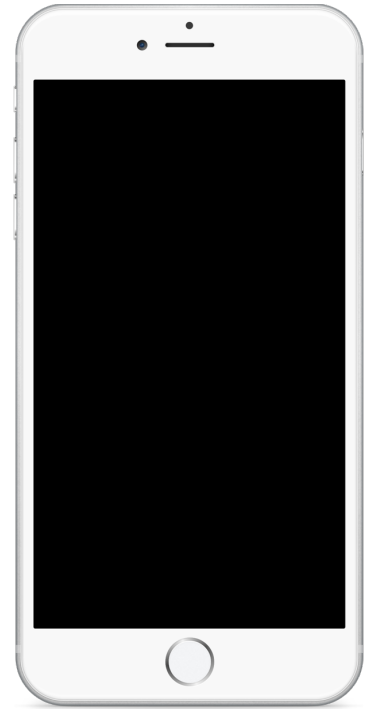# Journal
Lesson 1

Description

Run a simple iOS app, and trace its execution, starting with **main.swift**.

Learning Outcomes

- Describe the starting process of an iOS app.
- Relate app startup behavior to top level code within a **main.swift** file and the app delegate.
- Describe the behavior of the `UIApplicationMain` function.
- Relate the purpose of **main.swift**, the `UIApplicationMain` function, and the `@UIApplicationMain` attribute.

Vocabulary

app entry point	top level code	**main.swift**
`@UIApplicationMain`	delegate	app delegate
`UIApplication`	`UIApplicationDelegate`	attribute

Materials

- **Journal Lesson 1** Xcode project
- **App Launch** presentation

Opening

The "entry point" for a Swift program is the "top level code" in **main.swift**, so why is **main.swift** missing in a typical iOS Xcode project?

Agenda

- Using the Project Navigator (⌘1), observe how the project does not contain a storyboard or view controller class, but does include a **main.swift** file.

- Discuss that the **Journal Lesson 1** Xcode project is a non-traditional, "empty" iOS app project.

- Run the app (⌘R) and observe the black screen appear.

- Discuss how every Swift program has a starting point, or "application entry point," which is defined as the top-level code in a file called **main.swift**.

- Using the Project Navigator (⌘1), open **main.swift** and examine its contents.

- Discuss how the top level code in **main.swift** just calls `UIApplicationMain`.

- Explain how `UIApplicationMain` is passed command-line arguments and the class name for the project's app delegate.

- Using the Xcode Documentation and API Reference (⇧⌘0), examine the description of the `UIApplicationMain` function.

- Explain how the `UIApplicationMain` function instantiates a `UIApplication` object, assigns the app delegate to the `UIApplication` object `delegate` property, begins the main event loop, and, if configured, loads the main storyboard interface.

- Present the concept of app launch, relating the app launch process to code in the project.

- Using the Project Navigator (⌘1), delete the **main.swift** file.

- Run the app (⌘R) and use the Issue Navigator (⌘4) to observe the compilation error.

- Explain how Swift provides a `@UIApplicationMain` attribute that synthesizes a main entry point and eliminates the need for a **main.swift** file.

- Add the `@UIApplicationMain` attribute above the `AppDelegate` class definition.

  ```
  @UIApplicationMain
  class AppDelegate: UIResponder, UIApplicationDelegate {
  ...
  ```

- Run the app (⌘R) and observe the black screen appear.

- Discuss how the app does not have a storyboard, yet a default black screen is displayed.

Closing

Without a storyboard, how might you change the default background color with code?

Modifications and Extensions

- Investigate the `window` property of of `AppDelegate` to change the background color of the blank screen we see in the app.
- Add your own view controller to the project, and add the controller `view` as a `subView` of the `window` property.

Resources

The Swift Programming Language: A Swift Tour https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/GuidedTour.html

The Swift Programming Language: Top-Level Code https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/Declarations.html#//apple_ref/doc/uid/TP40014097-CH34-ID352

UIKit Function Reference https://developer.apple.com/library/ios/documentation/UIKit/Reference/UIKitFunctionReference/

UIApplication Class Reference https://developer.apple.com/library/ios/documentation/UIKit/Reference/UIApplication_Class/index.html

UIApplicationDelegate Protocol Reference https://developer.apple.com/library/ios/documentation/UIKit/Reference/UIApplicationDelegate_Protocol/index.html

Swift Blog: Files and Initialization https://developer.apple.com/swift/blog/?id=7

The Swift Programming Language: Attributes https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/Attributes.html

View Programming Guide for iOS: View and Window Architecture https://developer.apple.com/library/ios/documentation/WindowsViews/Conceptual/ViewPG_iPhoneOS/WindowsandViews/WindowsandViews.html

Cocoa Application Competencies for iOS: Application Object http://developer.apple.com/library/ios/documentation/general/conceptual/Devpedia-CocoaApp/ApplicationObject.html

Cocoa Application Competencies for iOS: Window Object https://developer.apple.com/library/ios/documentation/General/Conceptual/Devpedia-CocoaApp/Window.html

Cocoa Application Competencies: Main Event Loop https://developer.apple.com/library/ios/documentation/General/Conceptual/Devpedia-CocoaApp/MainEventLoop.html

UIWindow Class Reference https://developer.apple.com/library/ios/documentation/UIKit/Reference/UIWindow_Class/index.html