

```
In [1]: import requests
import pandas as pd
import datetime
```

```
In [3]: lat = 18.184135
lon = 74.610764
api_url = f"http://api.openweathermap.org/data/2.5/forecast?lat={lat}&lon={lon}&
```

```
In [7]: api_url1 = "https://api.openweathermap.org/data/2.5/forecast?lat=18.184135&lon=7
```

```
In [8]: import requests
response = requests.get(api_url1)
print(response.status_code)
```

401

```
In [10]: response = requests.get(api_url1)
weather_data = response.json()

print(weather_data)
```

```
{'cod': '200', 'message': 0, 'cnt': 40, 'list': [{'dt': 1759773600, 'main': {'temp': 296.93, 'feels_like': 297.43, 'temp_min': 295.74, 'temp_max': 296.93, 'pressure': 1013, 'sea_level': 1013, 'grnd_level': 950, 'humidity': 79, 'temp_kf': 1.19}, 'weather': [{'id': 800, 'main': 'Clear', 'description': 'clear sky', 'icon': '01n'}], 'clouds': {'all': 7}, 'wind': {'speed': 4.16, 'deg': 291, 'gust': 7.15}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-06 18:00:00'}, {'dt': 1759784400, 'main': {'temp': 295.71, 'feels_like': 296.19, 'temp_min': 294.8, 'temp_max': 295.71, 'pressure': 1012, 'sea_level': 1012, 'grnd_level': 949, 'humidity': 83, 'temp_kf': 0.91}, 'weather': [{'id': 800, 'main': 'Clear', 'description': 'clear sky', 'icon': '01n'}], 'clouds': {'all': 7}, 'wind': {'speed': 3.63, 'deg': 286, 'gust': 6.33}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-06 21:00:00'}, {'dt': 1759795200, 'main': {'temp': 294.17, 'feels_like': 294.63, 'temp_min': 294.17, 'temp_max': 294.17, 'pressure': 1012, 'sea_level': 1012, 'grnd_level': 949, 'humidity': 88, 'temp_kf': 0}, 'weather': [{'id': 800, 'main': 'Clear', 'description': 'clear sky', 'icon': '01n'}], 'clouds': {'all': 10}, 'wind': {'speed': 2.6, 'deg': 291, 'gust': 4.87}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-07 00:00:00'}, {'dt': 1759806000, 'main': {'temp': 296.45, 'feels_like': 296.87, 'temp_min': 296.45, 'temp_max': 296.45, 'pressure': 1015, 'sea_level': 1015, 'grnd_level': 951, 'humidity': 78, 'temp_kf': 0}, 'weather': [{'id': 803, 'main': 'Clouds', 'description': 'broken clouds', 'icon': '04d'}], 'clouds': {'all': 67}, 'wind': {'speed': 2.96, 'deg': 296, 'gust': 3.69}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'd'}, 'dt_txt': '2025-10-07 03:00:00'}, {'dt': 1759816800, 'main': {'temp': 300.42, 'feels_like': 301.58, 'temp_min': 300.42, 'temp_max': 300.42, 'pressure': 1013, 'sea_level': 1013, 'grnd_level': 950, 'humidity': 60, 'temp_kf': 0}, 'weather': [{'id': 803, 'main': 'Clouds', 'description': 'broken clouds', 'icon': '04d'}], 'clouds': {'all': 71}, 'wind': {'speed': 2.64, 'deg': 295, 'gust': 2.79}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'd'}, 'dt_txt': '2025-10-07 06:00:00'}, {'dt': 1759827600, 'main': {'temp': 302.53, 'feels_like': 303.18, 'temp_min': 302.53, 'temp_max': 302.53, 'pressure': 1009, 'sea_level': 1009, 'grnd_level': 947, 'humidity': 49, 'temp_kf': 0}, 'weather': [{'id': 803, 'main': 'Clouds', 'description': 'broken clouds', 'icon': '04d'}], 'clouds': {'all': 67}, 'wind': {'speed': 1.91, 'deg': 301, 'gust': 2.54}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'd'}, 'dt_txt': '2025-10-07 09:00:00'}, {'dt': 1759838400, 'main': {'temp': 300.75, 'feels_like': 302.22, 'temp_min': 300.75, 'temp_max': 300.75, 'pressure': 1010, 'sea_level': 1010, 'grnd_level': 948, 'humidity': 62, 'temp_kf': 0}, 'weather': [{'id': 803, 'main': 'Clouds', 'description': 'broken clouds', 'icon': '04d'}], 'clouds': {'all': 73}, 'wind': {'speed': 3.85, 'deg': 304, 'gust': 5.11}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'd'}, 'dt_txt': '2025-10-07 12:00:00'}, {'dt': 1759849200, 'main': {'temp': 298.41, 'feels_like': 298.85, 'temp_min': 298.41, 'temp_max': 298.41, 'pressure': 1013, 'sea_level': 1013, 'grnd_level': 950, 'humidity': 71, 'temp_kf': 0}, 'weather': [{'id': 500, 'main': 'Rain', 'description': 'light rain', 'icon': '10n'}], 'clouds': {'all': 80}, 'wind': {'speed': 4.18, 'deg': 294, 'gust': 6.05}, 'visibility': 10000, 'pop': 0.99, 'rain': {'3h': 1.24}, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-07 15:00:00'}, {'dt': 1759860000, 'main': {'temp': 296.29, 'feels_like': 296.83, 'temp_min': 296.29, 'temp_max': 296.29, 'pressure': 1013, 'sea_level': 1013, 'grnd_level': 950, 'humidity': 83, 'temp_kf': 0}, 'weather': [{'id': 500, 'main': 'Rain', 'description': 'light rain', 'icon': '10n'}], 'clouds': {'all': 68}, 'wind': {'speed': 5.28, 'deg': 311, 'gust': 8.34}, 'visibility': 10000, 'pop': 1, 'rain': {'3h': 0.25}, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-07 18:00:00'}, {'dt': 1759870800, 'main': {'temp': 295.43, 'feels_like': 295.99, 'temp_min': 295.43, 'temp_max': 295.43, 'pressure': 1012, 'sea_level': 1012, 'grnd_level': 949, 'humidity': 87, 'temp_kf': 0}, 'weather': [{'id': 803, 'main': 'Clouds', 'description': 'broken clouds', 'icon': '04n'}], 'clouds': {'all': 60}, 'wind': {'speed': 4.05, 'deg': 308, 'gust': 6.64}, 'visibility': 10000, 'pop': 0, 'sys': {'pod': 'n'}, 'dt_txt': '2025-10-07 21:00:00'}, {'dt': 1759881600, 'main': {'temp': 294.71, 'feels_like': 295.27, 'temp_min': 294.71, 'temp_max': 294.71, 'pressure': 1012, 'sea_level': 1012, 'grnd_level': 949, 'humidity': 90, 'temp_kf': 0}, 'weather': [{'id': 802, 'main': 'Clouds', 'description': 'scattered clouds', 'icon': '03n'}], 'clouds': {'all': 49}, 'win
```

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ulation': 53919, 'timezone': 19800, 'sunrise': 1759711968, 'sunset': 1759754783}}

```

```

In [11]: if 'list' in weather_data:
          print(len(weather_data['list']))
          print(weather_data['list'][0]['weather'][0]['description'])
        else:
          print("Error:", weather_data.get('message', 'Unknown error'))

```

```

40
clear sky

```

```

In [12]: temperatures = [item['main']['temp'] for item in weather_data['list']]

# It will extract all values (40) and putting into one variable
timestamps = [pd.to_datetime(item['dt'], unit='s') for item in weather_data['lis
temperature = [item['main']['temp'] for item in weather_data['list']]

```

```
humidity = [item['main']['humidity'] for item in weather_data['list']]
wind_speed = [item['wind']['speed'] for item in weather_data['list']]
weather_description = [item['weather'][0]['description'] for item in weather_data['list']]
```

```
In [13]: weather_df = pd.DataFrame({'Timestamp': timestamps,
                                   'Temperature': temperatures,
                                   'humidity': humidity,
                                   'wind_speed': wind_speed,
                                   'weather_description': weather_description})
```

```
In [14]: weather_df.set_index('Timestamp', inplace=True)
max_temp = weather_df['Temperature'].max()
print(f"Maximum Temperature - {max_temp}")
min_temp = weather_df['Temperature'].min()
print(f"Minimum Temperature - {min_temp}")
```

Maximum Temperature - 303.37

Minimum Temperature - 294.17

```
In [15]: weather_df.fillna(0, inplace=True)
```

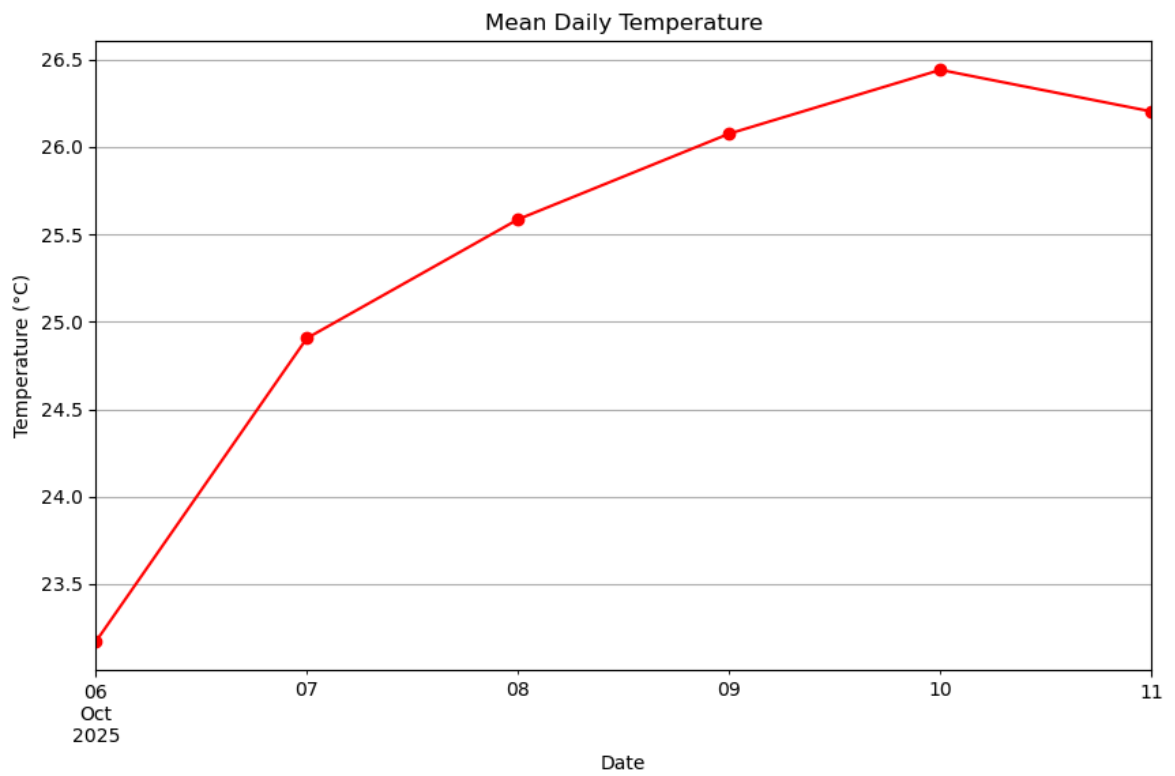
```
In [16]: weather_df['Temperature'] = weather_df['Temperature'].apply(lambda x: x - 273.15)
```

```
In [17]: print(weather_df)
```

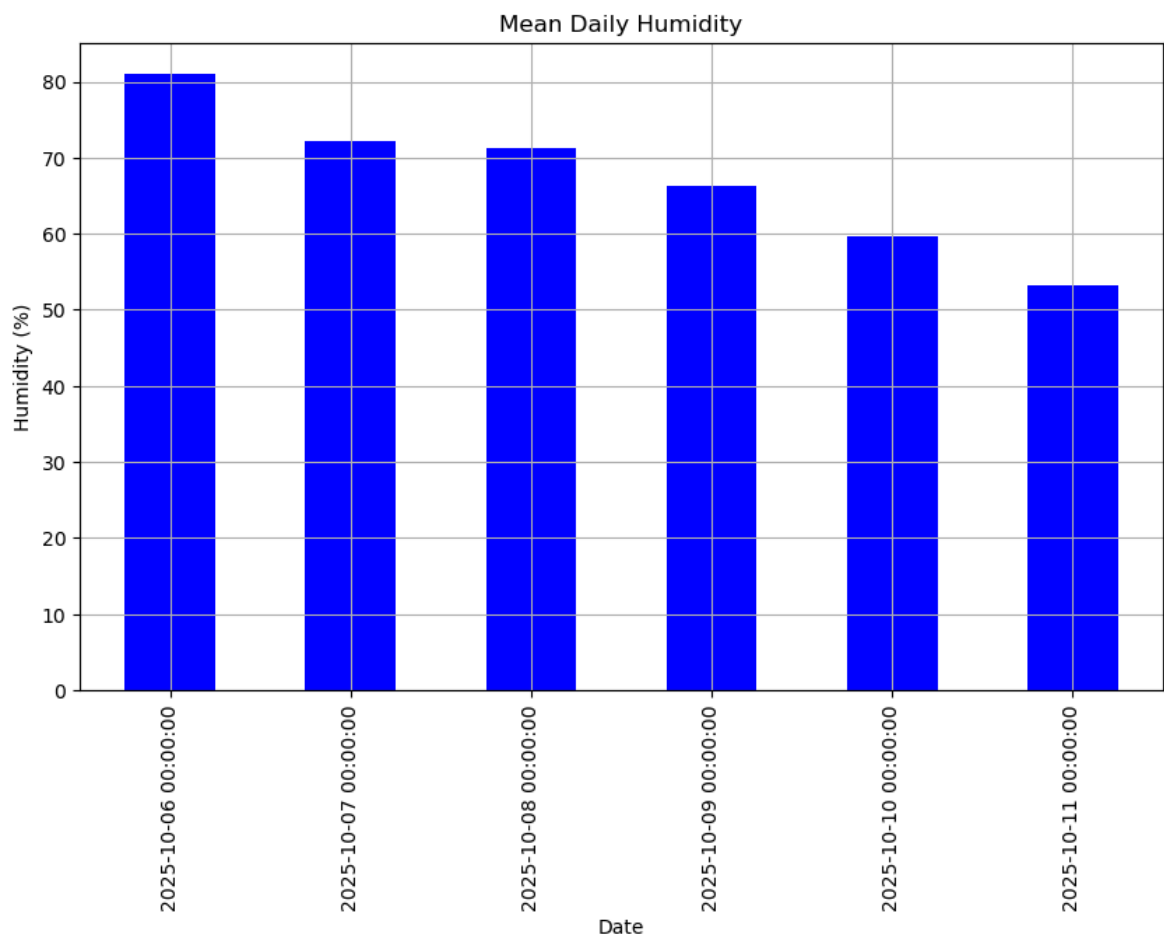
Timestamp	Temperature	humidity	wind_speed	weather_description
2025-10-06 18:00:00	23.78	79	4.16	clear sky
2025-10-06 21:00:00	22.56	83	3.63	clear sky
2025-10-07 00:00:00	21.02	88	2.60	clear sky
2025-10-07 03:00:00	23.30	78	2.96	broken clouds
2025-10-07 06:00:00	27.27	60	2.64	broken clouds
2025-10-07 09:00:00	29.38	49	1.91	broken clouds
2025-10-07 12:00:00	27.60	62	3.85	broken clouds
2025-10-07 15:00:00	25.26	71	4.18	light rain
2025-10-07 18:00:00	23.14	83	5.28	light rain
2025-10-07 21:00:00	22.28	87	4.05	broken clouds
2025-10-08 00:00:00	21.56	90	3.16	scattered clouds
2025-10-08 03:00:00	23.77	80	2.62	clear sky
2025-10-08 06:00:00	27.53	60	2.84	clear sky
2025-10-08 09:00:00	29.65	52	2.15	light rain
2025-10-08 12:00:00	28.17	61	1.77	light rain
2025-10-08 15:00:00	26.12	70	3.29	light rain
2025-10-08 18:00:00	24.40	77	4.19	light rain
2025-10-08 21:00:00	23.49	80	3.50	light rain
2025-10-09 00:00:00	22.60	84	3.68	light rain
2025-10-09 03:00:00	24.34	76	4.50	light rain
2025-10-09 06:00:00	28.01	58	3.63	light rain
2025-10-09 09:00:00	28.67	54	3.42	light rain
2025-10-09 12:00:00	27.51	62	1.74	broken clouds
2025-10-09 15:00:00	27.03	61	1.33	overcast clouds
2025-10-09 18:00:00	25.90	65	3.23	overcast clouds
2025-10-09 21:00:00	24.55	70	2.82	overcast clouds
2025-10-10 00:00:00	22.55	73	3.58	broken clouds
2025-10-10 03:00:00	24.49	66	3.06	clear sky
2025-10-10 06:00:00	28.09	55	3.08	clear sky
2025-10-10 09:00:00	30.22	44	2.39	scattered clouds
2025-10-10 12:00:00	29.63	48	2.95	scattered clouds
2025-10-10 15:00:00	26.55	59	3.63	scattered clouds
2025-10-10 18:00:00	25.55	65	2.03	broken clouds
2025-10-10 21:00:00	24.45	67	2.40	overcast clouds
2025-10-11 00:00:00	22.26	72	3.42	broken clouds
2025-10-11 03:00:00	24.24	62	3.24	clear sky
2025-10-11 06:00:00	27.87	48	3.46	clear sky
2025-10-11 09:00:00	29.73	40	3.54	clear sky
2025-10-11 12:00:00	28.26	45	4.40	clear sky
2025-10-11 15:00:00	24.86	52	3.91	scattered clouds

```
In [18]: import matplotlib.pyplot as plt
daily_mean_temp = weather_df['Temperature'].resample('D').mean()
daily_mean_humidity = weather_df['humidity'].resample('D').mean()
daily_mean_wind_speed = weather_df['wind_speed'].resample('D').mean()
```

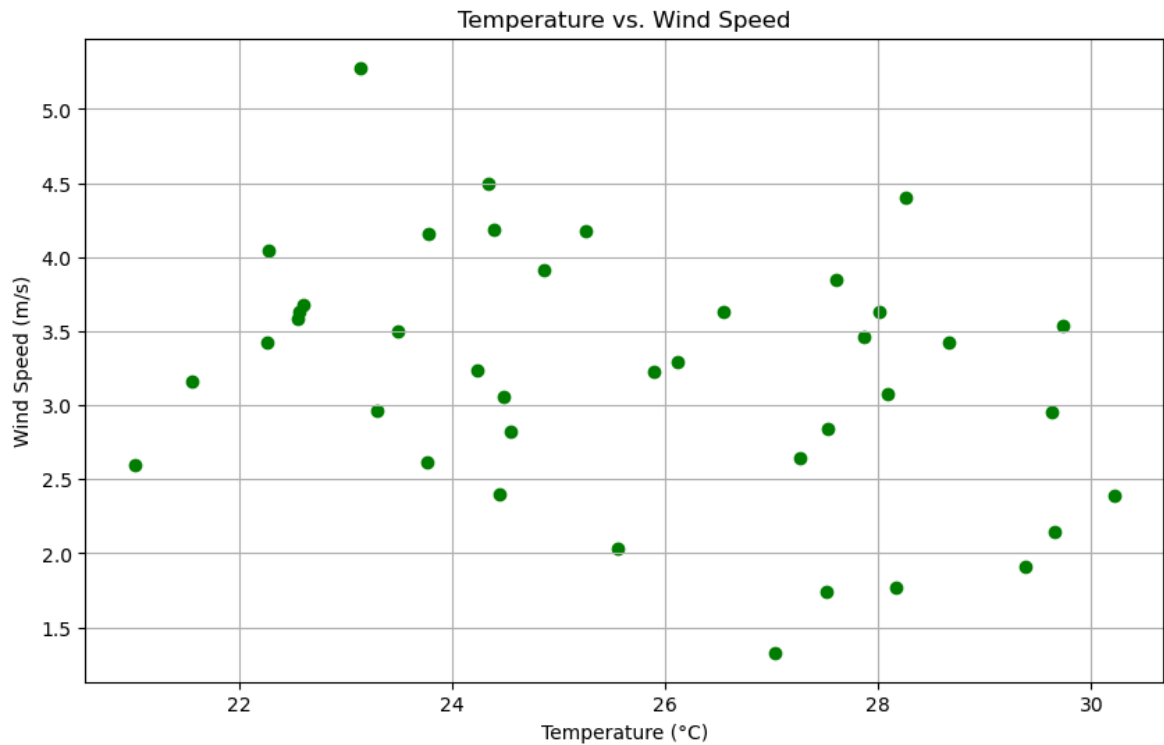
```
In [19]: plt.figure(figsize=(10, 6))
daily_mean_temp.plot(color='red', linestyle='--', marker='o')
plt.title('Mean Daily Temperature')
plt.xlabel('Date')
plt.ylabel('Temperature (°C)')
plt.grid(True)
plt.show()
```



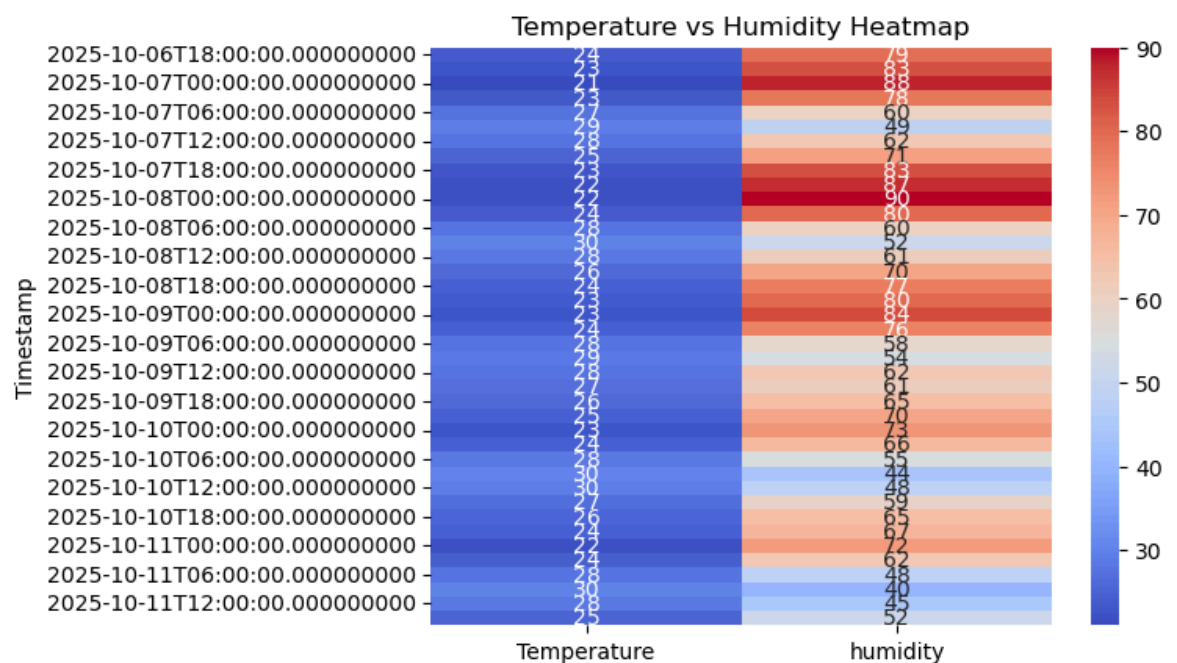
```
In [20]: plt.figure(figsize=(10, 6))
daily_mean_humidity.plot(kind='bar', color='blue')
plt.title('Mean Daily Humidity')
plt.xlabel('Date')
plt.ylabel('Humidity (%)')
plt.grid(True)
plt.show()
```



```
In [21]: plt.figure(figsize=(10, 6))
plt.scatter(weather_df['Temperature'], weather_df['wind_speed'], color='green')
plt.title('Temperature vs. Wind Speed')
plt.xlabel('Temperature (°C)')
plt.ylabel('Wind Speed (m/s)')
plt.grid(True)
plt.show()
```



```
In [22]: import seaborn as sns
heatmap_data = weather_df[['Temperature', 'humidity']]
sns.heatmap(heatmap_data, annot=True, cmap='coolwarm')
plt.title('Temperature vs Humidity Heatmap')
plt.show()
```



```
In [23]: plt.scatter(weather_df['Temperature'], weather_df['humidity'])
plt.xlabel('Temperature (°C)')
plt.ylabel('Humidity (%)')
plt.title('Temperature vs Humidity Scatter Plot')
plt.show()
```

