Assignment No.8

[1]:
```
import requests
import pandas as pd
import datetime
# Set your OpenWeatherMap API key
api_key = 'fb365aa6104829b44455572365ff3b4e'
```

[2]:
```
lat = 18.184135
lon = 74.610764
#https://openweathermap.org/api/one-call-3#how How to use api call
# Construct the API URL
api_url = f"http://api.openweathermap.org/data/2.5/forecast?lat={lat}&lon={lon}&appid={api_key}"
# Send a GET request to the API
response = requests.get(api_url)
weather_data = response.json() #pass response to weather_data object(dictionary)
weather_data.keys()
dict_keys=(['cod', 'message', 'cnt', 'list', 'city'])
weather_data['list'][0]
{'dt': 1690189200,
 'main': {'temp': 298.21,
 'feels_like': 298.81,
 'temp_min': 298.1,
 'temp_max': 298.21,
 'pressure': 1006,
 'sea_level': 1006,
 'grnd_level': 942,
 'humidity': 78,
 'temp_kf': 0.11},
 'weather': [{'id': 804,
 'main': 'Clouds',
 'description': 'overcast clouds',
 'icon': '04d'}],
 'clouds': {'all': 100},
 'wind': {'speed': 6.85, 'deg': 258, 'gust': 12.9},
 'visibility': 10000,
 'pop': 0.59,
 'sys': {'pod': 'd'},
 'dt_txt': '2023-07-24 09:00:00'}
```

[5]:
```
temperatures = [item['main']['temp'] for item in weather_data['list']]
timestamps = [pd.to_datetime(item['dt'], unit='s') for item in weather_data['list']]
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']]
# Create a pandas DataFrame with the extracted weather data
weather_df = pd.DataFrame({
'Timestamp': timestamps,
'Temperature': temperatures,
'humidity': humidity,
'wind_speed': wind_speed,
'weather_description': weather_description,
})
# Set the Timestamp column as the DataFrame's index
weather_df.set_index('Timestamp', inplace=True)
max_temp = weather_df['Temperature'].max()
max_temp
```

[2]:

```
{'dt': 1690189200,
 'main': {'temp': 298.21,
  'feels_like': 298.81,
  'temp_min': 298.1,
  'temp_max': 298.21,
  'pressure': 1006,
  'sea_level': 1006,
  'grnd_level': 942,
  'humidity': 78,
  'temp_kf': 0.11},
 'weather': [{'id': 804,
   'main': 'Clouds',
   'description': 'overcast clouds',
   'icon': '04d'}],
 'clouds': {'all': 100},
 'wind': {'speed': 6.85, 'deg': 258, 'gust': 12.9},
 'visibility': 10000,
 'pop': 0.59,
 'sys': {'pod': 'd'},
 'dt_txt': '2023-07-24 09:00:00'}
```


[3]:
```
len(weather_data['list'])
```

[3]:
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40
```

[4]:
```
weather_data['list'][0]['weather'][0]['description']
```

[4]:
```
'few clouds'
```

[5]:
```
temperatures = [item['main']['temp'] for item in weather_data['list']]
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humidity = [item['main']['humidity'] for item in weather_data['list']]
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weather_description = [item['weather'][0]['description'] for item in weather_data['list']]
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'Timestamp': timestamps,
'Temperature': temperatures,
'humidity': humidity,
'wind_speed': wind_speed,
'weather_description': weather_description,
})
# Set the Timestamp column as the DataFrame's index
weather_df.set_index('Timestamp', inplace=True)
max_temp = weather_df['Temperature'].max()
max_temp
```

[5]:
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305.36
```

[6]:
```
min_temp = weather_df['Temperature'].min()
min_temp
```

[6]:
```
295.41
```

[7]:
```
# Handling missing values
weather_df.fillna(0, inplace=True) # Replace missing values with 0 or appropriate value
# Handling inconsistent format (if applicable)
weather_df['Temperature'] = weather_df['Temperature'].apply(lambda x: x - 273.15 if isinstance(x, float)else x)
```

[8]:
```
print(weather_df)
```

Timestamp	Temperature	humidity	wind_speed	weather_description
2024-09-18 18:00:00	24.33	68	4.26	few clouds
2024-09-18 21:00:00	23.82	71	3.52	few clouds
2024-09-19 00:00:00	23.00	74	2.91	scattered clouds
2024-09-19 03:00:00	24.71	61	2.73	overcast clouds
2024-09-19 06:00:00	29.62	41	2.28	overcast clouds
2024-09-19 09:00:00	32.21	32	2.82	scattered clouds
2024-09-19 12:00:00	30.62	38	5.27	broken clouds
2024-09-19 15:00:00	26.98	59	6.01	scattered clouds
2024-09-19 18:00:00	25.08	69	5.18	few clouds
2024-09-19 21:00:00	23.67	77	4.11	few clouds
2024-09-20 00:00:00	22.80	81	3.67	clear sky
2024-09-20 03:00:00	25.62	65	3.50	light rain
2024-09-20 06:00:00	30.69	46	3.72	scattered clouds
2024-09-20 09:00:00	32.07	40	3.46	broken clouds
2024-09-20 12:00:00	29.92	49	5.51	overcast clouds
2024-09-20 15:00:00	26.40	68	5.94	light rain
2024-09-20 18:00:00	24.83	75	4.92	light rain
2024-09-20 21:00:00	23.98	78	4.38	light rain
2024-09-21 00:00:00	23.53	81	3.66	light rain
2024-09-21 03:00:00	24.91	74	3.86	overcast clouds
2024-09-21 06:00:00	28.78	57	3.88	light rain
2024-09-21 09:00:00	29.64	52	3.59	light rain
2024-09-21 12:00:00	26.76	69	4.28	moderate rain
2024-09-21 15:00:00	24.76	79	5.00	moderate rain
2024-09-21 18:00:00	23.64	86	4.91	light rain
2024-09-21 21:00:00	22.94	89	3.67	moderate rain
2024-09-22 00:00:00	22.26	93	3.00	moderate rain
2024-09-22 03:00:00	22.57	91	3.61	light rain
2024-09-22 06:00:00	26.92	69	4.80	overcast clouds
2024-09-22 09:00:00	28.92	59	4.88	light rain
2024-09-22 12:00:00	27.11	69	5.11	light rain
2024-09-22 15:00:00	24.98	81	5.93	light rain
2024-09-22 18:00:00	24.02	85	4.73	light rain
2024-09-22 21:00:00	23.22	87	4.32	light rain
2024-09-23 00:00:00	22.92	88	3.96	light rain
2024-09-23 03:00:00	24.17	80	4.30	light rain
2024-09-23 06:00:00	28.17	61	3.76	overcast clouds
2024-09-23 09:00:00	30.53	53	4.37	overcast clouds
2024-09-23 12:00:00	27.97	66	4.98	light rain
2024-09-23 15:00:00	25.43	79	5.96	light rain