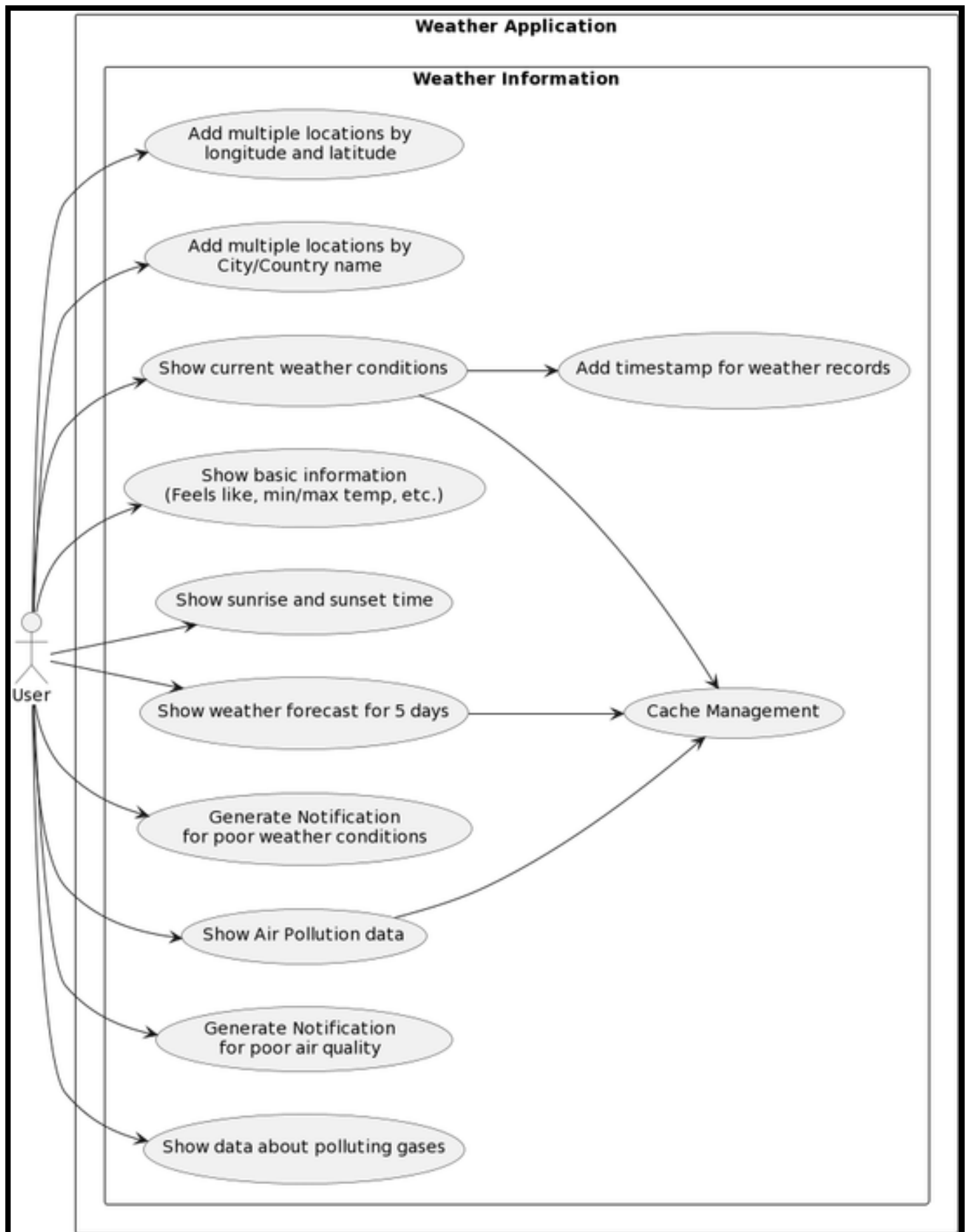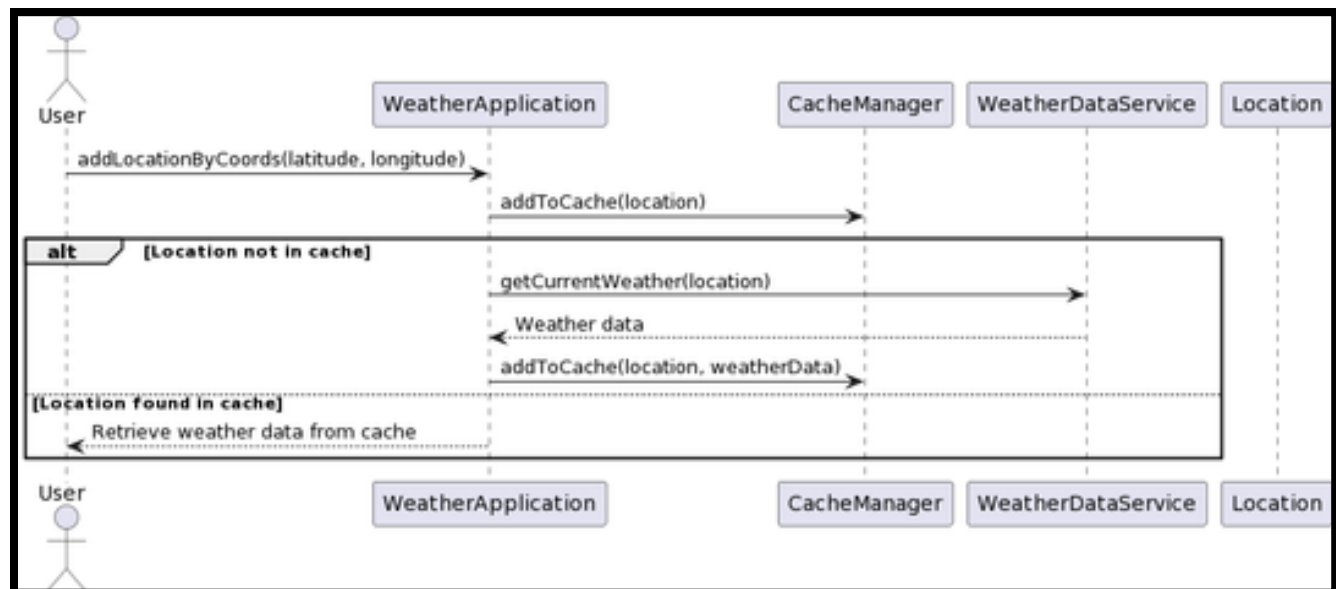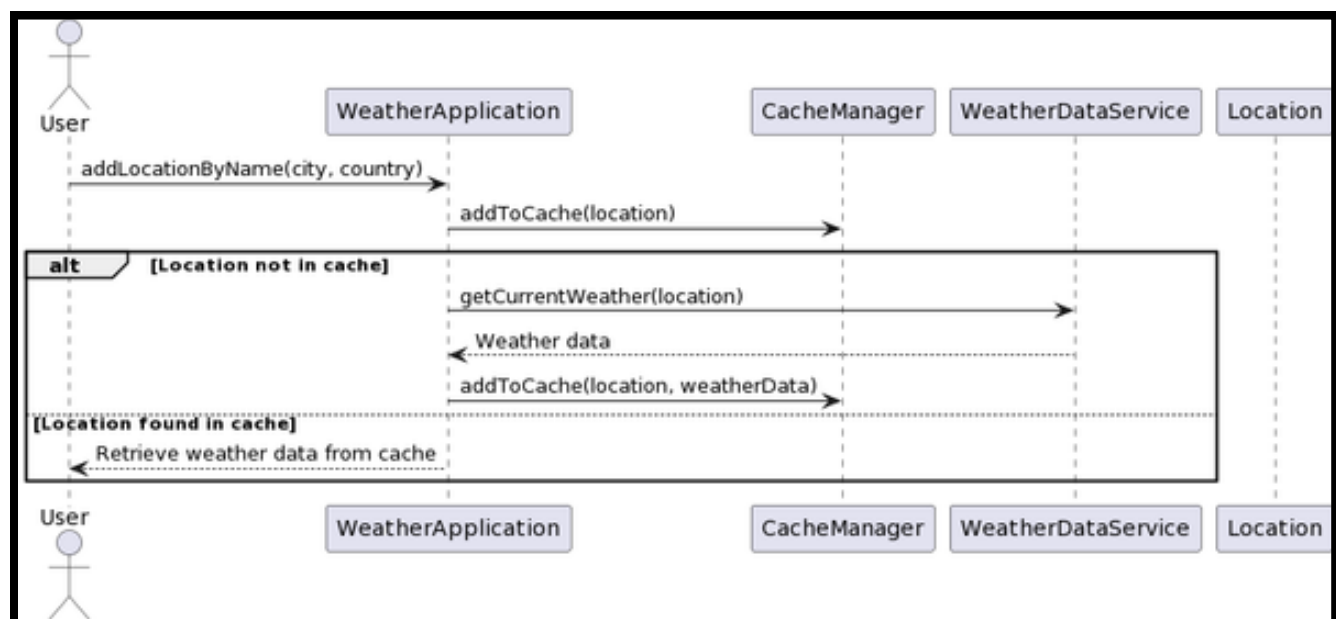# Phase 1
Design

1. Use case diagram

1. Sequence diagrams
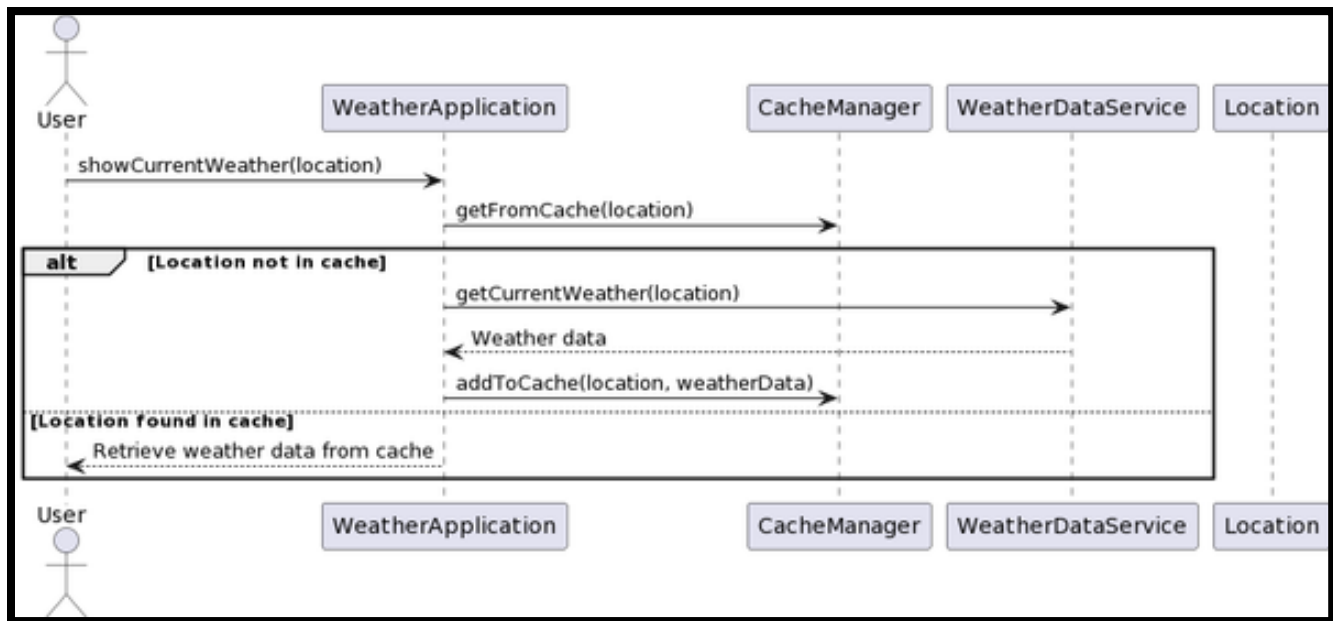
1) Add multiple locations to check weather with longitude and latitude.

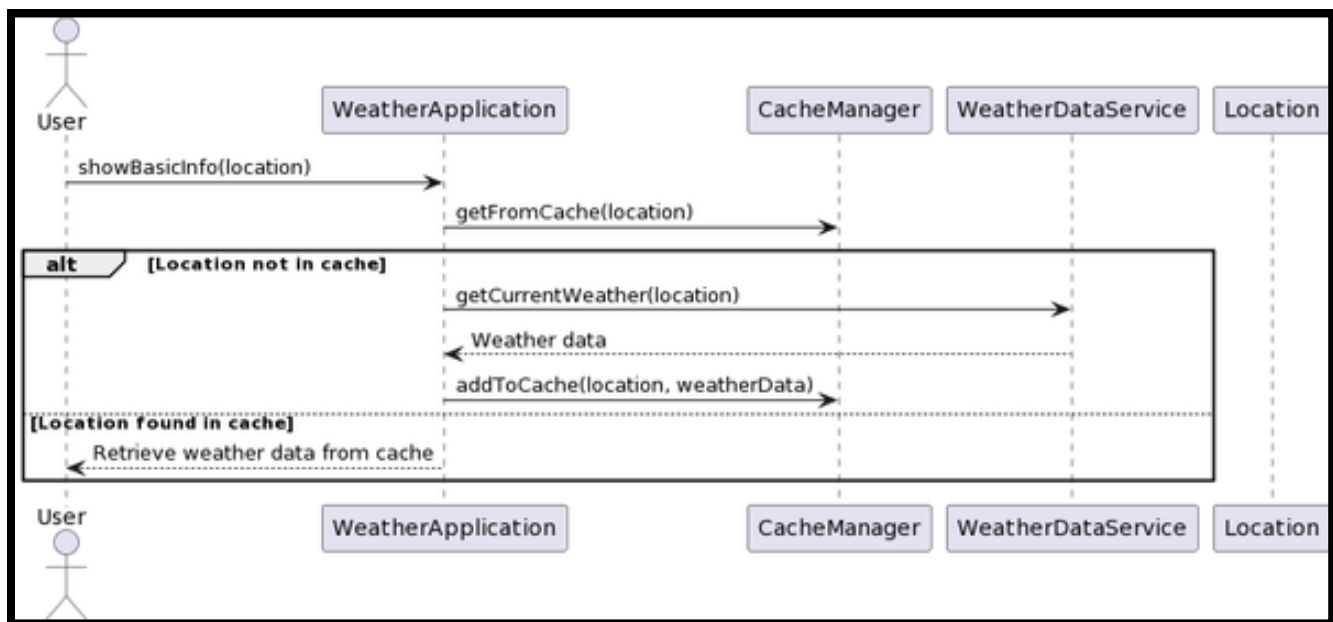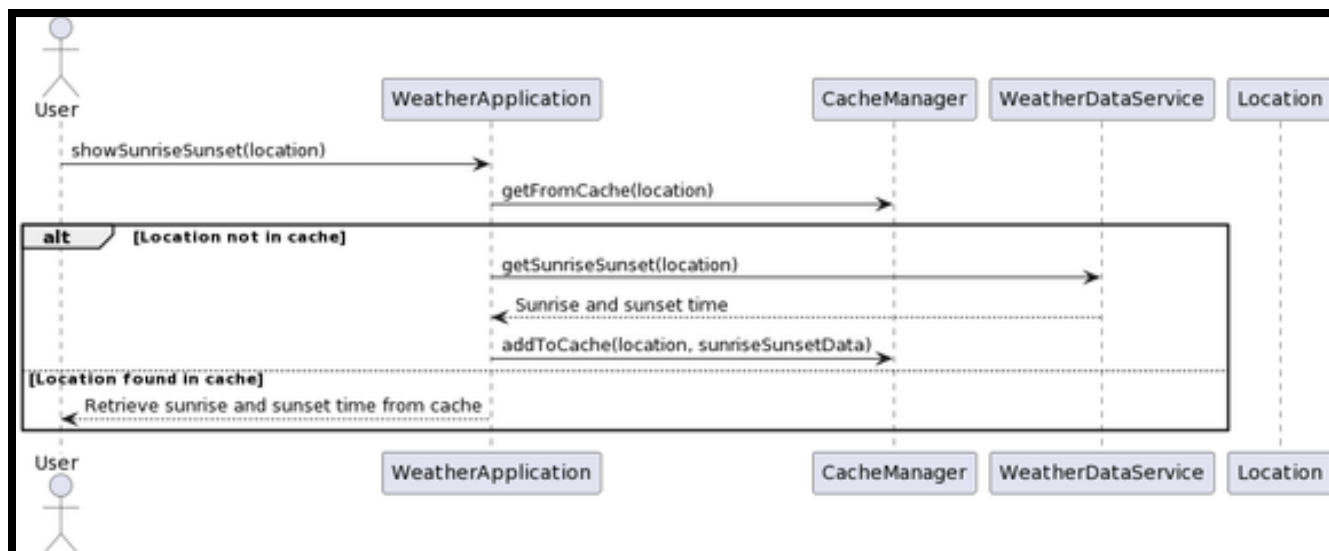**2) Add multiple locations to check weather with city/country name.**

3) Show current weather conditions.

Sequence diagram with participants: User, WeatherApplication, CacheManager, WeatherDataService, Location

- User → WeatherApplication: showCurrentWeather(location)
- WeatherApplication → CacheManager: getFromCache(location)
- alt [Location not in cache]
  - WeatherApplication → WeatherDataService: getCurrentWeather(location)
  - WeatherDataService → WeatherApplication: Weather data
  - WeatherApplication → CacheManager: addToCache(location, weatherData)
- [Location found in cache]
  - WeatherApplication → User: Retrieve weather data from cache

4) Show basic information like "Feels like, minimum and maximum temperature" etc

Sequence diagram with participants: User, WeatherApplication, CacheManager, WeatherDataService, Location

- User → WeatherApplication: showBasicInfo(location)
- WeatherApplication → CacheManager: getFromCache(location)
- alt [Location not in cache]
  - WeatherApplication → WeatherDataService: getCurrentWeather(location)
  - WeatherDataService → WeatherApplication: Weather data
  - WeatherApplication → CacheManager: addToCache(location, weatherData)
- [Location found in cache]
  - WeatherApplication → User: Retrieve weather data from cache

5) Show sunrise and sunset time.

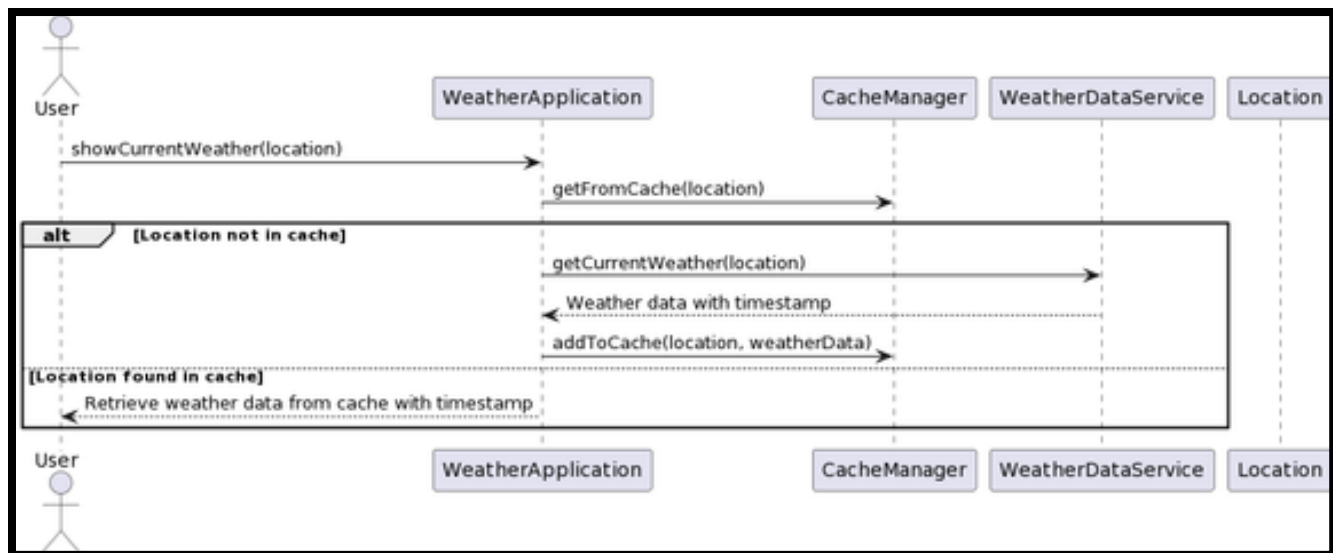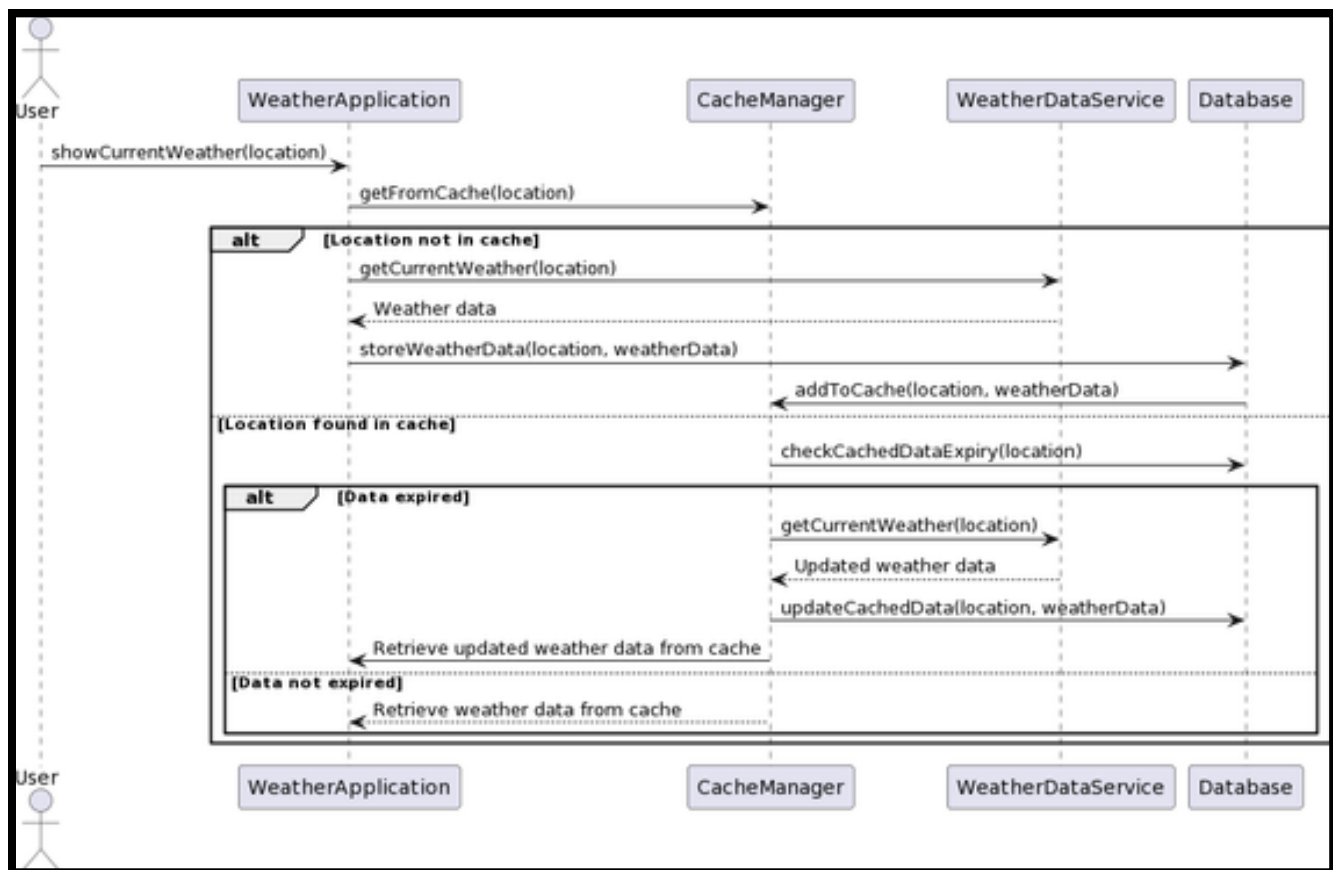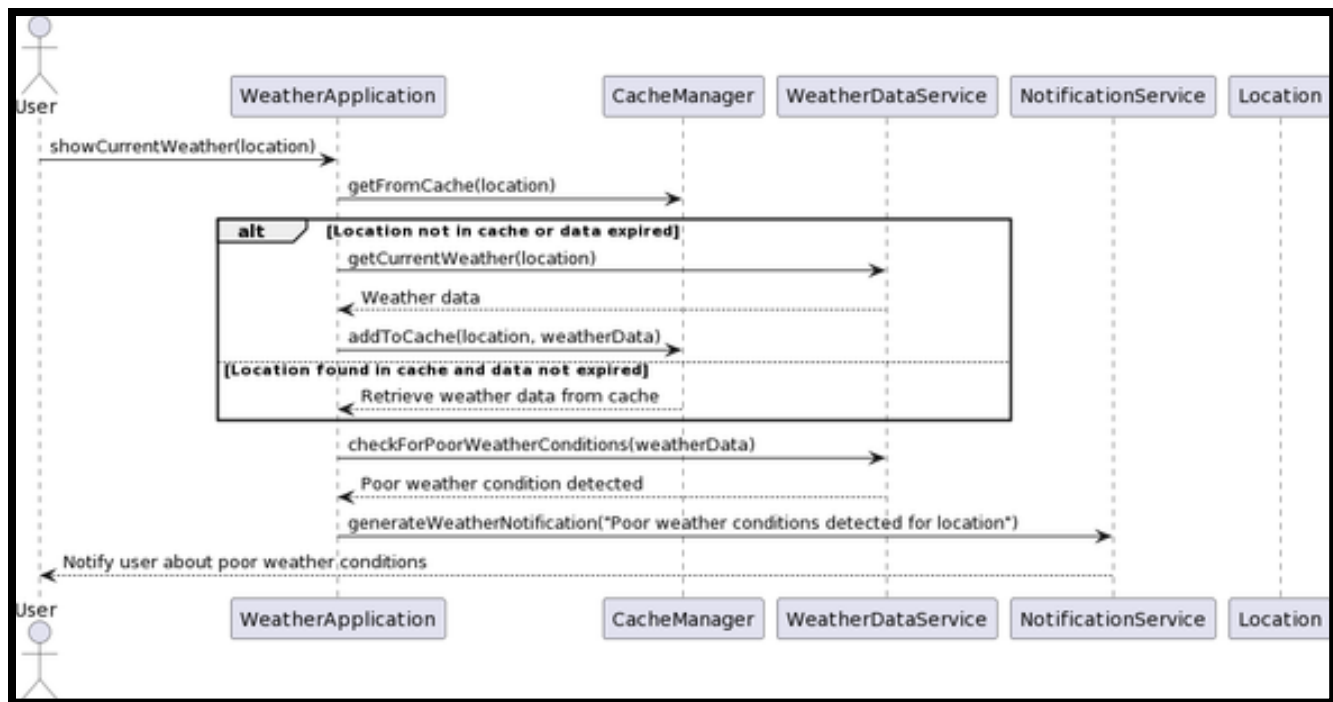**6) Show weather forecast for 5 days.**
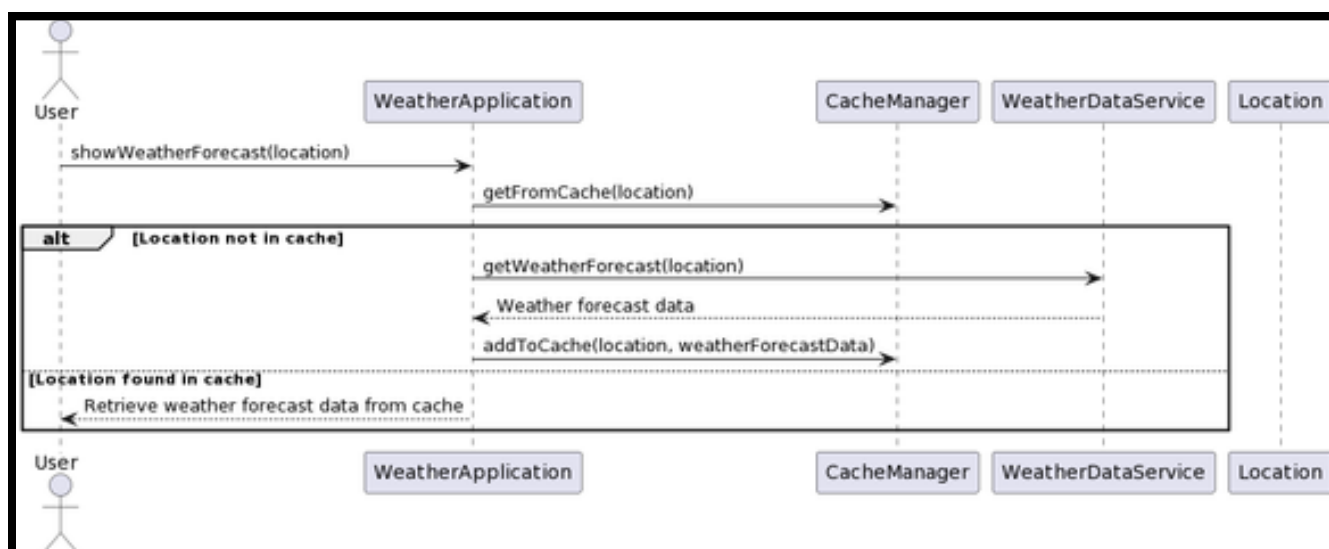
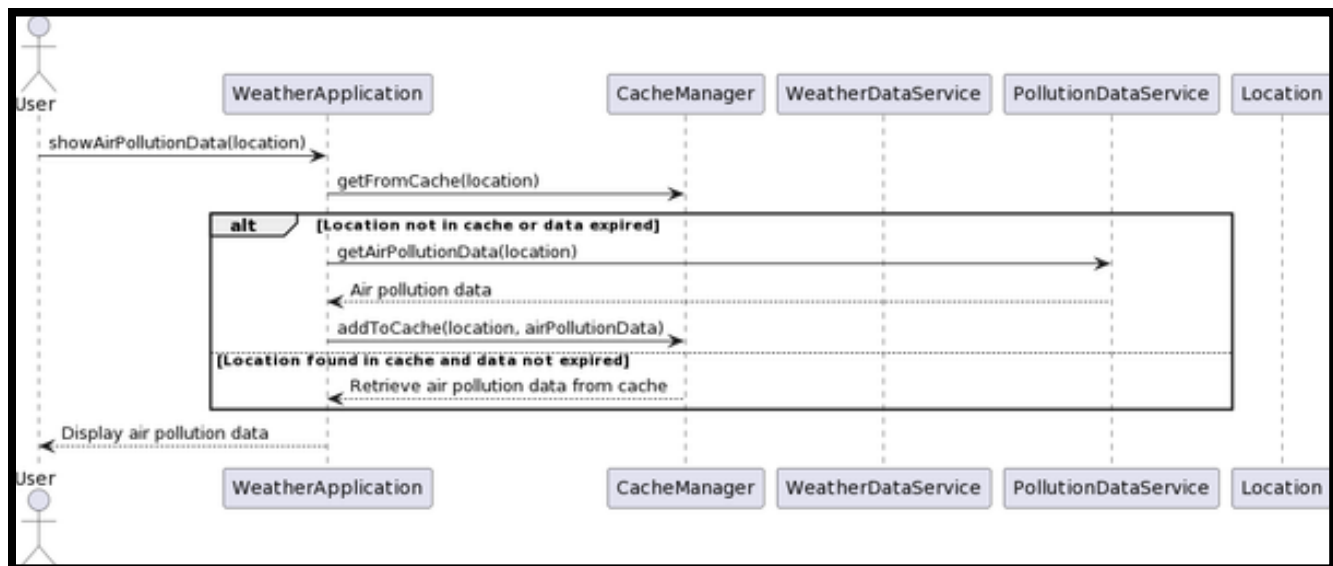**7) Add timestamp for weather records**

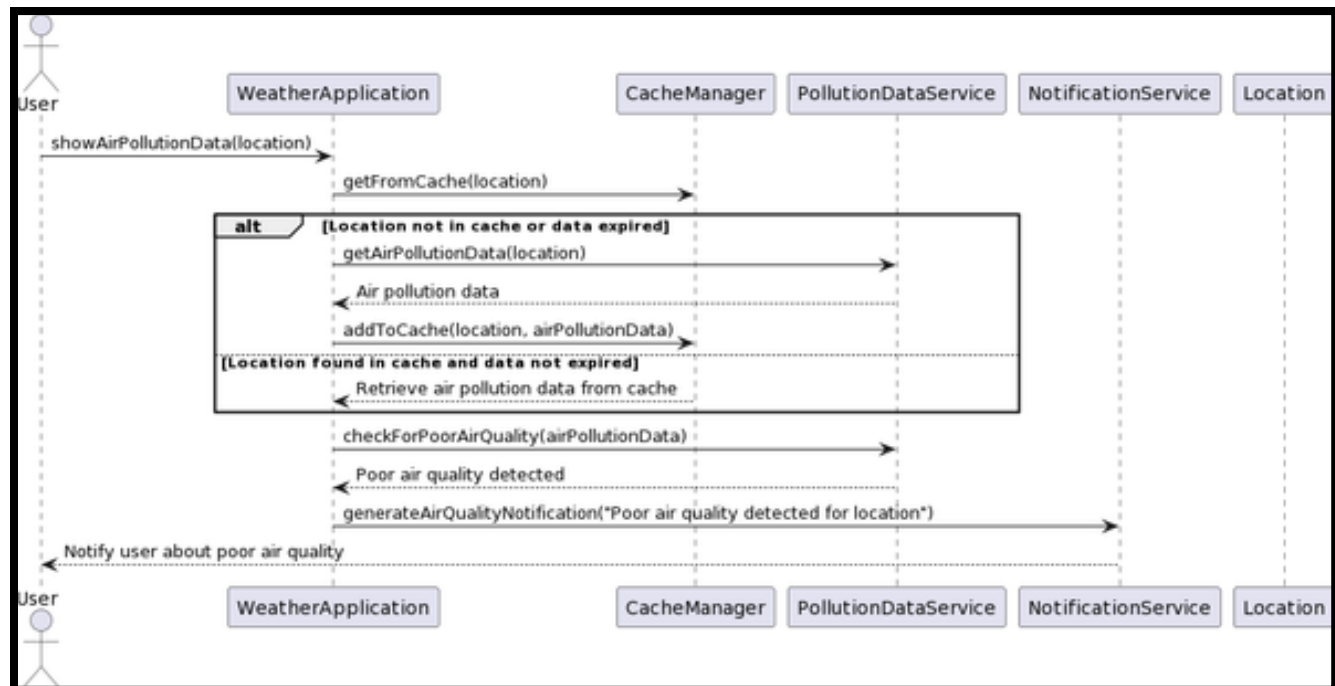**8) Implement Cache Management:**

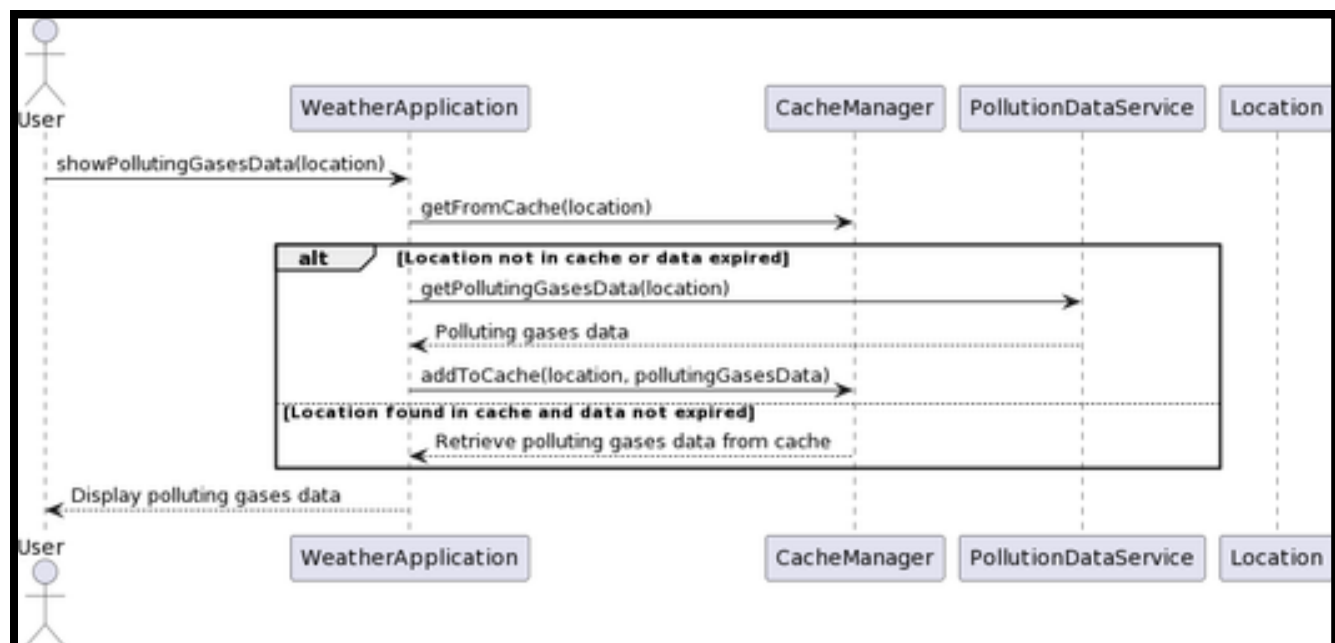**9) Generate Notification for poor weather conditions.**

10) Show Air Pollution data.
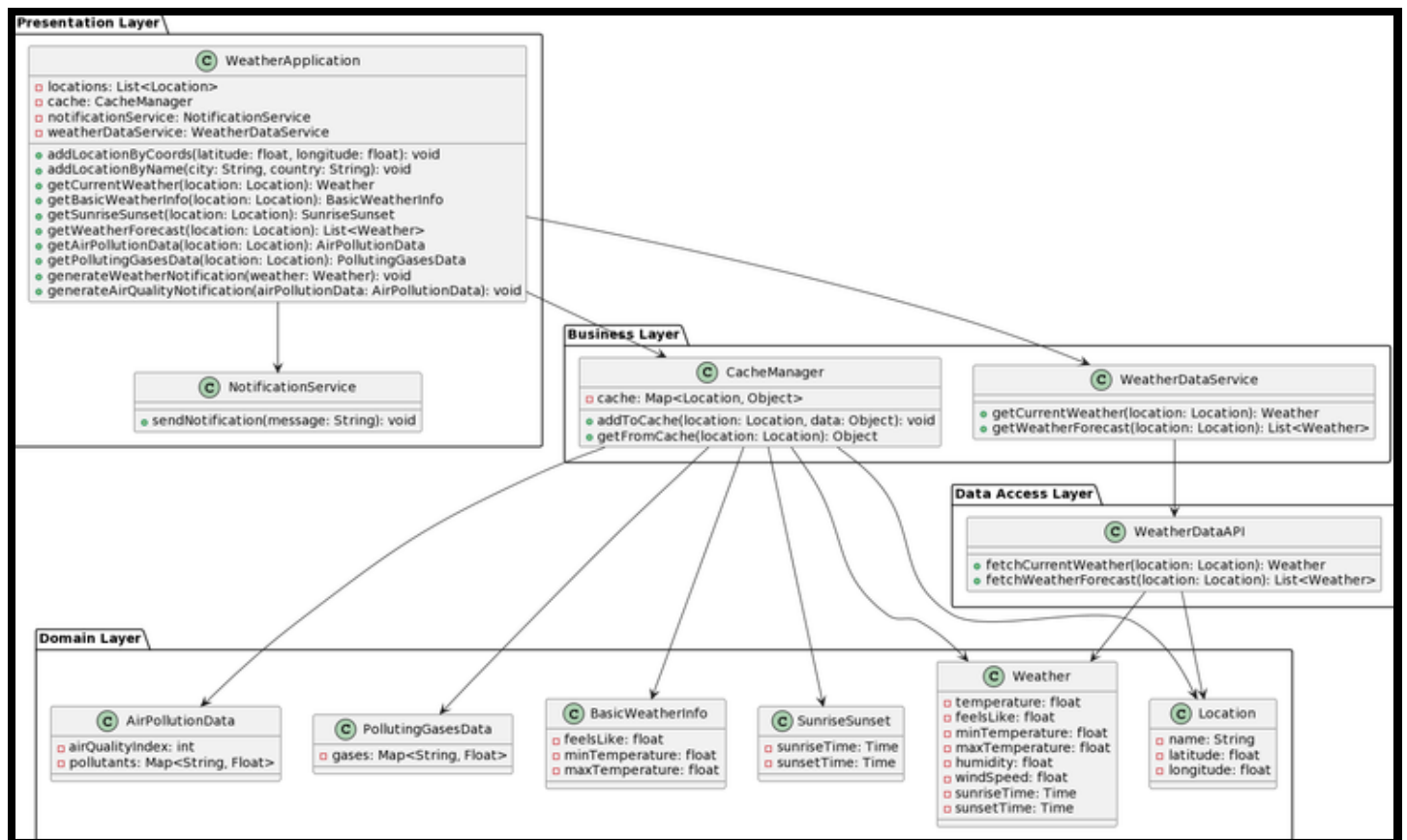
11) Generate Notification for poor air quality.

12) Show data about polluting gasses.

1. Class diagram

Presentation Layer

WeatherApplication
- locations: List<Location>
- cache: CacheManager
- notificationService: NotificationService
- weatherDataService: WeatherDataService
- addLocationByCoords(latitude: float, longitude: float): void
- addLocationByName(city: String, country: String): void
- getCurrentWeather(location: Location): Weather
- getBasicWeatherInfo(location: Location): BasicWeatherInfo
- getSunriseSunset(location: Location): SunriseSunset
- getWeatherForecast(location: Location): List<Weather>
- getAirPollutionData(location: Location): AirPollutionData
- getPollutingGasesData(location: Location): PollutingGasesData
- generateWeatherNotification(weather: Weather): void
- generateAirQualityNotification(airPollutionData: AirPollutionData): void

NotificationService
- sendNotification(message: String): void

Business Layer

CacheManager
- cache: Map<Location, Object>
- addToCache(location: Location, data: Object): void
- getFromCache(location: Location): Object

WeatherDataService
- getCurrentWeather(location: Location): Weather
- getWeatherForecast(location: Location): List<Weather>

Data Access Layer

WeatherDataAPI
- fetchCurrentWeather(location: Location): Weather
- fetchWeatherForecast(location: Location): List<Weather>

Domain Layer

AirPollutionData
- airQualityIndex: int
- pollutants: Map<String, Float>

PollutingGasesData
- gases: Map<String, Float>

BasicWeatherInfo
- feelsLike: float
- minTemperature: float
- maxTemperature: float

SunriseSunset
- sunriseTime: Time
- sunsetTime: Time

Weather
- temperature: float
- feelsLike: float
- minTemperature: float
- maxTemperature: float
- humidity: float
- windSpeed: float
- sunriseTime: Time
- sunsetTime: Time

Location
- name: String
- latitude: float
- longitude: float

Group members

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