

Saiket Systems



Weather CLI Project Report

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1. Objectives

- Build a command-line application in Python that fetches and displays weather data.
- Support current conditions and 7-day forecast.
- Provide options for temperature units and multiple cities.
- Include error handling, unit tests, logging, packaging, and optional Docker support.

2. Environment Setup

1. Python & Virtual Environment

- Installed Python 3.10+.
- Created a virtual environment:

```
python -m venv .venv
```

```
.\.venv\Scripts\Activate.ps1
```

2. Dependencies

- Added to requirements.txt:

```
requests
```

```
matplotlib
```

```
pytest
```

```
python-dotenv
```

```
aiohttp
```

3. Switching to a Key-Free API

- Original plan: OpenWeatherMap (required API key)
- Switched to Open-Meteo (free, no key) for simplicity and reliability.

4. Core Script `weather_open_meteo.py`

- **Functions:**
 - `get_coordinates(city, language)` — Uses Open-Meteo Geocoding.
 - `get_current_weather(lat, lon, temp_unit)` — Fetches current weather.
 - `get_weekly_forecast(lat, lon, temp_unit)` — Fetches 7-day forecast.
 - `display_current_weather(...)` — Logs current conditions.
 - `display_weekly_forecast(...)` — Logs text forecast.
 - `plot_weekly_forecast(...)` — Renders Matplotlib line chart.
- **Argument Parsing** (`argparse`):
 - Positional: one or more city names.
 - Options:
 - `--units: celsius or fahrenheit` (default: celsius)
 - `--lang: language for geocoding` (default: en)
 - `--daily: show 7-day forecast`
 - `--plot: plot forecast chart`
- **Logging** (`logging` module):
 - Configured `app.log` and console output.

5. Unit Testing with `pytest`

- Created `tests/test_weather.py` covering:
 - Successful and error cases for each API function.
 - Output checks for display functions.

- Test suite ran successfully:

- collected 7 items

7 passed in 0.76s

6. Packaging as CLI Tool

- **setup.py** configured:
 - `name="weather-open-meteo", version, dependencies.`

- entry_points for weather_open_meteo=weather_open_meteo:main.
- Installed in editable mode:

```
python setup.py develop
```

- Invoked via:

```
weather_open_meteo Cairo --daily --plot
```

7. Run Cases

Test the CLI script with the following scenarios:

1. Current weather (°C) for a single city

```
python weather_open_meteo.py Cairo
```

2. Current weather (°F) for a single city

```
python weather_open_meteo.py Cairo --units fahrenheit
```

3. 7-day forecast (text only)

```
python weather_open_meteo.py Cairo --daily
```

4. 7-day forecast + plot

```
python weather_open_meteo.py Cairo --daily --plot
```

5. Plot flag without daily (ignored)

```
python weather_open_meteo.py Cairo --plot
```

6. Multiple cities (current only)

```
python weather_open_meteo.py Cairo London "New York"
```

7. Multiple cities + text forecast

```
python weather_open_meteo.py Cairo London "New York" --daily
```

8. Multiple cities + forecast + plot

```
python weather_open_meteo.py Cairo London "New York" --daily --plot
```

9. Geocoding in another language (e.g., Arabic)

```
python weather_open_meteo.py القاهرة --lang ar
```

10. Error case: invalid city name

python weather_open_meteo.py InvalidCity

```
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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS D:\intern\Saiket System\task 2> .\.venv\Scripts\Activate.ps1
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo
Current weather in Cairo, Egypt:
  • Condition: Clear sky
  • Temperature: 27.2°C
  • Wind speed: 9.5 km/h

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --units fahrenheit
Current weather in Cairo, Egypt:
  • Condition: Clear sky
  • Temperature: 81.1°F
  • Wind speed: 9.5 km/h

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --daily
Current weather in Cairo, Egypt:
  • Condition: Clear sky
  • Temperature: 27.2°C

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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --daily
Current weather in Cairo, Egypt:
  • Condition: Clear sky
  • Temperature: 27.2°C
  • Wind speed: 9.5 km/h

7-day forecast for Cairo, Egypt:
2025-07-04 | Max: 37.4°C | Min: 23.6°C | Partly cloudy
2025-07-05 | Max: 37.2°C | Min: 22.7°C | Mainly clear
2025-07-06 | Max: 37.5°C | Min: 22.3°C | Mainly clear
2025-07-07 | Max: 37.8°C | Min: 21.9°C | Fog
2025-07-08 | Max: 36.9°C | Min: 22.2°C | Mainly clear
2025-07-09 | Max: 36.4°C | Min: 21.6°C | Partly cloudy
2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --daily --plot

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```

2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy

(.venv) PS D:\intern\Saiket System\task 2>

(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --daily --plot

Current weather in Cairo, Egypt:

- Condition: Clear sky
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2025-07-08 | Max: 36.9°C | Min: 22.2°C | Mainly clear
2025-07-09 | Max: 36.4°C | Min: 21.6°C | Partly cloudy
2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy

Traceback (most recent call last):

KeyboardInterrupt

python weather_open_meteo.py Cairo --daily --plot System\task 2>

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C
- Wind speed: 9.5 km/h

7-day forecast for Cairo, Egypt:

2025-07-04 | Max: 37.4°C | Min: 23.6°C | Partly cloudy
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2025-07-08 | Max: 36.9°C | Min: 22.2°C | Mainly clear
2025-07-09 | Max: 36.4°C | Min: 21.6°C | Partly cloudy
2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy

(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --plot

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C

```
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo --plot
```

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C
- Wind speed: 9.5 km/h

```
(.venv) PS D:\intern\Saiket System\task 2>
```

```
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo London "New York"
```

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C
- Wind speed: 9.5 km/h

Current weather in London, United Kingdom:

- Condition: Overcast
- Temperature: 22.4°C
- Wind speed: 12.9 km/h

- Wind speed: 12.4 km/h

```
(.venv) PS D:\intern\Saiket System\task 2>
```

```
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo London "New York" --daily
```

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C
- Wind speed: 9.5 km/h

7-day forecast for Cairo, Egypt:

| | | | |
|------------|-------------|-------------|---------------|
| 2025-07-04 | Max: 37.4°C | Min: 23.6°C | Partly cloudy |
| 2025-07-05 | Max: 37.2°C | Min: 22.7°C | Mainly clear |
| 2025-07-06 | Max: 37.5°C | Min: 22.3°C | Mainly clear |
| 2025-07-07 | Max: 37.8°C | Min: 21.9°C | Fog |
| 2025-07-08 | Max: 36.9°C | Min: 22.2°C | Mainly clear |
| 2025-07-09 | Max: 36.4°C | Min: 21.6°C | Partly cloudy |
| 2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy |

Current weather in London, United Kingdom:

```
(.venv) PS D:\intern\Saiket System\task 2>
```

```
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py Cairo London "New York" --daily --plot
```

Current weather in Cairo, Egypt:

- Condition: Clear sky
- Temperature: 27.2°C
- Wind speed: 9.5 km/h

7-day forecast for Cairo, Egypt:

| | | | |
|------------|-------------|-------------|---------------|
| 2025-07-04 | Max: 37.4°C | Min: 23.6°C | Partly cloudy |
| 2025-07-05 | Max: 37.2°C | Min: 22.7°C | Mainly clear |
| 2025-07-06 | Max: 37.5°C | Min: 22.3°C | Mainly clear |
| 2025-07-07 | Max: 37.8°C | Min: 21.9°C | Fog |
| 2025-07-08 | Max: 36.9°C | Min: 22.2°C | Mainly clear |
| 2025-07-09 | Max: 36.4°C | Min: 21.6°C | Partly cloudy |
| 2025-07-10 | Max: 38.1°C | Min: 22.1°C | Partly cloudy |

Current weather in London, United Kingdom:

- Condition: Overcast

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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

• Condition: Overcast
• Temperature: 22.4°C
• Wind speed: 12.9 km/h

7-day forecast for London, United Kingdom:
2025-07-04 | Max: 26.3°C | Min: 15.2°C | Overcast
2025-07-05 | Max: 22.2°C | Min: 16.3°C | Overcast
2025-07-06 | Max: 22.4°C | Min: 17.7°C | Slight rain showers
2025-07-07 | Max: 21.6°C | Min: 13.5°C | Slight rain
2025-07-08 | Max: 23.2°C | Min: 11.8°C | Overcast
2025-07-09 | Max: 26.9°C | Min: 13.1°C | Partly cloudy
2025-07-10 | Max: 28.1°C | Min: 17.6°C | Overcast

Current weather in New York, United States:
• Condition: Clear sky
• Temperature: 28.9°C
• Wind speed: 12.4 km/h

7-day forecast for New York, United States:
```

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2025-07-08 | Max: 29.8°C | Min: 23.8°C | Moderate rain showers
2025-07-09 | Max: 32.0°C | Min: 23.0°C | Overcast
2025-07-10 | Max: 25.5°C | Min: 22.0°C | Overcast

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py --lang ar
Current weather in القاهرة, مصر:
• Condition: Clear sky
• Temperature: 27.2°C
• Wind speed: 9.5 km/h

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> python weather_open_meteo.py InvalidCity
Error for InvalidCity: No coordinates found for 'InvalidCity'

(.venv) PS D:\intern\Saiket System\task 2>
(.venv) PS D:\intern\Saiket System\task 2> |
```




