 1.06,
  'winddeg': 345,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 22:00:00'),
  'temp': 299.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 1.92,
  'winddeg': 321,
  'cloudall': 76,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-04 23:00:00'),
  'temp': 299.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 94,
  'windspeed': 1.67,
  'winddeg': 321,
  'cloudall': 68,
  'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 00:00:00'),
 'temp': 299.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 93,
 'windspeed': 1.41,
 'winddeg': 325,
 'cloudall': 58,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 01:00:00'),
 'temp': 300.99,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 88,
 'windspeed': 1.14,
 'winddeg': 333,
 'cloudall': 37,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 02:00:00'),
 'temp': 302.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 1.41,
 'winddeg': 355,
 'cloudall': 58,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 03:00:00'),
 'temp': 303.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 2.26,
 'winddeg': 352,
 'cloudall': 69,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 04:00:00'),
 'temp': 304.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 2.99,
 'winddeg': 339,
 'cloudall': 71,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 05:00:00'),
 'temp': 305.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 64,
```

```
  'windspeed': 3.29,
  'winddeg': 337,
  'cloudall': 75,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 06:00:00'),
  'temp': 305.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 61,
  'windspeed': 3.24,
  'winddeg': 347,
  'cloudall': 74,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 07:00:00'),
  'temp': 305.99,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 2.79,
  'winddeg': 355,
  'cloudall': 74,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 08:00:00'),
  'temp': 306.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 58,
  'windspeed': 2.48,
  'winddeg': 13,
  'cloudall': 86,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 09:00:00'),
  'temp': 306.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 64,
  'windspeed': 2.51,
  'winddeg': 22,
  'cloudall': 91,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 10:00:00'),
  'temp': 306.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 72,
  'windspeed': 2.83,
  'winddeg': 22,
  'cloudall': 93,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 11:00:00'),
```

```
 'temp': 305.09,
 'pressure': 1008,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 2.56,
 'winddeg': 14,
 'cloudall': 87,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 12:00:00'),
 'temp': 304.09,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 73,
 'windspeed': 2.04,
 'winddeg': 7,
 'cloudall': 96,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 13:00:00'),
 'temp': 304.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.52,
 'winddeg': 16,
 'cloudall': 88,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 14:00:00'),
 'temp': 303.2,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.64,
 'winddeg': 64,
 'cloudall': 68,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 15:00:00'),
 'temp': 303.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.65,
 'winddeg': 93,
 'cloudall': 62,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 16:00:00'),
 'temp': 302.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 1.72,
 'winddeg': 106,
```

```
  'cloudall': 65,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 17:00:00'),
  'temp': 301.2,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 79,
  'windspeed': 1.41,
  'winddeg': 96,
  'cloudall': 72,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 18:00:00'),
  'temp': 302.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 1.46,
  'winddeg': 83,
  'cloudall': 81,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 19:00:00'),
  'temp': 301.2,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 1.32,
  'winddeg': 51,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 20:00:00'),
  'temp': 301.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 81,
  'windspeed': 1.37,
  'winddeg': 14,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 21:00:00'),
  'temp': 301.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 82,
  'windspeed': 1.47,
  'winddeg': 347,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-05 22:00:00'),
  'temp': 300.09,
  'pressure': 1010,
```

```
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 1.45,
 'winddeg': 335,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-05 23:00:00'),
 'temp': 300.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 1.51,
 'winddeg': 311,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 00:00:00'),
 'temp': 300.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 80,
 'windspeed': 1.01,
 'winddeg': 349,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 01:00:00'),
 'temp': 301.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.05,
 'winddeg': 19,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 02:00:00'),
 'temp': 302.09,
 'pressure': 1013,
 'grnd_level': None,
 'humidity': 70,
 'windspeed': 1.08,
 'winddeg': 31,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 03:00:00'),
 'temp': 303.09,
 'pressure': 1013,
 'grnd_level': None,
 'humidity': 66,
 'windspeed': 1.32,
 'winddeg': 40,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 04:00:00'),
  'temp': 304.09,
  'pressure': 1012,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 1.69,
  'winddeg': 39,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 05:00:00'),
  'temp': 304.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 59,
  'windspeed': 1.92,
  'winddeg': 28,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 06:00:00'),
  'temp': 305.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 57,
  'windspeed': 2.33,
  'winddeg': 18,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 07:00:00'),
  'temp': 306.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 2.36,
  'winddeg': 8,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 08:00:00'),
  'temp': 306.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 55,
  'windspeed': 2.52,
  'winddeg': 350,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 09:00:00'),
  'temp': 306.09,
  'pressure': 1007,
  'grnd_level': None,
  'humidity': 56,
```

```
  'windspeed': 2.63,
  'winddeg': 346,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 10:00:00'),
  'temp': 305.09,
  'pressure': 1008,
  'grnd_level': None,
  'humidity': 62,
  'windspeed': 2.37,
  'winddeg': 344,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 11:00:00'),
  'temp': 306.09,
  'pressure': 1009,
  'grnd_level': None,
  'humidity': 66,
  'windspeed': 2.14,
  'winddeg': 349,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 12:00:00'),
  'temp': 304.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 69,
  'windspeed': 2.62,
  'winddeg': 8,
  'cloudall': 97,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 13:00:00'),
  'temp': 303.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 71,
  'windspeed': 2.06,
  'winddeg': 4,
  'cloudall': 29,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 14:00:00'),
  'temp': 303.09,
  'pressure': 1012,
  'grnd_level': None,
  'humidity': 73,
  'windspeed': 1.59,
  'winddeg': 355,
  'cloudall': 50,
  'weathermain': 'Rain'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 15:00:00'),
```

```
 'temp': 301.99,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.34,
 'winddeg': 342,
 'cloudall': 42,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 16:00:00'),
 'temp': 301.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.15,
 'winddeg': 339,
 'cloudall': 51,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 17:00:00'),
 'temp': 300.99,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 78,
 'windspeed': 1.05,
 'winddeg': 352,
 'cloudall': 44,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 18:00:00'),
 'temp': 300.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 1.25,
 'winddeg': 79,
 'cloudall': 54,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 19:00:00'),
 'temp': 299.3,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 82,
 'windspeed': 1.39,
 'winddeg': 102,
 'cloudall': 59,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-06 20:00:00'),
 'temp': 300.09,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 1.27,
 'winddeg': 103,
```

```
  'cloudall': 56,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 21:00:00'),
  'temp': 300.09,
  'pressure': 1010,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 1.24,
  'winddeg': 92,
  'cloudall': 51,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 22:00:00'),
  'temp': 300.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 86,
  'windspeed': 1.27,
  'winddeg': 59,
  'cloudall': 56,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-06 23:00:00'),
  'temp': 299.09,
  'pressure': 1011,
  'grnd_level': None,
  'humidity': 87,
  'windspeed': 1.13,
  'winddeg': 35,
  'cloudall': 65,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-07 00:00:00'),
  'temp': 298.9,
  'pressure': 1012,
  'grnd_level': None,
  'humidity': 85,
  'windspeed': 1.31,
  'winddeg': 51,
  'cloudall': 74,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-07 01:00:00'),
  'temp': 299.95,
  'pressure': 1013,
  'grnd_level': None,
  'humidity': 80,
  'windspeed': 1.79,
  'winddeg': 62,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-07 02:00:00'),
  'temp': 301.21,
  'pressure': 1014,
```

```
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.69,
 'winddeg': 36,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 03:00:00'),
 'temp': 302.44,
 'pressure': 1014,
 'grnd_level': None,
 'humidity': 69,
 'windspeed': 1.73,
 'winddeg': 11,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 04:00:00'),
 'temp': 303.65,
 'pressure': 1013,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 1.91,
 'winddeg': 19,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 05:00:00'),
 'temp': 304.51,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 2.07,
 'winddeg': 30,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 06:00:00'),
 'temp': 305.52,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 2.22,
 'winddeg': 46,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 07:00:00'),
 'temp': 305.73,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 54,
 'windspeed': 2.08,
 'winddeg': 60,
 'cloudall': 100,
 'weathermain': 'Clouds'},
```

```
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 08:00:00'),
 'temp': 305.4,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 55,
 'windspeed': 1.88,
 'winddeg': 72,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 09:00:00'),
 'temp': 304.51,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 60,
 'windspeed': 1.55,
 'winddeg': 70,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 10:00:00'),
 'temp': 304.01,
 'pressure': 1009,
 'grnd_level': None,
 'humidity': 64,
 'windspeed': 1.29,
 'winddeg': 36,
 'cloudall': 100,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 11:00:00'),
 'temp': 303.05,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 2.21,
 'winddeg': 17,
 'cloudall': 95,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 12:00:00'),
 'temp': 302.91,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 68,
 'windspeed': 2.3,
 'winddeg': 26,
 'cloudall': 95,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 13:00:00'),
 'temp': 302.5,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 70,
```

```
 'windspeed': 1.76,
 'winddeg': 19,
 'cloudall': 96,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 14:00:00'),
 'temp': 305.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 72,
 'windspeed': 1.72,
 'winddeg': 10,
 'cloudall': 97,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 15:00:00'),
 'temp': 304.2,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 74,
 'windspeed': 1.41,
 'winddeg': 357,
 'cloudall': 74,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 16:00:00'),
 'temp': 302.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 75,
 'windspeed': 1.4,
 'winddeg': 9,
 'cloudall': 67,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 17:00:00'),
 'temp': 302.3,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 76,
 'windspeed': 1.46,
 'winddeg': 27,
 'cloudall': 57,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 18:00:00'),
 'temp': 302.3,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 77,
 'windspeed': 1.74,
 'winddeg': 22,
 'cloudall': 68,
 'weathermain': 'Rain'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 19:00:00'),
```

```
 'temp': 302.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 79,
 'windspeed': 2.09,
 'winddeg': 19,
 'cloudall': 16,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 20:00:00'),
 'temp': 301.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 81,
 'windspeed': 2.05,
 'winddeg': 12,
 'cloudall': 19,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 21:00:00'),
 'temp': 301.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.01,
 'winddeg': 1,
 'cloudall': 18,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 22:00:00'),
 'temp': 301.2,
 'pressure': 1010,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 1.94,
 'winddeg': 357,
 'cloudall': 18,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-07 23:00:00'),
 'temp': 301.09,
 'pressure': 1011,
 'grnd_level': None,
 'humidity': 84,
 'windspeed': 1.85,
 'winddeg': 8,
 'cloudall': 19,
 'weathermain': 'Clouds'},
{'station': '3T',
 'timestamp': Timestamp('2024-10-08 00:00:00'),
 'temp': 301.09,
 'pressure': 1012,
 'grnd_level': None,
 'humidity': 83,
 'windspeed': 2.08,
 'winddeg': 37,
```

```
  'cloudall': 27,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-08 01:00:00'),
  'temp': 301.2,
  'pressure': 1013,
  'grnd_level': None,
  'humidity': 76,
  'windspeed': 1.53,
  'winddeg': 48,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-08 02:00:00'),
  'temp': 303.09,
  'pressure': 1013,
  'grnd_level': None,
  'humidity': 70,
  'windspeed': 1.16,
  'winddeg': 17,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 {'station': '3T',
  'timestamp': Timestamp('2024-10-08 03:00:00'),
  'temp': 304.09,
  'pressure': 1013,
  'grnd_level': None,
  'humidity': 67,
  'windspeed': 1.47,
  'winddeg': 359,
  'cloudall': 100,
  'weathermain': 'Clouds'},
 ...]
```


In [45]:
```
all_df = pd.DataFrame(all_data)
```

In [46]:
```
all_df
```

Out[46]:

	station	timestamp	temp	pressure	grnd_level	humidity	windspeed	winddeg
0	3T	2024-05-04 17:00:00	305.44	1006	None	70	6.57	181
1	3T	2024-05-04 18:00:00	304.42	1006	None	68	6.04	179
2	3T	2024-05-04 19:00:00	304.42	1005	None	69	5.53	176
3	3T	2024-05-04 20:00:00	304.09	1004	None	69	5.03	174
4	3T	2024-05-04 21:00:00	304.52	1005	None	69	4.84	168
...	...	...	...	...	...	...	...	...
14128	61T	2025-04-06 13:00:00	303.12	1009	None	68	7.68	189
14129	61T	2025-04-06 14:00:00	303.12	1010	None	68	7.03	189
14130	61T	2025-04-06 15:00:00	303.12	1011	None	69	7.04	187
14131	61T	2025-04-06 16:00:00	303.12	1011	None	71	6.84	183
14132	61T	2025-04-06 17:00:00	302.12	1011	None	73	5.92	183

14133 rows × 10 columns

In [47]:
```
all_df.drop(columns=['grnd_level'], inplace=True)
```

In [48]:
```
all_df.isna().sum()
```

Out[48]:
```
station        0
timestamp      0
temp           0
pressure       0
humidity       0
windspeed      0
winddeg        0
cloudall       0
weathermain    0
dtype: int64
```

In [49]:
```
all_df.to_csv('../datasets/weather_historical_1y.csv', index=False)
```

Merge all required datasets

In [50]:
```
import pandas as pd

# Load Data
df_weather = pd.read_csv("../datasets/weather_historical_1y.csv")
df_variable = pd.read_csv("../datasets/variables.csv")
df_traffic = pd.read_csv("../datasets/traffic.csv")

# Fix column name issue in df_traffic (remove unwanted space)
df_traffic.rename(columns={"station ": "station"}, inplace=True)

# Convert timestamp to datetime format
df_weather["datetime"] = pd.to_datetime(df_weather["timestamp"])

# Extract relevant time features for merging with df_traffic
df_weather["day_of_week"] = df_weather["datetime"].dt.dayofweek  # 0=Monday, 6=Suna
df_weather["hour"] = df_weather["datetime"].dt.hour

# **Merge df_weather with df_traffic (keeping all rows from df_weather)**
df_merged = df_weather.merge(df_traffic, on=["station", "day_of_week", "hour"], how

# **Merge with df_variable on 'station' (df_variable is a dictionary-like dataset)*
df_final = df_merged.merge(df_variable, on="station", how="left")

# Fill missing station-level attributes from df_variable
for col in ["sea_level", "population", "population_density", "household",
            "household_density", "green_space", "green_space_area",
            "factory_num", "factory_area"]:
    df_final[col] = df_final.groupby("station")[col].transform("first")

# Drop duplicate records if needed
df_final = df_final.drop_duplicates(subset=["station", "datetime"], keep="first")

# Drop timestamp column
df_final.drop(columns=['timestamp'], inplace=True)

# Save the cleaned merged DataFrame
df_final.to_csv("../datasets/final_cleaned_merged_data.csv", index=False)

print("Cleaning & Merging Complete! Data saved as 'final_cleaned_merged_data.csv'")
```

```
Cleaning & Merging Complete! Data saved as 'final_cleaned_merged_data.csv'
```

In [51]:
```
df_final
```

Out[51]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain
0	3T	305.44	1006	70	6.57	181	63	Clouds
2	3T	304.42	1006	68	6.04	179	68	Clouds
4	3T	304.42	1005	69	5.53	176	100	Clouds
6	3T	304.09	1004	69	5.03	174	100	Clouds
8	3T	304.52	1005	69	4.84	168	100	Clouds
...	...	...	...	...	...	...	...	...
16147	61T	303.12	1009	68	7.68	189	100	Clouds
16148	61T	303.12	1010	68	7.03	189	100	Clouds
16149	61T	303.12	1011	69	7.04	187	100	Clouds
16150	61T	303.12	1011	71	6.84	183	98	Clouds
16151	61T	302.12	1011	73	5.92	183	86	Clouds

14133 rows × 21 columns

In [52]:

```
df_final.isna().sum()
```

Out[52]:
```
station               0
temp                  0
pressure              0
humidity              0
windspeed             0
winddeg               0
cloudall              0
weathermain           0
datetime              0
day_of_week           0
hour                  0
traffic_level         0
sea_level             0
population            0
population_density    0
household             0
household_density     0
green_space           0
green_space_area      0
factory_num           0
factory_area          0
dtype: int64
```

In [53]:
```
df_final.shape
```

Out[53]:
```
(14133, 21)
```

Load final dataset

In [54]:
```
# Load the datasets
df_final = pd.read_csv('../datasets/final_cleaned_merged_data.csv')
df_pollution = pd.read_csv('../datasets/pm25_bangkok_2025_lat_lon_.csv')

# Convert datetime columns to datetime format for merging
df_final['datetime'] = pd.to_datetime(df_final['datetime'])
df_pollution['datetime'] = pd.to_datetime(df_pollution['datetime'])

# Merge the data on 'station' and 'datetime', left join
merged_df = df_final.merge(df_pollution, on=['station', 'datetime'], how='left')
```

In [55]:
```
df_pollution.shape
```

Out[55]:
```
(62650, 11)
```

In [56]:
```
df_pollution
```

Out[56]:

	Unnamed: 0	datetime	station	lat	lon	pm2_5	pm10	so2	no2	o3
0	0	2024-04-05 00:00:00	3T	13.7563	100.5018	60.38	105.99	46.73	42.84	0.17
1	1	2024-04-05 00:00:00	5T	13.7367	100.5231	60.38	105.99	46.73	42.84	0.17
2	2	2024-04-05 00:00:00	10T	13.7291	100.7750	24.00	64.58	6.68	12.34	36.84
3	3	2024-04-05 00:00:00	11T	13.7898	100.4486	53.13	85.17	25.75	34.62	5.63
4	4	2024-04-05 00:00:00	12T	13.8225	100.5147	60.38	105.99	46.73	42.84	0.17
...	...	...	...	...	...	...	...	...	...	..
62645	62645	2025-04-12 21:00:00	10T	13.7291	100.7750	1.83	2.21	0.27	1.19	11.53
62646	62646	2025-04-12 21:00:00	11T	13.7898	100.4486	3.05	3.48	0.25	1.57	6.27
62647	62647	2025-04-12 21:00:00	12T	13.8225	100.5147	4.75	5.61	0.59	2.80	6.24
62648	62648	2025-04-12 21:00:00	15T	13.7083	100.3728	4.27	4.74	0.23	1.94	1.04
62649	62649	2025-04-12 21:00:00	61T	13.6796	100.6067	1.83	2.21	0.27	1.19	11.53

62650 rows × 11 columns

In [57]:

```
#Check Shape for df_final
df_final.shape
```

Out[57]: (14133, 21)

In [58]:

```
df_final
```

Out[58]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain
0	3T	305.44	1006	70	6.57	181	63	Clouds
1	3T	304.42	1006	68	6.04	179	68	Clouds
2	3T	304.42	1005	69	5.53	176	100	Clouds
3	3T	304.09	1004	69	5.03	174	100	Clouds
4	3T	304.52	1005	69	4.84	168	100	Clouds
...	...	...	...	...	...	...	...	...
14128	61T	303.12	1009	68	7.68	189	100	Clouds
14129	61T	303.12	1010	68	7.03	189	100	Clouds
14130	61T	303.12	1011	69	7.04	187	100	Clouds
14131	61T	303.12	1011	71	6.84	183	98	Clouds
14132	61T	302.12	1011	73	5.92	183	86	Clouds

14133 rows × 21 columns

In [59]:

```
#Check Shape for merged_df
merged_df.shape
```

Out[59]: (14133, 30)

In [60]:

```
merged_df
```

Out[60]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain
0	3T	305.44	1006	70	6.57	181	63	Clouds
1	3T	304.42	1006	68	6.04	179	68	Clouds
2	3T	304.42	1005	69	5.53	176	100	Clouds
3	3T	304.09	1004	69	5.03	174	100	Clouds
4	3T	304.52	1005	69	4.84	168	100	Clouds
...	...	...	...	...	...	...	...	...
14128	61T	303.12	1009	68	7.68	189	100	Clouds
14129	61T	303.12	1010	68	7.03	189	100	Clouds
14130	61T	303.12	1011	69	7.04	187	100	Clouds
14131	61T	303.12	1011	71	6.84	183	98	Clouds
14132	61T	302.12	1011	73	5.92	183	86	Clouds

14133 rows × 30 columns

In [61]:
```
merged_df.isna().sum()
```

Out[61]:

```
station                 0
temp                    0
pressure                0
humidity                0
windspeed               0
winddeg                 0
cloudall                0
weathermain             0
datetime                0
day_of_week             0
hour                    0
traffic_level           0
sea_level               0
population              0
population_density      0
household               0
household_density       0
green_space             0
green_space_area        0
factory_num             0
factory_area            0
Unnamed: 0           1232
lat                  1232
lon                  1232
pm2_5                1232
pm10                 1232
so2                  1232
no2                  1232
o3                   1232
co                   1232
dtype: int64
```

In [62]:

```
# Drop the 'Unnamed: 0' column if it exists
merged_df = merged_df.drop(columns=['Unnamed: 0'], errors='ignore')

# Save the merged dataset as master_dataset.csv
merged_df.to_csv('../datasets/master_dataset.csv', index=False)
```

In [63]:

```
merged_df.isna().sum()
```

Out[63]:
```
station                  0
temp                     0
pressure                 0
humidity                 0
windspeed                0
winddeg                  0
cloudall                 0
weathermain              0
datetime                 0
day_of_week              0
hour                     0
traffic_level            0
sea_level                0
population               0
population_density       0
household                0
household_density        0
green_space              0
green_space_area         0
factory_num              0
factory_area             0
lat                   1232
lon                   1232
pm2_5                 1232
pm10                  1232
so2                   1232
no2                   1232
o3                    1232
co                    1232
dtype: int64
```

In [64]:
```
df = pd.read_csv('../datasets/master_dataset.csv')
df
```

Out[64]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain
0	3T	305.44	1006	70	6.57	181	63	Clouds
1	3T	304.42	1006	68	6.04	179	68	Clouds
2	3T	304.42	1005	69	5.53	176	100	Clouds
3	3T	304.09	1004	69	5.03	174	100	Clouds
4	3T	304.52	1005	69	4.84	168	100	Clouds
...	...	...	...	...	...	...	...	...
14128	61T	303.12	1009	68	7.68	189	100	Clouds
14129	61T	303.12	1010	68	7.03	189	100	Clouds
14130	61T	303.12	1011	69	7.04	187	100	Clouds
14131	61T	303.12	1011	71	6.84	183	98	Clouds
14132	61T	302.12	1011	73	5.92	183	86	Clouds

14133 rows × 29 columns

In [65]:

```
df.columns
```

Out[65]:

```
Index(['station', 'temp', 'pressure', 'humidity', 'windspeed', 'winddeg',
       'cloudall', 'weathermain', 'datetime', 'day_of_week', 'hour',
       'traffic_level', 'sea_level', 'population', 'population_density',
       'household', 'household_density', 'green_space', 'green_space_area',
       'factory_num', 'factory_area', 'lat', 'lon', 'pm2_5', 'pm10', 'so2',
       'no2', 'o3', 'co'],
      dtype='object')
```

6. Explanatory Data Analysis

In [66]:
```
# Add more feature about time
df['datetime'] = pd.to_datetime(df['datetime'])

# Extract hour as 'time'
df['hour'] = df['datetime'].dt.hour

# Extract month
df['month'] = df['datetime'].dt.month

# Extract day of the week as a number (0 as Monday to 6 as Sunday)
df['day_of_week'] = df['datetime'].dt.dayofweek

# Display the updated DataFrame
df.head()
```

Out[66]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain	datet
0	3T	305.44	1006	70	6.57	181	63	Clouds	2024- 17:0(
1	3T	304.42	1006	68	6.04	179	68	Clouds	2024- 18:0(
2	3T	304.42	1005	69	5.53	176	100	Clouds	2024- 19:0(
3	3T	304.09	1004	69	5.03	174	100	Clouds	2024- 20:0(
4	3T	304.52	1005	69	4.84	168	100	Clouds	2024- 21:0(

5 rows × 30 columns

In [67]:
```
df_variable = pd.read_csv('../datasets/variables.csv',header=0)
```

In [68]:
```
df.head()
```

Out[68]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain	datet
0	3T	305.44	1006	70	6.57	181	63	Clouds	2024- 17:0(
1	3T	304.42	1006	68	6.04	179	68	Clouds	2024- 18:0(
2	3T	304.42	1005	69	5.53	176	100	Clouds	2024- 19:0(
3	3T	304.09	1004	69	5.03	174	100	Clouds	2024- 20:0(
4	3T	304.52	1005	69	4.84	168	100	Clouds	2024- 21:0(

5 rows × 30 columns

In [69]:

```
def map_season(month):
    if 3 <= month <= 4:
        return 'Hot Season'
    elif 5 <= month <= 10:
        return 'Rainy Season'
    else:
        return 'Cool Season'

# Apply the function to create a new 'season' column
df['season'] = df['month'].apply(map_season)
```

In [70]:

```
#  🔹 Ensure all seasons exist (even if missing in dataset)
expected_seasons = ["season_Hot Season", "season_Rainy Season"]

# Perform one-hot encoding
season_dummies = pd.get_dummies(df["season"], prefix="season")

# Add missing columns (if not generated)
for col in expected_seasons:
    if col not in season_dummies:
        season_dummies[col] = 0  # Fill missing season columns with 0

# Ensure all dummy columns are int type (not bool)
season_dummies = season_dummies.astype(int)

# Concatenate the encoded season features back to the dataset
df = pd.concat([df, season_dummies], axis=1)
```

In [71]:

```
df.columns
```

Out[71]:
```
Index(['station', 'temp', 'pressure', 'humidity', 'windspeed', 'winddeg',
       'cloudall', 'weathermain', 'datetime', 'day_of_week', 'hour',
       'traffic_level', 'sea_level', 'population', 'population_density',
       'household', 'household_density', 'green_space', 'green_space_area',
       'factory_num', 'factory_area', 'lat', 'lon', 'pm2_5', 'pm10', 'so2',
       'no2', 'o3', 'co', 'month', 'season', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season'],
      dtype='object')
```

In [72]:
```python
df.head()
```

Out[72]:

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain	datet
0	3T	305.44	1006	70	6.57	181	63	Clouds	2024- 17:0(
1	3T	304.42	1006	68	6.04	179	68	Clouds	2024- 18:0(
2	3T	304.42	1005	69	5.53	176	100	Clouds	2024- 19:0(
3	3T	304.09	1004	69	5.03	174	100	Clouds	2024- 20:0(
4	3T	304.52	1005	69	4.84	168	100	Clouds	2024- 21:0(

5 rows × 34 columns

In [73]:
```python
# Ensure 'df' is a DataFrame
if not isinstance(df, pd.DataFrame):
    raise TypeError("df is not a DataFrame. Ensure it is correctly loaded.")
```

In [74]:
```python
# Check if 'season' and 'pm2_5' exist
if 'season' not in df.columns or 'pm2_5' not in df.columns:
    raise KeyError("Ensure 'season' and 'pm2_5' exist in df.")
```

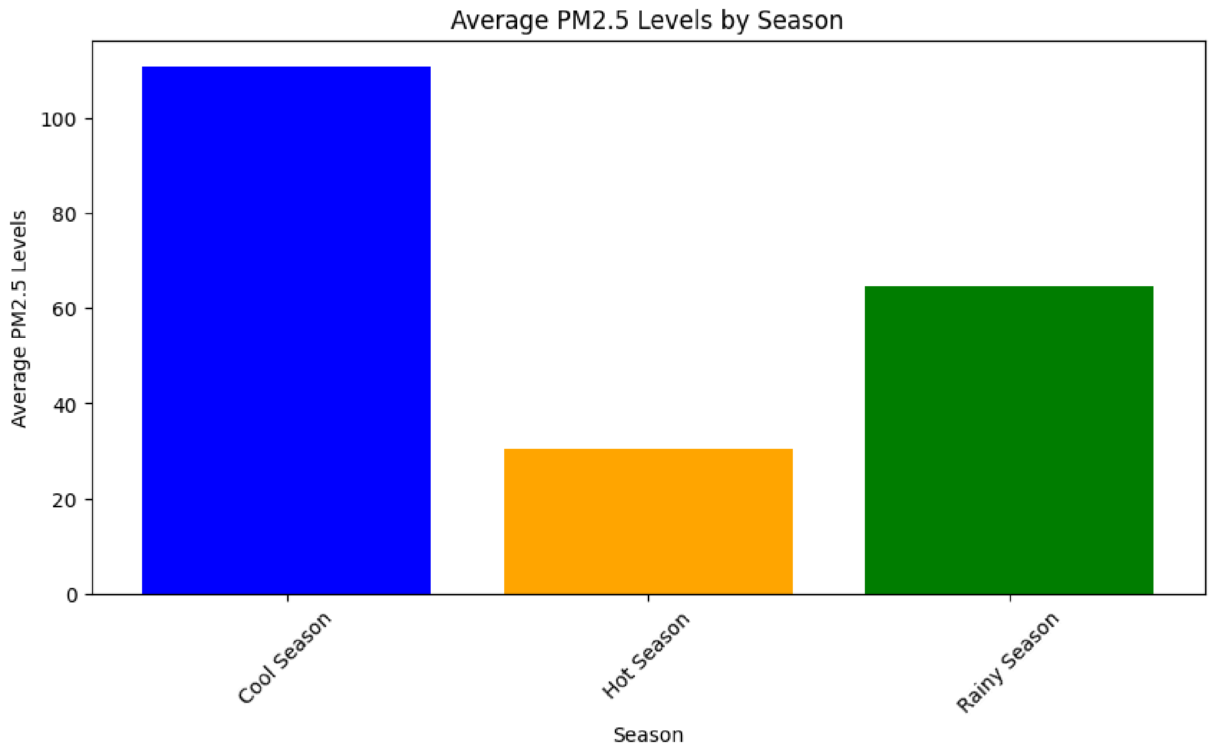
In [75]:
```python
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14133 entries, 0 to 14132
Data columns (total 34 columns):
 #   Column               Non-Null Count  Dtype
---  ------               --------------  -----
 0   station              14133 non-null  object
 1   temp                 14133 non-null  float64
 2   pressure             14133 non-null  int64
 3   humidity             14133 non-null  int64
 4   windspeed            14133 non-null  float64
 5   winddeg              14133 non-null  int64
 6   cloudall             14133 non-null  int64
 7   weathermain          14133 non-null  object
 8   datetime             14133 non-null  datetime64[ns]
 9   day_of_week          14133 non-null  int32
 10  hour                 14133 non-null  int32
 11  traffic_level        14133 non-null  int64
 12  sea_level            14133 non-null  int64
 13  population           14133 non-null  int64
 14  population_density   14133 non-null  float64
 15  household            14133 non-null  int64
 16  household_density    14133 non-null  float64
 17  green_space          14133 non-null  float64
 18  green_space_area     14133 non-null  float64
 19  factory_num          14133 non-null  int64
 20  factory_area         14133 non-null  int64
 21  lat                  12901 non-null  float64
 22  lon                  12901 non-null  float64
 23  pm2_5                12901 non-null  float64
 24  pm10                 12901 non-null  float64
 25  so2                  12901 non-null  float64
 26  no2                  12901 non-null  float64
 27  o3                   12901 non-null  float64
 28  co                   12901 non-null  float64
 29  month                14133 non-null  int32
 30  season               14133 non-null  object
 31  season_Cool Season   14133 non-null  int64
 32  season_Hot Season    14133 non-null  int64
 33  season_Rainy Season  14133 non-null  int64
dtypes: datetime64[ns](1), float64(14), int32(3), int64(13), object(3)
memory usage: 3.5+ MB
```

In [76]:

```python
# Group by season and calculate the mean
seasonal_pm25 = df.groupby('season', as_index=False)['pm2_5'].mean()

# Ensure it is a DataFrame
if not isinstance(seasonal_pm25, pd.DataFrame):
    raise TypeError("seasonal_pm25 is not a DataFrame after groupby operation.")

# Create a bar plot
plt.figure(figsize=(10, 5))
plt.bar(seasonal_pm25['season'], seasonal_pm25['pm2_5'], color=['blue', 'orange', '
plt.title('Average PM2.5 Levels by Season')
plt.xlabel('Season')
plt.ylabel('Average PM2.5 Levels')
```

```
plt.xticks(rotation=45)
plt.show()
```



In [77]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14133 entries, 0 to 14132
Data columns (total 34 columns):
 #   Column               Non-Null Count  Dtype
---  ------               --------------  -----
 0   station              14133 non-null  object
 1   temp                 14133 non-null  float64
 2   pressure             14133 non-null  int64
 3   humidity             14133 non-null  int64
 4   windspeed            14133 non-null  float64
 5   winddeg              14133 non-null  int64
 6   cloudall             14133 non-null  int64
 7   weathermain          14133 non-null  object
 8   datetime             14133 non-null  datetime64[ns]
 9   day_of_week          14133 non-null  int32
 10  hour                 14133 non-null  int32
 11  traffic_level        14133 non-null  int64
 12  sea_level            14133 non-null  int64
 13  population           14133 non-null  int64
 14  population_density   14133 non-null  float64
 15  household            14133 non-null  int64
 16  household_density    14133 non-null  float64
 17  green_space          14133 non-null  float64
 18  green_space_area     14133 non-null  float64
 19  factory_num          14133 non-null  int64
 20  factory_area         14133 non-null  int64
 21  lat                  12901 non-null  float64
 22  lon                  12901 non-null  float64
 23  pm2_5                12901 non-null  float64
 24  pm10                 12901 non-null  float64
 25  so2                  12901 non-null  float64
 26  no2                  12901 non-null  float64
 27  o3                   12901 non-null  float64
 28  co                   12901 non-null  float64
 29  month                14133 non-null  int32
 30  season               14133 non-null  object
 31  season_Cool Season   14133 non-null  int64
 32  season_Hot Season    14133 non-null  int64
 33  season_Rainy Season  14133 non-null  int64
dtypes: datetime64[ns](1), float64(14), int32(3), int64(13), object(3)
memory usage: 3.5+ MB
```

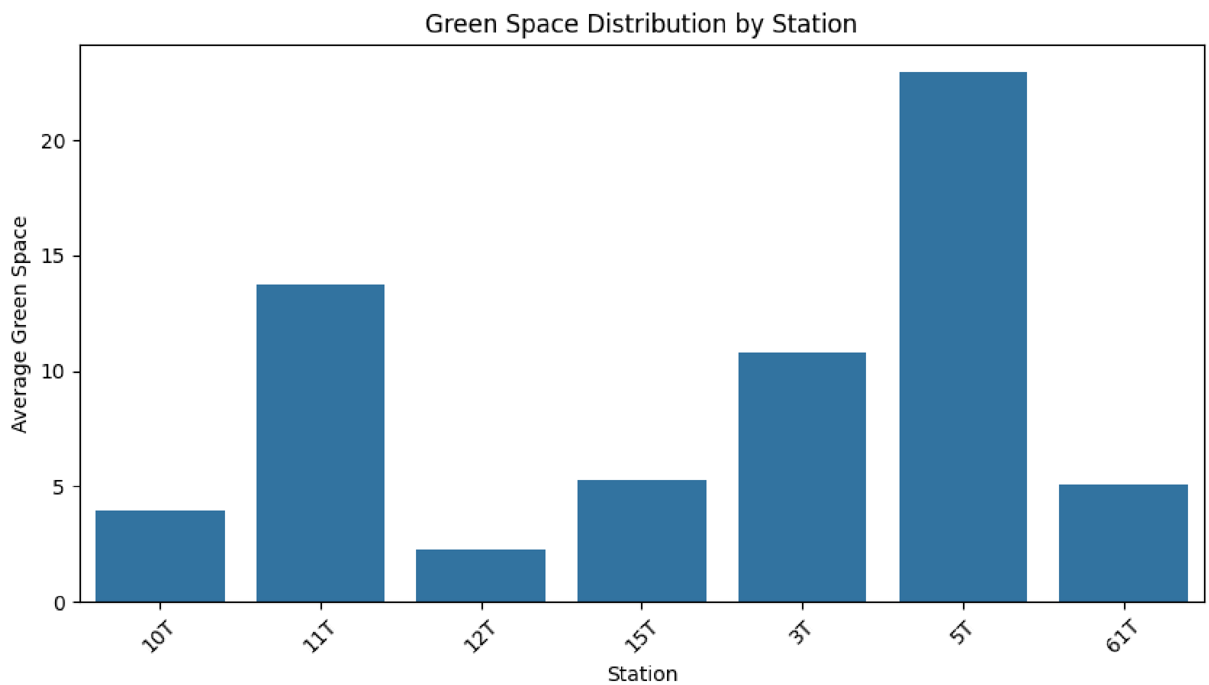
In [78]:
```
df.columns
```

Out[78]:
```
Index(['station', 'temp', 'pressure', 'humidity', 'windspeed', 'winddeg',
       'cloudall', 'weathermain', 'datetime', 'day_of_week', 'hour',
       'traffic_level', 'sea_level', 'population', 'population_density',
       'household', 'household_density', 'green_space', 'green_space_area',
       'factory_num', 'factory_area', 'lat', 'lon', 'pm2_5', 'pm10', 'so2',
       'no2', 'o3', 'co', 'month', 'season', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season'],
      dtype='object')
```

Inspect `PM2.5`

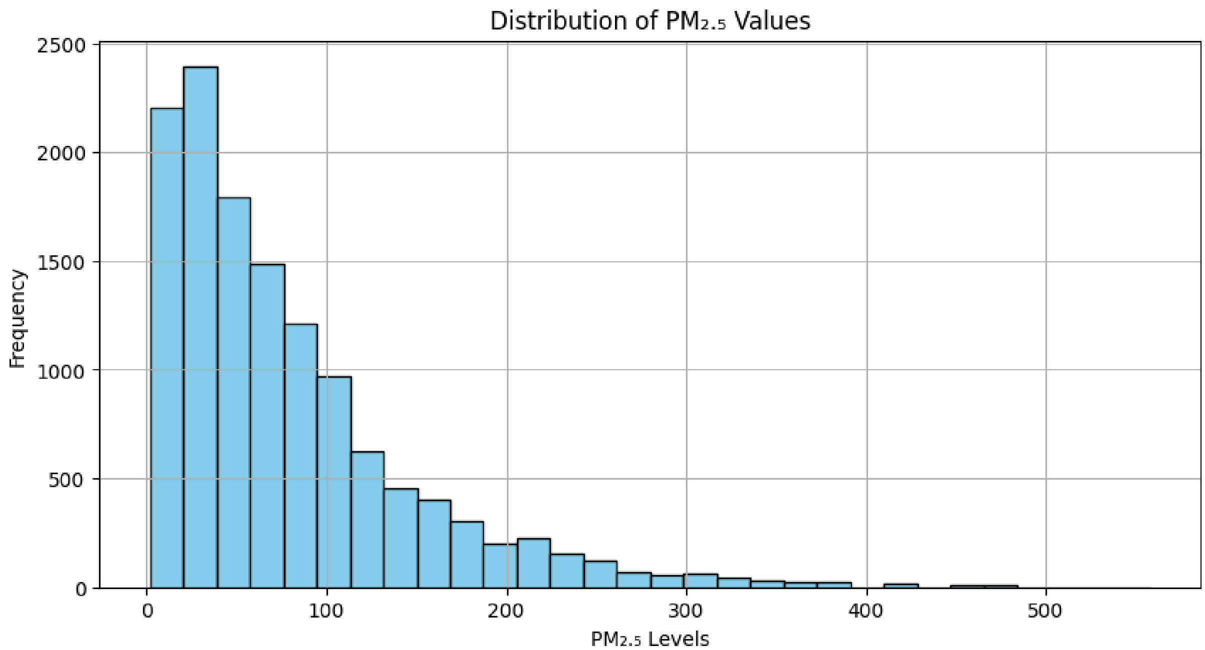
Green Space Distribution By Station

In [79]:
```
green_space_per_station = df.groupby('station')['green_space'].mean().reset_index()

# Create the bar graph
plt.figure(figsize=(10, 5))
sns.barplot(x='station', y='green_space', data=green_space_per_station)
plt.title('Green Space Distribution by Station')
plt.xlabel('Station')
plt.ylabel('Average Green Space')
plt.xticks(rotation=45)  # Rotate station names for better readability
plt.show()
```



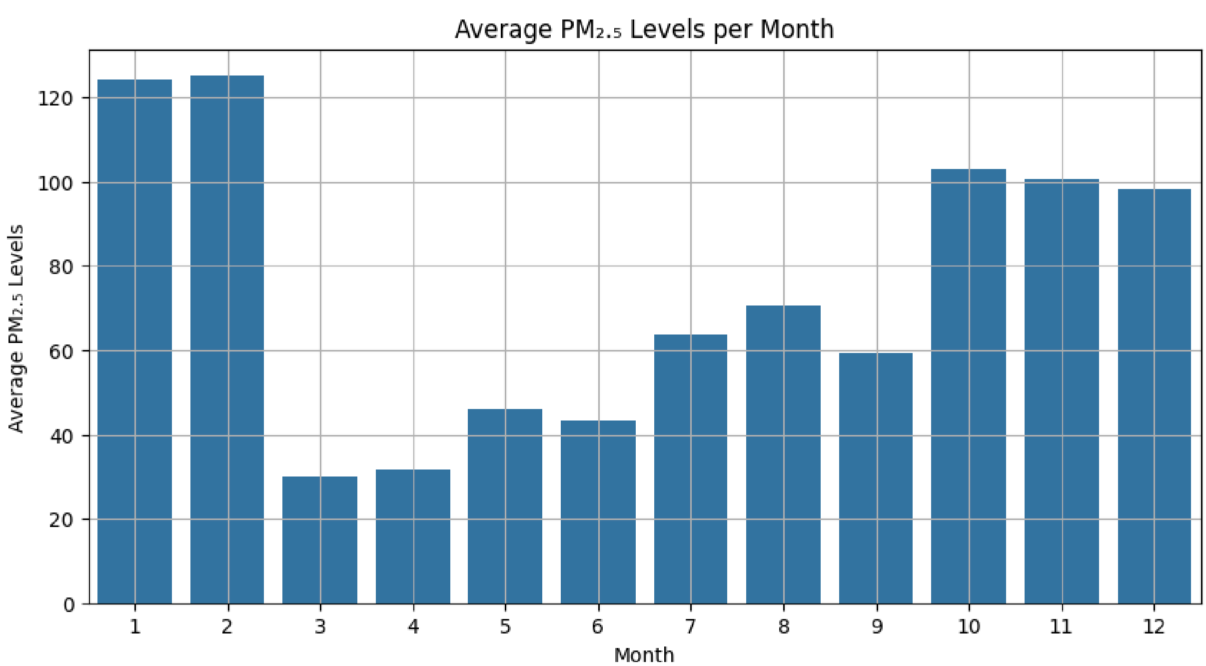
Distribution of PM2.5 Values

In [80]:
```
# Create histogram for PM2.5 distribution
plt.figure(figsize=(10, 5))
plt.hist(df['pm2_5'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of PM₂.₅ Values')
plt.xlabel('PM₂.₅ Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```

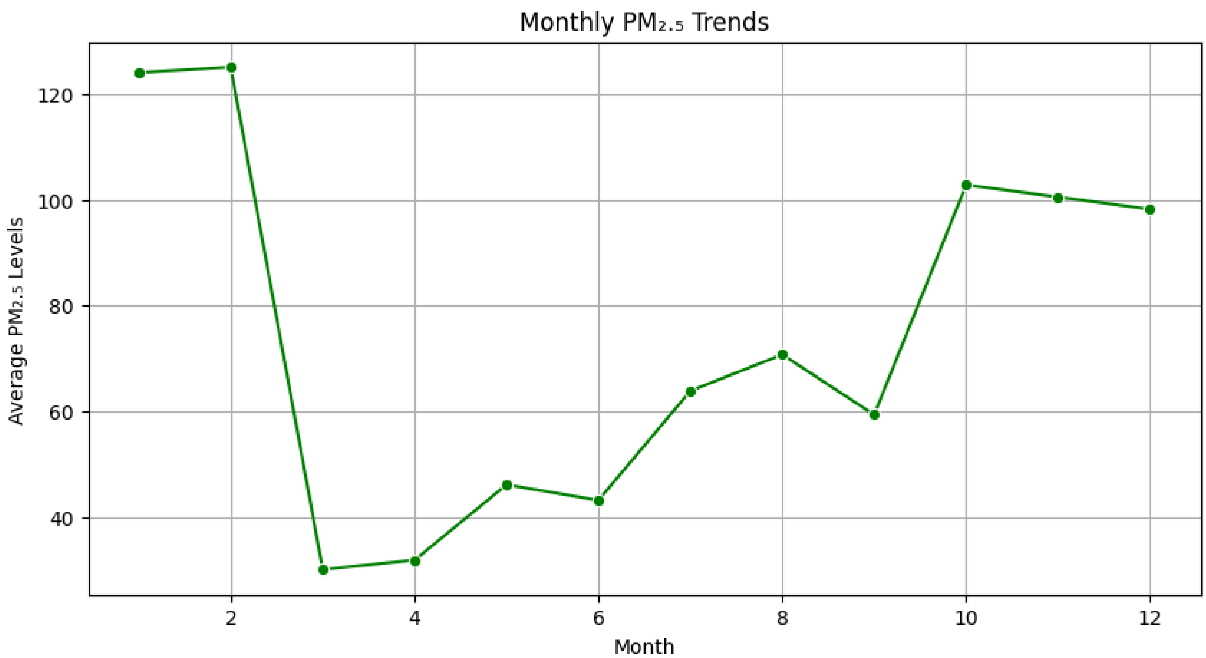


Average PM2.5 Level Per Month

In [81]:
```
# Calculate average PM2.5 per month (Bar Graph)
average_pm25_per_month = df.groupby('month')['pm2_5'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_pm25_per_month, x='month', y='pm2_5')
plt.title('Average PM₂.₅ Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average PM₂.₅ Levels')
plt.grid(True)
plt.show()
```

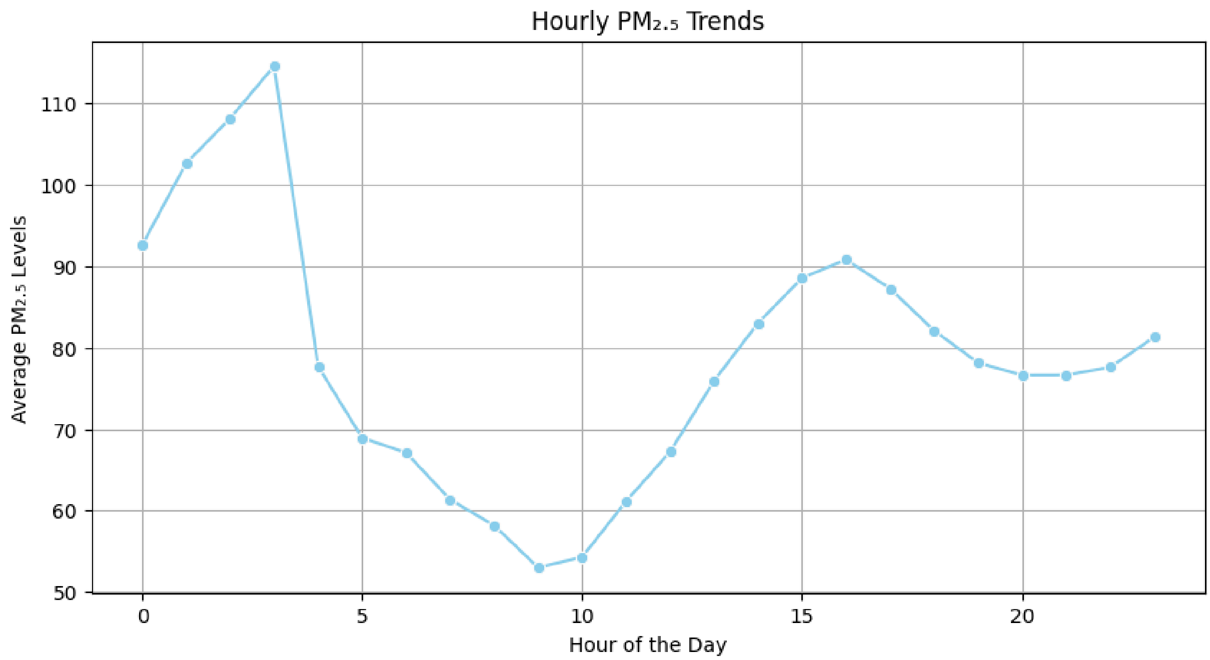


In [82]:
```
# Calculate average PM2.5 per month (Line Plot)
average_pm25_per_month = df.groupby('month')['pm2_5'].mean().reset_index()

# Create Line Plot
plt.figure(figsize=(10, 5))
sns.lineplot(data=average_pm25_per_month, x='month', y='pm2_5', marker='o', color='
plt.title('Monthly PM₂.₅ Trends')
plt.xlabel('Month')
plt.ylabel('Average PM₂.₅ Levels')
plt.grid(True)
plt.show()
```



Hourly Distribution of PM2.5

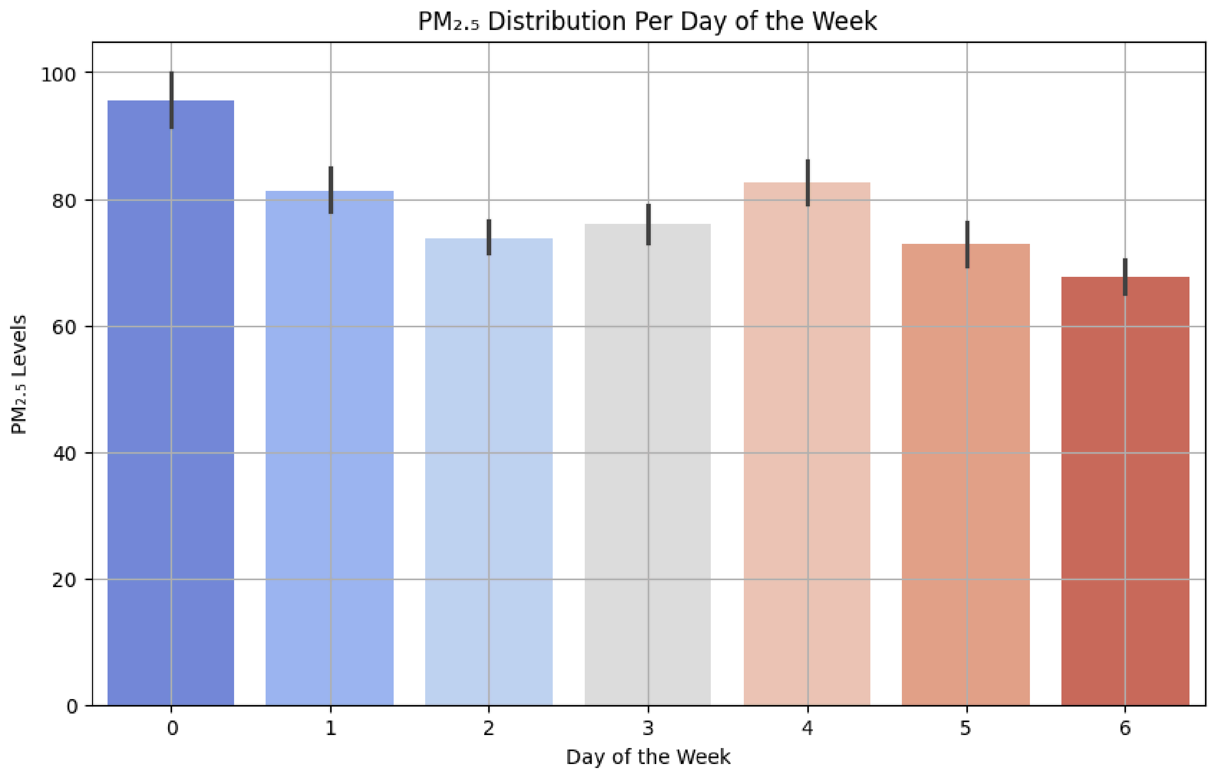
In [83]:
```
#Hourly Distribution of PM2.5 throughout the day
hourly_pm25_trends = df.groupby('hour')['pm2_5'].mean().reset_index()

# Create Line Plot
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_pm25_trends, x='hour', y='pm2_5', marker='o', color='skybl
plt.title('Hourly PM₂.₅ Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average PM₂.₅ Levels')
plt.grid(True)
plt.show()
```



Distribution Per Day Throughtout the Week (0-Monday & 6-Sunday)

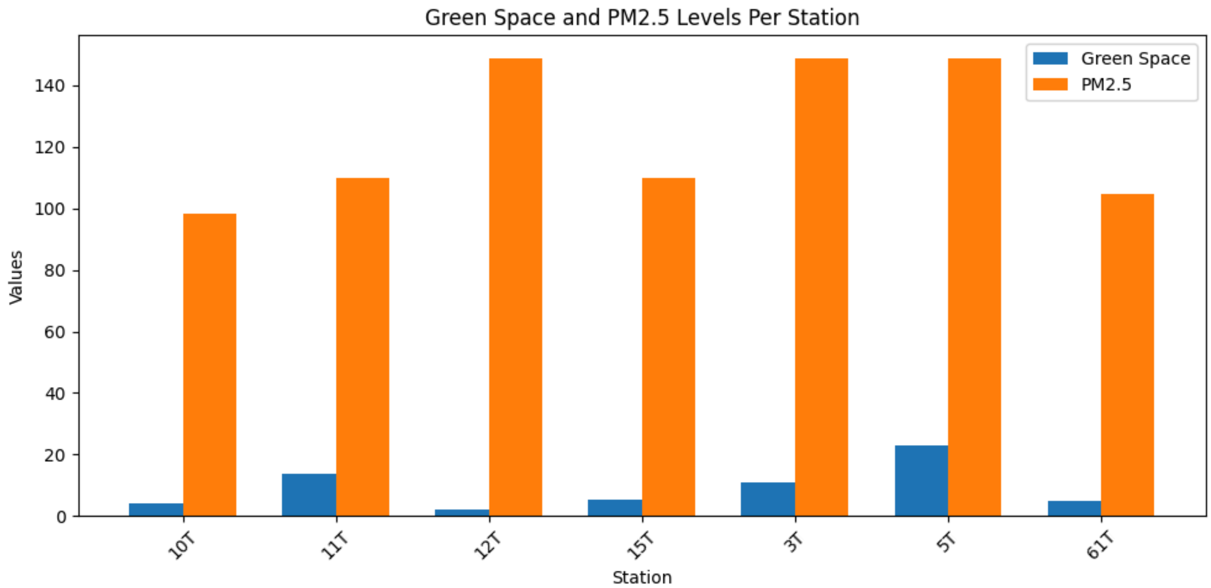
In [84]:
```
# Bar plot for PM2.5 distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='pm2_5', palette='coolwarm')
plt.title('PM₂.₅ Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('PM₂.₅ Levels')
plt.grid(True)
plt.show()
```

```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1072736171.py:3: FutureWarn
ing:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='pm2_5', palette='coolwarm')
```



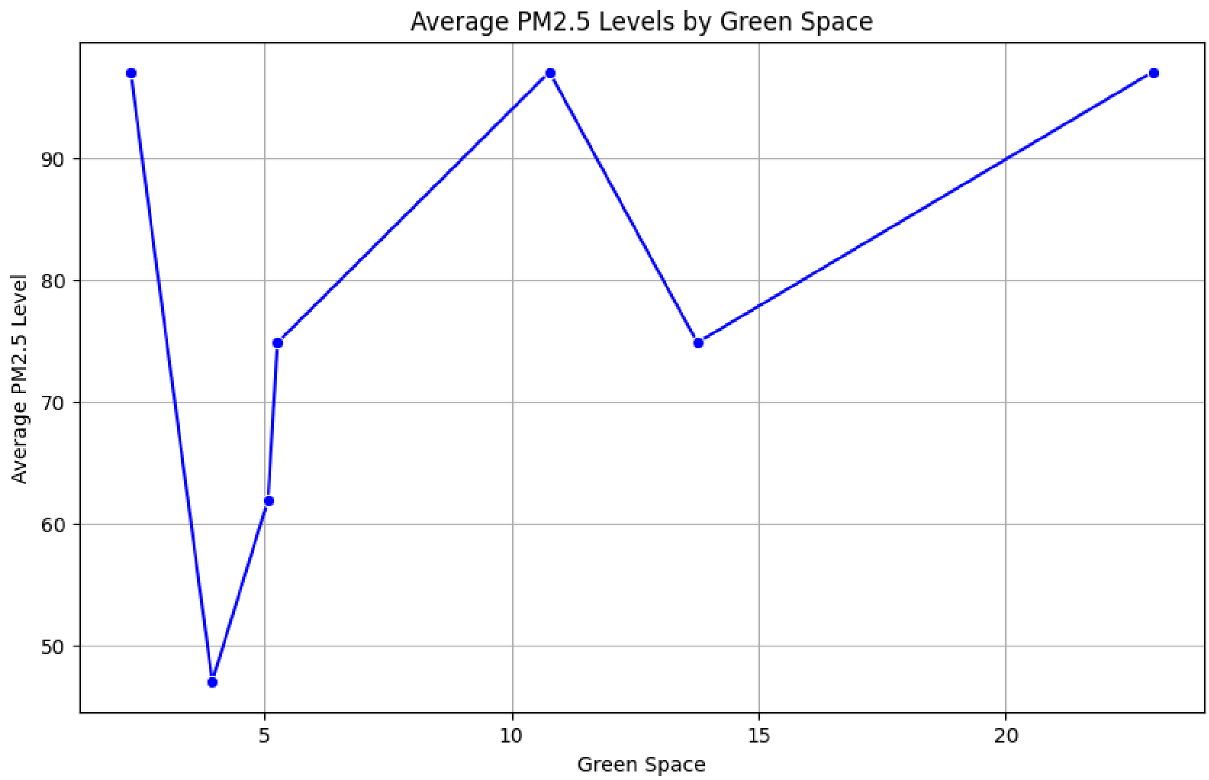
Green Space and PM2.5 Levels Per Station

In [85]:
```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'pm10': 'mean'        # Average PM2.5 levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'pm10' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['pm10'], bar_width, l

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and PM2.5 Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

# Show Graph
plt.tight_layout()
plt.show()
```



Average PM2.5 Level By Green Space

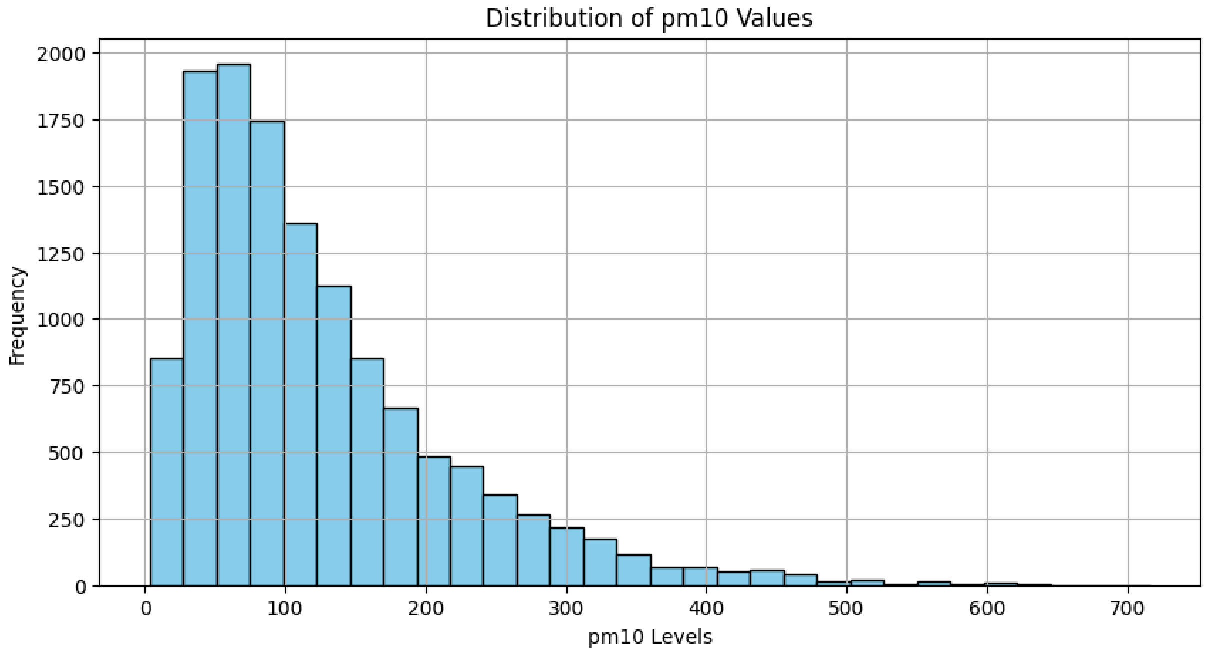
In [86]:
```
average_pm25_by_greenspace = df.groupby('green_space')['pm2_5'].mean().reset_index(
average_pm25_by_greenspace = average_pm25_by_greenspace.sort_values('green_space')

# Create a line plot for the average PM2.5 levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='pm2_5', data=average_pm25_by_greenspace, marker='o
plt.title('Average PM2.5 Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average PM2.5 Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```



Inspect `PM10`

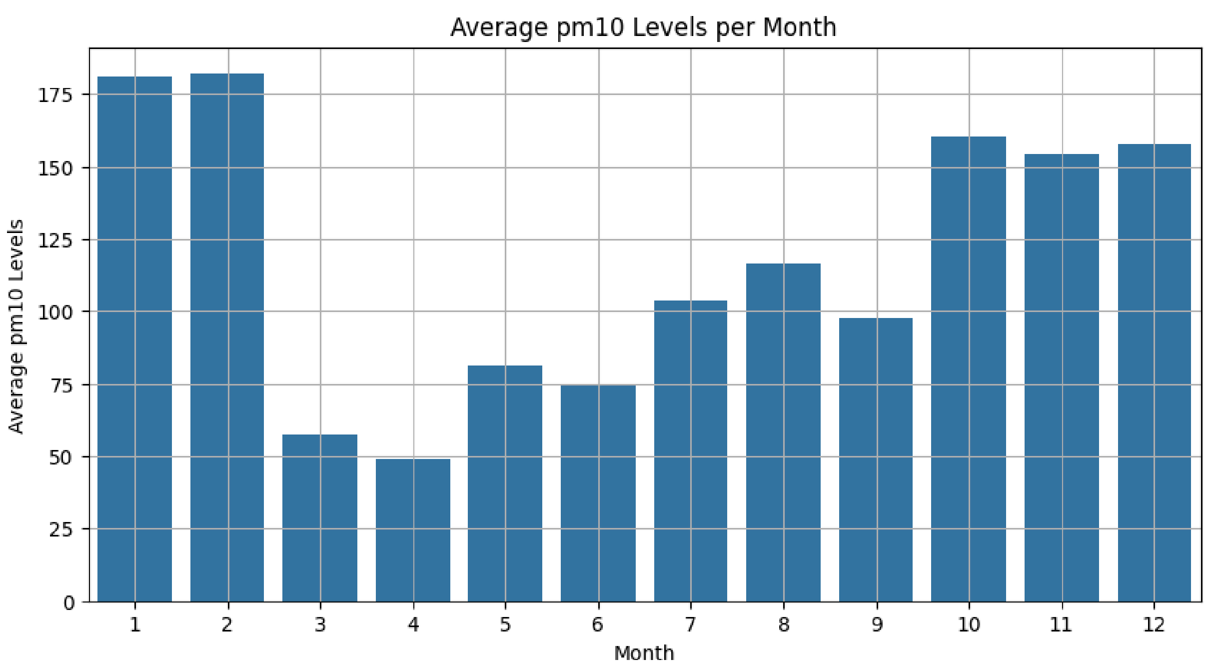
Distribution of PM10 Values

In [87]:
```
# Create histogram for pm10 distribution
plt.figure(figsize=(10, 5))
plt.hist(df['pm10'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of pm10 Values')
plt.xlabel('pm10 Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```

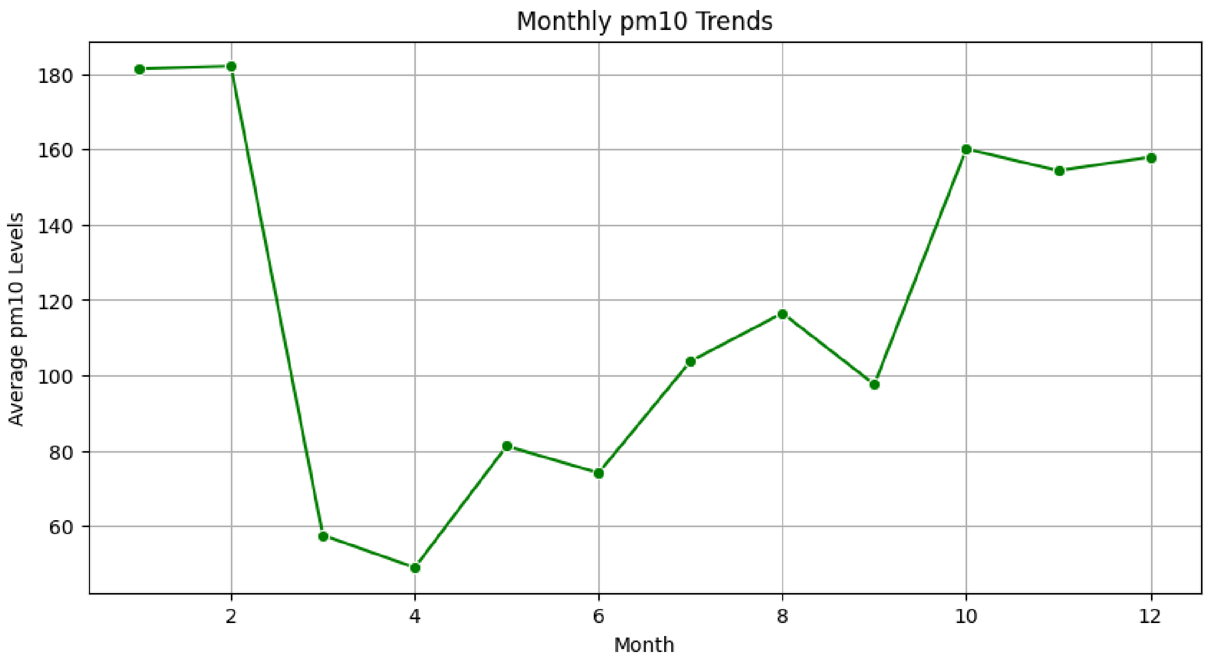


Average PM10 Levels Per Month

In [88]:
```
# Calculate average pm10 per month
average_pm10_per_month = df.groupby('month')['pm10'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_pm10_per_month, x='month', y='pm10')
plt.title('Average pm10 Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average pm10 Levels')
plt.grid(True)
plt.show()
```

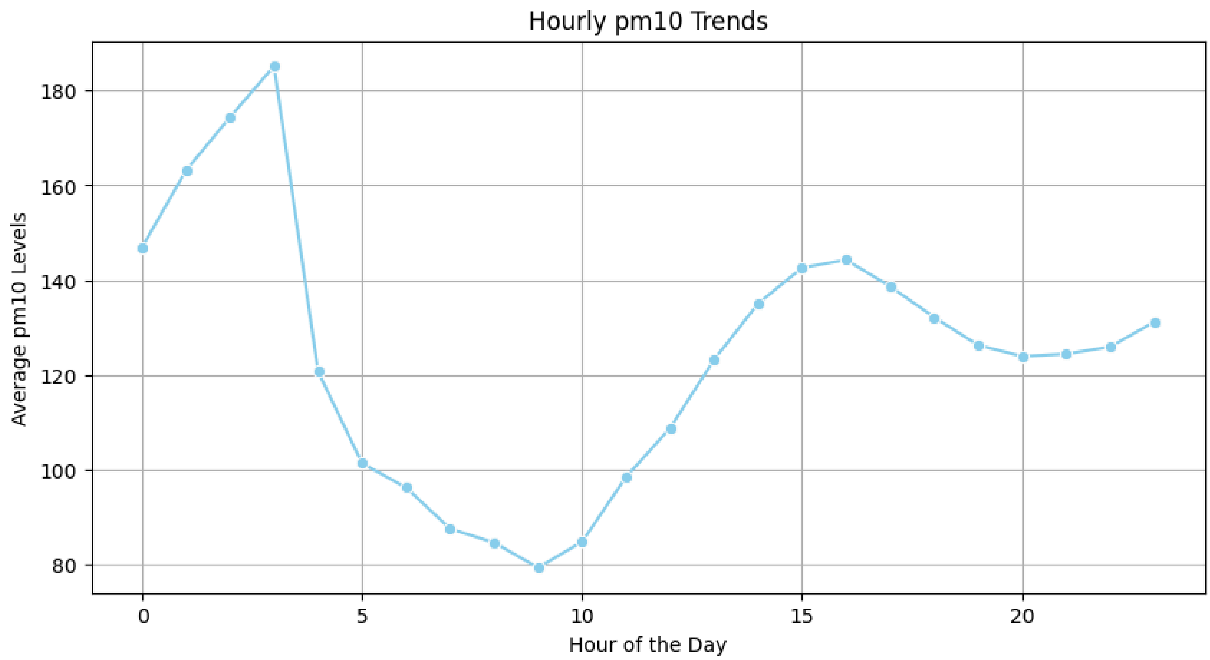


In [89]:
```
#Montly Trend PM10 Distribution
average_pm10_per_month = df.groupby('month')['pm10'].mean().reset_index()
plt.figure(figsize=(10, 5))
sns.lineplot(data=average_pm10_per_month, x='month', y='pm10', marker='o', color='g
plt.title('Monthly pm10 Trends')
plt.xlabel('Month')
plt.ylabel('Average pm10 Levels')
plt.grid(True)
plt.show()
```



Hourly Distribution of PM10

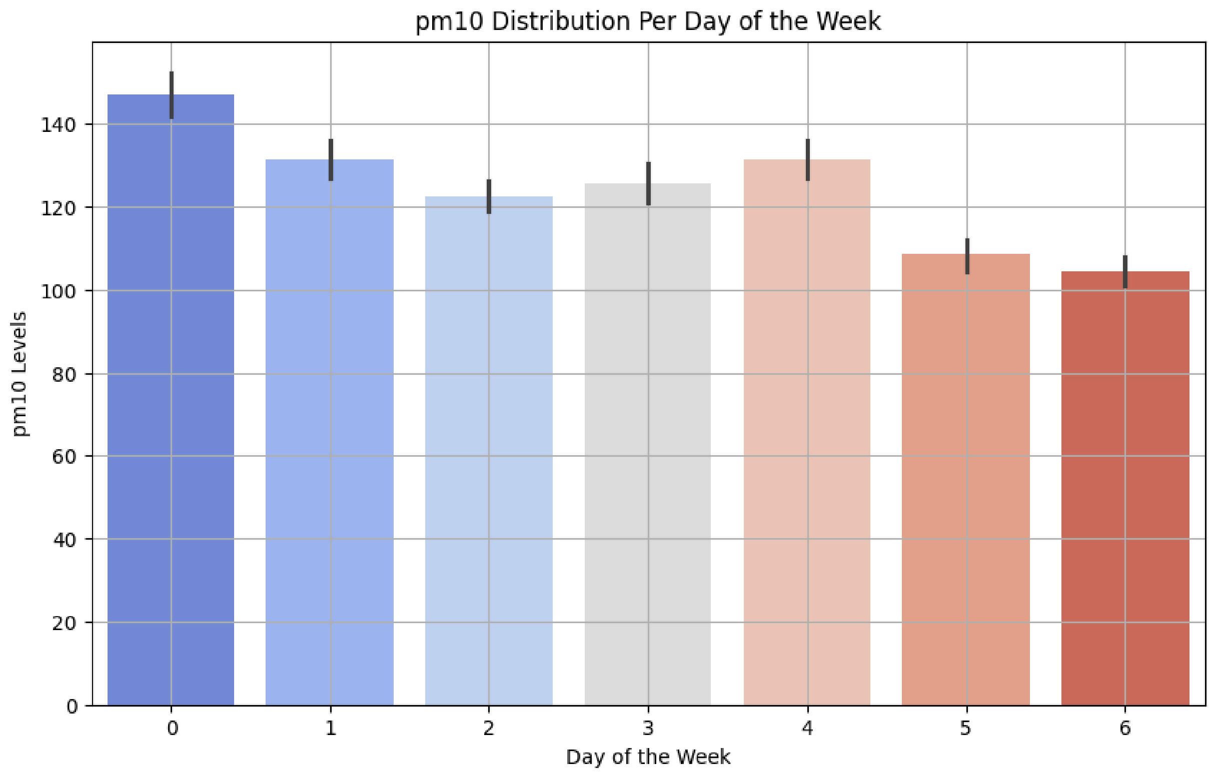
In [90]:
```
hourly_pm10_trends = df.groupby('hour')['pm10'].mean().reset_index()

# Create line plot for hourly trends
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_pm10_trends, x='hour', y='pm10', marker='o', color='skyblu
plt.title('Hourly pm10 Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average pm10 Levels')
plt.grid(True)
plt.show()
```



PM10 Distribution Per Day of the Week (0-Monday & 6-Sunday)

In [91]:
```
# Bar plot for pm10 distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='pm10', palette='coolwarm')
plt.title('pm10 Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('pm10 Levels')
plt.grid(True)
plt.show()
```

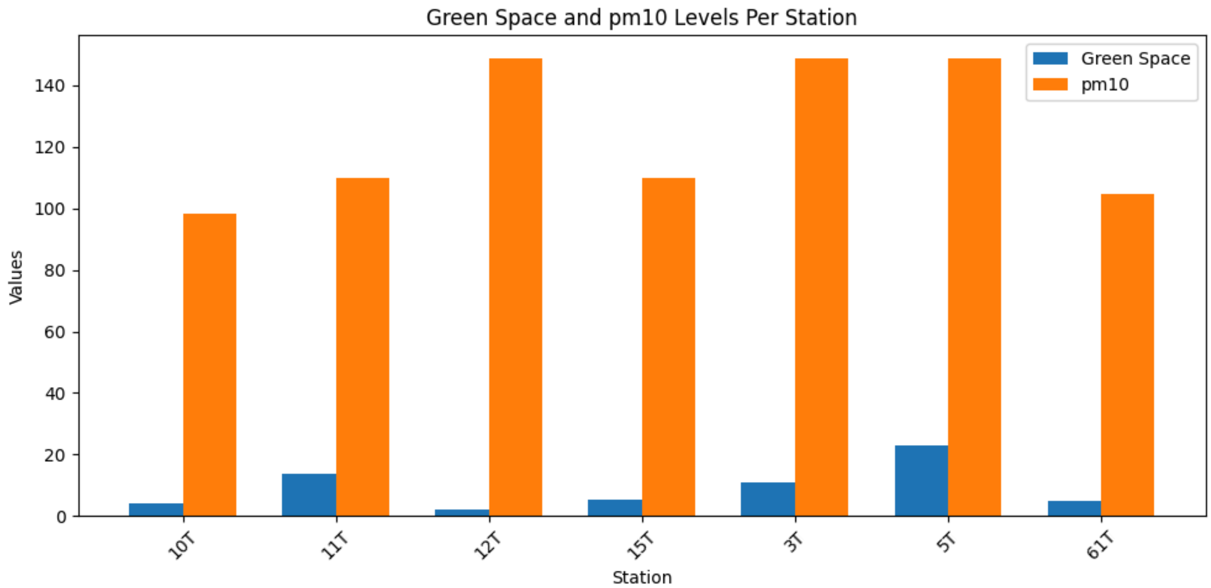
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\693026414.py:3: FutureWarni
ng:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='pm10', palette='coolwarm')
```



Green Space and PM10 Levels per Station

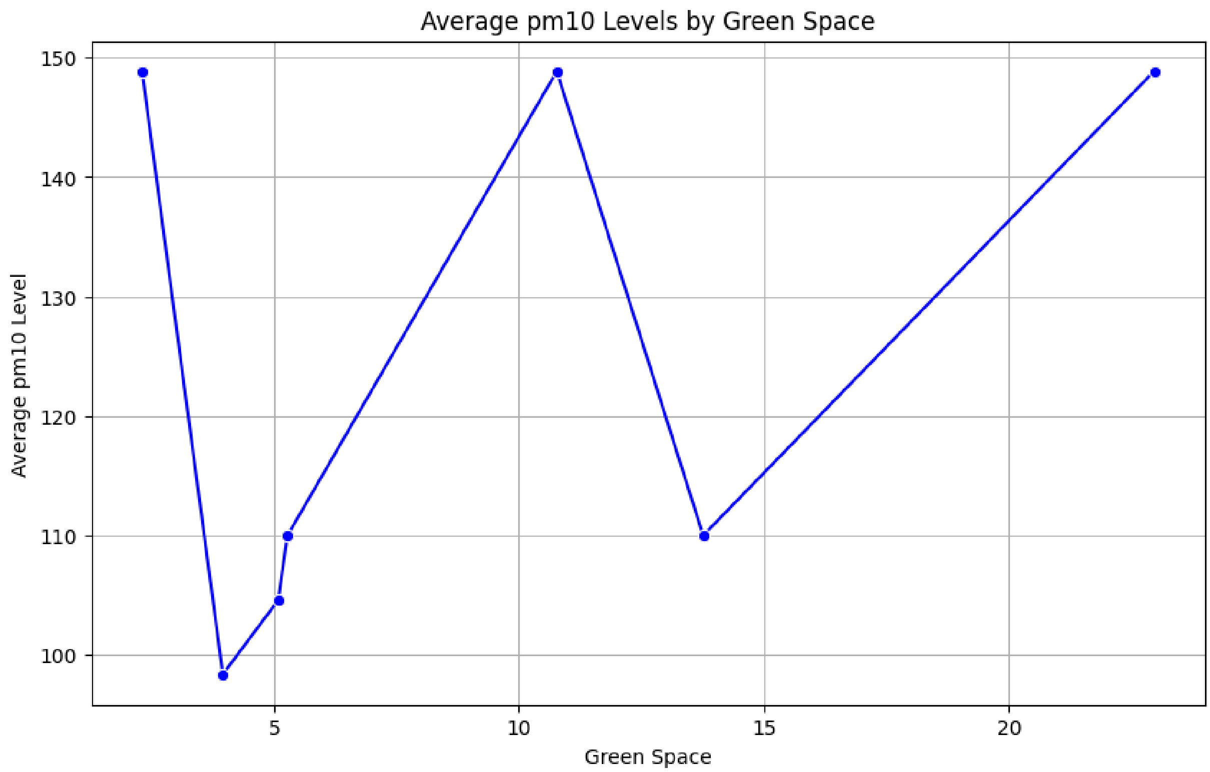
In [92]:

```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'pm10': 'mean'        # Average pm10 levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'pm10' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['pm10'], bar_width, l

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and pm10 Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

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



Average PM10 Levels by Green Space

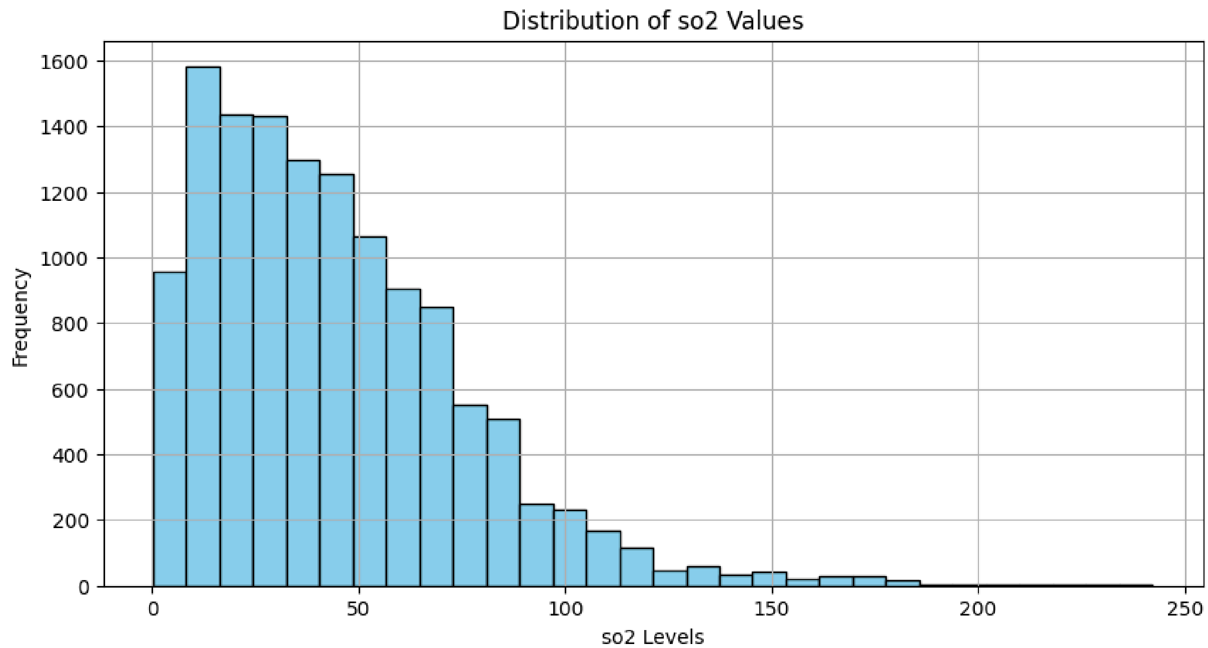
In [93]:
```
average_pm10_by_greenspace = df.groupby('green_space')['pm10'].mean().reset_index()
average_pm10_by_greenspace = average_pm10_by_greenspace.sort_values('green_space')

# Create a line plot for the average pm10 levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='pm10', data=average_pm10_by_greenspace, marker='o'
plt.title('Average pm10 Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average pm10 Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```



Inspect `Sulfur dioxide(SO2)`

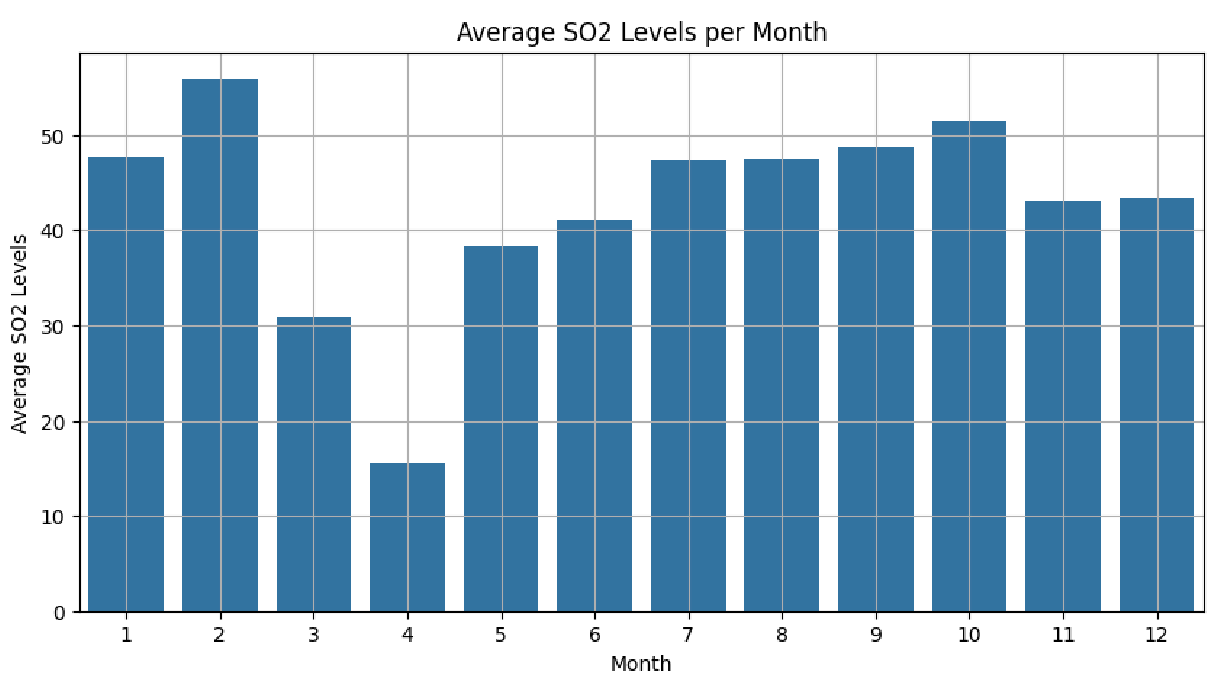
Distribution of SO2 Values

In [94]:
```
# Create histogram for so2 distribution
plt.figure(figsize=(10, 5))
plt.hist(df['so2'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of so2 Values')
plt.xlabel('so2 Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```

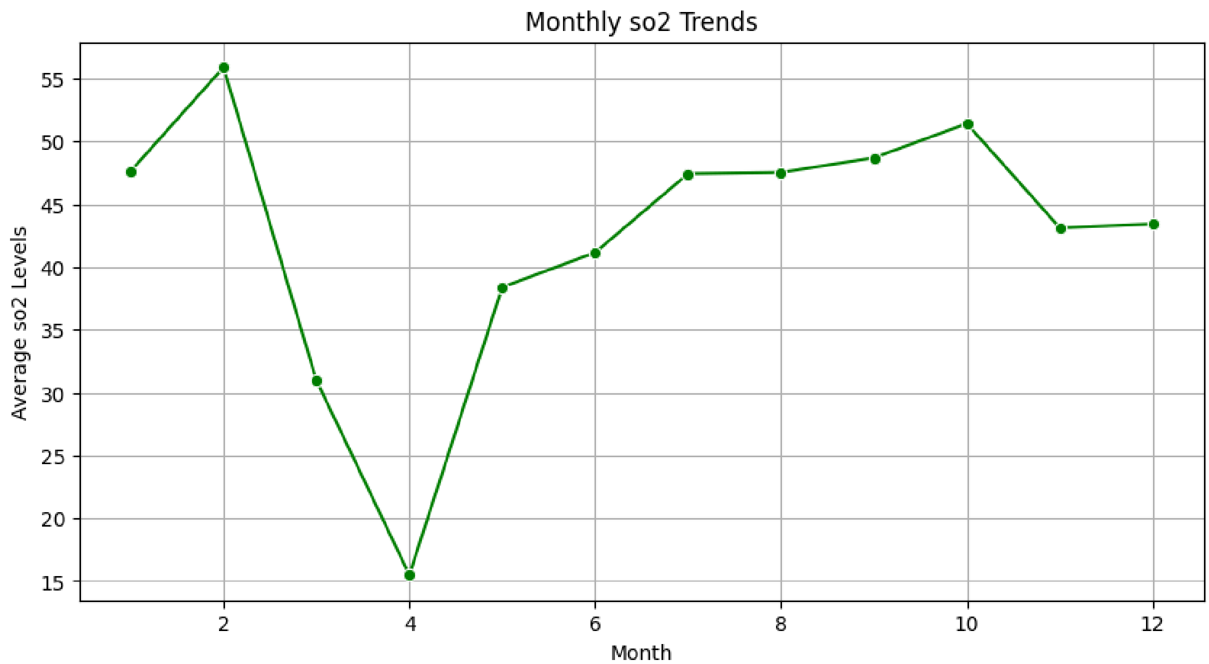


Average Distribution of SO2 Levels per Month

In [95]:
```
# Calculate average so2 per month
average_so2_per_month = df.groupby('month')['so2'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_so2_per_month, x='month', y='so2')
plt.title('Average SO2 Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average SO2 Levels')
plt.grid(True)
plt.show()
```

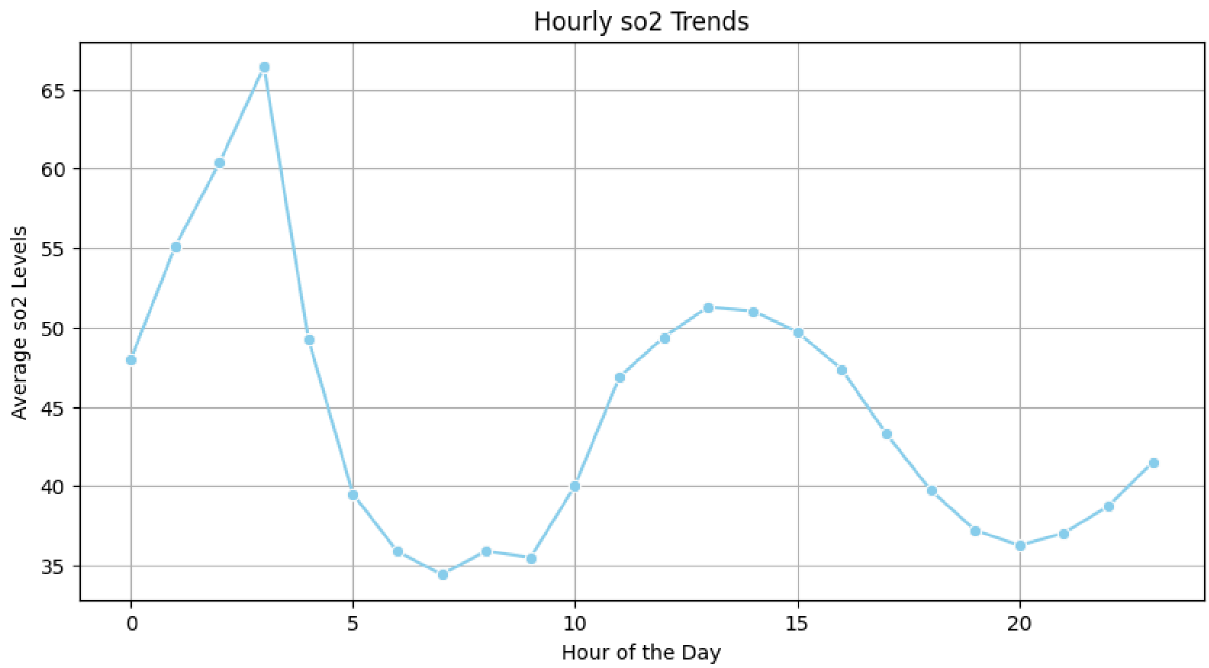


In [96]:
```
#Trends of Montly SO2 Distribution
average_so2_per_month = df.groupby('month')['so2'].mean().reset_index()

plt.figure(figsize=(10, 5))
sns.lineplot(data=average_so2_per_month, x='month', y='so2', marker='o', color='gre
plt.title('Monthly so2 Trends')
plt.xlabel('Month')
plt.ylabel('Average so2 Levels')
plt.grid(True)
plt.show()
```



Hourly Distribution of SO2

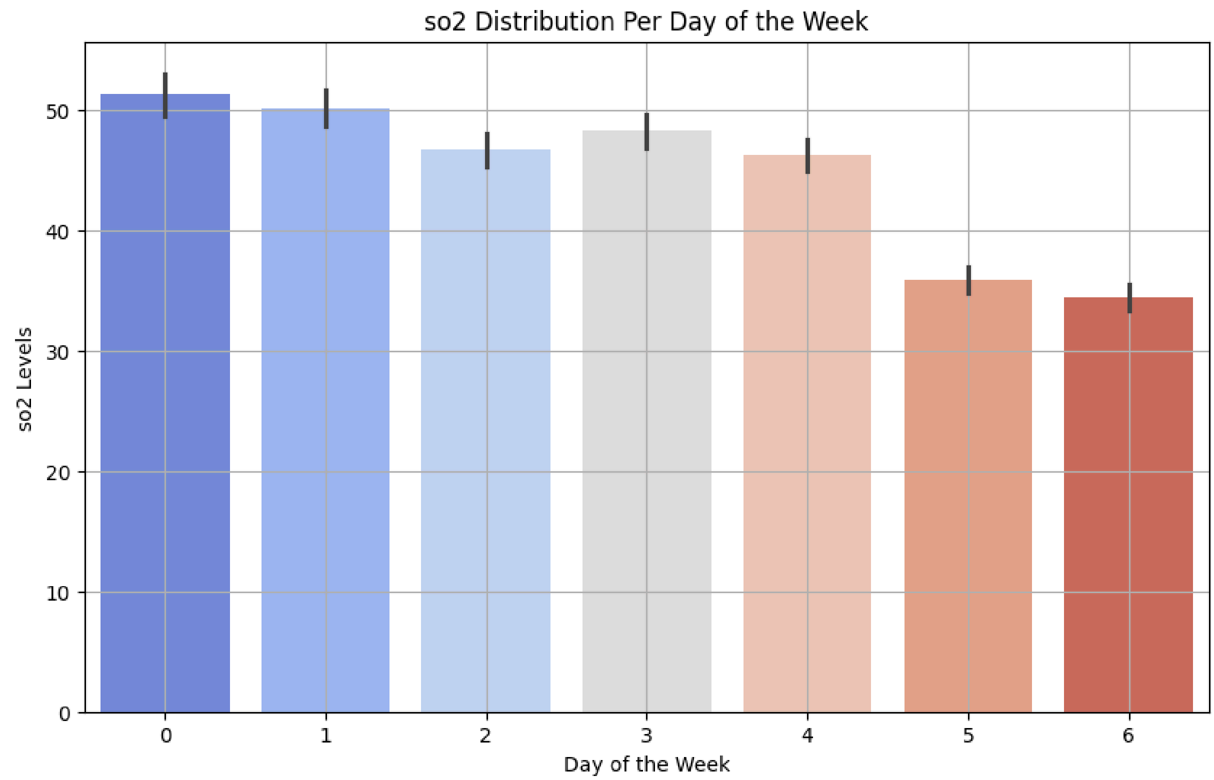
In [97]:
```
hourly_so2_trends = df.groupby('hour')['so2'].mean().reset_index()

# Create line plot for hourly trends
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_so2_trends, x='hour', y='so2', marker='o', color='skyblue'
plt.title('Hourly so2 Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average so2 Levels')
plt.grid(True)
plt.show()
```



Distributuion of SO2 Per Day of the Week (0-Monday & 6-Sunday)

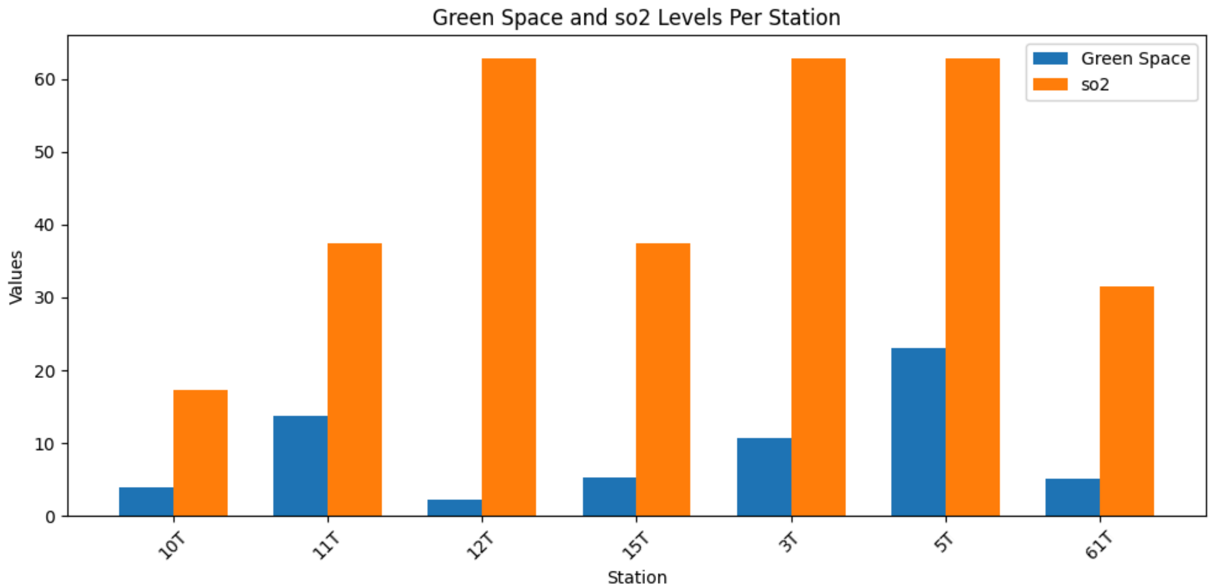
In [98]:
```
# Bar plot for so2 distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='so2', palette='coolwarm')
plt.title('so2 Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('so2 Levels')
plt.grid(True)
plt.show()
```

```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1278283898.py:3: FutureWarn
ing:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='so2', palette='coolwarm')
```



Green Space and SO2 Levels Per Station

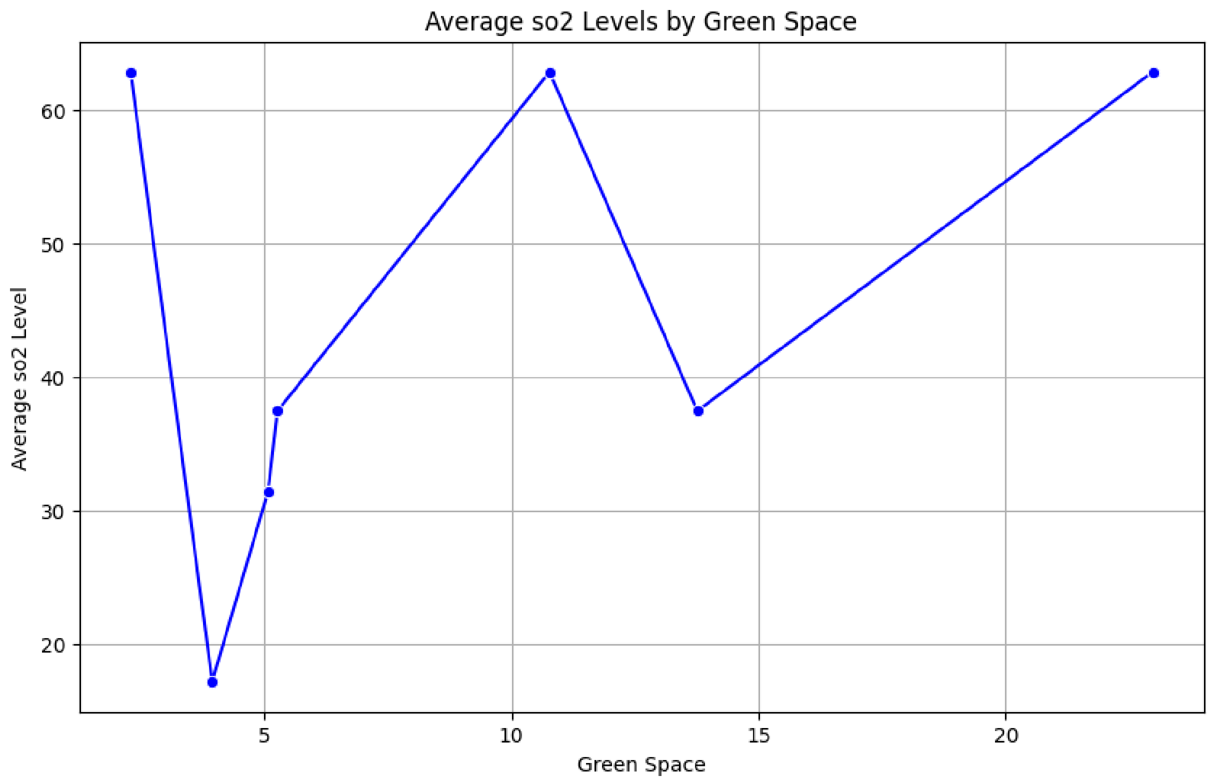
In [99]:
```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'so2': 'mean'        # Average so2 levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'so2' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['so2'], bar_width, la

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and so2 Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

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



Average SO2 Levels by Green Space

In [100…

```
average_so2_by_greenspace = df.groupby('green_space')['so2'].mean().reset_index()
average_so2_by_greenspace = average_so2_by_greenspace.sort_values('green_space')

# Create a line plot for the average so2 levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='so2', data=average_so2_by_greenspace, marker='o',
plt.title('Average so2 Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average so2 Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```

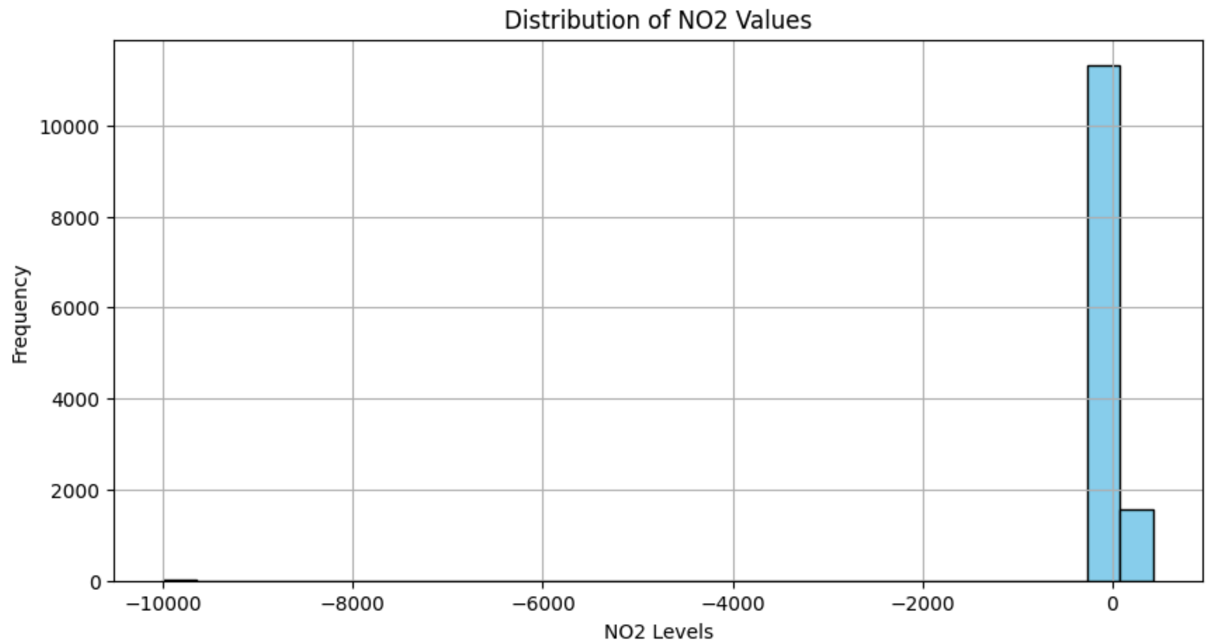


Inspect `Nitrogen dioxide (NO2)`

Distributuon of NO2 Values

In [101…

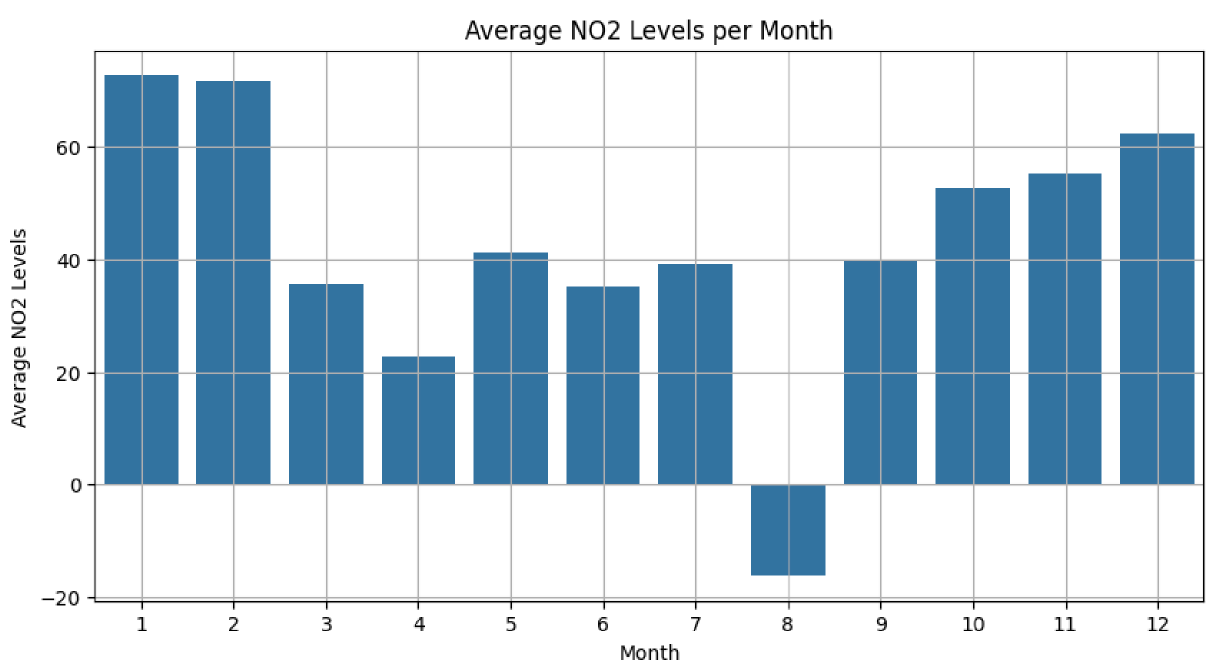
```
# Create histogram for no2 distribution
plt.figure(figsize=(10, 5))
plt.hist(df['no2'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of NO2 Values')
plt.xlabel('NO2 Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```



Average Distributuon of NO2 Levels per Month

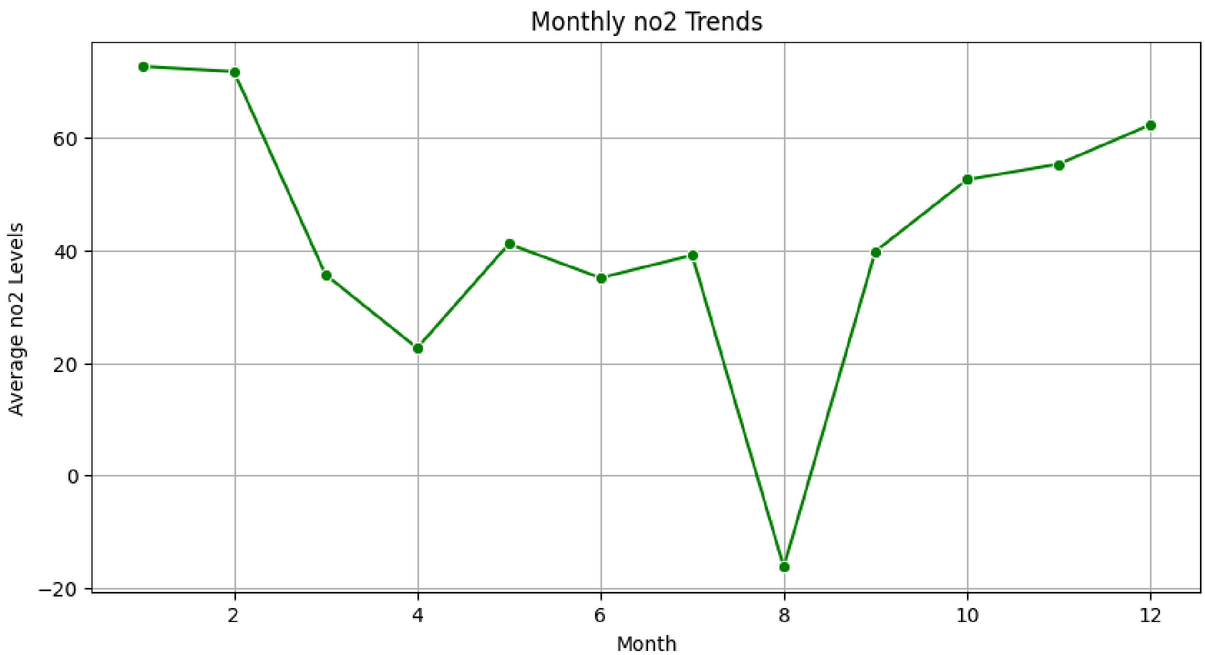
In [102…

```
# Calculate average no2 per month
average_no2_per_month = df.groupby('month')['no2'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_no2_per_month, x='month', y='no2')
plt.title('Average NO2 Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average NO2 Levels')
plt.grid(True)
plt.show()
```



In [103…

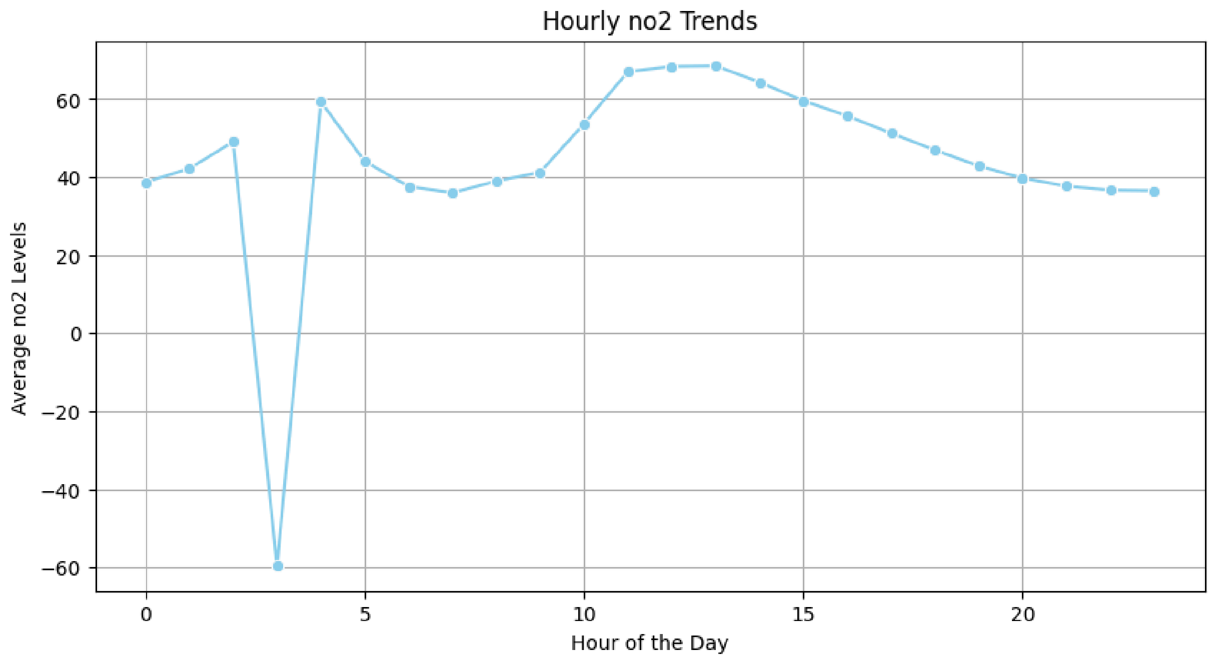
```
# You can reuse average_no2_per_month calculated previously
average_no2_per_month = df.groupby('month')['no2'].mean().reset_index()

plt.figure(figsize=(10, 5))
sns.lineplot(data=average_no2_per_month, x='month', y='no2', marker='o', color='gre
plt.title('Monthly no2 Trends')
plt.xlabel('Month')
plt.ylabel('Average no2 Levels')
plt.grid(True)
plt.show()
```



Hourly Distribution of NO2 Trend

In [104…

```
hourly_no2_trends = df.groupby('hour')['no2'].mean().reset_index()

# Create line plot for hourly trends
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_no2_trends, x='hour', y='no2', marker='o', color='skyblue'
plt.title('Hourly no2 Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average no2 Levels')
plt.grid(True)
plt.show()
```

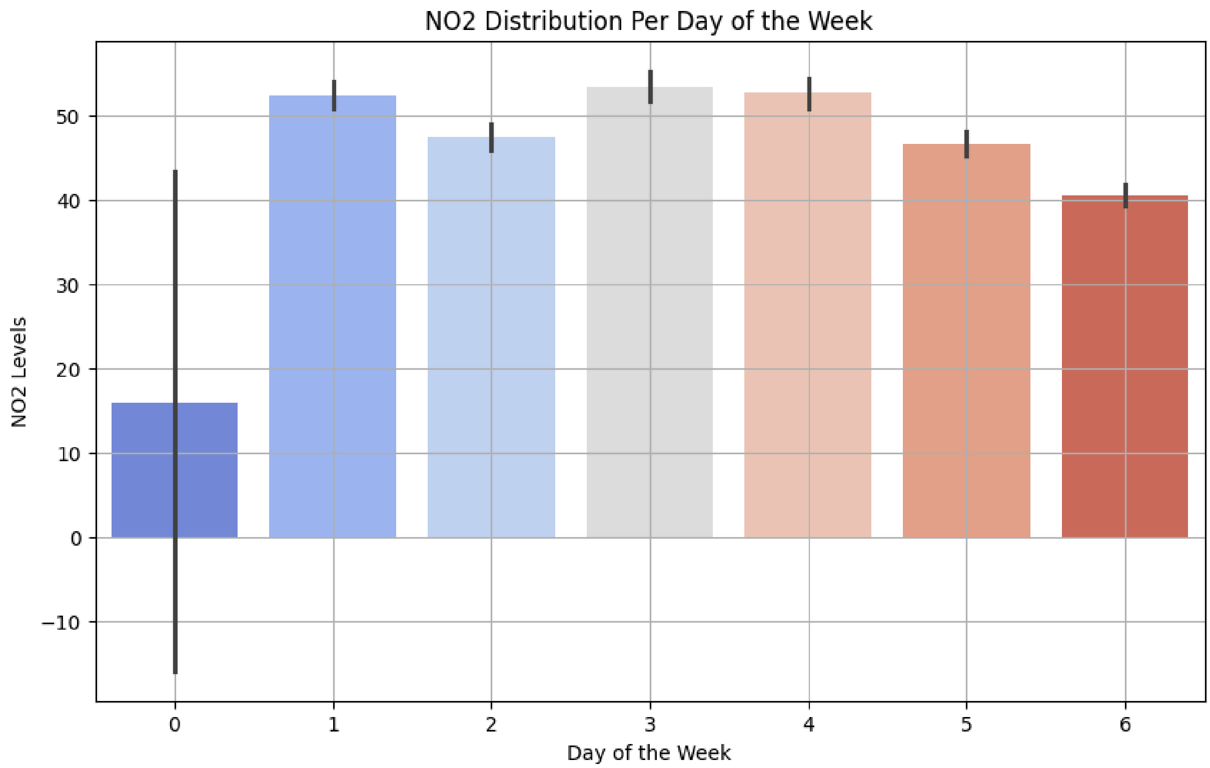


NO2 Distribution Per Day of the Week (0-Monday & 6-Sunday)

In [105…

```
# Bar plot for no2 distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='no2', palette='coolwarm')
plt.title('NO2 Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('NO2 Levels')
plt.grid(True)
plt.show()
```

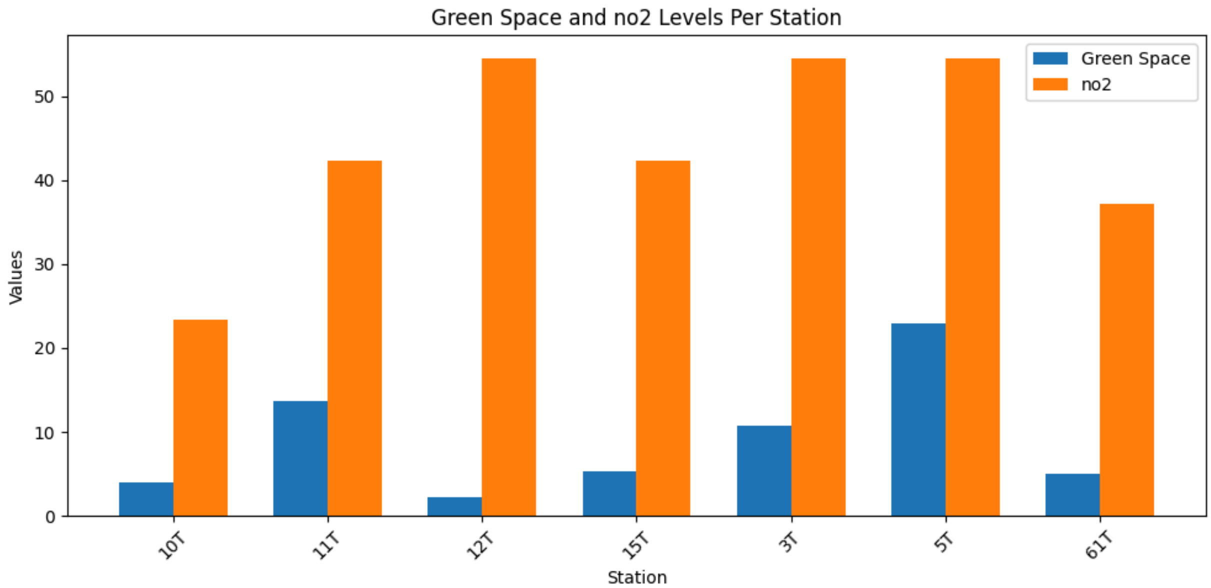
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1610298790.py:3: FutureWarn
ing:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='no2', palette='coolwarm')
```



Green Space and NO2 Levels Per Station

In [106…

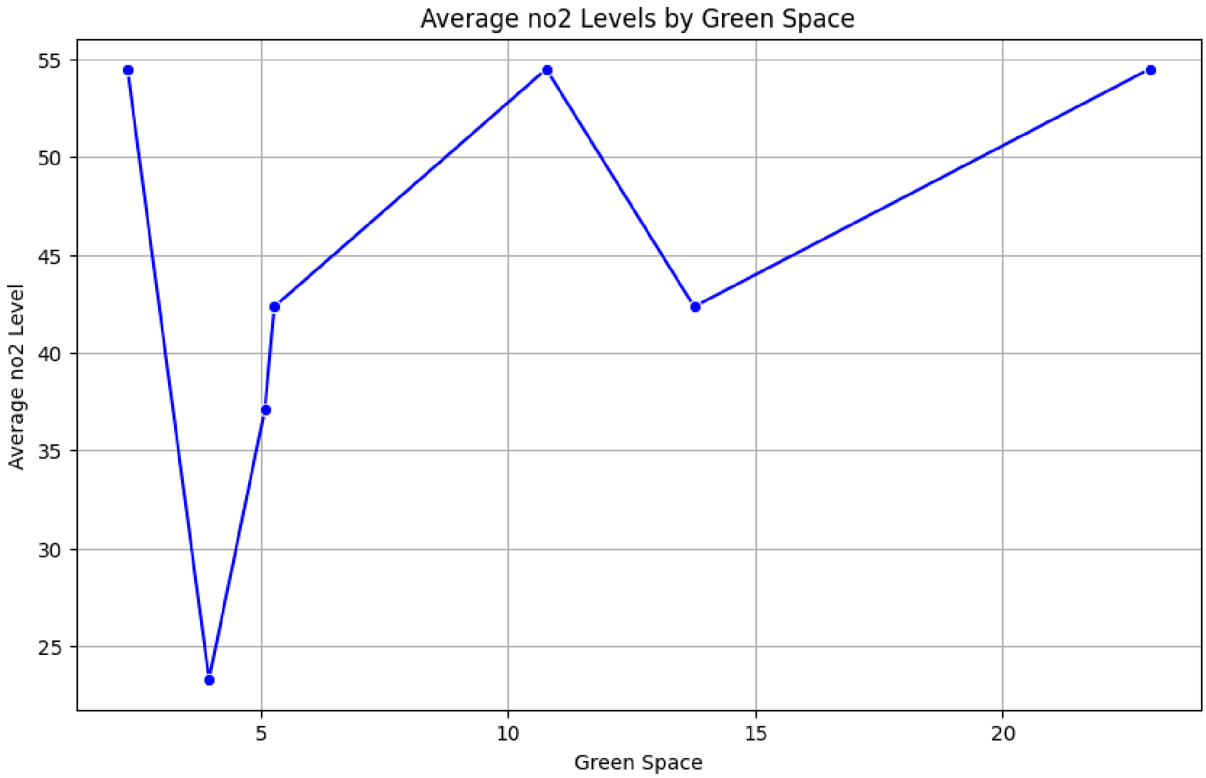
```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'no2': 'mean'        # Average no2 levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'no2' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['no2'], bar_width, la

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and no2 Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

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



Average NO2 Levels by Green Space

In [107…

```
average_no2_by_greenspace = df.groupby('green_space')['no2'].mean().reset_index()
average_no2_by_greenspace = average_no2_by_greenspace.sort_values('green_space')

# Create a line plot for the average no2 levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='no2', data=average_no2_by_greenspace, marker='o',
plt.title('Average no2 Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average no2 Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```

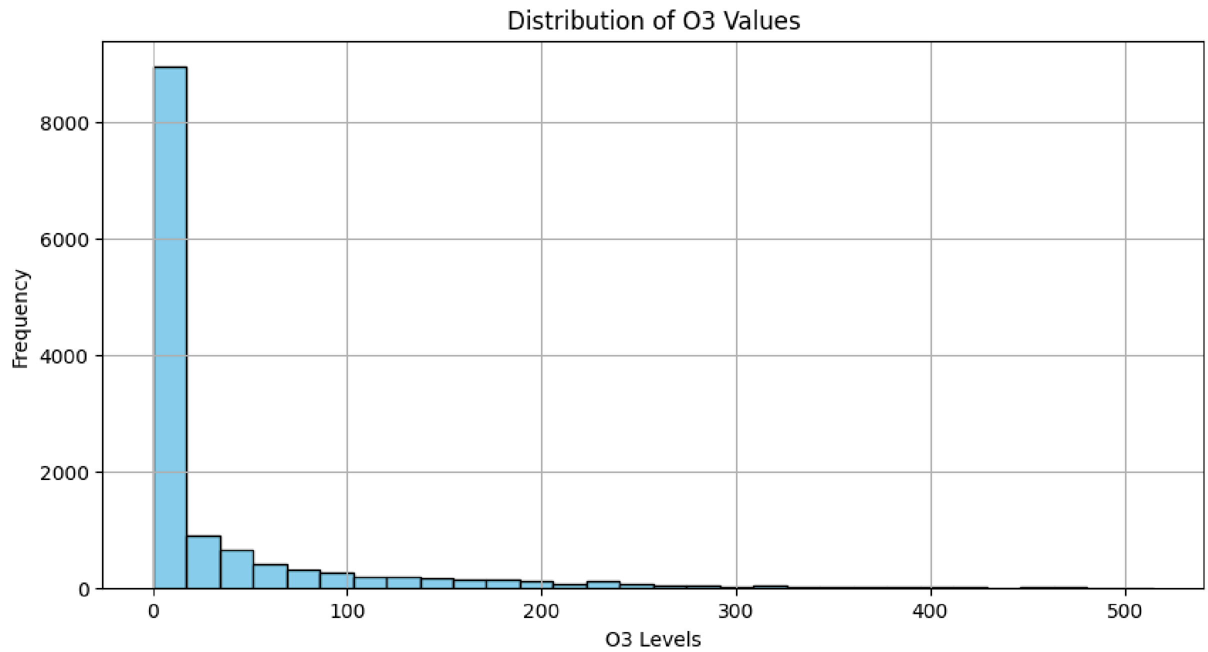


Inspect `Ozone Level(O3)`

Distribution of O3 Values

In [108…

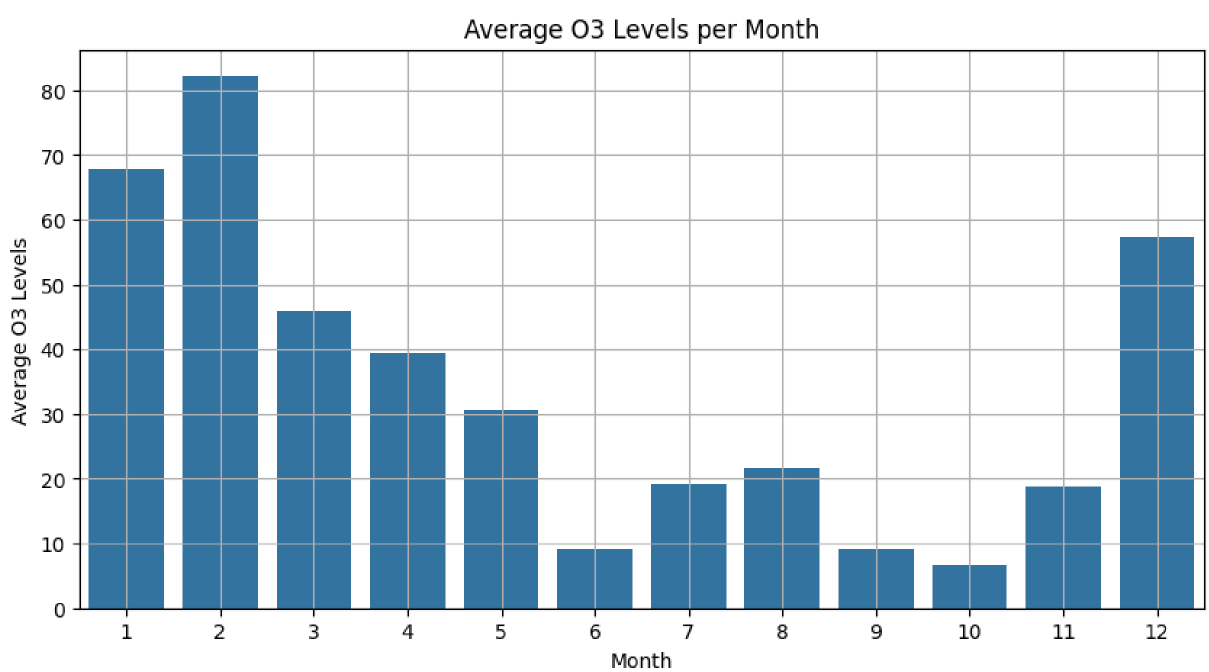
```
# Create histogram for o3 distribution
plt.figure(figsize=(10, 5))
plt.hist(df['o3'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of O3 Values')
plt.xlabel('O3 Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```



Average O3 Level Per Month

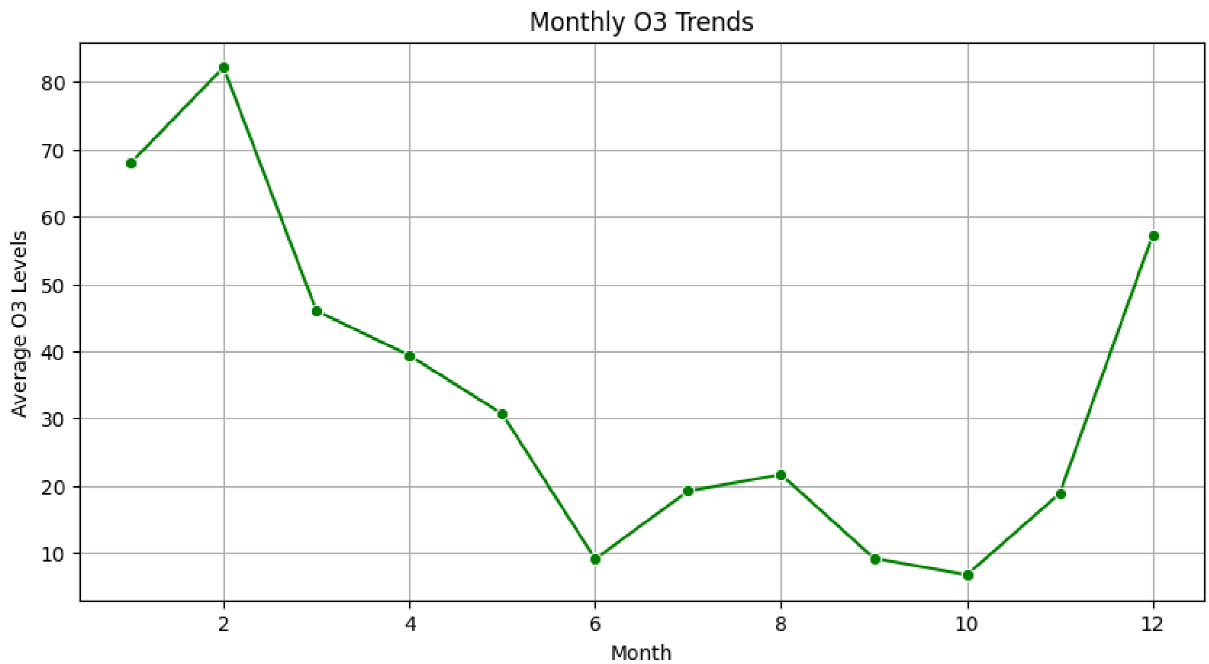
In [109…

```
# Calculate average o3 per month
average_o3_per_month = df.groupby('month')['o3'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_o3_per_month, x='month', y='o3')
plt.title('Average O3 Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average O3 Levels')
plt.grid(True)
plt.show()
```



In [110…

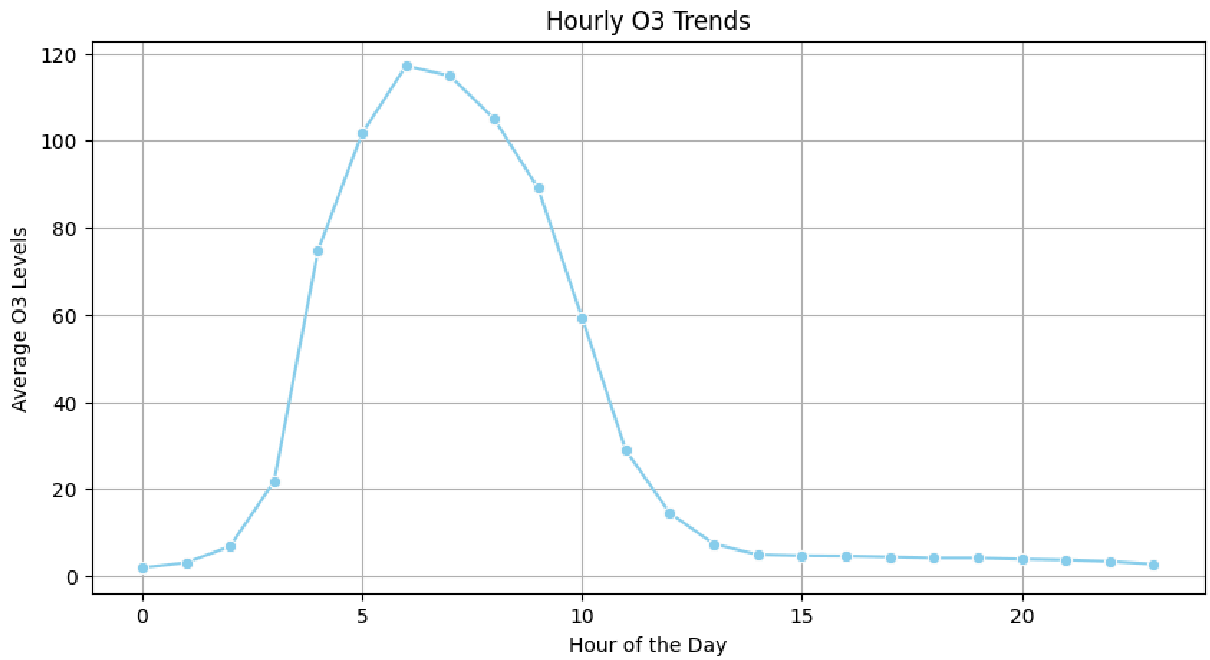
```
# You can reuse average_o3_per_month calculated previously
average_o3_per_month = df.groupby('month')['o3'].mean().reset_index()

plt.figure(figsize=(10, 5))
sns.lineplot(data=average_o3_per_month, x='month', y='o3', marker='o', color='green
plt.title('Monthly O3 Trends')
plt.xlabel('Month')
plt.ylabel('Average O3 Levels')
plt.grid(True)
plt.show()
```



Average Hourly O3 Trends

In [111…

```
hourly_o3_trends = df.groupby('hour')['o3'].mean().reset_index()

# Create line plot for hourly trends
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_o3_trends, x='hour', y='o3', marker='o', color='skyblue')
plt.title('Hourly O3 Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average O3 Levels')
plt.grid(True)
plt.show()
```

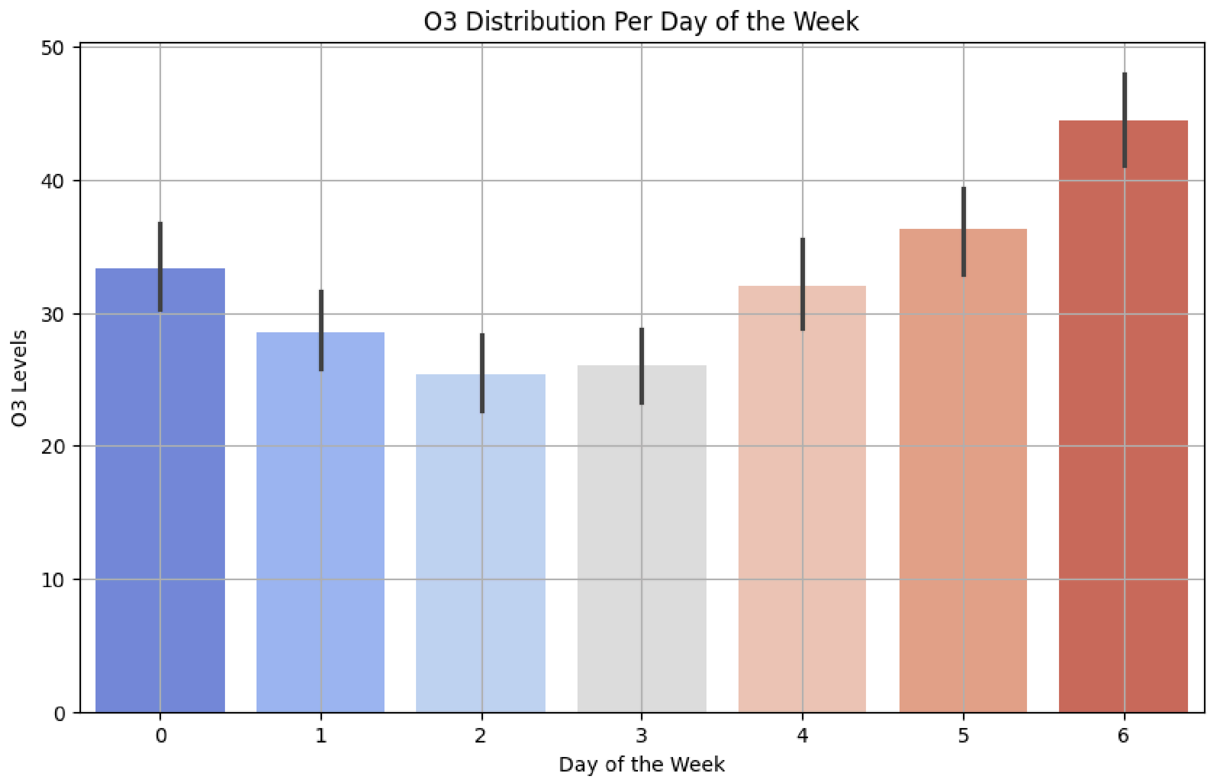


O3 Distribution per Day of the Week (0-Monday & 6-Sunday)

In [112…

```
# Bar plot for o3 distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='o3', palette='coolwarm')
plt.title('O3 Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('O3 Levels')
plt.grid(True)
plt.show()
```

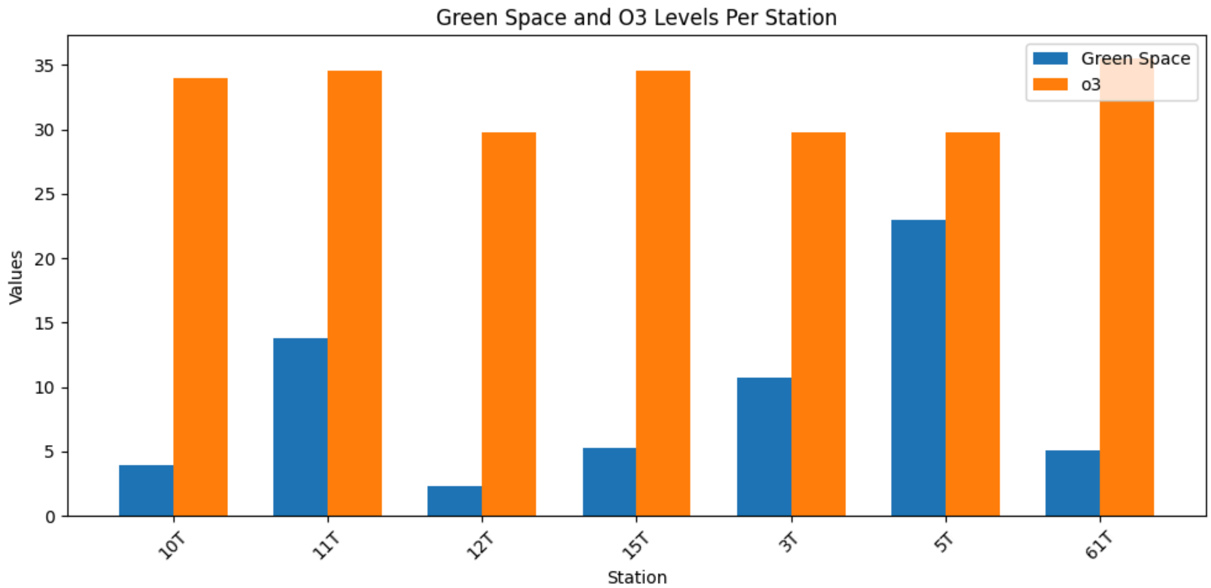
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\605535918.py:3: FutureWarni
ng:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='o3', palette='coolwarm')
```



Green Space nad O3 Levels Per Station

In [113…

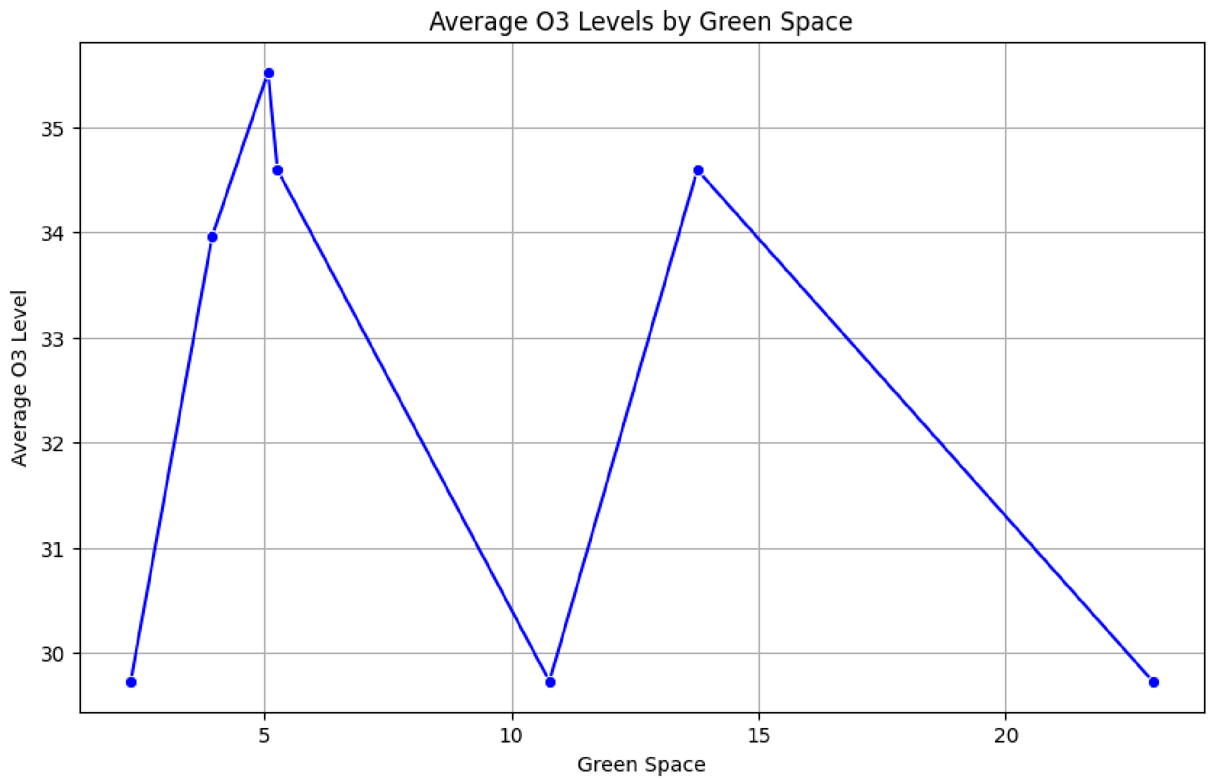
```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'o3': 'mean'        # Average o3 levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'o3' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['o3'], bar_width, lab

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and O3 Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

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



Average O3 Levels by Green Space

In [114…

```
average_o3_by_greenspace = df.groupby('green_space')['o3'].mean().reset_index()
average_o3_by_greenspace = average_o3_by_greenspace.sort_values('green_space')

# Create a line plot for the average o3 levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='o3', data=average_o3_by_greenspace, marker='o', co
plt.title('Average O3 Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average O3 Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```

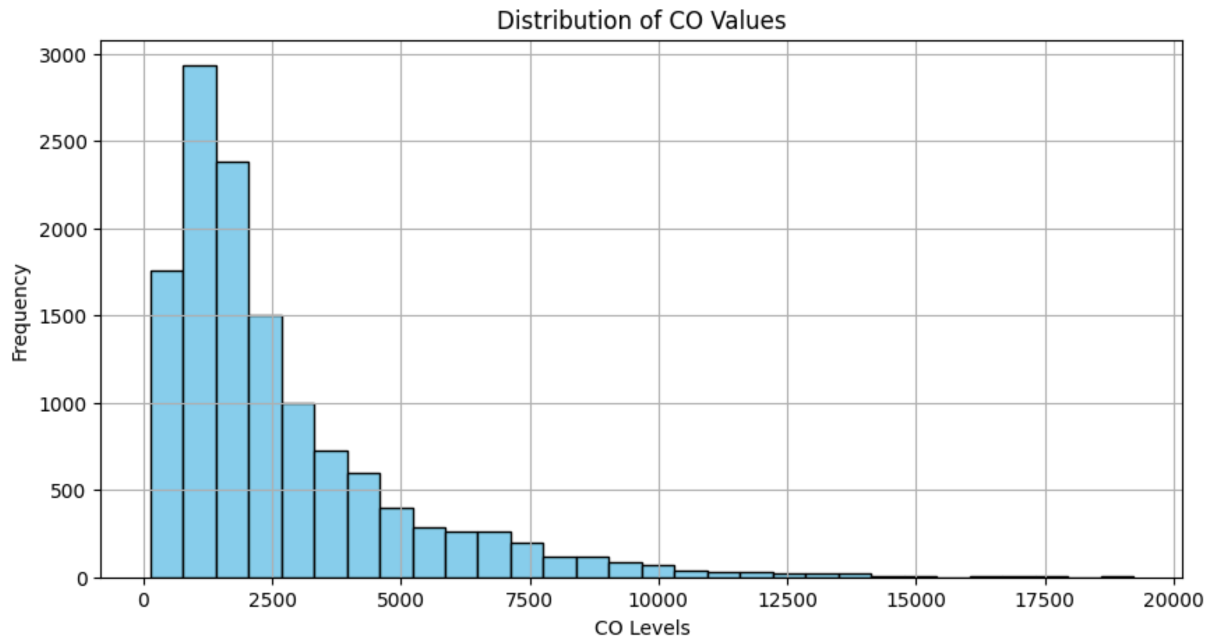


Inspect `Carbon Monoxide(CO)`

Distribution of CO Values

In [115…

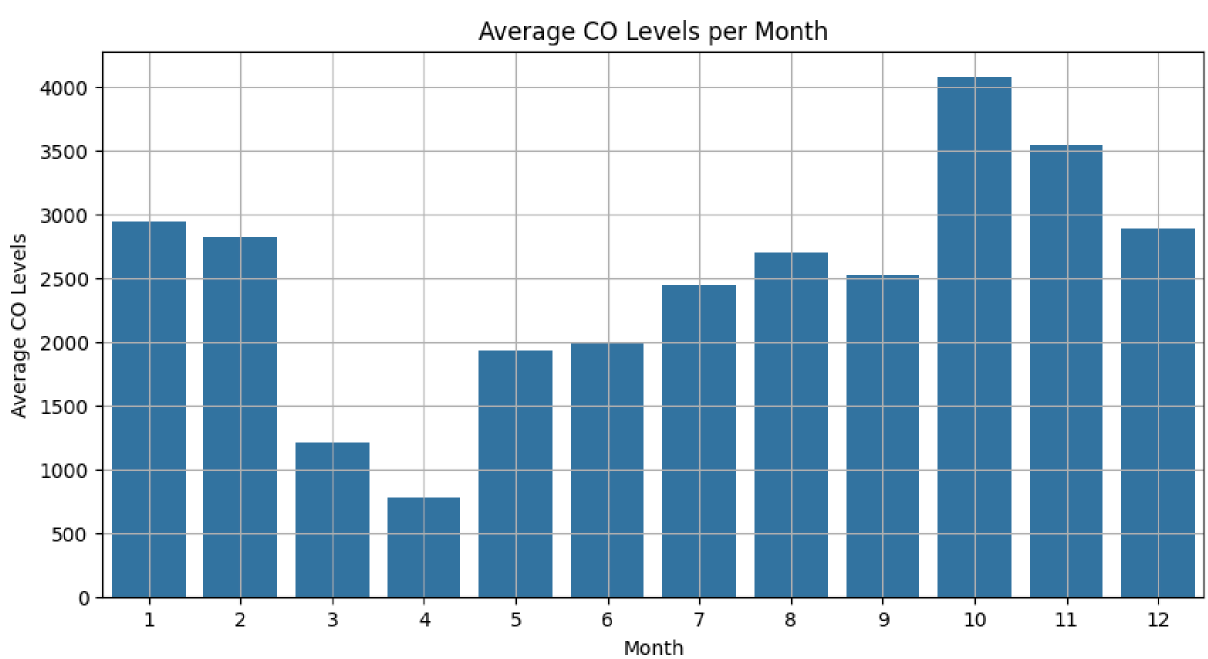
```
# Create histogram for co distribution
plt.figure(figsize=(10, 5))
plt.hist(df['co'], bins=30, color='skyblue', edgecolor='black')
plt.title('Distribution of CO Values')
plt.xlabel('CO Levels')
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```



Average CO Levels Per Month

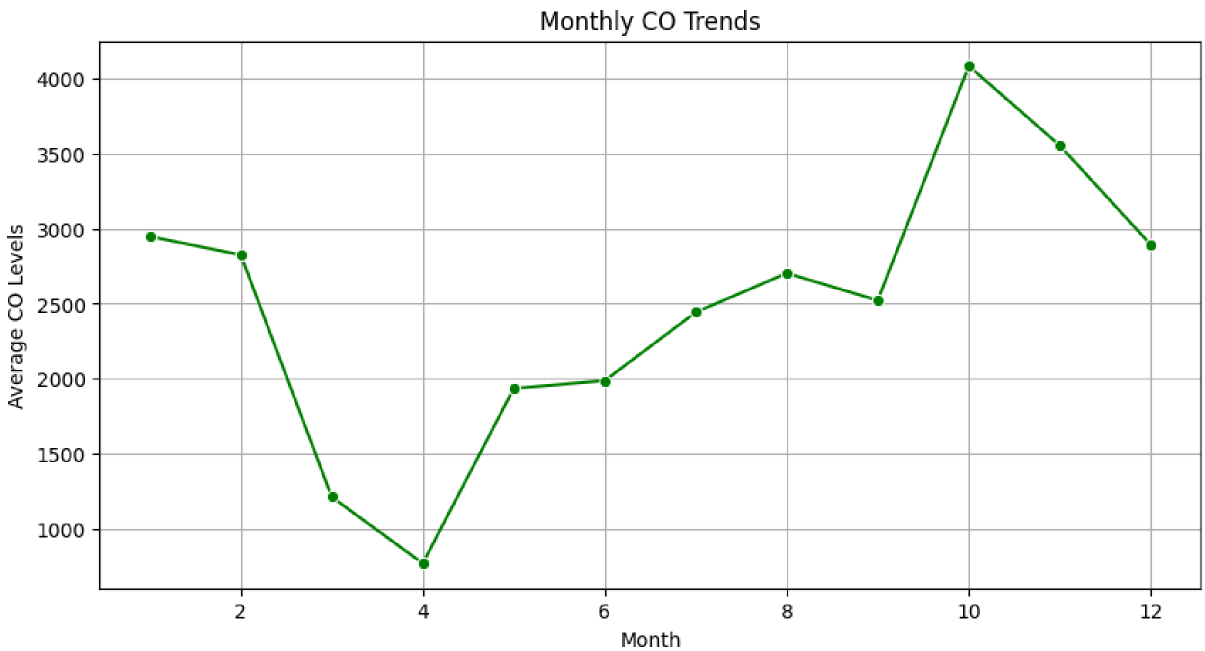
In [116…

```
# Calculate average co per month
average_co_per_month = df.groupby('month')['co'].mean().reset_index()

# Create bar chart
plt.figure(figsize=(10, 5))
sns.barplot(data=average_co_per_month, x='month', y='co')
plt.title('Average CO Levels per Month')
plt.xlabel('Month')
plt.ylabel('Average CO Levels')
plt.grid(True)
plt.show()
```



In [117…

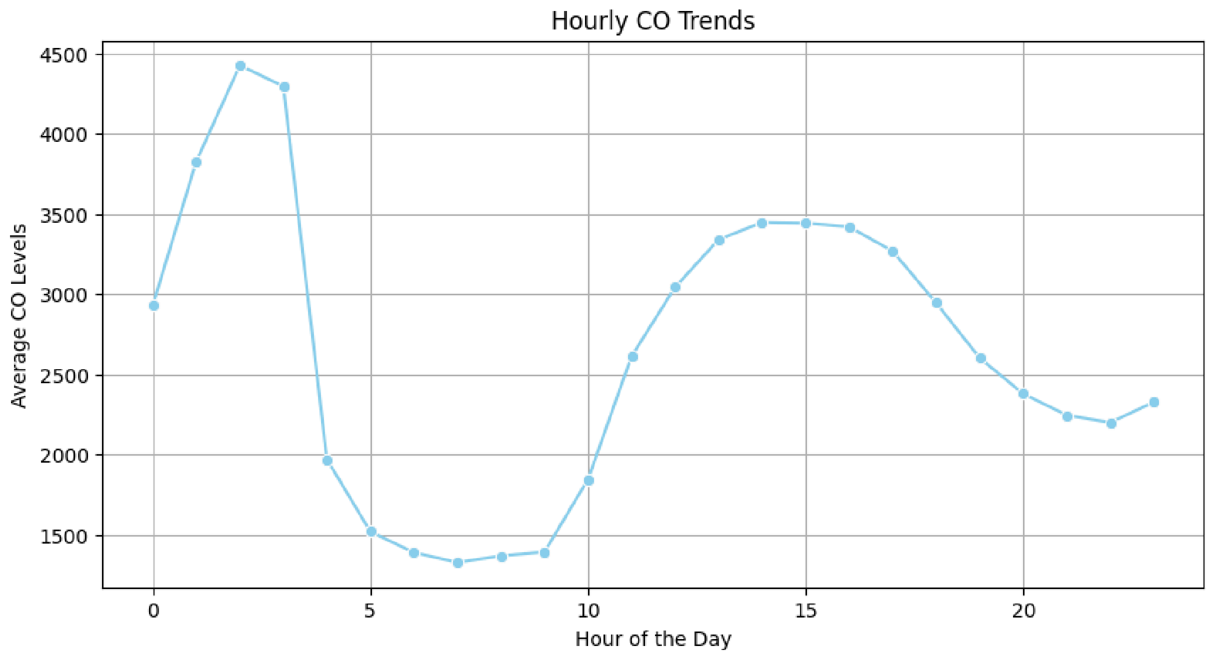
```
# You can reuse average_co_per_month calculated previously
average_co_per_month = df.groupby('month')['co'].mean().reset_index()

plt.figure(figsize=(10, 5))
sns.lineplot(data=average_co_per_month, x='month', y='co', marker='o', color='green
plt.title('Monthly CO Trends')
plt.xlabel('Month')
plt.ylabel('Average CO Levels')
plt.grid(True)
plt.show()
```



Hourly Distribution of CO Trends

In [118…

```
hourly_co_trends = df.groupby('hour')['co'].mean().reset_index()

# Create line plot for hourly trends
plt.figure(figsize=(10, 5))
sns.lineplot(data=hourly_co_trends, x='hour', y='co', marker='o', color='skyblue')
plt.title('Hourly CO Trends')
plt.xlabel('Hour of the Day')
plt.ylabel('Average CO Levels')
plt.grid(True)
plt.show()
```

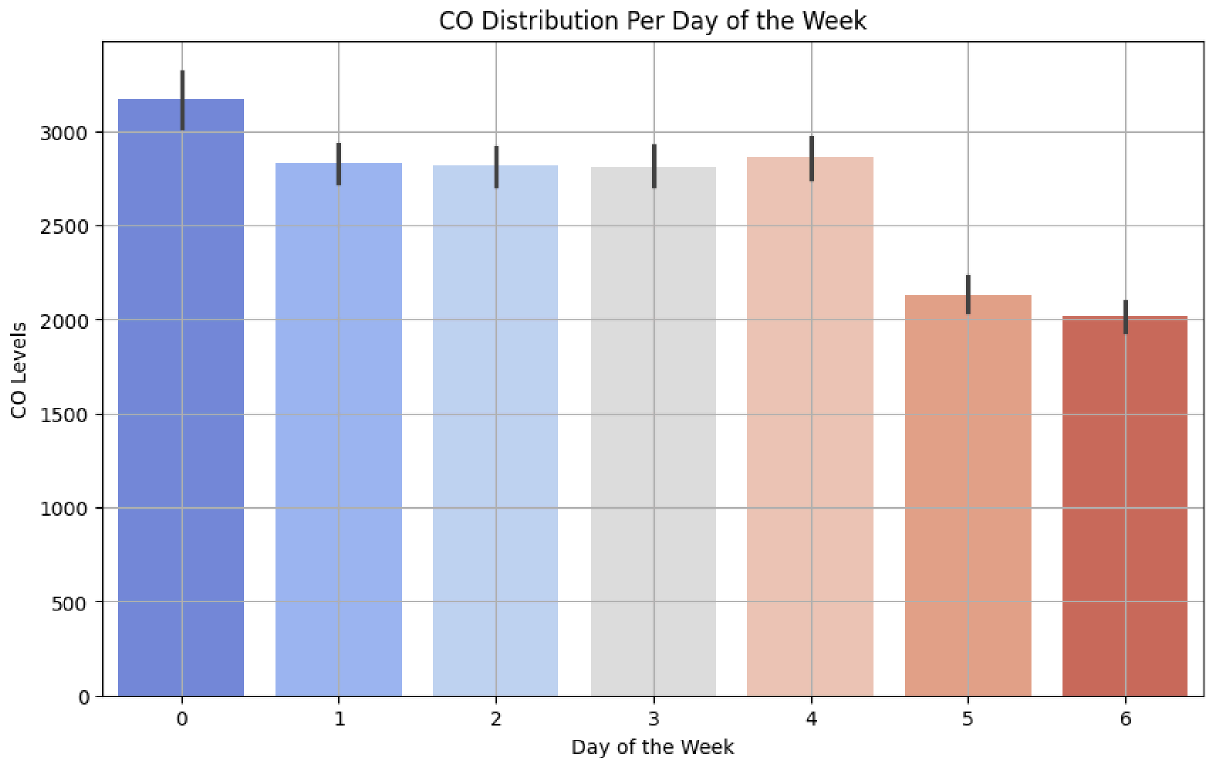


CO Distribution Per Day of the Week

In [119…

```
# Bar plot for co distribution per day of the week
plt.figure(figsize=(10, 6))
sns.barplot(data=df, x='day_of_week', y='co', palette='coolwarm')
plt.title('CO Distribution Per Day of the Week')
plt.xlabel('Day of the Week')
plt.ylabel('CO Levels')
plt.grid(True)
plt.show()
```

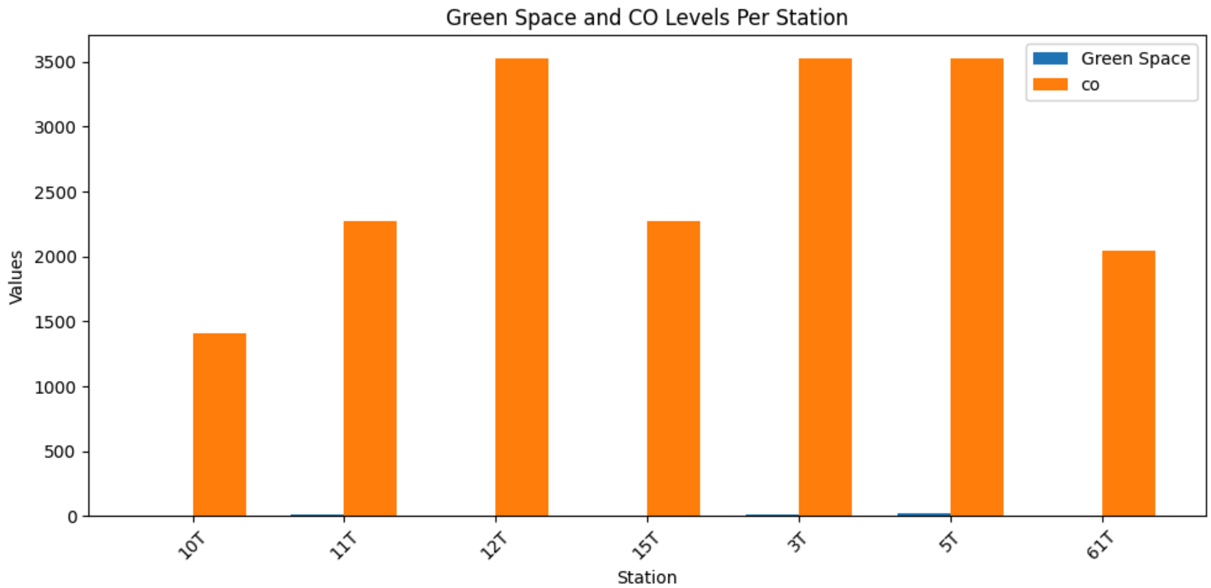
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\313729694.py:3: FutureWarni
ng:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(data=df, x='day_of_week', y='co', palette='coolwarm')
```



Green Space and CO Levels Per Station

In [120…

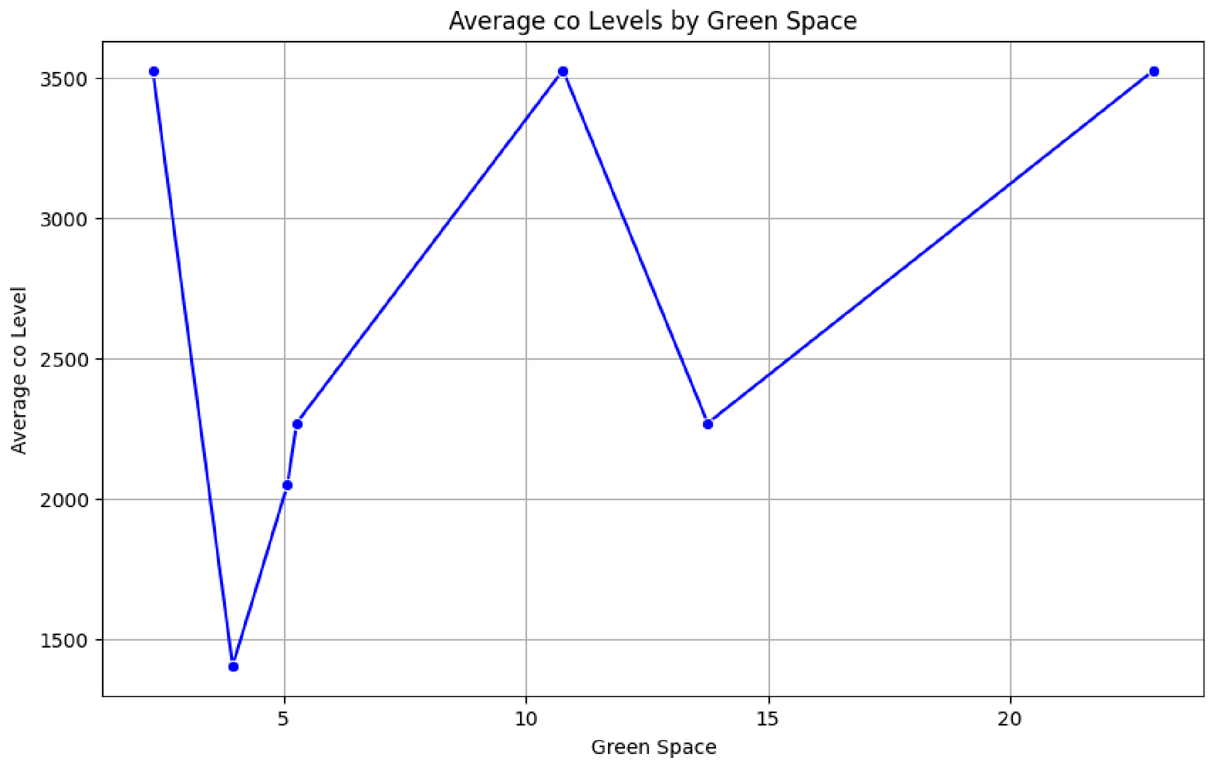
```
station_stats = df.groupby('station').agg({
    'green_space': 'mean',  # Average or sum of green space per station
    'co': 'mean'        # Average co levels per station
}).reset_index()

# Create a grouped bar chart
plt.figure(figsize=(10, 5))
# Setting the positions for the bars
bar_width = 0.35
index = range(len(station_stats['station']))

# Plotting both 'green_space' and 'co' data
bars1 = plt.bar(index, station_stats['green_space'], bar_width, label='Green Space'
bars2 = plt.bar([p + bar_width for p in index], station_stats['co'], bar_width, lab

# Adding labels, title, and legend
plt.xlabel('Station')
plt.ylabel('Values')
plt.title('Green Space and CO Levels Per Station')
plt.xticks([p + bar_width / 2 for p in index], station_stats['station'], rotation=4
plt.legend()

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



Average CO Levels By Green Space

In [121…

```
average_co_by_greenspace = df.groupby('green_space')['co'].mean().reset_index()
average_co_by_greenspace = average_co_by_greenspace.sort_values('green_space')

# Create a line plot for the average co levels by green space
plt.figure(figsize=(10, 6))
sns.lineplot(x='green_space', y='co', data=average_co_by_greenspace, marker='o', co
plt.title('Average co Levels by Green Space')
plt.xlabel('Green Space')
plt.ylabel('Average co Level')
plt.grid(True)  # Optional: Adds a grid for better readability
plt.show()
```



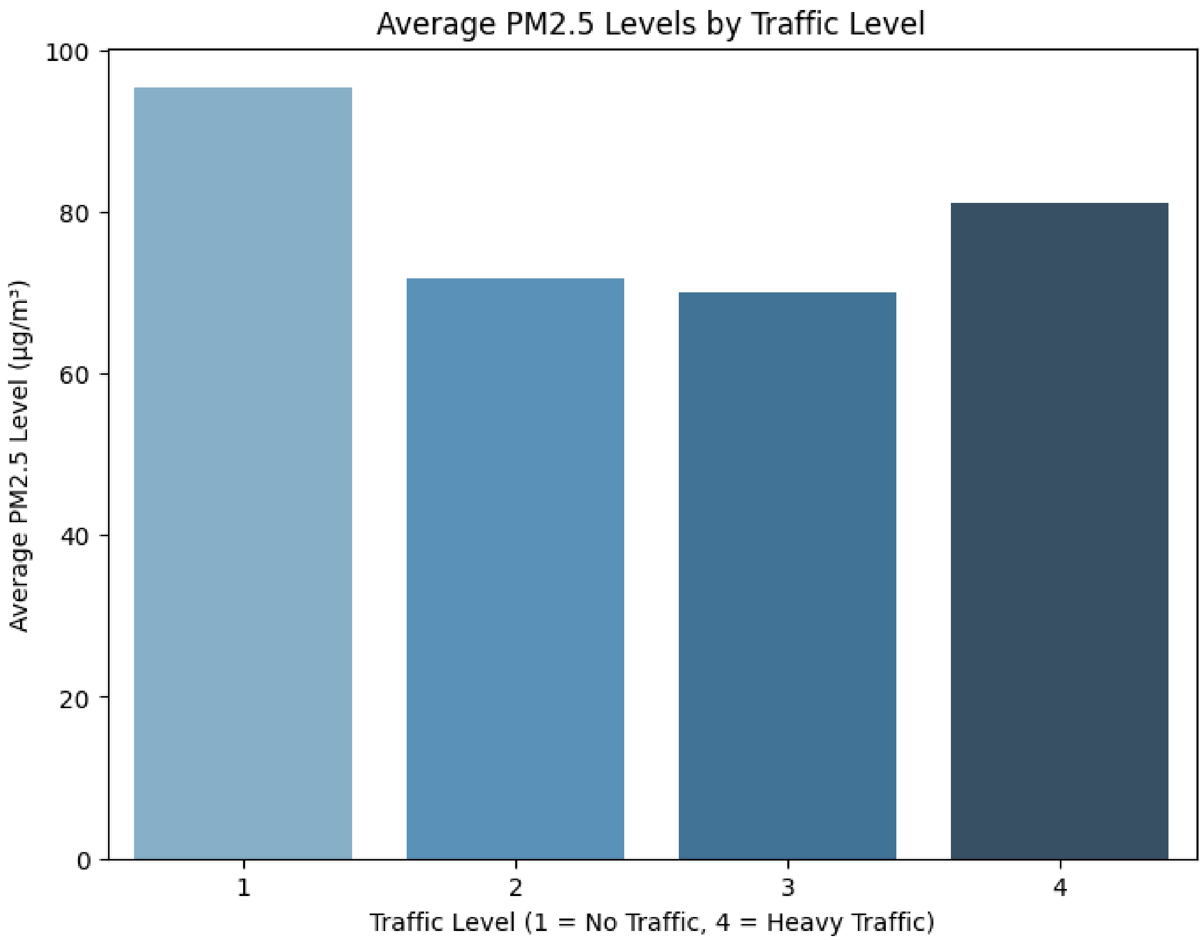
Inspect `Other Variables`

Average PM2.5 Levels by Traffic Level

In [122…

```
# Calculate the average PM2.5 for each traffic level
avg_pm25_by_traffic = df.groupby('traffic_level')['pm2_5'].mean().reset_index()

# Create a bar plot
plt.figure(figsize=(8, 6))
sns.barplot(x='traffic_level', y='pm2_5', data=avg_pm25_by_traffic, palette="Blues_

# Add labels and title
plt.xlabel('Traffic Level (1 = No Traffic, 4 = Heavy Traffic)')
plt.ylabel('Average PM2.5 Level (µg/m³)')
plt.title('Average PM2.5 Levels by Traffic Level')

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

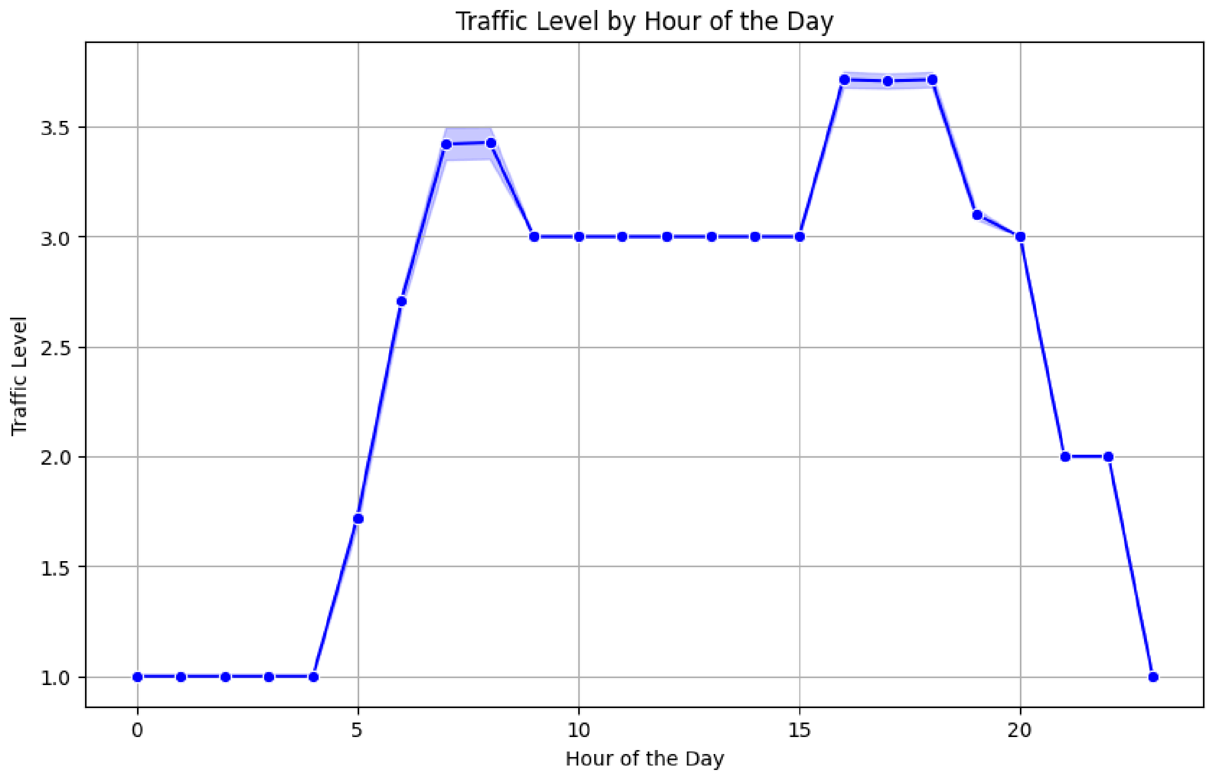
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1396813456.py:6: FutureWarn
ing:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `x` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(x='traffic_level', y='pm2_5', data=avg_pm25_by_traffic, palette="Blues
_d")
```



Traffic Level by Hour of the Day

In [123…

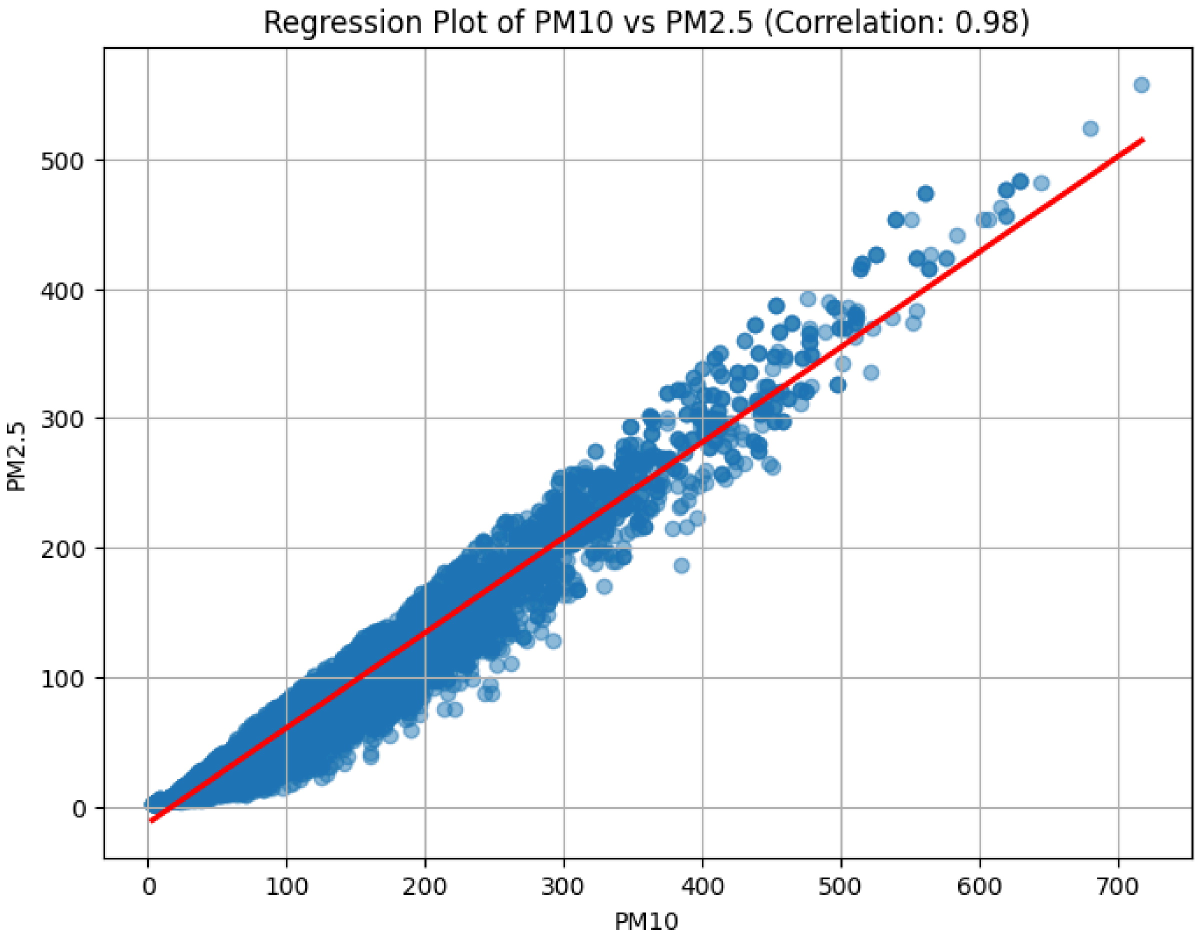
```
# Create a line plot for Traffic Level by Hour
plt.figure(figsize=(10, 6))
sns.lineplot(x='hour', y='traffic_level', data=df, marker='o', color='b')

# Label the axes and the plot
plt.xlabel('Hour of the Day')
plt.ylabel('Traffic Level')
plt.title('Traffic Level by Hour of the Day')

# Show grid for better readability
plt.grid(True)

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



Analyzing Correlation `Correlation between PM2.5 and Other Air Quality Indices (PM10, SO2, NO2, O3, CO)'`

Correlation Plot between PM10 and PM2.5

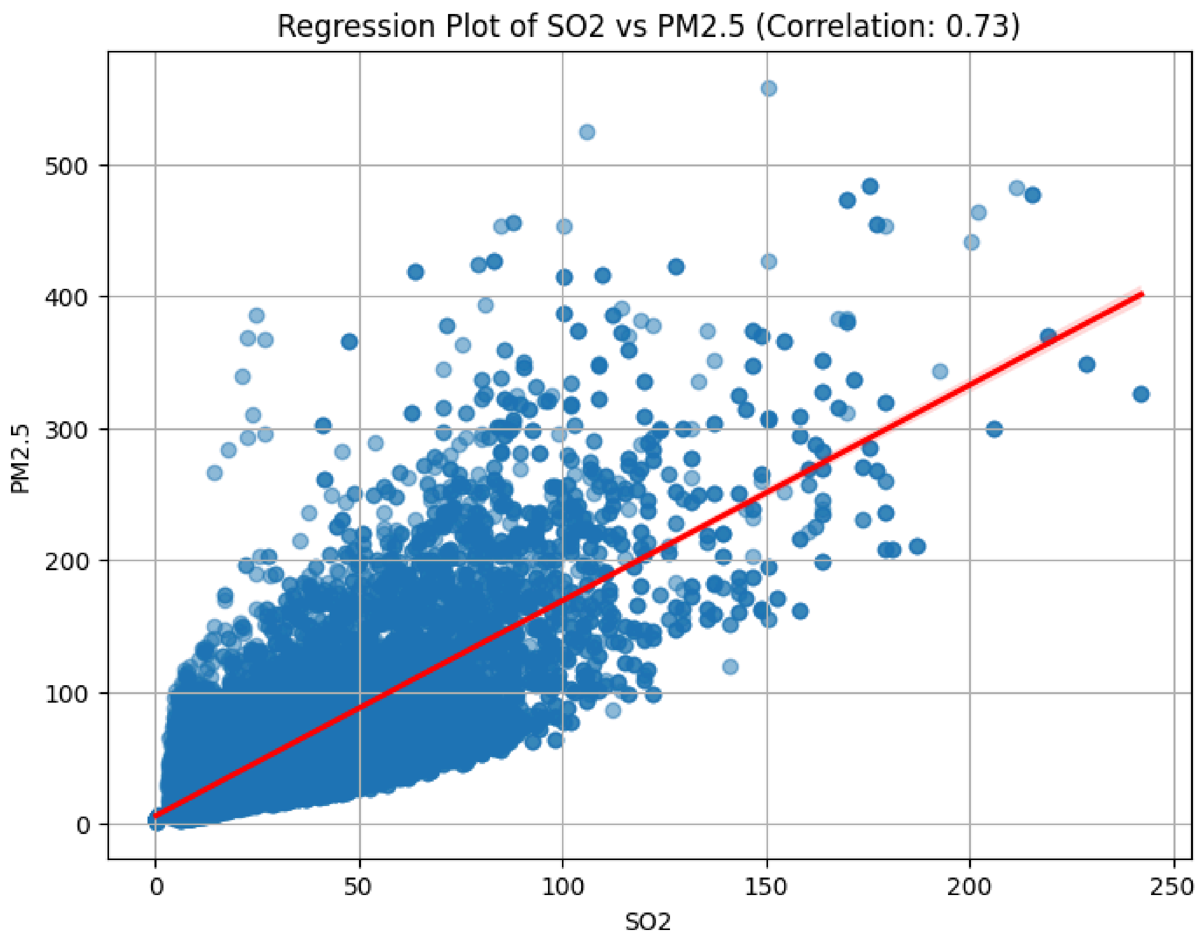
In [124…
```
# Create the regression plot for pm10 vs. pm2.5
plt.figure(figsize=(8, 6))
sns.regplot(x=df['pm10'], y=df['pm2_5'], scatter_kws={"alpha": 0.5}, line_kws={"col
plt.xlabel("PM10")
plt.ylabel("PM2.5")
plt.title(f"Regression Plot of PM10 vs PM2.5 (Correlation: {df['pm10'].corr(df['pm2
plt.grid()
plt.show()
```



Correlation Plot between SO2 and PM2.5

In [125…

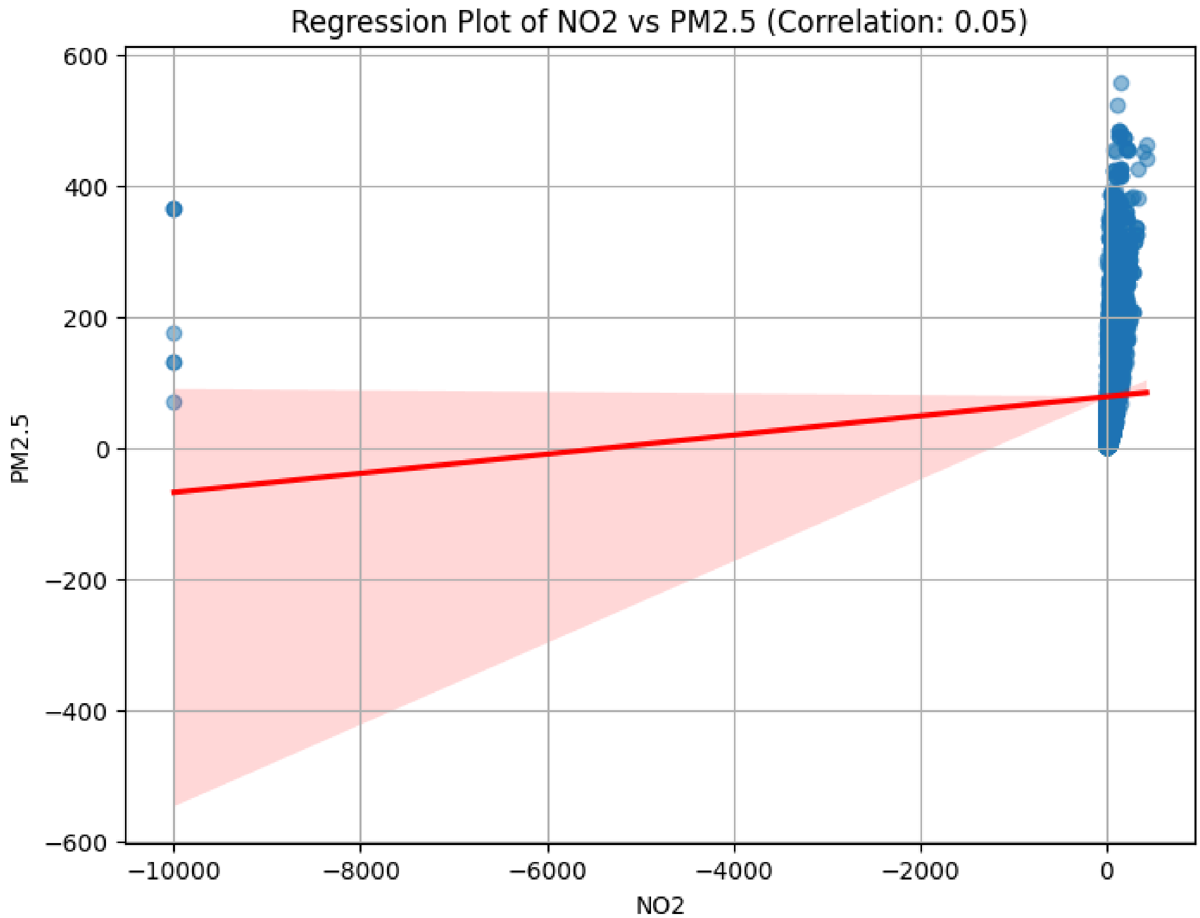
```
# Create the regression plot for so2 vs. pm2.5
plt.figure(figsize=(8, 6))
sns.regplot(x=df['so2'], y=df['pm2_5'], scatter_kws={"alpha": 0.5}, line_kws={"colo
plt.xlabel("SO2")
plt.ylabel("PM2.5")
plt.title(f"Regression Plot of SO2 vs PM2.5 (Correlation: {df['so2'].corr(df['pm2_5
plt.grid()
plt.show()
```



Correlation Plot between NO2 and PM2.5

In [126…

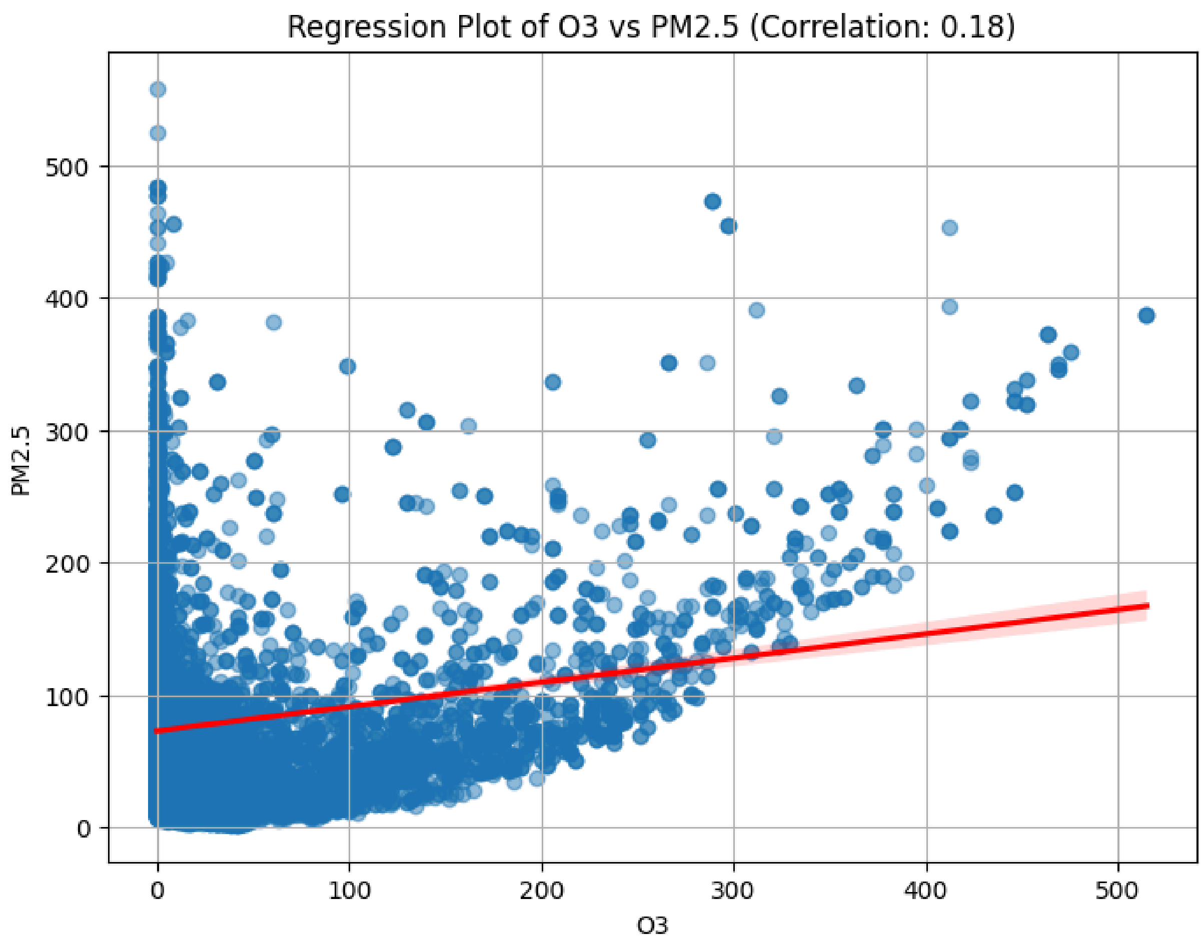
```
# Create the regression plot for no2 vs. pm2.5
plt.figure(figsize=(8, 6))
sns.regplot(x=df['no2'], y=df['pm2_5'], scatter_kws={"alpha": 0.5}, line_kws={"colo
plt.xlabel("NO2")
plt.ylabel("PM2.5")
plt.title(f"Regression Plot of NO2 vs PM2.5 (Correlation: {df['no2'].corr(df['pm2_5
plt.grid()
plt.show()
```



Correlation Plot between O3 and PM2.5

In [127…

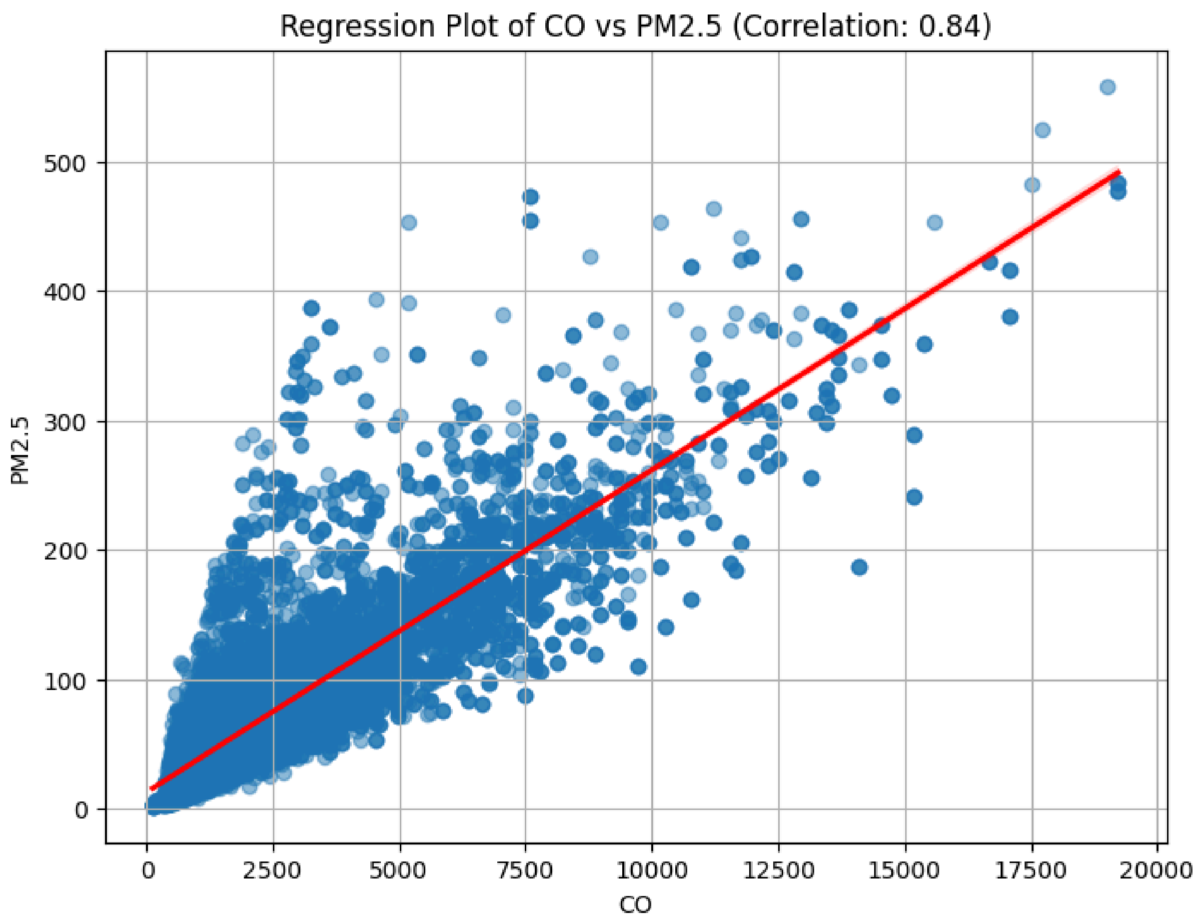
```
# Create the regression plot for o3 vs. pm2.5
plt.figure(figsize=(8, 6))
sns.regplot(x=df['o3'], y=df['pm2_5'], scatter_kws={"alpha": 0.5}, line_kws={"color
plt.xlabel("O3")
plt.ylabel("PM2.5")
plt.title(f"Regression Plot of O3 vs PM2.5 (Correlation: {df['o3'].corr(df['pm2_5']
plt.grid()
plt.show()
```



Correlation Plot between CO and PM2.5

In [128…

```
# Create the regression plot for co vs. pm2.5
plt.figure(figsize=(8, 6))
sns.regplot(x=df['co'], y=df['pm2_5'], scatter_kws={"alpha": 0.5}, line_kws={"color
plt.xlabel("CO")
plt.ylabel("PM2.5")
plt.title(f"Regression Plot of CO vs PM2.5 (Correlation: {df['co'].corr(df['pm2_5']
plt.grid()
plt.show()
```



We need to use these analysis

- Trend analysis
- Cyclicity analysis
- Seasonal analysis

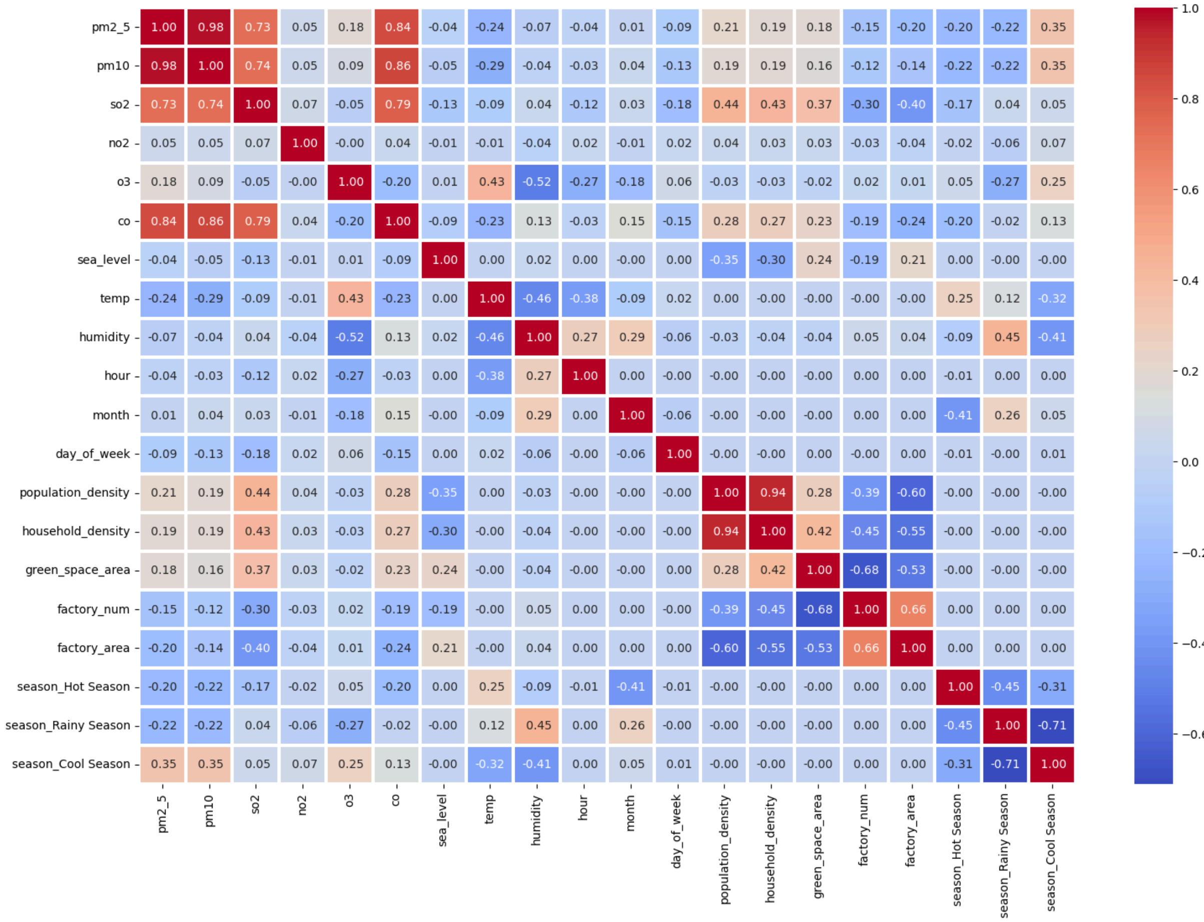
In [129…

```
# Selected features for heatmap correlation analysis
selected_cols = ['pm2_5', 'pm10', 'so2', 'no2', 'o3', 'co', 'sea_level','temp','hum
```

Heatmap with `pearson` method: Good for linear relationship

In [130…

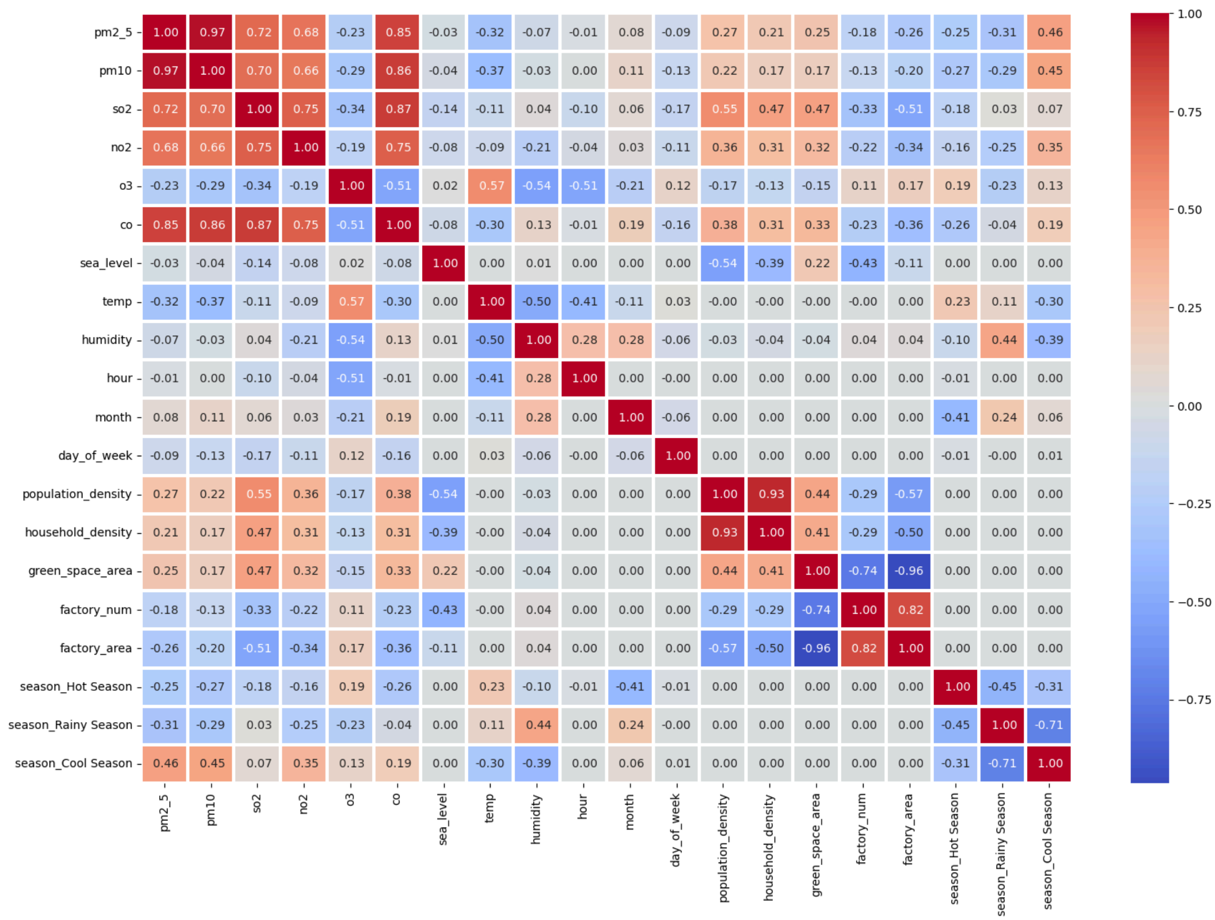
```
corr_matrix = df[selected_cols].corr(method='pearson')
corr_matrix

# Plotting the heatmap for numerical columns
plt.figure(figsize=(18,12))
sns.heatmap(data=corr_matrix, cmap='coolwarm', fmt=' .2f', annot=True, linewidths=1
plt.show()
```



Heatmap with `spearman` method: Good for non-linear relationship

In [131…

```
corr_matrix = df[selected_cols].corr(method='spearman')
corr_matrix

# Plotting the heatmap for numerical columns
plt.figure(figsize=(18,12))
sns.heatmap(data=corr_matrix, cmap='coolwarm', fmt=' .2f', annot=True, linewidths=1
plt.show()
```



We use `spearman` method of correlation

- Because we are relying on rendom forest, XGBoost, Decision Tree!
- This is the non-parametric method!
- And we will compare performance for these 3 models (non-parametric method) to Linear models like Linear Regression, Ridge, Lasso Regression (Parametric method), and non-machine-learning method such as moving average to make sure that our assumption of non-parametric method is the best suited for PM2.5 prediction
- Additionally, spearman (non-linear relation) captures relationship better than pearson (Linear relation)

7. Feature selection

Choose the most salient X

- Rule of thumb: Good features MUST NOT BE correlated, i.e., independent
- Rule of thumb: Correlation is not causation; don't pick features using correlation only; it should make sense!
- Rule of thumb: For ML, less features are usually better (but NOT necessarily for DL)

Specify the y

Split train / test

In [132…

```
average_no2_per_month#  🔹 Ensure all expected stations exist (even if missing in df
expected_stations = ['3T', '5T', '10T', '11T', '12T', '15T', '61T']  # include all

# Perform one-hot encoding
station_dummies = pd.get_dummies(df["station"], prefix="station")

# Add missing station columns (if not present in df)
for col in expected_stations:
    dummy_col = f'station_{col}'
    if dummy_col not in station_dummies:
        station_dummies[dummy_col] = 0  # Fill missing station columns with 0

# Ensure all dummy columns are int type
station_dummies = station_dummies.astype(int)

# Concatenate the encoded station features back to the dataset
df = pd.concat([df, station_dummies], axis=1)
```

In [133…

```
df
```

Out[133…

	station	temp	pressure	humidity	windspeed	winddeg	cloudall	weathermain
0	3T	305.44	1006	70	6.57	181	63	Clouds
1	3T	304.42	1006	68	6.04	179	68	Clouds
2	3T	304.42	1005	69	5.53	176	100	Clouds
3	3T	304.09	1004	69	5.03	174	100	Clouds
4	3T	304.52	1005	69	4.84	168	100	Clouds
...	...	...	...	...	...	...	...	...
14128	61T	303.12	1009	68	7.68	189	100	Clouds
14129	61T	303.12	1010	68	7.03	189	100	Clouds
14130	61T	303.12	1011	69	7.04	187	100	Clouds
14131	61T	303.12	1011	71	6.84	183	98	Clouds
14132	61T	302.12	1011	73	5.92	183	86	Clouds

14133 rows × 41 columns

In [134…

```
df.columns
```

Out[134…
```
Index(['station', 'temp', 'pressure', 'humidity', 'windspeed', 'winddeg',
       'cloudall', 'weathermain', 'datetime', 'day_of_week', 'hour',
       'traffic_level', 'sea_level', 'population', 'population_density',
       'household', 'household_density', 'green_space', 'green_space_area',
       'factory_num', 'factory_area', 'lat', 'lon', 'pm2_5', 'pm10', 'so2',
       'no2', 'o3', 'co', 'month', 'season', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season', 'station_10T',
       'station_11T', 'station_12T', 'station_15T', 'station_3T', 'station_5T',
       'station_61T'],
      dtype='object')
```

In [135…
```
df['station'].unique()
```

Out[135…
```
array(['3T', '5T', '10T', '11T', '12T', '15T', '61T'], dtype=object)
```

In [136…
```
for col in df.columns:
    if df[col].nunique() == 1:
        print(f"⚠️ '{col}' has only one unique value in test set: {df[col].unique(
```

In [137…
```
features = df[['station', 'temp','population_density','factory_area','season_Cool S
target = df['pm2_5']
```

Split X and y features (Time-Aware Style)

In [138…
```
df['population_density'].unique()
```

Out[138…
```
array([ 9046.87,  4788.74,  1452.45,  3437.36, 10275.79,  4324.14,
        4542.29])
```

In [139…
```
df_sorted = df.sort_values(by=['datetime', 'station']).reset_index(drop=True)
```

In [140…
```
int(len(features) * 0.9)
```

Out[140…
```
12719
```

In [141…
```
target.isna().sum()
```

Out[141…
```
np.int64(1232)
```

In [142…
```
df_sorted.isna().sum()
```

Out[142…

```
station                   0
temp                      0
pressure                  0
humidity                  0
windspeed                 0
winddeg                   0
cloudall                  0
weathermain               0
datetime                  0
day_of_week               0
hour                      0
traffic_level             0
sea_level                 0
population                0
population_density        0
household                 0
household_density         0
green_space               0
green_space_area          0
factory_num               0
factory_area              0
lat                    1232
lon                    1232
pm2_5                  1232
pm10                   1232
so2                    1232
no2                    1232
o3                     1232
co                     1232
month                     0
season                    0
season_Cool Season        0
season_Hot Season         0
season_Rainy Season       0
station_10T               0
station_11T               0
station_12T               0
station_15T               0
station_3T                0
station_5T                0
station_61T               0
dtype: int64
```

In [143…

```
df_sorted.dropna(inplace=True)
```

In [144…

```
features = df_sorted[['station_10T', 'station_11T', 'station_12T', 'station_15T', '
                      'station_61T', 'temp','population_density','factory_area',
                      'season_Cool Season','season_Hot Season','season_Rainy Season
                      'pm10', 'so2', 'no2', 'o3', 'co']]

target = df_sorted['pm2_5']

split_point = int(len(features) * 0.9)
X_train = features.iloc[:split_point]
X_test = features.iloc[split_point:]
```

```
y_train = target.iloc[:split_point]
y_test = target.iloc[split_point:]
```

In [145…

```
for col in X_test.columns:
    if X_test[col].nunique() == 1:
        print(f"⚠️ '{col}' has only one unique value in test set: {X_test[col].uni
```

```
⚠️ 'season_Rainy Season' has only one unique value in test set: 0
```

In [146…

```
print("Train unique pop_density:", X_train['population_density'].nunique())
print("Test unique pop_density:", X_test['population_density'].nunique())
```

```
Train unique pop_density: 7
Test unique pop_density: 7
```

In [147…

```
print("X_train shape:", X_train.shape)
print("X_test shape:", X_test.shape)
```

```
X_train shape: (11610, 18)
X_test shape: (1291, 18)
```

In [148…

```
print("y_train shape:", y_train.shape)
print("y_test shape:", y_test.shape)
```

```
y_train shape: (11610,)
y_test shape: (1291,)
```

In [149…

```
X_train
```

Out[149…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11610 rows × 18 columns

In [150…

```
X_test
```

Out[150…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
11610	0	0	0	0	1	0	
11611	0	0	0	0	0	1	
11612	0	0	0	0	0	0	
11613	1	0	0	0	0	0	
11614	0	1	0	0	0	0	
...	...	...	...	...	...	...	
14128	0	0	1	0	0	0	
14129	0	0	0	1	0	0	
14130	0	0	0	0	1	0	
14131	0	0	0	0	0	1	
14132	0	0	0	0	0	0	

1291 rows × 18 columns

In [151…

```
y_train
```

Out[151…

```
0         20.68
1         31.13
2         38.68
3         31.13
4         38.68
          ...
11605     99.46
11606     81.52
11607    214.77
11608    144.39
11609    214.77
Name: pm2_5, Length: 11610, dtype: float64
```

In [152…

```
y_test
```

Out[152…

```
11610    144.39
11611    144.39
11612     87.53
11613     80.80
11614    228.16
          ...
14128      3.96
14129      4.18
14130      3.96
14131      3.96
14132      3.81
Name: pm2_5, Length: 1291, dtype: float64
```

In [153…

```
X_train
```

Out[153…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11610 rows × 18 columns

In [154…

```
X_train.isna().sum()
```

Out[154…
```
station_10T            0
station_11T            0
station_12T            0
station_15T            0
station_3T             0
station_5T             0
station_61T            0
temp                   0
population_density     0
factory_area           0
season_Cool Season     0
season_Hot Season      0
season_Rainy Season    0
pm10                   0
so2                    0
no2                    0
o3                     0
co                     0
dtype: int64
```

In [155…
```
X_test.isna().sum()
```

Out[155…
```
station_10T            0
station_11T            0
station_12T            0
station_15T            0
station_3T             0
station_5T             0
station_61T            0
temp                   0
population_density     0
factory_area           0
season_Cool Season     0
season_Hot Season      0
season_Rainy Season    0
pm10                   0
so2                    0
no2                    0
o3                     0
co                     0
dtype: int64
```

In [156…
```
y_train.shape
```

Out[156…
```
(11610,)
```

In [157…
```
y_train.isna().sum()
```

Out[157…
```
np.int64(0)
```

In [158…
```
y_test.shape
```

Out[158…
```
(1291,)
```

In [159…
```
y_test.isna().sum()
```

Out[159…
```
np.int64(0)
```

Handling Missing Values After Spliting

In [160…
```
# Drop missing values in y_train and y_test
X_train = X_train[~y_train.isna()]
y_train = y_train.dropna()

X_test = X_test[~y_test.isna()]
y_test = y_test.dropna()
```

In [161…
```
X_train.columns
```

Out[161…
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

In [162…
```
y_train
```

Out[162…
```
0         20.68
1         31.13
2         38.68
3         31.13
4         38.68
          ...
11605     99.46
11606     81.52
11607    214.77
11608    144.39
11609    214.77
Name: pm2_5, Length: 11610, dtype: float64
```

Check Distribution and skew value

In [163…
```
X_train.columns
```

Out[163…
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

In [164…
```
X_test.columns
```

Out[164…
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

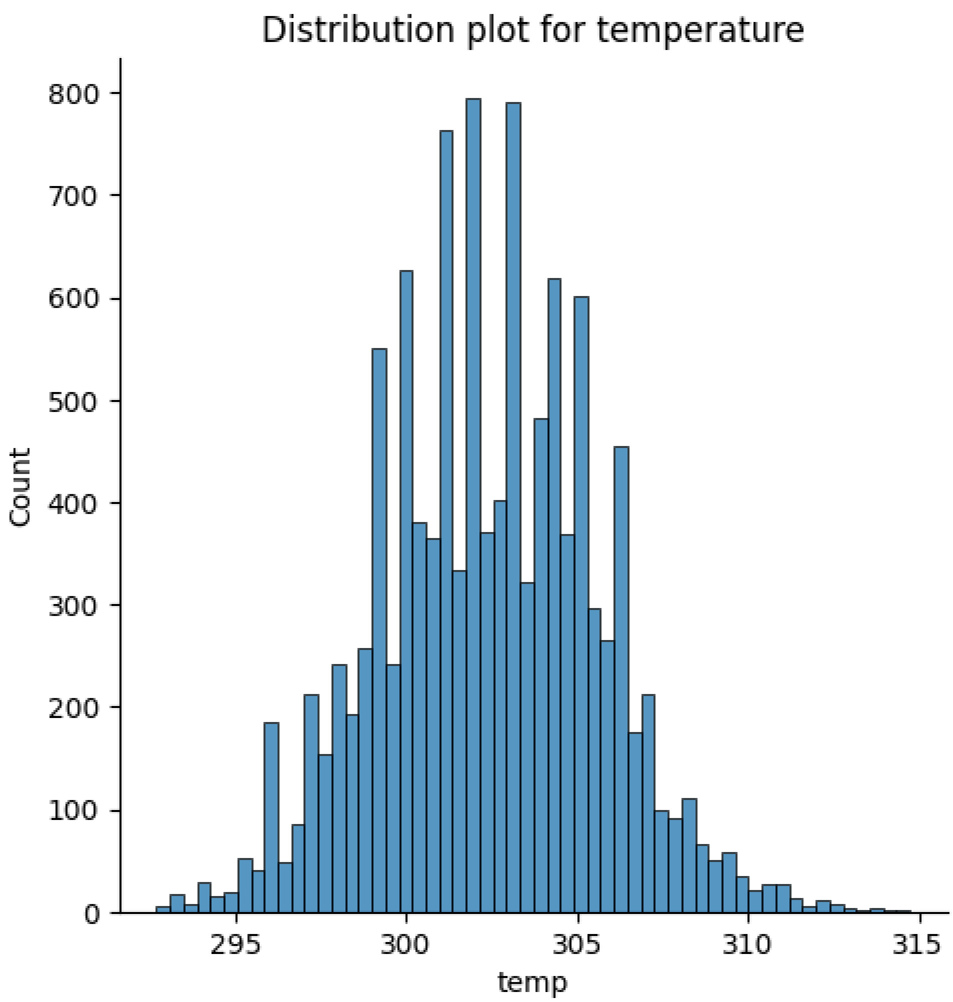
Check distribution

`temp`

- X_train

In [165…

```
sns.displot(X_train, x='temp')

plt.title('Distribution plot for temperature')

plt.show()
print('The distribution of temperature feature seems to be normaly distributed')
```




```
The distribution of temperature feature seems to be normaly distributed
```

In [166…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['temp'])
print('-'*30)
print(f"SKewness of temperature: {round(skew_value, 4)}")
print('-'*30)
```

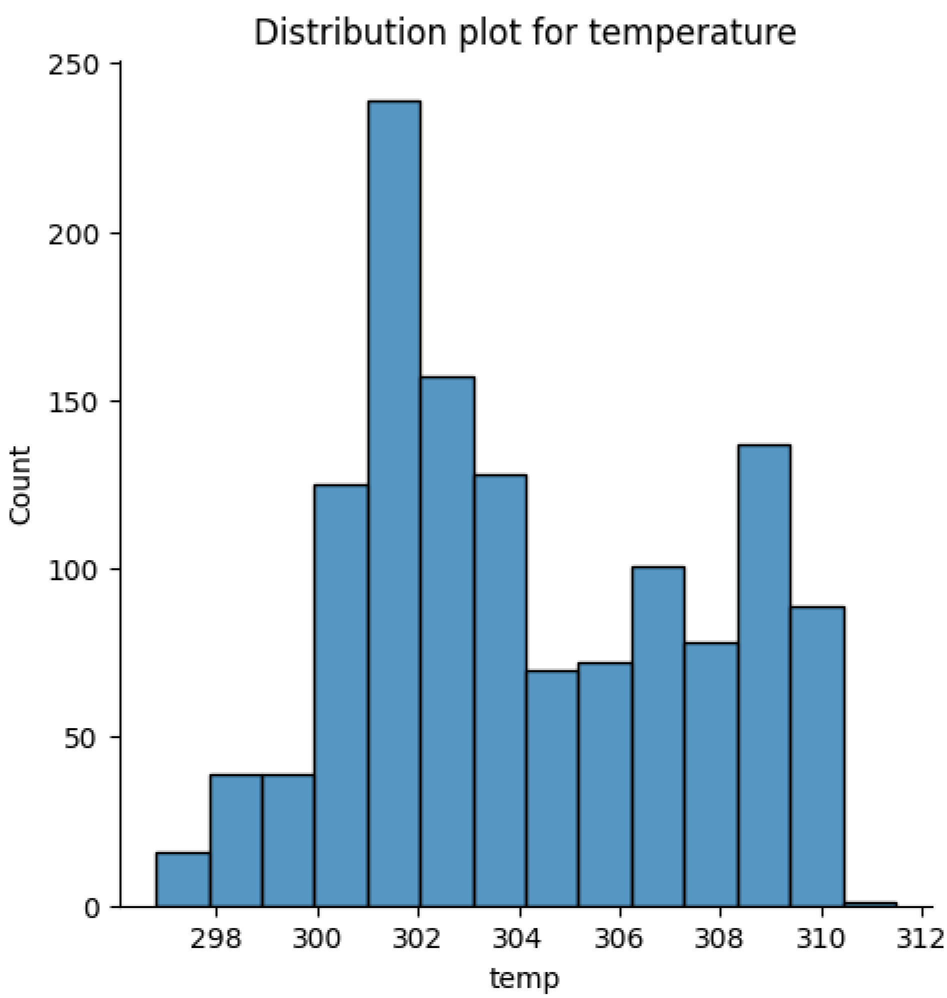
```
print(f'The skewness is being around {round(skew_value, 4)} which is very close to
print('This suggest taht the distribution is nearly normaly distributed')
```

```
------------------------------
SKewness of temperature: 0.0419
------------------------------
The skewness is being around 0.0419 which is very close to the center
This suggest taht the distribution is nearly normaly distributed
```

- X_test

In [167…

```
sns.displot(X_test, x='temp')

plt.title('Distribution plot for temperature')

plt.show()
print('The distribution of temperature feature seems to be normaly distributed')
```




```
The distribution of temperature feature seems to be normaly distributed
```

In [168…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['temp'])
print('-'*30)
```

```
print(f"SKewness of temperature: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is very close to
print('This suggest taht the distribution is nearly normaly distributed')
```

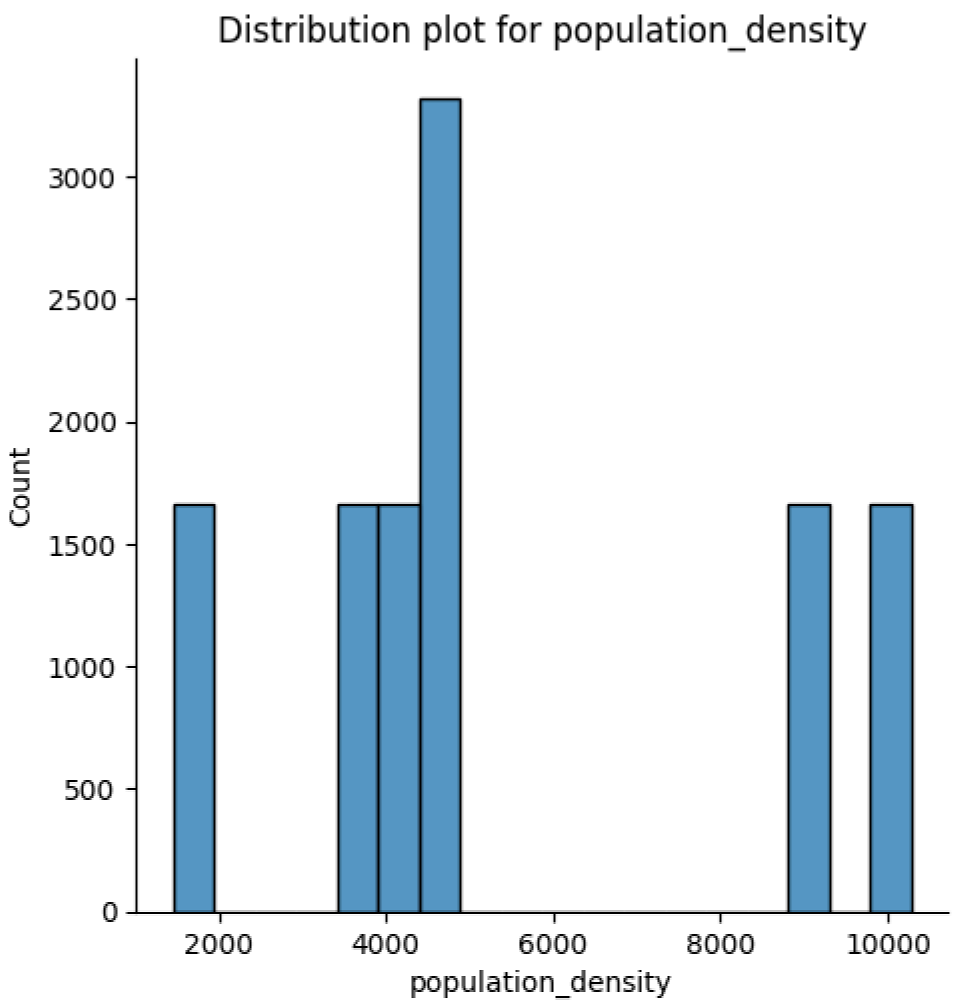
```
------------------------------
SKewness of temperature: 0.2394
------------------------------
The skewness is being around 0.2394 which is very close to the center
This suggest taht the distribution is nearly normaly distributed
```

`poppulation_density`

- X_train

In [169…

```
sns.displot(X_train, x='population_density')

plt.title('Distribution plot for population_density')

plt.show()
print('The distribution of population_density feature seems to be normaly distribut
```




```
The distribution of population_density feature seems to be normaly distributed
```

In [170…

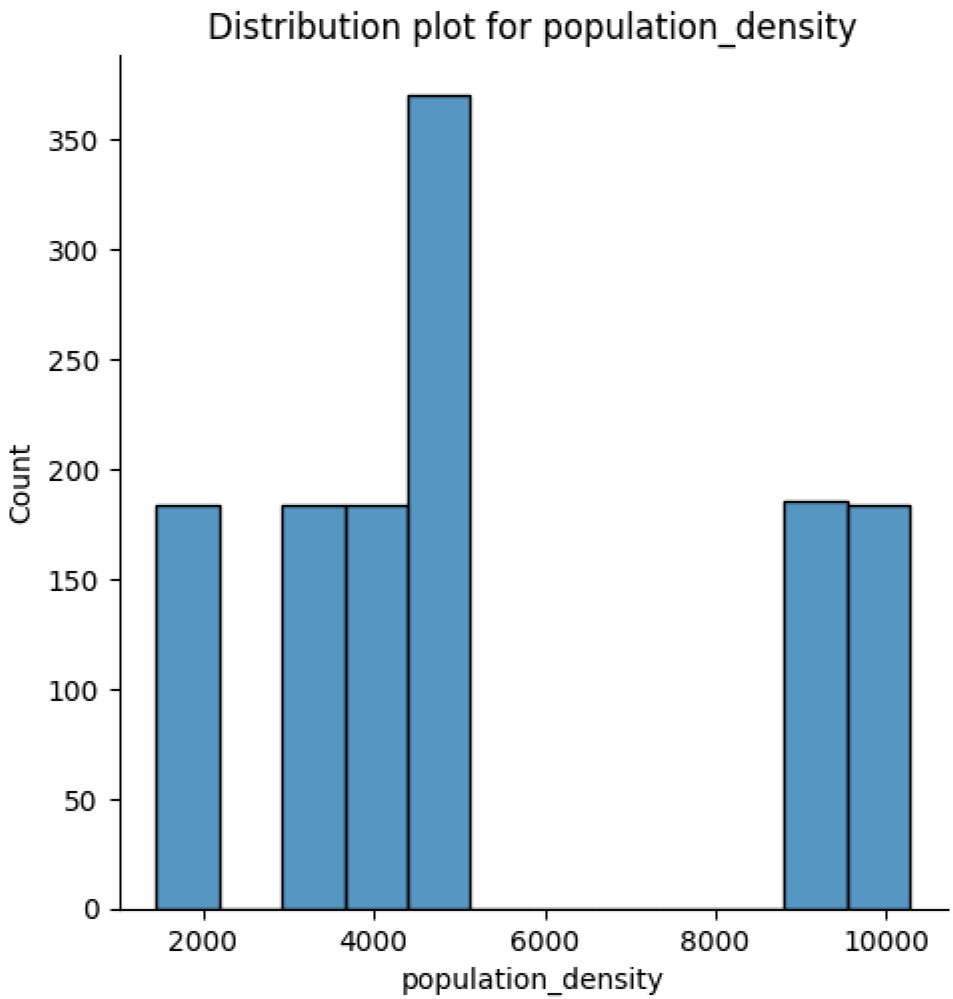
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['population_density'])
print('-'*30)
print(f"SKewness of population_density: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

```
------------------------------
SKewness of population_density: 0.5375
------------------------------
The skewness is being around 0.5375 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

- X_test

In [171…

```
sns.displot(X_test, x='population_density')

plt.title('Distribution plot for population_density')

plt.show()
print('The distribution of population_density feature seems to be normaly distribut
```



The distribution of population_density feature seems to be normaly distributed

In [172…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['population_density'])
print('-'*30)
print(f"SKewness of population_density: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

```
------------------------------
SKewness of population_density: 0.5368
------------------------------
The skewness is being around 0.5368 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

In [173…

```
X_train.columns
```

Out[173…

```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

In [174…

```
print("Unique population_density values in X_train:", sorted(X_train['population_de
print("Value counts:")
print(X_train['population_density'].value_counts())
```

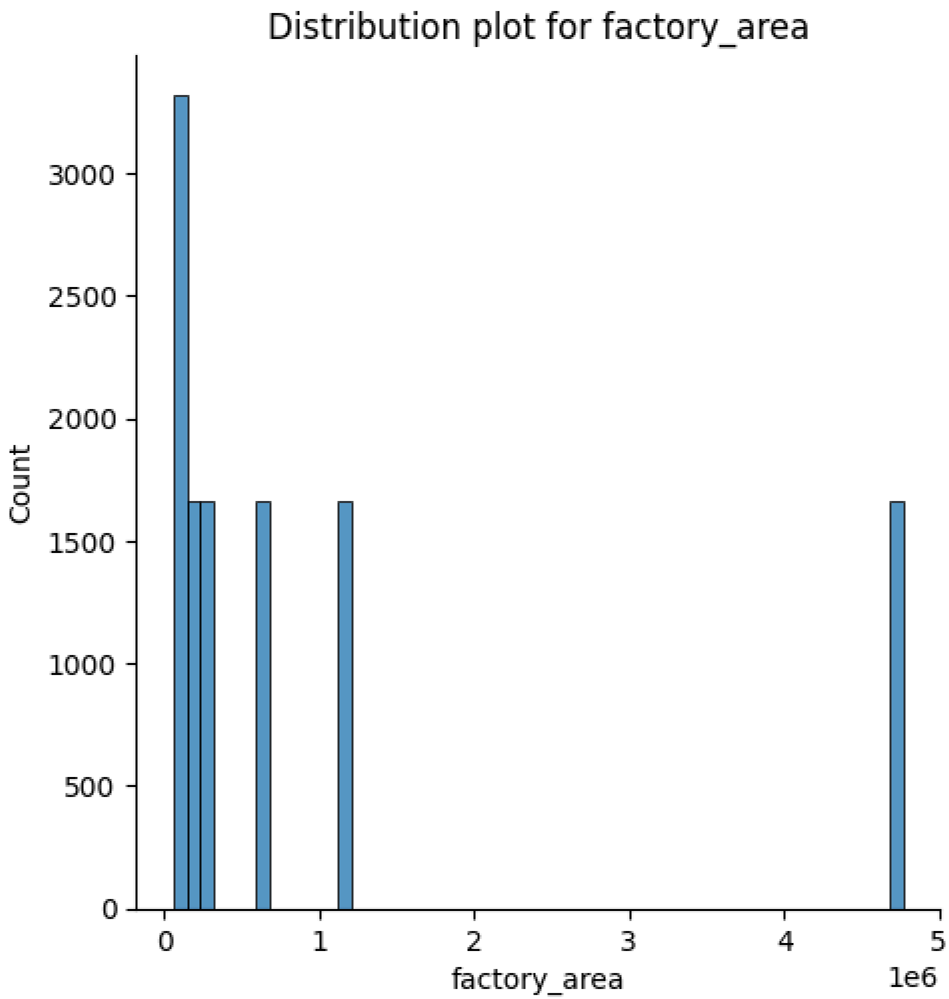
```
Unique population_density values in X_train: [np.float64(1452.45), np.float64(3437.3
6), np.float64(4324.14), np.float64(4542.29), np.float64(4788.74), np.float64(9046.8
7), np.float64(10275.79)]
Value counts:
population_density
1452.45     1659
3437.36     1659
10275.79    1659
4324.14     1659
9046.87     1658
4788.74     1658
4542.29     1658
Name: count, dtype: int64
```

`factory_area`

- X_train

In [175…

```
sns.displot(X_train, x='factory_area')

plt.title('Distribution plot for factory_area')

plt.show()
print('The distribution of factory_area feature seems to be right-skewd distributed
```



The distribution of factory_area feature seems to be right-skewd distributed

In [176…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['factory_area'])
print('-'*30)
print(f"SKewness of factory_area: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

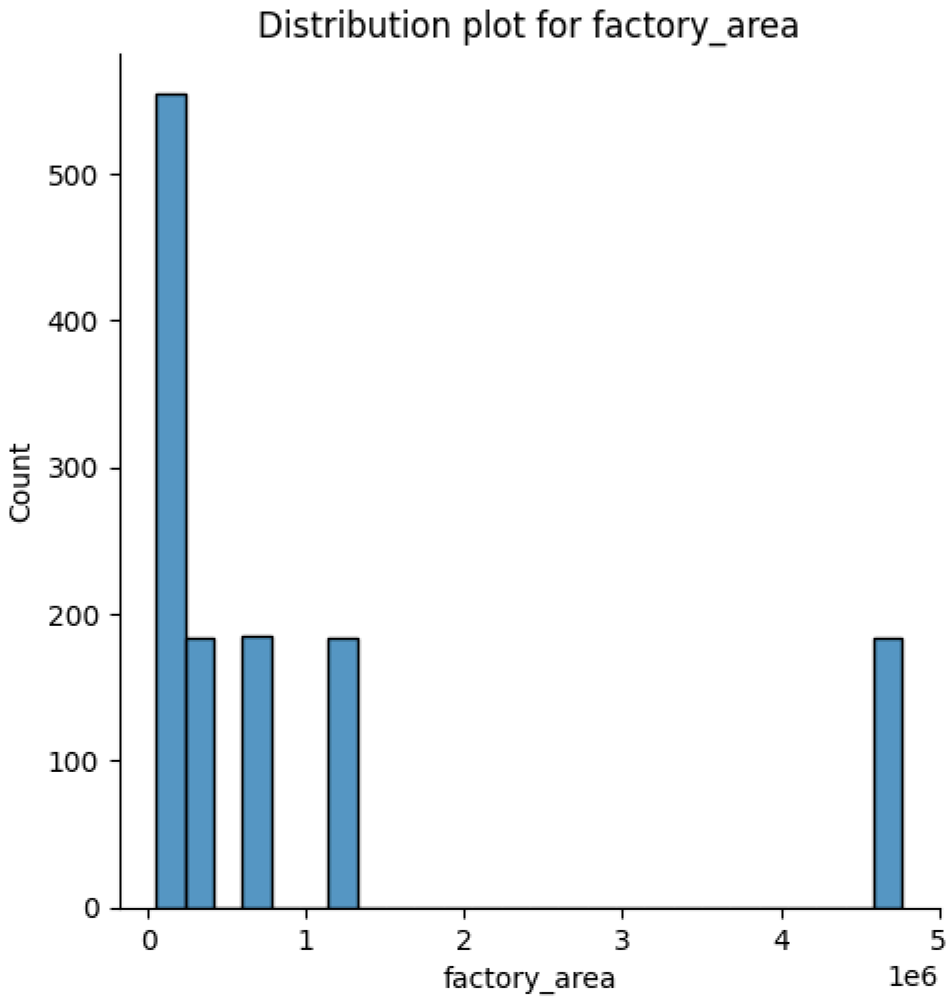
```
------------------------------
SKewness of factory_area: 1.8374
------------------------------
The skewness is being around 1.8374 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

- X_test

In [177…

```
sns.displot(X_test, x='factory_area')

plt.title('Distribution plot for factory_area')
```

```
plt.show()
print('The distribution of factory_area feature seems to be right-skewd distributed
```




```
The distribution of factory_area feature seems to be right-skewd distributed
```

In [178…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['factory_area'])
print('-'*30)
print(f"SKewness of factory_area: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

```
------------------------------
SKewness of factory_area: 1.8413
------------------------------
The skewness is being around 1.8413 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

In [179…

```
print("Unique factory_area values in X_train:", sorted(X_train['factory_area'].uniq
print("Value counts:")
print(X_train['factory_area'].value_counts())
```

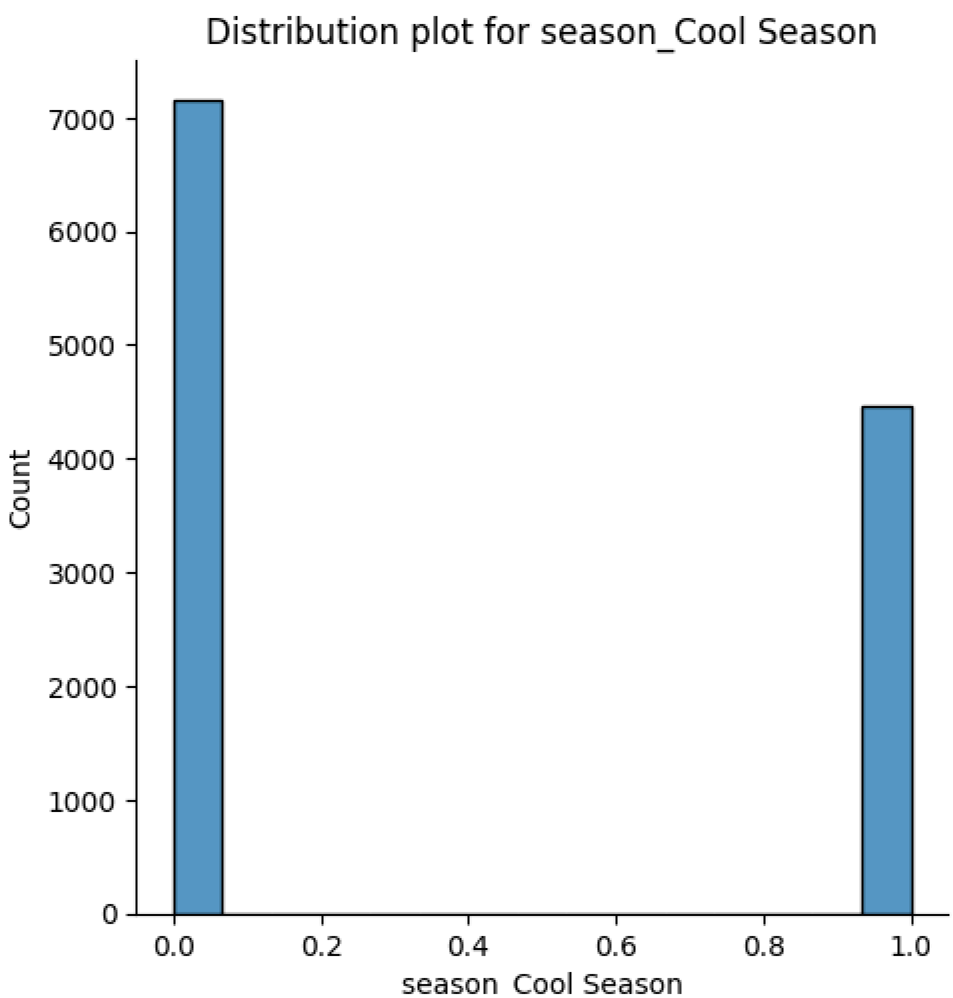
```
Unique factory_area values in X_train: [np.int64(54185), np.int64(123059), np.int64
(144736), np.int64(297638), np.int64(631723), np.int64(1148799), np.int64(4770457)]
Value counts:
factory_area
4770457    1659
144736     1659
297638     1659
1148799    1659
123059     1658
54185      1658
631723     1658
Name: count, dtype: int64
```

`season_Cool Season`

- X-train

In [180…

```
sns.displot(X_train, x='season_Cool Season')

plt.title('Distribution plot for season_Cool Season')

plt.show()
print('The distribution of season_Cool Season feature seems to be right-skewd distr
```



```
The distribution of season_Cool Season feature seems to be right-skewd distributed
```

In [181…

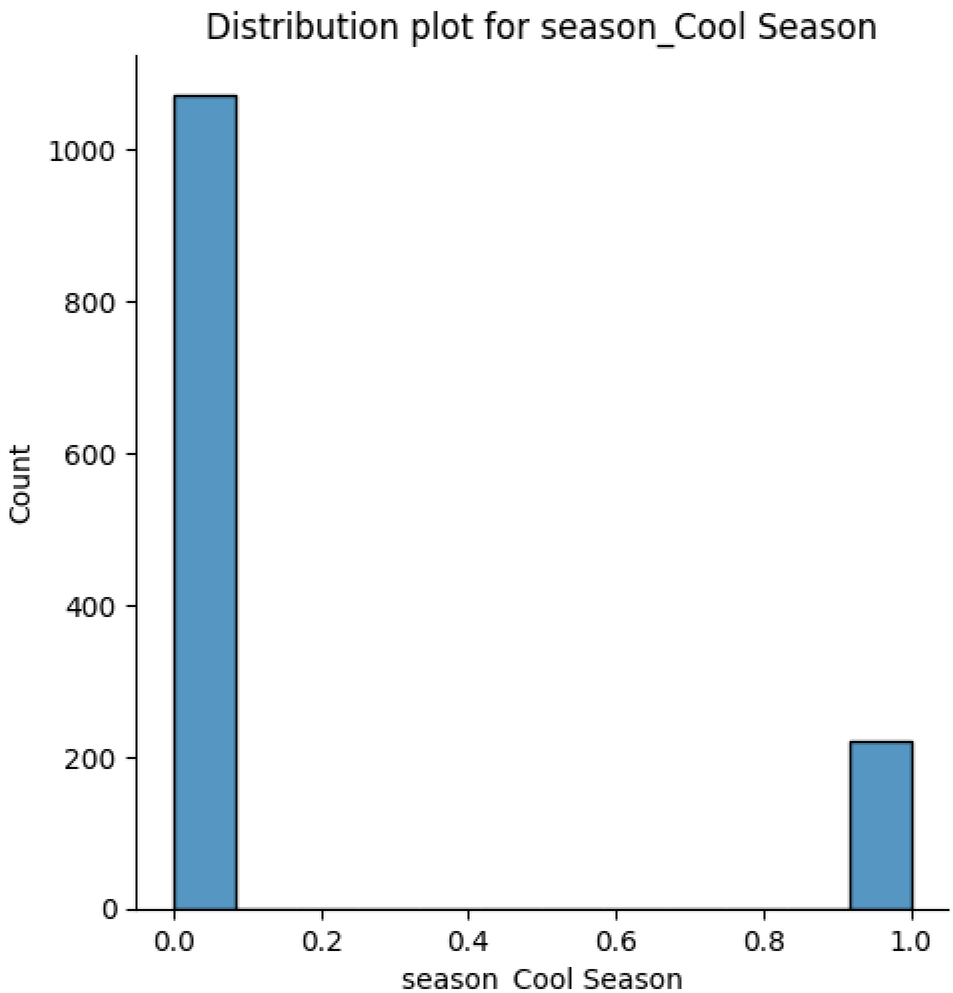
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['season_Cool Season'])
print('-'*30)
print(f"SKewness of season_Cool Season: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

```
------------------------------
SKewness of season_Cool Season: 0.4752
------------------------------
The skewness is being around 0.4752 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

- X_test

In [182…

```
sns.displot(X_test, x='season_Cool Season')

plt.title('Distribution plot for season_Cool Season')

plt.show()
print('The distribution of season_Cool Season feature seems to be right-skewd distr
```




```
The distribution of season_Cool Season feature seems to be right-skewd distributed
```

In [183…

```python
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['season_Cool Season'])
print('-'*30)
print(f"SKewness of season_Cool Season: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest taht the distribution is right-skewed')
```

```
------------------------------
SKewness of season_Cool Season: 1.7532
------------------------------
The skewness is being around 1.7532 which is skewed to the right side
This suggest taht the distribution is right-skewed
```

In [184…

```python
X_train.columns
```

Out[184…

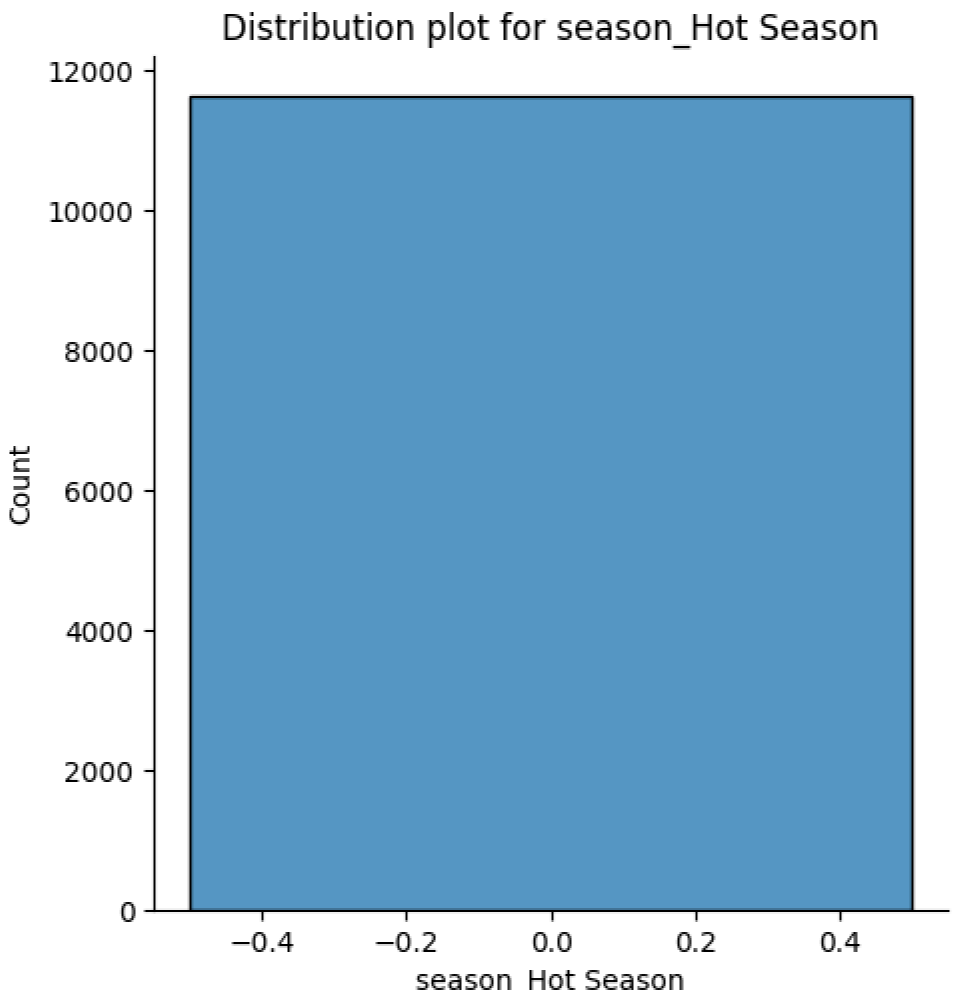
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

`season_Hot Season`

- X_train

In [185…

```
sns.displot(X_train, x='season_Hot Season')

plt.title('Distribution plot for season_Hot Season')

plt.show()
print('The distribution of season_Hot Season feature seems to be right-skewd distri
```




```
The distribution of season_Hot Season feature seems to be right-skewd distributed
```

In [186…

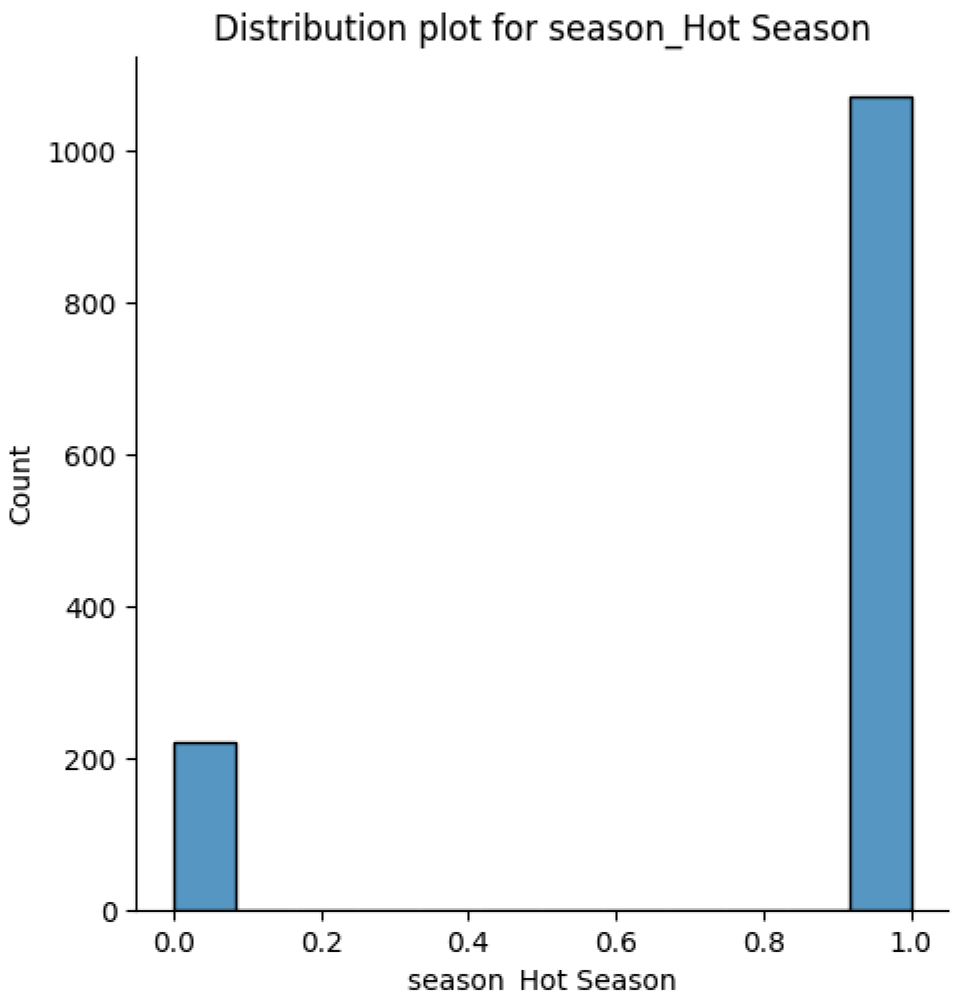
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['season_Hot Season'])
print('-'*30)
print(f"SKewness of season_Hot Season: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest taht the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of season_Hot Season: nan
------------------------------
The skewness is being around nan which is heavily skewed to the right side
This suggest taht the distribution is heavily right-skewed
```

- X_test

In [187…

```
sns.displot(X_test, x='season_Hot Season')

plt.title('Distribution plot for season_Hot Season')

plt.show()
print('The distribution of season_Hot Season feature seems to be right-skewd distri
```




```
The distribution of season_Hot Season feature seems to be right-skewd distributed
```

In [188…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['season_Hot Season'])
print('-'*30)
print(f"SKewness of season_Hot Season: {round(skew_value, 4)}")
print('-'*30)
```

```
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest taht the distribution is heavily right-skewed')
```

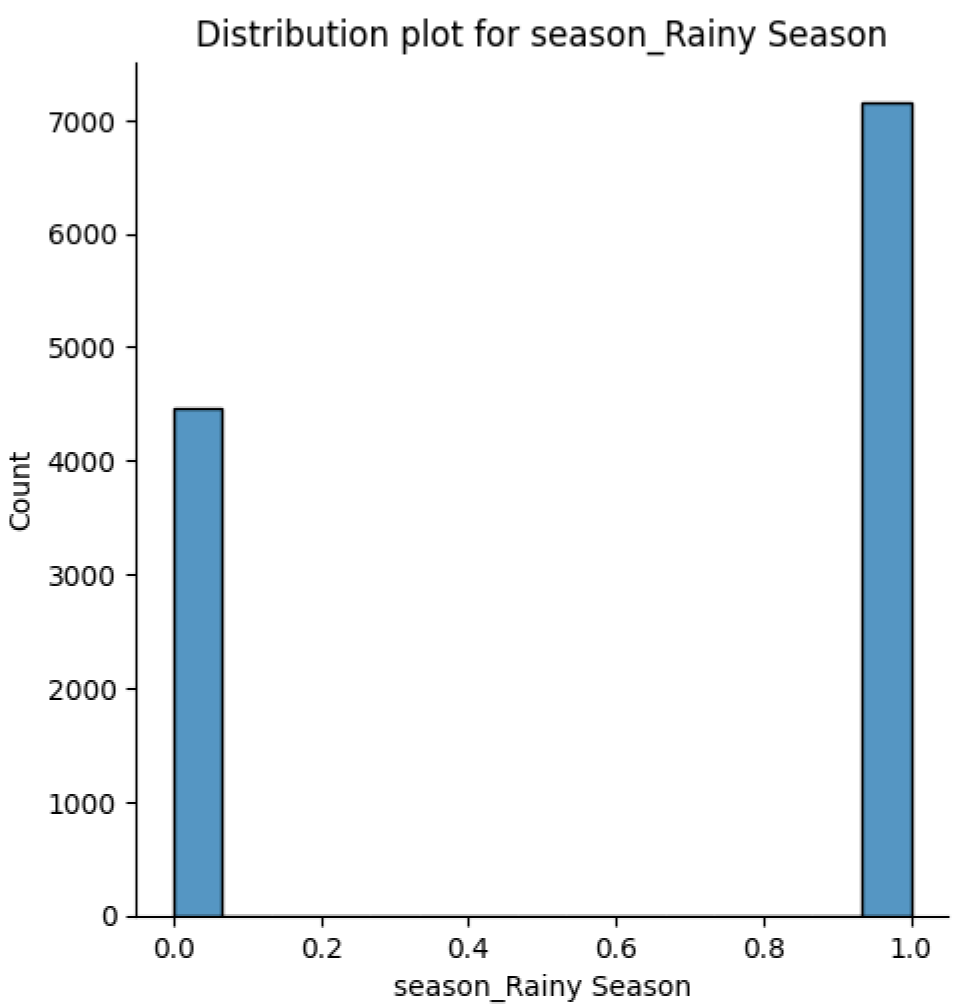
```
-----------------------------
SKewness of season_Hot Season: -1.7532
-----------------------------
The skewness is being around -1.7532 which is heavily skewed to the right side
This suggest taht the distribution is heavily right-skewed
```

season_Rainy Season

- X_train

In [189…

```
sns.displot(X_train, x='season_Rainy Season')

plt.title('Distribution plot for season_Rainy Season')

plt.show()
print('The distribution of season_Rainy Season feature seems to be normaly distribu
```




```
The distribution of season_Rainy Season feature seems to be normaly distributed
```

In [190…

```
# Check skewness
from scipy.stats import skew
```

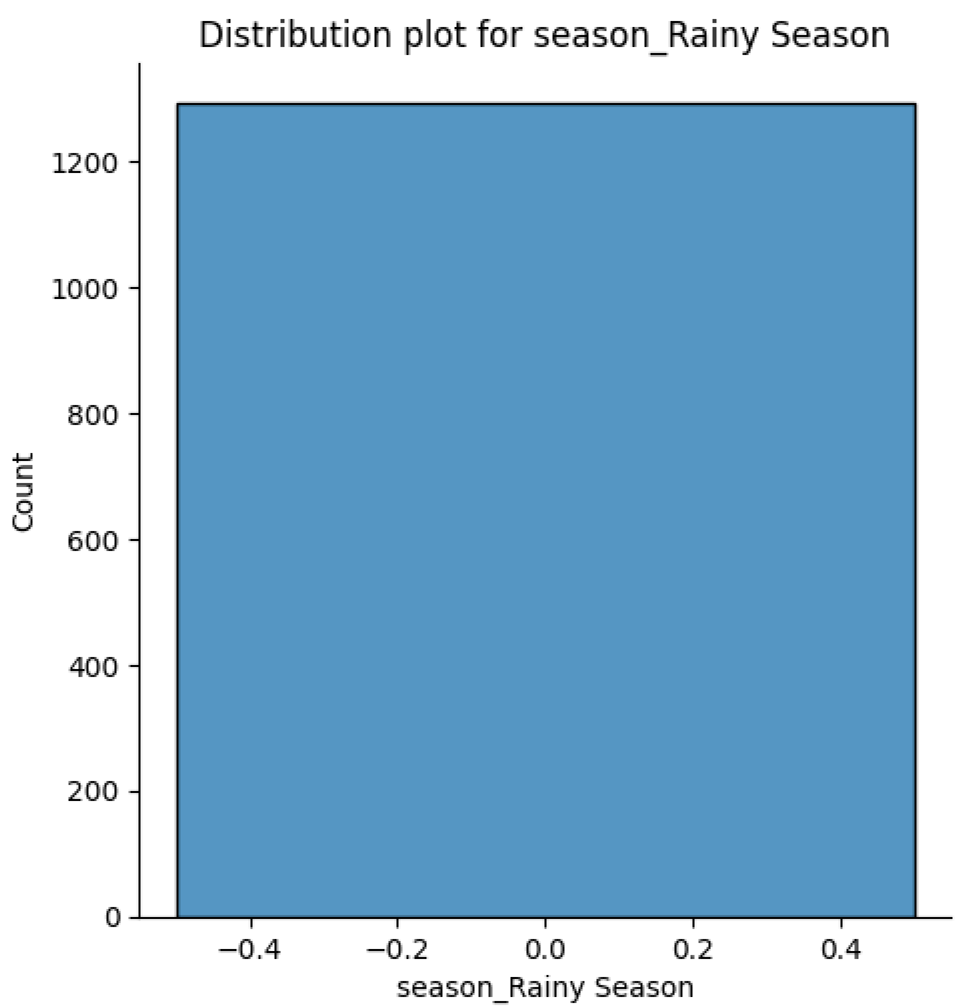
```
# Calculate skewness
skew_value = skew(X_train['season_Rainy Season'])
print('-'*30)
print(f"SKewness of season_Rainy Season: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is close to the c
print('This suggest that the distribution is normaly distributed')
```

```
------------------------------
SKewness of season_Rainy Season: -0.4752
------------------------------
The skewness is being around -0.4752 which is close to the center
This suggest that the distribution is normaly distributed
```

- X_test

In [191…

```
sns.displot(X_test, x='season_Rainy Season')

plt.title('Distribution plot for season_Rainy Season')

plt.show()
print('The distribution of season_Rainy Season feature seems to be normaly distribu
```




```
The distribution of season_Rainy Season feature seems to be normaly distributed
```

In [192…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['season_Rainy Season'])
print('-'*30)
print(f"SKewness of season_Rainy Season: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is close to the c
print('This suggest that the distribution is normaly distributed')
```

```
------------------------------
SKewness of season_Rainy Season: nan
------------------------------
The skewness is being around nan which is close to the center
This suggest that the distribution is normaly distributed
```

In [193…

```
X_train.columns
```

Out[193…

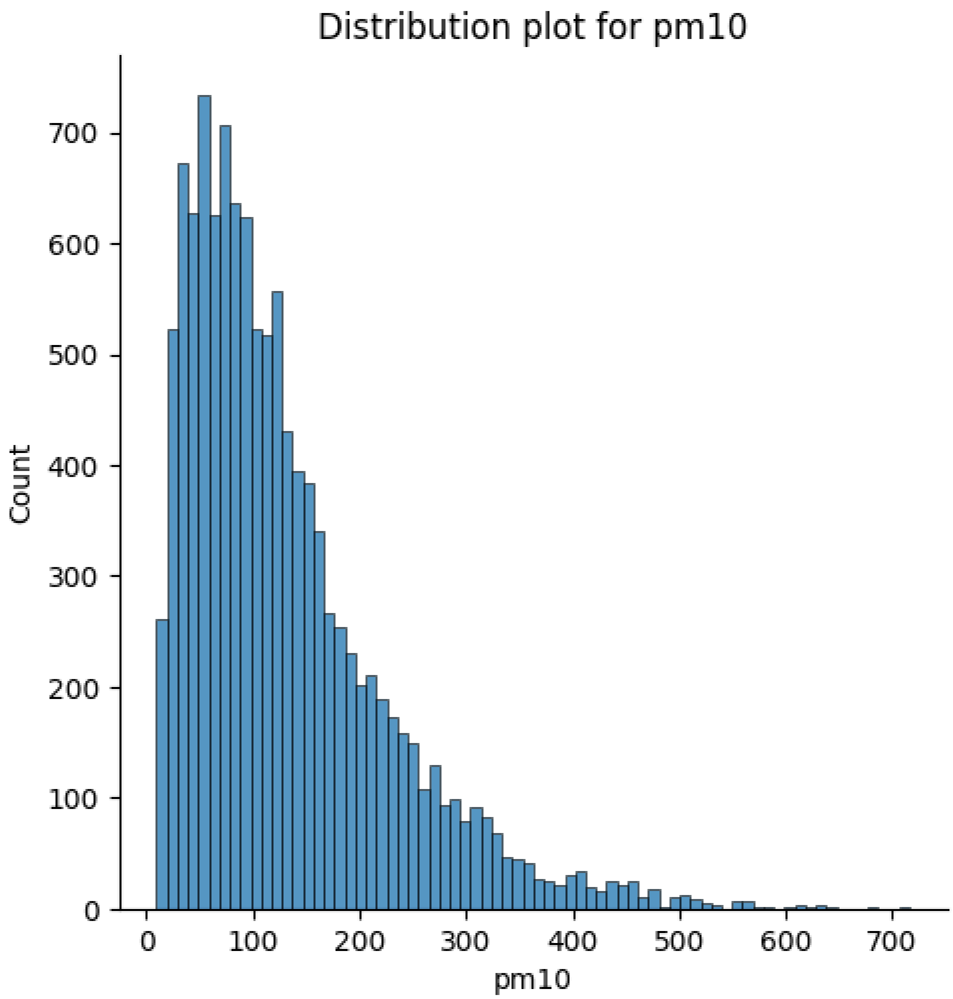
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

`pm10`

- X_train

In [194…

```
sns.displot(X_train, x='pm10')

plt.title('Distribution plot for pm10')

plt.show()
print('The distribution of pm10 feature seems to be heavily right-skewd distributio
```



The distribution of pm10 feature seems to be heavily right-skewd distribution

In [195…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['pm10'])
print('-'*30)
print(f"SKewness of pm10: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

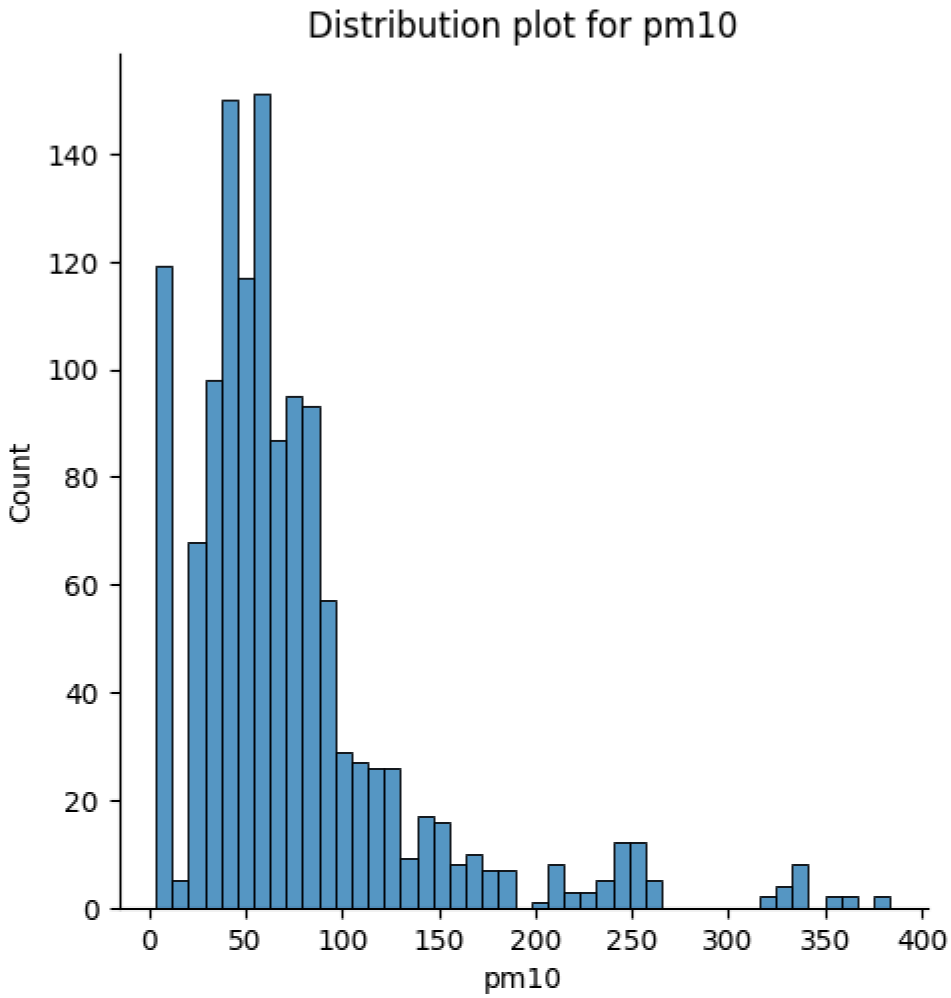
```
------------------------------
SKewness of pm10: 1.4901
------------------------------
The skewness is being around 1.4901 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

- X_test

In [196…

```
sns.displot(X_test, x='pm10')

plt.title('Distribution plot for pm10')
```

```
plt.show()
print('The distribution of pm10 feature seems to be heavily right-skewd distributio
```




```
The distribution of pm10 feature seems to be heavily right-skewd distribution
```

In [197…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['pm10'])
print('-'*30)
print(f"SKewness of pm10: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of pm10: 2.2215
------------------------------
The skewness is being around 2.2215 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

In [198…

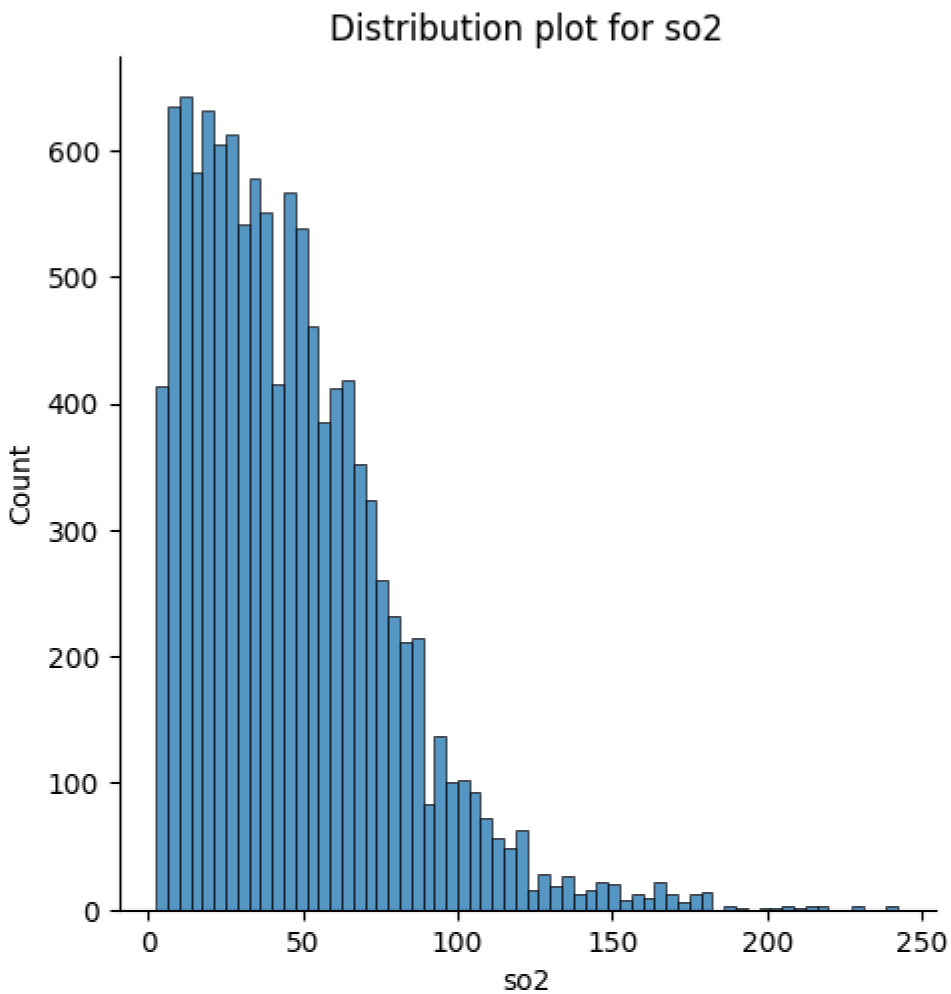
```
X_train.columns
```

Out[198…
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

`so2`

- X_train

In [199…
```
sns.displot(X_train, x='so2')

plt.title('Distribution plot for so2')

plt.show()
print('The distribution of so2 feature seems to be right-skewd distribution')
```




```
The distribution of so2 feature seems to be right-skewd distribution
```

In [200…
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['so2'])
```

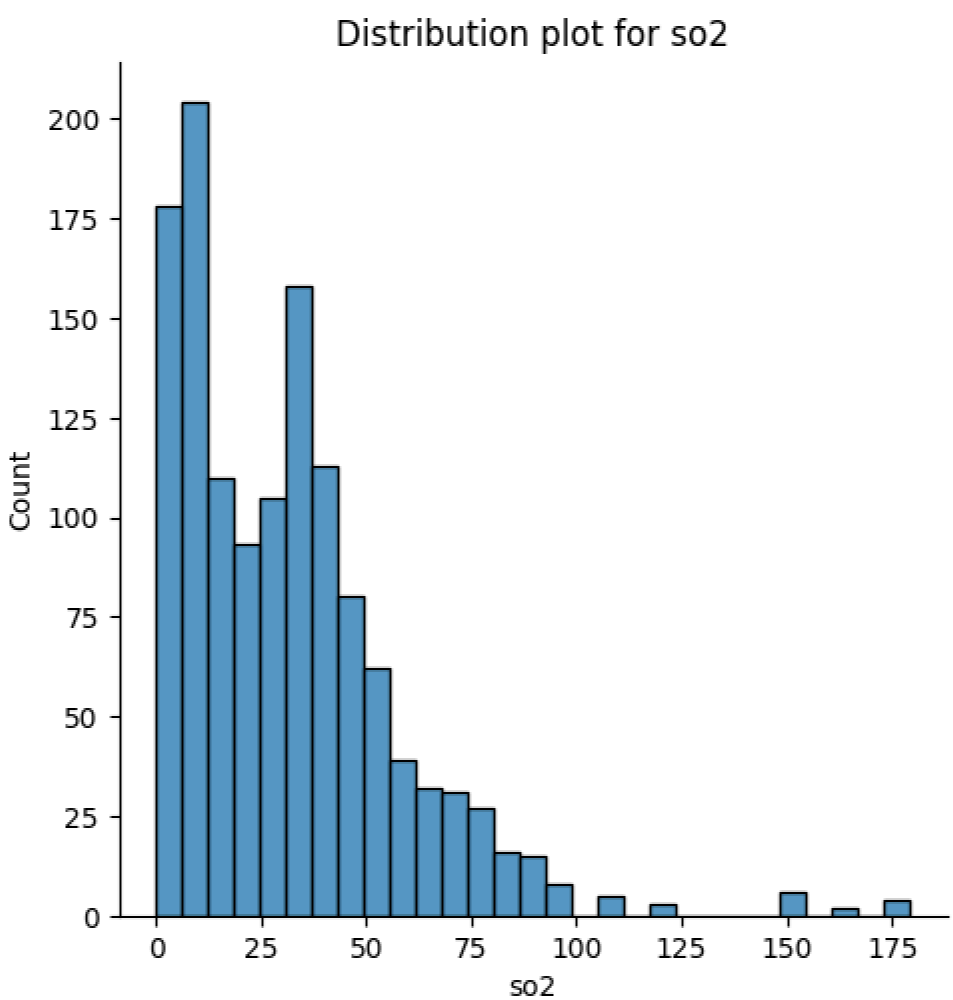
```
print('-'*30)
print(f"SKewness of so2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest that the distribution is right-skewed')
```

```
------------------------------
SKewness of so2: 1.2583
------------------------------
The skewness is being around 1.2583 which is skewed to the right side
This suggest that the distribution is right-skewed
```

- X_test

In [201…

```
sns.displot(X_test, x='so2')

plt.title('Distribution plot for so2')

plt.show()
print('The distribution of so2 feature seems to be right-skewd distribution')
```




```
The distribution of so2 feature seems to be right-skewd distribution
```

In [202…

```
# Check skewness
from scipy.stats import skew
```

```
# Calculate skewness
skew_value = skew(X_test['so2'])
print('-'*30)
print(f"SKewness of so2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is skewed to the
print('This suggest that the distribution is right-skewed')
```

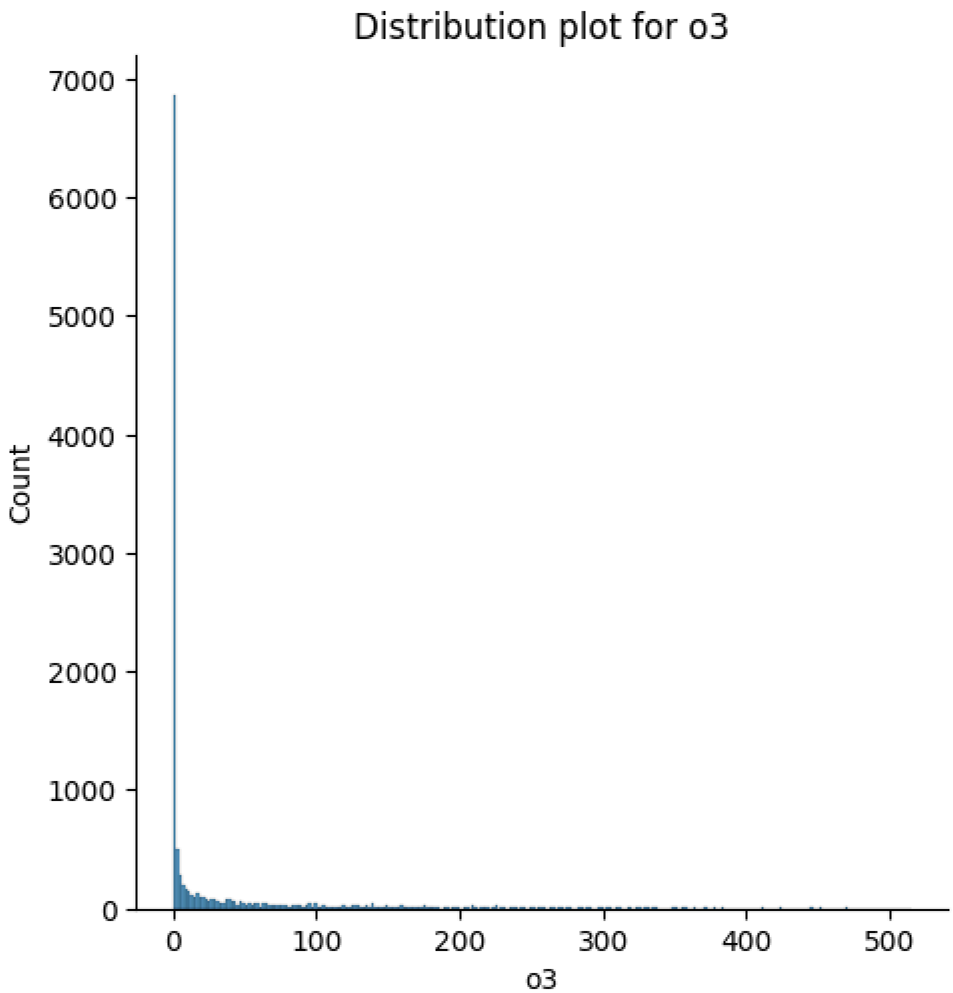
```
------------------------------
SKewness of so2: 1.5841
------------------------------
The skewness is being around 1.5841 which is skewed to the right side
This suggest that the distribution is right-skewed
```

`o3`

- X_train

In [203…

```
sns.displot(X_train, x='o3')

plt.title('Distribution plot for o3')

plt.show()
print('The distribution of o3 feature seems to be heavily right-skewd distribution'
```



The distribution of o3 feature seems to be heavily right-skewd distribution

In [204…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['o3'])
print('-'*30)
print(f"SKewness of o3: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

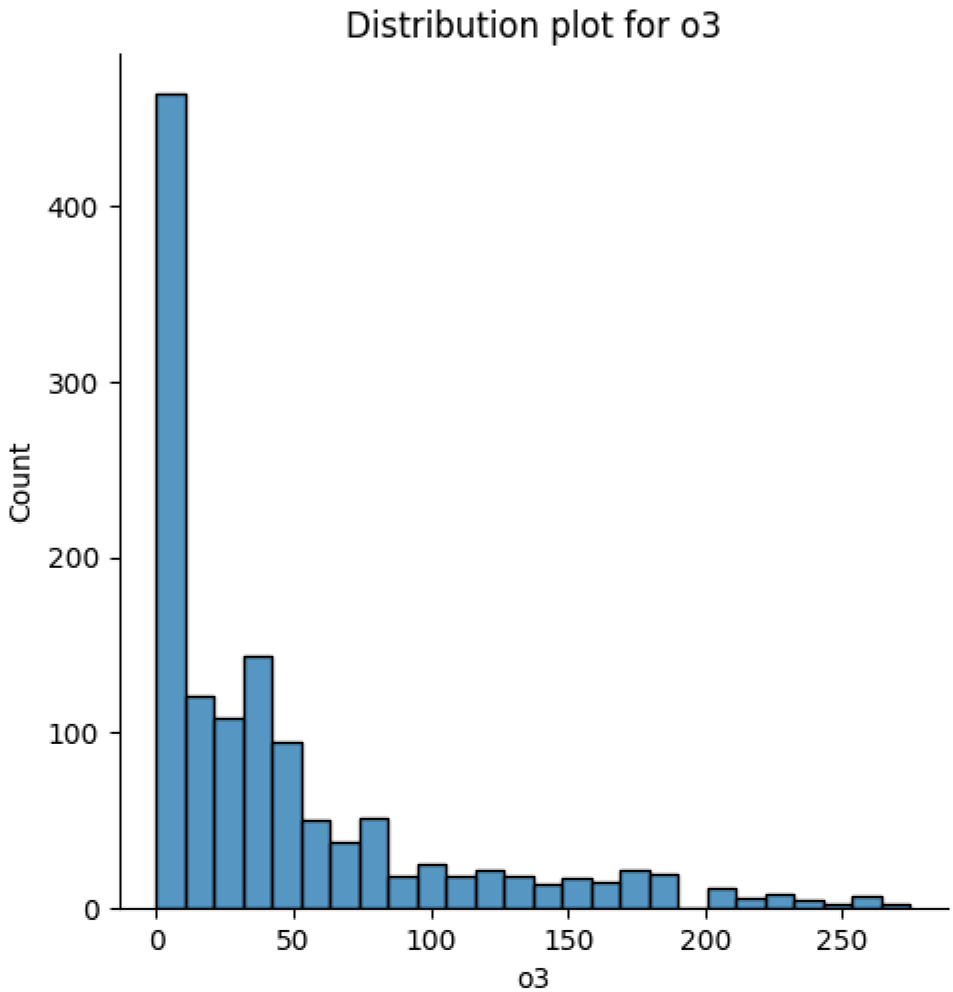
```
------------------------------
SKewness of o3: 3.0859
------------------------------
The skewness is being around 3.0859 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

- X_test

In [205…

```
sns.displot(X_test, x='o3')

plt.title('Distribution plot for o3')
```

```
plt.show()
print('The distribution of o3 feature seems to be heavily right-skewd distribution'
```




```
The distribution of o3 feature seems to be heavily right-skewd distribution
```

In [206…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['o3'])
print('-'*30)
print(f"SKewness of o3: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

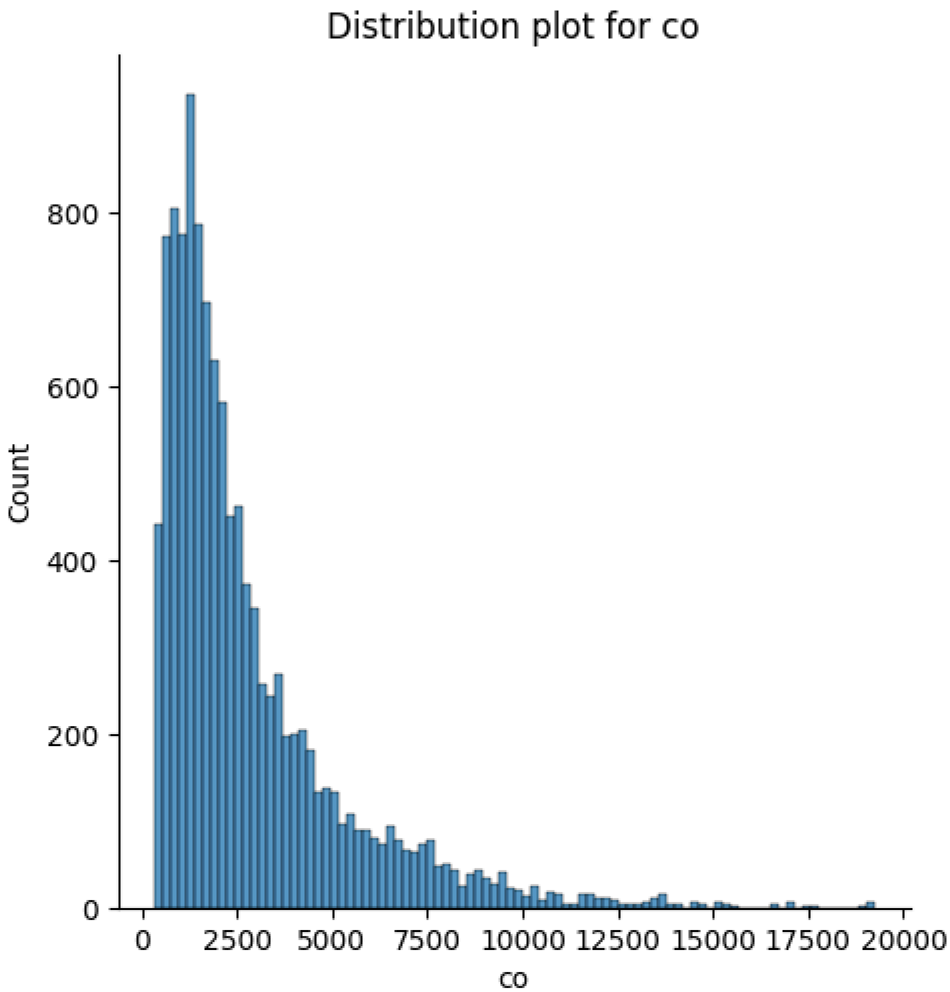
```
------------------------------
SKewness of o3: 1.6909
------------------------------
The skewness is being around 1.6909 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

`co`

- X_train

In [207…

```
sns.displot(X_train, x='co')

plt.title('Distribution plot for co')

plt.show()
print('The distribution of co feature seems to be heavily right-skewd distribution'
```




```
The distribution of co feature seems to be heavily right-skewd distribution
```

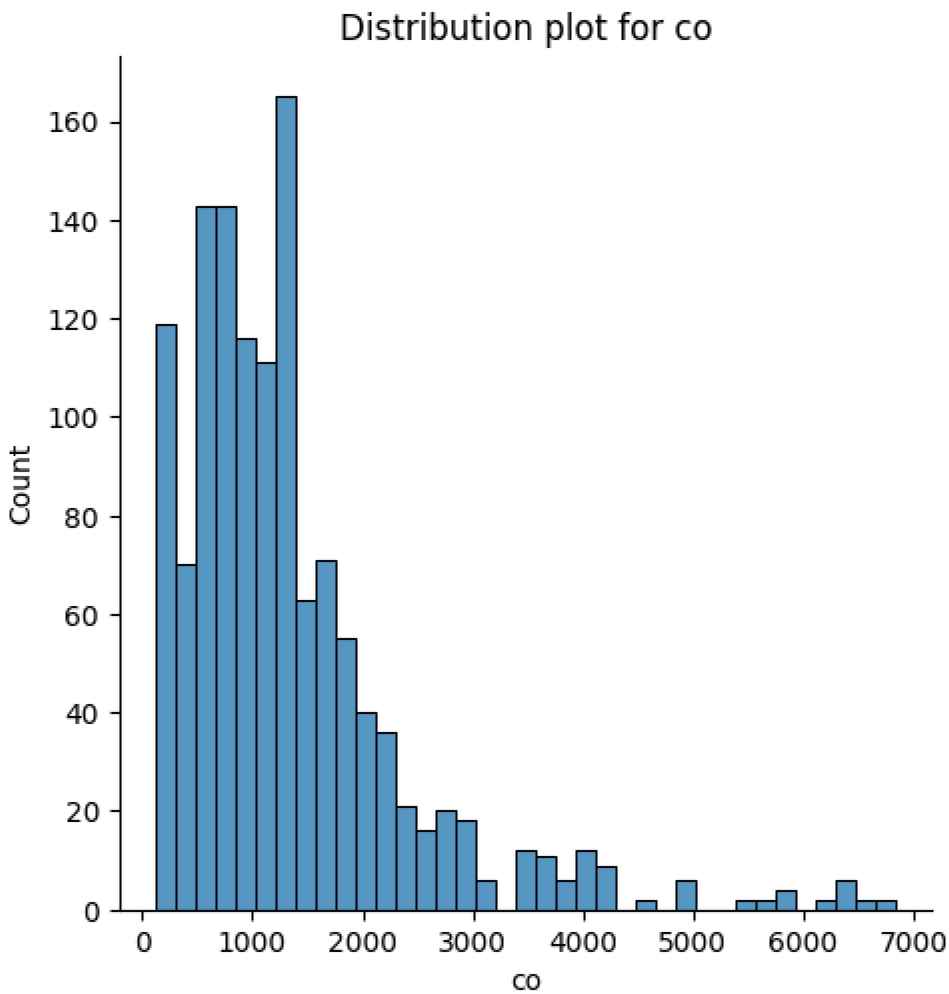
In [208…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['co'])
print('-'*30)
print(f"SKewness of co: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of co: 2.0521
------------------------------
The skewness is being around 2.0521 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

- X_test

In [209…
```
sns.displot(X_test, x='co')

plt.title('Distribution plot for co')

plt.show()
print('The distribution of co feature seems to be heavily right-skewd distribution'
```




```
The distribution of co feature seems to be heavily right-skewd distribution
```

In [210…
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['co'])
print('-'*30)
print(f"SKewness of co: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of co: 2.0962
------------------------------
The skewness is being around 2.0962 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

The distribution summary for the processed trainning dataset

- `'fuel_eff'` has the normal distribution: Skewness of fuel_eff: 0.0015
- `'year'` has the left-skewed distribution: Skewness of year: -0.82
- `'max_power'` has the `right-skewed` distribution: Skewness of max_power: `0.84`
- `'km_driven'` has the `right-skewed` distribution: Skewness of km_driven: `0.75`

Handling Outliners

- We found out that some of the features are unbalanced distributed
- Thus, this can be caused by having the outliner and is also leaving unsolved
- To improve the model performance in prediction, the outliners that can alter the predicting values must be handled
- **Rule of trump**: The catrgorical features must be excluded from scaling

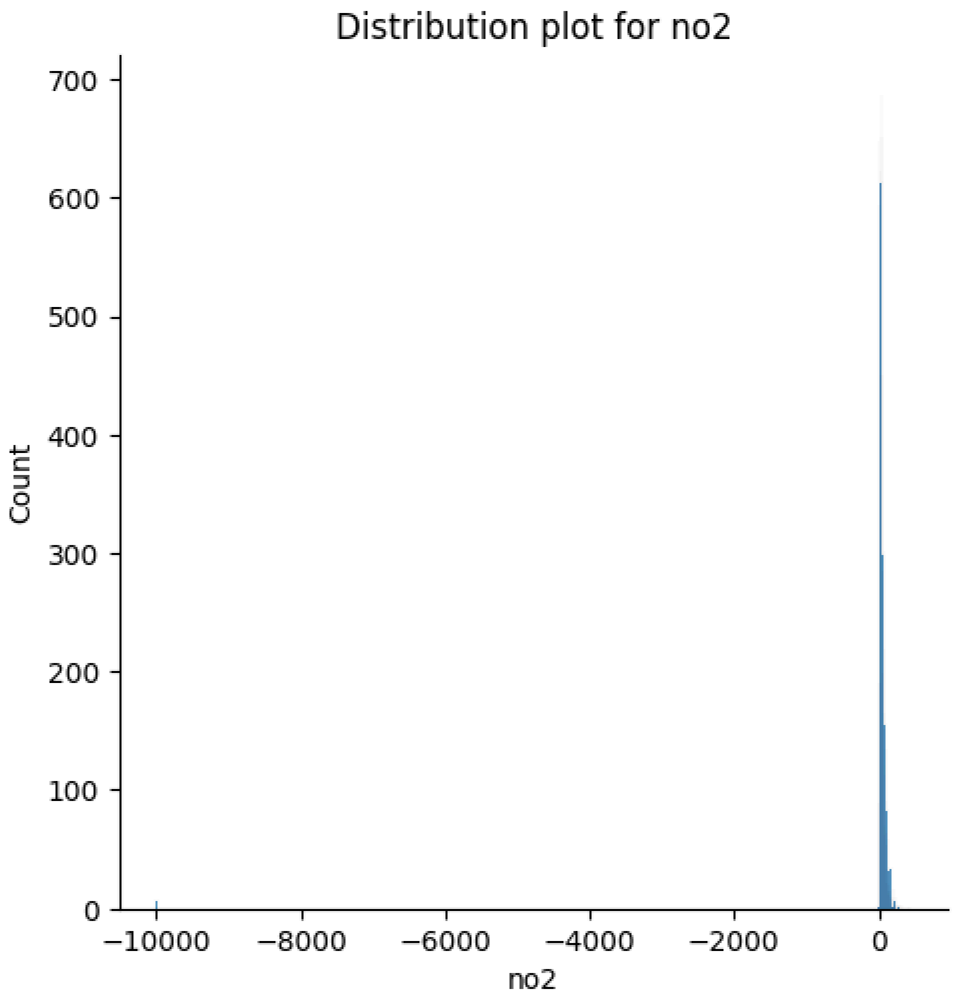
Check propamatic feature with abnormal distribution

`no2` in X_train **Need to be fixed**

- X_train

In [211…

```
sns.displot(X_train, x='no2')

plt.title('Distribution plot for no2')

plt.show()
print('The distribution of no2 feature seems to be right-skewd distribution')
```



The distribution of no2 feature seems to be right-skewd distribution

In [212…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train['no2'])
print('-'*30)
print(f"SKewness of no2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is abnormal as th
print('This suggest that the distribution is abnormal as the further investigation
```

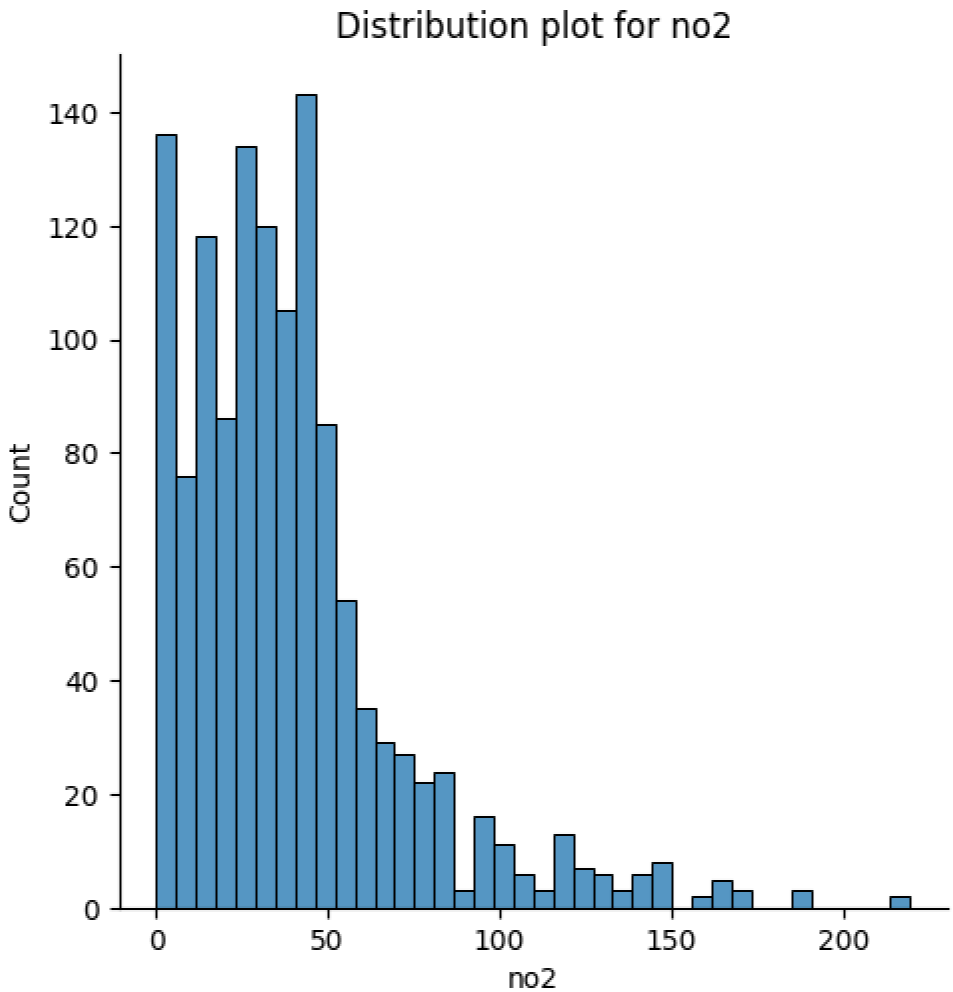
```
------------------------------
SKewness of no2: -39.3749
------------------------------
The skewness is being around -39.3749 which is abnormal as the further investigation
is needed
This suggest that the distribution is abnormal as the further investigation is neede
```

- X_test

In [213…

```
sns.displot(X_test, x='no2')

plt.title('Distribution plot for no2')
```

```
plt.show()
print('The distribution of no2 feature seems to be right-skewd distribution')
```




```
The distribution of no2 feature seems to be right-skewd distribution
```

In [214…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_test['no2'])
print('-'*30)
print(f"SKewness of no2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of no2: 1.7355
------------------------------
The skewness is being around 1.7355 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

In [215…

```
X_train.columns
```

Out[215…
```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

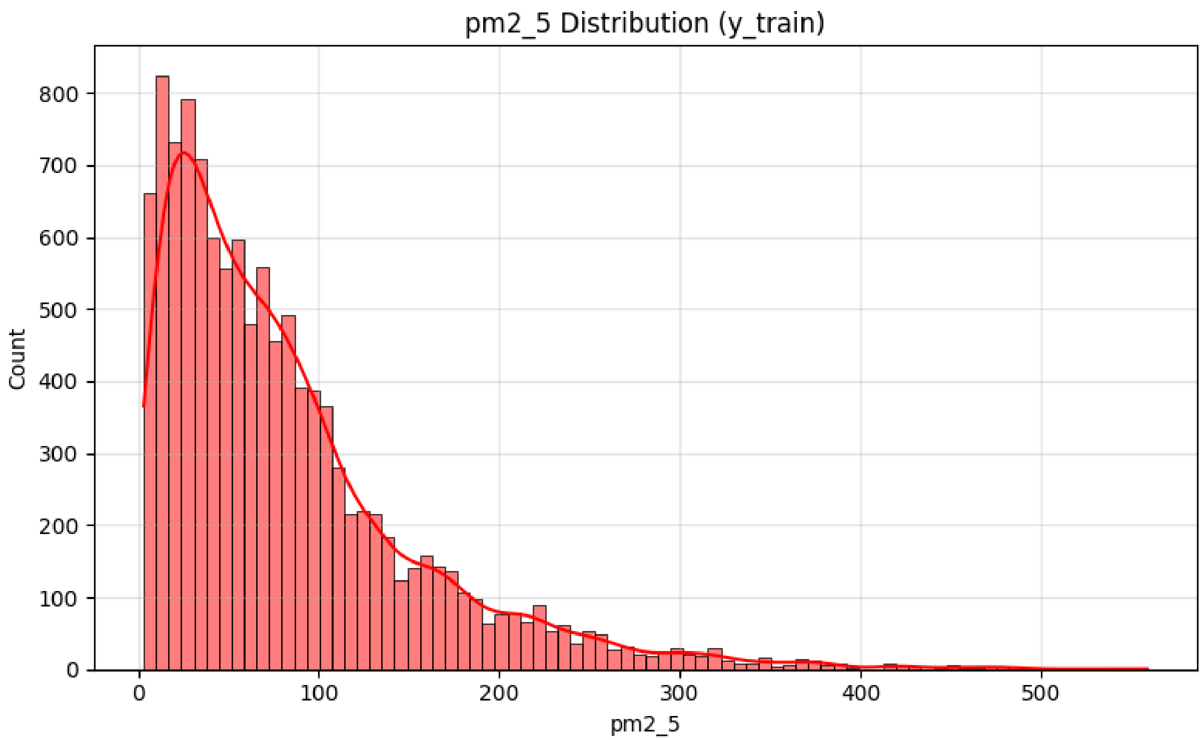
`pm2_5` in y_train needed to be fixed

- y_train

In [216…
```
y_train
```

Out[216…
```
0         20.68
1         31.13
2         38.68
3         31.13
4         38.68
          ...  
11605     99.46
11606     81.52
11607    214.77
11608    144.39
11609    214.77
Name: pm2_5, Length: 11610, dtype: float64
```

In [217…
```
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(8, 5))
sns.histplot(y_train, kde=True, color="red")
plt.title("pm2_5 Distribution (y_train)")
plt.xlabel("pm2_5")
plt.ylabel("Count")
plt.grid(alpha=0.3)
plt.tight_layout()
plt.show()
```



In [218…

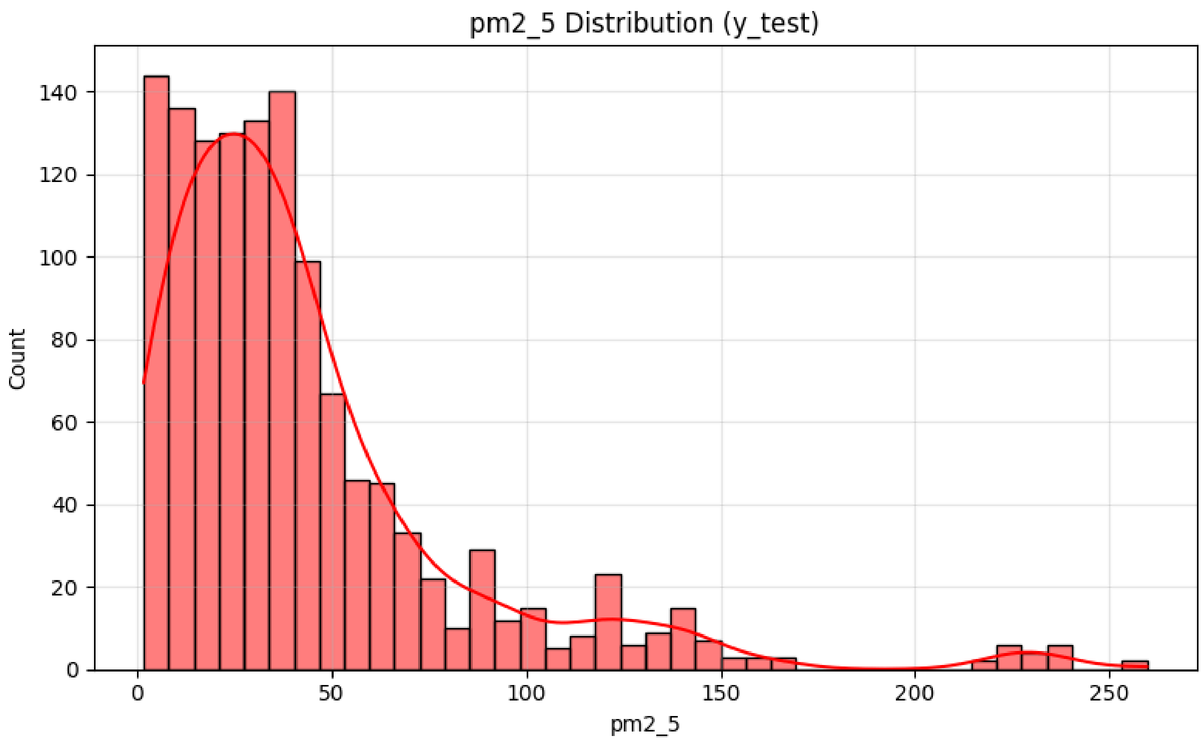
```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(y_train)
print('-'*30)
print(f"SKewness of pm2_5: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is abnormal as th
print('This suggest that the distribution is abnormal as the further investigation
```

```
------------------------------
SKewness of pm2_5: 1.7241
------------------------------
The skewness is being around 1.7241 which is abnormal as the further investigation i
s needed
This suggest that the distribution is abnormal as the further investigation is neede
```

- y_test

In [219…

```
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(8, 5))
sns.histplot(y_test, kde=True, color="red")
plt.title("pm2_5 Distribution (y_test)")
plt.xlabel("pm2_5")
plt.ylabel("Count")
plt.grid(alpha=0.3)
plt.tight_layout()
plt.show()
```



In [220…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(y_test)
print('-'*30)
print(f"SKewness of no2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is abnormal as th
print('This suggest that the distribution is abnormal as the further investigation
```

```
------------------------------
SKewness of no2: 2.2416
------------------------------
The skewness is being around 2.2416 which is abnormal as the further investigation i
s needed
This suggest that the distribution is abnormal as the further investigation is neede
```

In [221…

```
upper_bound = y_train.quantile(0.94)
# lower_bound = y_train.quantile(0.05)

# y_train = y_train.copy()
y_train[y_train > upper_bound] = upper_bound
# y_train[y_train < lower_bound] = lower_bound
```

In [222…

```
print("Old Max:", y_train.max())

# Replace any pm2_5 values above threshold with the median
threshold = 150
y_train[y_train > threshold] = y_train.median()

print("Number of outliers replaced:",
```

```
      (y_train > threshold).sum())
print("Old Max:", y_train.max(), "| New Max:", y_train.max())
```

```
Old Max: 218.6
Number of outliers replaced: 0
Old Max: 149.99 | New Max: 149.99
```

In [223…

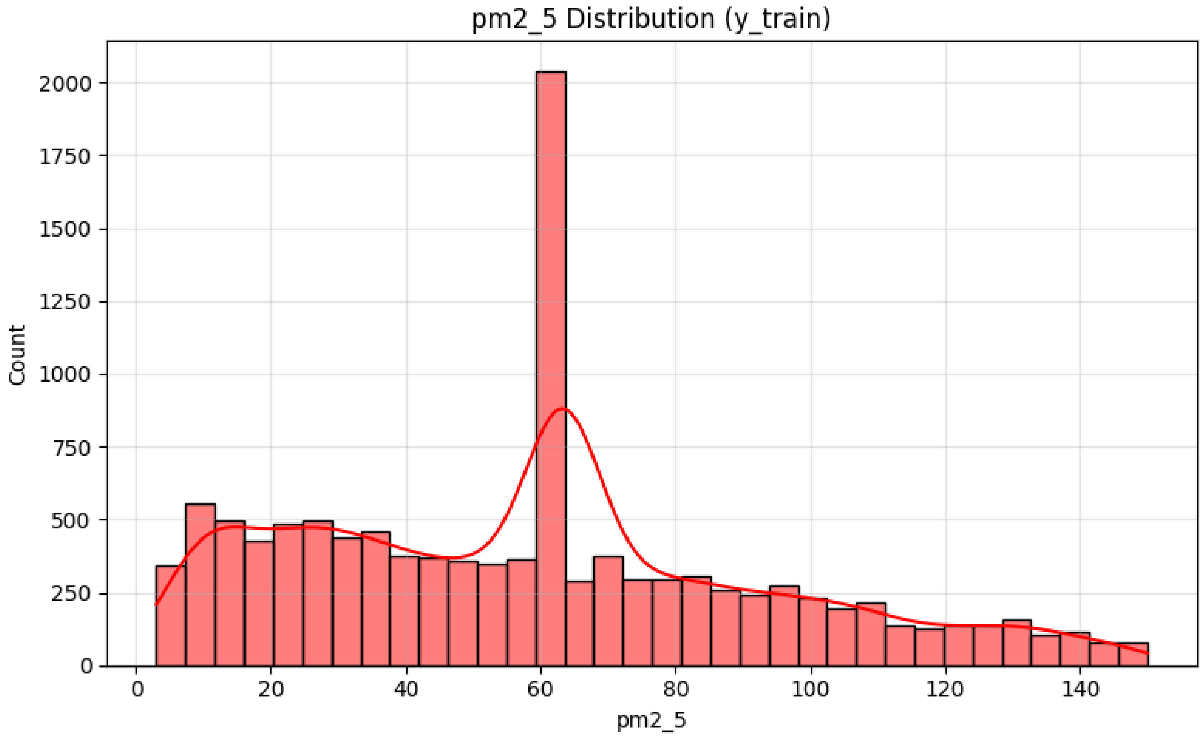
```
print("Old Max:", y_test.max())

# Replace any pm2_5 values above threshold with the median
threshold = 150
y_test[y_test > threshold] = y_test.median()

print("Number of outliers replaced:",
      (y_test > threshold).sum())
print("New Max:", y_test.max())
```

```
Old Max: 259.56
Number of outliers replaced: 0
New Max: 144.71
 259.56
Number of outliers replaced: 0
New Max: 144.71
```

After capping outliners, check distribution and skewness again

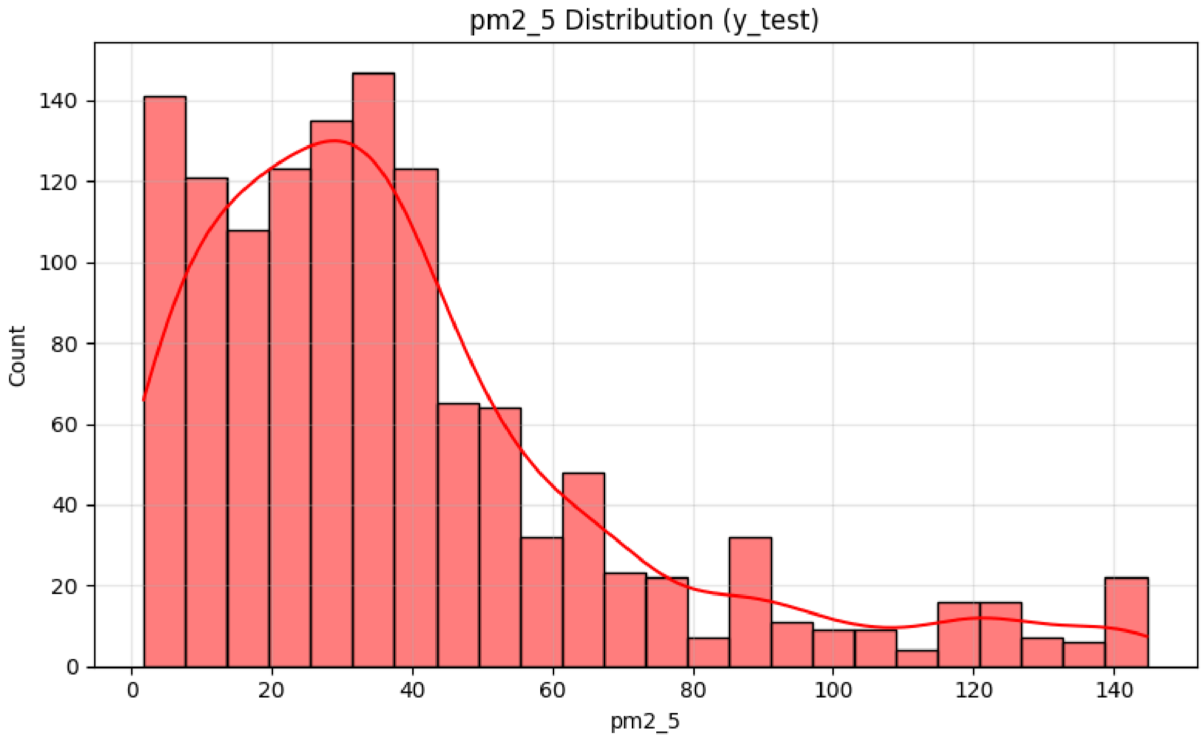
In [224…

```
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(8, 5))
sns.histplot(y_train, kde=True, color="red")
plt.title("pm2_5 Distribution (y_train)")
plt.xlabel("pm2_5")
plt.ylabel("Count")
plt.grid(alpha=0.3)
plt.tight_layout()
plt.show()
```



In [225…

```
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(8, 5))
sns.histplot(y_test, kde=True, color="red")
plt.title("pm2_5 Distribution (y_test)")
plt.xlabel("pm2_5")
plt.ylabel("Count")
plt.grid(alpha=0.3)
plt.tight_layout()
plt.show()
```



Possible causes of extreme abnormal distribution of `no2`

1. Distribution plot shows extreme negative skewness

- The strange distribution reaching down to -10,000 and beyond is not normal at all.
- NO_2 (Nitrogen Dioxide) levels can't realistically be negative in such extreme ways — it's likely:
  - Corrupted values
  - Measurement/recording errors
  - Or possibly placeholder values for missing data (e.g., -9999)

2. Skewness of -54.6277:

- This is extremely negative skew, which strongly contradicts our plot description ("right-skewed").
- This kind of value clearly shows abnormal, broken, or erroneous entries.

-> **Issue found: `X_train['no2']` column contains severe outliers or corrupted data, probably negative values that shouldn't be there.**

Solution:

- Check for negative values and count occuerances

- Investigate or clean them

In [226…

```
# Check for negative values
print(X_train['no2'].describe())
print('-'*40)
print(f"Min value: {X_train['no2'].min()}")
print('-'*40)
print(f"Negative values count: {(X_train['no2'] < 0).sum()}")
```

```
count    11610.000000
mean        44.619483
std        249.396851
min      -9999.000000
25%         27.080000
50%         41.130000
75%         63.750000
max        433.210000
Name: no2, dtype: float64
----------------------------------------
Min value: -9999.0
----------------------------------------
Negative values count: 7
```

In [227…

```
# Remove rows with negative NO2
X_train_cleaned = X_train[X_train['no2'] >= 0]
```

In [228…

```
X_train_cleaned
```

Out[228…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11603 rows × 18 columns

In [229…

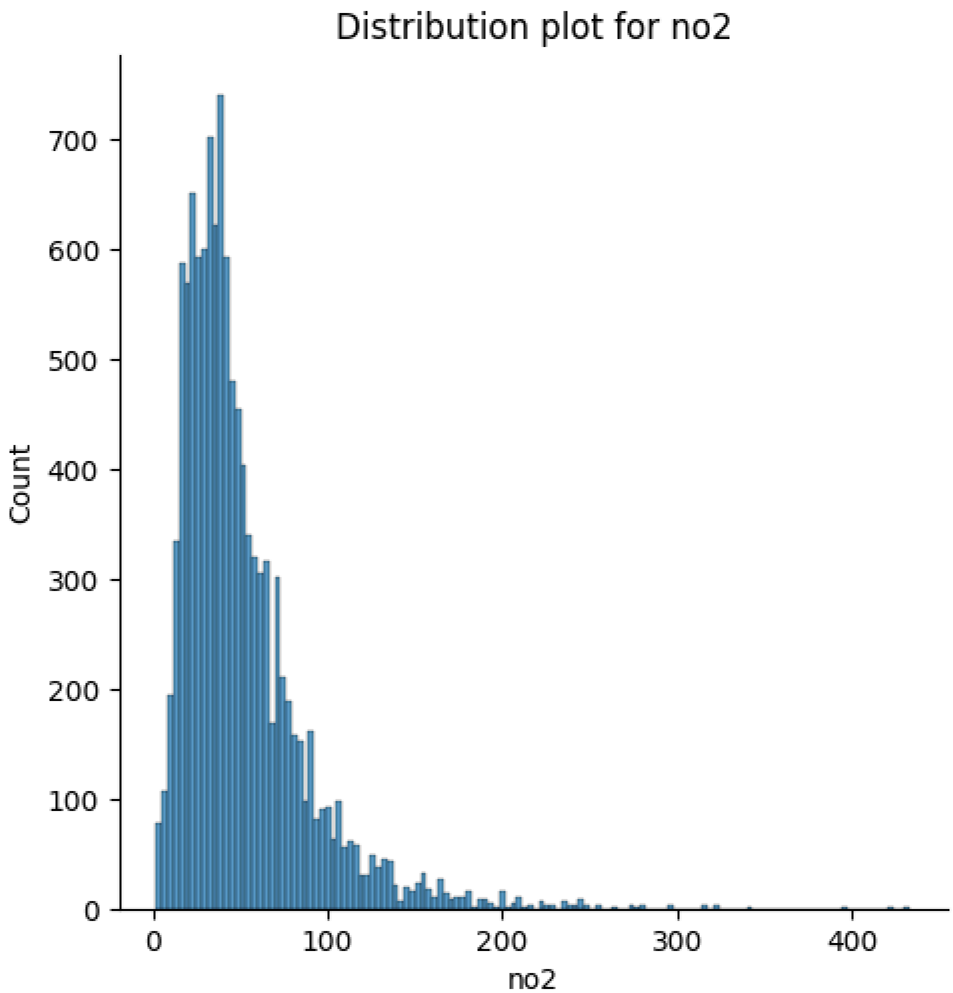
```
# Check for negative values
print(X_train_cleaned['no2'].describe())
print('-'*40)
print(f"Min value: {X_train_cleaned['no2'].min()}")
print('-'*40)
print(f"Negative values count: {(X_train_cleaned['no2'] < 0).sum()}")
```

```
count    11603.000000
mean        50.678721
std         36.574232
min          2.210000
25%         27.080000
50%         41.130000
75%         63.750000
max        433.210000
Name: no2, dtype: float64
----------------------------------------
Min value: 2.21
----------------------------------------
Negative values count: 0
```

The cleaned `no2` (After handling corrupted values)

In [230…

```
# Check distribution again
sns.displot(X_train_cleaned, x='no2')

plt.title('Distribution plot for no2')

plt.show()
print('The distribution of no2 feature seems to be right-skewd distribution')
```



The distribution of no2 feature seems to be right-skewd distribution

In [231…

```
# Check skewness
from scipy.stats import skew

# Calculate skewness
skew_value = skew(X_train_cleaned['no2'])
print('-'*30)
print(f"SKewness of no2: {round(skew_value, 4)}")
print('-'*30)
print(f'The skewness is being around {round(skew_value, 4)} which is heavily skewed
print('This suggest that the distribution is heavily right-skewed')
```

```
------------------------------
SKewness of no2: 2.3724
------------------------------
The skewness is being around 2.3724 which is heavily skewed to the right side
This suggest that the distribution is heavily right-skewed
```

8. Scaling

Log-transformation for right-skewed numerical features

All these plots we have found:

- `pm10`
- `so2`
- `o3`
- `co`
- `no2`

They have to be log-transformed due to:

- They are all heavily right-skewed
- Continuous numerical features
- Showing long tails and concentrated values near zero
- Vulnerable to model distortion, especially with linear models or distance-based algorithms (like KNN, SVM, Logistic Regression, etc.)

In [232…

```
# Apply log1p (log(1 + x)) for safe transformation
for col in ['pm10', 'so2', 'o3', 'co', 'no2']:
    X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
    X_test[col + '_log'] = np.log1p(X_test[col])

X_train_cleaned = X_train_cleaned.drop(columns=['co', 'no2', 'o3', 'pm10', 'so2'])
X_test = X_test.drop(columns=['co', 'no2', 'o3', 'pm10', 'so2'])
```

```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1145569456.py:3: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/u
ser_guide/indexing.html#returning-a-view-versus-a-copy
  X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1145569456.py:3: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/u
ser_guide/indexing.html#returning-a-view-versus-a-copy
  X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1145569456.py:3: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/u
ser_guide/indexing.html#returning-a-view-versus-a-copy
  X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1145569456.py:3: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/u
ser_guide/indexing.html#returning-a-view-versus-a-copy
  X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1145569456.py:3: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/u
ser_guide/indexing.html#returning-a-view-versus-a-copy
  X_train_cleaned[col + '_log'] = np.log1p(X_train_cleaned[col])
```

In [233…

```
X_train_cleaned
```

Out[233…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11603 rows × 18 columns

In [234…

```
X_test
```

Out[234…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
11610	0	0	0	0	1	0	
11611	0	0	0	0	0	1	
11612	0	0	0	0	0	0	
11613	1	0	0	0	0	0	
11614	0	1	0	0	0	0	
...	...	...	...	...	...	...	
14128	0	0	1	0	0	0	
14129	0	0	0	1	0	0	
14130	0	0	0	0	1	0	
14131	0	0	0	0	0	1	
14132	0	0	0	0	0	0	

1291 rows × 18 columns

In [235…

```
# Align target to the cleaned X
y_train_cleaned = y_train.loc[X_train_cleaned.index]
```

Apply Standard Scaler

In [236…

```
X_train.columns
```

Out[236…

```
Index(['station_10T', 'station_11T', 'station_12T', 'station_15T',
       'station_3T', 'station_5T', 'station_61T', 'temp', 'population_density',
       'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10', 'so2', 'no2', 'o3', 'co'],
      dtype='object')
```

In [237…

```
from sklearn.preprocessing import StandardScaler

# Choose all columns to be scaled
log_cols = ['temp', 'population_density',
        'factory_area', 'season_Cool Season', 'season_Hot Season',
       'season_Rainy Season', 'pm10_log', 'so2_log', 'no2_log', 'co_log', 'o3_log']

# Fit only on training data, transform both
scaler = StandardScaler()
X_train_cleaned[log_cols] = scaler.fit_transform(X_train_cleaned[log_cols])
X_test[log_cols] = scaler.transform(X_test[log_cols])
```

In [238…

```
X_train_cleaned
```

Out[238…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11603 rows × 18 columns

In [239…
```
X_test
```

Out[239…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
11610	0	0	0	0	1	0	
11611	0	0	0	0	0	1	
11612	0	0	0	0	0	0	
11613	1	0	0	0	0	0	
11614	0	1	0	0	0	0	
...	...	...	...	...	...	...	
14128	0	0	1	0	0	0	
14129	0	0	0	1	0	0	
14130	0	0	0	0	1	0	
14131	0	0	0	0	0	1	
14132	0	0	0	0	0	0	

1291 rows × 18 columns

In [240…
```
y_test
```

Out[240…
```
11610    144.39
11611    144.39
11612     87.53
11613     80.80
11614     32.59
          ...
14128      3.96
14129      4.18
14130      3.96
14131      3.96
14132      3.81
Name: pm2_5, Length: 1291, dtype: float64
```

In [241…
```
y_train
```

Out[241…

```
0         20.680
1         31.130
2         38.680
3         31.130
4         38.680
           ...
11605     99.460
11606     81.520
11607     63.305
11608    144.390
11609     63.305
Name: pm2_5, Length: 11610, dtype: float64
```

Check the summary statistics for both features to confirm the transformations

In [242…

```
print(X_train_cleaned[log_cols].describe())
print('-'*140)
print('According to the summary statistics, the \'pm10_log\', \'so2_log\', \'co_log
```

```
               temp  population_density  factory_area  season_Cool Season  \
count  1.160300e+04        1.160300e+04  1.160300e+04        1.160300e+04   
mean  -5.584892e-15        1.604240e-16  5.492269e-18       -2.351533e-16   
std    1.000043e+00        1.000043e+00  1.000043e+00        1.000043e+00   
min   -3.048272e+00       -1.365528e+00 -6.179456e-01       -7.906137e-01   
25%   -7.105744e-01       -6.805566e-01 -5.740861e-01       -7.906137e-01   
50%   -3.279908e-02       -2.992572e-01 -4.629130e-01       -7.906137e-01   
75%    6.951818e-01        1.255225e+00  7.911237e-02        1.264840e+00   
max    3.873823e+00        1.679312e+00  2.385410e+00        1.264840e+00   

       season_Hot Season  season_Rainy Season      pm10_log       so2_log  \
count            11603.0         1.160300e+04  1.160300e+04  1.160300e+04   
mean                 0.0        -7.838444e-17  5.290950e-16  2.694465e-16   
std                  0.0         1.000043e+00  1.000043e+00  1.000043e+00   
min                  0.0        -1.264840e+00 -3.012631e+00 -3.016115e+00   
25%                  0.0        -1.264840e+00 -6.606180e-01 -6.506113e-01   
50%                  0.0         7.906137e-01  7.491591e-02  1.684495e-01   
75%                  0.0         7.906137e-01  7.173640e-01  7.531009e-01   
max                  0.0         7.906137e-01  2.608362e+00  2.483305e+00   

            no2_log        co_log        o3_log  
count  1.160300e+04  1.160300e+04  1.160300e+04  
mean   3.331339e-16  7.446522e-16  5.878833e-17  
std    1.000043e+00  1.000043e+00  1.000043e+00  
min   -3.979510e+00 -2.373563e+00 -8.052052e-01  
25%   -6.256302e-01 -7.024295e-01 -8.052052e-01  
50%    1.760925e-03 -4.370793e-02 -6.291494e-01  
75%    6.663764e-01  7.088715e-01  8.532980e-01  
max    3.609227e+00  2.840489e+00  2.462989e+00  
--------------------------------------------------------------------------------------
------------------------------------------------------
According to the summary statistics, the 'pm10_log', 'so2_log', 'co_log', 'o3_log' c
olumn has been successfully transformed and standardized
```

9. Modeling

Modeling using non-parametric method (`XGBoost`, `RandomForest`, `DecisionTree`)

Scaling for `XGBoost` model

- We will use these scaled X features for `XGBoost` model only

In [243…

```
# Import modules for modeling
from sklearn.ensemble import RandomForestRegressor
from xgboost import XGBRegressor
from sklearn.tree import DecisionTreeRegressor
from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import cross_val_score
```

In [244…

```
X_test
```

Out[244…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
11610	0	0	0	0	1	0	
11611	0	0	0	0	0	1	
11612	0	0	0	0	0	0	
11613	1	0	0	0	0	0	
11614	0	1	0	0	0	0	
...	...	...	...	...	...	...	
14128	0	0	1	0	0	0	
14129	0	0	0	1	0	0	
14130	0	0	0	0	1	0	
14131	0	0	0	0	0	1	
14132	0	0	0	0	0	0	

1291 rows × 18 columns

In [245…

```
# Double-Check Time Splits (Data Leakage Check)
print("Train Date Range:", X_train_cleaned.index.min(), "to", X_train_cleaned.index
print("Test Date Range:", X_test.index.min(), "to", X_test.index.max())
```

```
Train Date Range: 0 to 11609
Test Date Range: 11610 to 14132
```

In [246…
```
X_test.shape
```
Out[246…
```
(1291, 18)
```
In [247…
```
X_train_cleaned.shape
```
Out[247…
```
(11603, 18)
```
In [248…
```
# Define the models
models = {
    "RandomForest": RandomForestRegressor(random_state=42),
    "XGBoost": XGBRegressor(objective="reg:squarederror", random_state=42),
    "DecisionTree": DecisionTreeRegressor(random_state=42)
}

# Define hyperparameter grids
param_grids = {
    "RandomForest": {
        "n_estimators": [100, 200, 250],
        "max_depth": [8, 12, 15],
        "min_samples_split": [3, 5]
    },
    "XGBoost": {
        "n_estimators": [100, 200, 250],
        "learning_rate": [0.1, 0.01, 0.001],
        "max_depth": [8, 12],
        "subsample": [0.7, 0.9],
        "colsample_bytree": [0.7, 1]
    },
    "DecisionTree": {
        "max_depth": [5, 10, 20],
        "min_samples_split": [5, 7, 12]
    }
}
```
In [249…
```
X_train_cleaned = X_train_cleaned.drop(columns=[col for col in X_train_cleaned.colu
```
In [250…
```
X_train_cleaned
```

Out[250…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
0	0.830109	-1.365528	2.385410	-0.790614	0.0	0.790614
1	1.162721	-0.680557	-0.560282	-0.790614	0.0	0.790614
2	1.037207	1.679312	-0.462913	-0.790614	0.0	0.790614
3	1.338441	-0.374538	0.079112	-0.790614	0.0	0.790614
4	0.955623	1.255225	-0.574086	-0.790614	0.0	0.790614
...	...	...	...	...	...	...
11605	-0.399927	-0.299257	-0.250165	1.264840	0.0	-1.264840
11606	-0.713712	-1.365528	2.385410	1.264840	0.0	-1.264840
11607	-0.773331	-0.680557	-0.560282	1.264840	0.0	-1.264840
11608	-0.832951	1.679312	-0.462913	1.264840	0.0	-1.264840
11609	-0.704299	-0.374538	0.079112	1.264840	0.0	-1.264840

11603 rows × 11 columns

In [251…

```
X_test = X_test.drop(columns=[col for col in X_test.columns if col.startswith("stat
```

In [252…

```
X_test
```

Out[252…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
11610	-0.688609	1.255225	-0.574086	1.264840	0.0	-1.26484
11611	-0.688609	-0.214210	-0.617946	1.264840	0.0	-1.26484
11612	-0.475236	-0.299257	-0.250165	1.264840	0.0	-1.26484
11613	-0.986705	-1.365528	2.385410	1.264840	0.0	-1.26484
11614	-1.033773	-0.680557	-0.560282	1.264840	0.0	-1.26484
...	...	...	...	...	...	...
14128	-0.083005	1.679312	-0.462913	-0.790614	1.0	-1.26484
14129	-0.101832	-0.374538	0.079112	-0.790614	1.0	-1.26484
14130	-0.095556	1.255225	-0.574086	-0.790614	1.0	-1.26484
14131	-0.095556	-0.214210	-0.617946	-0.790614	1.0	-1.26484
14132	-0.086143	-0.299257	-0.250165	-0.790614	1.0	-1.26484

1291 rows × 11 columns

In [253…

```
y_test
```

Out[253…

```
11610    144.39
11611    144.39
11612     87.53
11613     80.80
11614     32.59
          ...
14128      3.96
14129      4.18
14130      3.96
14131      3.96
14132      3.81
Name: pm2_5, Length: 1291, dtype: float64
```

In [254…

```
y_train_cleaned
```

Out[254…

```
0         20.680
1         31.130
2         38.680
3         31.130
4         38.680
          ...
11605     99.460
11606     81.520
11607     63.305
11608    144.390
11609     63.305
Name: pm2_5, Length: 11603, dtype: float64
```

In [255…

```
X_train_cleaned
```

Out[255…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
0	0.830109	-1.365528	2.385410	-0.790614	0.0	0.790614
1	1.162721	-0.680557	-0.560282	-0.790614	0.0	0.790614
2	1.037207	1.679312	-0.462913	-0.790614	0.0	0.790614
3	1.338441	-0.374538	0.079112	-0.790614	0.0	0.790614
4	0.955623	1.255225	-0.574086	-0.790614	0.0	0.790614
...	...	...	...	...	...	...
11605	-0.399927	-0.299257	-0.250165	1.264840	0.0	-1.264840
11606	-0.713712	-1.365528	2.385410	1.264840	0.0	-1.264840
11607	-0.773331	-0.680557	-0.560282	1.264840	0.0	-1.264840
11608	-0.832951	1.679312	-0.462913	1.264840	0.0	-1.264840
11609	-0.704299	-0.374538	0.079112	1.264840	0.0	-1.264840

11603 rows × 11 columns

In [256…

```
# Perform Cross-Validation and GridSearchCV

from sklearn.metrics import mean_squared_error, r2_score, mean_absolute_error
from sklearn.model_selection import train_test_split, cross_val_score

best_models = {}

for model_name, model in models.items():
    print(f"Training {model_name}...")

    # # Use scaled data for XGBoost, but original data for RF and DT
    # X_train_cleaned = X_train_cleaned if model_name == "XGBoost" else X_train
    # X_test_used = X_test if model_name == "XGBoost" else X_test

    # GridSearchCV
    grid_search = GridSearchCV(model, param_grids[model_name], cv=5, scoring="neg_m
    grid_search.fit(X_train_cleaned, y_train_cleaned)

    # Best model
    best_model = grid_search.best_estimator_
    best_models[model_name] = best_model

    # Cross-validation scores
    mse_scores = -cross_val_score(best_model, X_train_cleaned, y_train_cleaned, cv=
    rmse_scores = np.sqrt(mse_scores)

    mae_scores = -cross_val_score(best_model, X_train_cleaned, y_train_cleaned, cv=
```

```
    r2_scores = cross_val_score(best_model, X_train_cleaned, y_train_cleaned, cv=5,

    mean_cv_rmse = rmse_scores.mean()
    mean_cv_mae = mae_scores.mean()
    mean_cv_mse = -mse_scores.mean()
    mean_cv_r2 = r2_scores.mean()

    # Evaluate on test set
    y_pred = best_model.predict(X_test)
    test_rmse = np.sqrt(mean_squared_error(y_test, y_pred))
    test_mae = mean_absolute_error(y_test, y_pred)
    test_mse = mean_squared_error(y_test, y_pred)
    test_r2 = r2_score(y_test, y_pred)

    # Print evaluation metrics
    print(f"{model_name} Mean CV RMSE: {mean_cv_rmse}")
    print(f"{model_name} Mean CV MAE: {mean_cv_mae}")
    print(f"{model_name} Mean CV MSE: {mean_cv_mse}")
    print(f"{model_name} Mean CV R²: {mean_cv_r2}")

    print(f"{model_name} Test RMSE: {test_rmse}")
    print(f"{model_name} Test MAE: {test_mae}")
    print(f"{model_name} Test MSE: {test_mse}")
    print(f"{model_name} Test R²: {test_r2}\n")
```

```
Training RandomForest...
RandomForest Mean CV RMSE: 12.852386449819278
RandomForest Mean CV MAE: 7.649770542406318
RandomForest Mean CV MSE: -177.6366260200761
RandomForest Mean CV R²: 0.8068362723980183
RandomForest Test RMSE: 10.982860270514914
RandomForest Test MAE: 5.833144424345439
RandomForest Test MSE: 120.62321972165493
RandomForest Test R²: 0.8761427145595069

Training XGBoost...
XGBoost Mean CV RMSE: 12.471040897786319
XGBoost Mean CV MAE: 7.48887977393246
XGBoost Mean CV MSE: -168.44409597651915
XGBoost Mean CV R²: 0.8165701665464317
XGBoost Test RMSE: 10.146072088643475
XGBoost Test MAE: 5.807055082978619
XGBoost Test MSE: 102.94277882795016
XGBoost Test R²: 0.8942971911150039

Training DecisionTree...
DecisionTree Mean CV RMSE: 14.777887785541722
DecisionTree Mean CV MAE: 9.759514350563498
DecisionTree Mean CV MSE: -230.9468851787038
DecisionTree Mean CV R²: 0.7457814099000715
DecisionTree Test RMSE: 12.974886321281824
DecisionTree Test MAE: 7.798185472523801
DecisionTree Test MSE: 168.34767505018618
DecisionTree Test R²: 0.8271387043883476
```

Best Model: XGBoost

XGBoost sparkled in cross-validation, it is also stumbled less on the test set.

XGBoost had:

- Stable performance between CV and test
- Lowest test RMSE and MSE
- Highest test R^2

Save the model for future usages...

In [257...

```
import os
import pickle

# Define save directory
save_dir = "../saved_model"
os.makedirs(save_dir, exist_ok=True)  # Ensure directory exists

# File paths
model_path = os.path.join(save_dir, "best_xgb_model.pkl")
scaler_path = os.path.join(save_dir, "scaler.pkl")

# Save column names order during training
with open("../saved_model/log_col_order.pkl", "wb") as f:
    pickle.dump(log_cols, f)


# Save objects
pickle.dump(best_models["XGBoost"], open(model_path, "wb"))  # Save model
pickle.dump(scaler, open(scaler_path, "wb"))  # Save MinMaxScaler (or StandardScale

print(f"Best XGBoost model has been successfully saved in {save_dir}")
print(f"The column names order during training has been successfully saved in {save
print(f"The scaler has been successfully saved in {save_dir}")
```

```
Best XGBoost model has been successfully saved in ../saved_model
The column names order during training has been successfully saved in ../saved_model
The scaler has been successfully saved in ../saved_model
```

Load the model...

In [258...

```
X_test.columns
```

Out[258...

```
Index(['temp', 'population_density', 'factory_area', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season', 'pm10_log', 'so2_log',
       'o3_log', 'co_log', 'no2_log'],
      dtype='object')
```

In [259…

```
# Load saved model and scaler
with open("../saved_model/best_xgb_model.pkl", "rb") as f:
    best_xgb_model = pickle.load(f)
    print("Model loaded successfully!")

with open("../saved_model/scaler.pkl", "rb") as f:
    loaded_scaler = pickle.load(f)
    print("Scaler loaded successfully!")

with open("../saved_model/log_col_order.pkl", "rb") as f:
    log_cols = pickle.load(f)

# # Define other columns used in training
# other_cols = ['temp', 'population_density', 'factory_area',
#               'season_Cool Season', 'season_Hot Season', 'season_Rainy Season']

# Prepare input features
X_test_log = X_test[log_cols]
scaled_log = pd.DataFrame(
    loaded_scaler.transform(X_test_log),  # no .values
    columns=log_cols,
    index=X_test.index
)


# X_test_final = pd.concat([scaled_log, X_test[other_cols]], axis=1)
X_test_final = X_test_log.copy()

# [Optional safety step]
# Ensure column order matches what model was trained with
if hasattr(best_xgb_model, 'feature_names_in_'):
    X_test_final = X_test_final[best_xgb_model.feature_names_in_]

# Make predictions
predictions = best_xgb_model.predict(X_test_final)
```

```
Model loaded successfully!
Scaler loaded successfully!
```

9.Feature Importance

Check feature importance

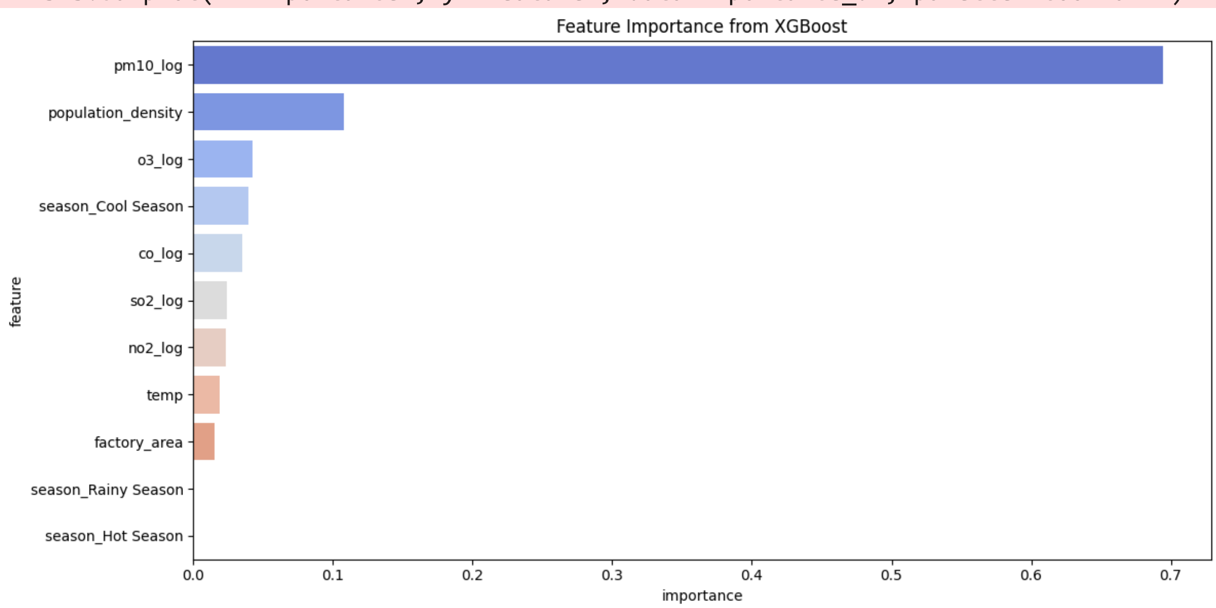
In [260…

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from xgboost import XGBRegressor

# Fit a XGBoost model on the entire train set for a global view
xgb_model = XGBRegressor(random_state=42)
xgb_model.fit(X_train_cleaned, y_train_cleaned)
```

```
# IMPORTANT: Use the actual feature names that were passed into the model
used_features = X_train_cleaned.columns.tolist()
if 'pm2_5' in used_features:
    used_features.remove('pm2_5')
print("Used features (count = {}):".format(len(used_features)))
print(used_features)

# Make sure xgb_model.feature_importances_ has the same length as used_features
print("xgb_model.feature_importances_ shape:", xgb_model.feature_importances_.shape

# Create a DataFrame with feature importance
importance_df = pd.DataFrame({
    "feature": used_features,
    "importance": xgb_model.feature_importances_
}).sort_values(by="importance", ascending=False)

# Plot feature importance
plt.figure(figsize=(12, 6))
sns.barplot(x="importance", y="feature", data=importance_df, palette="coolwarm")
plt.title("Feature Importance from XGBoost")
plt.tight_layout()
plt.show()
```

```
Used features (count = 11):
['temp', 'population_density', 'factory_area', 'season_Cool Season', 'season_Hot Sea
son', 'season_Rainy Season', 'pm10_log', 'so2_log', 'o3_log', 'co_log', 'no2_log']
xgb_model.feature_importances_ shape: (11,)
```

```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\1139130461.py:29: FutureWar
ning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(x="importance", y="feature", data=importance_df, palette="coolwarm")
```

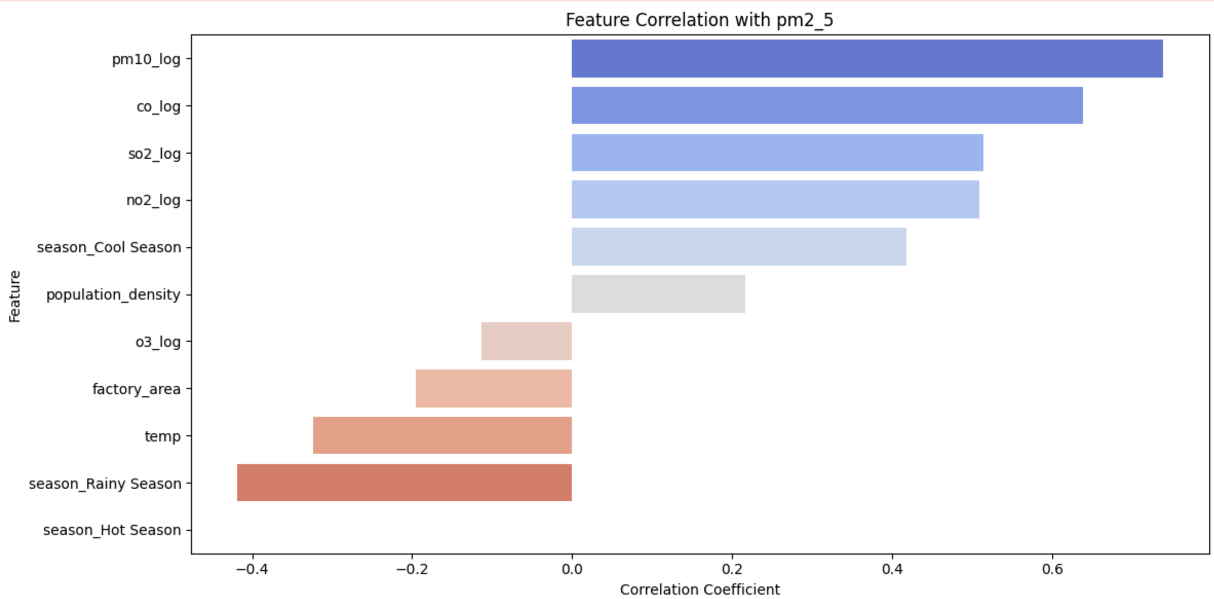


Check overall feature correlation to pm2_5

In [261…

```
# Plot correlation
X_train_cleaned['pm2_5'] = y_train_cleaned
correlation_matrix = X_train_cleaned.corr()
pm25_correlations = correlation_matrix['pm2_5'].drop('pm2_5').sort_values(ascending

plt.figure(figsize=(12, 6))
sns.barplot(x=pm25_correlations.values, y=pm25_correlations.index, palette='coolwar
plt.title('Feature Correlation with pm2_5')
plt.xlabel('Correlation Coefficient')
plt.ylabel('Feature')
plt.tight_layout()
plt.show()
```

```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\2790382756.py:7: FutureWarn
ing:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.1
4.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

  sns.barplot(x=pm25_correlations.values, y=pm25_correlations.index, palette='coolwa
rm')
```



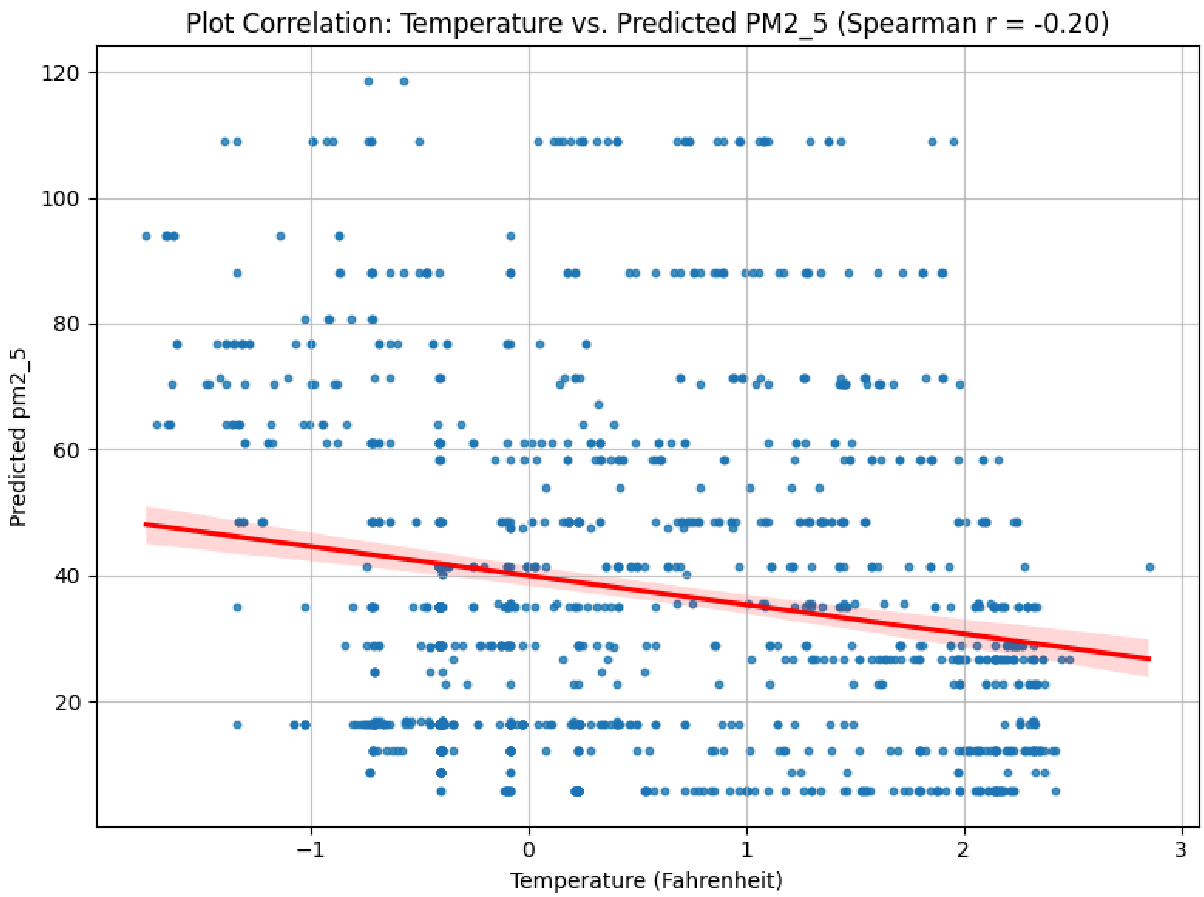
Check feature correlation to pm2_5 for each feature one by one

Temperature vs pm2_5

In [262…

```
import matplotlib.pyplot as plt
import seaborn as sns
from scipy.stats import spearmanr

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['temp'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['temp'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color": "
```

```
plt.xlabel('Temperature (Fahrenheit)')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: Temperature vs. Predicted PM2_5 (Spearman r = {spearm
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



Population density vs pm2_5

In [263…

```
X_test.columns
```

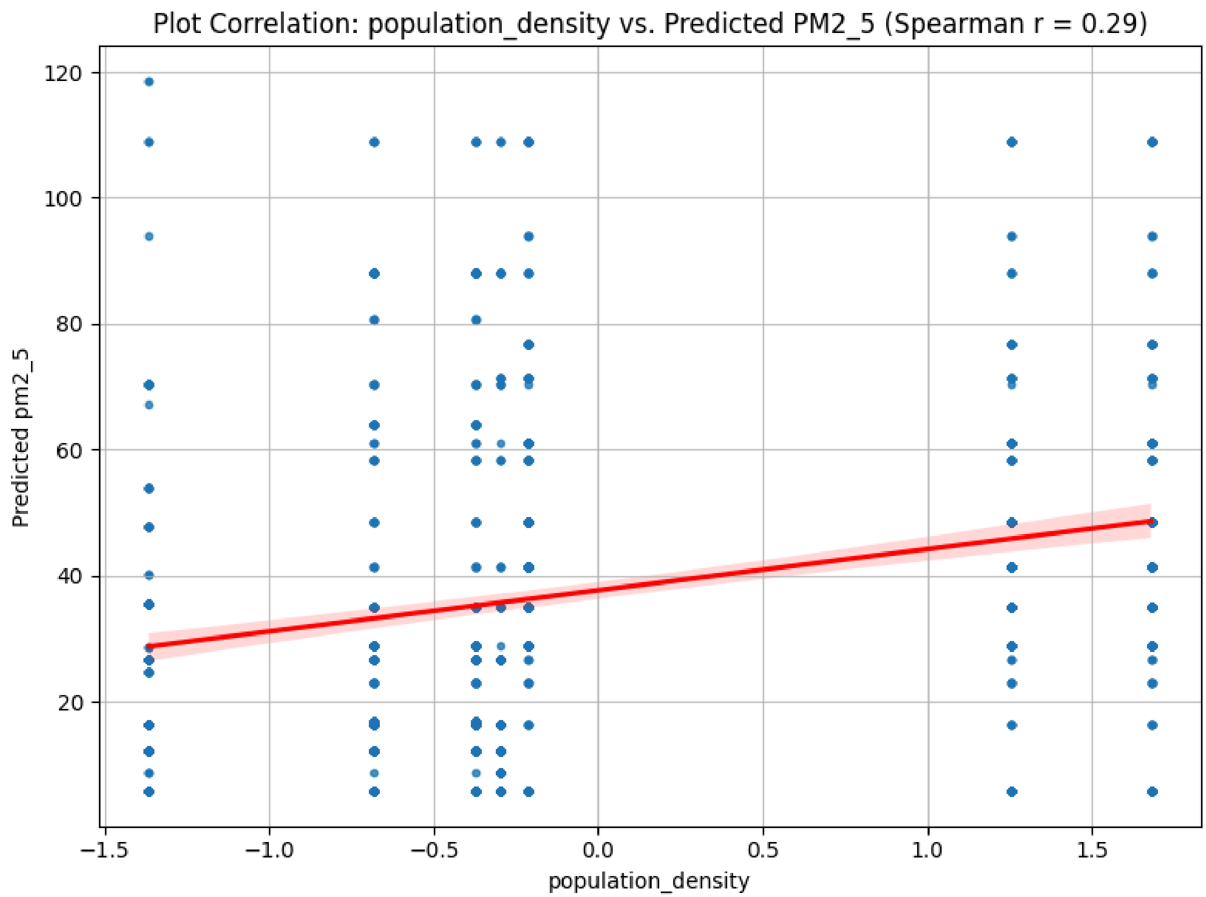
Out[263…

```
Index(['temp', 'population_density', 'factory_area', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season', 'pm10_log', 'so2_log',
       'o3_log', 'co_log', 'no2_log'],
      dtype='object')
```

In [264…

```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['population_density'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['population_density'], y=y_pred, scatter_kws={"s": 10}, line_k
plt.xlabel('population_density')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: population_density vs. Predicted PM2_5 (Spearman r =
plt.grid(True, alpha=0.7)
```

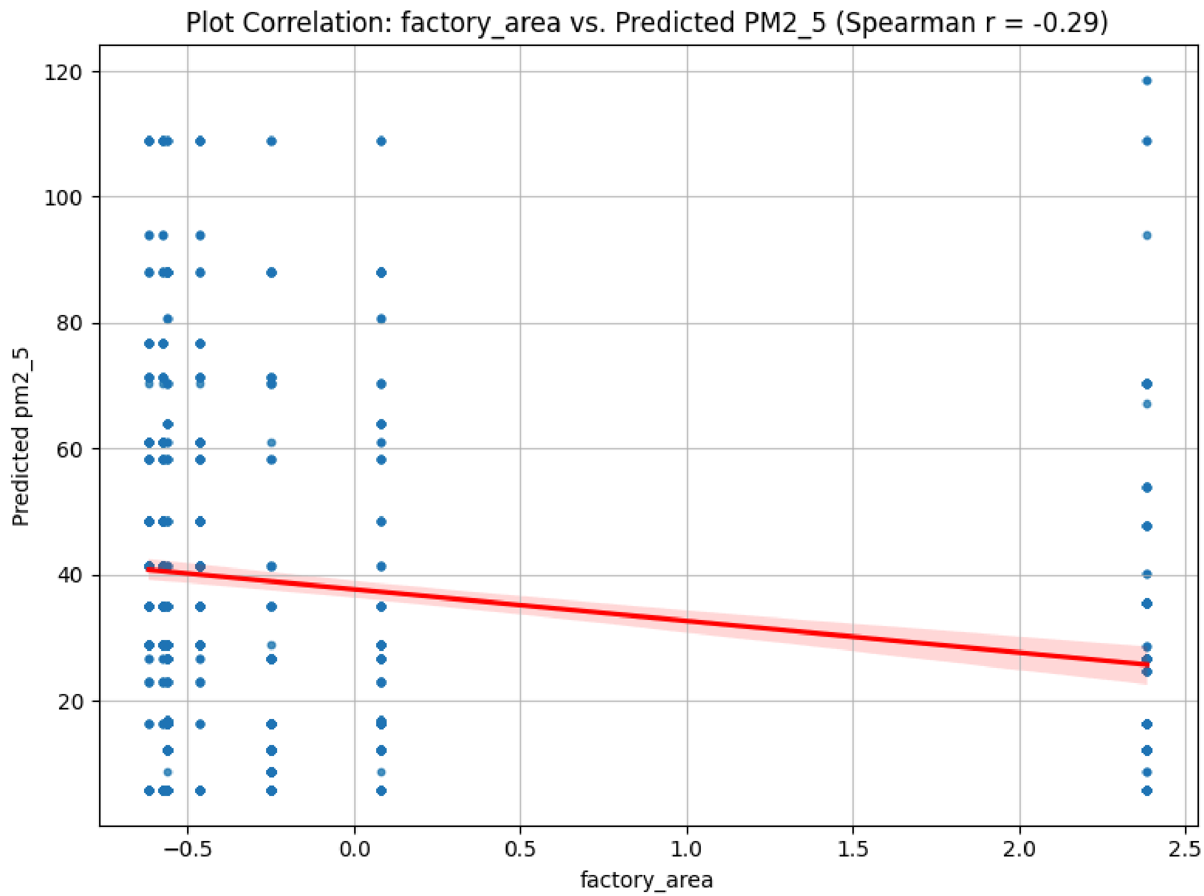
```
plt.tight_layout()
plt.show()
```



Factory area vs pm2_5

In [265…

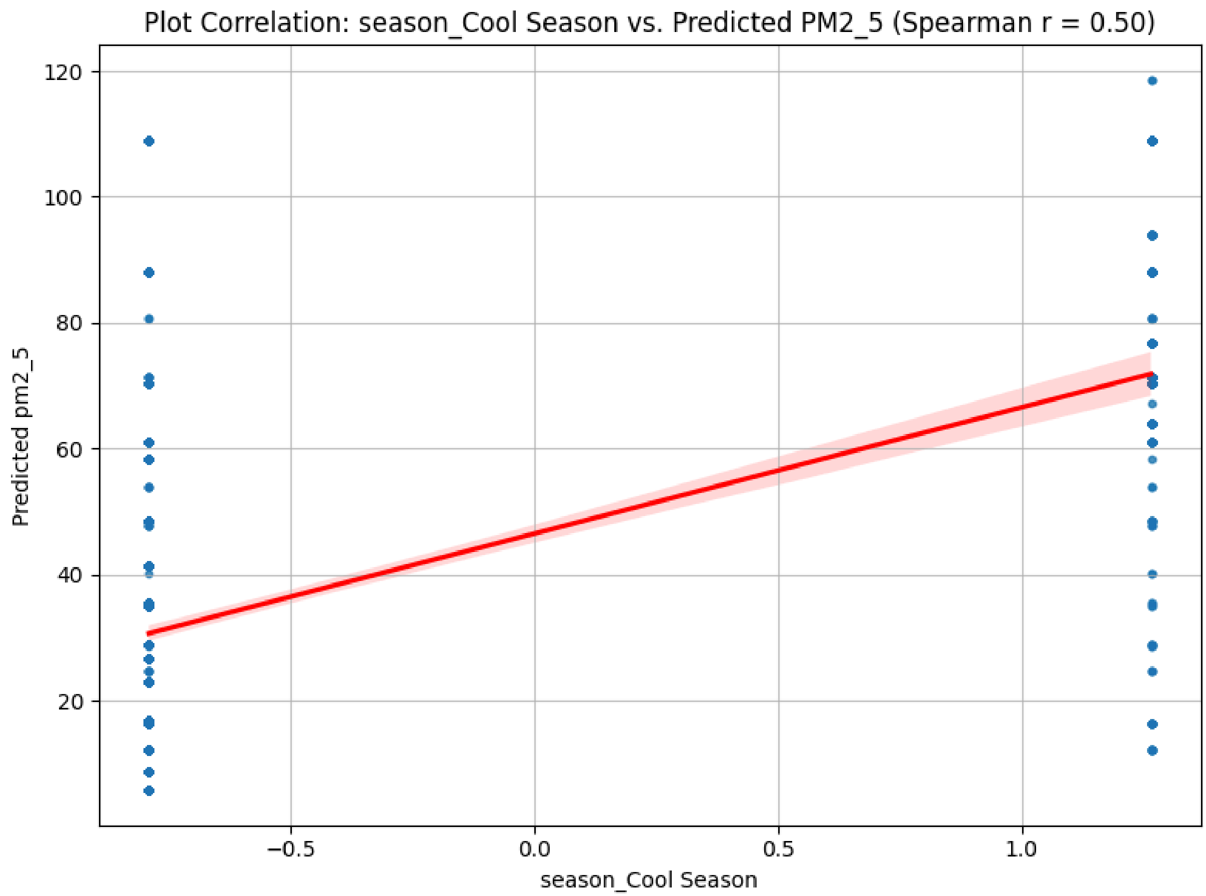
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['factory_area'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['factory_area'], y=y_pred, scatter_kws={"s": 10}, line_kws={"c
plt.xlabel('factory_area')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: factory_area vs. Predicted PM2_5 (Spearman r = {spear
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



season_Cool Season vs pm2_5

In [266…

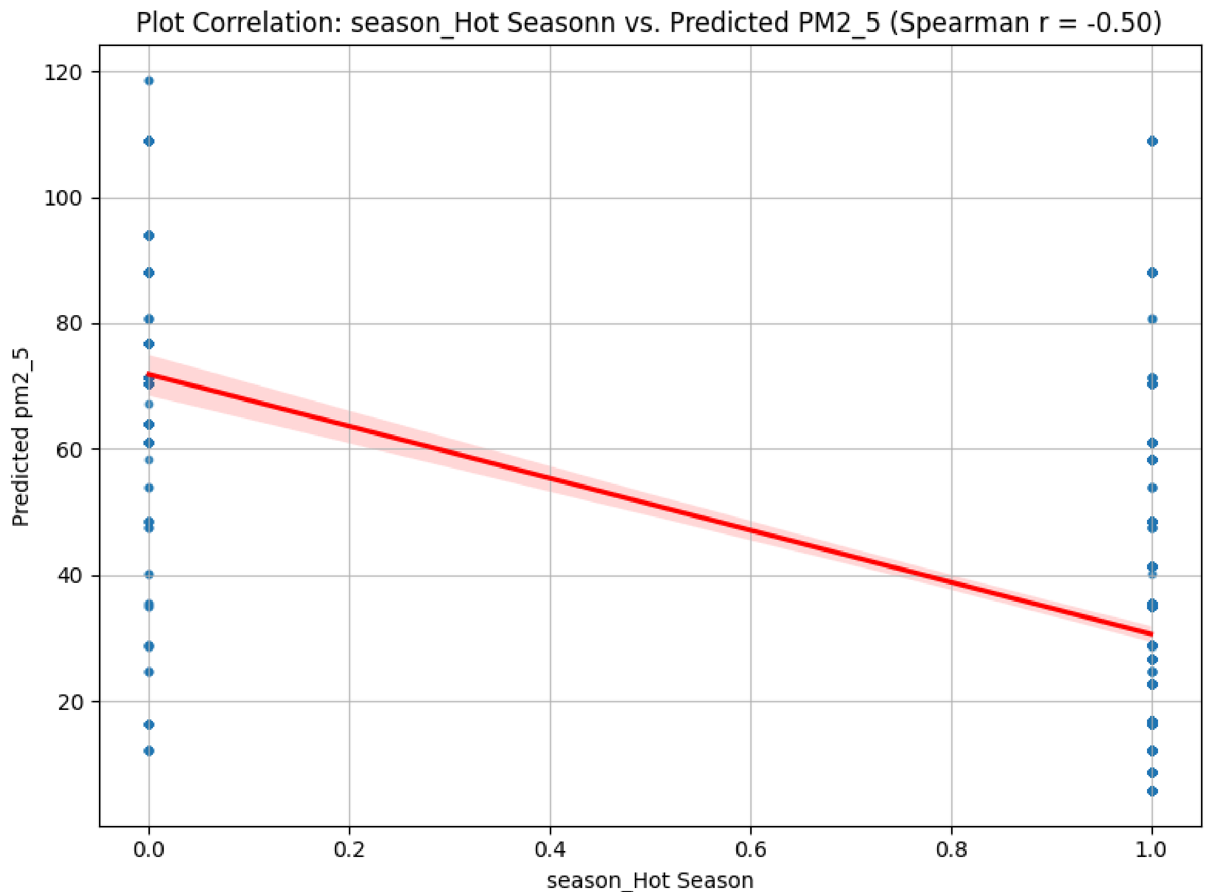
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['season_Cool Season'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['season_Cool Season'], y=y_pred, scatter_kws={"s": 10}, line_k
plt.xlabel('season_Cool Season')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: season_Cool Season vs. Predicted PM2_5 (Spearman r = 
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



season_Hot Season vs pm2_5 `Box_plot`

In [267…

```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['season_Hot Season'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['season_Hot Season'], y=y_pred, scatter_kws={"s": 10}, line_kw
plt.xlabel('season_Hot Season')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: season_Hot Seasonn vs. Predicted PM2_5 (Spearman r =
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```

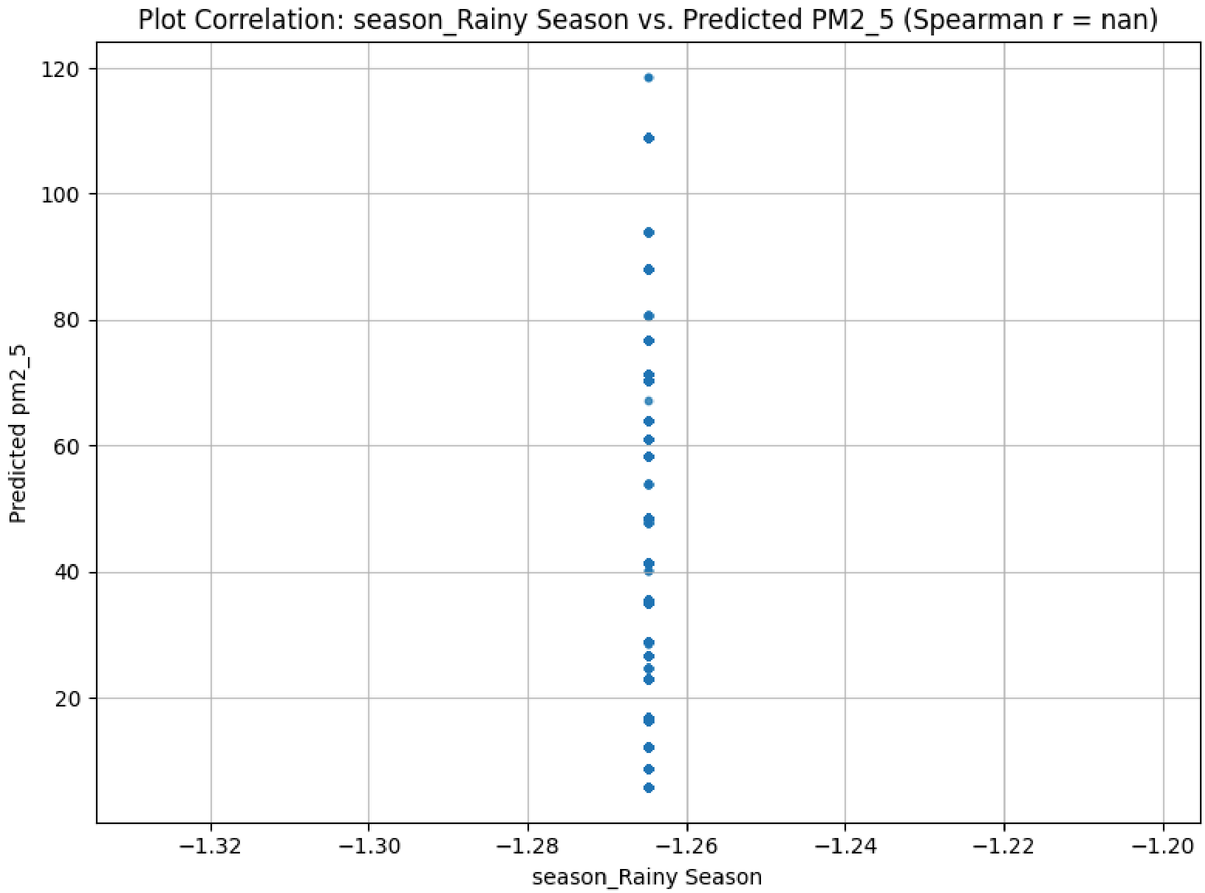


season_Rainy Season vs pm2_5

In [268…

```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['season_Rainy Season'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['season_Rainy Season'], y=y_pred, scatter_kws={"s": 10}, line_
plt.xlabel('season_Rainy Season')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: season_Rainy Season vs. Predicted PM2_5 (Spearman r =
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```

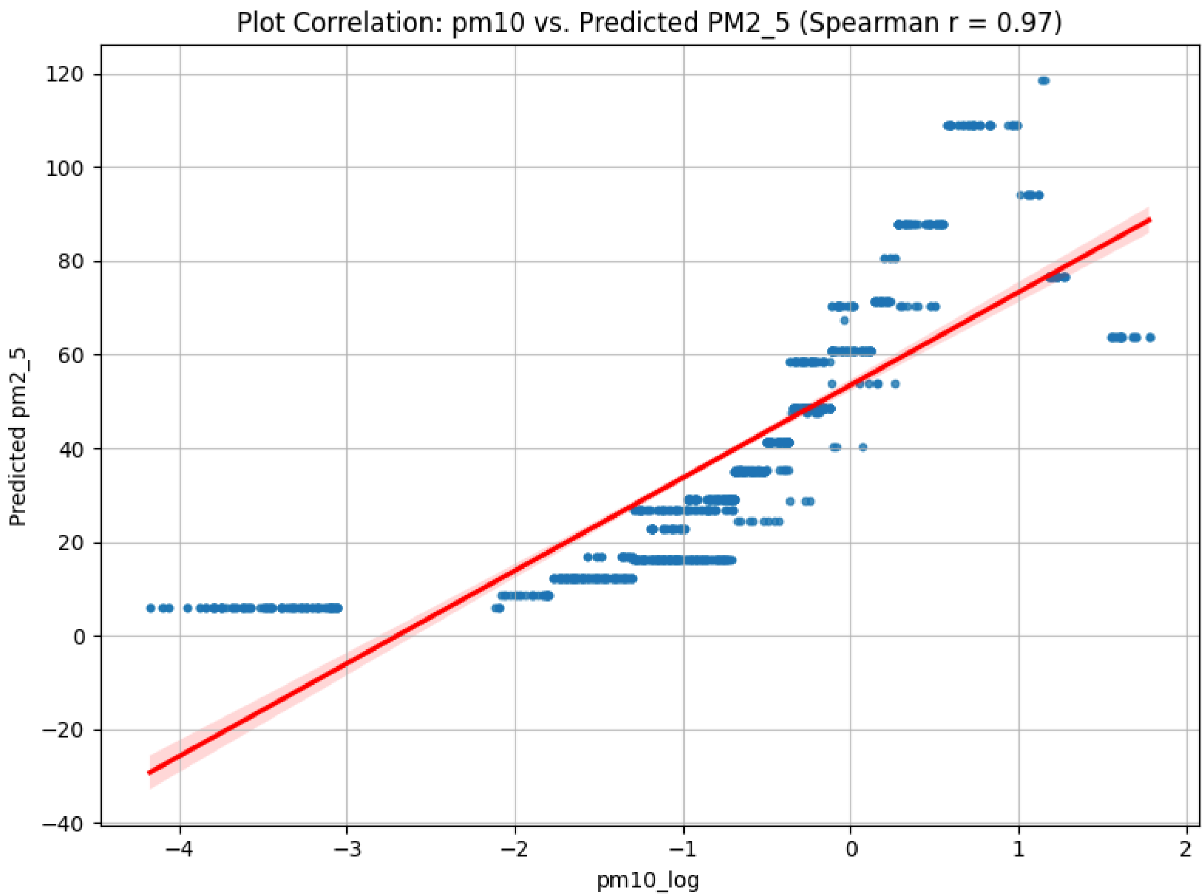
```
C:\Users\Legion 5 Pro\AppData\Local\Temp\ipykernel_41828\2472194936.py:5: ConstantIn
putWarning: An input array is constant; the correlation coefficient is not defined.
  spearman_coef, _ = spearmanr(X_test['season_Rainy Season'], y_pred)
```



pm10 vs pm2_5

In [269…

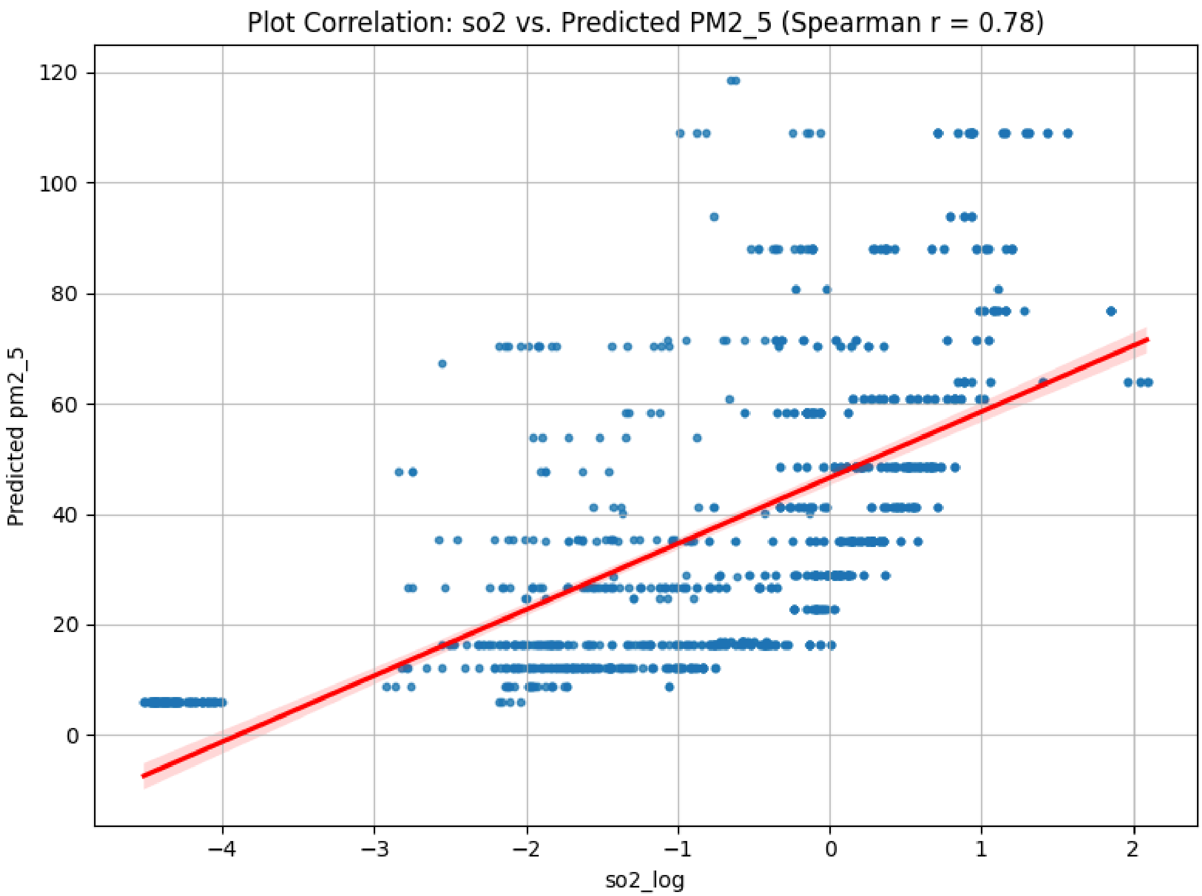
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['pm10_log'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['pm10_log'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color
plt.xlabel('pm10_log')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: pm10 vs. Predicted PM2_5 (Spearman r = {spearman_coef
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



so2 vs pm2_5

In [270…

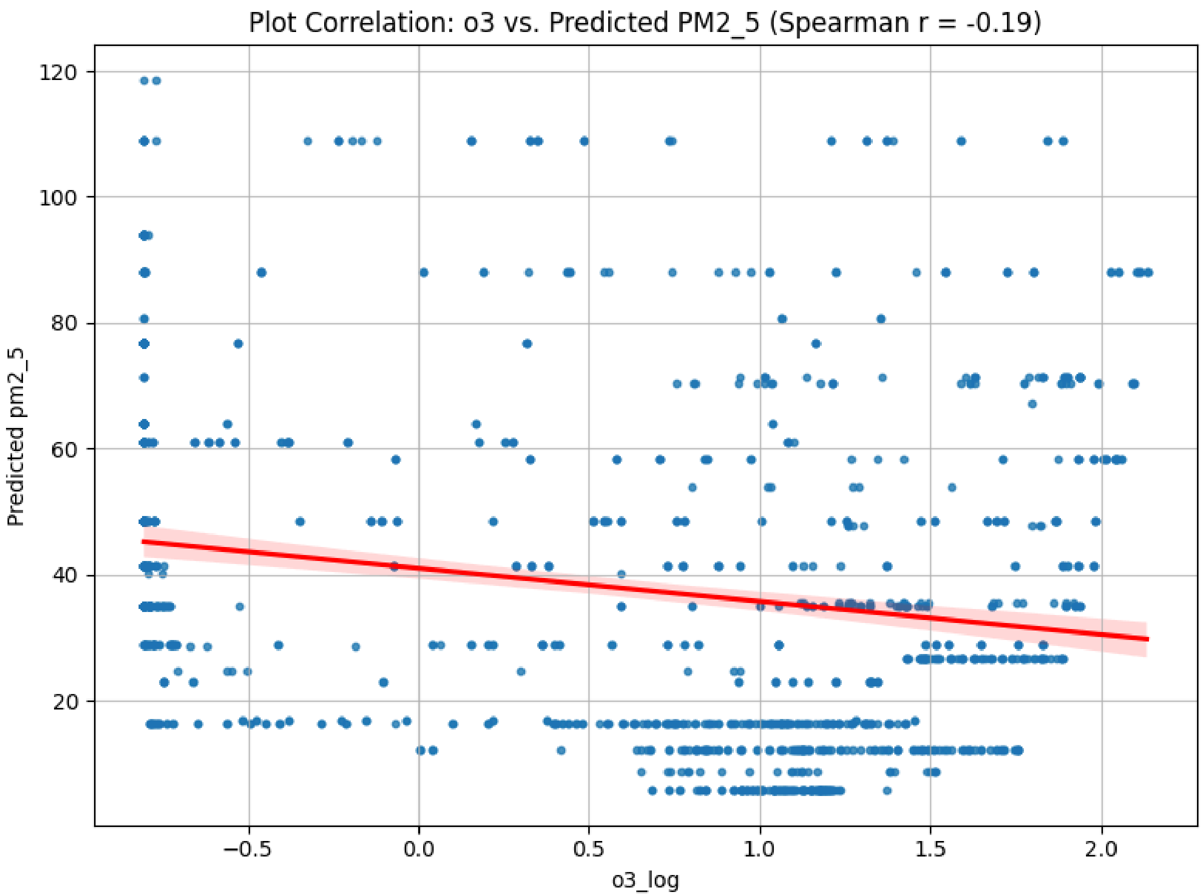
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['so2_log'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['so2_log'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color"
plt.xlabel('so2_log')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: so2 vs. Predicted PM2_5 (Spearman r = {spearman_coef:
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



o3 vs pm2_5

In [271…

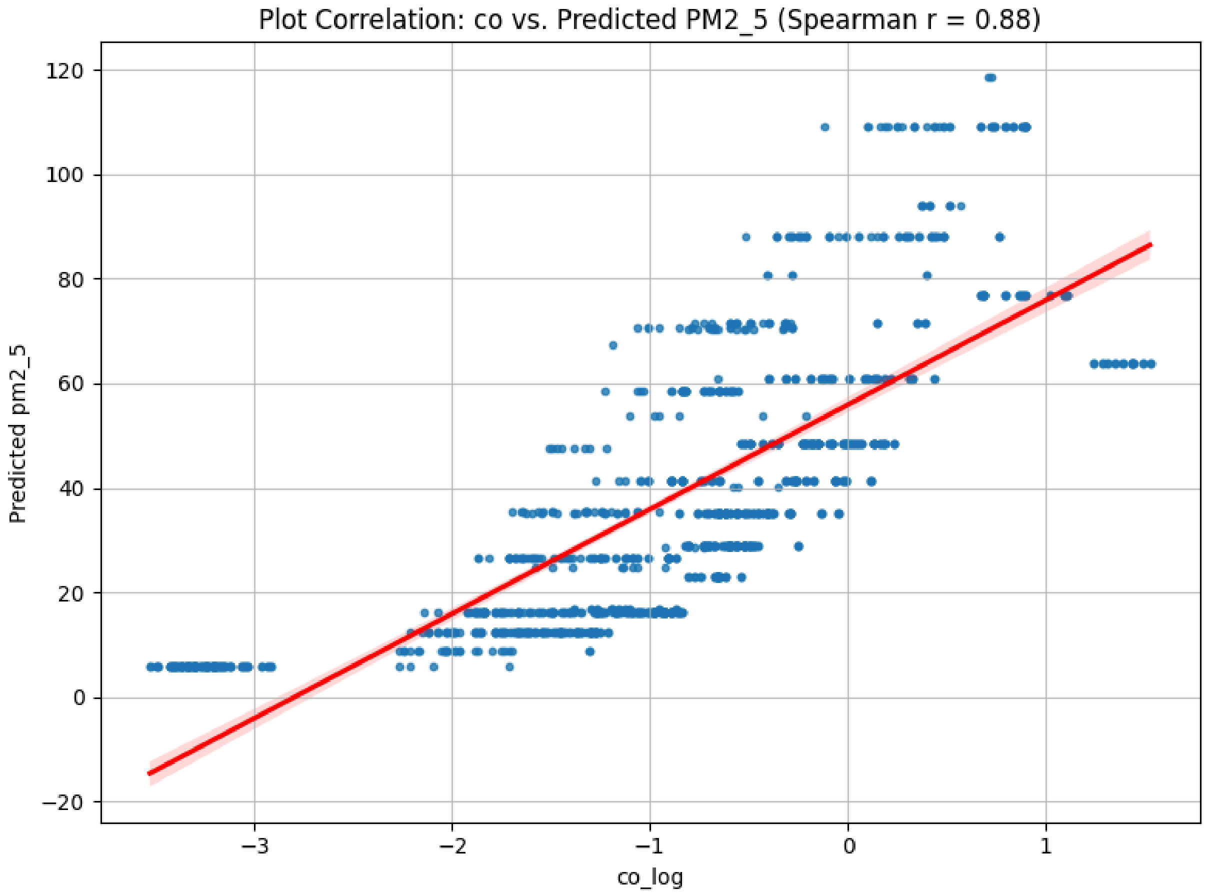
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['o3_log'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['o3_log'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color":
plt.xlabel('o3_log')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: o3 vs. Predicted PM2_5 (Spearman r = {spearman_coef:.
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



co vs pm2_5

In [272…

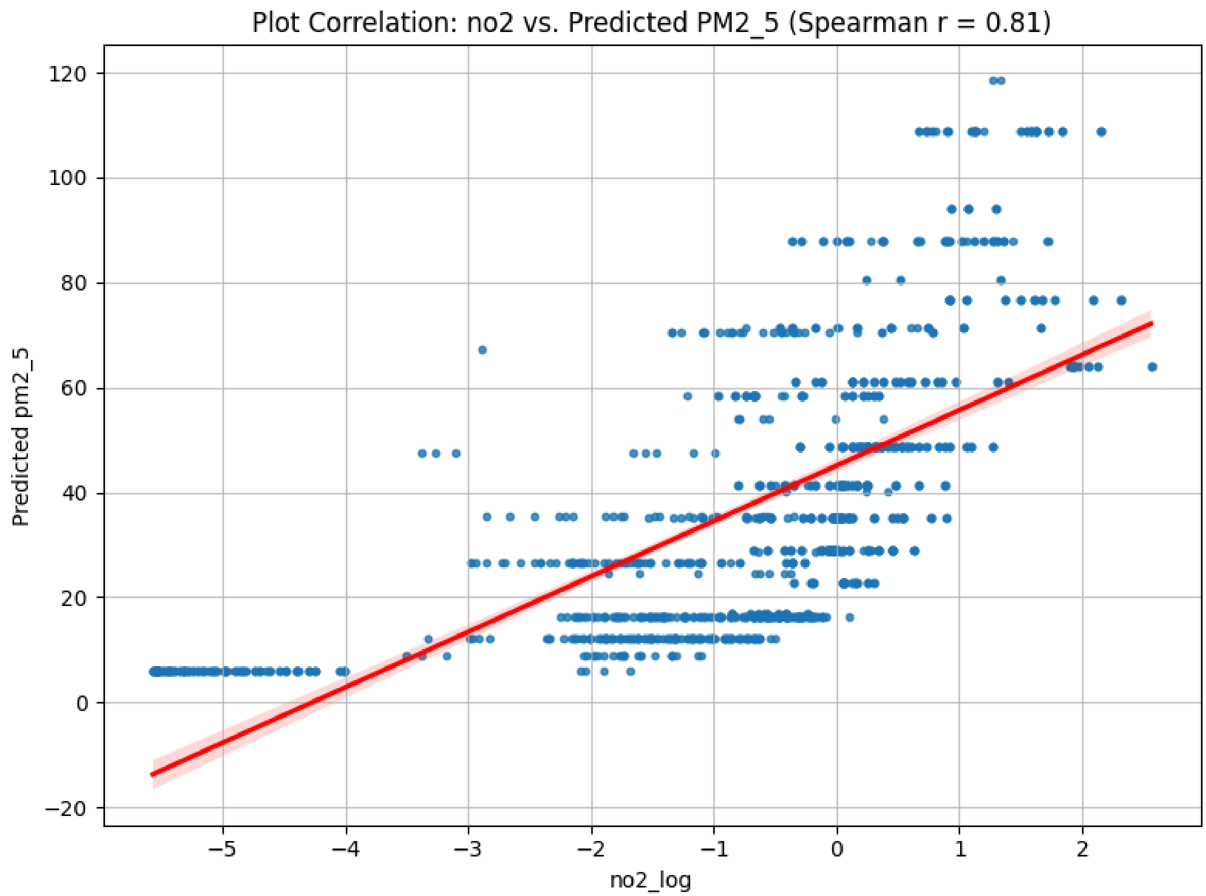
```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['co_log'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['co_log'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color":
plt.xlabel('co_log')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: co vs. Predicted PM2_5 (Spearman r = {spearman_coef:.
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



no2 vs pm2_5

In [273…

```
import matplotlib.pyplot as plt
import seaborn as sns

# Compute the Spearman correlation coefficient
spearman_coef, _ = spearmanr(X_test['no2_log'], y_pred)

plt.figure(figsize=(8, 6))
sns.regplot(x=X_test['no2_log'], y=y_pred, scatter_kws={"s": 10}, line_kws={"color"
plt.xlabel('no2_log')
plt.ylabel('Predicted pm2_5')
plt.title(f"Plot Correlation: no2 vs. Predicted PM2_5 (Spearman r = {spearman_coef:
plt.grid(True, alpha=0.7)
plt.tight_layout()
plt.show()
```



In [274…

```
X_train_cleaned
```

Out[274…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
0	0.830109	-1.365528	2.385410	-0.790614	0.0	0.790614
1	1.162721	-0.680557	-0.560282	-0.790614	0.0	0.790614
2	1.037207	1.679312	-0.462913	-0.790614	0.0	0.790614
3	1.338441	-0.374538	0.079112	-0.790614	0.0	0.790614
4	0.955623	1.255225	-0.574086	-0.790614	0.0	0.790614
...	...	...	...	...	...	...
11605	-0.399927	-0.299257	-0.250165	1.264840	0.0	-1.264840
11606	-0.713712	-1.365528	2.385410	1.264840	0.0	-1.264840
11607	-0.773331	-0.680557	-0.560282	1.264840	0.0	-1.264840
11608	-0.832951	1.679312	-0.462913	1.264840	0.0	-1.264840
11609	-0.704299	-0.374538	0.079112	1.264840	0.0	-1.264840

11603 rows × 12 columns

In [275…

```
X_test
```

Out[275…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
11610	-0.688609	1.255225	-0.574086	1.264840	0.0	-1.26484
11611	-0.688609	-0.214210	-0.617946	1.264840	0.0	-1.26484
11612	-0.475236	-0.299257	-0.250165	1.264840	0.0	-1.26484
11613	-0.986705	-1.365528	2.385410	1.264840	0.0	-1.26484
11614	-1.033773	-0.680557	-0.560282	1.264840	0.0	-1.26484
...	...	...	...	...	...	...
14128	-0.083005	1.679312	-0.462913	-0.790614	1.0	-1.26484
14129	-0.101832	-0.374538	0.079112	-0.790614	1.0	-1.26484
14130	-0.095556	1.255225	-0.574086	-0.790614	1.0	-1.26484
14131	-0.095556	-0.214210	-0.617946	-0.790614	1.0	-1.26484
14132	-0.086143	-0.299257	-0.250165	-0.790614	1.0	-1.26484

1291 rows × 11 columns

In [276…

```
y_test
```

Out[276…

```
11610    144.39
11611    144.39
11612     87.53
11613     80.80
11614     32.59
          ...
14128      3.96
14129      4.18
14130      3.96
14131      3.96
14132      3.81
Name: pm2_5, Length: 1291, dtype: float64
```

In [277…

```
y_pred
```

Out[277…

```
array([76.74866422, 76.74866422, 88.01131413, ...,  5.87140468,
        5.87140468,  5.87140468], shape=(1291,))
```

Actual pm2_5 vs Predicted pm2_5 dataframe with error rate

In [278…

```
# Combine them into a single DataFrame for comparison
comparison_df = X_test.copy()
comparison_df['y_test'] = y_test.values
comparison_df['y_pred'] = y_pred
```

```
# Calculate error rate as percentage difference
comparison_df['error_percent'] = ((comparison_df['y_pred'] - comparison_df['y_test'

comparison_df
```

Out[278…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
11610	-0.688609	1.255225	-0.574086	1.264840	0.0	-1.26484
11611	-0.688609	-0.214210	-0.617946	1.264840	0.0	-1.26484
11612	-0.475236	-0.299257	-0.250165	1.264840	0.0	-1.26484
11613	-0.986705	-1.365528	2.385410	1.264840	0.0	-1.26484
11614	-1.033773	-0.680557	-0.560282	1.264840	0.0	-1.26484
...	...	...	...	...	...	...
14128	-0.083005	1.679312	-0.462913	-0.790614	1.0	-1.26484
14129	-0.101832	-0.374538	0.079112	-0.790614	1.0	-1.26484
14130	-0.095556	1.255225	-0.574086	-0.790614	1.0	-1.26484
14131	-0.095556	-0.214210	-0.617946	-0.790614	1.0	-1.26484
14132	-0.086143	-0.299257	-0.250165	-0.790614	1.0	-1.26484

1291 rows × 14 columns

In [279…

```
comparison_df['error_percent'].mean()
```

Out[279…

```
np.float64(28.104628985876047)
```

Inference

In [280…

```
X_train
```

Out[280…

	station_10T	station_11T	station_12T	station_15T	station_3T	station_5T	station_6
0	1	0	0	0	0	0	
1	0	1	0	0	0	0	
2	0	0	1	0	0	0	
3	0	0	0	1	0	0	
4	0	0	0	0	1	0	
...	...	...	...	...	...	...	
11605	0	0	0	0	0	0	
11606	1	0	0	0	0	0	
11607	0	1	0	0	0	0	
11608	0	0	1	0	0	0	
11609	0	0	0	1	0	0	

11610 rows × 18 columns

In [281…

```
X_train_cleaned
```

Out[281…

	temp	population_density	factory_area	season_Cool Season	season_Hot Season	season_Rainy Season
0	0.830109	-1.365528	2.385410	-0.790614	0.0	0.790614
1	1.162721	-0.680557	-0.560282	-0.790614	0.0	0.790614
2	1.037207	1.679312	-0.462913	-0.790614	0.0	0.790614
3	1.338441	-0.374538	0.079112	-0.790614	0.0	0.790614
4	0.955623	1.255225	-0.574086	-0.790614	0.0	0.790614
...	...	...	...	...	...	...
11605	-0.399927	-0.299257	-0.250165	1.264840	0.0	-1.264840
11606	-0.713712	-1.365528	2.385410	1.264840	0.0	-1.264840
11607	-0.773331	-0.680557	-0.560282	1.264840	0.0	-1.264840
11608	-0.832951	1.679312	-0.462913	1.264840	0.0	-1.264840
11609	-0.704299	-0.374538	0.079112	1.264840	0.0	-1.264840

11603 rows × 12 columns

In [282…

```
X_train_cleaned.columns
```

Out[282…

```
Index(['temp', 'population_density', 'factory_area', 'season_Cool Season',
       'season_Hot Season', 'season_Rainy Season', 'pm10_log', 'so2_log',
       'o3_log', 'co_log', 'no2_log', 'pm2_5'],
      dtype='object')
```

Create sample dataframe

`sample_df1`

In [283…

```
import pandas as pd
import numpy as np
from joblib import load
import matplotlib.pyplot as plt
import seaborn as sns

# ----- Step 1: Load your stored column order -----
log_col_order = load("../saved_model/log_col_order.pkl")  # This should be a list o

# ----- Step 2: Create your sample raw data and compute log-transformed features --
# Create the raw sample data as a dictionary
sample_raw = {
    'temp': [95],
    'population_density': [4788.74],
    'factory_area': [54185],
    'season_Cool Season': [1],
    'season_Hot Season': [0],
    'season_Rainy Season': [0],
    'pm10': [78],
    'so2': [27.31],
    'o3': [9.41],
    'co': [2198],
    'no2': [31]
}

# Build the DataFrame from raw data
sample_df = pd.DataFrame(sample_raw)

# Compute log-transformed features
sample_df['pm10_log'] = np.log1p(sample_df['pm10'])
sample_df['so2_log'] = np.log1p(sample_df['so2'])
sample_df['o3_log'] = np.log1p(sample_df['o3'])
sample_df['co_log'] = np.log1p(sample_df['co'])
sample_df['no2_log'] = np.log1p(sample_df['no2'])

# Drop the raw pollutant columns as your model was trained on the log-transformed v
sample_df.drop(columns=['pm10', 'so2', 'o3', 'co', 'no2'], inplace=True)

# ----- Step 3: Reorder sample DataFrame according to log_col_order -----
# Make sure that the list log_col_order exactly matches the columns expected by the
# For example, log_col_order might be:
# ['temp', 'population_density', 'factory_area', 'season_Cool Season',
#  'season_Hot Season', 'season_Rainy Season', 'pm10_log', 'so2_log', 'no2_log', 'c
```

```
sample_df = sample_df[log_col_order]
print("Sample DataFrame after reordering:")
print(sample_df)

# ----- Step 4: Load the scaler and best XGBoost model -----
scaler = load("../saved_model/scaler.pkl")
best_xgb_model = load("../saved_model/Best_XGBoost_model.pkl")  # Adjust the file n

# ----- Step 5: Scale the sample data -----
sample_df_scaled = sample_df.copy()
sample_df_scaled[log_col_order] = scaler.transform(sample_df[log_col_order])

# ----- Step 6: Make prediction -----
y_pred_sample = best_xgb_model.predict(sample_df_scaled)

print("Predicted PM2.5 for the sample:", y_pred_sample[0])
```

```
Sample DataFrame after reordering:
   temp  population_density  factory_area  season_Cool Season  \
0    95             4788.74         54185                   1

   season_Hot Season  season_Rainy Season  pm10_log   so2_log   no2_log  \
0                  0                    0  4.369448  3.343215  3.465736

     co_log    o3_log
0  7.695758  2.342767
Predicted PM2.5 for the sample: 51.722874
```

```
c:\Users\Legion 5 Pro\AppData\Local\Programs\Python\Python311\Lib\pickle.py:1718: Us
erWarning: [21:52:24] WARNING: C:\actions-runner\_work\xgboost\xgboost\src\data\../c
ommon/error_msg.h:82: If you are loading a serialized model (like pickle in Python,
RDS in R) or
configuration generated by an older version of XGBoost, please export the model by c
alling
`Booster.save_model` from that version first, then load it back in current version.
See:

    https://xgboost.readthedocs.io/en/stable/tutorials/saving_model.html

for more details about differences between saving model and serializing.

  setstate(state)
```

`sample_df2`

In [284…

```
import pandas as pd
import numpy as np
from joblib import load
import matplotlib.pyplot as plt
import seaborn as sns

# ----- Step 1: Load your stored column order -----
log_col_order = load("../saved_model/log_col_order.pkl")  # This should be a list o

# ----- Step 2: Create your sample raw data and compute log-transformed features --
# Create the raw sample data as a dictionary
```

```
sample_raw = {
    'temp': [95],
    'population_density': [4788.74],
    'factory_area': [54185],
    'season_Cool Season': [1],
    'season_Hot Season': [0],
    'season_Rainy Season': [0],
    'pm10': [138],
    'so2': [27.31],
    'o3': [9.41],
    'co': [2198],
    'no2': [31]
}

# Build the DataFrame from raw data
sample_df = pd.DataFrame(sample_raw)

# Compute log-transformed features
sample_df['pm10_log'] = np.log1p(sample_df['pm10'])
sample_df['so2_log'] = np.log1p(sample_df['so2'])
sample_df['o3_log'] = np.log1p(sample_df['o3'])
sample_df['co_log'] = np.log1p(sample_df['co'])
sample_df['no2_log'] = np.log1p(sample_df['no2'])

# Drop the raw pollutant columns as your model was trained on the log-transformed v
sample_df.drop(columns=['pm10', 'so2', 'o3', 'co', 'no2'], inplace=True)

# ----- Step 3: Reorder sample DataFrame according to log_col_order -----
# Make sure that the list log_col_order exactly matches the columns expected by the
# For example, log_col_order might be:
# ['temp', 'population_density', 'factory_area', 'season_Cool Season',
#  'season_Hot Season', 'season_Rainy Season', 'pm10_log', 'so2_log', 'no2_log', 'c
sample_df = sample_df[log_col_order]
print("Sample DataFrame after reordering:")
print(sample_df)

# ----- Step 4: Load the scaler and best XGBoost model -----
scaler = load("../saved_model/scaler.pkl")
best_xgb_model = load("../saved_model/Best_XGBoost_model.pkl")  # Adjust the file n

# ----- Step 5: Scale the sample data -----
sample_df_scaled = sample_df.copy()
sample_df_scaled[log_col_order] = scaler.transform(sample_df[log_col_order])

# ----- Step 6: Make prediction -----
y_pred_sample = best_xgb_model.predict(sample_df_scaled)

print("Predicted PM2.5 for the sample:", y_pred_sample[0])
```

```
Sample DataFrame after reordering:
   temp  population_density  factory_area  season_Cool Season  \
0    95             4788.74         54185                   1   

   season_Hot Season  season_Rainy Season  pm10_log   so2_log   no2_log  \
0                  0                    0  4.934474  3.343215  3.465736   

     co_log    o3_log  
0  7.695758  2.342767  
Predicted PM2.5 for the sample: 129.86984
```