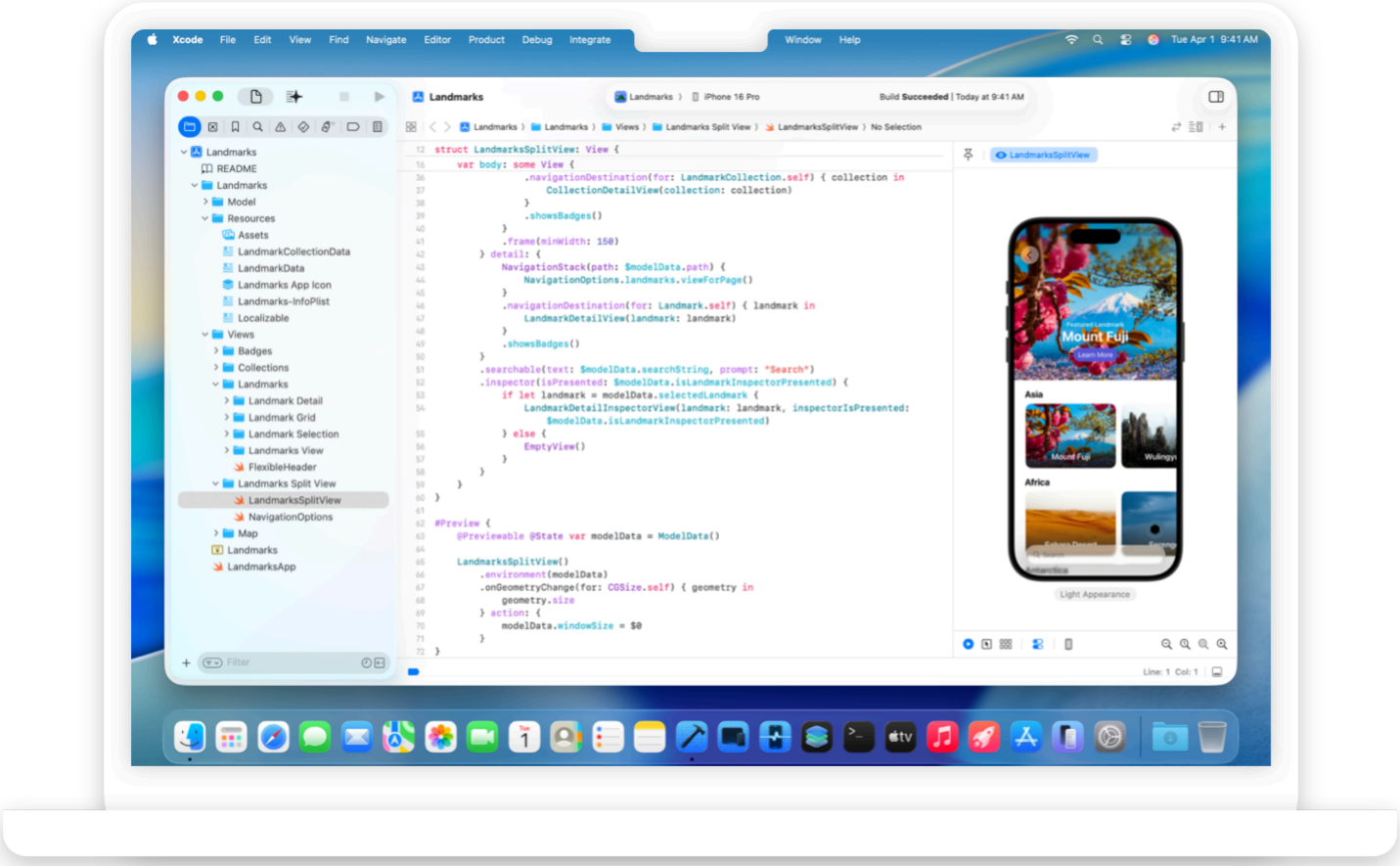
Documentation

Xcode

Build, test, and submit your app with Apple's integrated development environment.

Overview

Xcode is the suite of tools you use to build apps for Apple platforms. Use Xcode to manage your entire development workflow — from creating your app to testing, optimizing, and submitting it to the App Store.



Xcode includes a world-class source editor with code completion, source control, and a powerful debugger. Use coding intelligence to explain and write code, analyze bugs, and generate fixes. Add playground macros to run code snippets, and add SwiftUI previews to see your UI as you build it.

Xcode also includes several tools to help you rapidly develop and test your app:

- Run your entire app in Simulator without using a real device.
- Create a single, multilayer icon for your app using the Icon Composer app.
- Use Instruments to profile and analyze your app, improve performance, and investigate system resource usage.
- Construct 3D content with Reality Composer.
- Train custom machine learning models with Create ML.
- Identify areas of your app that aren't accessible with Accessibility Inspector.

> **Note**
>
> Download the latest version of Xcode from the Mac App Store. Download beta versions of Xcode from the Apple Developer website.

Topics

Essentials

Creating an Xcode project for an app
Start developing your app by creating an Xcode project from a template.

Creating your app's interface with SwiftUI
Develop apps in SwiftUI with an interactive preview that keeps the code and layout in sync.

Previewing your app's interface in Xcode
Iterate designs quickly and preview your apps' displays across different Apple devices.

Building and running an app
Compile your source files and assemble an app bundle to run on a device or simulator.

Xcode updates
Learn about important changes to Xcode.

Xcode IDE

Projects and workspaces
Manage the code and resources you use to build apps, libraries, and other software for Apple platforms.

- Source control management

  Back up your files, collaborate with others, and tag your releases with Git source control support in Xcode.

- Capabilities

  Enable services that Apple provides, such as In-App Purchase, Push Notifications, Apple Pay, iCloud, and many others.

- Build system

  Compile your code into a binary format, and customize your project settings to build your code.

- Command-line tools

  Develop and customize your projects in Terminal.

Code

- Source Editor

  Edit your source files, locate issues, and make necessary changes using the Source Editor.

- Bundles and frameworks

  Organize code and resources in bundles and frameworks.

- Swift packages

  Create reusable code, organize it in a lightweight way, and share it across Xcode projects and with other developers.

Interface

- Asset management

  Add app icons, images, strings, data files, machine learning models, and other resources to your projects, and manage how you load them at runtime.

- Localization

  Expand the market for your app by supporting multiple languages and regions.

- Accessibility Inspector

  Reveal how your app represents itself to people using accessibility features.

Documentation

- Writing documentation

  Produce rich and engaging developer documentation for your apps, frameworks, and packages.

Tuning and debugging

- Devices and Simulator

  Configure and manage devices connected to your Mac or devices in Simulator and use them to run your app.

- Debugging

  Identify and address issues in your app using the Xcode debugger, Xcode Organizer, Metal debugger, and Instruments.

- Performance and metrics

  Measure, investigate, and address the use of system resources and issues impacting performance using Instruments and Xcode Organizer.

- Testing

  Develop and run tests to detect logic failures, UI problems, and performance regressions.

Distribution and continuous integration

- Distribution

  Prepare your app and share it with your team, beta testers, and customers.

- Xcode Cloud

  Automatically build, test, and distribute your apps with Xcode Cloud to verify changes and create high-quality apps.

Hardware considerations

- Apple silicon

  Get the resources you need to create software for Macs with Apple silicon.

- Application binary interfaces

  Write assembly instructions that adhere to the application binary interfaces of Apple platforms.