Weather Data Visualization and Interaction on ESP32

Project Description

Problem: A system needs to be developed to fetch weather data from SMHI's API and display it on an ESP32 microcontroller. The system should allow users to interact with the data, navigate with the touchscreen, and configure API call settings.

Solution:

The solution will implement a menu-driven interface on the ESP32 microcontroller, developed on PlatformIO enabling users to:

- Fetch weather data from **SMHI's API** (https://opendata.smhi.se/apidocs/).
- **View weather data** in a simple graphical format.
- **Navigate** through various screens using **the touchscreen**.
- **Interact with the displayed data** (e.g., scrolling through historical weather data).
- **Select cities, weather parameters, and forecast options** by the user.
- **Configure settings,** such as city selection and weather parameter.

User Stories

Start-up

- **US1.1**: As a user, I want to see a boot screen to display the current program version and group number for three seconds.
- **US1.2:** As a user, I want to see the **weather forecast for the next 7 days for** Karlskrona on the starting screen in terms of temperate per day at 12:00.

Tile Navigation & Access

- **US2.1:** As a user, I want to be able to navigate between different screens (like forecast screen) **by sliding a finger over the touch screen**.

Weather Data Display

- **US3.1:** As a user, I want to have a screen to view **historical weather data**.
- **US3.2:** As a user, I want to view **historical temperature data** (latest months) for Karlskrona in a line graph.

Non-Functional Requirements (NFRs)

- **NF1:** The code must follow a **suitable coding standard**.
- **NF2:** The code must be **well-documented**, including:
    - o **Inline comments** within the code.
    - o **Markdown documentation** in the project repository.
- **NF3:** The project must follow the **terms and conditions for data (license compliance)** with the data source.