

Homework 5: PhotoWeather

Due: October 21, 11:59 PM

Submit via the class TEAMS site.

Grading: 30 points total + up to 3 points Extra Credit.

Goal

In this assignment, you'll extend the PhotoLibrary app that uses the Open-Meteo API (<https://open-meteo.com>) to display weather types with photos for searched cities. You'll practice real-world API integration, JSON decoding, and interface refinement with SwiftUI.

Learning Objectives

You will:

- Work with public REST APIs (Open-Meteo)
- Use async/await networking and JSON decoding
- Bind API data to SwiftUI views using MVVM architecture
- Implement navigation, weather data visualization, and dynamic views
- Integrate weather data with existing photo management system

Provided Starter Code

You will receive a complete Photo Library app with the following features already implemented:

- Photo management system (add, delete, favorite photos)
- Photo gallery with grid layout
- Photo detail views with descriptions
- Data persistence using UserDefaults
- Tab-based navigation (Home, Favorites)
- Camera and photo library integration

Tasks (30 Points Total)

Part A. Project Setup and New Tab View (2 pts)

Add a third tab to the existing TabView for "Weather". Create the basic WeatherView structure. Ensure the app builds and runs with the new weather tab. Verify proper navigation between tabs.

Part B. Weather API Integration (5 pts)

- Implement `WeatherAPIService` class for Open-Meteo API integration
- Create weather data models (`WeatherData`, `WeatherType`, etc.)
- Add proper error handling for network requests and API failures
- Test API calls with sample cities and verify data retrieval

Part C. Weather Photo Assignment System (8 pts)

- Create a weather setup interface where users can assign photos to weather types
- Implement weather types: Sunny, Rainy, Snowy, Foggy. Everything else would be considered as Sunny weather type.
- Allow users to select photos from their photo gallery library for each weather type by choosing new photos per weather type.
- Store weather-photo associations persistently
- Validate that all weather types have assigned photos before allowing weather searches
- Create an intuitive setup flow with proper navigation

Part D. Weather Search and Display (8 pts)

- Implement city search functionality in the weather tab
- Display current weather information (temperature, conditions, precipitation)
- Show the assigned photo based on current weather conditions
- Map weather codes from the API to appropriate weather types
- Handle search results and display weather data clearly

Part E. User Experience and Accessibility (5 pts)

- Implement proper loading states during weather API calls
- Add error handling with user-friendly messages and retry functionality
- Provide appropriate accessibility labels for weather data
- Ensure clear navigation and intuitive user flow

- Handle edge cases (invalid cities, network failures, missing weather data)

Part F. Code Quality and Organization (2 pts)

- Follow MVVM separation (Repository/Service, ViewModel, View)
- Use consistent naming conventions and file organization
- Implement proper async/await patterns for API calls
- Keep functions focused and well-commented
- Remove unused code and imports
- Ensure proper error handling throughout the weather implementation

Extra Credit (+3 pts max)

(+3) Optional

Open ended part for the better application experiences. You can expand this minimalist application by proposing anything. Mention all the things you did in 'README.md' file.

Deliverables

- A working Xcode project (.zip) that builds and runs.
- Include your README.md explaining design changes and extra credit.
- Submit via TEAMS with the proper naming convention.

Grading Rubric

Part	Task	Pts
A	Project Setup	2
B	Weather API Integration	5
C	Weather Photo Assignment System	8
D	Weather Search and Display	8
E	User Experience & Accessibility	5
F	Code Quality & Organization	2
	Total	30
	Extra Credit —	+3



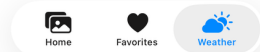
Weather



Default Images Not Set

You need to set images for all weather types before you can search for weather.

[Set Images](#)



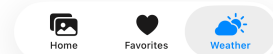
Weather Search

[Search](#)



Search for Weather

Enter a city name to see the weather and your assigned photo



[Cancel](#) [Done](#)

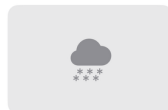
Set Weather Images



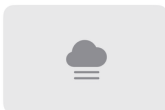
Sunny
Tap to Set



Rainy
Tap to Set



Snowy
Tap to Set



Foggy
Tap to Set



[Cancel](#) [Done](#)

Set Weather Images



Sunny
✓ Set



Rainy
✓ Set



Snowy
✓ Set



Foggy
✓ Set



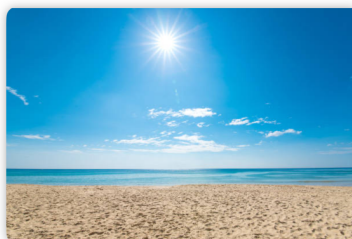
[Edit](#)

Weather Search

[Search](#)

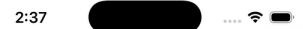
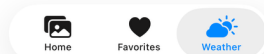
Houston

United States



27°C

Sunny
☁ Rain: 0%



[Edit](#)

Weather Search

[Search](#)

Kenora

Canada



10°C

Rainy
☁ Rain: 10%

