Guide2Code - Swift Programming Roadmap

🔷 Phase 1: Beginner Level

📌 Topics to Learn:

1. Introduction to Swift (Xcode Installation, Swift Playground)
2. Basic Syntax (Variables, Constants, Data Types)
3. Operators (Arithmetic, Comparison, Logical, Bitwise)
4. Control Flow (if-else, switch-case, guard)
5. Loops (for, while, repeat-while, break, continue)
6. Functions (Defining, Calling, Parameters, Return Types)
7. Collections (Arrays, Sets, Dictionaries)
8. Optionals (nil, Optional Binding, Unwrapping)
9. Error Handling (try, catch, throw)
10. Basic Debugging (Breakpoints, Console Logs)

🚀 Beginner Project Ideas:

- 🖩 **Simple Calculator** – Perform basic arithmetic operations
- 📊 **Student Grade Calculator** – Input marks and display grades
- 🔢 **Number Guessing Game** – User guesses a number, program gives hints
- 🌡 **Temperature Converter** – Convert Celsius ↔ Fahrenheit
- 📅 **Age Calculator** – Calculate age based on birth year
- 🎨 **Color Mixer App** – Mix RGB values to create colors

🔷 Phase 2: Intermediate Level

📌 Topics to Learn:

1. Object-Oriented Programming (Classes, Structs, Inheritance, Protocols)
2. Closures & Higher-Order Functions (map, filter, reduce)
3. Extensions & Protocol-Oriented Programming
4. Memory Management (ARC, Strong vs. Weak References)
5. Concurrency & Multithreading (DispatchQueue, async-await)

6. Working with JSON & APIs (URLSession, Codable)
7. Core Data & SQLite (Local Database Management)
8. SwiftUI Basics (Views, Modifiers, State Management)
9. UIKit (ViewControllers, TableViews, CollectionViews)
10. Unit Testing (XCTest, Test-Driven Development)

🚀 **Intermediate Project Ideas:**

- 📚 **Library Management System** – Store and manage books
- 📞 **Contact Management System** – Store, edit, delete contacts
- 📝 **To-Do List App** – Task management with Core Data
- 🌦 **Weather App** – Fetch and display live weather data from an API
- 🎮 **Tic-Tac-Toe Game** – Playable in SwiftUI or UIKit
- 📍 **Location-Based App** – Use GPS to track and display locations

🔷 **Phase 3: Advanced Level**

📌 **Topics to Learn:**

1. Advanced SwiftUI (Animations, Gestures, Custom UI Components)
2. Networking with Combine & Alamofire
3. Security in Swift (Encryption, OAuth, Keychain)
4. App Performance Optimization & Profiling
5. Machine Learning with Core ML
6. Augmented Reality with ARKit
7. Game Development with SpriteKit & SceneKit
8. Cloud Integration (Firebase, AWS, iCloud)
9. Push Notifications & Background Processing
10. Publishing Apps on the App Store

🚀 **Advanced Project Ideas:**

- 💬 **Chat Application** – Real-time messaging with Firebase
- 🏬 **E-commerce App** – Full shopping platform with payment integration
- 📊 **Stock Market Tracker** – Fetch and visualize stock market data

- 🔒 **Secure Login System** – Authentication with OAuth and Face ID
- 🎥 **Face Recognition System** – AI-based image processing using Core ML
- 🎮 **Augmented Reality App** – Interactive AR experience using ARKit