Homework 4: WeatherNow — Open-Meteo API App

Due: October 15, 11:59 PM
Submit via the class TEAMS site.
Grading: 30 points total + up to 5 points Extra Credit.

Goal

In this assignment, you'll extend the WeatherNow app that uses the Open-Meteo API (**https://open-meteo.com**) to display weather forecasts for searched cities. You'll practice real-world API integration, JSON decoding, and interface refinement with SwiftUI. You'll also develop your design initiative by proposing and implementing at least three visual enhancements to the dispalyed minimalist app.

Learning Objectives

You will:

- Work with public REST APIs (Open-Meteo and Geocoding API).
- Use async/await networking and JSON decoding.
- Bind API data to SwiftUI views using MVVM.
- Implement navigation, charts, and dynamic views.
- Exercise personal design choices (branding, color, typography, and app icon).

Tasks (30 Points Total)

Part A. Project Setup/Search (2 pts)

Build a (WeatherNow) app using the relevant API and display city names through a search function.

Part B. Networking and Model Validation/Forecast Viz (10 pts)

Take care of your Details screen as follows: Confirm that the Geocoding API returns valid city data and the Forecast API fetches and decodes hourly weather data correctly (temperature, precipitation probability, wind speed).

Furthermore, display hourly weather using Swift Charts (line or bar). Show a 'Today at a glance' summary with min/max temperature, precipitation %, and wind speed. Handle missing data gracefully (show '—').

Part C. Favorites (3 pts)

Allow users to mark/unmark cities as persistent favorites with a toggle.

Part D. Design Enhancement (5 pts)

Demonstrate creative initiative by adding at least three of the following design elements:
- Custom app icon and splash screen.
- New color scheme (e.g.,).
- Typography refinement (system text styles with hierarchy).

- Light animation or motion (fade-in, etc.).

Include a short description (≤200 words) in a README.md file explaining your design rationale and assets used.

Part E. User Experience and Accessibility (5 pts)

Ensure clear navigation titles (WeatherNow, city names). Support dark mode. Provide appropriate SF Symbols and accessibility labels. Implement loading/error/empty states with retry buttons.

Part F. Code Quality and Organization (5 pts)

Follow MVVM separation (Repository, ViewModel, View). Use consistent naming and file organization. Keep functions small and commented where logic may not be obvious. Remove unused code and imports.

Extra Credit (+5 pts max)

(+5) Metric vs. Imperial Mode

Add a unit-toggle in app settings or toolbar:
- Convert all displayed values (temperature, wind speed, etc.) to either Metric or Imperial.
- Persist the user’s choice across launches with @AppStorage.
- Update charts and summary text dynamically.

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

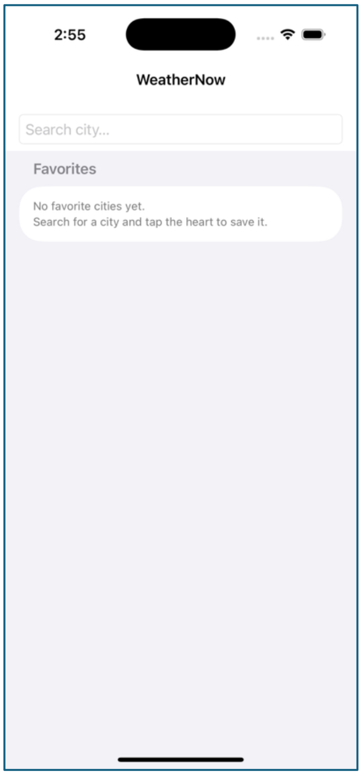
Part	Task	Pts
A	Project Setup/Search	2
B	Networking & Model Validation/ Forecast Visualization	10
C	Favorites	3
D	Design Enhancement	5
E	User Experience & Accessibility	5
F	Code Quality & Organization	5
	Total	30
	Extra Credit — Metric vs. Imperial Toggle	+5

NOTES

A **REST API** (or “RESTful API”) is just a **web service that follows certain principles** so that clients (like your Swift app) can easily communicate with servers using **standard HTTP** methods.

MVVM stands for **Model – View – ViewModel** is an **architectural pattern** — a way to organize your code so your app is clean, testable, and easy to maintain.

Part	Role	Typical in SwiftUI
Model	The raw **data** and business logic.	Structs like WeatherData, City, or your API services.
View	The **UI layer** — what the user sees on screen.	SwiftUI views like ContentView, WeatherChartView.
ViewModel	The **bridge** between View and Model — prepares data in a UI-friendly form and handles user actions.	A class or @Observable that conforms to ObservableObject.

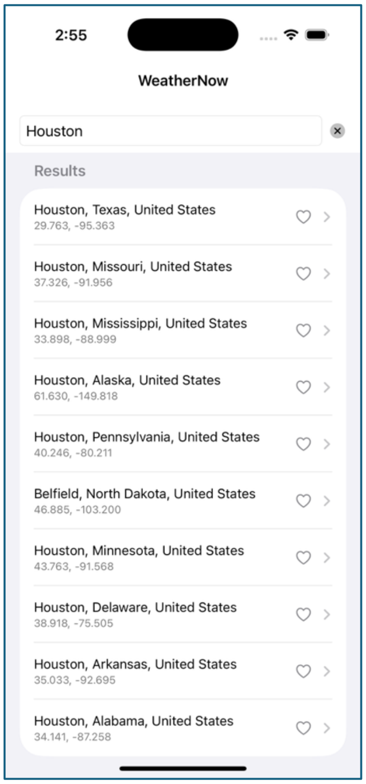


WeatherNow

Search city...

Favorites

No favorite cities yet.
Search for a city and tap the heart to save it.



WeatherNow

Houston

Results

Houston, Texas, United States
29.763, -95.363

Houston, Missouri, United States
37.326, -91.956

Houston, Mississippi, United States
33.898, -88.999

Houston, Alaska, United States
61.630, -149.818

Houston, Pennsylvania, United States
40.246, -80.211

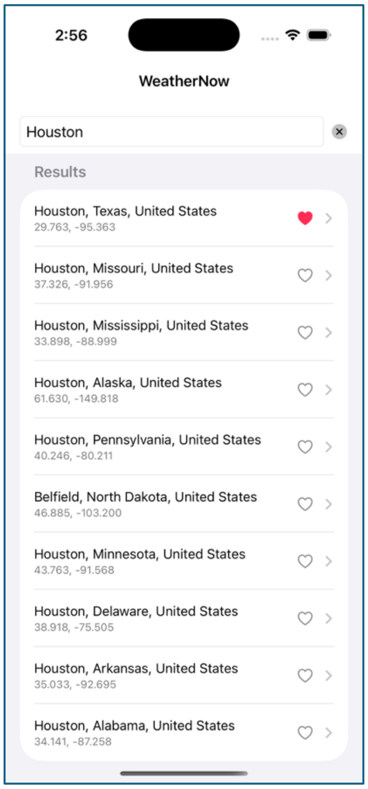
Belfield, North Dakota, United States
46.885, -103.200

Houston, Minnesota, United States
43.763, -91.568

Houston, Delaware, United States
38.918, -75.505

Houston, Arkansas, United States
35.033, -92.695

Houston, Alabama, United States
34.141, -87.258



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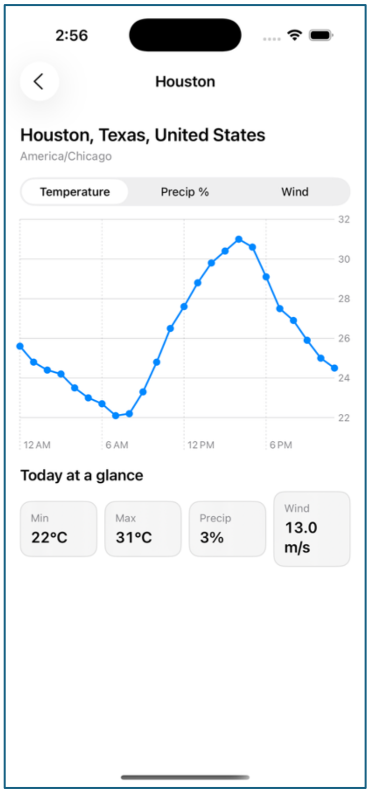
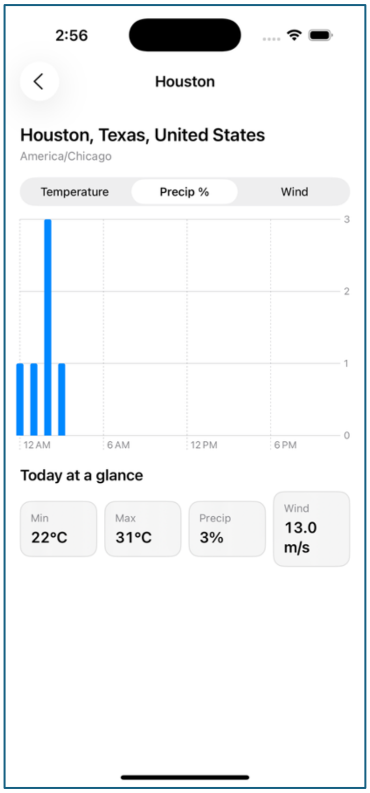


Houston, Texas, United States
America/Chicago

Today at a glance

Min 22°C
Max 31°C
Precip 3%
Wind 13.0 m/s



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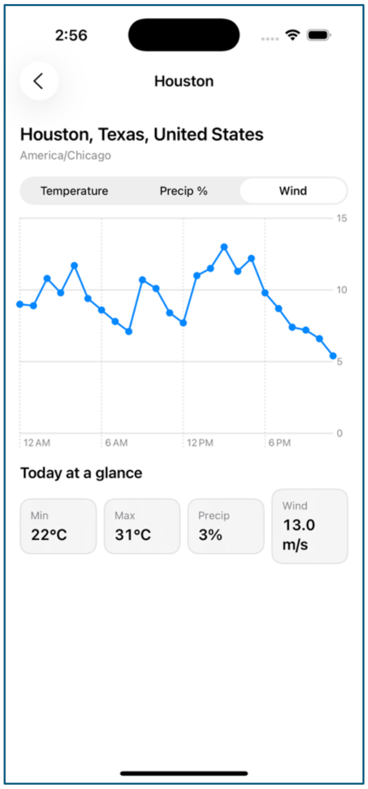

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