Weather Data Aggregator and Analyzer

Git Repository: https://github.com/geetanjali1312/weather_data_analysis.git

Requirements:

Python 3.x

API Key from a weather data provider (e.g., OpenWeatherMap)

Libraries Used:

requests, sqlite3, matplotlib, pandas

Scripts Description:

There are 4 scripts used in the project

1. database.py: this script creates the database weather_data.db and table 'weather' using sqllite3 repo
2. fetch_data.py : This script pulls the data (location, temperature, humidity and wind speed) from http://api.openweathermap.org and stores into database on regular time interval (60 seconds)
3. analyze_data.py : The script analyzes the fetched metric data and calculates the average.
4. visualize_data.py : This script shows the analyzed data into visual format using matplotlib library.

Run the Application:

1. Run database.py, this will create weather_data.db file in the current folder where the python scripts are stored.
2. Register for an API key from OpenWeatherMap, copy your api key in fetch_data.py. Run fetch_data.py – this stores the weather data into 'weather' table of 'weather_data.db' on regular time interval
3. Run analyze_data.py – this calculates the average of all the data present in database table from start time to end time.
4. Finally, run the visualize_data.py to get the plot.

Outputs:

In [2]: runfile('C:/Users/win 10/Desktop/weather_data_analysis/fetch_data.py', wdir='C:/Users/win 10/Desktop/weather_data_analysis')
{'coord': {'lon': 75.9167, 'lat': 17.6833}, 'weather': [{'id': 501, 'main': 'Rain', 'description': 'moderate rain', 'icon': '10d'}], 'base': 'stations', 'main': {'temp': 31.37, 'feels_like': 32.63, 'temp_min': 31.37, 'temp_max': 31.37, 'pressure': 1005, 'humidity': 47, 'sea_level': 1005, 'grnd_level': 953}, 'visibility': 10000, 'wind': {'speed': 3.82, 'deg': 319, 'gust': 4.3}, 'rain': {'1h': 3.16}, 'clouds': {'all': 97}, 'dt': 1726917056, 'sys': {'country': 'IN', 'sunrise': 1726879509, 'sunset': 1726923222}, 'timezone': 19800, 'id': 1256436, 'name': 'Solapur', 'cod': 200}
{'coord': {'lon': 75.9167, 'lat': 17.6833}, 'weather': [{'id': 501, 'main': 'Rain', 'description': 'moderate rain', 'icon': '10d'}], 'base': 'stations', 'main': {'temp': 31.37, 'feels_like': 32.63, 'temp_min': 31.37, 'temp_max': 31.37, 'pressure': 1005, 'humidity': 47, 'sea_level': 1005, 'grnd_level': 953}, 'visibility': 10000, 'wind': {'speed': 3.82, 'deg': 319, 'gust': 4.3}, 'rain': {'1h': 3.16}, 'clouds': {'all': 97}, 'dt': 1726917056, 'sys': {'country': 'IN', 'sunrise': 1726879509, 'sunset': 1726923222}, 'timezone': 19800, 'id': 1256436, 'name': 'Solapur', 'cod': 200}
{'coord': {'lon': 75.9167, 'lat': 17.6833}, 'weather': [{'id': 501, 'main': 'Rain', 'description': 'moderate rain', 'icon': '10d'}], 'base': 'stations', 'main': {'temp': 31.37, 'feels_like': 32.63, 'temp_min': 31.37, 'temp_max': 31.37, 'pressure': 1005, 'humidity': 47, 'sea_level': 1005, 'grnd_level': 953}, 'visibility': 10000, 'wind': {'speed': 3.82, 'deg': 319, 'gust': 4.3}, 'rain': {'1h': 3.16}, 'clouds': {'all': 97}, 'dt': 1726917056, 'sys': {'country': 'IN', 'sunrise': 1726879509, 'sunset': 1726923222}, 'timezone': 19800, 'id': 1256436, 'name': 'Solapur', 'cod': 200}

```
In [1]: runfile('C:/Users/win 10/Desktop/weather_data_analysis/analyze_data.py', wdir='C:/Users/win 10/Desktop/weather_data_analysis')
Average Temperature: 18.024545454545457, Average Humidity: 86.0
```

visualize_data.py output :