Weather Forecast for Macedonian Cities

This web application provides weather forecasts for Macedonian cities using Java Spring Boot on the back-end and Bootstrap-enabled HTML page on the front-end. It fetches weather data from the **OpenWeatherMap API**, stores it in **PostgreSQL** database and allows users to view all forecasts or filter only hot weather days (where the max temperature exceeds 25°C).

➢ Project Structure

✓ Entity Layer

- **WeatherForecast.java**
  - Represents a weather forecast record with fields for city, date, max temperature and feels-like temperature. Annotated with **@Entity** for JPA persistence.

✓ Repository Layer

- **WeatherForecastRepository.java**
  - Extends **JpaRepository** to provide ORM access and defines custom query method:
    List<WeatherForecast> findByMaxTempGreaterThan(double temp);

✓ Service Layer

- **WeatherForecastService.java – Interface**
- **WeatherForecastServiceImpl.java** – Implementation that implements core business logic:
  - **fetchAndStoreWeatherData()** - fetches weather data from the OpenWeatherMap API and saves it to the database.
  - ***getAllForecasts()*** – retrieves all forecast records.
  - **getHotDays()** – filters and returns forecasts where maxTemp > 25.0.

✓ Controller Layer

- **WeatherForecastController.java** that defines REST API endpoints:
  - ***GET api/load*** – Fetch and store weather data from the API.
  - ***GET /api/all*** – Retrieve all forecast data
  - ***GET /api/hot-days*** – Retrieve only hot weather days

✓ Frontend (HTML + Bootstrap + JavaScript)

- HTML page styled with Bootstrap 5
- Two buttons provided:
  - All Weather – loads all forecasts.
  - Hot Weather Only – filters and shows only hot days.
- Results are rendered in a styled table

- Uses **fetch()** to call the backend endpoints and dynamically display the results in the DOM.
- Accessible via:
  localhost:8081/api/load
  http://localhost:8081/weather.html

✓ **Database Configuration**

- **Database: PostgreSQL**
- **Connection Details** (in application.properties):

```
spring.datasource.url=jdbc:postgresql://localhost:5432/weatherdb
spring.datasource.username=postgres
spring.datasource.password=postgres
```

- **JPA Settings**

```
# JPA settings
spring.jpa.hibernate.ddl-auto=update
spring.jpa.show-sql=true
spring.jpa.properties.hibernate.dialect=org.hibernate.dialect.PostgreSQLDialect
```

- **API Integration**
  Uses the OpenWeatherMap API:

```
openweather.api.key = a4c0b3fe13e8f2deb1410da731f060f8
openweather.api.url=http://api.openweathermap.org/data/2.5/forecast
openweather.api.cities=Skopje:41.9981,21.4254;Gostivar:41.8000,20.9167;Ohrid:41.1231,20.8016
```