



## **Basics of Web Programming**

Project work report

Lappeenrannan–Lahden teknillinen yliopisto LUT

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## **Project overview**

The project is a modern web application for weather forecasts and meteorological data visualization. Users can search for different cities and access a comprehensive range of weather-related functions including current conditions, forecasts, interactive charts, and live webcam feeds.

## **Technical Architecture**

The application is built using modern web technologies with a clean, modular architecture:

Frontend: HTML5, CSS3, and JavaScript ES6+ with module system

Architecture: Service-oriented design with clear separation of concerns

Data Visualization: Frappe Charts for interactive weather graphs

Storage: LocalStorage for user preferences and favorites

Responsive Design: Mobile and desktop optimized interface

## **API Integration**

The app integrates with 3 primary APIs for comprehensive weather data:

### **OpenWeatherMap.org One Call API 3.0**

Purpose: Primary weather data source for global coverage

Data: Current weather, 24-hour forecasts, 7-day forecasts

Rate Limit: 1,000 calls/day (free tier)

Coverage: Worldwide weather information

### **2. FMI (Finnish Meteorological Institute)**

Purpose: Specialized weather data for Finland and Nordic regions

Data: High-quality meteorological data for Finnish locations

API: WFS (Web Feature Service) for XML-based weather data

Advantage: More accurate data for Finnish locations

### **3. WindyWebcams API**

Purpose: Live webcam feeds for visual weather conditions

Data: Real-time webcam streams from weather stations

Rate Limit: 500 calls/day (free tier)

Feature: Visual confirmation of weather conditions

## **Key Features**

### **Core Functionality**

City Search: Search weather by city name or GPS coordinates

Multi-source Data: Automatic fallback between OpenWeatherMap and FMI

Comprehensive Forecasts: 24-hour and 7-day weather predictions

Interactive Charts: Temperature and precipitation visualizations

Favorites System: Save and manage preferred locations

Multiple Units: Celsius, Fahrenheit, and Kelvin temperature units

## Points proposal

Feature	Points
Report	3
Application is responsive and can be used on both desktop and mobile environment	4
Application works on Firefox, Safari, Edge and Chrome	3
The application has clear directory structure and everything is organized well	1 (-1 cos could be better)
Location search	1
GPS	2
2 data forecast provs	3
3 data forecast provs	2
Icons	3
Themes (look / feel)	2
2 forecasts (OW + FMI)	3
Favorites	2
C, K, F	2
<b>TOTAL</b>	31/40

Tools & AI use

Used chatgpt for ideas & digging API documentations & Cursor agent to help build the code.