Intro to iOS

Lecture 1

CIS 1951

Installing Xcode

Installing Xcode

- Important! **UPDATE TO macOS Sonoma 14.5** or higher
- Note, Xcode takes A LOT of space :(
  - Expect **~40 GBs**, so make sure you have space
  - If you have trouble clearing up space, come talk to us after and we have suggestions!
- For iOS/Apple development, we recommend always keeping your computer and Xcode updated to the most recent version

Installing Xcode Part 2

- Install the latest Xcode version from the App Store
- Open Xcode, then check the **iOS** box when prompted
- More detailed instructions, and a video can be found in HW0 instructions
  - Getting the environment set up is part of HW0, but start early! All of the updates/downloads/clearing space can take much longer than you expect.

Welcome!

- Icebreakers
  - Name
  - Year
  - Why you’re interested in iOS development, or a favorite project you’ve worked on (not necessarily iOS)!

Intro Survey

- Complete this survey by tonight!
  - https://forms.gle/3iEHKu1uDtm5JcqP7

Schedule

Meet weekly here, AGH 214 - One section:

Section 201
Wed 5:15-6:45 PM

Prerequisites

- Some coding experience, e.g. CIS 1200
- Macs are ***HIGHLY PREFERRED***
  - Apple development can only be done on a Mac (sadly)
  - We will make virtual macOS instances available, but your experience will be degraded :(

Goals for the Semester

- Learn iOS Dev (with Swift and SwiftUI)
- Be able to develop your own apps and projects independently!
- Know how to submit apps to App Store
- Make an completed app ready to be published!
  - The final project is done in teams of 3

Class Resources

- Course Website:

  https://www.seas.upenn.edu/~cis1951/25fa/

- Gradescope: for submitting assignments
- Ed: for questions/discussions (join via Canvas)
- OH: from TAs/instructors, TBD (stay tuned)

Attendance Policies

- Attendance is **required**
  - We may also do in-class activities, graded on completion
- 2 free absences
- Health or family emergency? Let us know on Ed

Late Policy

- You will be given **5 calendar late days** throughout the semester
- You can use a maximum of **2 late days** on a given assignment
- You can use late days on any assignment, **except for the final project**
- We will apply late days automatically — no need to ask beforehand
- Any late submissions made outside this policy is a 0%
- Health or family emergency? Let us know on Ed

AI Policy 🤖🤖

- Allowed, but **don't rely on it**
  - ChatGPT is outdated — you'll get worse code
- Start on your own
  - ChatGPT can give you logic/UI bugs that are hard to debug
- You are responsible for every line you or ChatGPT writes!

Permits and Waitlist…

- We have a long waitlist, but you are on the top by being here
- Auditing (informally) is allowed
- Course material & HWs are public to everyone
  - You may choose to follow along via the website

Finally... iOS Dev!

$$$

Why iOS?

In the US, iPhone has a **57.93%** market share. As of 2023, Android has a 70.29% global market share. iPhone users have a 43.7% higher average salary than Android users. Gen Z and Millennials are more likely to be iPhone users.

Exploding Topics
Dec 6, 2023

iPhone vs Android User Stats (2024 Data) - Exploding Topics

Why iOS?

- Good user experience
- Apple Store provides easy user reachability
- Seamless with the Apple ecosystem
- Integration with other platforms:
  - macOS, tvOS, watchOS, and recently… visionOS!

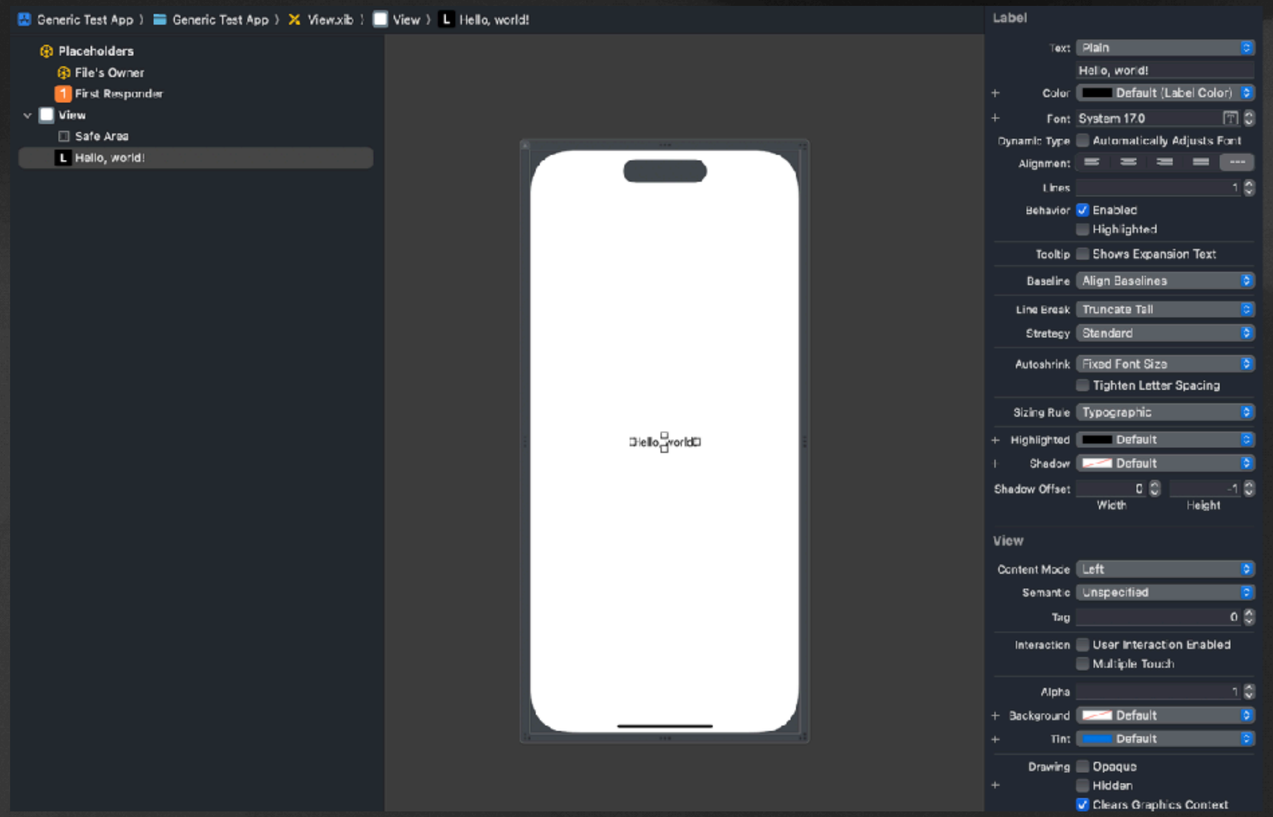
visionOS?!


Home
Dining
GSR
Laundry
More
0 Commons
Menu
Hours
Location
9:30
2 - 4:30
7:30 - 10:30
11 - 4:30
5 - 9:30
Tuesday
7:30 - 10:30
11 - 4:30
5 - 9:30
Wednesday
7:30 - 10:30
11 - 2
5 - 9:30
Thursday
7:30 - 10:30
11 - 4:30
5 - 9:30
Friday
11 - 4:30
5 - 8

iOS Platform & Evolution

2008

UIKit, a classic UI framework



iOS Platform & Evolution

2008

Objective-C, a superset of C

```objc
@implementation ObjCViewController: UIViewController

- (NSString *) greet:(NSString*) name {
    return [NSString stringWithFormat:@"Hello, %@!", name, NULL];
}

- (void) viewDidLoad {
    [super viewDidLoad];

    UILabel *label = [[UILabel alloc] init];
    label.text = [self greet:@"world"];

    [self.view addSubview:label];
}

@end
```

iOS Platform & Evolution

2014

Swift w/ modern syntax

```
class SwiftViewController: UIViewController {
    func greet(name: String) → String {
        "Hello, \(name)!"
    }

    override func viewDidLoad() {
        super.viewDidLoad()

        let label = UILabel()
        label.text = greet(name: "world")

        view.addSubview(label)
    }
}
```

iOS Platform & Evolution

2019

SwiftUI for declarative UI

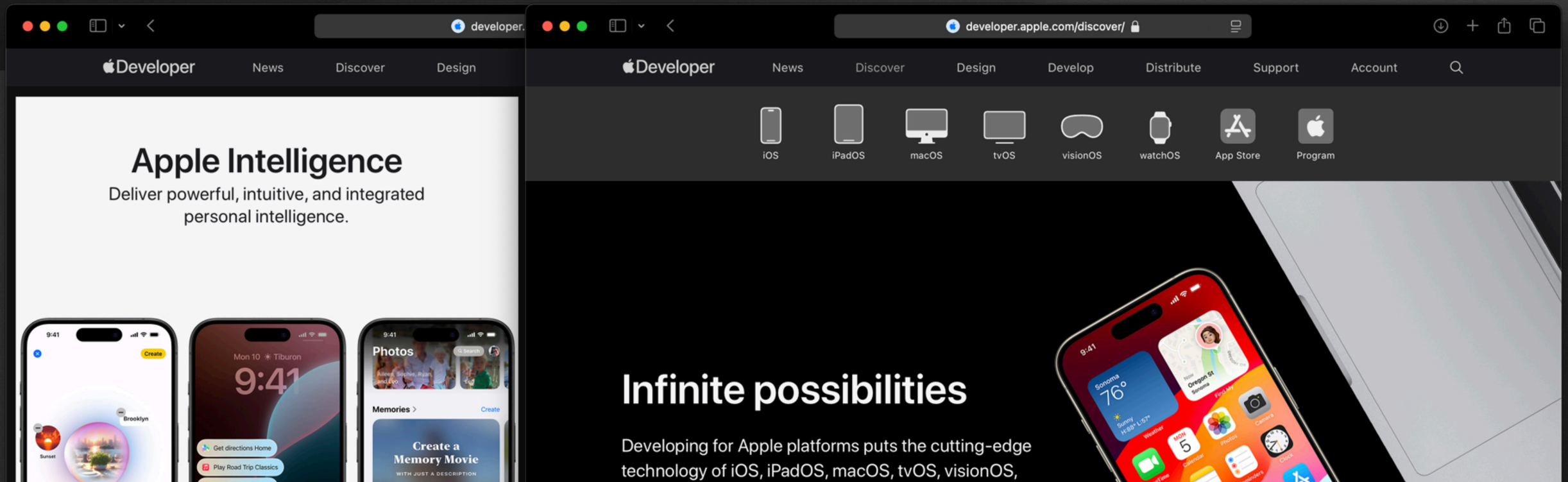
```
struct SwiftView: View {
    func greet(name: String) → String {
        "Hello, \(name)!"
    }

    var body: some View {
        Text(greet(name: "world"))
    }
}
```

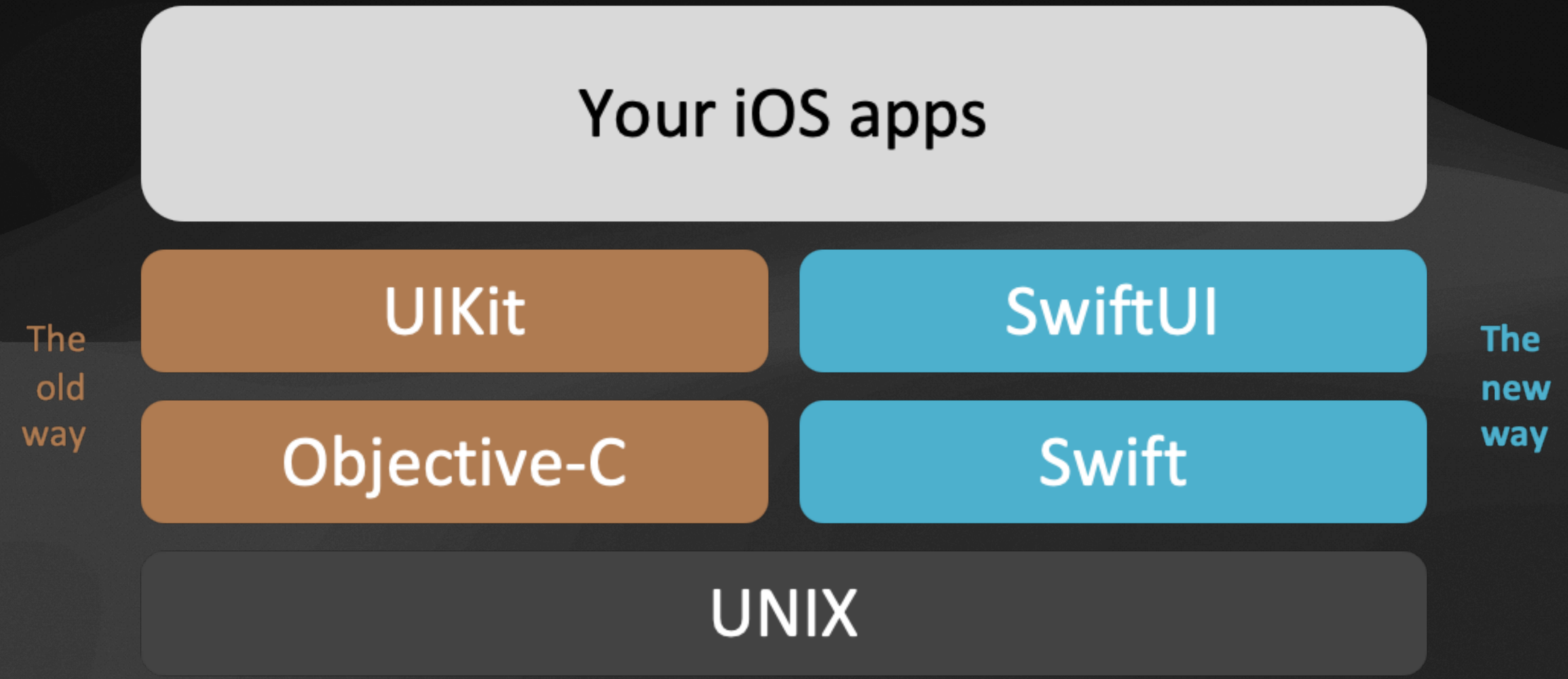
iOS Platform & Evolution

Continual updates with iOS releases

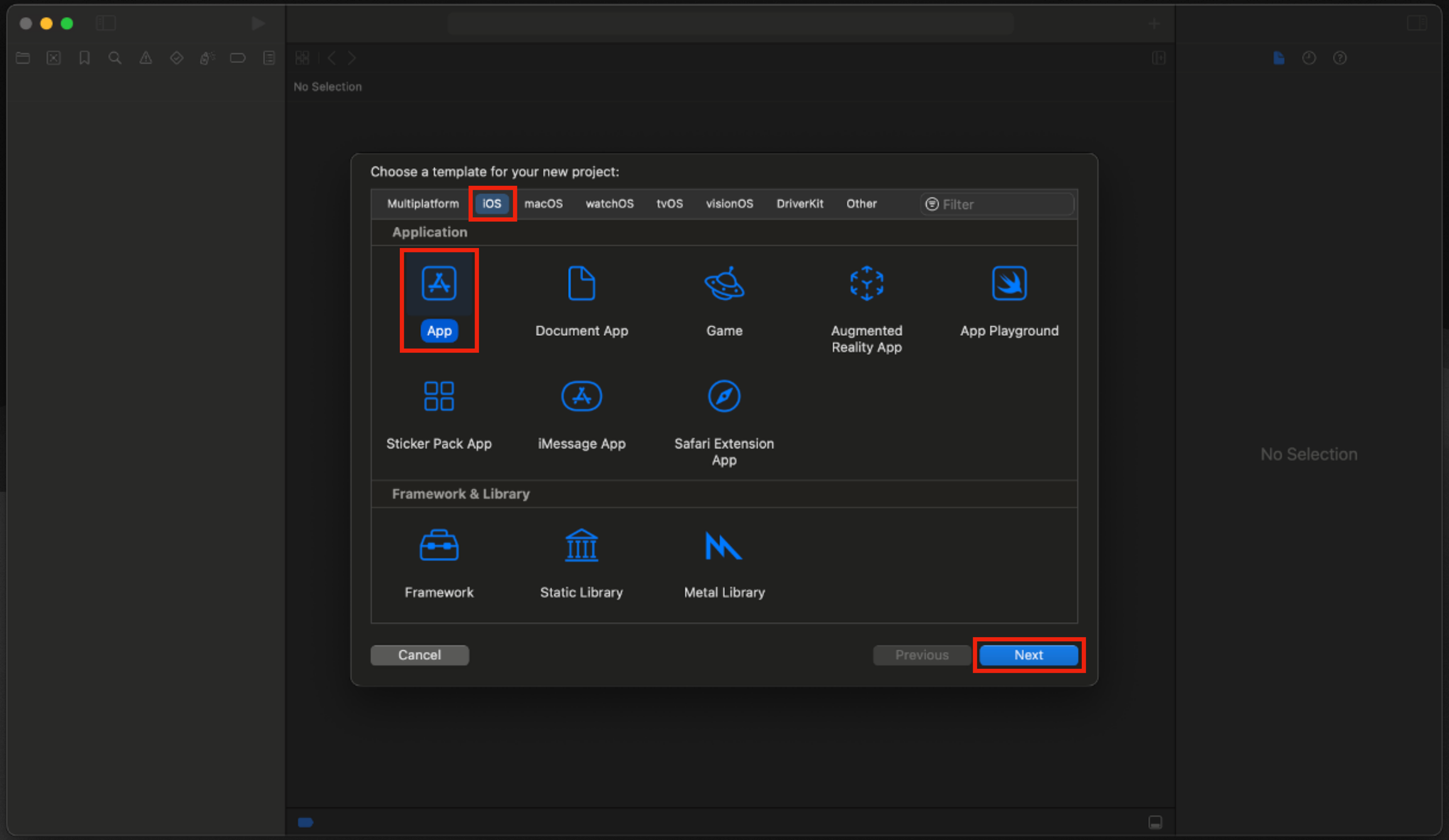
Easy integration with the Apple ecosystem

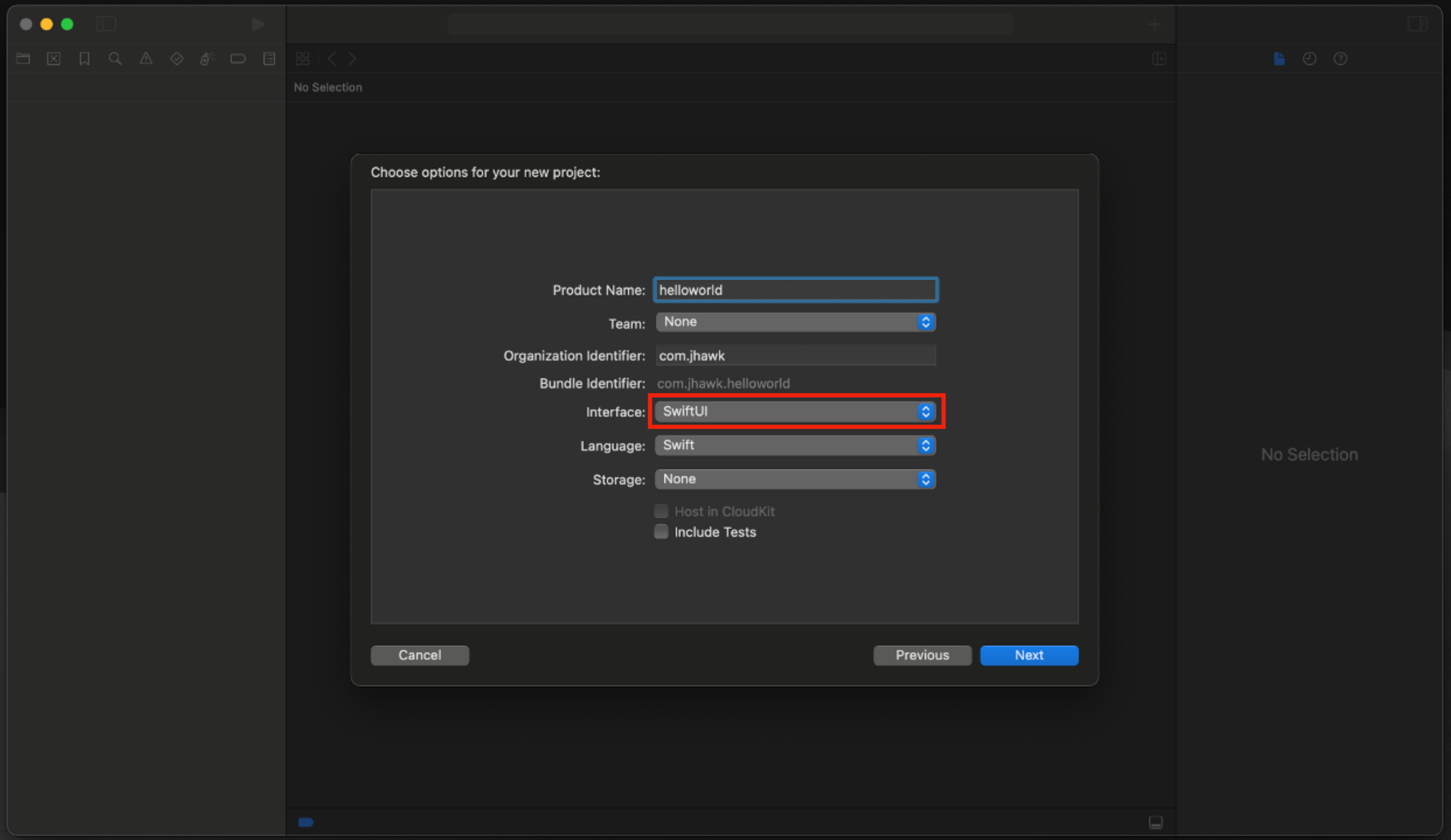


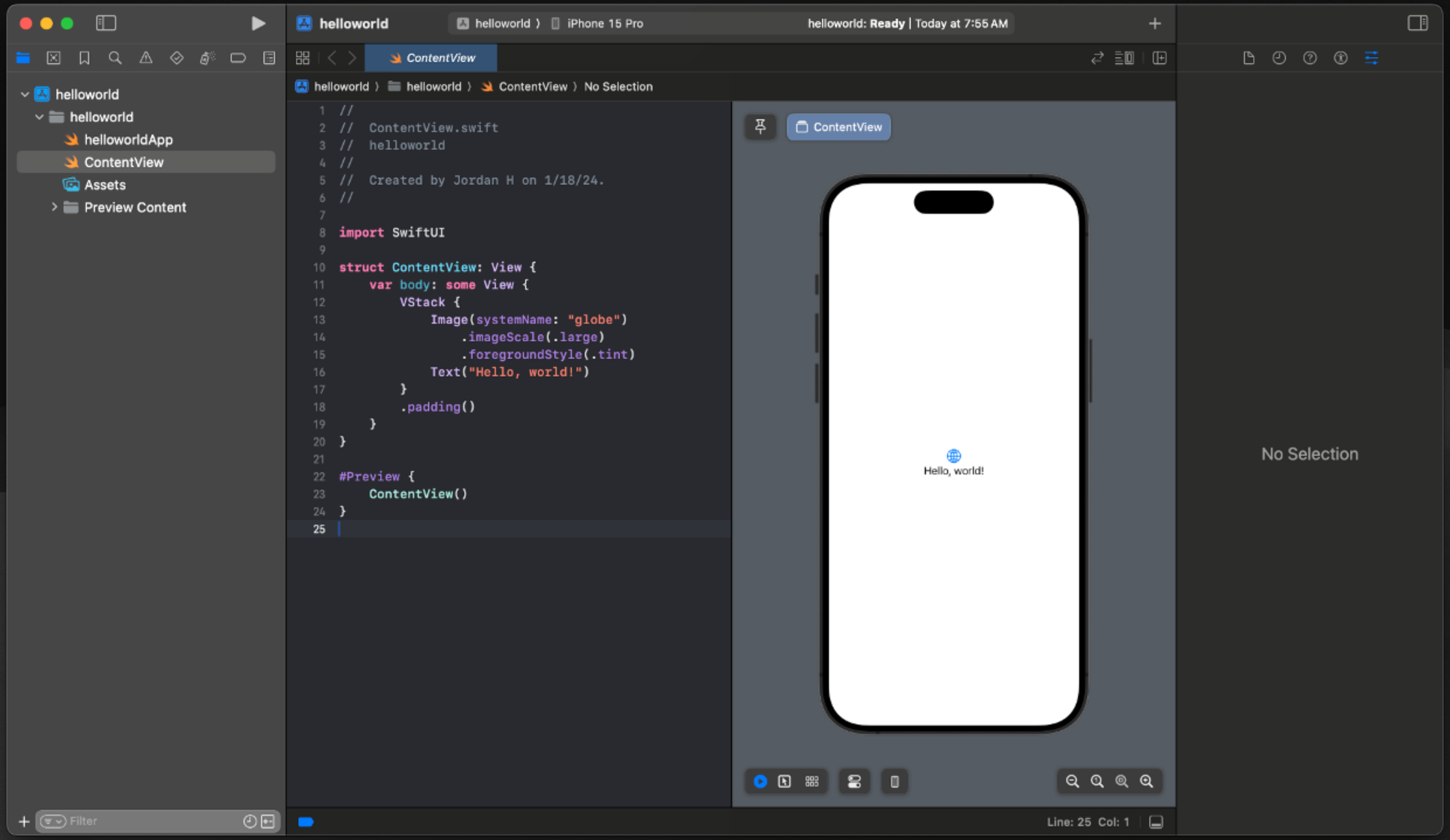
iOS Platform & Evolution



Hello World App!


No Selection
Choose a template for your new project:
Multiplatform
iOS
macOS
watchOS
tvOS
visionOS
DriverKit
Other
Filter
Application
App
Document App
Game
Augmented Reality App
App Playground
Sticker Pack App
iMessage App
Safari Extension App
Framework & Library
Framework
Static Library
Metal Library
Cancel
Previous
Next
No Selection


No Selection
Choose options for your new project:
Product Name: helloworld
Team: None
Organization Identifier: com.jhawk
Bundle Identifier: com.jhawk.helloworld
Interface: SwiftUI
Language: Swift
Storage: None
Host in CloudKit
Include Tests
Cancel
Previous
Next
No Selection

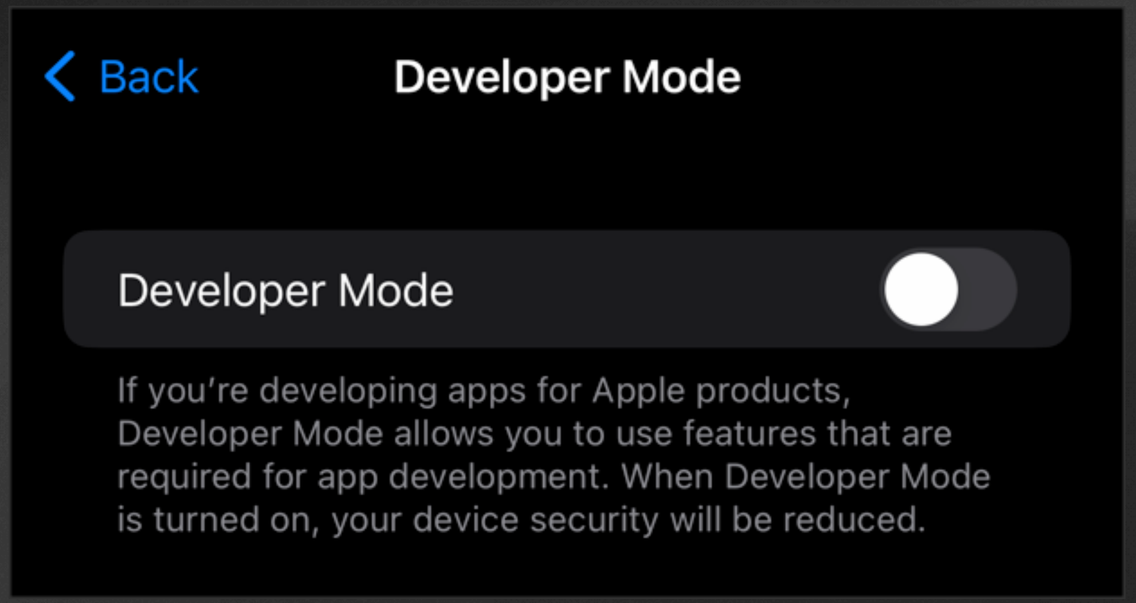

helloworld
helloworld 〉 iPhone 15 Pro
helloworld: Ready | Today at 7:55 AM
ContentView
helloworld 〉 helloworld 〉 ContentView 〉 No Selection
helloworld
helloworld
helloworldApp
ContentView
Assets
Preview Content
//
// ContentView.swift
// helloworld
//
// Created by Jordan H on 1/18/24.
//
import SwiftUI
struct ContentView: View {
var body: some View {
VStack {
Image(systemName: "globe")
.imageScale(.large)
.foregroundStyle(.tint)
Text("Hello, world!")
}
.padding()
}
}
#Preview {
ContentView()
}
ContentView
Hello, world!
No Selection
Filter
Line: 25 Col: 1

Running your app on-device

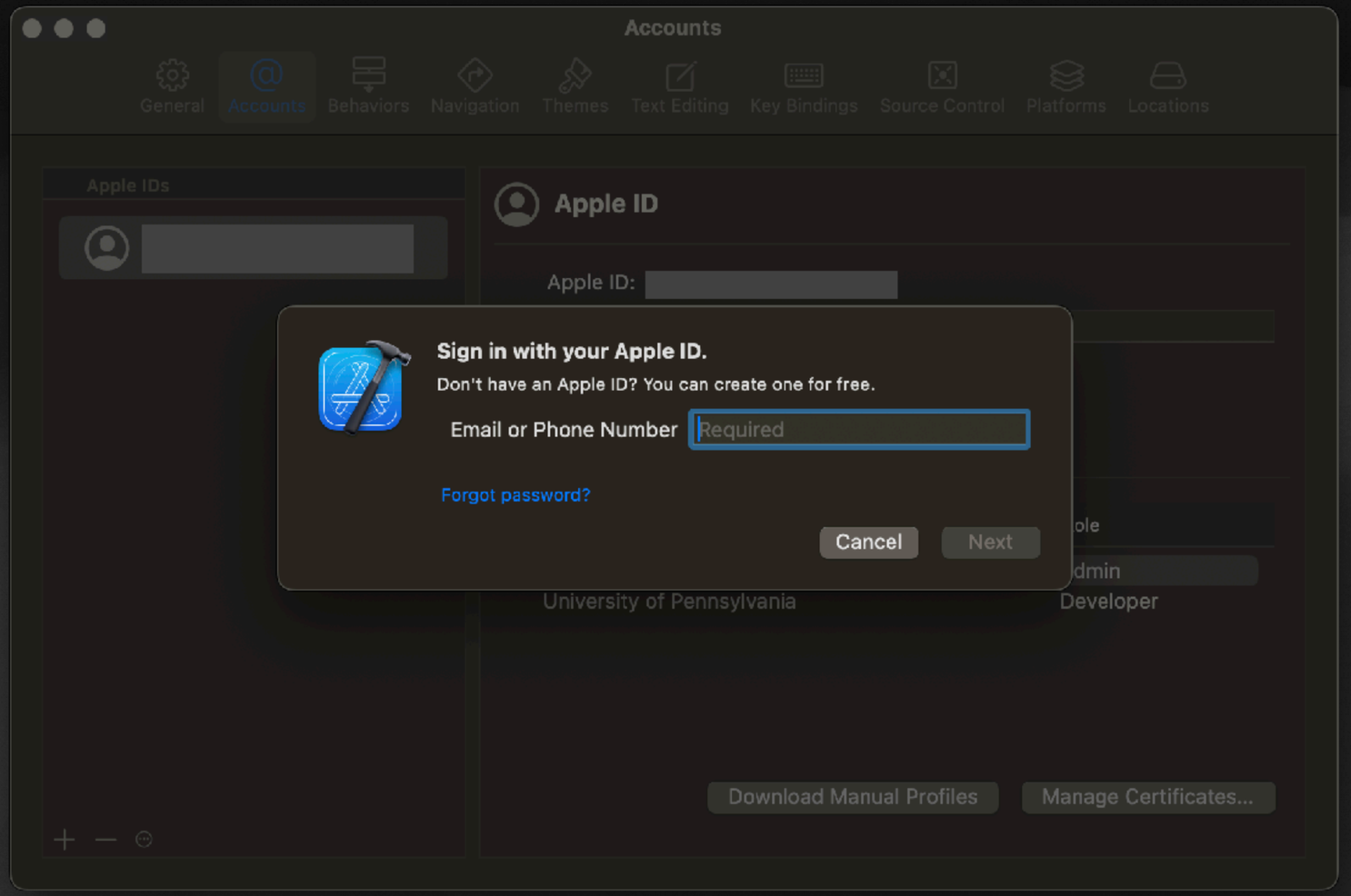
1 Plug your device into your computer

2 Enable Developer Mode on your device

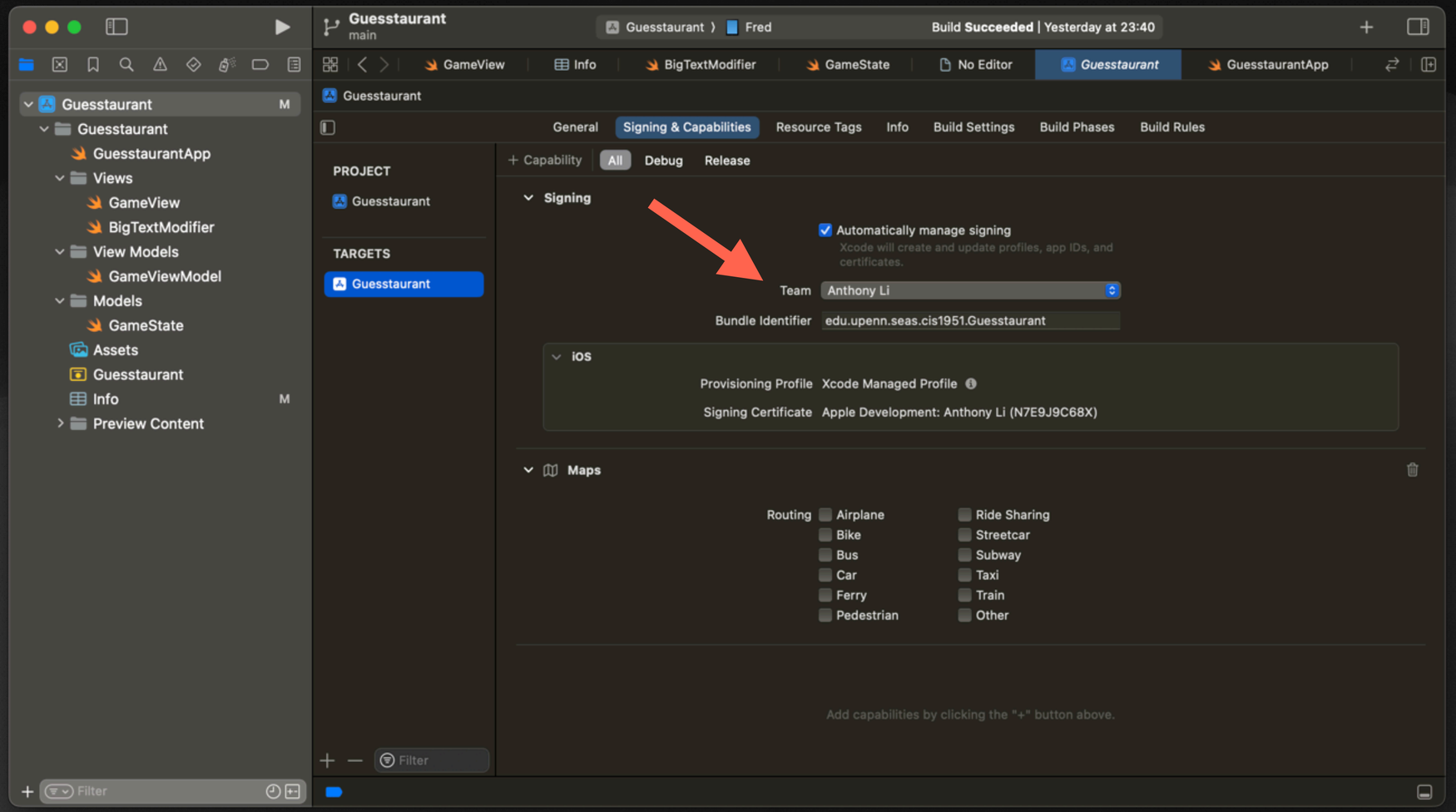
Settings › Privacy & Security



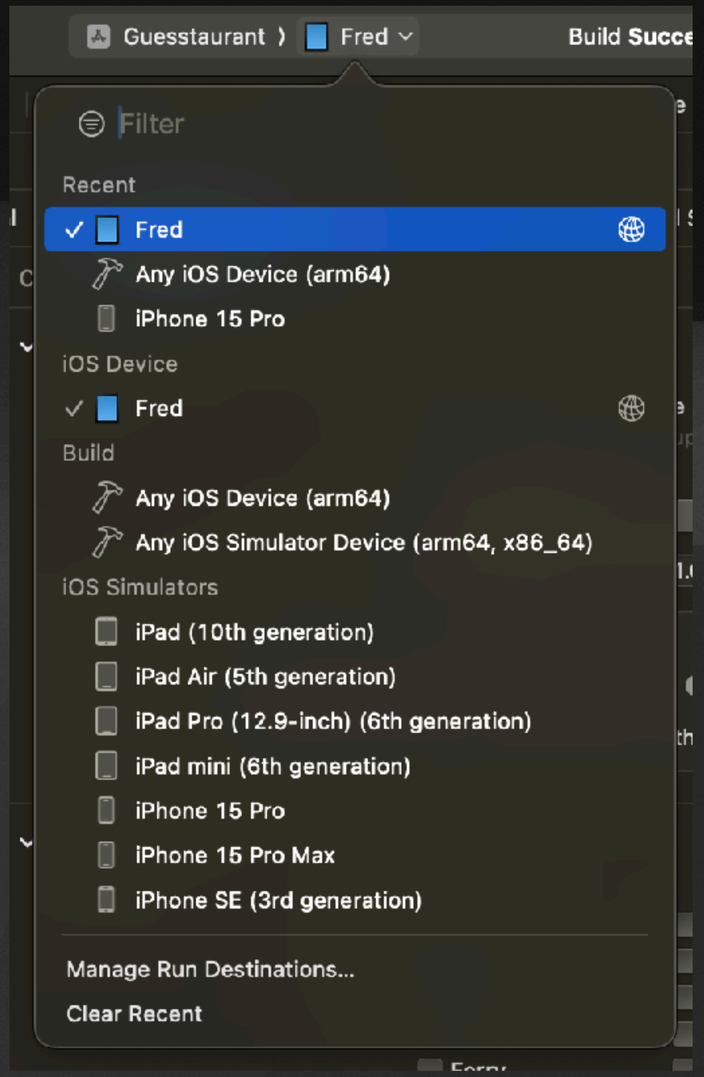
3 Sign into your Apple ID in Xcode Settings



4 Set your Team under Signing & Capabilities



5 Select your device



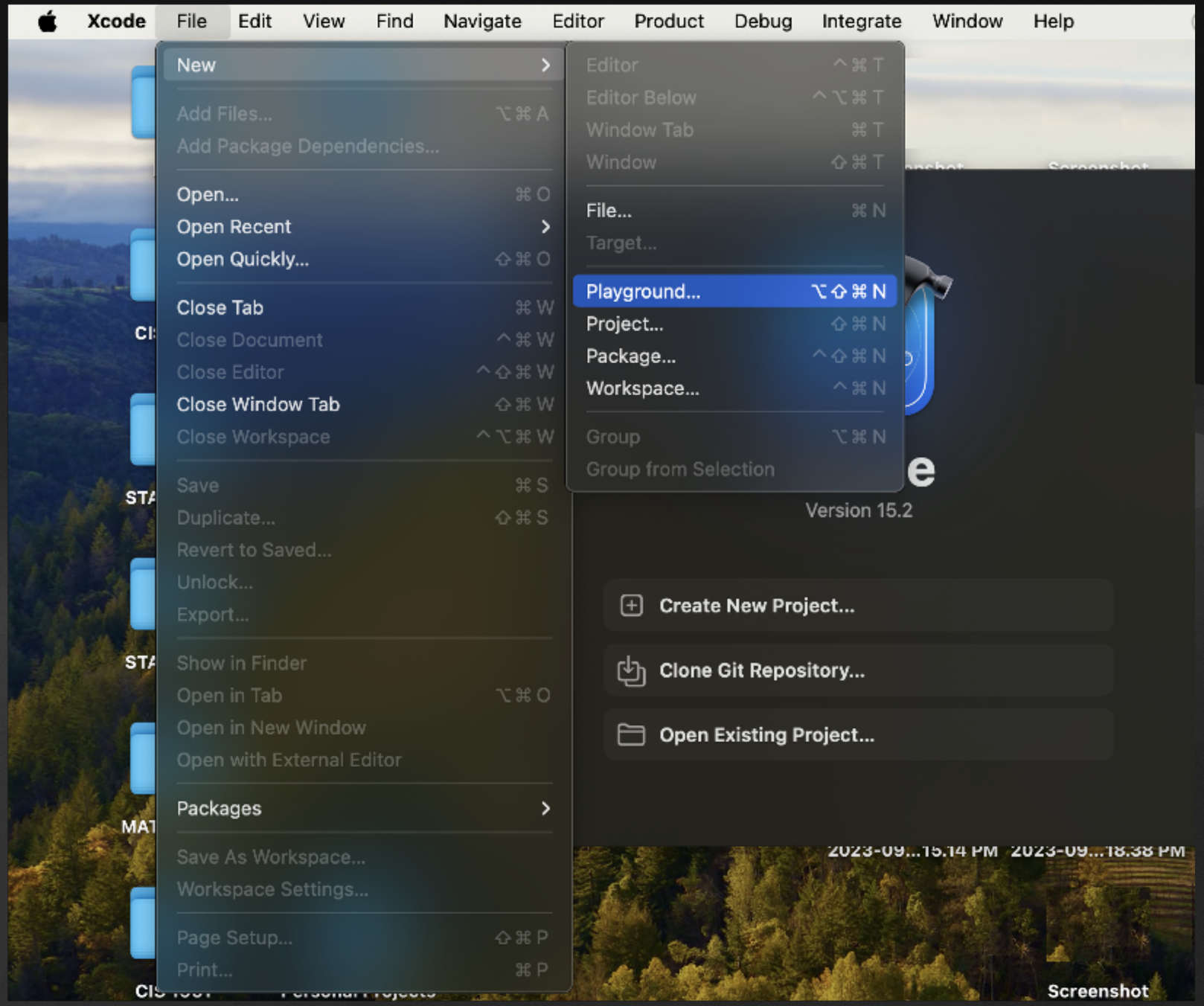
6 Build and run!

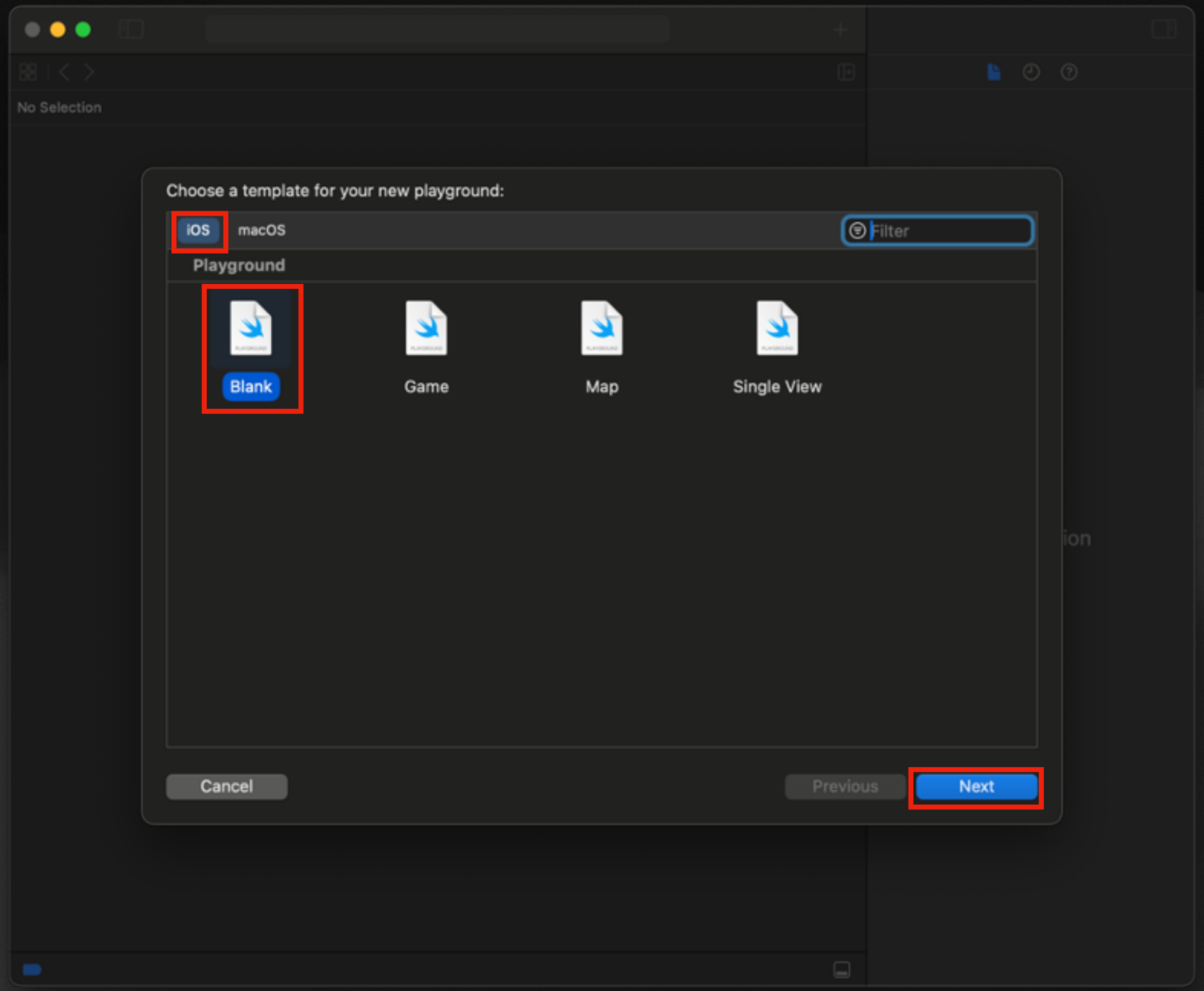
Playgrounds in Xcode

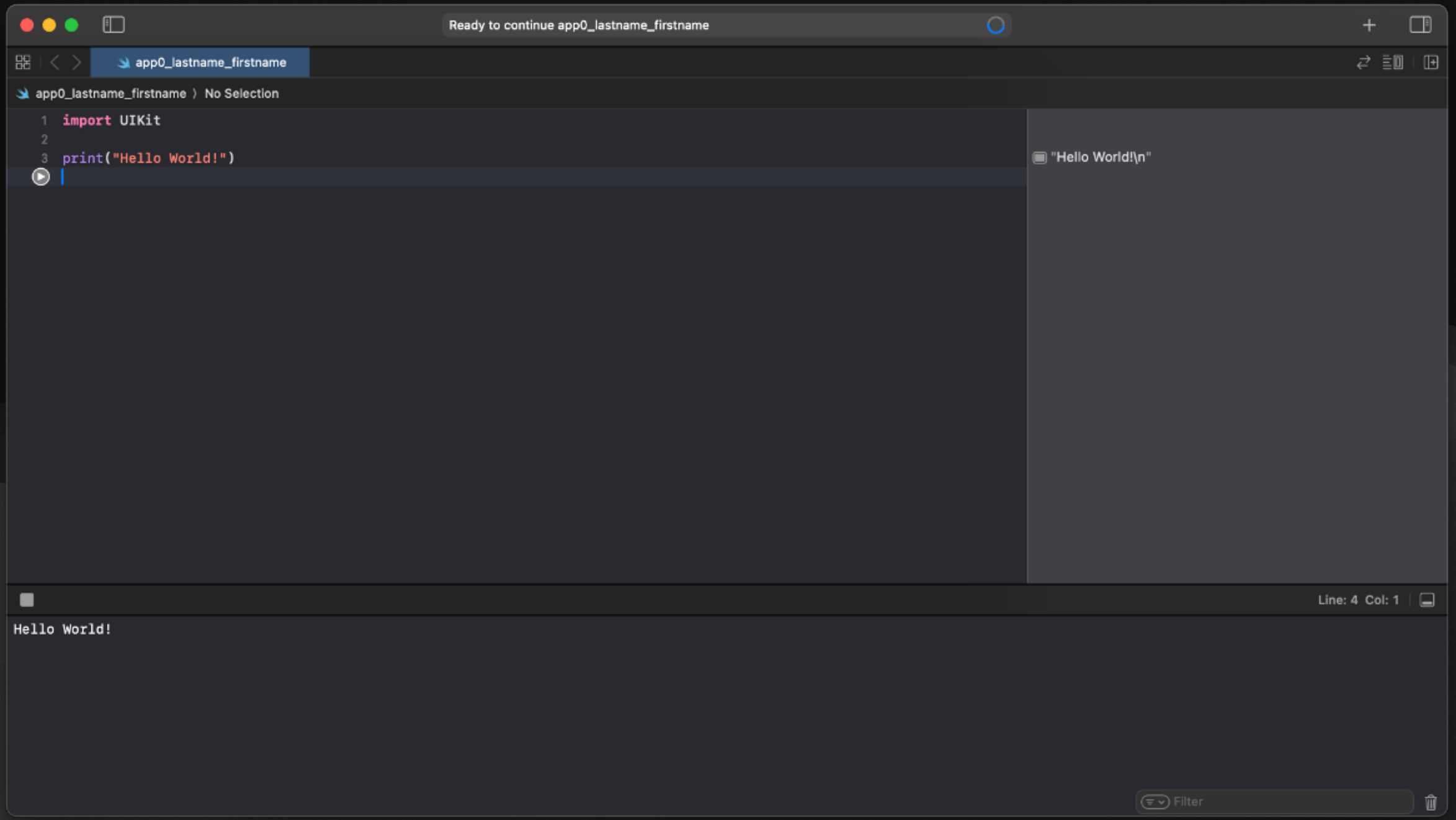
For some of our development, we will be using Playgrounds

- Easier/quicker development
- Instant execution
- Interact with and inspect return values

Making a Playground!




No Selection
Choose a template for your new playground:
iOS
macOS
Filter
Playground
Blank
Game
Map
Single View
Cancel
Previous
Next


Ready to continue app0_lastname_firstname
app0_lastname_firstname
app0_lastname_firstname 〉 No Selection
1 import UIKit
2
3 print("Hello World!")
"Hello World!\n"
Line: 4 Col: 1
Hello World!
Filter

Thanks for Coming!!!!

- Reminder, **UPDATE YOUR COMPUTER** and **INSTALL XCODE**.
  This may take a decent amount of time to install.

- Part of HW0 is to do this, which is due 9/10!
  - https://www.seas.upenn.edu/~cis1951/25fa/assignments/hw/hw0/
- Make sure to complete the Intro Survey!
  - https://forms.gle/3iEHKu1uDtm5JcqP7