Large-Scale and Multi-Structured Databases
Project Design

Weather Prediction App

Rojan Shrestha

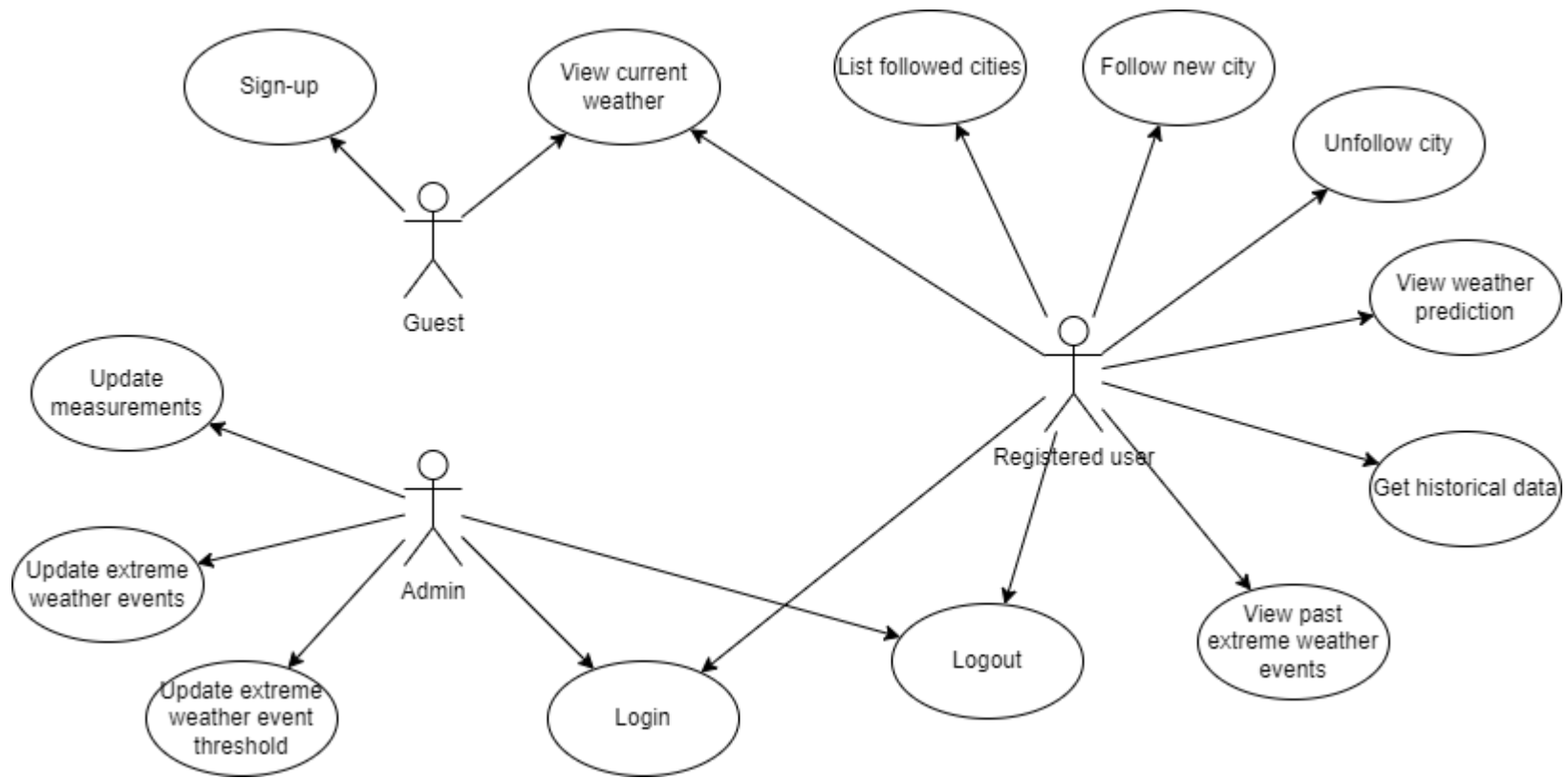Alessio Simoncini

Lorenzo Vezzani

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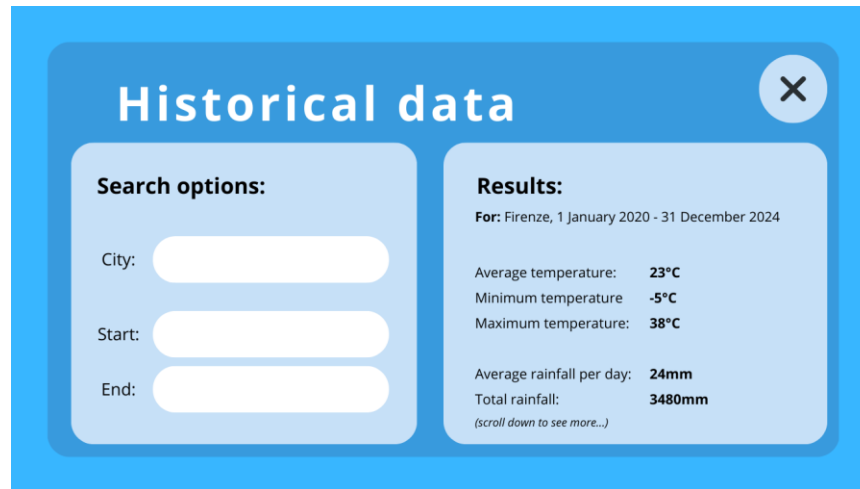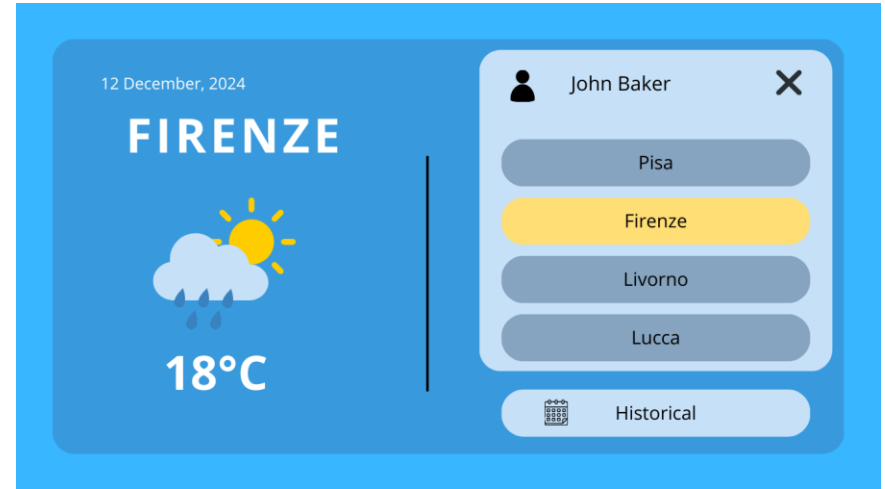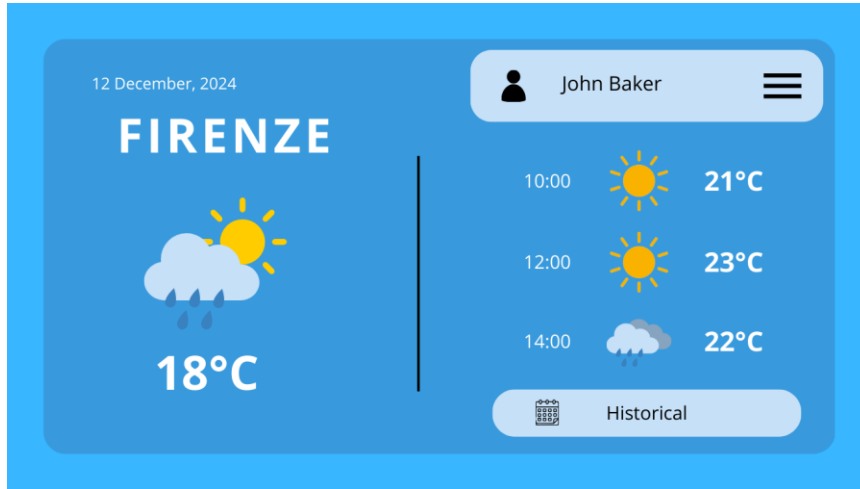
Application Highlights

WeatherApp provides you with the weather information you need to plan your day with key features:

- **Current Weather** - Provides up-to-date information about the temperature, rainfall, wind, and other statistics for the user selected city.

- **Weather Forecast** - Offers hourly, daily, or weekly weather forecasts, helping users plan ahead. Based on proximity and weather patterns the app even provides weather forecast of cities not in database.

- **Weather Trends and History** - Offers historical weather data, allowing user to analyze past weather conditions for specific cities over selected time periods.

- **Extreme Weather events** - Notifies user of severe weather warnings such as thunderstorms, hurricanes or extreme temperatures.

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Actors

Main mock-ups

Dataset Description

Source:
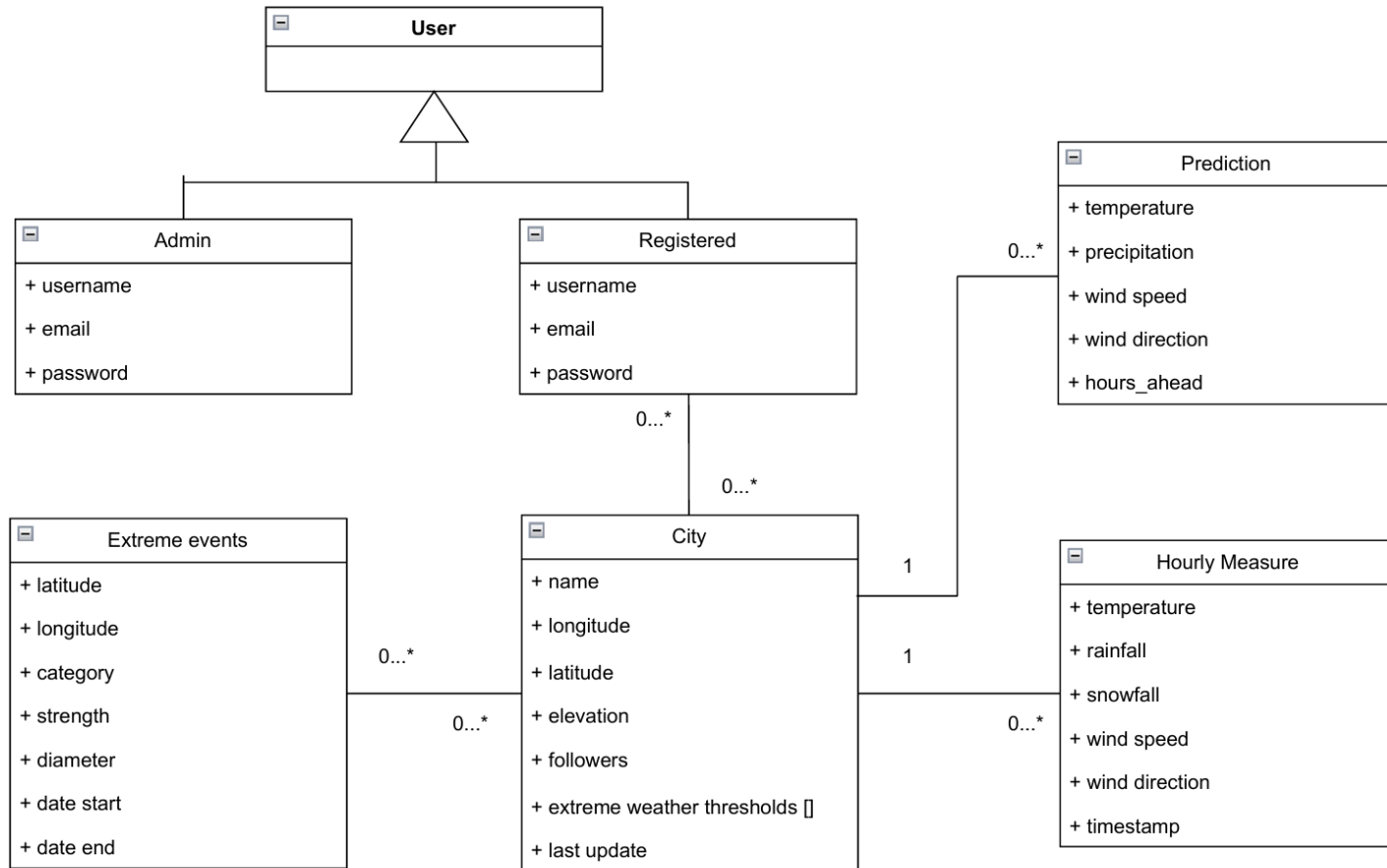https://open-meteo.com/en/docs/historical-weather-api
Open-Meteo is an open source weather API that partners with national weather services around the globe.

Description: The hourly weather data over 80 years of any major city of Italy.

Volume: 75MB

Velocity/Variability: Weather information is important only when recent. After a certain period of time it will be relevant only for statistical purposes.

Preliminary UML Class Diagram

Relevant Queries and Entities handled by Document DB

Entities stored

- User

- City

- Measurement

- Extreme Weather Event

Relevant queries

Registered client and admin:
- Analyze the historical weather of a specific city over a defined time-period
- Count of extreme weather events in a city
- Search for cities with a given weather pattern
- Search the most affected cities by Extreme Weather

Admin / meteorologist only:
- Search for and evaluate current or past extreme weather events

Relevant queries and Entities handled by Key-Value DB

Entities stored

○ City - Geographical Information

○ Prediction

Functional Requirements

Registered user and admin:

- View weather prediction (or current weather) of a province capital
- View weather prediction (or current weather) of an arbitrary city

Admin / meteorologist:

- Insert Prediction