WeatherAPI_ETL

September 17, 2025

[1]:
```
import json
import requests
import pandas as pd
from datetime import datetime
import matplotlib.pyplot as plt
import seaborn as sns
```

[2]:
```
#Get the Weather data from API
api_key = "YOUR_API_KEY"
city = "London,uk"
url = f"http://api.openweathermap.org/data/2.5/forecast?
 ↪q=London,uk&appid={api_key}"
print(url)
response = requests.get(url)
```

```
http://api.openweathermap.org/data/2.5/forecast?q=London,uk&appid=97a0fa32e4d3b0
9986acf3de7b4b2ea8
```

[3]:
```
if response.status_code == 200:
    data = response.json()
    weather_data = []
    for entry in data['list']:
        dt_str = datetime.utcfromtimestamp(entry['dt']).strftime('%Y-%m-%d %H:
 ↪%M:%S')
        main = entry['main']
        weather = entry['weather'][0]
        clouds = entry['clouds']
        wind = entry['wind']
        sys = entry['sys']

        # Convert temperatures from Kelvin to Celsius
        temp_c = main['temp'] - 273.15
        feels_like_c = main['feels_like'] - 273.15
        temp_min_c = main['temp_min'] - 273.15
        temp_max_c = main['temp_max'] - 273.15

        record = {
            'datetime': dt_str,
```

```
            'temp_celsius': round(temp_c, 2),
            'feels_like_celsius': round(feels_like_c, 2),
            'temp_min_celsius': round(temp_min_c, 2),
            'temp_max_celsius': round(temp_max_c, 2),
            'pressure': main['pressure'],
            'humidity': main['humidity'],
            'weather_main': weather['main'],
            'weather_description': weather['description'],
            'clouds_all': clouds['all'],
            'wind_speed_m_s': wind['speed'],
            'wind_deg': wind['deg'],
            'visibility_meters': entry.get('visibility', None),
            'pop': entry.get('pop', None),
            'part_of_day': sys.get('pod', None),
            'dt_txt': entry.get('dt_txt', None)
        }

        weather_data.append(record)
    df = pd.DataFrame(weather_data)
else:
    print(f"Failed to get data: {response.status_code}")
```

```
/var/folders/l2/2z44g3090wbd6sc3nb91dh8c0000gn/T/ipykernel_3367/1972579743.py:5:
DeprecationWarning: datetime.datetime.utcfromtimestamp() is deprecated and
scheduled for removal in a future version. Use timezone-aware objects to
represent datetimes in UTC: datetime.datetime.fromtimestamp(timestamp,
datetime.UTC).
  dt_str = datetime.utcfromtimestamp(entry['dt']).strftime('%Y-%m-%d %H:%M:%S')
```

[4]:
```
df.head()  # Print first two for check
```

[4]:

	datetime	temp_celsius	feels_like_celsius	temp_min_celsius	temp_max_celsius	pressure	humidity	weather_main	weather_description	clouds_all	wind_speed_m_s	wind_deg	visibility_meters	pop	part_of_day
0	2025-09-17 12:00:00	16.97	17.02	16.97	17.45	1016	88	Clouds	overcast clouds	100	6.42	221	10000	0.0	d
1	2025-09-17 15:00:00	17.56	17.62	17.56	18.73	1016	86	Clouds	overcast clouds	100	5.49	231	10000	0.0	d
2	2025-09-17 18:00:00	17.85	17.94	17.85	18.29	1017	86	Clouds	overcast clouds						
3	2025-09-17 21:00:00	18.25	18.45	18.25	18.25	1018	89	Clouds	overcast clouds						
4	2025-09-18 00:00:00	17.60	17.79	17.60	17.60	1018	91	Clouds	overcast clouds						

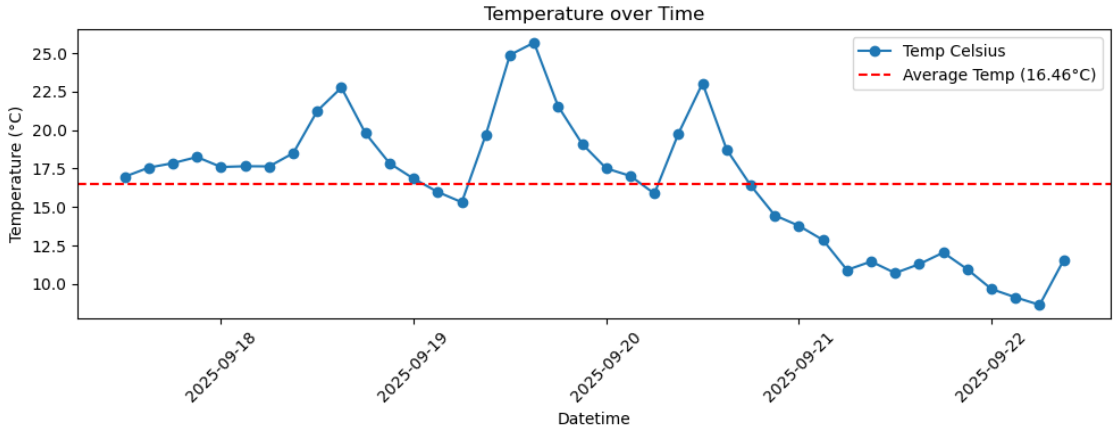
```
2          100            5.45       227              10000  0.0           d
3          100            5.14       235              10000  0.0           n
4           93            4.50       235              10000  0.0           n

                 dt_txt
0   2025-09-17 12:00:00
1   2025-09-17 15:00:00
2   2025-09-17 18:00:00
3   2025-09-17 21:00:00
4   2025-09-18 00:00:00
```

[5]:
```
# Convert the 'datetime' column to pandas datetime type if not already
df['datetime'] = pd.to_datetime(df['datetime'])

# Extract day and hour into new columns
df['day'] = df['datetime'].dt.day
df['hour'] = df['datetime'].dt.hour
```

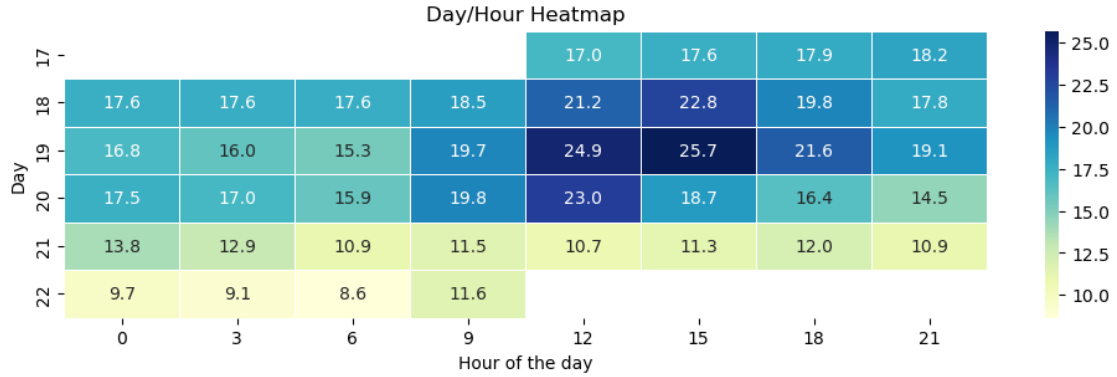
[6]:
```
df_pivot = df.pivot(index='day', columns='hour', values = 'temp_celsius')
```

[7]:
```
avg_temp = df['temp_celsius'].mean()
```

[8]:
```
plt.figure(figsize=(10, 4))
plt.plot(df['datetime'], df['temp_celsius'], marker='o', linestyle='-',␣
 ↪label='Temp Celsius')

# Calculate average temperature
avg_temp = df['temp_celsius'].mean()

# Add horizontal line for average temperature
plt.axhline(avg_temp, color='red', linestyle='--', label=f'Average Temp␣
 ↪({avg_temp:.2f}°C)')

plt.xlabel('Datetime')
plt.ylabel('Temperature (°C)')
plt.title('Temperature over Time')
plt.legend()
plt.xticks(rotation=45)
plt.tight_layout()
plt.show()
```



[9]:
```
plt.figure(figsize=(12, 3))
sns.heatmap(df_pivot, cmap='YlGnBu', annot=True, fmt=".1f", linewidths=.5)
plt.title('Day/Hour Heatmap')
plt.xlabel('Hour of the day')
plt.ylabel('Day')
plt.show()
```



[10]:
```
import sys
print(sys.executable)
```

```
/opt/homebrew/Cellar/jupyterlab/4.4.5/libexec/bin/python
```

[11]:
```
import psycopg2
from sqlalchemy import create_engine
```

[30]:
```
db_username = "YOUR_USERNAME"
db_password = "YOUR_PASSWORD"
db_host = "localhost"
```

```
db_port = "5432"
db_name = "postgres"
```

[32]:
```
# Create the SQLAlchemy engine
engine = create_engine(f'postgresql://{db_username}:{db_password}@{db_host}:
 ↪{db_port}/{db_name}')
```

[33]:
```
df.to_sql('weather', engine, if_exists='append', index=False)

print("DataFrame successfully written to the 'weather' table.")
```

```
DataFrame successfully written to the 'weather' table.
```

[34]:
```
engine.dispose()
```

[ ]:
```

```