



Social Media Apps Programming

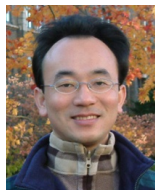
Developing iPhone / iPad Native Apps with Swift (XCode)

1071SMAP04

TLMXM1A (8550) (M2143) (Fall 2018)

(MIS MBA) (2 Credits, Elective) [Full English Course]

Thu 8,9 (10:10-12:00) B206



Min-Yuh Day, Ph.D.

Assistant Professor

Department of Information Management

Tamkang University

<http://mail.tku.edu.tw/myday>

2018-10-04



Course Schedule (1/2)



Tamkang
University

Week	Date	Subject/Topics
1	2018/09/13	Course Orientation and Introduction to Social Media and Mobile Apps Programming
2	2018/09/20	Introduction to Android / iOS Apps Programming
3	2018/09/27	Developing Android Native Apps with Java (Android Studio)
4	2018/10/04	Developing iPhone / iPad Native Apps with Swift (XCode)
5	2018/10/11	Mobile Apps using HTML5/CSS3/JavaScript
6	2018/10/18	jQuery Mobile
7	2018/10/25	Create Hybrid Apps with Phonegap
8	2018/11/01	jQuery Mobile/Phonegap
9	2018/11/08	jQuery Mobile/Phonegap

Course Schedule (2/2)



**Tamkang
University**

Week	Date	Subject/Topics
10	2018/11/15	Midterm Exam Week / Project Presentation
11	2018/11/22	Case Study on Social Media Apps Programming and Marketing in Google Play and App Store
12	2018/11/29	Google Cloud Platform
13	2018/12/06	Google App Engine
14	2018/12/13	Google Map API
15	2018/12/20	Facebook API (Facebook JavaScript SDK) (Integrate Facebook with iOS/Android Apps)
16	2018/12/27	Twitter API
17	2019/01/03	Final Project Presentation
18	2019/01/10	Final Exam Week / Final Project Presentation

Android /iOS Apps Programming

Native Apps



Hybrid Apps



Mobile Web Apps



App Development Comparison

Device Access	Speed	Development Cost	App Store	Approval Process
---------------	-------	------------------	-----------	------------------

Native Apps

Full

Very Fast

Expensive

Available

Mandatory

Hybrid Apps

Full

Native Speed
as Necessary

Reasonable

Available

Low
Overhead

Web Apps

Partial

Fast

Reasonable

Not
Available

None

Outline

- **Developing iPhone / iPad Native Apps with Swift 4 (Xcode 9)**
 - Mac OS X 10.8, 10.9, 10.10, 10.11, 10.12, 10.13
 - Xcode 6, Xcode 7, Xcode 8, Xcode 9, Xcode 10
 - iOS 8, iOS 9, iOS 10, iOS 11, iOS 12
- **Building Your First iOS App with Xcode 9**



Xcode 8



Swift 3

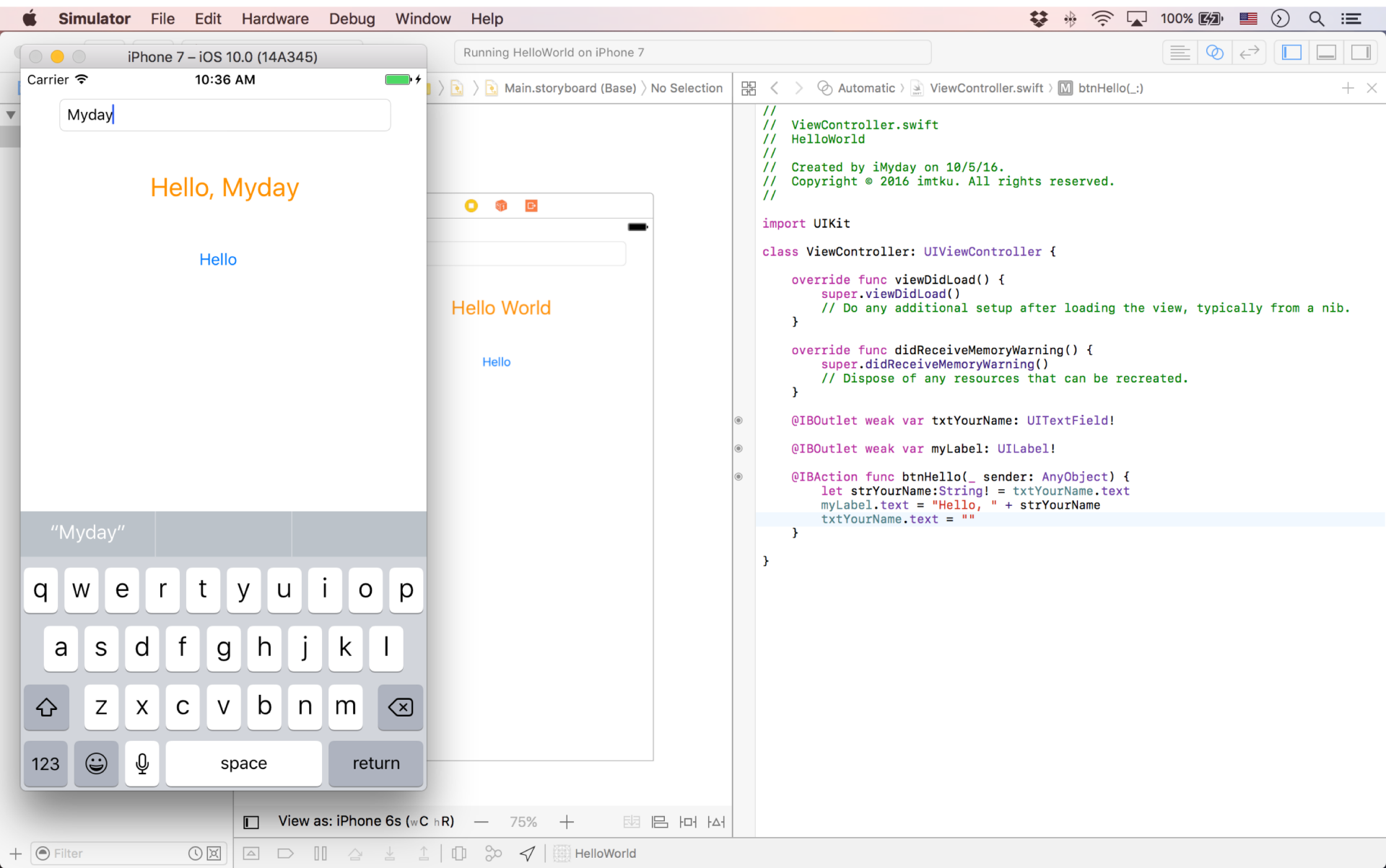


Xcode 9

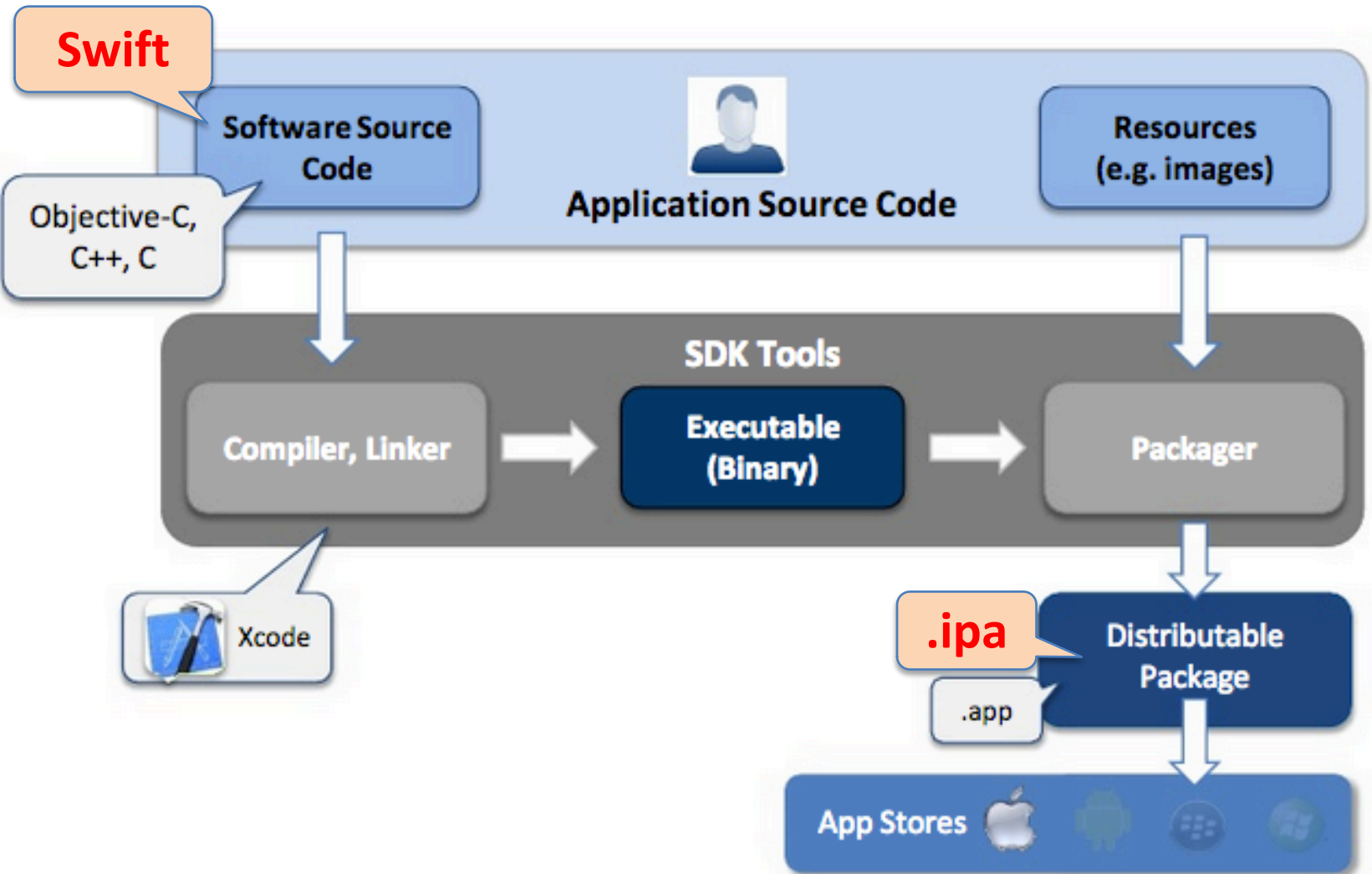


Swift 4

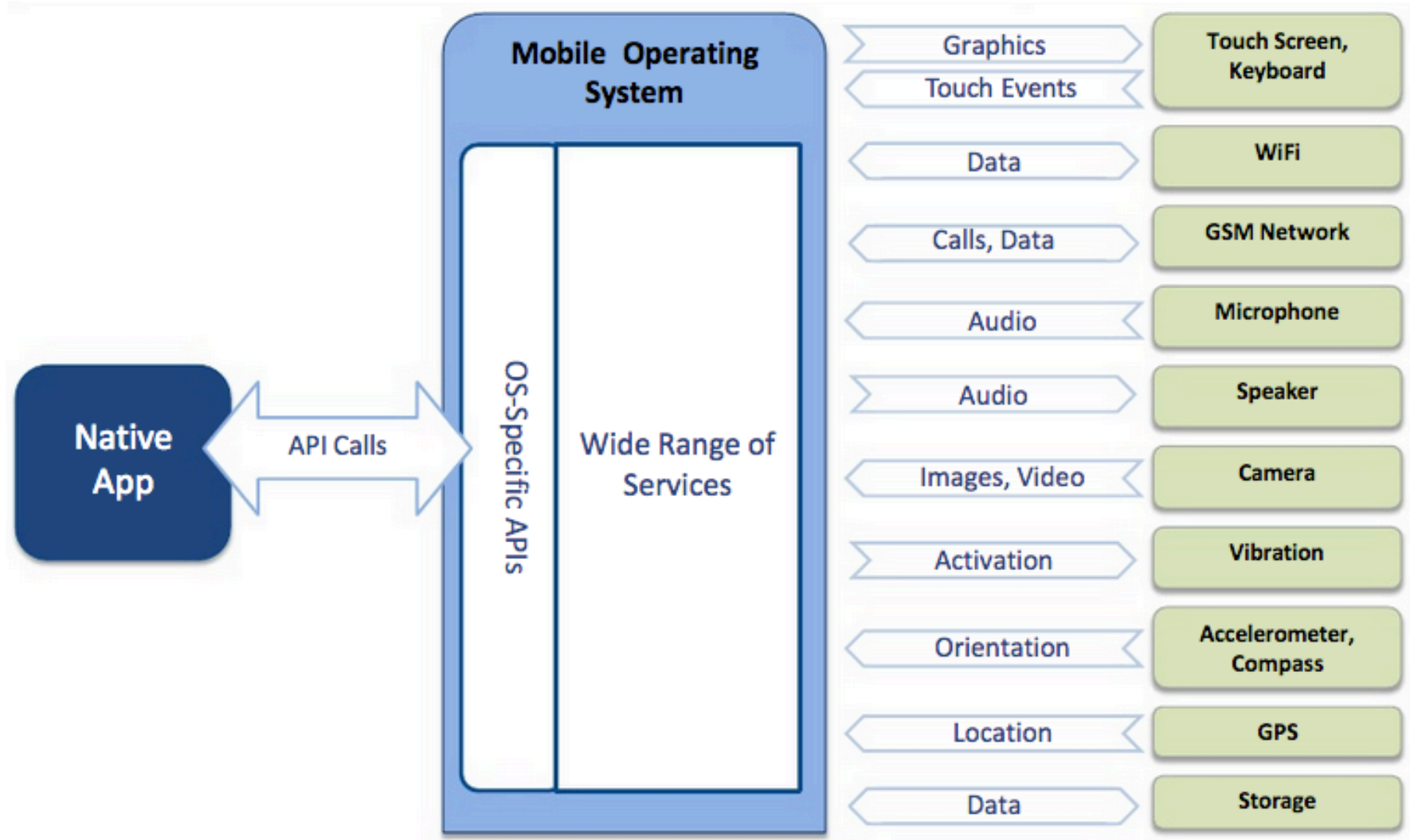
Building Your First iOS App with Xcode 9



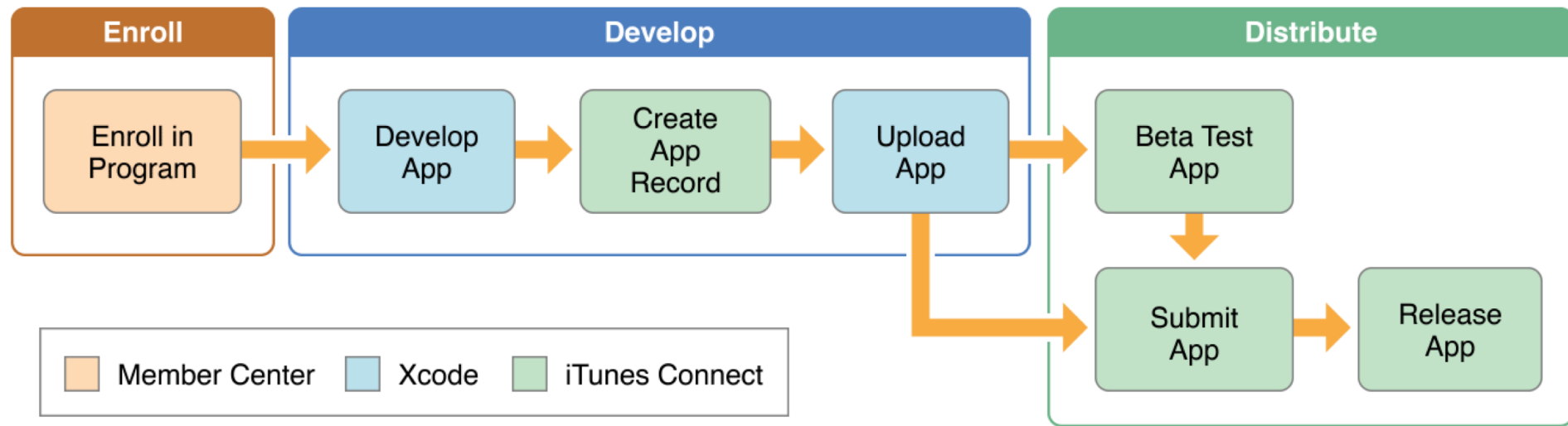
iOS - Native App Development



Native App – Interaction with Mobile Device



Apple App Distribution Workflows



developer.apple.com

 Developer

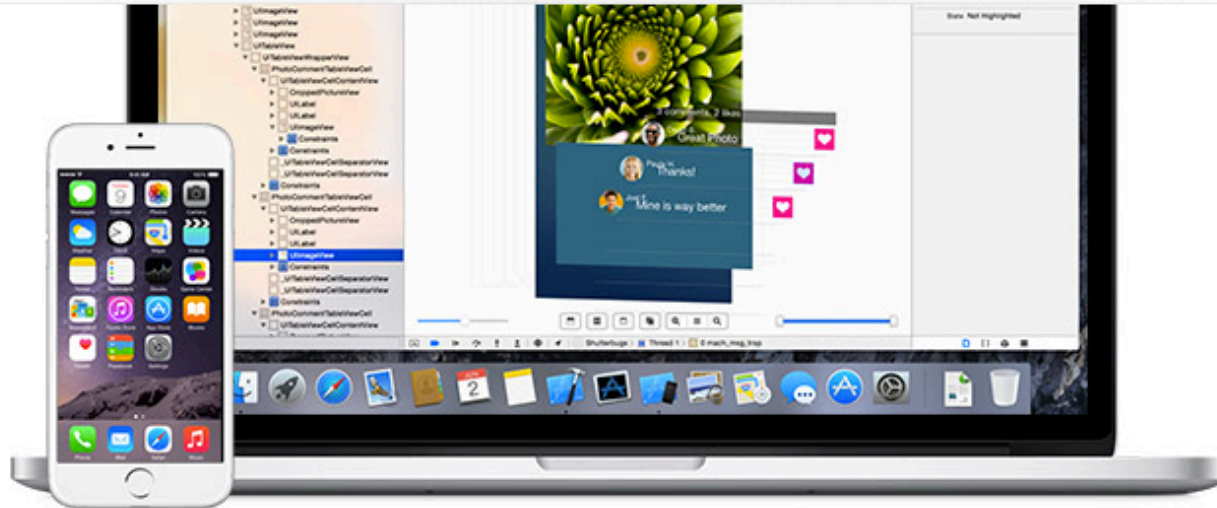
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See what's new for developers.

Learn about all the new technologies and powerful capabilities available in iOS 8, OS X Yosemite, and the new programming language, Swift, available in Xcode 6.

developer.apple.com

Download the latest development tools and SDKs.



iOS Apps



Mac Apps



Xcode

developer.apple.com

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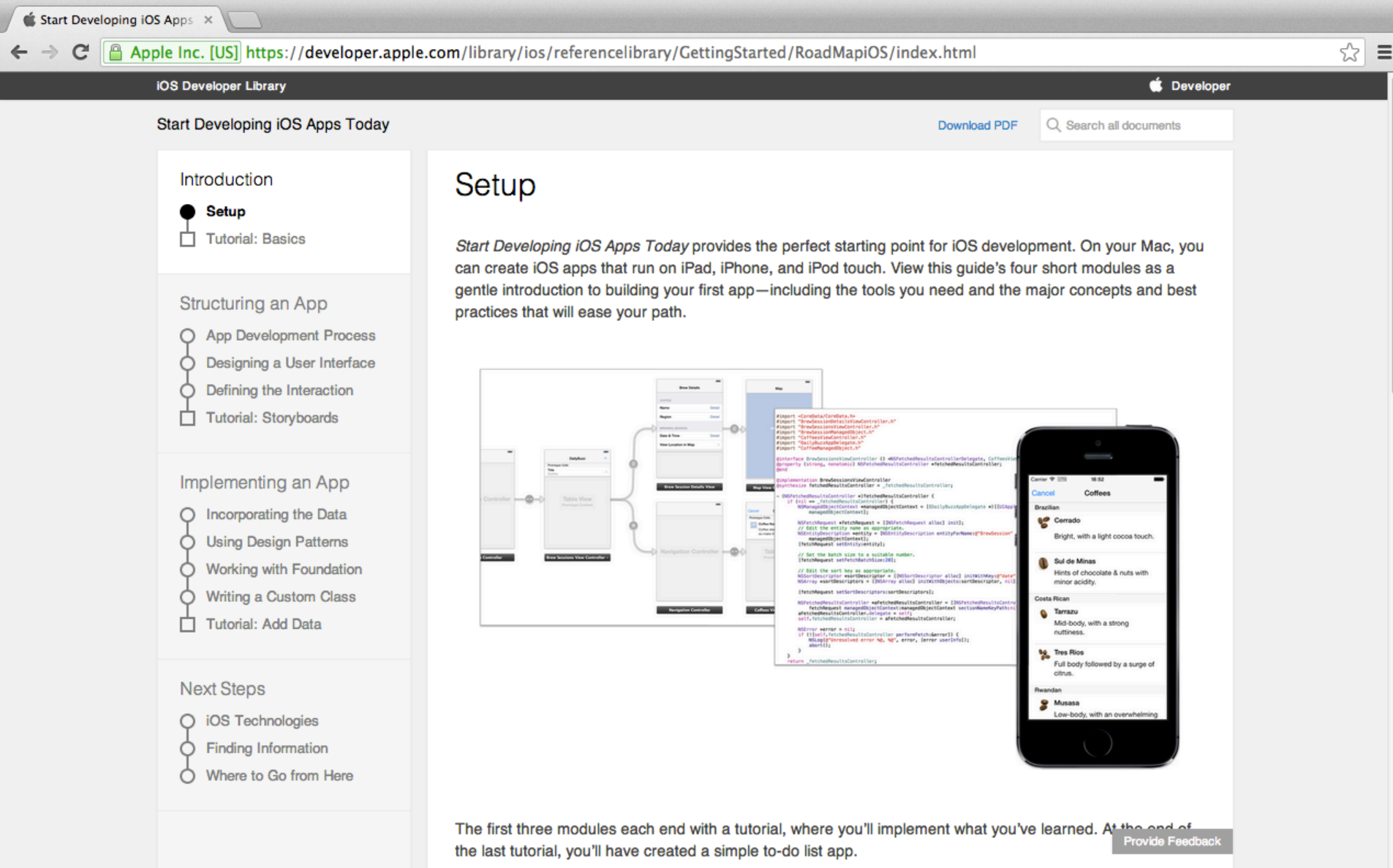
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Pro SharePoint 2013 Branding and Responsive Web Development

Start Developing iOS Apps Today



Start Developing iOS Apps Today



To develop iOS apps, you need:

- A **Mac computer** running OS X 10.8 or later
 - Mac OS X 10.8 (Mountain Lion)
 - Mac OS X 10.9 (Mavericks)
 - Mac OS X 10.10 (Yosemite)
 - Mac OS X 10.11 (El Capitan)
 - **macOS Sierra (10.12)**
 - **macOS High Sierra (10.13)**
- Xcode
 - Xcode 6
 - Xcode 7
 - **Xcode 8**
 - **Xcode 9**
 - **Xcode 10**
- iOS SDK



Mac

iPad

iPhone

Watch

TV

Music

Support



MacBook



MacBook Air



MacBook Pro



iMac



Mac Pro



Mac mini



Accessories



macOS Sierra



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MacBook Air



MacBook Pro



Mac mini



iMac



Mac Pro



OS X Mavericks

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The notebook people love.

MacBook Air



MacBook and MacBook Air



MacBook
from \$1299

- 12-inch (diagonal) LED-backlit Retina display
- 1.2GHz dual-core Intel Core m3, 1.3GHz dual-core Intel Core i5, or 1.4GHz dual-core Intel Core i7 processor
Turbo Boost up to 3.6GHz
- Up to 10 hours battery life¹
- Up to 512GB SSD²
- Force Touch trackpad
- 2.03 pounds³



MacBook Air 13-inch
from \$999

- 13.3-inch (diagonal) LED-backlit widescreen display
- 1.8GHz dual-core Intel Core i5 or 2.2GHz dual-core Intel Core i7 processor
Turbo Boost up to 3.2GHz
- Up to 12 hours battery life¹
- Up to 512GB SSD²
- Multi-Touch trackpad
- 2.96 pounds³



MacBook Pro 15-inch
from \$1999

- 15.4-inch (diagonal) LED-backlit Retina display
- 2.2GHz, 2.5GHz, or 2.8GHz quad-core Intel Core i7 processor
Turbo Boost up to 4.0GHz
- Up to 9 hours battery life¹
- Up to 1TB SSD²
- Force Touch trackpad
- 4.49 pounds³

MacBook Pro



New

MacBook Pro 13-inch
from \$1299

- 13.3-inch (diagonal) LED-backlit Retina display
- 2.3GHz dual-core Intel Core i5 or 2.5GHz dual-core Intel Core i7 processor
Turbo Boost up to 4.0GHz
- Up to 10 hours battery life¹
- Up to 1TB SSD²
- Force Touch trackpad
- 3.02 pounds³



New

MacBook Pro 13-inch
from \$1799

- Touch Bar and Touch ID
- 13.3-inch (diagonal) LED-backlit Retina display
- 3.1GHz or 3.3GHz dual-core Intel Core i5 or 3.5GHz dual-core Intel Core i7 processor
Turbo Boost up to 4.0GHz
- Up to 10 hours battery life¹
- Up to 1TB SSD²
- Force Touch trackpad
- 3.02 pounds³



New

MacBook Pro 15-inch
from \$2399

- Touch Bar and Touch ID
- 15.4-inch (diagonal) LED-backlit Retina display
- 2.8GHz, 2.9GHz, or 3.1GHz quad-core Intel Core i7 processor
Turbo Boost up to 4.1GHz
- Up to 10 hours battery life¹
- Up to 2TB SSD²
- Force Touch trackpad
- 4.02 pounds³

iMac



New

iMac 21.5-inch
from \$1099

- 21.5-inch (diagonal) LED-backlit display
- 2.3GHz dual-core Intel Core i5 processor
Turbo Boost up to 3.6GHz
- 1TB 5400-rpm hard drive; 1TB Fusion Drive; or 256GB SSD²
- Magic Keyboard and



New

iMac 21.5-inch
from \$1299

- 21.5-inch (diagonal) LED-backlit Retina 4K display
- 3.0GHz or 3.4GHz quad-core Intel Core i5 or 3.6GHz quad-core Intel Core i7 processor
Turbo Boost up to 4.2GHz
- 1TB 5400-rpm hard drive; 1TB Fusion Drive; or up to 1TB SSD²



New

iMac 27-inch
from \$1799

- 27-inch (diagonal) LED-backlit Retina 5K display
- 3.4GHz, 3.5GHz, or 3.8GHz quad-core Intel Core i5 or 4.2GHz quad-core Intel Core i7 processor
Turbo Boost up to 4.5GHz
- 1TB, 2TB, or 3TB Fusion Drive; or up to 2TB SSD²

Mac mini



Mac mini
from \$499

- Highly energy efficient⁴
- Up to 3.0GHz dual-core Intel Core i7 processor
Turbo Boost up to 3.5GHz
- Up to 1TB hard drive; 256GB, 512GB, or 1TB SSD; or 1TB or 2TB Fusion Drive²



Mac Pro
from \$2999

- 3.5GHz 6-core, 3.0GHz 8-core, or 2.7GHz 12-core Intel Xeon E5 processor
Up to 30MB of L3 cache
- Up to 1TB SSD²

macOS High Sierra

macOS

[Overview](#)

[How to Upgrade](#)

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macOS High Sierra

Your Mac. Elevated.

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OS X

[Design](#)[Continuity](#)[Better Apps](#)[What is OS X](#)[How to Upgrade](#)[Upgrade](#)

OS X Yosemite

Every bit as powerful as it looks.

An elegant design that feels entirely fresh, yet inherently familiar. The apps you use every day, enhanced with new features. And a completely new relationship between your Mac and iOS devices. OS X Yosemite changes how you see your Mac.

And what you can do with it. Upgrade for free at the Mac App Store.

OS X El Capitan

A refined experience and improved performance for your Mac.

FREE UPGRADE

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OS X El Capitan

Utilities



165 Ratings

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macOS Sierra



macOS Sierra

What can your Mac do now? Just ask.

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macOS Sierra
Utilities

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macOS Sierra

macOS Sierra

By Apple

Open the Mac App Store to buy and download apps.



[View in Mac App Store](#)

Free

Category: [Utilities](#)

Updated: Sep 20, 2016

Version: 10.12

Size: 4.77 GB

Languages: English, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Norwegian, Polish, Portuguese, Romanian, Russian, Simplified Chinese, Slovak, Spanish, Swedish, Thai, Traditional Chinese, Turkish, Ukrainian, Vietnamese

Seller: Apple Inc.

© 2016 Apple, Inc.

[Rated 4+](#)

Description

Siri makes its debut on Mac, with new features designed just for the desktop. Your Mac works with iCloud and your Apple devices in smart new ways, and intelligent capabilities make your photos, music, and messaging even more enjoyable.

[Apple Web Site](#) ▶ [macOS Sierra Support](#) ▶

[...More](#)

Screenshots



Search for information and images just by asking Siri.
Then drag results right into an email or document.



macOS Sierra

To set up the installation of macOS Sierra, click Continue.



Continue

macOS High Sierra



macOS High Sierra 4+

New technologies at the heart of the system make your Mac more reliable, capable and responsive — and lay the foundation for future innovations. macOS High Sierra also refines the features and apps you use every day. It's macOS at its highest level yet.

Easily organise, edit and view your photos in Photos.

- Make short videos from your Live Photos using new Loop and Bounce effects.
- Easily locate and organise your content with the new sidebar.
- Conveniently access all of your editing tools in the redesigned Edit View.
- Fine-tune colour and contrast in your photos with new Curves and Selective Color tools.
- Access third-party apps directly from Photos and save the edited images back to your Photos library. ...

- [Apple Web Site](#) >
- [macOS High Sierra Support](#) >
- [App License Agreement](#) >
- [Privacy Policy](#) >

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Information

Category: **Utilities**

Updated: 12 October 2017

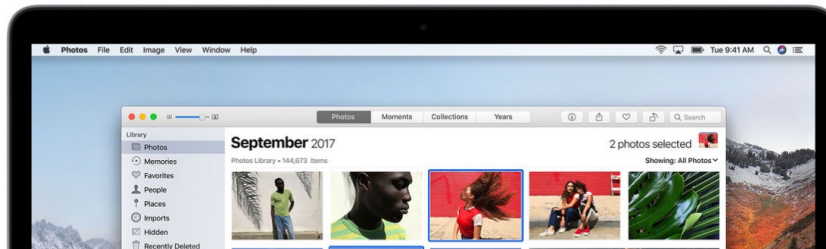
Version: 10.13

Price: Free

Size: 4.80 GB

Family Sharing: Yes

Languages: English, Arabic, Catalan, Croatian, Czech, Danish, Dutch, Finnish, French, German, Greek, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Malay, Norwegian, Polish, Portuguese, Romanian, Russian, Simplified Chinese, Slovak, Spanish, Swedish, Thai, Traditional Chinese, Turkish, Ukrainian, Vietnamese



Xcode 6



Xcode

The complete toolset for building great apps.



Xcode 7



Xcode

The complete toolset for building great apps.



Swift 2

Xcode 8



Xcode

The complete toolset for building great apps.



Swift 3

Xcode 9



Xcode

The complete toolset for building great apps.



Swift 4

iOS 9 for Developers



Developing for iOS 9

iOS 9 SDK includes new APIs and services that enable new categories of apps and features. Multitasking and gaming APIs help enhance app functionality and create immersive games. Expanded search capabilities, and new support for CloudKit, HomeKit, HealthKit, and MapKit extend iOS to more places than ever before.

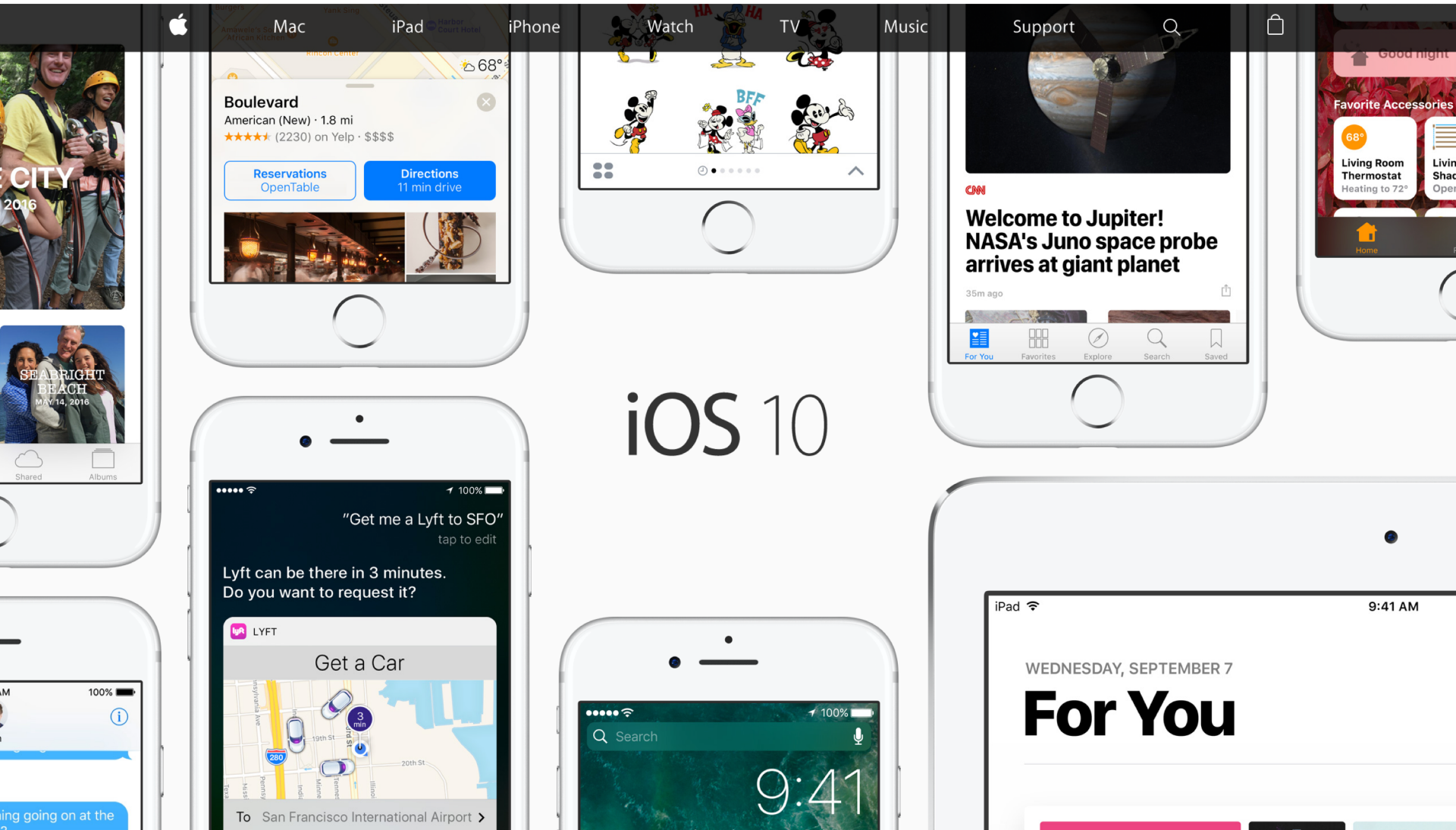
iOS 10 for Developers



Developing for iOS 10

The iOS 10 SDK includes new APIs and services that enable new categories of apps and features. Your apps can now extend to Messages, Siri, Phone, and Maps to provide more engaging functionality like never before.

iOS 10



iOS 10

iOS 10

The world's most advanced
mobile operating system.

iOS 10 is compatible with these devices.

iPhone



iPhone 7
iPhone 7 Plus
iPhone 6s
iPhone 6s Plus
iPhone 6
iPhone 6 Plus
iPhone SE
iPhone 5s
iPhone 5c
iPhone 5

iPad



iPad Pro 12.9-inch
iPad Pro 9.7-inch
iPad Air 2
iPad Air
iPad 4th generation
iPad mini 4
iPad mini 3
iPad mini 2

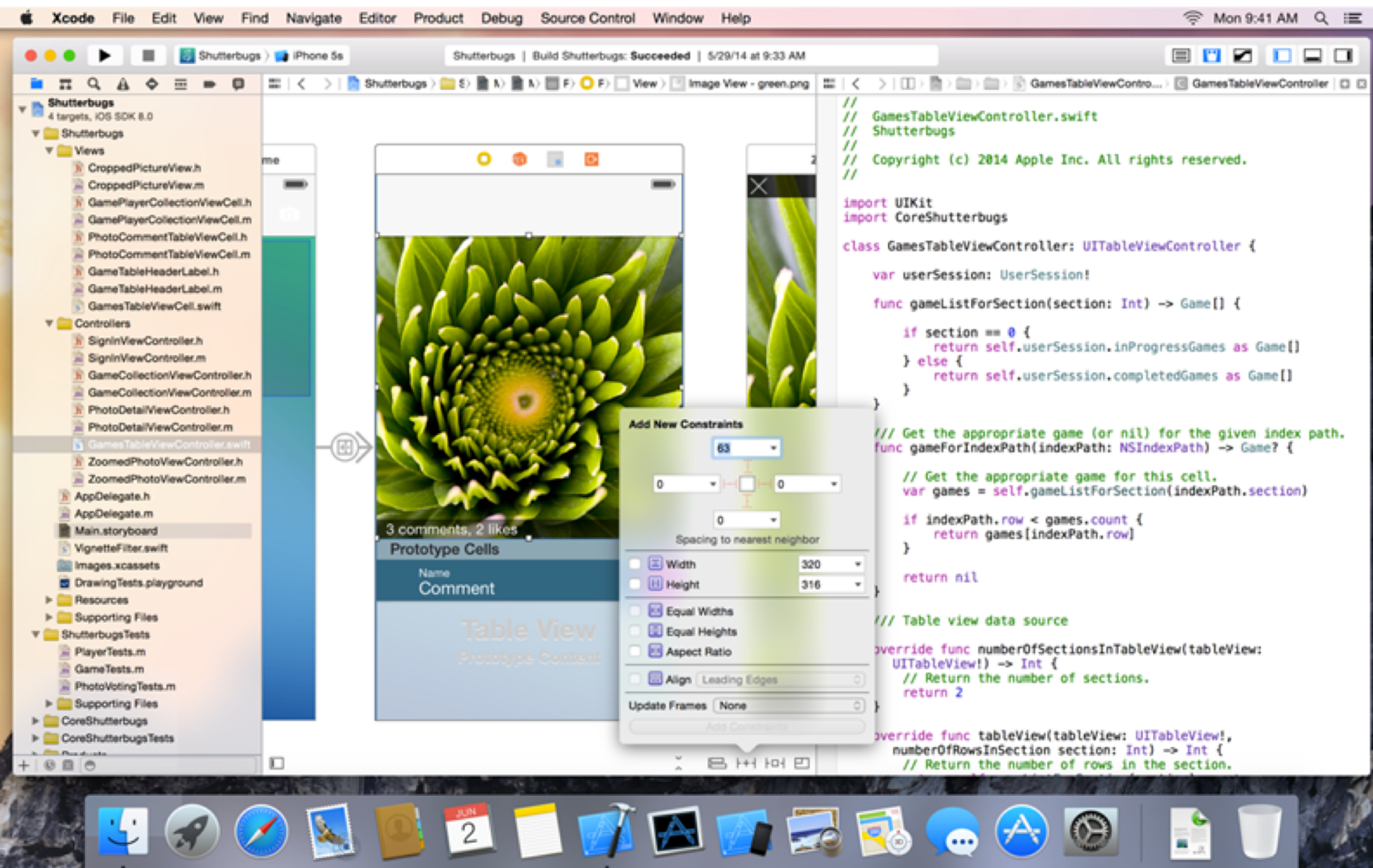
iPod



iPod touch 6th generation



Xcode 6



Get the Tools

Mac App Store



Xcode FREE ▼



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Xcode 7



Xcode 7

This release includes the Xcode IDE, Swift 2 compiler, Instruments, Simulator, and latest SDKs for OS X, iOS, and watchOS.

Build
7A220
Posted Date
Sep 16, 2015
SDK
iOS 9
OS X v10.11
watchOS 2

Xcode 8



Xcode 8
requires a Mac running
macOS Sierra 10.12 or OS X
El Capitan 10.11.5 or later.
Xcode 8 includes SDKs for
iOS 10.0, watchOS 3.0,
macOS Sierra 10.12, and tvOS
10.0.

Build
8A218a
Posted Date
Sep 13, 2016
SDKs
iOS 10
macOS 10.12
watchOS 3
tvOS 10

Xcode 8



Get the latest beta releases of Xcode, iOS, macOS, watchOS, tvOS, and more.



Xcode 8.1 beta 2

⬇ [Download Xcode 8.1](#)

📄 [Release Notes](#)

Build
8T46g

Posted Date
Oct 04, 2016

SDKs
iOS 10.1
macOS 10.12.1
watchOS 3.1
tvOS 10.0.1



Xcode 8

⬇ [Download Xcode 8](#)

📄 [Release Notes](#)

Build
8A218a

Posted Date
Sep 13, 2016

SDKs
iOS 10
macOS 10.12
watchOS 3
tvOS 10

Source: <https://developer.apple.com/xcode/download/>

Xcode 8



Install

Xcode



Xcode 4+

Essentials

Xcode includes everything developers need to create great applications for Mac, iPhone, iPad, Apple TV, and Apple Watch. Xcode provides developers a unified workflow for user interface design, coding, testing, and debugging. The Xcode IDE combined with the Swift programming language make developing apps easier and more fun than ever before.

...

What's New in Version 8.0

Xcode 8 includes Swift 3, and SDKs for iOS 10, watchOS 3, tvOS 10, and macOS Sierra.

...

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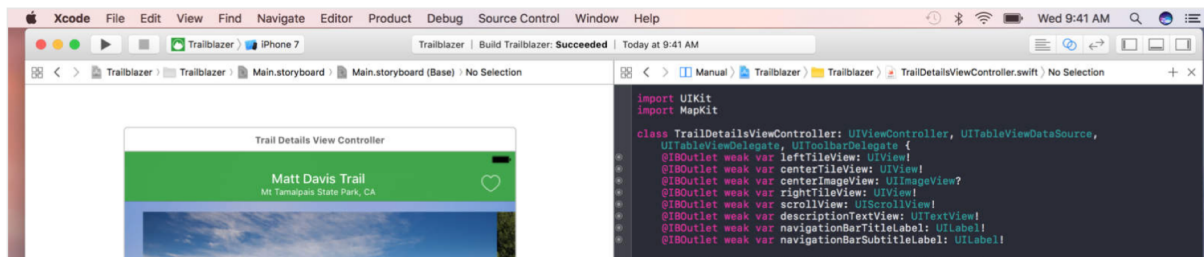


Information

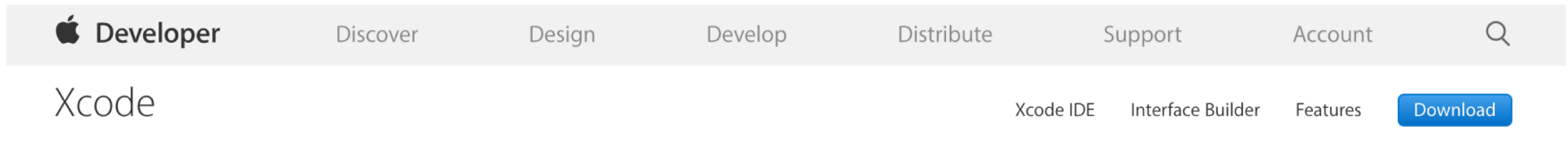
Category: **Developer Tools**
Updated: 13 September 2016
Version: 8.0
Price: Free
Size: 4.43 GB
Family Sharing: Yes
Language: English
Developer: iTunes S.a.r.l.
© 1999–2016 Apple Inc.

Rated 4+

Compatibility:
OS X 10.11.5 or later

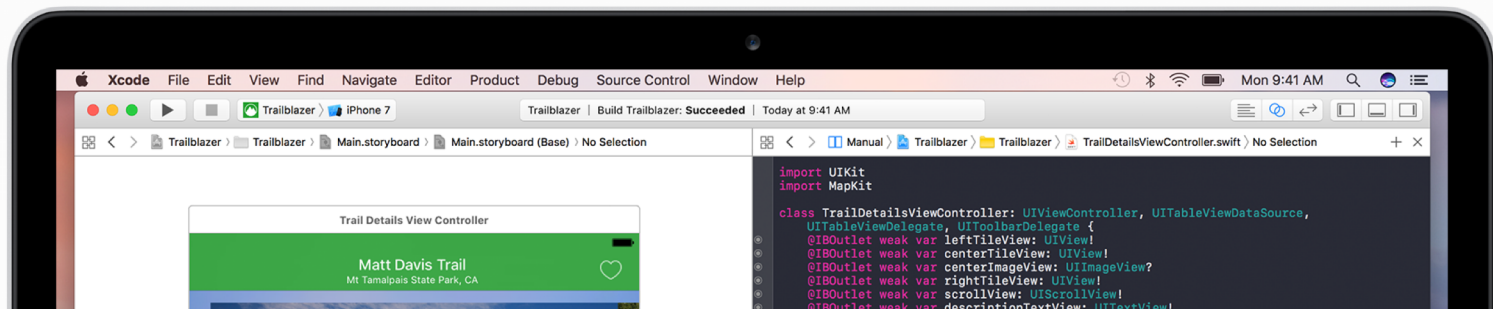


Xcode 8



Xcode 8

Xcode 8 includes everything you need to create amazing apps for iPhone, iPad, Mac, Apple Watch, and Apple TV. This radically faster version of the IDE features new editor extensions that you can use to completely customize your coding experience. New runtime issues alert you to hidden bugs by pointing out memory leaks, and a new Memory Debugger dives deep into your object graph. Swift 3 includes more natural and consistent API naming, which you can experiment with in the new Swift Playgrounds app for iPad.



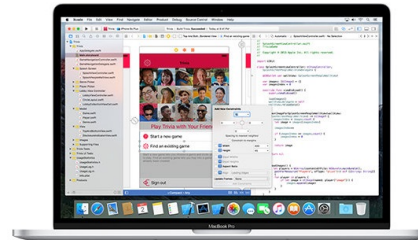
Source: <https://developer.apple.com/xcode/>

Xcode 9



Open

Xcode



Xcode **4+**

Essentials

Xcode includes everything developers need to create great applications for Mac, iPhone, iPad, Apple TV, and Apple Watch. Xcode provides developers a unified workflow for user interface design, coding, testing, and debugging. The Xcode IDE combined with the Swift programming language make developing apps easier and more fun than ever before.

...

...More

What's New in Version 9.0

Xcode 9 includes Swift 4 and SDKs for iOS 11, watchOS 4, tvOS 11, and macOS High Sierra 10.13

...

...More

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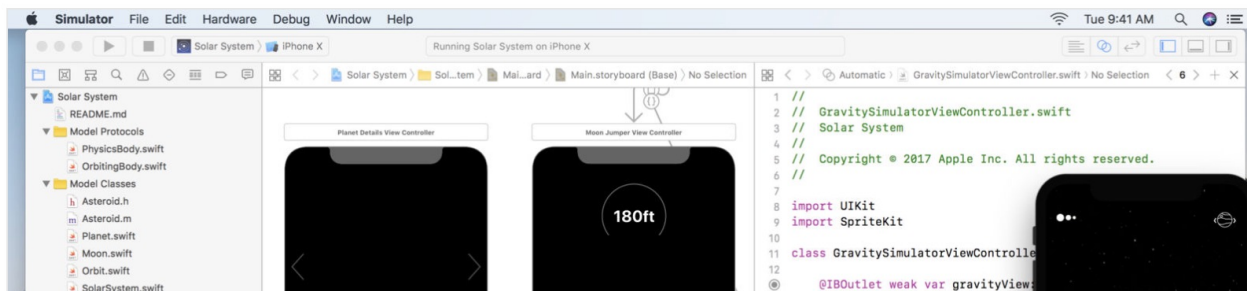
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Information

Category: Developer Tools
Updated: 19 September 2017
Version: 9.0
Price: Free
Size: 5.39 GB
Family Sharing: Yes
Language: English
Developer: Apple Distribution International
© 1999–2017 Apple Inc.

Rated 4+

Compatibility:
macOS 10.12.6 or later



Xcode 8

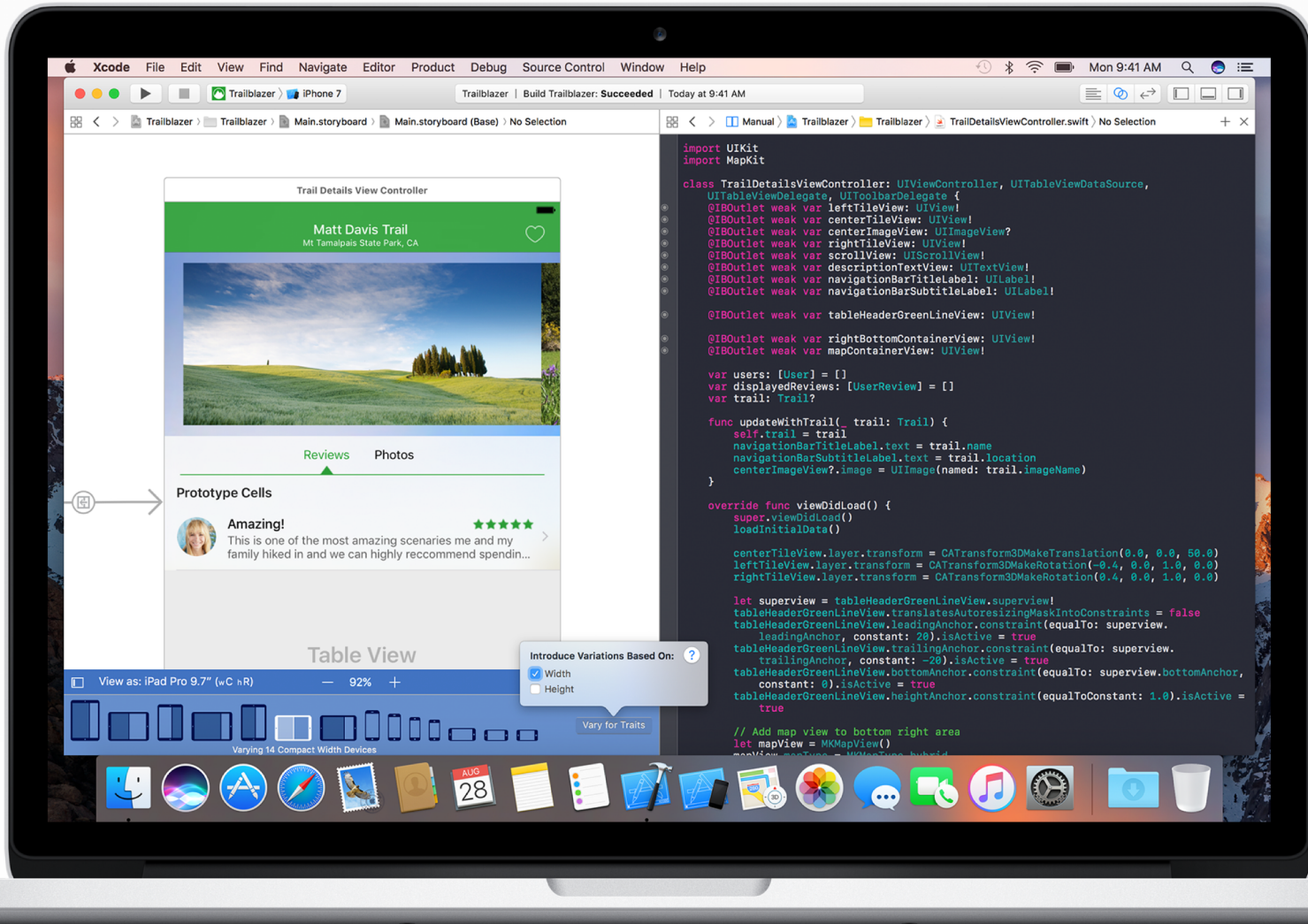
Xcode

Xcode IDE

Interface Builder

Features

Download



Swift 3



Swift 3 is the first major release of the innovative programming language built completely in the open with the community of developers at Swift.org.

This release unifies core API naming rules under a new public API Naming Guidelines document that makes writing Swift code feel even more natural.

You can also experiment with Swift 3 in the new Swift Playgrounds app for iPad.

Swift 3



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DOCUMENTATION

MIGRATING TO SWIFT 3

SOURCE CODE

COMMUNITY

CONTRIBUTING

CONTINUOUS
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PROJECTS

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Releases

Swift 3.0


Download	Date
Xcode 8* (Toolchain) (Debugging Symbols)	September 13, 2016
Ubuntu 15.10 (Signature)	September 13, 2016
Ubuntu 14.04 (Signature)	September 13, 2016

*Swift 3.0 is available as part of [Xcode 8](#).

Source: <https://swift.org/download/#releases>

Swift 4

→ ↺ Apple Inc. [US] | <https://swift.org/download/#releases>

 **Swift**

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Releases

Swift 4.0

Download	Date
Xcode 9.0* (Toolchain) (Debugging Symbols)	September 19, 2017
Ubuntu 16.10 (Signature)	September 19, 2017
Ubuntu 16.04 (Signature)	September 19, 2017
Ubuntu 14.04 (Signature)	September 19, 2017

Xcode

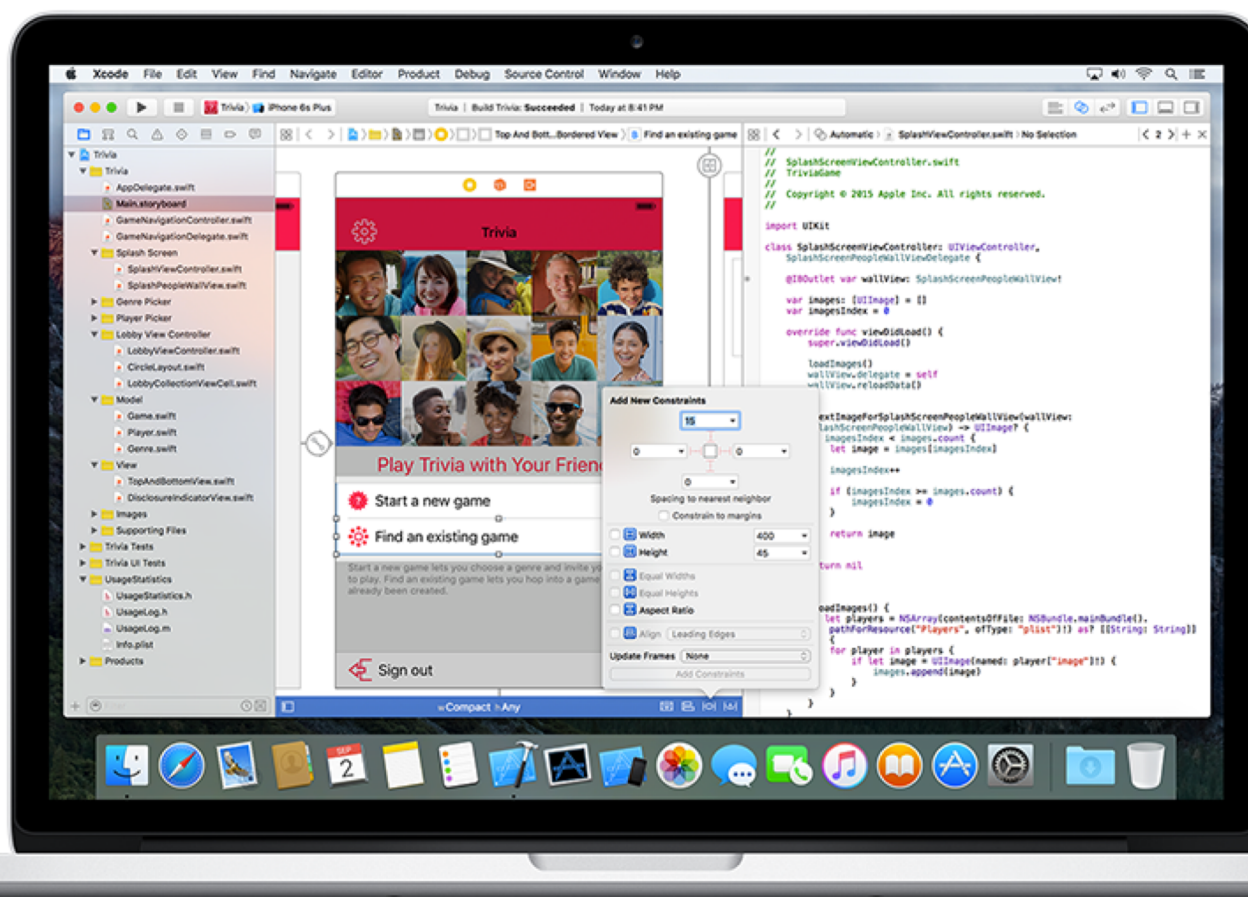
What's New

Xcode IDE

Interface Builder

Features

Download



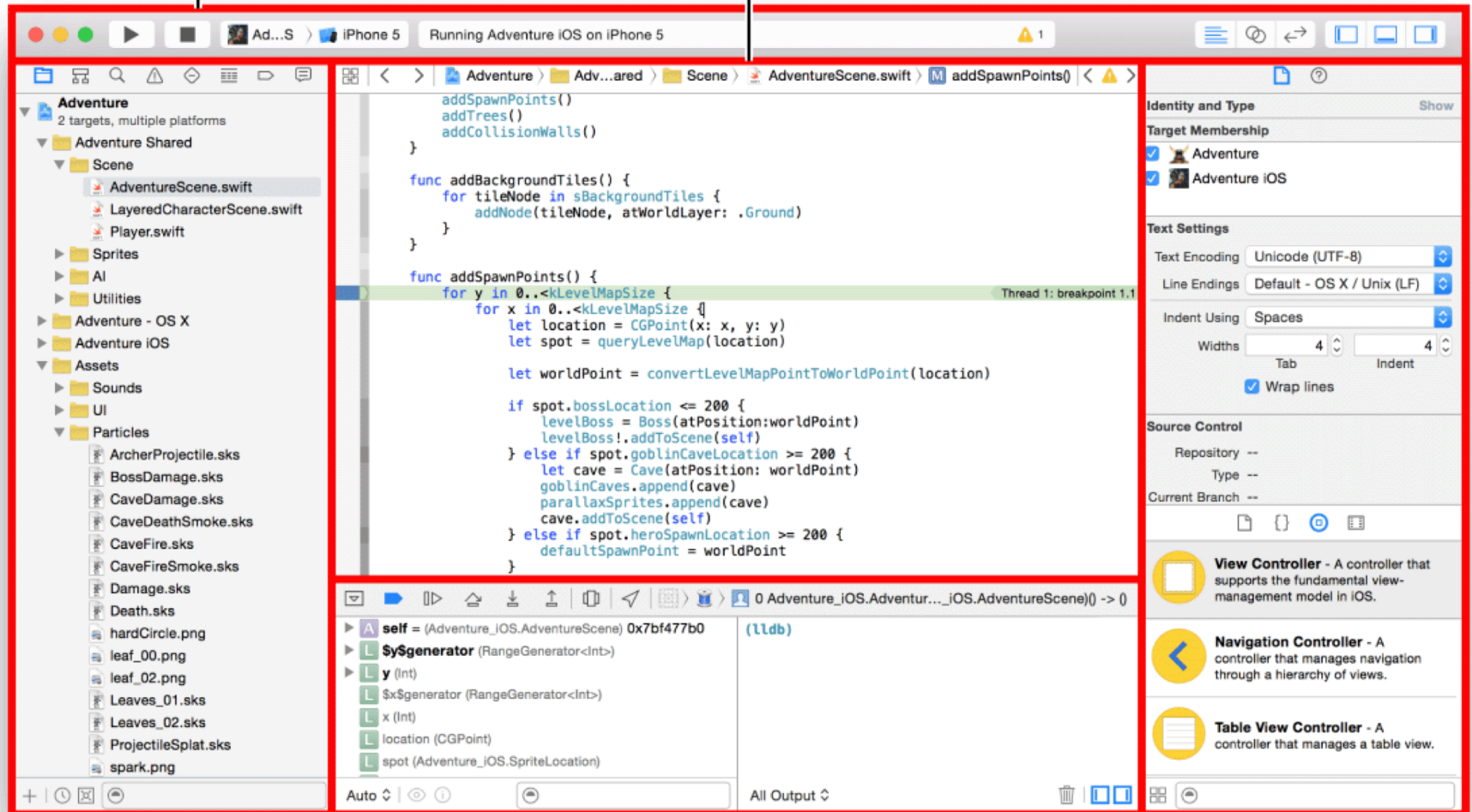
Xcode





Toolbar

Editor area



Navigator area

Debug area

Utilities area



Xcode

Inspector pane

Library pane

The screenshot displays the Xcode interface with two panes highlighted by red boxes and labels. The top pane, labeled 'Inspector bar', contains a toolbar with icons for file operations and a 'Show' button. Below this is the 'Identity and Type' section, which includes a 'Show' button and a list of settings: 'Opens in' (Default (6.0)), 'Builds for' (Project Deployment Tar...), 'View as' (iOS 7.0 and Later), 'Use Auto Layout' (checked), and 'Use Size Classes' (unchecked). The bottom pane, labeled 'Library bar', contains a toolbar with icons for file operations and a 'Filter bar' at the bottom. The 'Library bar' also displays a list of UI components: 'View Controller' (A controller that supports the fundamental view-management model in iOS.), 'Navigation Controller' (A controller that manages navigation through a hierarchy of views.), and 'Table View Controller' (A controller that manages a table view.).

Inspector bar

Identity and Type [Show](#)

Interface Builder Document

Opens in [Default \(6.0\)](#)

Builds for [Project Deployment Tar...](#)

View as [iOS 7.0 and Later](#)

☒ Use Auto Layout

☐ Use Size Classes

Library bar

View Controller - A controller that supports the fundamental view-management model in iOS.

Navigation Controller - A controller that manages navigation through a hierarchy of views.

Table View Controller - A controller that manages a table view.

Filter bar

Getting Started with Xcode 9 Development

1. Get a Mac
2. Register as an Apple Developer
3. Install Xcode
4. Enroll in the Apple Developer Program
(Optional)



Swift.

A modern programming language
that is safe, fast, and interactive.



Swift

- Swift is a powerful and intuitive **programming language** for **iOS**, **OS X**, and **watchOS**.
- Writing Swift code is interactive and fun, the syntax is concise yet expressive, and apps run lightning-fast.
- Swift is ready for your next project — or addition into your current app — because Swift code works side-by-side with Objective-C.

Swift Language



- Swift is a new **object-oriented programming language** for **iOS and OS X development**.
- Swift is **modern, powerful, expressive, and easy to use**.

Swift Language



- **Unified**
A **complete replacement** for both the **C** and **Objective-C** languages.
 - Swift provides full object-oriented features, and includes low-level language primitives such as types, flow control, and operators.
- **Fast**
- **Complete platform**
- **Safe by design**
- **Modern**
- **Interactive**





```
print("Hello world")
```

```
println("Hello world")
```



```
println("Hello World")
```



```
println("Hello World")
```



'println' has been renamed to 'print'



Fix-it Replace "println" with "print"



```
print("Hello world")
```

Swift



```
let count = 10
var price = 23.55

let firstMessage = "Swift is awesome. "
let secondMessage = "What do you think?"
var message = firstMessage + secondMessage

print(message)
```

Objective-C

```
const int count = 10;  
double price = 23.55;  
  
NSString *firstMessage = @"Swift is awesome. ";  
NSString *secondMessage = @"What do you think?";  
NSString *message = [NSString stringWithFormat:@"%s%s",  
firstMessage, secondMessage];  
  
NSLog(@"%@", message);
```



```
var s = "Hello" + " World"
```

```
var myVariable = 82  
myVariable = 90  
let myConstant = 82
```

```
let individualScores = [75, 43, 93, 87, 12]
var teamScore = 0
for score in individualScores {
    if score > 60 {
        teamScore += 3
    } else {
        teamScore += 1
    }
}
print(teamScore)
```

```
let individualScores = [75, 43, 93, 87, 12]
var teamScore = 0
for score in individualScores {
    if score > 60 {
        teamScore += 3
    } else {
        teamScore += 1
    }
}
print(teamScore)
```

```
[75, 43, 93, 87, 12]
0
```

```
(3 times)
```

```
(2 times)
```

```
"11\n"
```

The Swift Programming Language (Swift 4)

```
print( "Hello, world!" )
```


Xcode 9



Welcome to Xcode

Version 9.0 (9A235)



Get started with a playground

Explore new ideas quickly and easily.



Create a new Xcode project

Create an app for iPhone, iPad, Mac, Apple Watch or Apple TV.

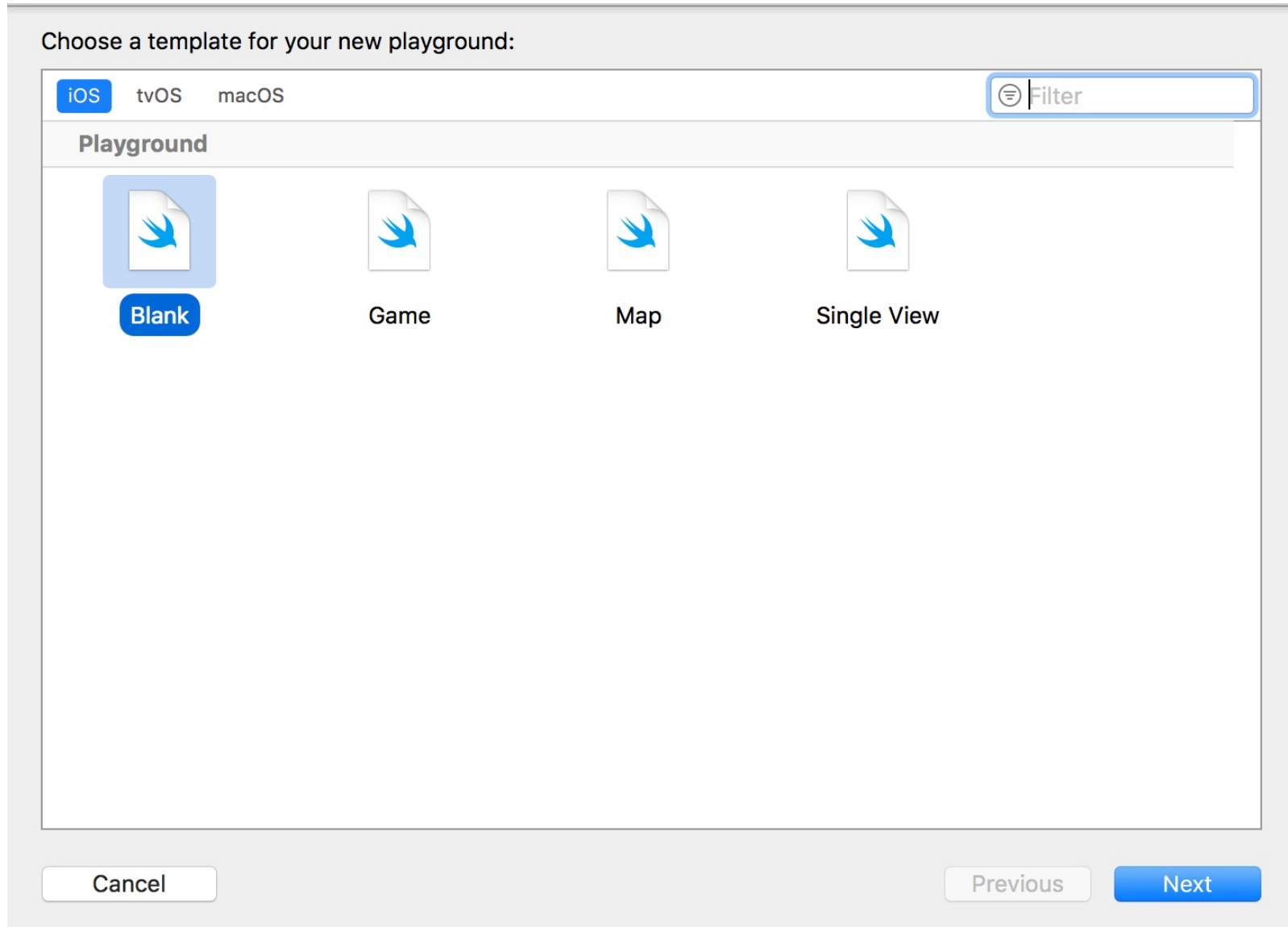


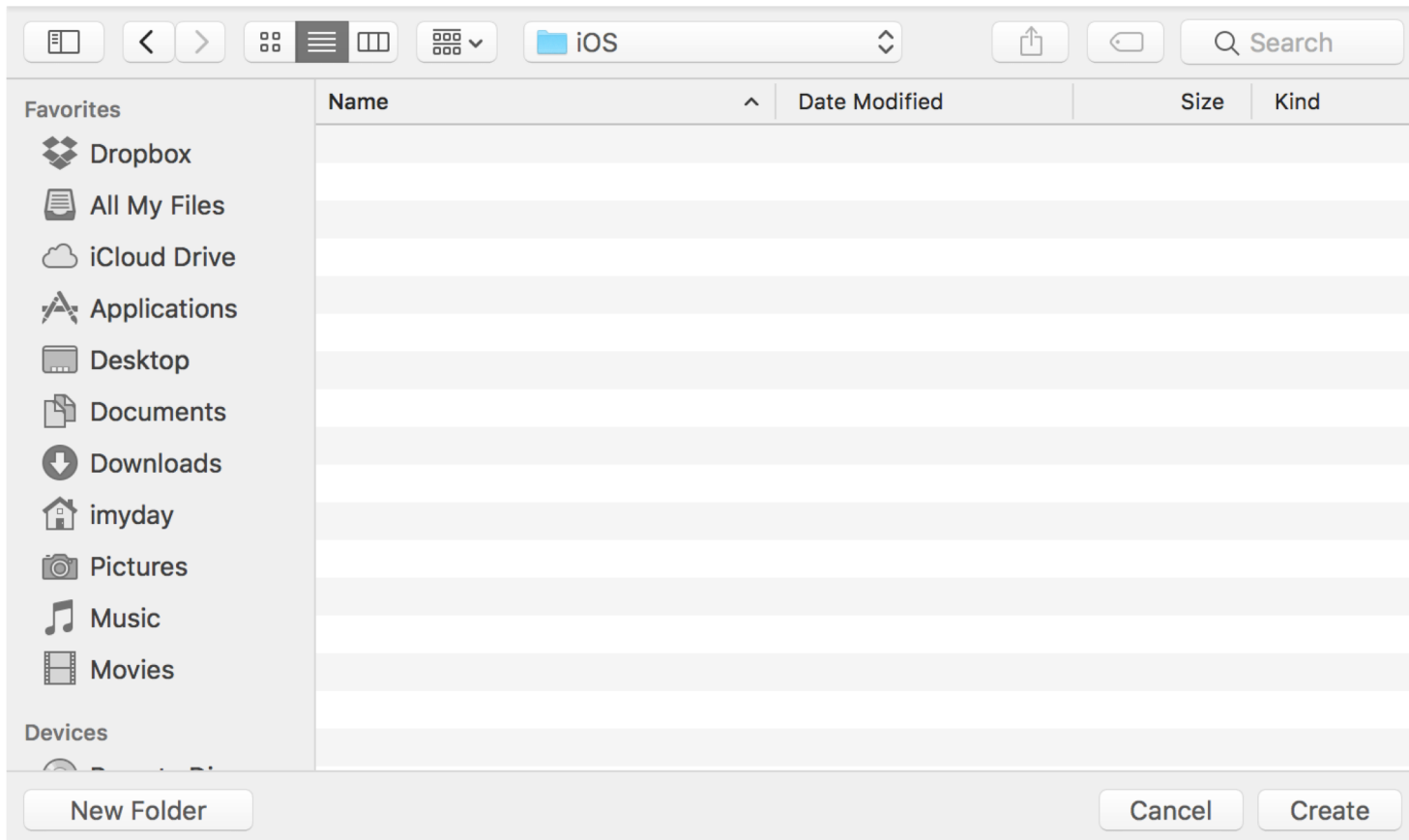
Clone an existing project

Start working on something from an SCM repository.

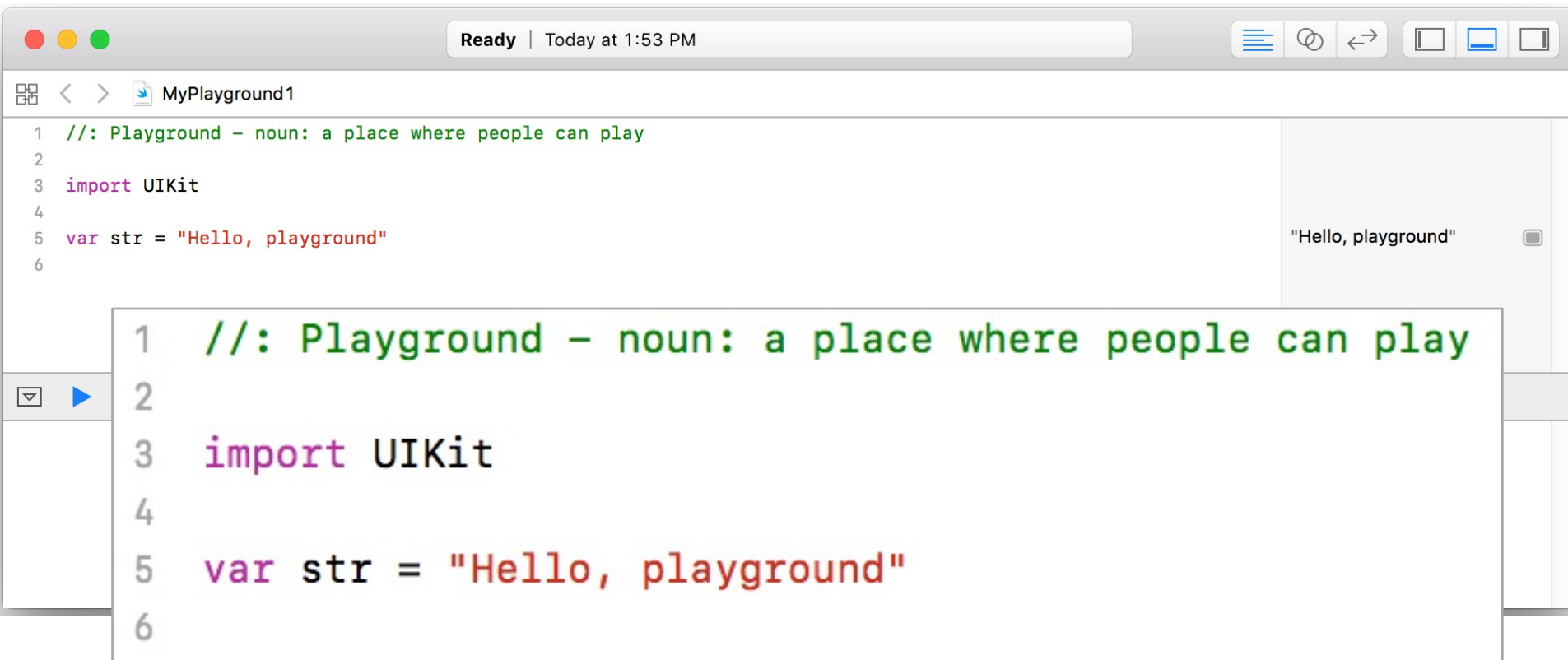
☒ Show this window when Xcode launches

Xcode 9 Playground

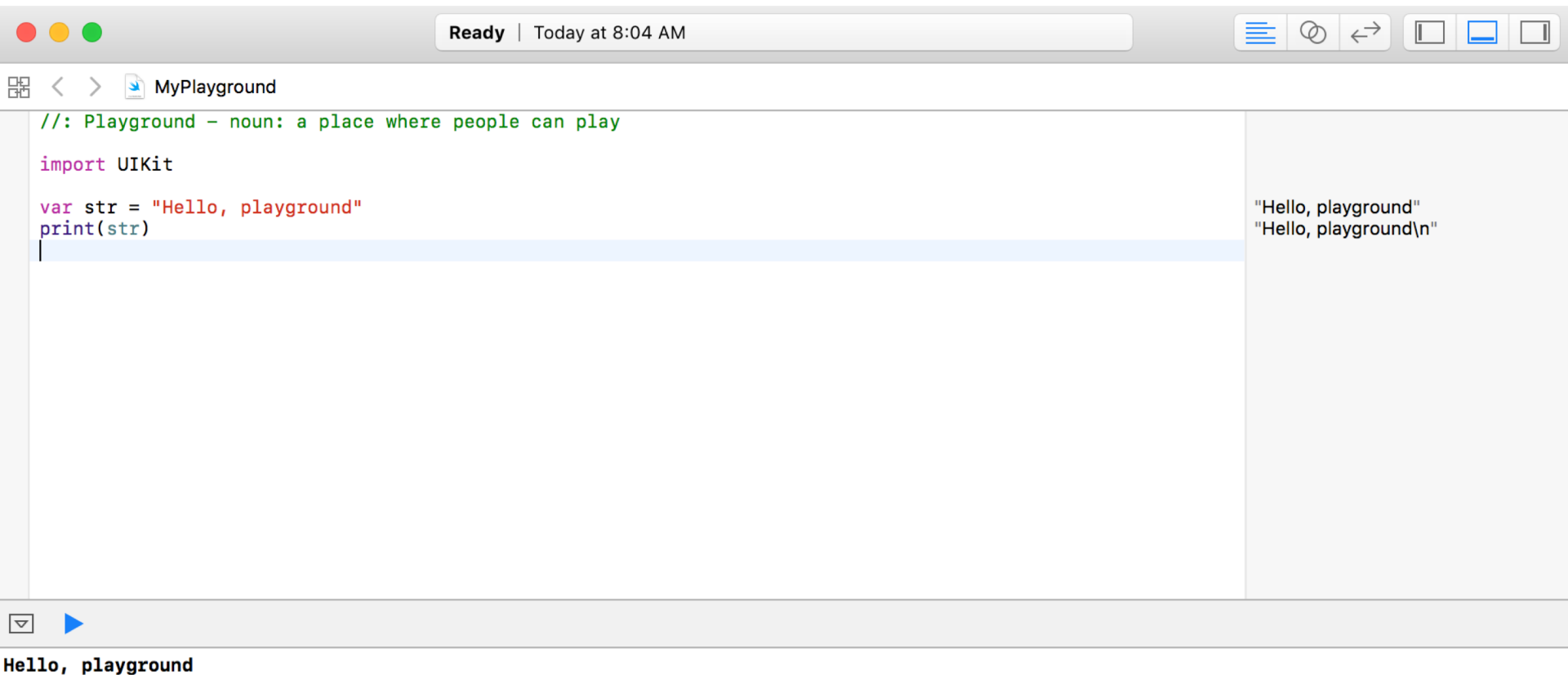




Swift 4 in Xcode 9 Playground



Swift 4 in Xcode 9 Playground

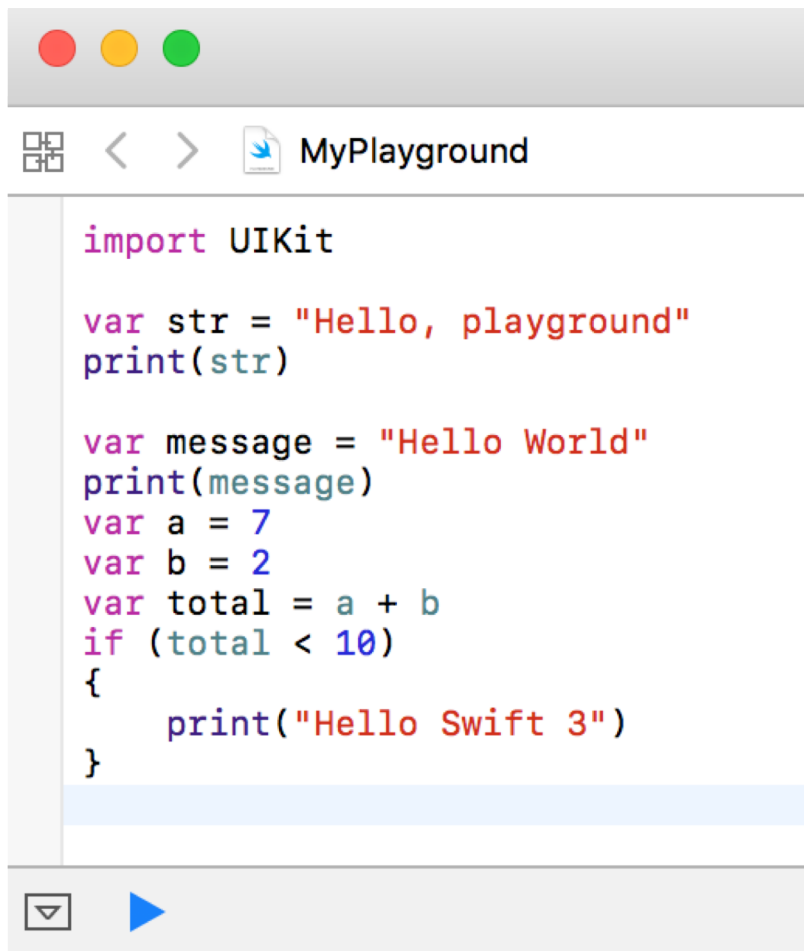


Swift 4 in Xcode 9 Playground



```
var message = "Hello World"
print(message)
var a = 7
var b = 2
var total = a + b
if (total < 10)
{
    print("Hello Swift 3")
}
```


Swift 4 in Xcode 9 Playground

A screenshot of the Xcode 9 Playground window. The title bar shows three colored window control buttons (red, yellow, green) and the title "MyPlayground". The toolbar includes a file icon, left and right arrow icons, and a document icon. The code editor contains the following Swift code:

```
import UIKit

var str = "Hello, playground"
print(str)

var message = "Hello World"
print(message)
var a = 7
var b = 2
var total = a + b
if (total < 10)
{
    print("Hello Swift 3")
}
```

The code is syntax-highlighted with colors: purple for keywords, red for strings, blue for variables, and black for operators and punctuation. A light blue horizontal bar is visible at the bottom of the code editor area.

Hello, playground
Hello World
Hello Swift 3

```
"Hello, playground"
"Hello, playground\n"

"Hello World"
"Hello World\n"
7
2
9

"Hello Swift 3\n"
```



Swift 4 in Xcode 9 Playground



```
var strS = "Your score is "  
var score = 90  
var yourScore = strS + String(score)  
print(yourScore)  
if (score >= 60) {  
    print("Pass")  
}  
else {  
    print("Fail")  
}
```

Swift 4 in Xcode 9 Playground



 < >  MyPlayground

```
//: Playground – noun: a place where people can play

import UIKit

var str = "Hello, playground"



var strS = "Your score is "
var score = 90
var yourScore = strS + String(score)
print(yourScore)

if (score >= 60) {
    print("Pass")
}
else {
    print("Fail")
}
```

```
"Hello, playground"

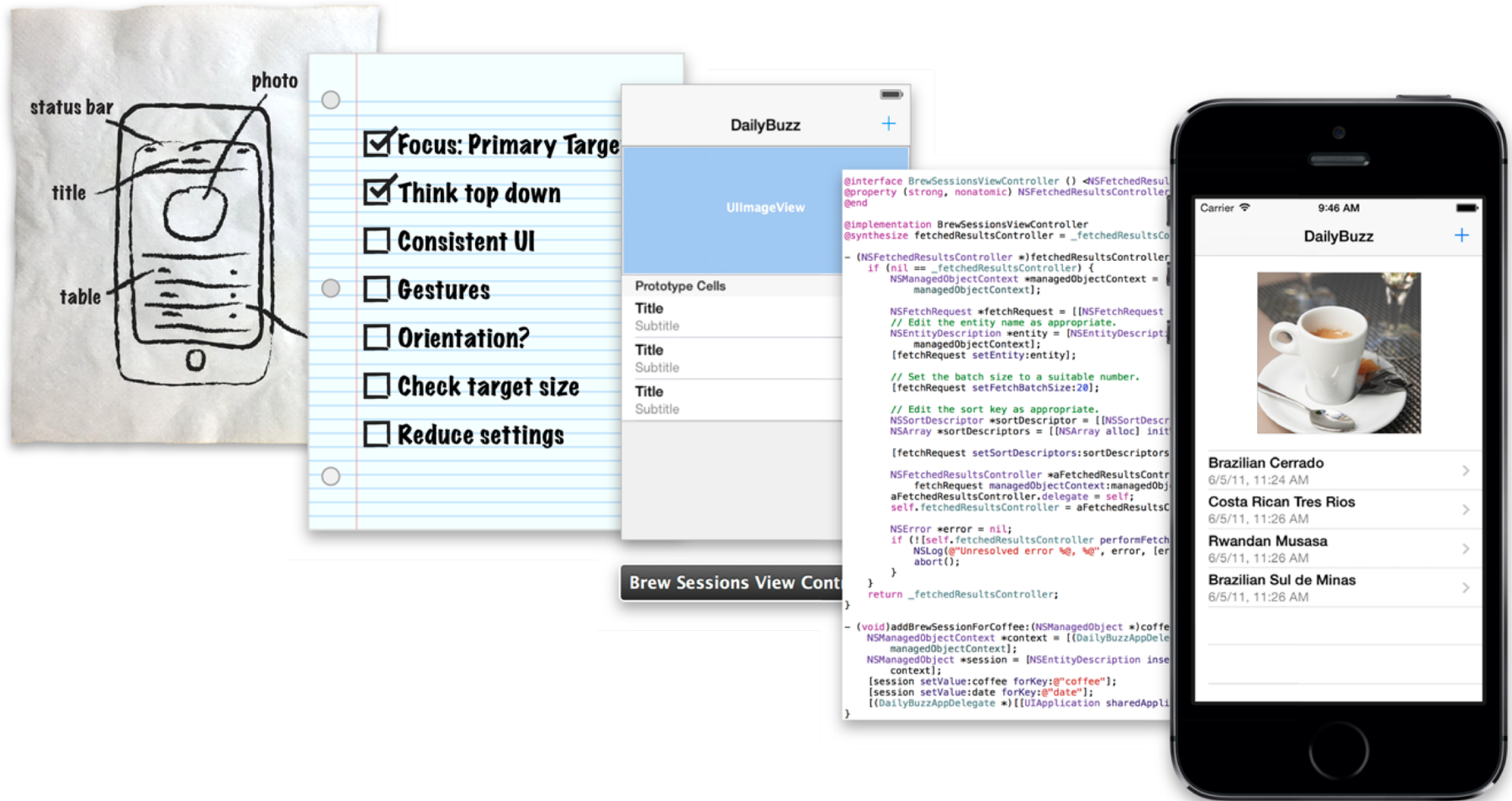
"Your score is "
90
"Your score is 90"
"Your score is 90\n"

"Pass\n"
```

Your score is 90
Pass

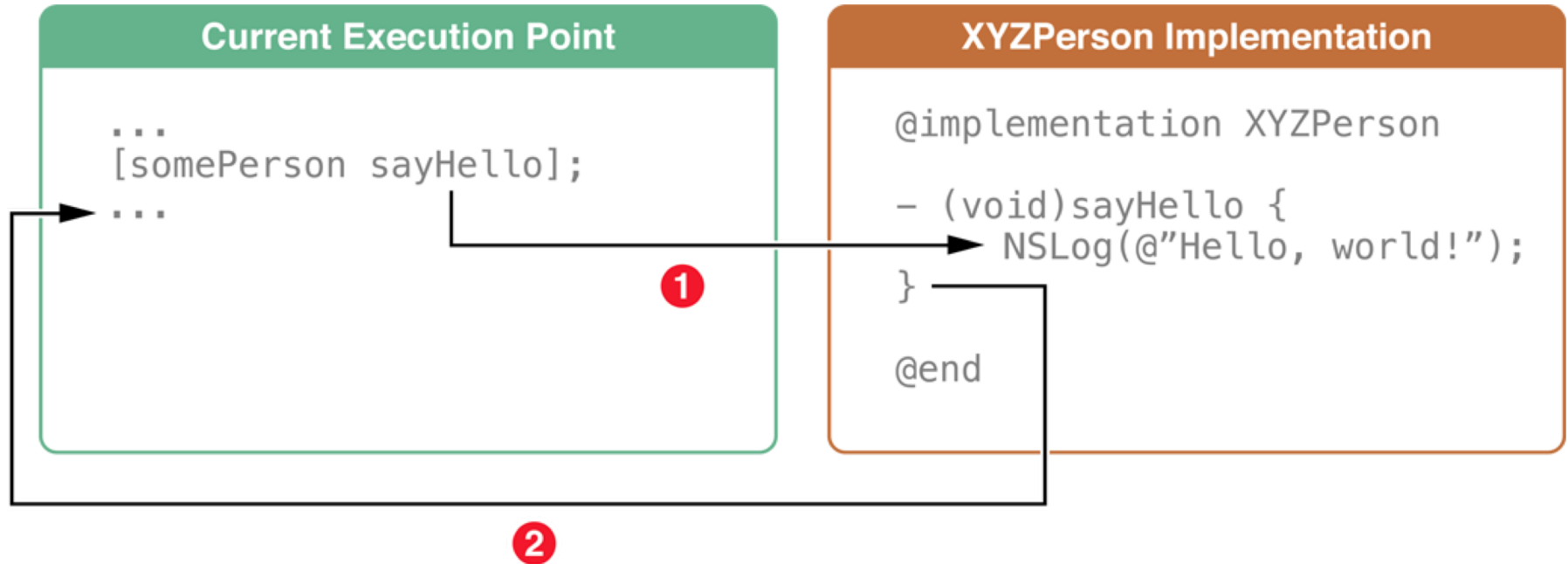
iOS App Development Process



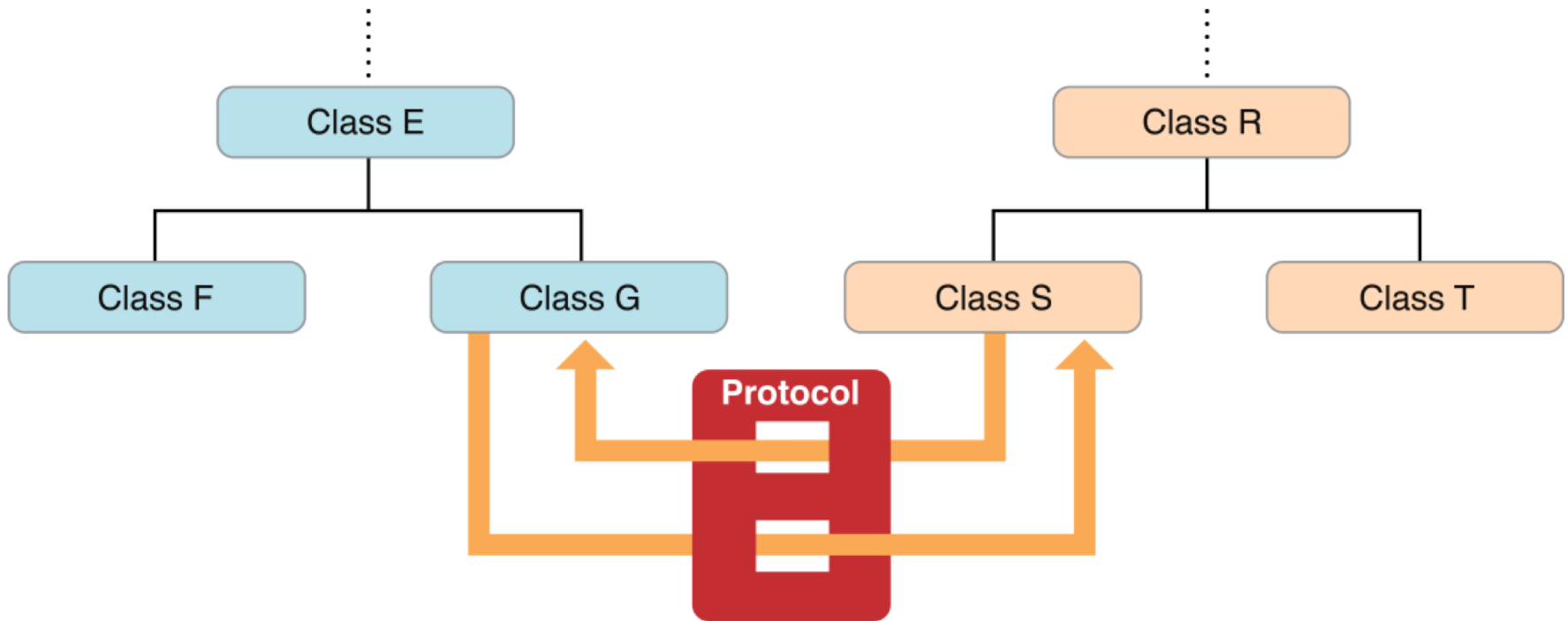
iOS App Development Process

- Defining the Concept
- Designing a User Interface
- Defining the Interaction
- Implementing the Behavior

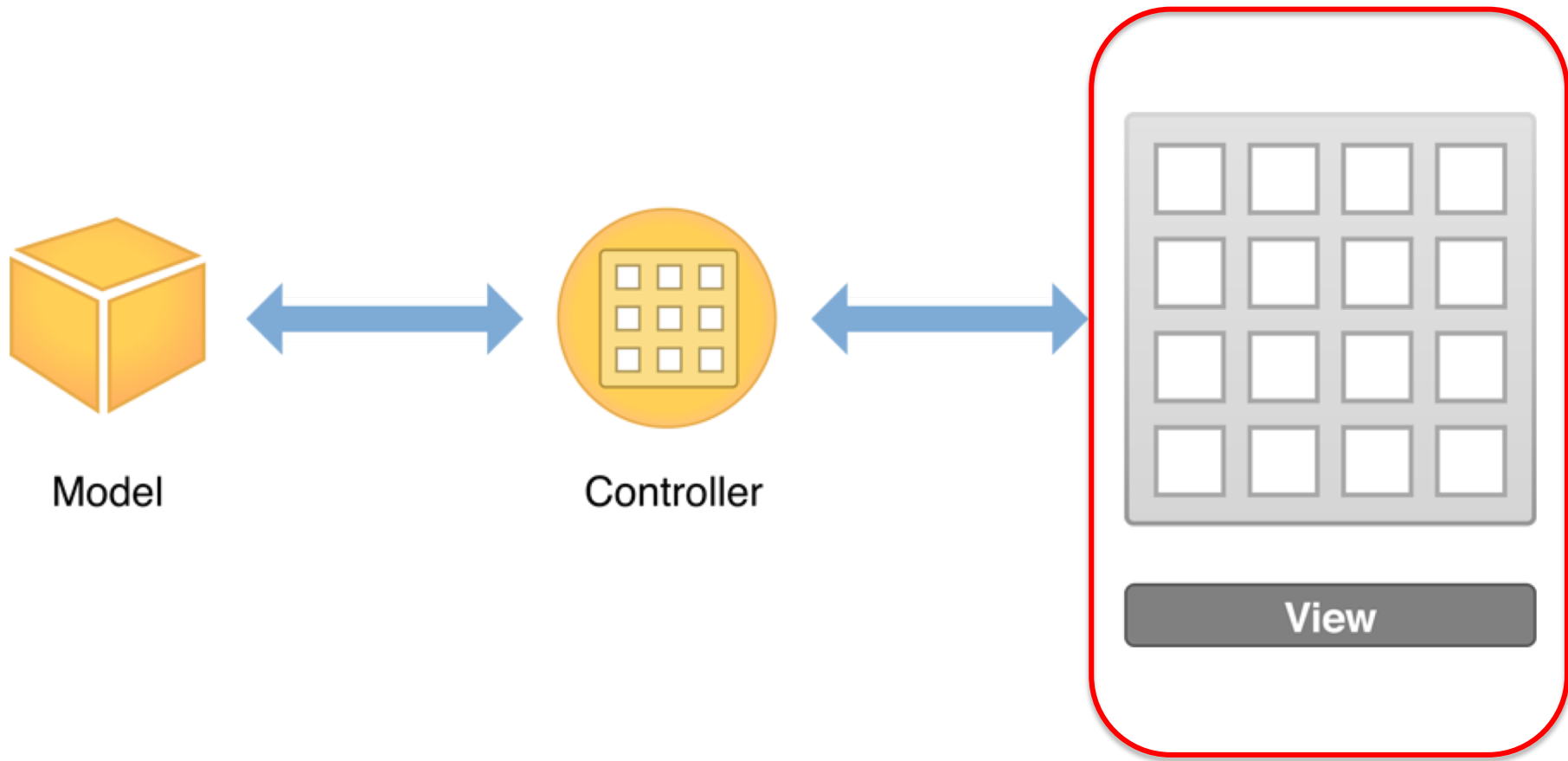
Objects Communicate Through Messages



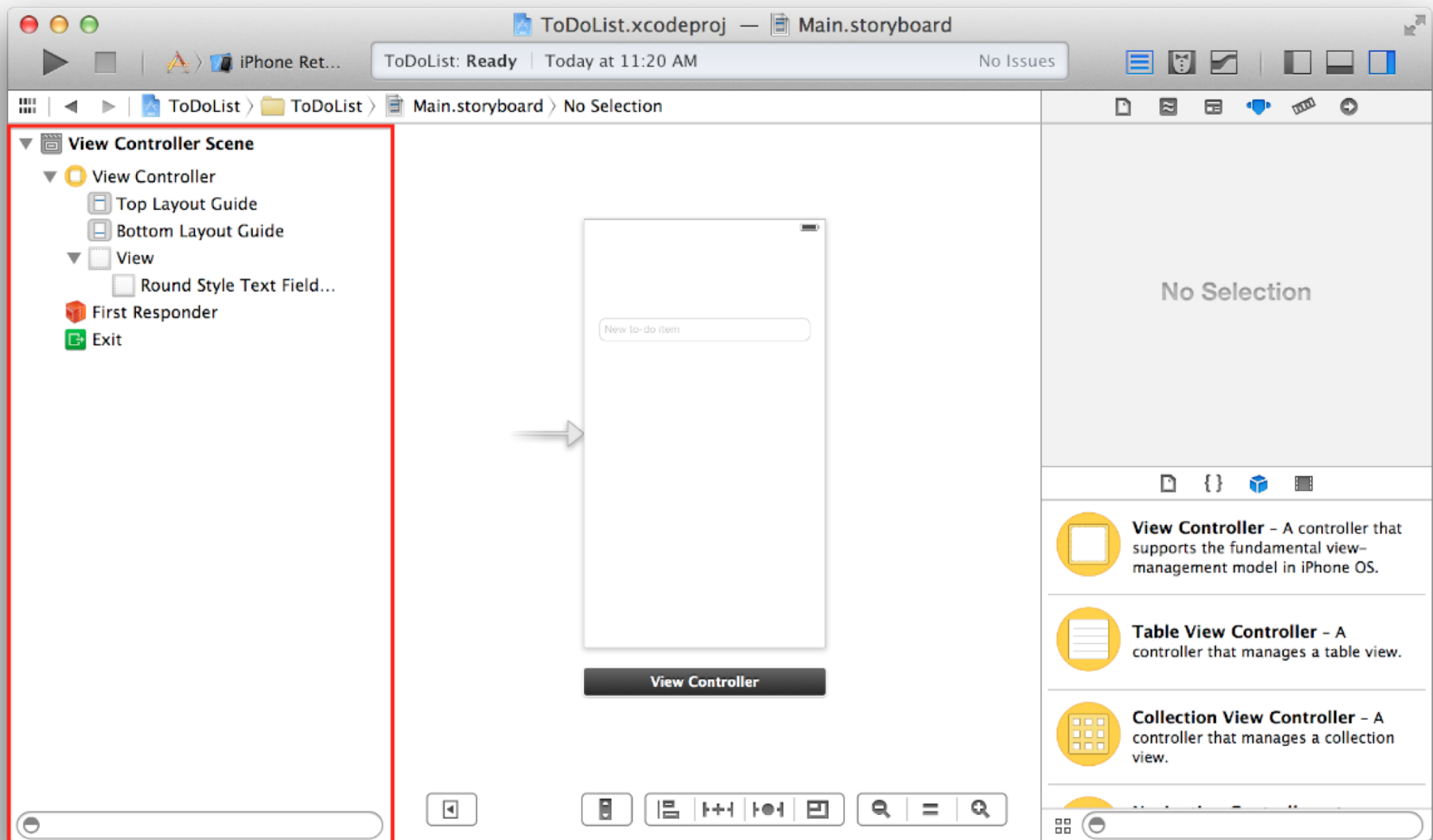
Protocols Define Messaging Contracts



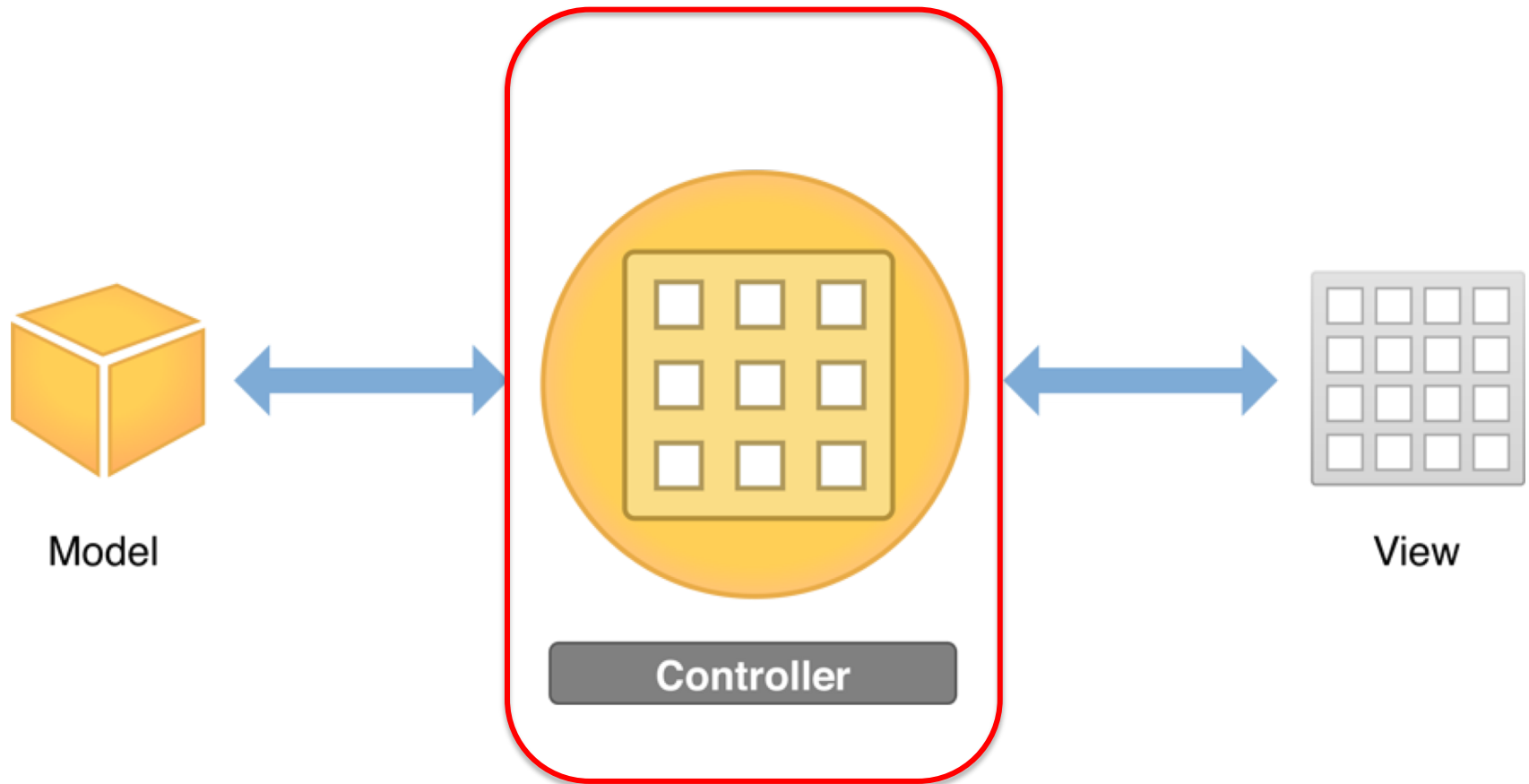
Designing a User Interface



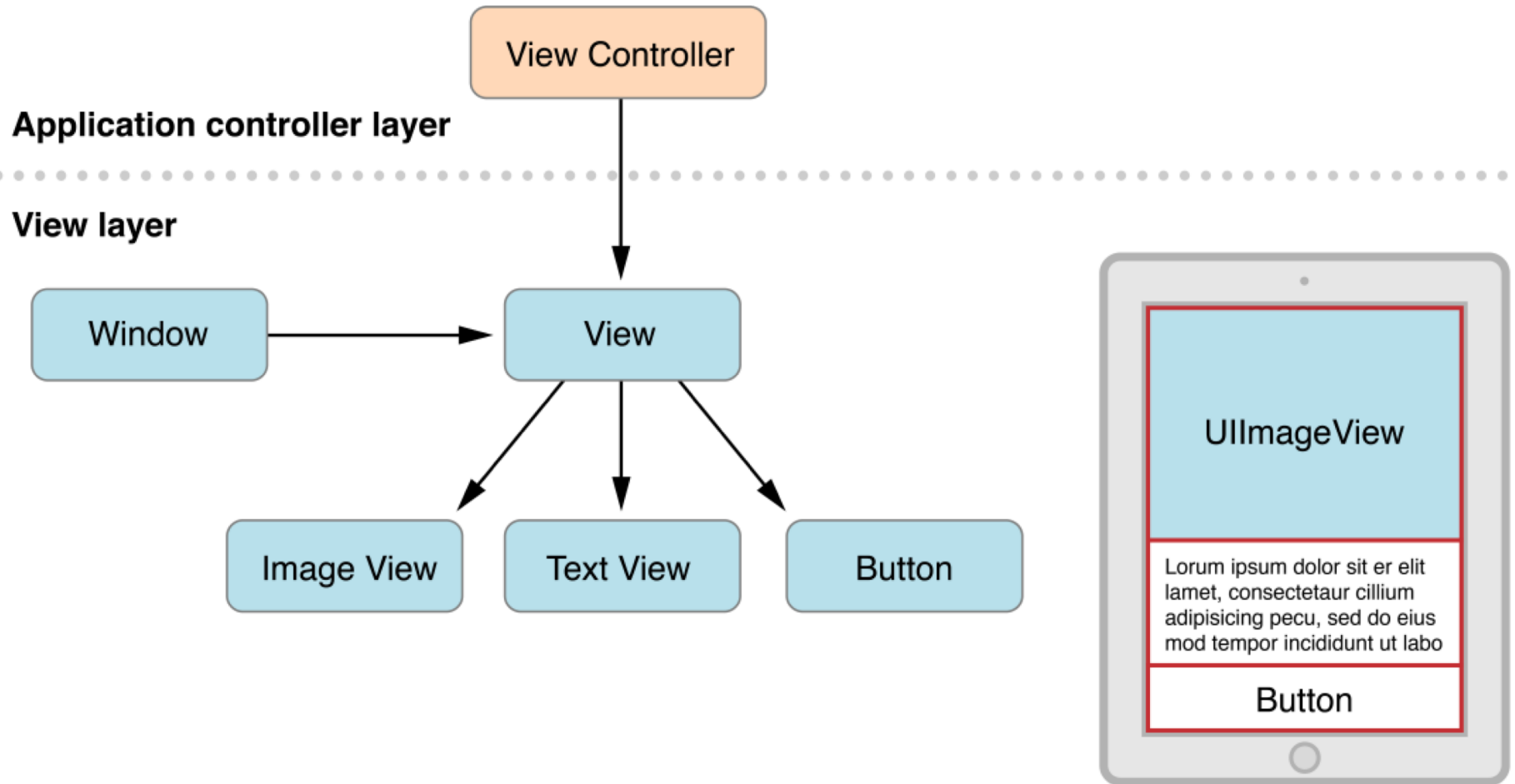
Use Storyboards to Lay Out Views



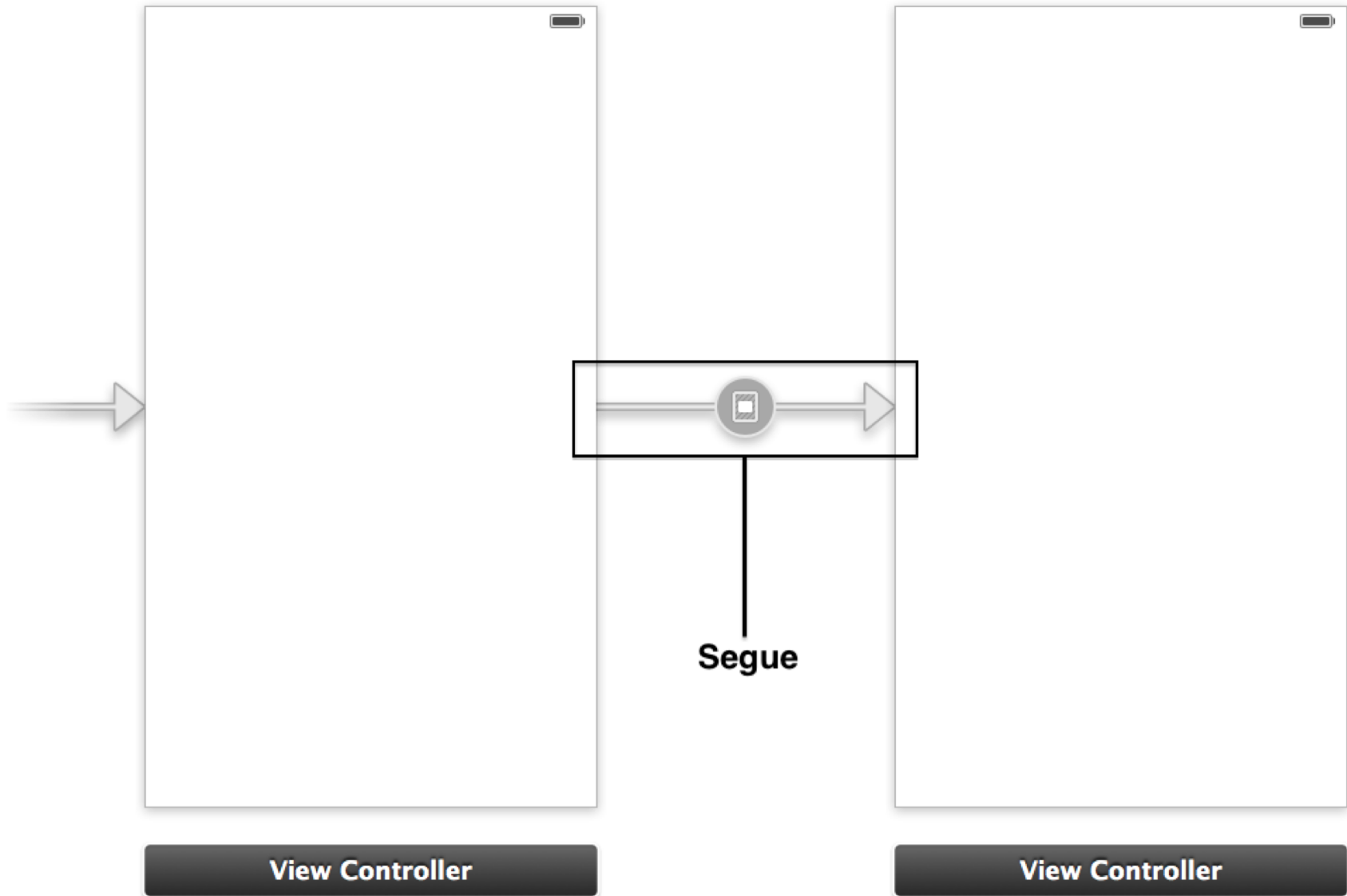
Defining the Interaction



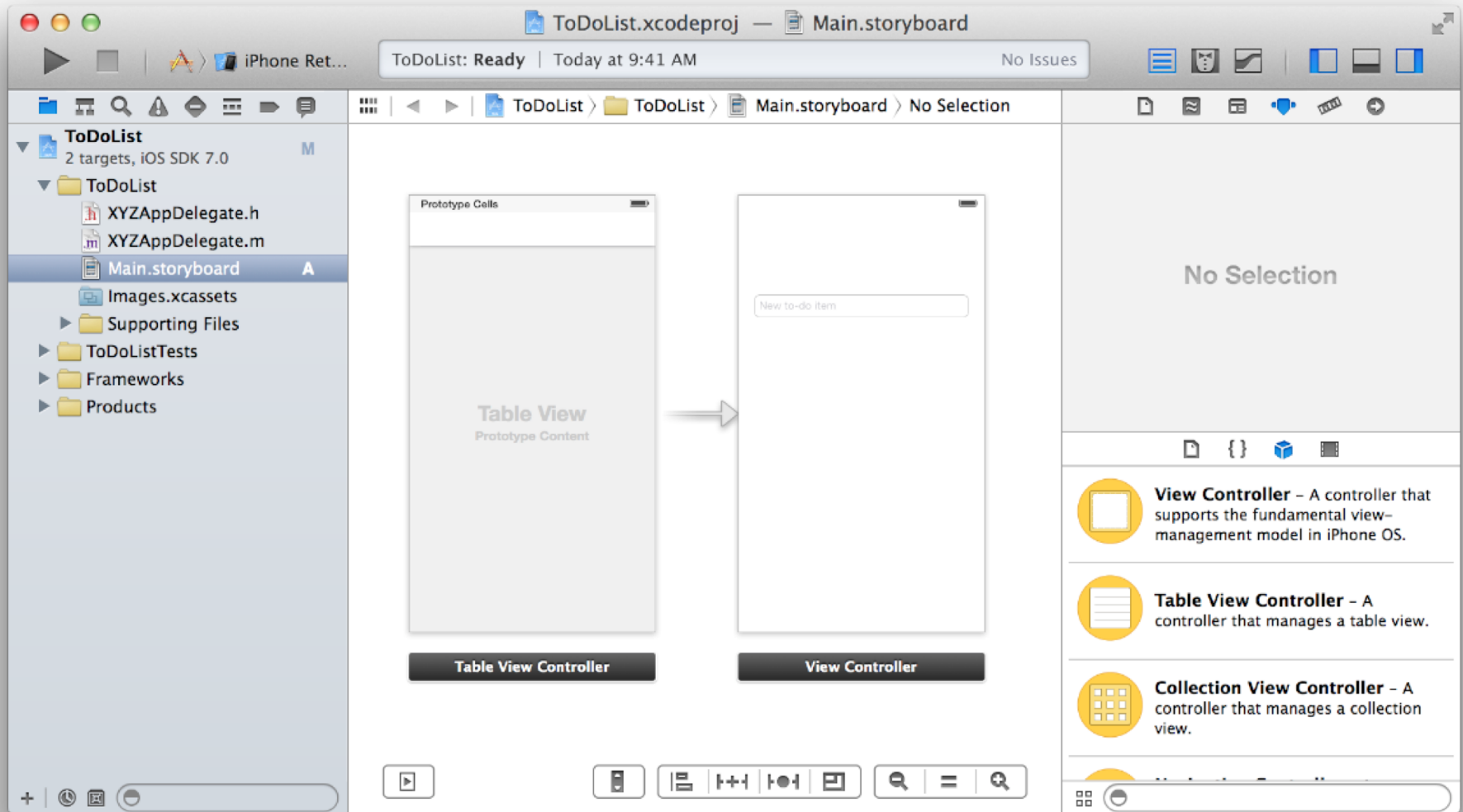
View Controllers



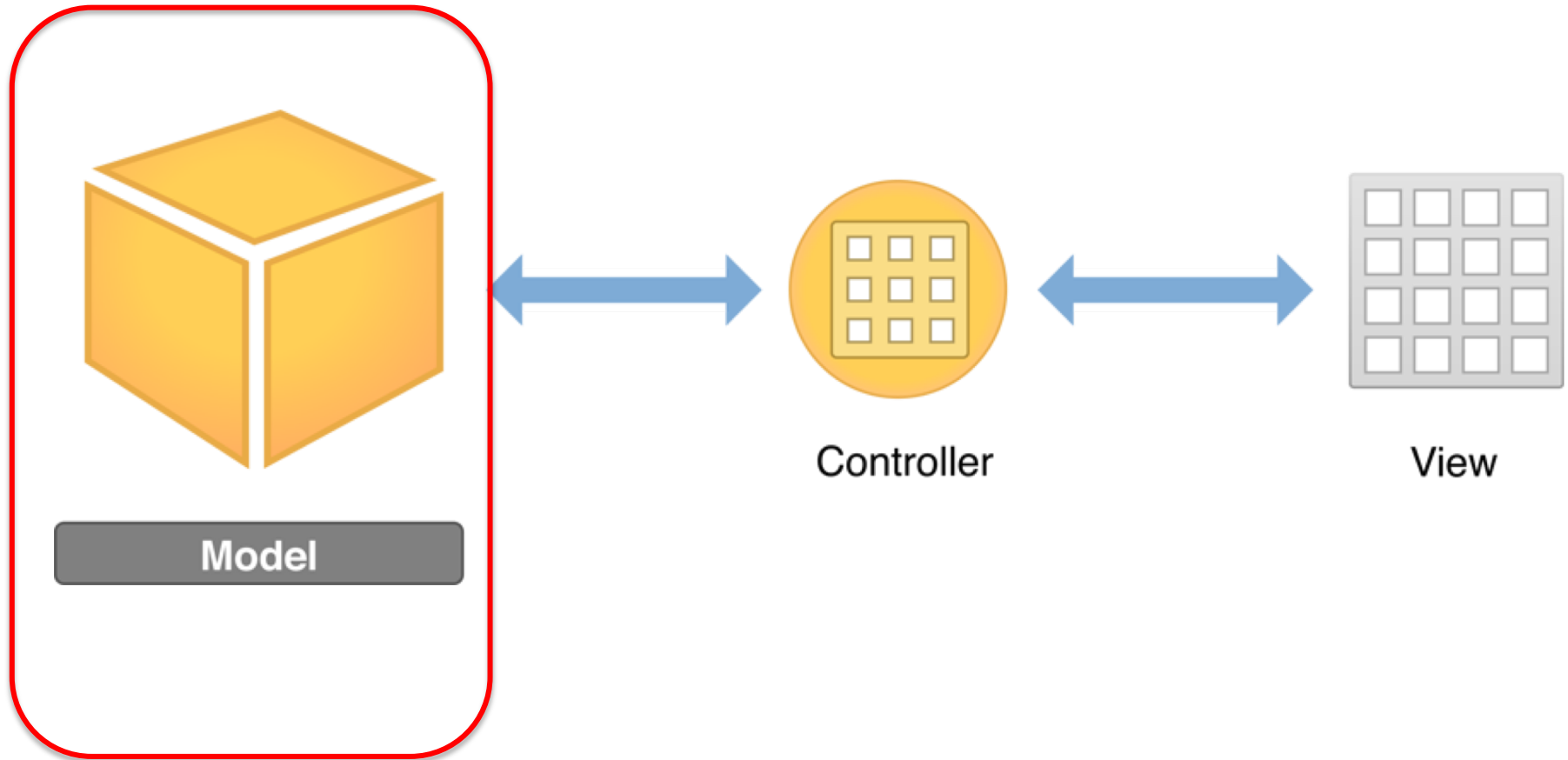
Use Storyboards to Define Navigation



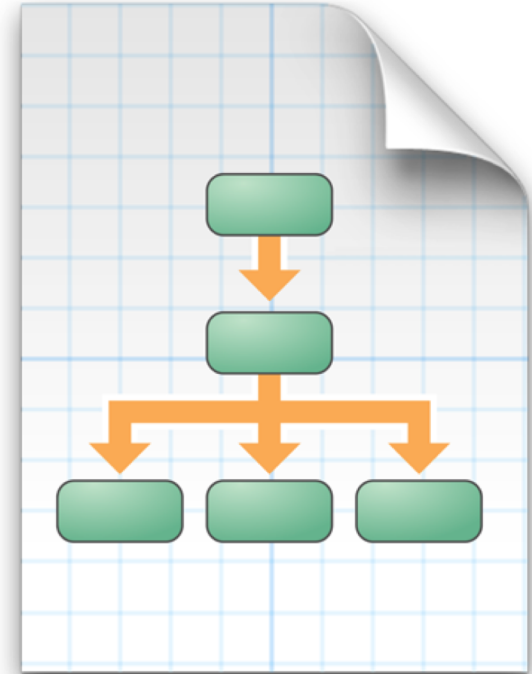
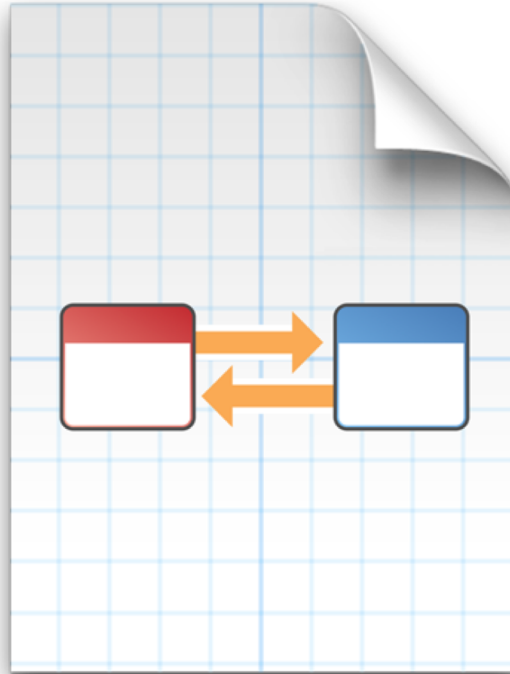
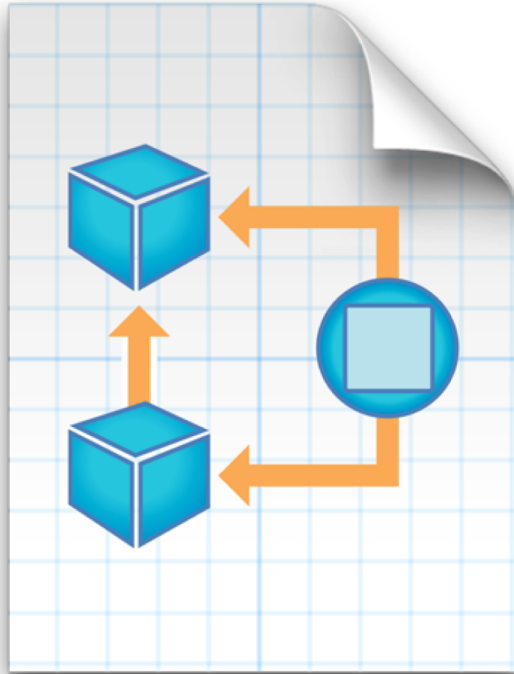
Storyboards



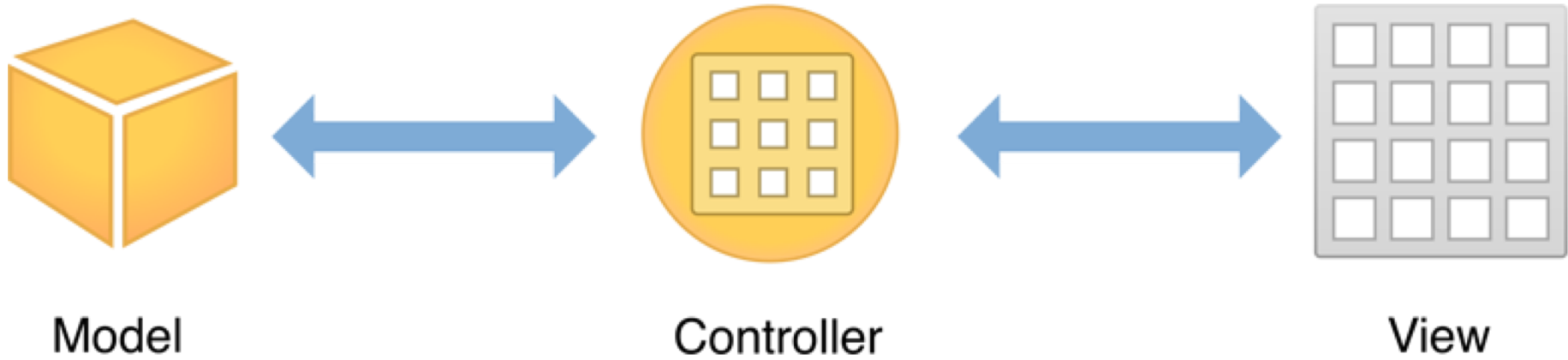
Incorporating the Data



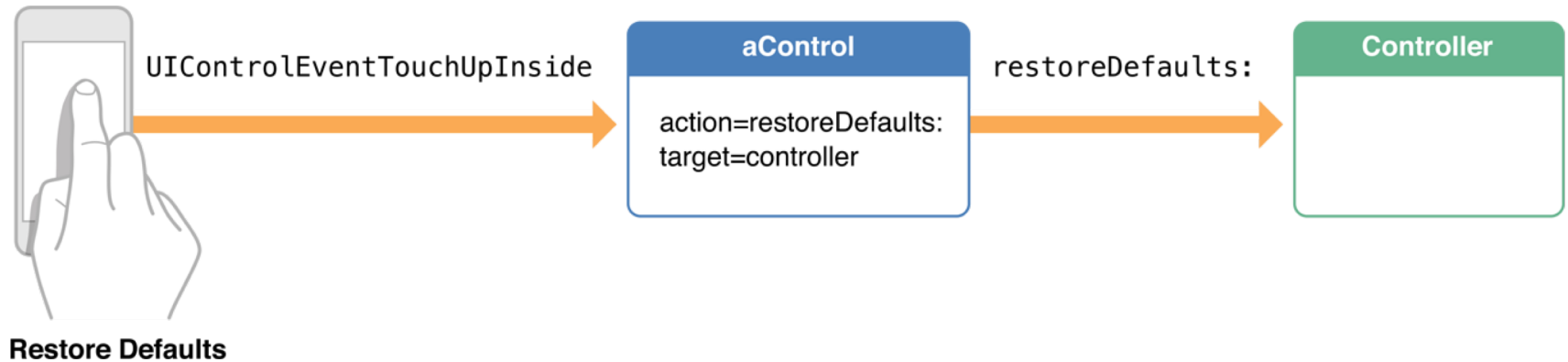
Using Design Patterns



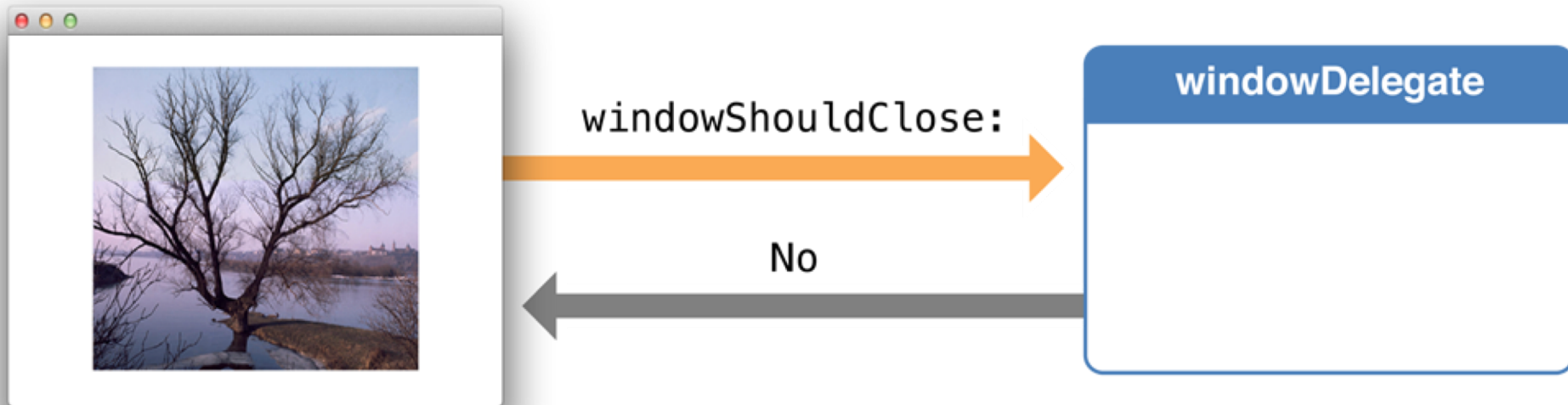
Model-View-Controller (MVC)



Target-Action



Delegation

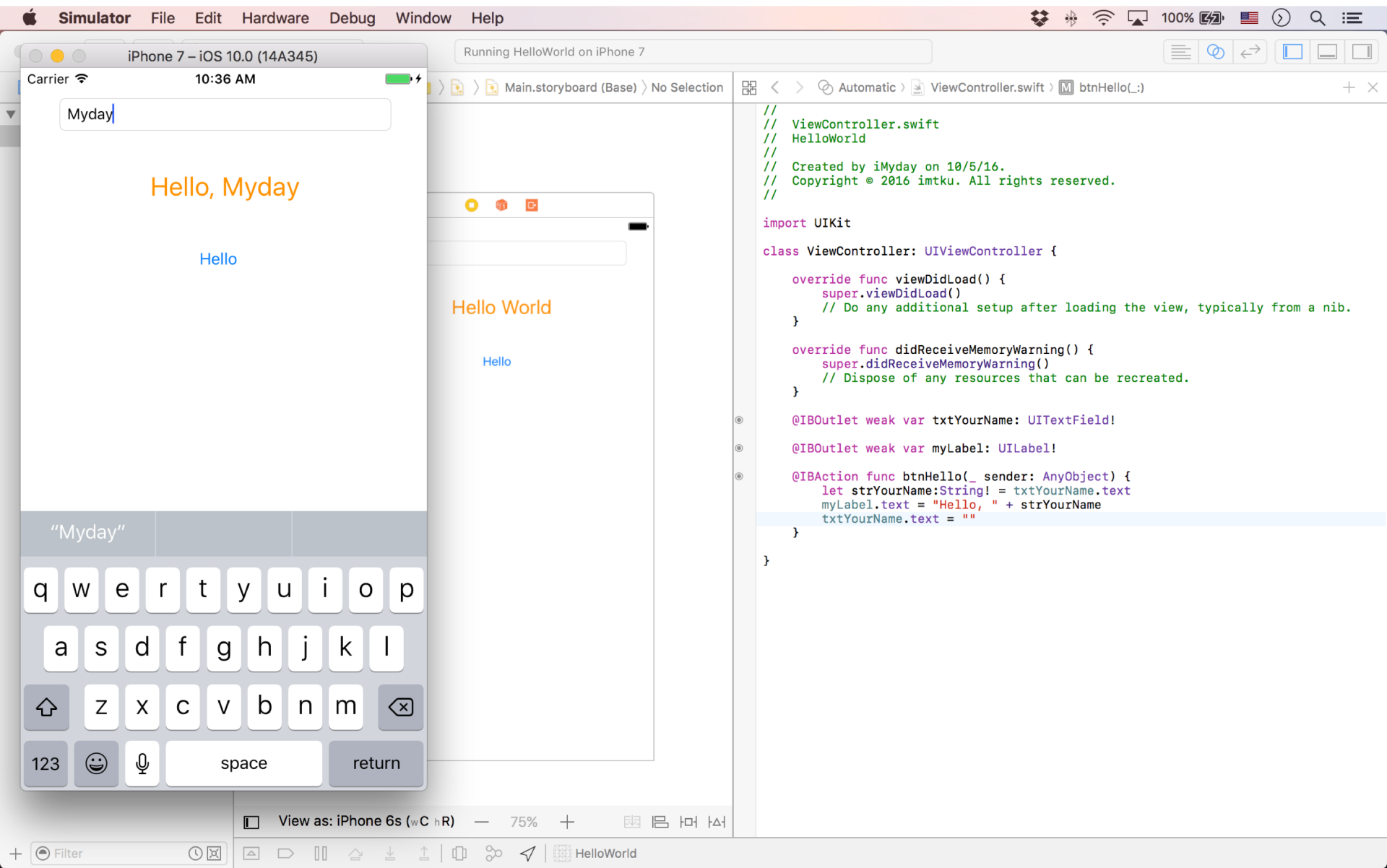


IBOutlet and IBAction

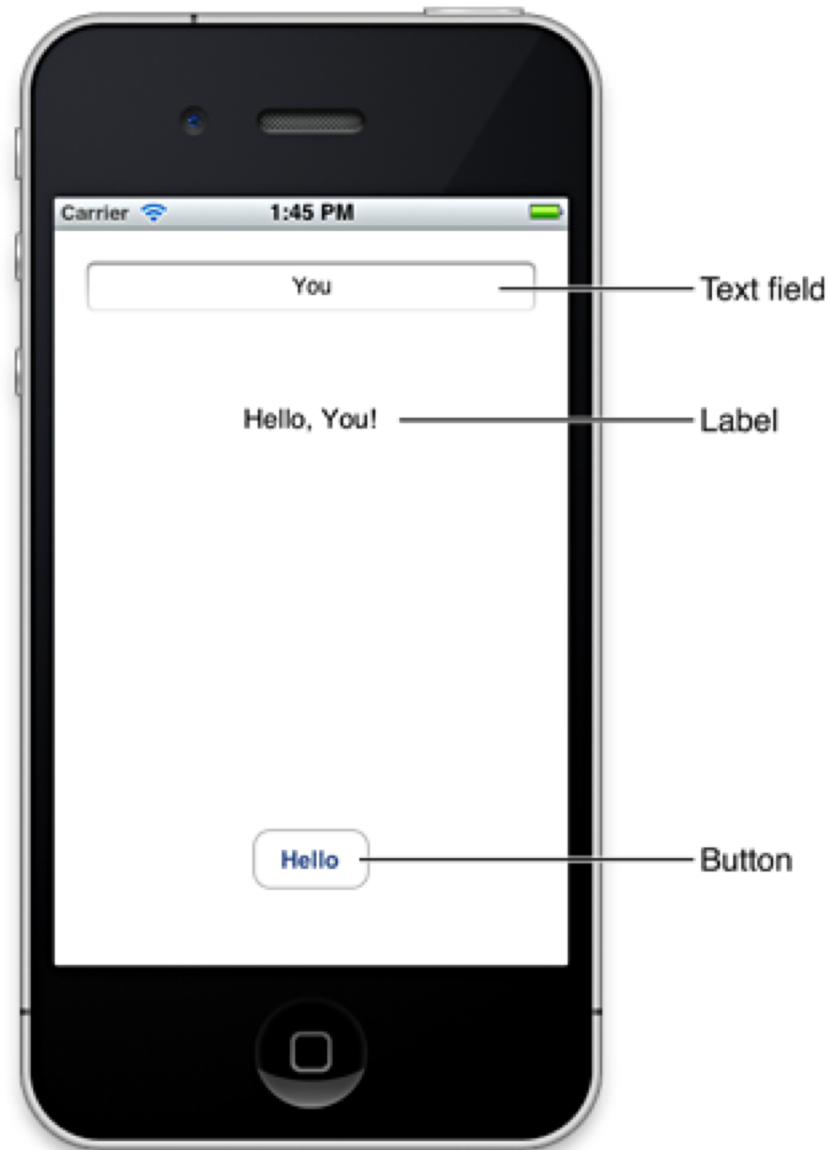
- IBOutlet
 - Interface Builder Outlet
- IBAction
 - Interface Builder Action

Demo:
**Building Your First iOS App with
Xcode 9 (Swift 4)**

Building Your First iOS App with Xcode 9



Your First iOS App



Xcode 8 with Swift 3



Xcode 8



Swift 3

Xcode 9 with Swift 4



Xcode 9



Swift 4

Xcode 10 with Swift 4.2



Xcode 10



Swift 4.2

Launchpad → Xcode



Safari



Mail



Contacts



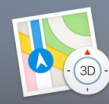
Calendar



Reminders



Notes



Maps



Messages



FaceTime



Photo Booth



Photos



iMovie



GarageBand



iTunes



iBooks



App Store



Pages



Numbers



Keynote



Preview



Dictionary



Calculator



Other



Mission Control



Dashboard



System Preferences



Google Chrome



Dropbox



Microsoft OneNote



Microsoft PowerPoint



Microsoft Excel



Microsoft Outlook



Microsoft Word



Siri



Xcode



Xcode 9



Welcome to Xcode

Version 9.0 (9A235)



Get started with a playground

Explore new ideas quickly and easily.



Create a new Xcode project

Create an app for iPhone, iPad, Mac, Apple Watch or Apple TV.



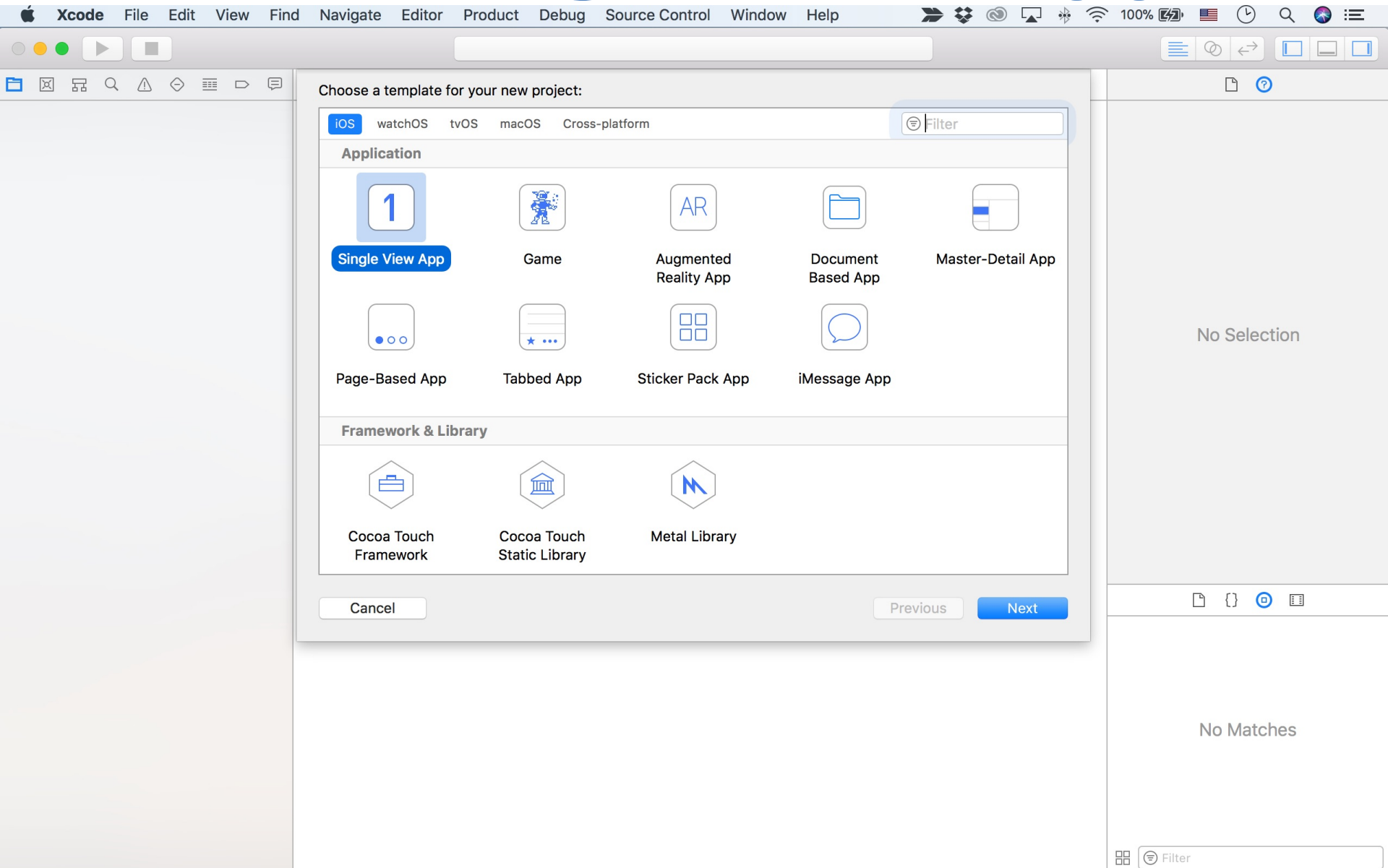
Clone an existing project

Start working on something from an SCM repository.

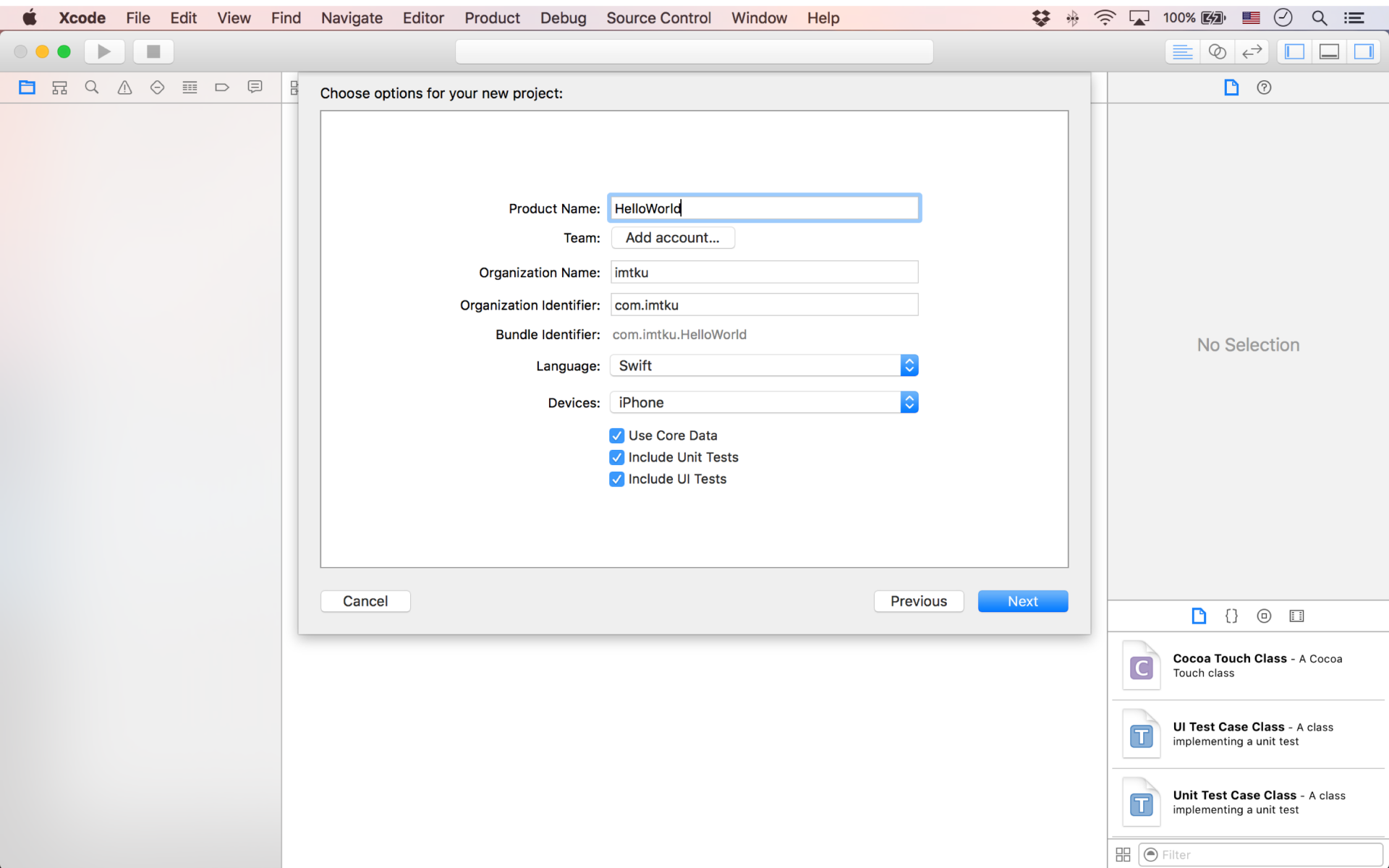


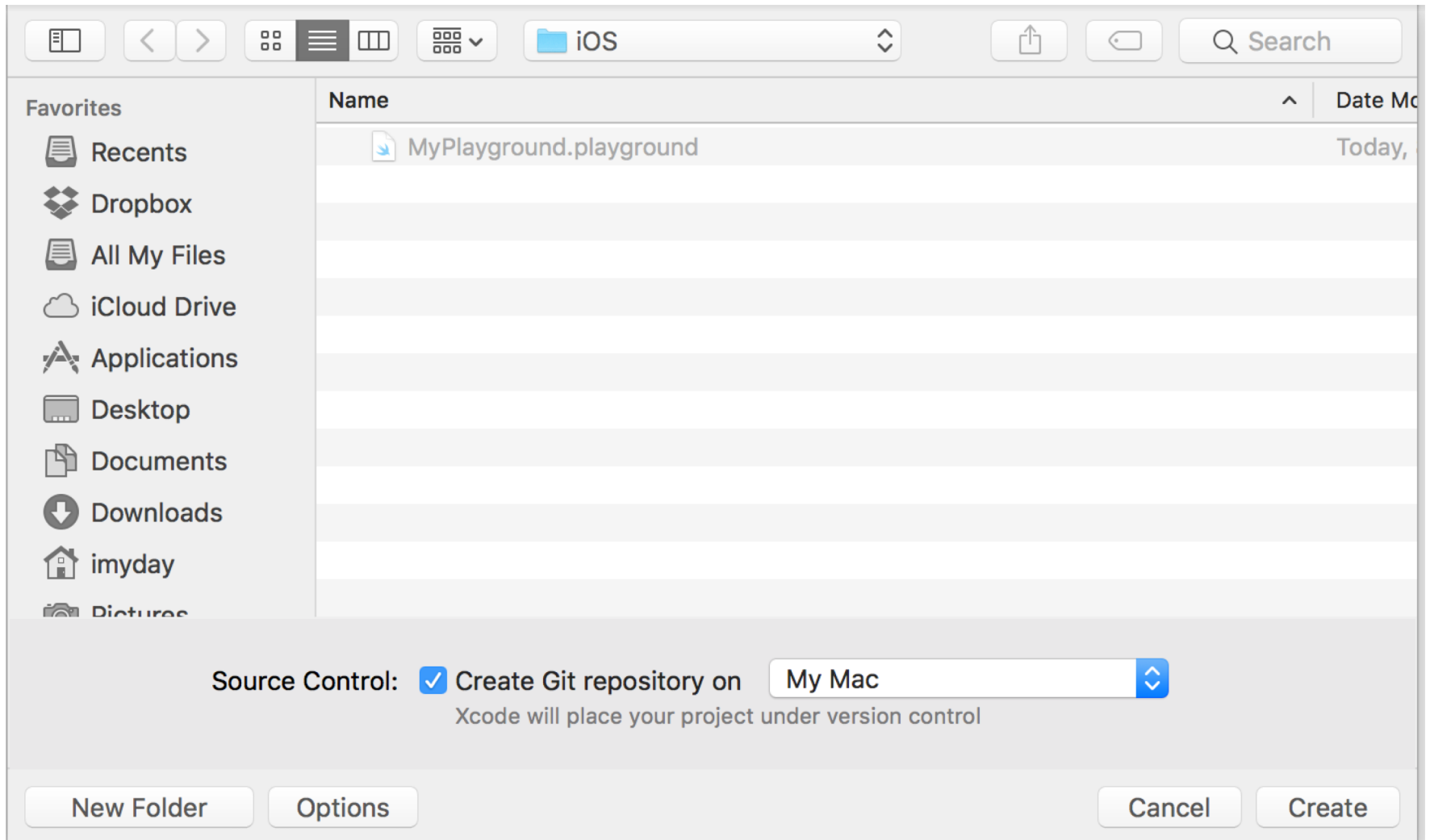
Show this window when Xcode launches

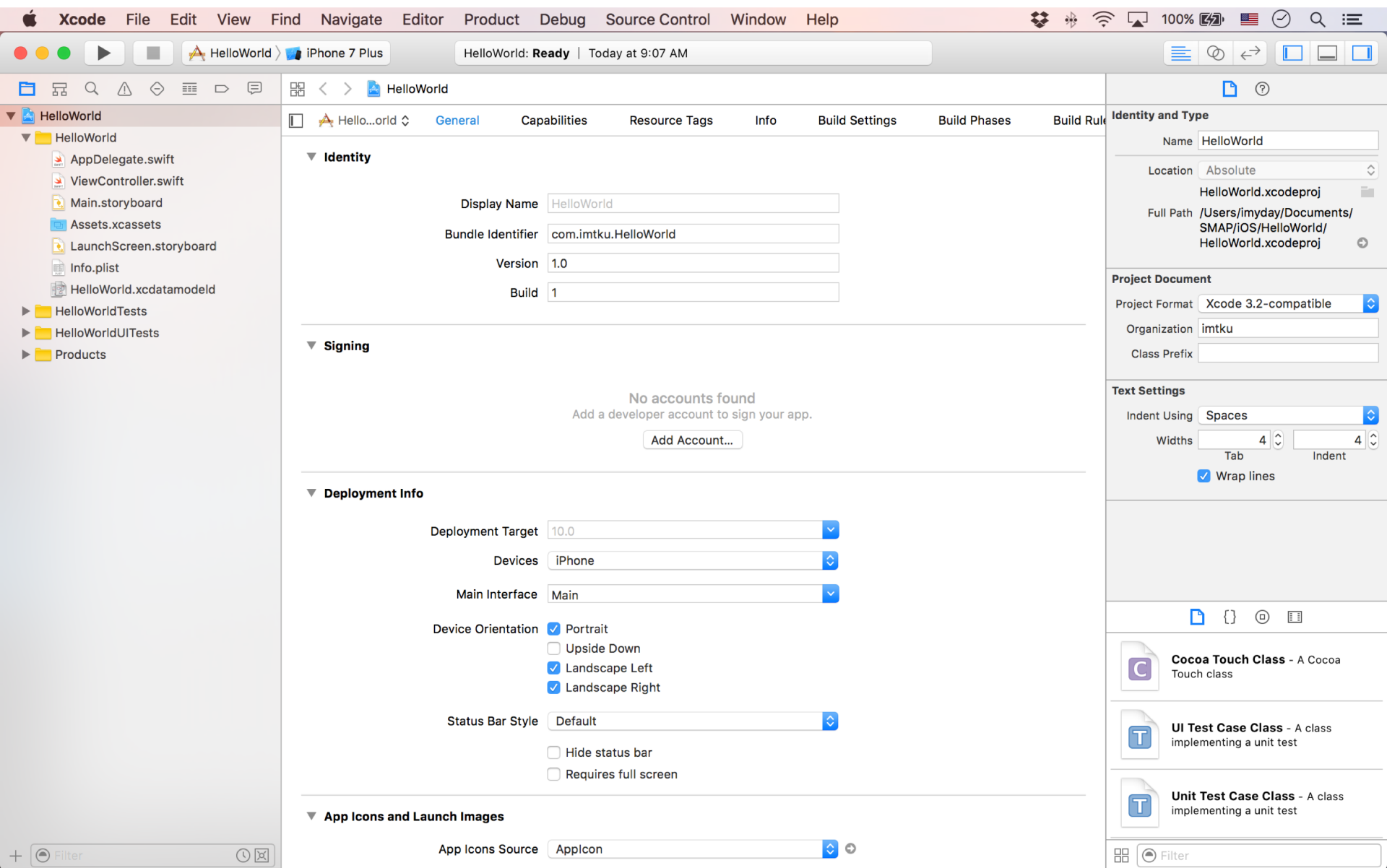
Xcode Single View App

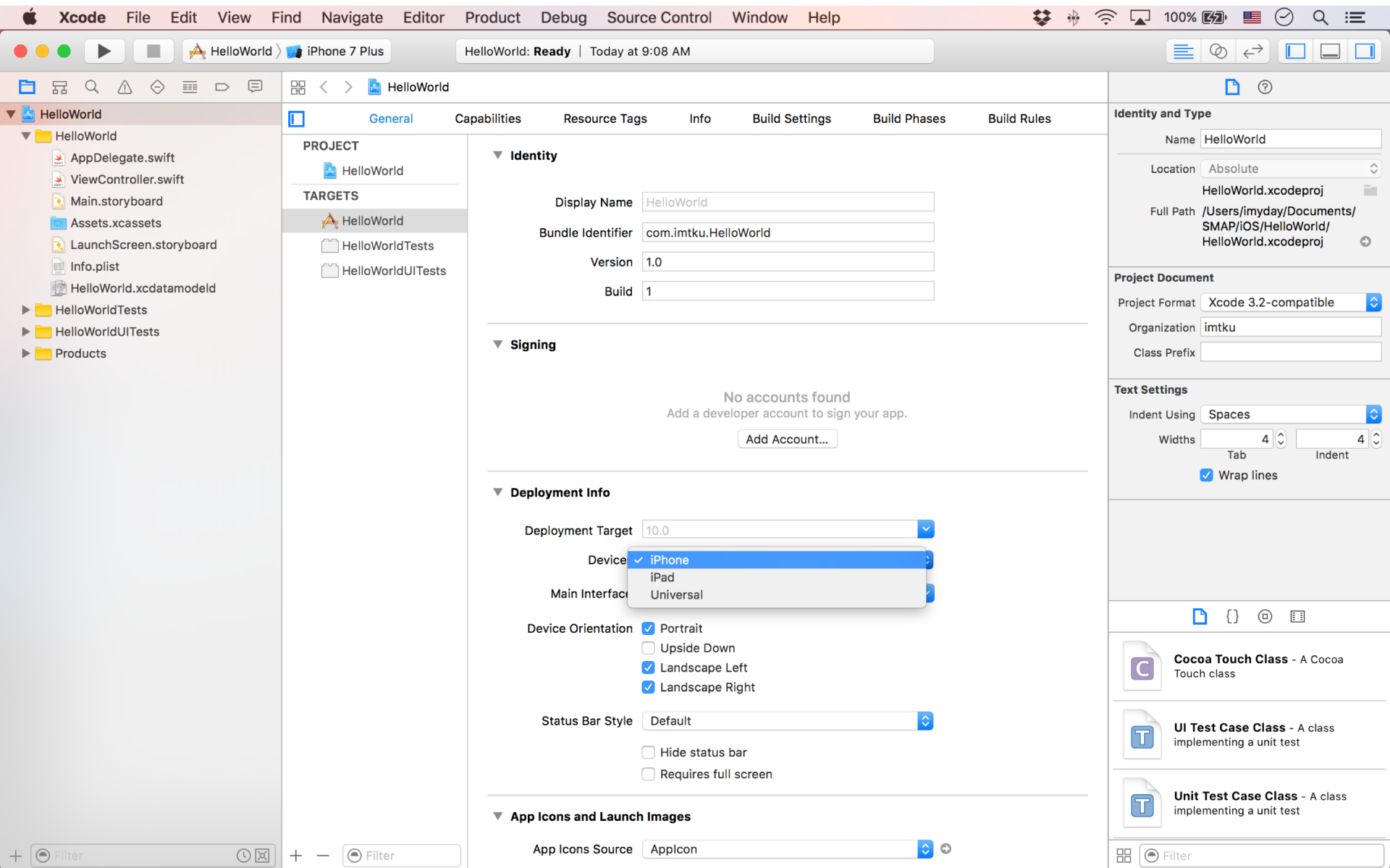


Swift Language

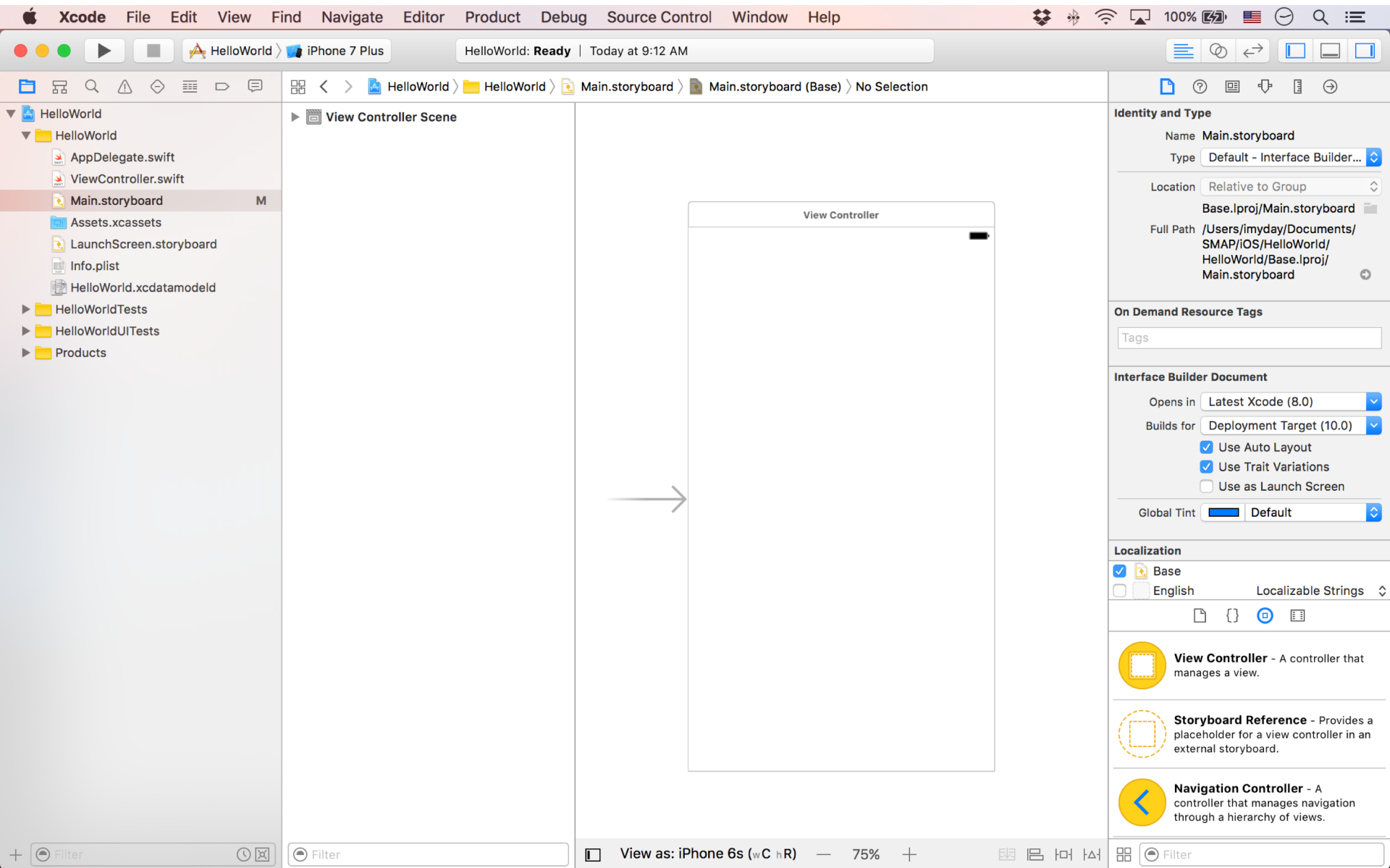




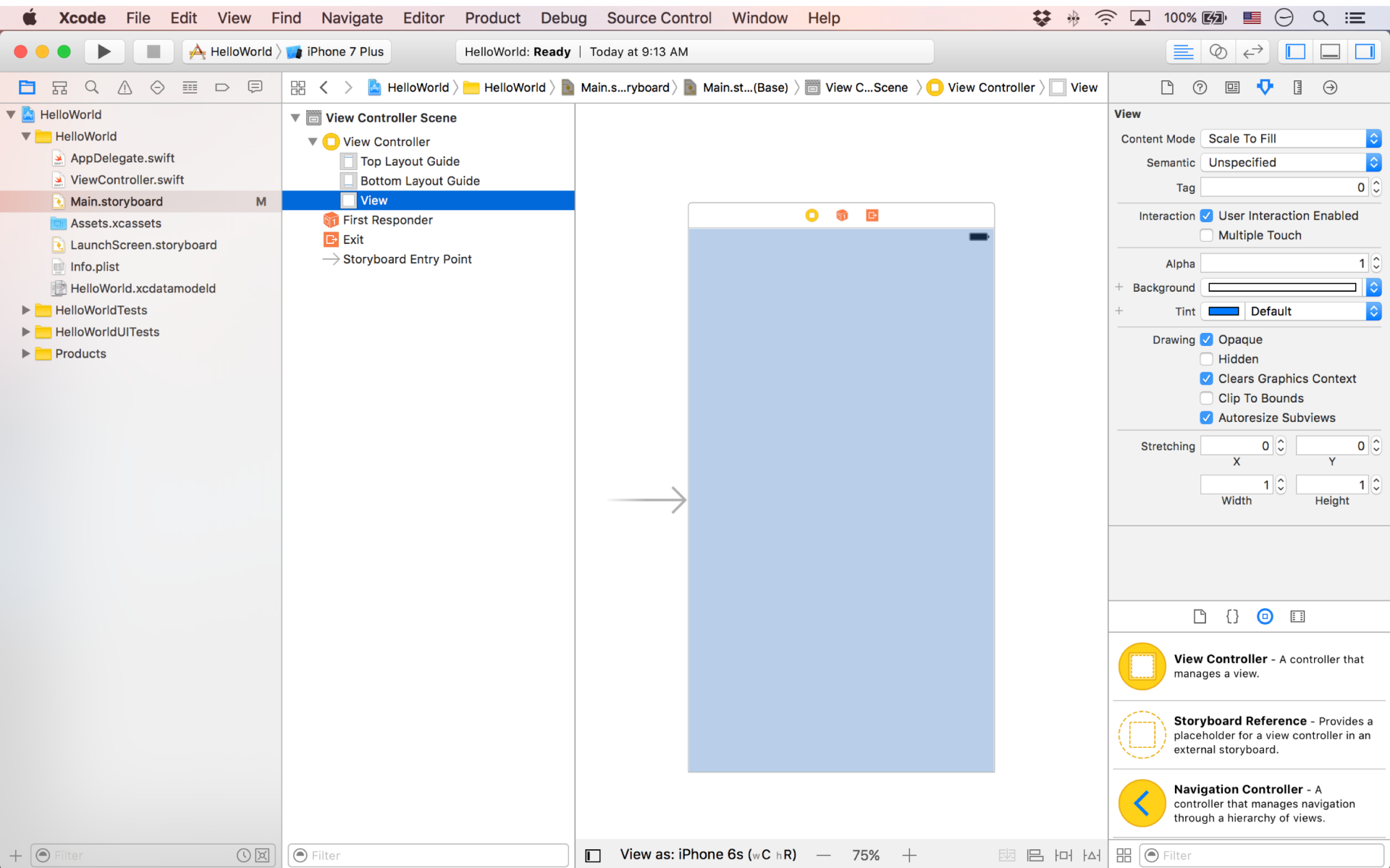




Main.storyboard (UI)

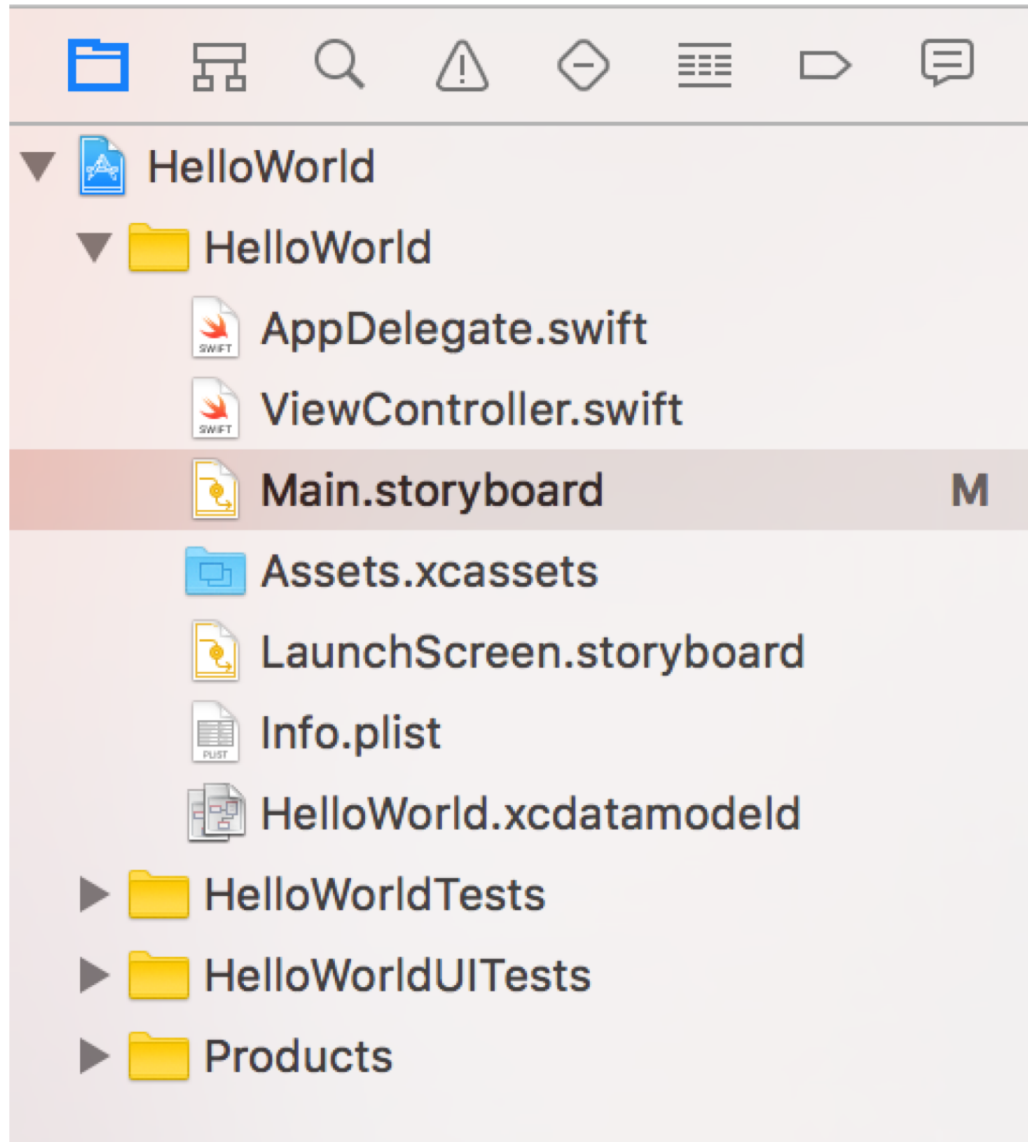


Main.storyboard (UI)



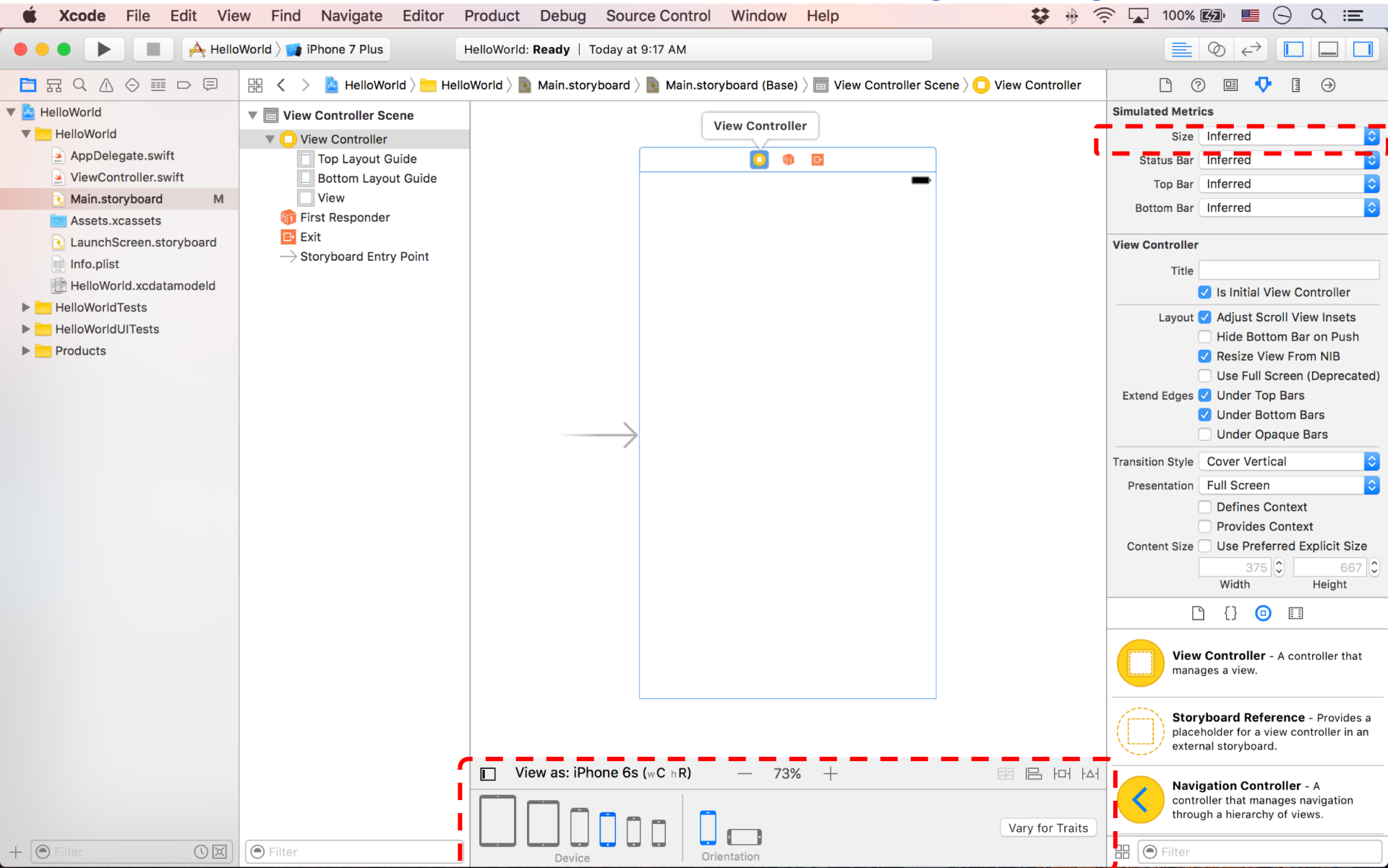
Main.storyboard (UI)

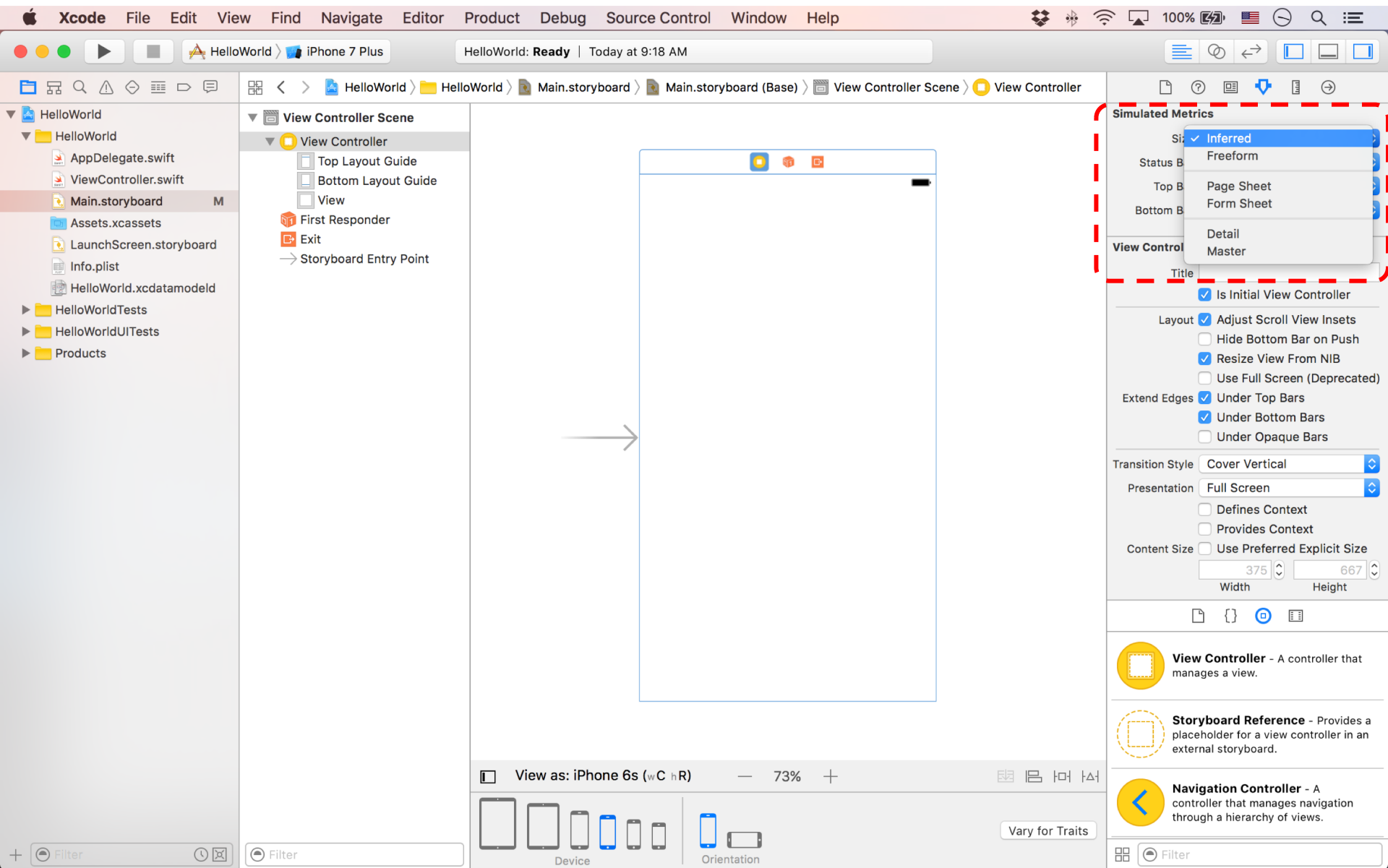
ViewController.swift (Code)



Main.storyboard (UI)

ViewController.swift (Code)





Label

The screenshot shows the Xcode IDE with a storyboard open. The left sidebar shows the project structure for 'HelloWorld'. The main canvas displays a 'View Controller Scene' with a 'View Controller' containing a 'View'. A 'Label' widget is being added to the view, and a tooltip is shown with the following text:

Label UILabel

Implements a read-only text view. A label can contain an arbitrary amount of text, but UILabel may shrink, wrap, or truncate the text, depending on the size of the bounding rectangle and properties you set. You can control the font, text color, alignment, highlighting, and shadowing of the text in the label.

The right sidebar shows the 'Simulated Metrics' and 'View Controller' panels. The 'Simulated Metrics' panel includes settings for Size, Status Bar, Top Bar, and Bottom Bar, all set to 'Inferred'. The 'View Controller' panel includes settings for Title, Is Initial View Controller, Layout, Extend Edges, Transition Style, and Presentation. The 'Label' widget is highlighted in the 'Simulated Metrics' panel.

The bottom status bar shows 'View as: iPhone 6s (wC hR)' and '100%' zoom.

Button

The screenshot displays the Xcode IDE interface for a project named "HelloWorld" on an iPhone 7 Plus. The interface is divided into several panels:

- Left Panel (Project Navigator):** Shows the project structure with folders like "HelloWorld", "HelloWorldTests", and "HelloWorldUITests". The "Main.storyboard" file is selected.
- Top Panel (Toolbar):** Contains standard Xcode tools like Run, Stop, and a search bar.
- Right Panel (Simulated Metrics):** Displays various settings for the selected storyboard scene, including "View Controller" (Title, Is Initial View Controller, Layout, Extend Edges, Transition Style, Presentation) and "Simulated Metrics" (Size, Status Bar, Top Bar, Bottom Bar).
- Center Panel (Storyboard Canvas):** Shows a storyboard scene with a "View Controller" containing a "View". A "Button" widget is visible in the canvas.
- Bottom Panel (Inspector):** Displays the "Button" widget's properties. The "Button" widget is highlighted with a red dashed border. The description for the "Button" widget is shown: "Button - Intercepts touch events and sends an action message to a target object when it's tapped." The "Done" button is visible at the bottom right of the inspector.

The "Button" widget is described as follows:

Button
UIButton

Implements a button that intercepts touch events and sends an action message to a target object when it's tapped. You can set the title, image, and other appearance properties of a button. In addition, you can specify a different appearance for each button state.

Text Field

The screenshot shows the Xcode IDE with a project named "HelloWorld" open. The interface is set to "View as: iPhone 6s (w/ notch)". The storyboard is titled "Main.storyboard (Base)" and shows a "View Controller Scene" with a "View Controller" containing a "View". A "Text Field" widget is being added to the view, as indicated by the tooltip.

Text Field
UITextField

Displays a rounded rectangle that can contain editable text. When a user taps a text field, a keyboard appears; when a user taps Return in the keyboard, the keyboard disappears and the text field can handle the input in an application-specific way. UITextField supports overlay views to display additional information, such as a bookmarks icon. UITextField also provides a clear text control a user taps to erase the contents of the text field.

Simulated Metrics

- Size: Inferred
- Status Bar: Inferred
- Top Bar: Inferred
- Bottom Bar: Inferred

View Controller

- Title:
- ☒ Is Initial View Controller
- Layout: ☒ Adjust Scroll View Insets
 - ☐ Hide Bottom Bar on Push
 - ☒ Resize View From NIB
 - ☐ Use Full Screen (Deprecated)
- Extend Edges: ☒ Under Top Bars
 - ☒ Under Bottom Bars
 - ☐ Under Opaque Bars
- Transition Style: Cover Vertical
- Presentation: Full Screen
 - ☐ Defines Context
 - ☐ Provides Context

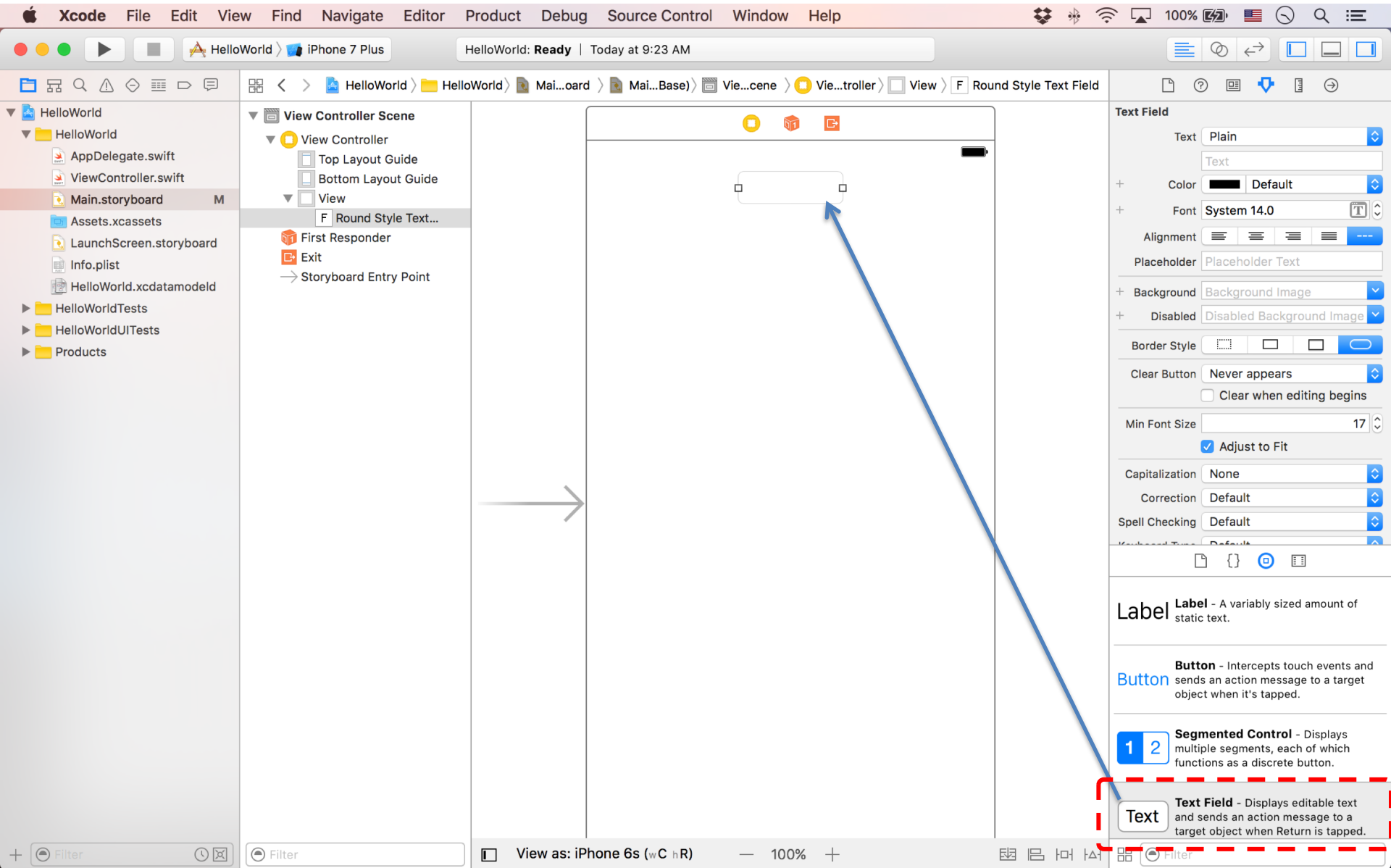
Label - A variably sized amount of static text.

Button - Intercepts touch events and sends an action message to a target object when it's tapped.

Segmented Control - Displays multiple segments, each of which functions as a discrete button.

Text Field - Displays editable text and sends an action message to a target object when Return is tapped.

Text Field



Text Field

The screenshot displays the Xcode development environment. The top menu bar includes File, Edit, View, Find, Navigate, Editor, Product, Debug, Source Control, Window, and Help. The status bar at the top indicates 'HelloWorld: Ready' and 'Today at 9:24 AM'. The left sidebar shows the project structure for 'HelloWorld', with 'Main.storyboard' selected. The middle pane shows the 'View Controller Scene' hierarchy, with 'View' selected. The right pane shows the 'Text Field' properties, including Text, Color, Font, Alignment, Placeholder, Background, Disabled, Border Style, Clear Button, Min Font Size, Capitalization, Correction, and Spell Checking. The bottom status bar shows 'View as: iPhone 6s (w C h R)' and '100%' zoom.

Text Field

Text: Plain

Color: Default

Font: System 14.0

Alignment: Left

Placeholder: Placeholder Text

Background: Background Image

Disabled: Disabled Background Image

Border Style: Rounded

Clear Button: Never appears

Min Font Size: 17

Adjust to Fit: ☒

Capitalization: None

Correction: Default

Spell Checking: Default

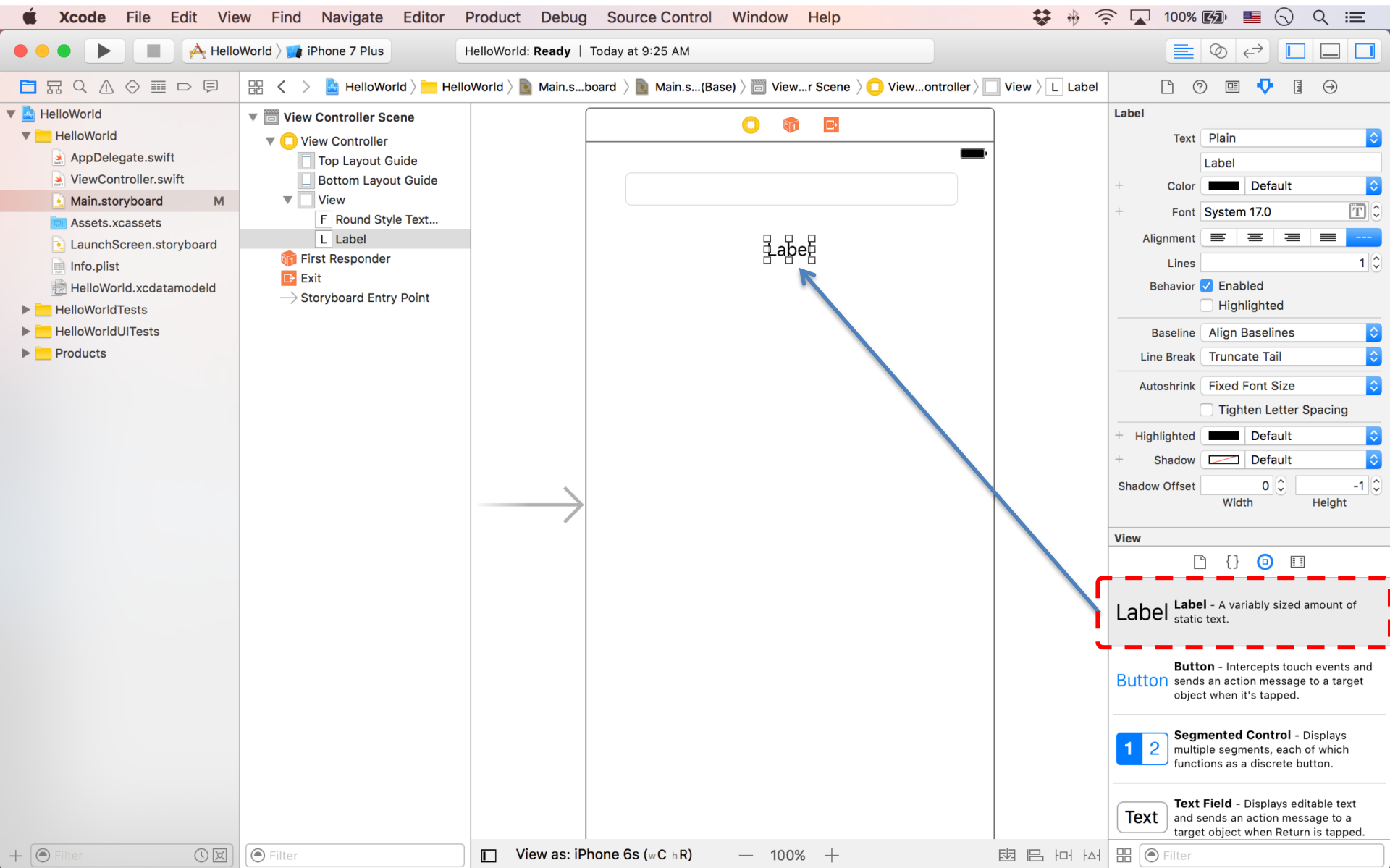
Label Label - A variably sized amount of static text.

Button Button - Intercepts touch events and sends an action message to a target object when it's tapped.

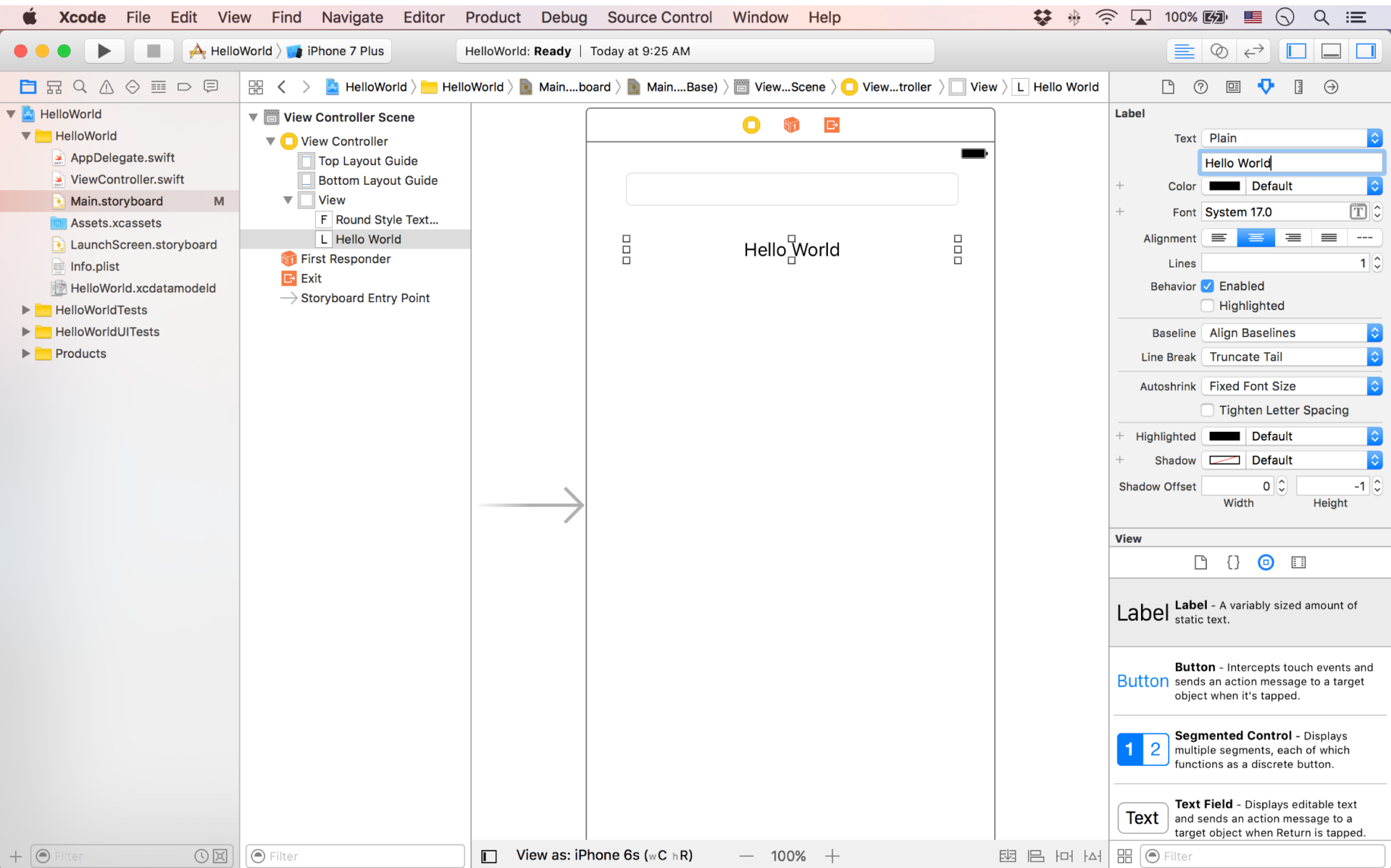
Segmented Control 1 2 - Displays multiple segments, each of which functions as a discrete button.

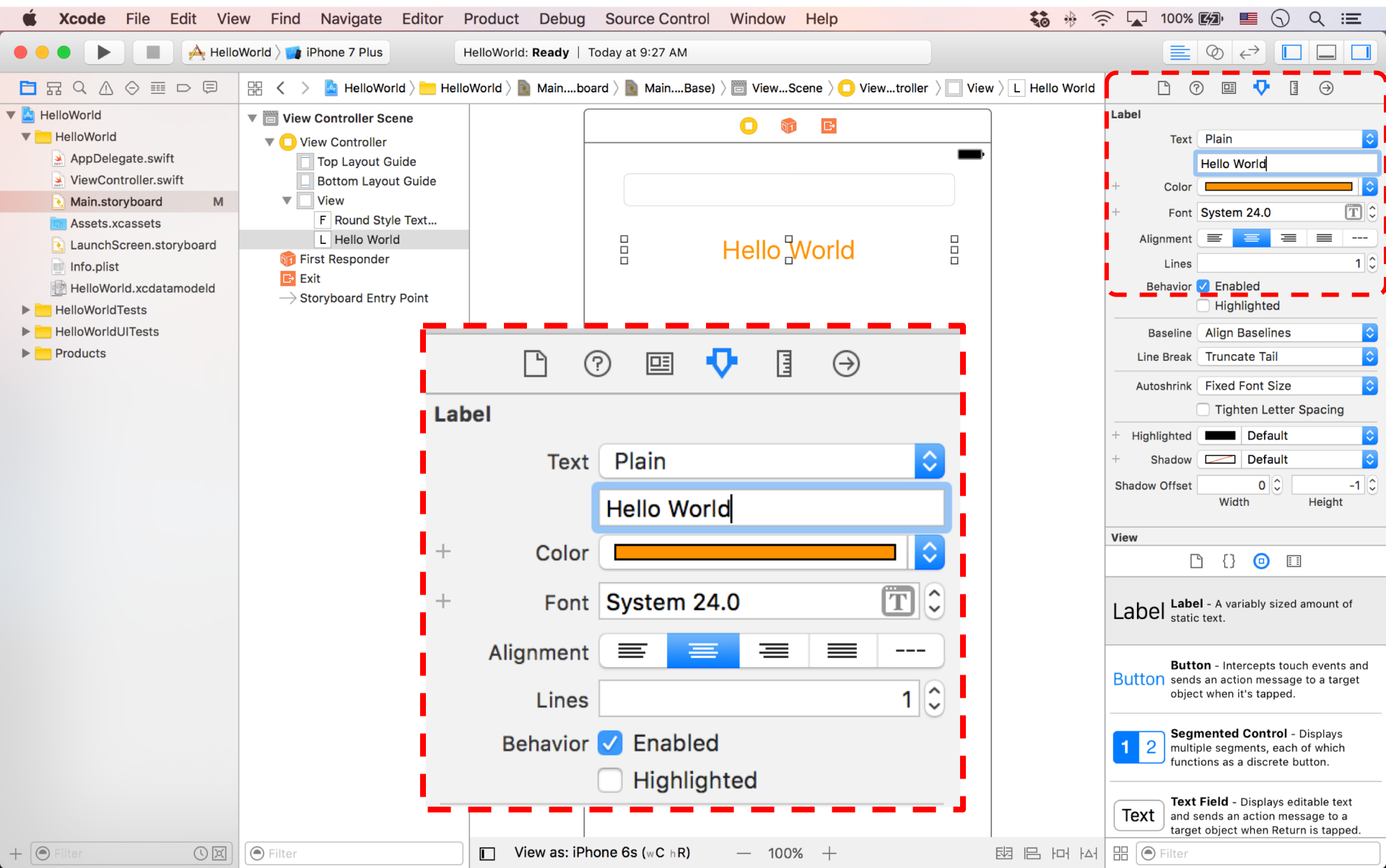
Text Field Text - Displays editable text and sends an action message to a target object when Return is tapped.

Label



Label





Button

The screenshot displays the Xcode IDE with a project named 'HelloWorld' open. The main canvas shows a storyboard for an iPhone 7 Plus, featuring a 'Hello World' label and a 'Button' control. A blue arrow points from the 'Button' control in the storyboard to the 'Button' section in the right-hand properties pane. The properties pane shows the 'Button' control's configuration, including its type, state, title, font, and drawing options. A red dashed box highlights the 'Button' description in the 'Control' section of the properties pane.

Button

Type: System

State Config: Default

Title: Plain

Button

Font: System 15.0

Text Color: Default

Shadow Color: Default

Image: Default Image

Background: Default Background Image

Shadow Offset: Width 0, Height 0

☐ Reverses On Highlight

☐ Shows Touch On Highlight

☒ Highlighted Adjusts Image

☒ Disabled Adjusts Image

Line Break: Truncate Middle

Control

Label - A variably sized amount of static text.

Button - Intercepts touch events and sends an action message to a target object when it's tapped.

Segmented Control - Displays multiple segments, each of which functions as a discrete button.

Text Field - Displays editable text and sends an action message to a target object when Return is tapped.

Button

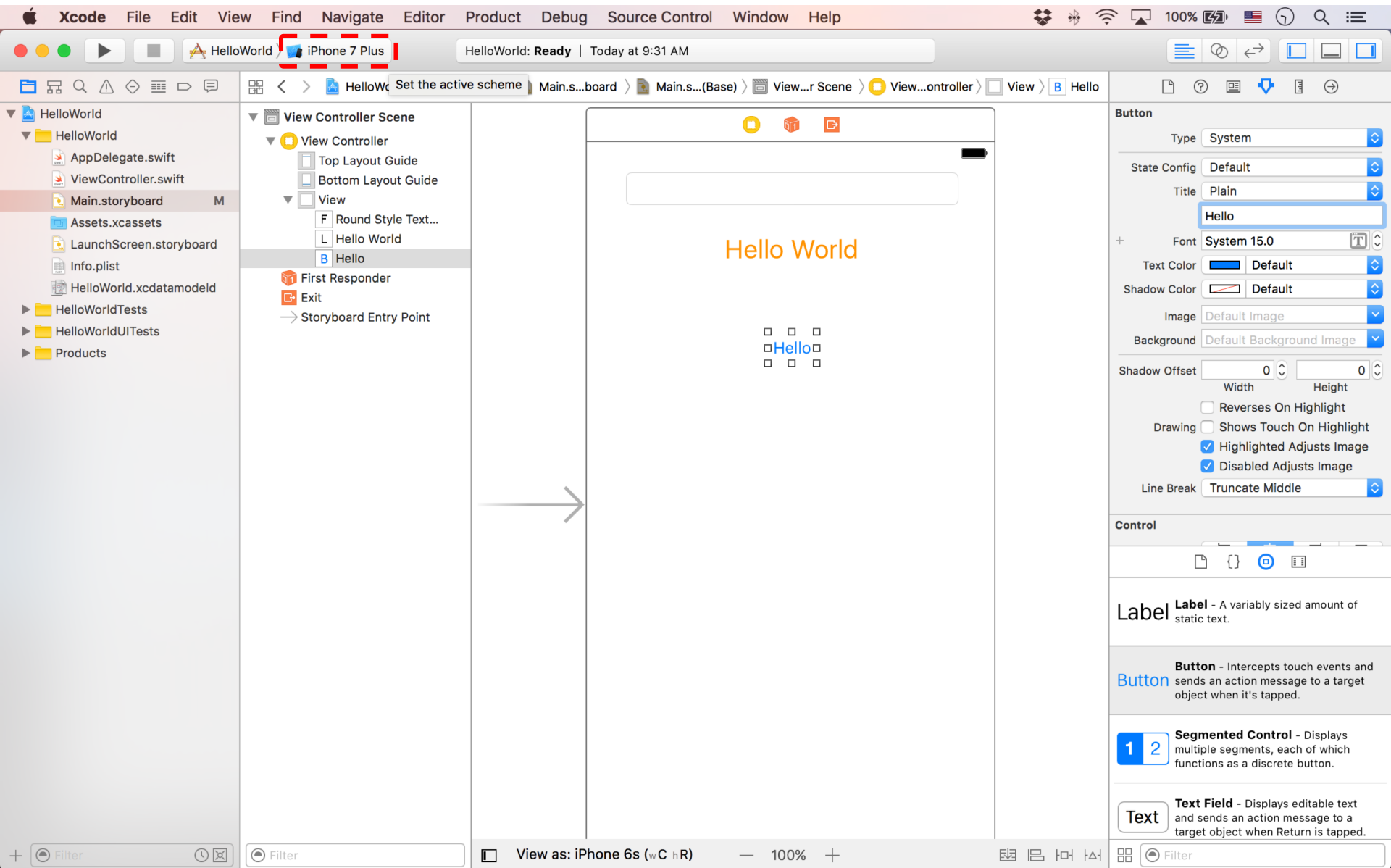
The screenshot displays the Xcode development environment for an iPhone 7 Plus app named 'HelloWorld'. The interface is divided into several panels:

- Left Panel (Project Navigator):** Shows the project structure. The 'Main.storyboard' file is selected, indicated by a blue highlight.
- Middle-Left Panel (Document Outline):** Displays the hierarchy of the selected storyboard. The 'View Controller' is expanded, showing a 'View' containing a 'Hello' button.
- Center Panel (Canvas):** Shows the visual representation of the 'Hello World' app. The text 'Hello World' is displayed in orange. Below it, a small grid of icons represents the storyboard's structure, with the 'Hello' button highlighted.
- Right Panel (Inspector):** Contains the 'Button' control inspector. It shows the 'Type' set to 'System', 'State Config' set to 'Default', and 'Title' set to 'Hello'. The 'Font' is 'System 15.0'. The 'Text Color' is 'Default'. The 'Shadow Color' is 'Default'. The 'Image' is 'Default Image'. The 'Background' is 'Default Background Image'. The 'Shadow Offset' is '0' for both width and height. The 'Drawing' options are 'Reverses On Highlight' (unchecked), 'Shows Touch On Highlight' (unchecked), 'Highlighted Adjusts Image' (checked), and 'Disabled Adjusts Image' (checked). The 'Line Break' is 'Truncate Middle'.

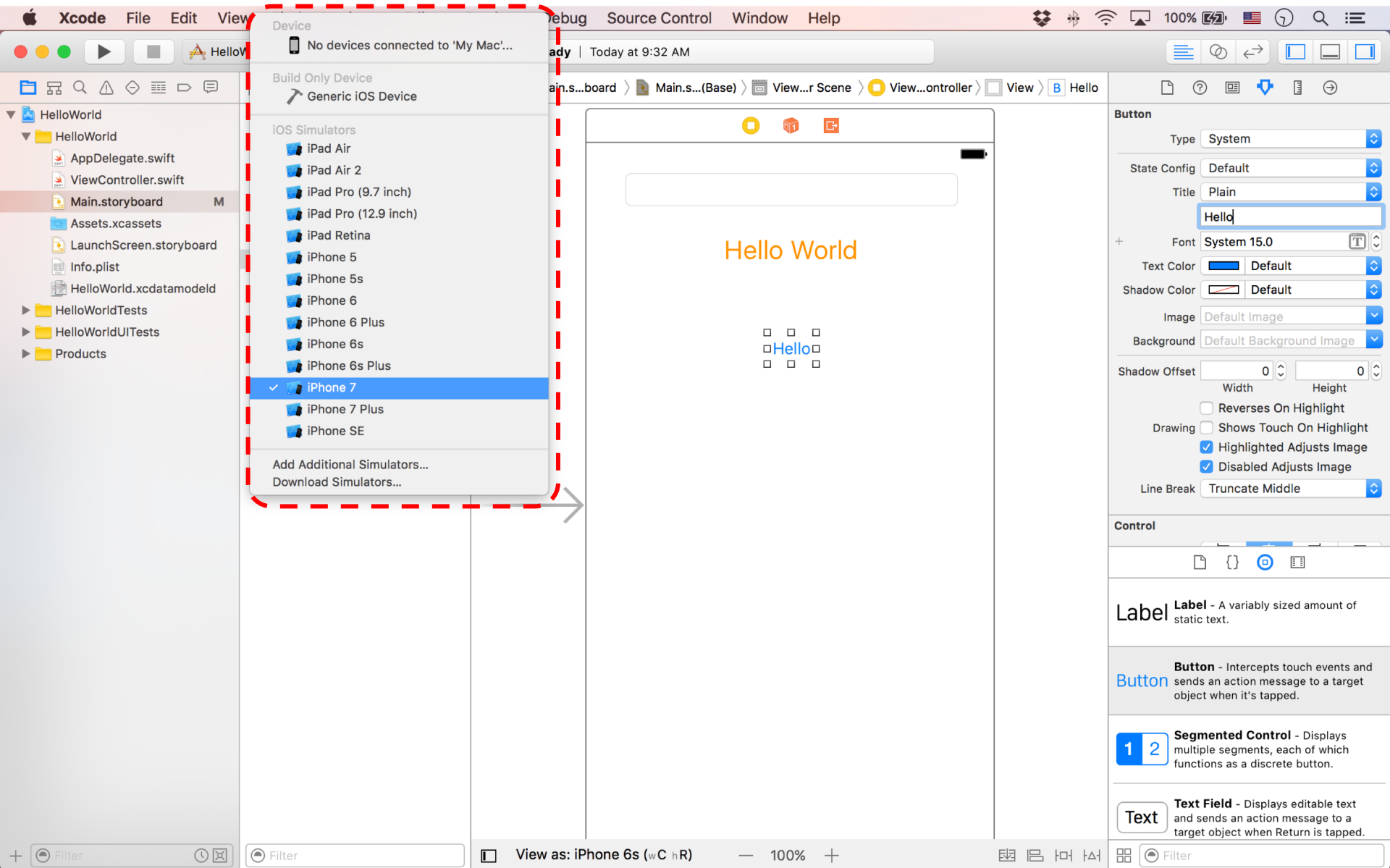
At the bottom of the screen, the status bar indicates the device is 'View as: iPhone 6s (w C h R)' and the zoom level is '100%'.

Set the active scheme

iOS Simulator: iPhone



iOS Simulators: iPhone 7



Build and Run

The screenshot shows the Xcode IDE with the 'HelloWorld' project open. The top menu bar includes 'Xcode', 'File', 'Edit', 'View', 'Find', 'Navigate', 'Editor', 'Product', 'Debug', 'Source Control', 'Window', and 'Help'. The top toolbar shows the 'Run' button (a play icon) highlighted with a red box. The main canvas displays a 'Hello World' app on an iPhone 7 simulator. The right sidebar shows the 'Triggered Segues', 'Outlet Collections', 'Sent Events', 'Referencing Outlets', and 'Referencing Outlet Collections' sections. The bottom status bar indicates 'Build Succeeded'.

Triggered Segues

- action

Outlet Collections

- gestureRecognizers

Sent Events

- Did End On Exit
- Editing Changed
- Editing Did Begin
- Editing Did End
- Primary Action Triggered
- Touch Cancel
- Touch Down
- Touch Down Repeat
- Touch Drag Enter
- Touch Drag Exit
- Touch Drag Inside
- Touch Drag Outside
- Touch Up Inside
- Touch Up Outside
- Value Changed

Referencing Outlets

- New Referencing Outlet

Referencing Outlet Collections

- New Referencing Outlet Collection

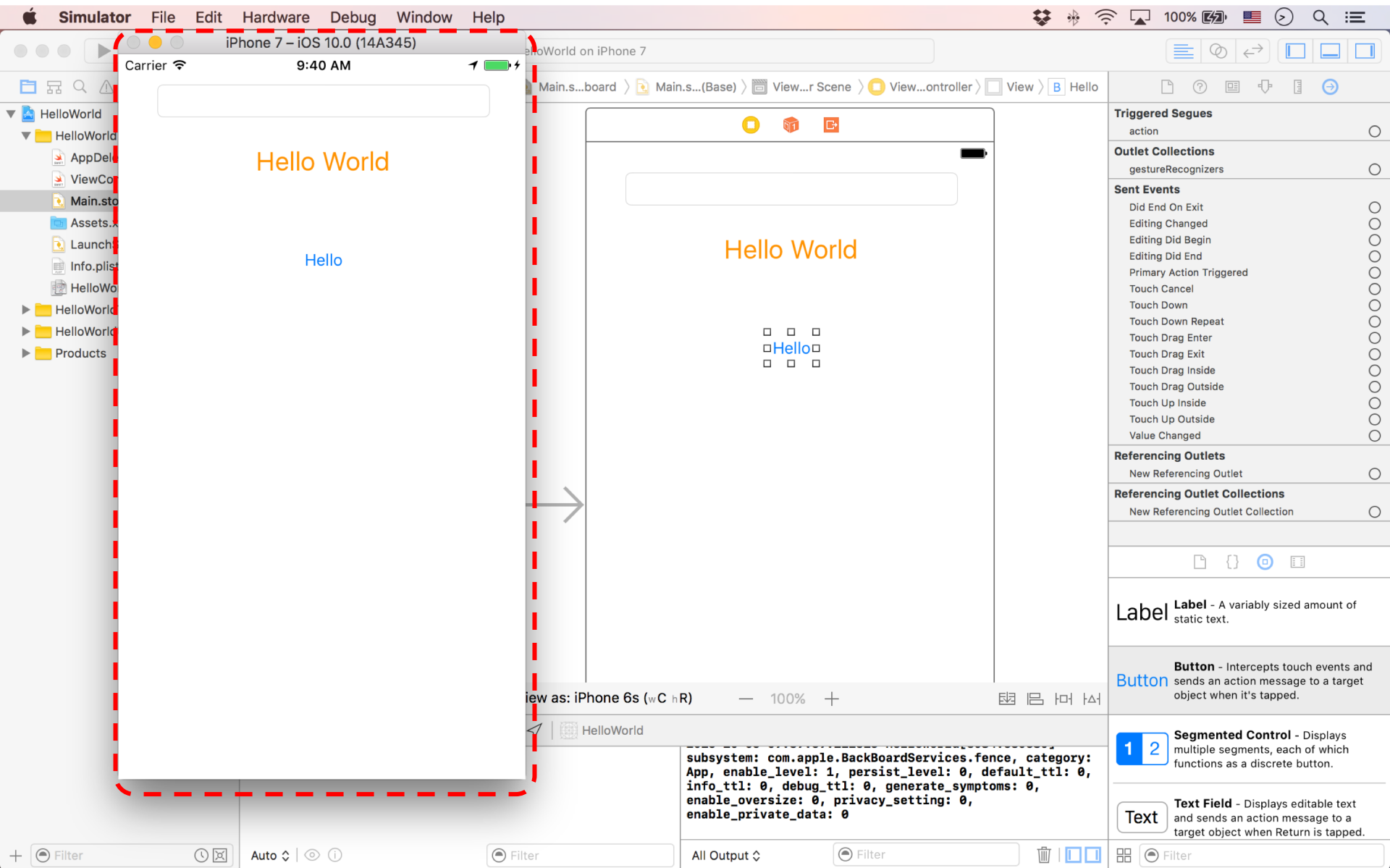
Label Label - A variably sized amount of static text.

Button Button - Intercepts touch events and sends an action message to a target object when it's tapped.

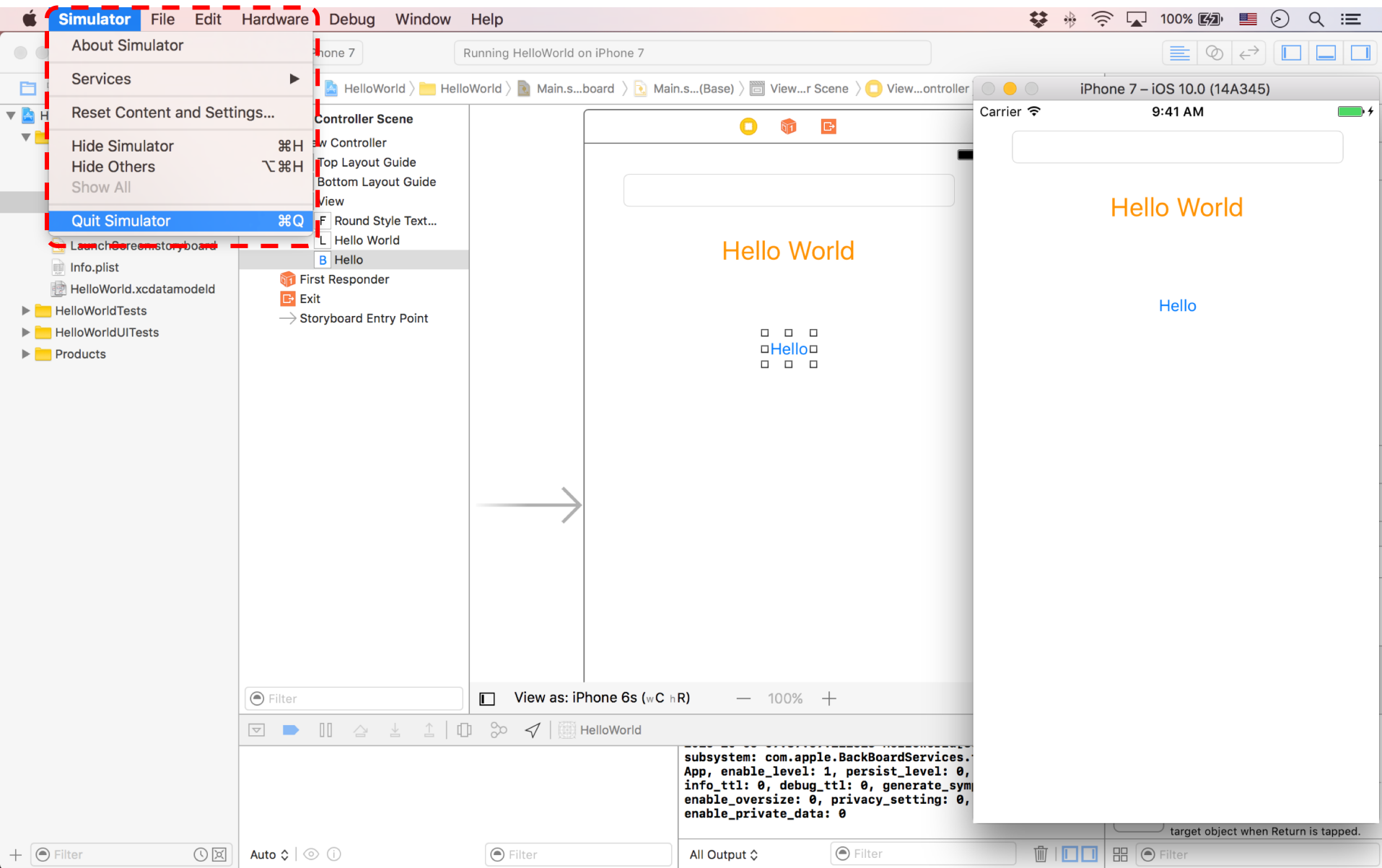
1 2 Segmented Control - Displays multiple segments, each of which functions as a discrete button.

Text Text Field - Displays editable text and sends an action message to a target object when Return is tapped.

iOS Simulator: iPhone 7 - iOS 10

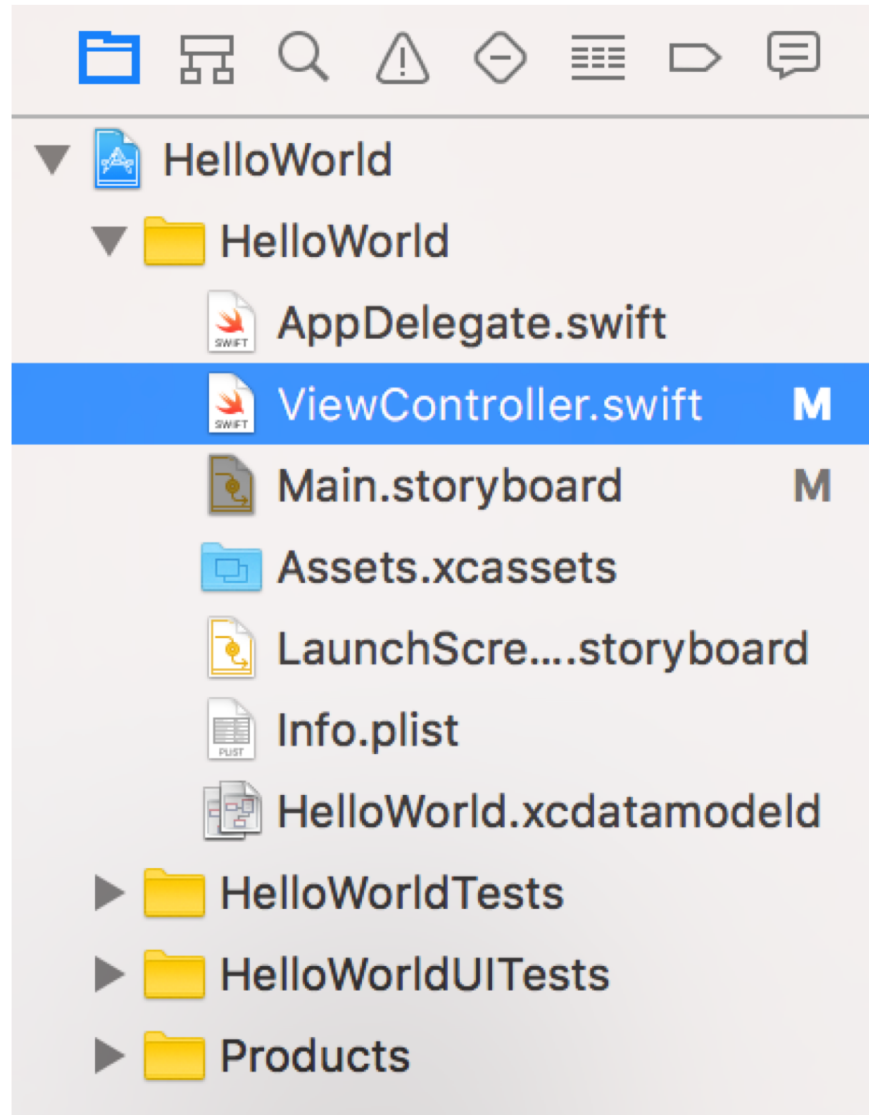


Simulator: Quit Simulator



Main.storyboard (UI)

ViewController.swift (Code)



ViewController.swift (Code)

The screenshot displays the Xcode IDE with the following components:

- Top Bar:** Xcode menu bar with File, Edit, View, Find, Navigate, Editor, Product, Debug, Source Control, Window, and Help. The status bar shows the device as iPhone 7 and the app as HelloWorld.
- Left Sidebar (Project Navigator):** Shows the project structure for HelloWorld, including AppDelegate.swift, ViewController.swift (selected), Main.storyboard, Assets.xcassets, LaunchScreen.storyboard, Info.plist, and HelloWorld.xcdatamodeld. There are also folders for HelloWorldTests and HelloWorldUITests.
- Center Editor:** Displays the code for ViewController.swift:

```
//
//  ViewController.swift
//  HelloWorld
//
//  Created by iMyday on 10/5/16.
//  Copyright © 2016 imtku. All rights reserved.
//

import UIKit

class ViewController: UIViewController {

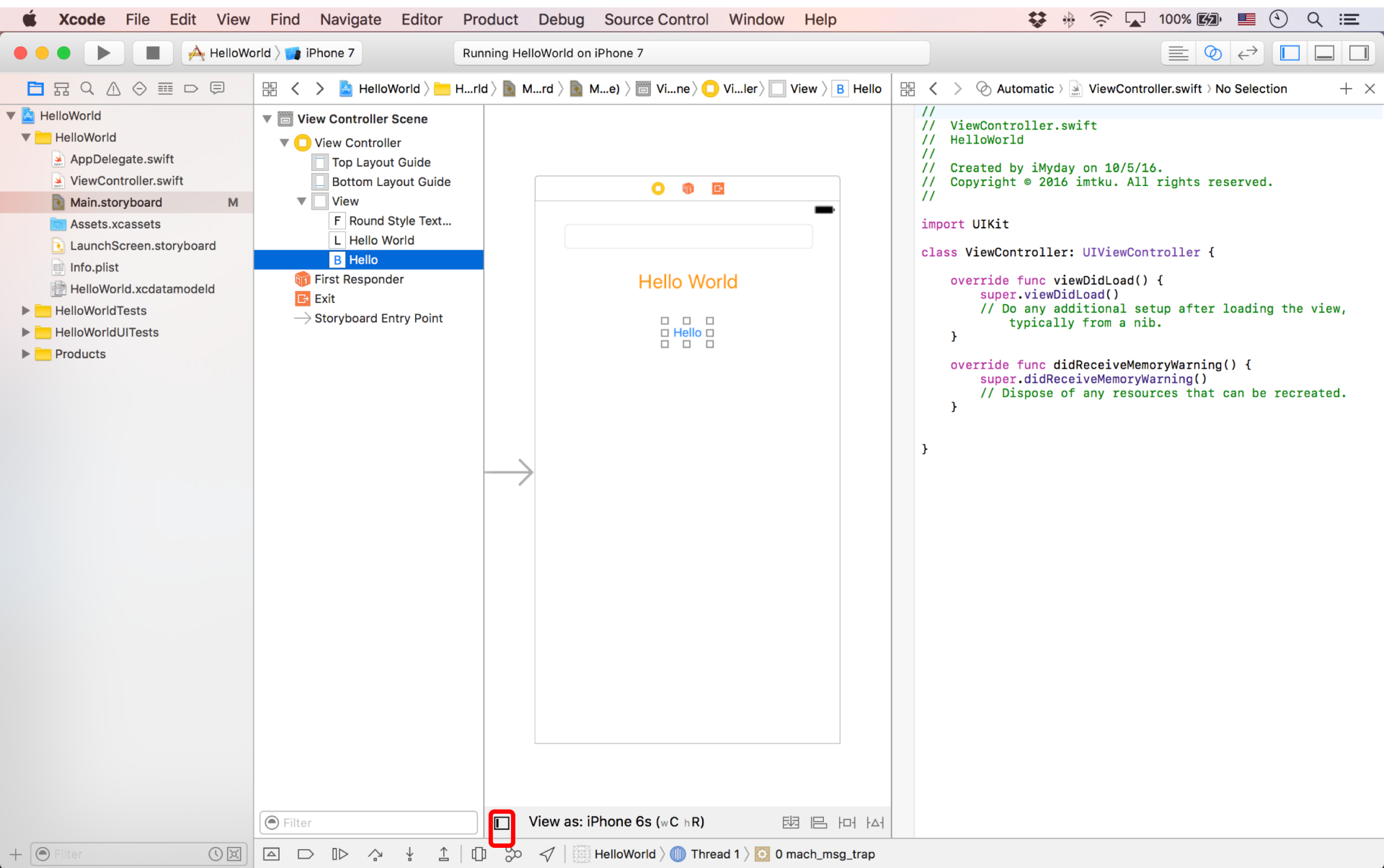
    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
    }

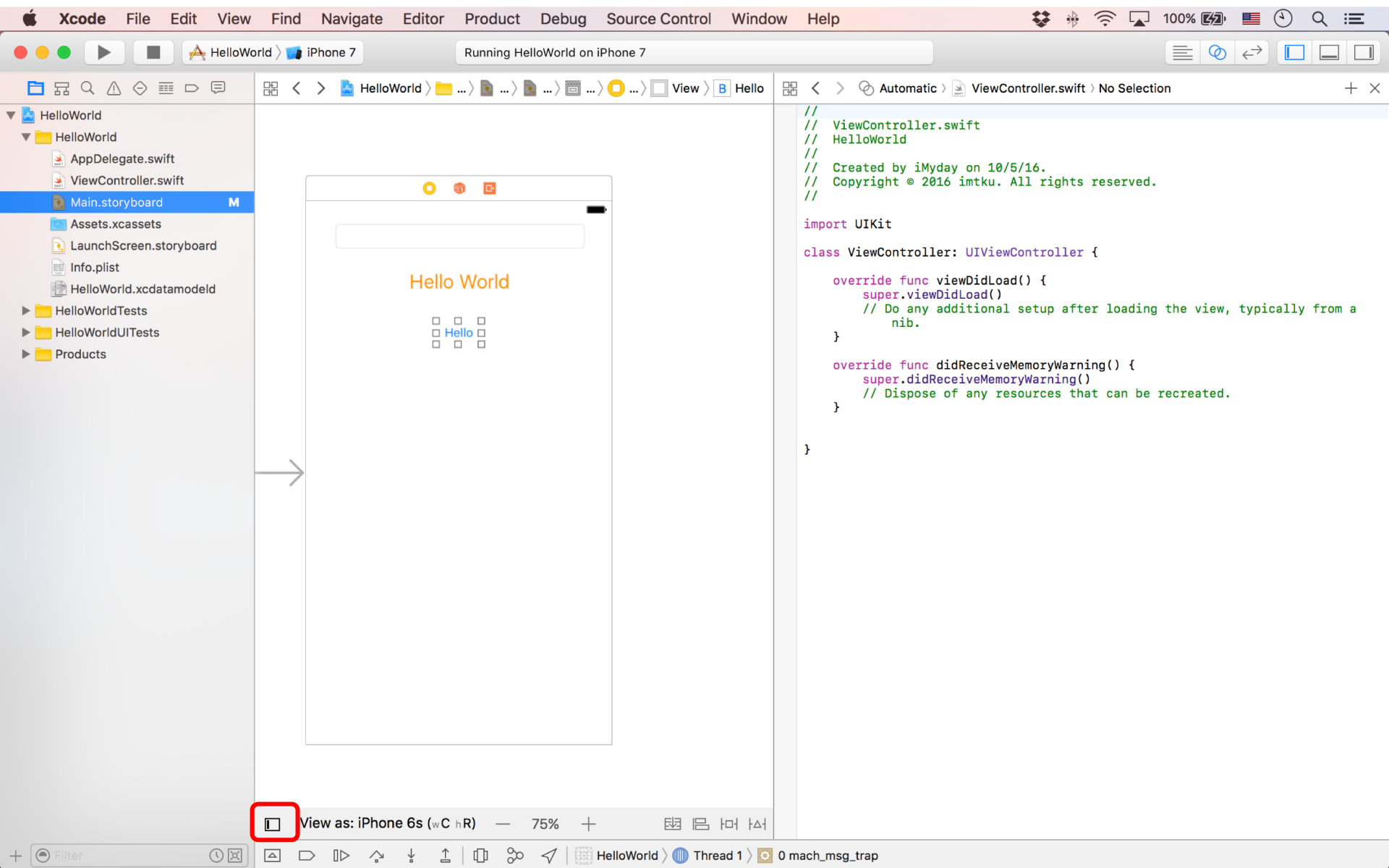
    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

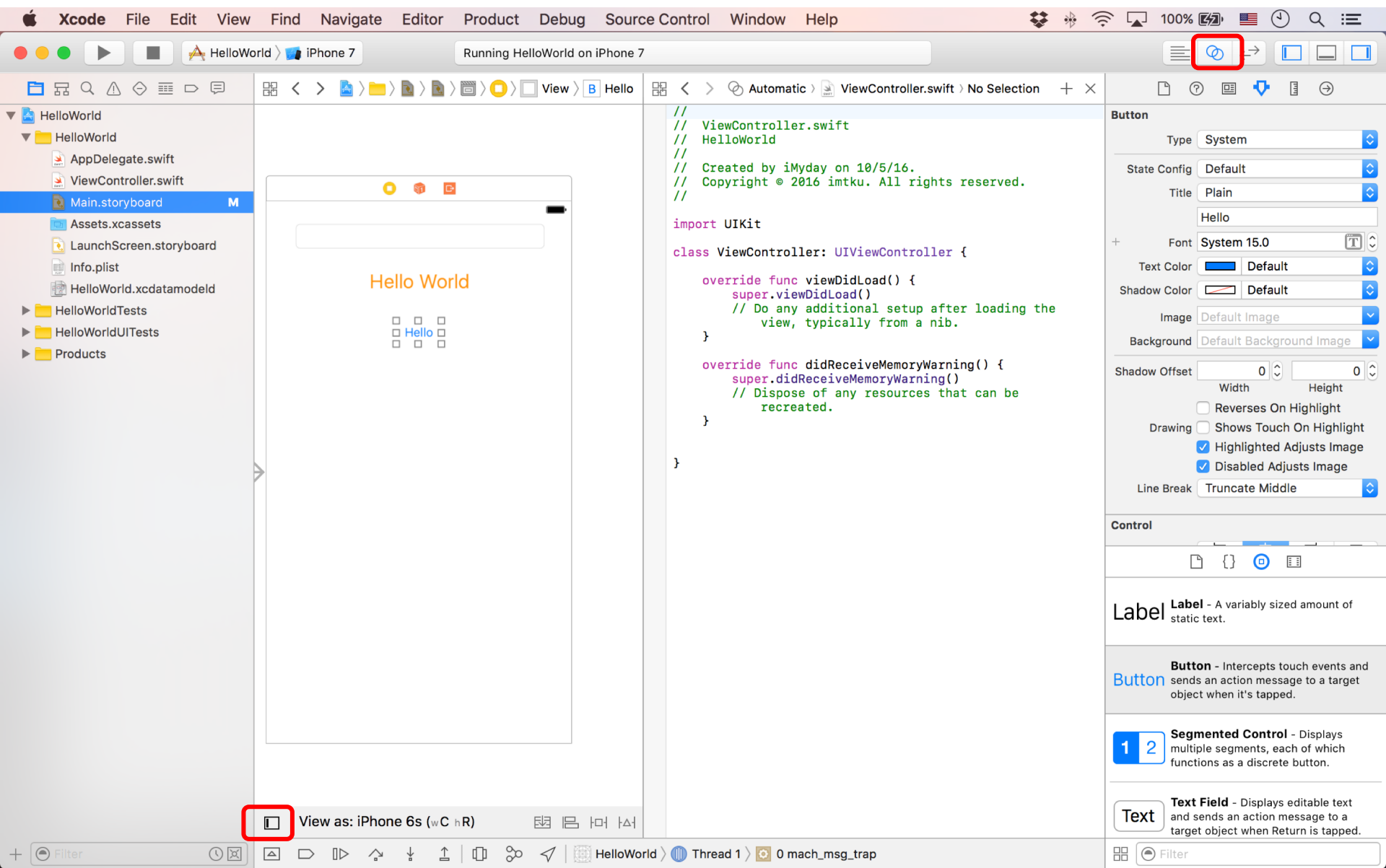
}
```
- Right Sidebar (Inspector):**
 - Identity and Type:** Name is ViewController.swift, Type is Default - Swift Source, Location is Relative to Group, and Full Path is /Users/imyday/Documents/SMAP/iOS/HelloWorld/HelloWorld/ViewController.swift.
 - On Demand Resource Tags:** Only resources are taggable.
 - Target Membership:** Checked for HelloWorld, unchecked for HelloWorldTests and HelloWorldUITests.
 - Text Settings:** Text Encoding is Default - Unicode (UTF-8), Line Endings is Default - macOS / Unix (LF).
- Bottom Bar:** A toolbar with various icons and a list of UI elements: Label (A variably sized amount of static text), Button (Intercepts touch events and sends an action message to a target object when it's tapped), Segmented Control (Displays multiple segments, each of which functions as a discrete button), and Text Field (Displays editable text and sends an action message to a target object when Return is tapped).

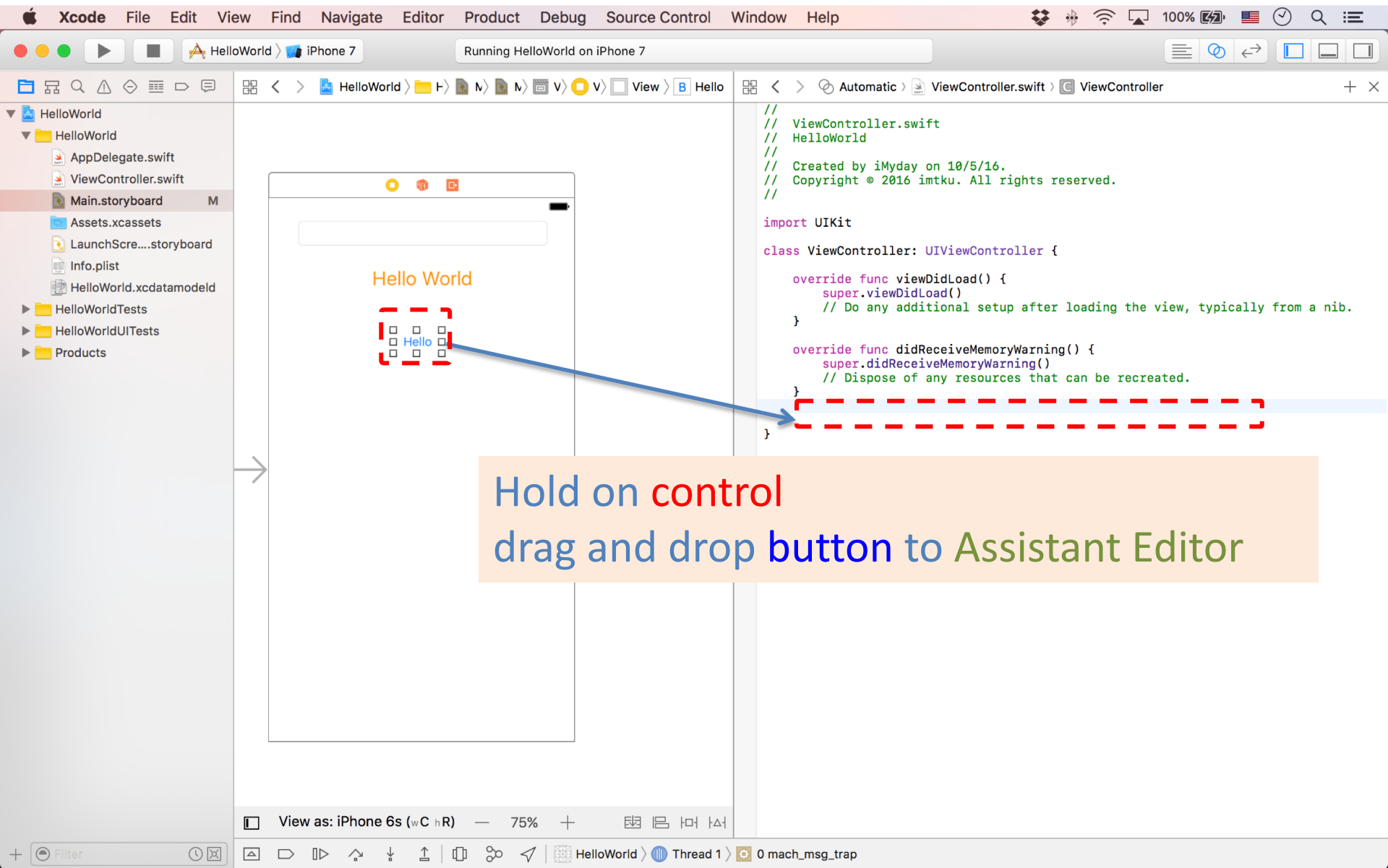
IBOutlet and IBAction

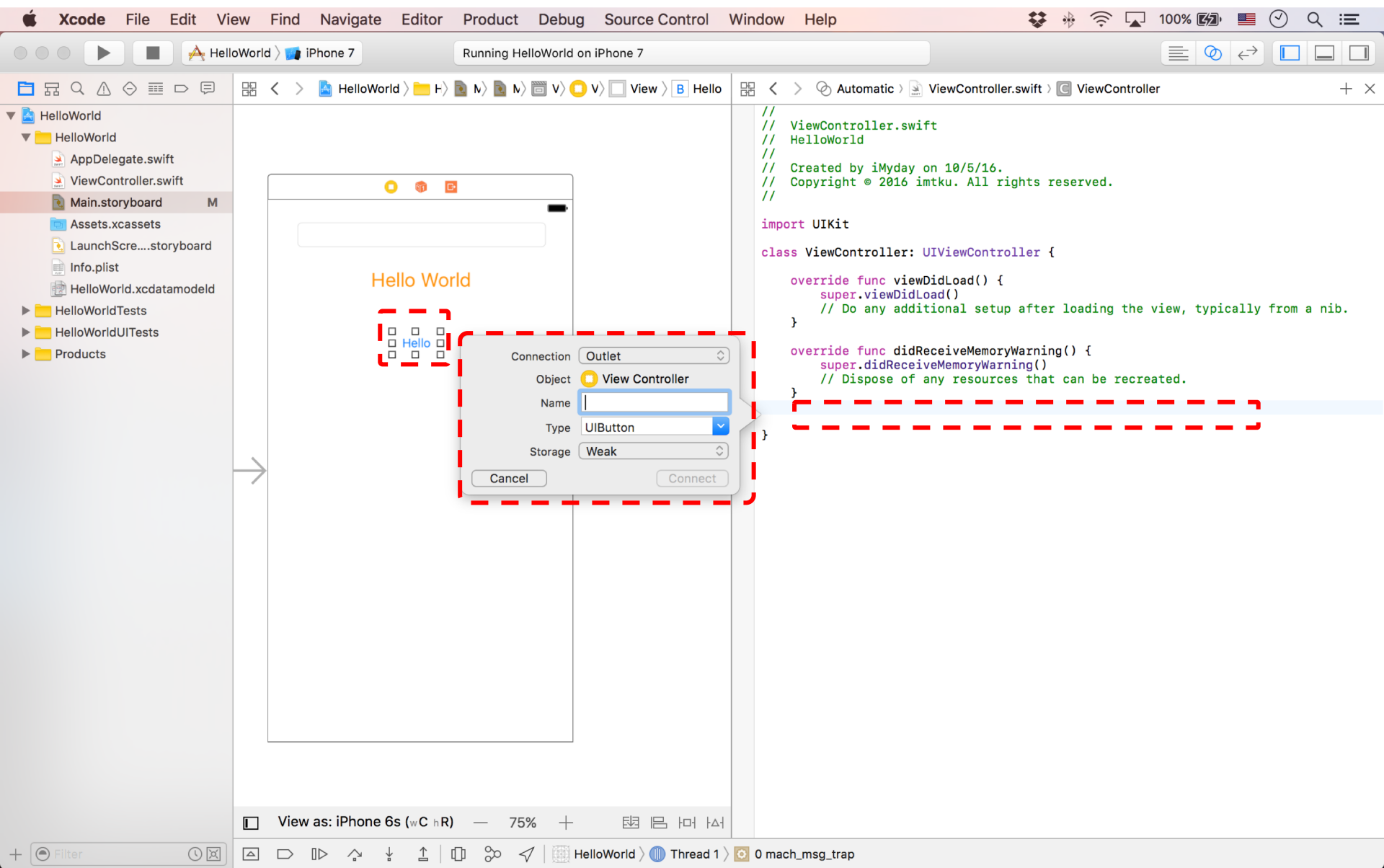
- IBOutlet
 - Interface Builder Outlet
- IBAction
 - Interface Builder Action

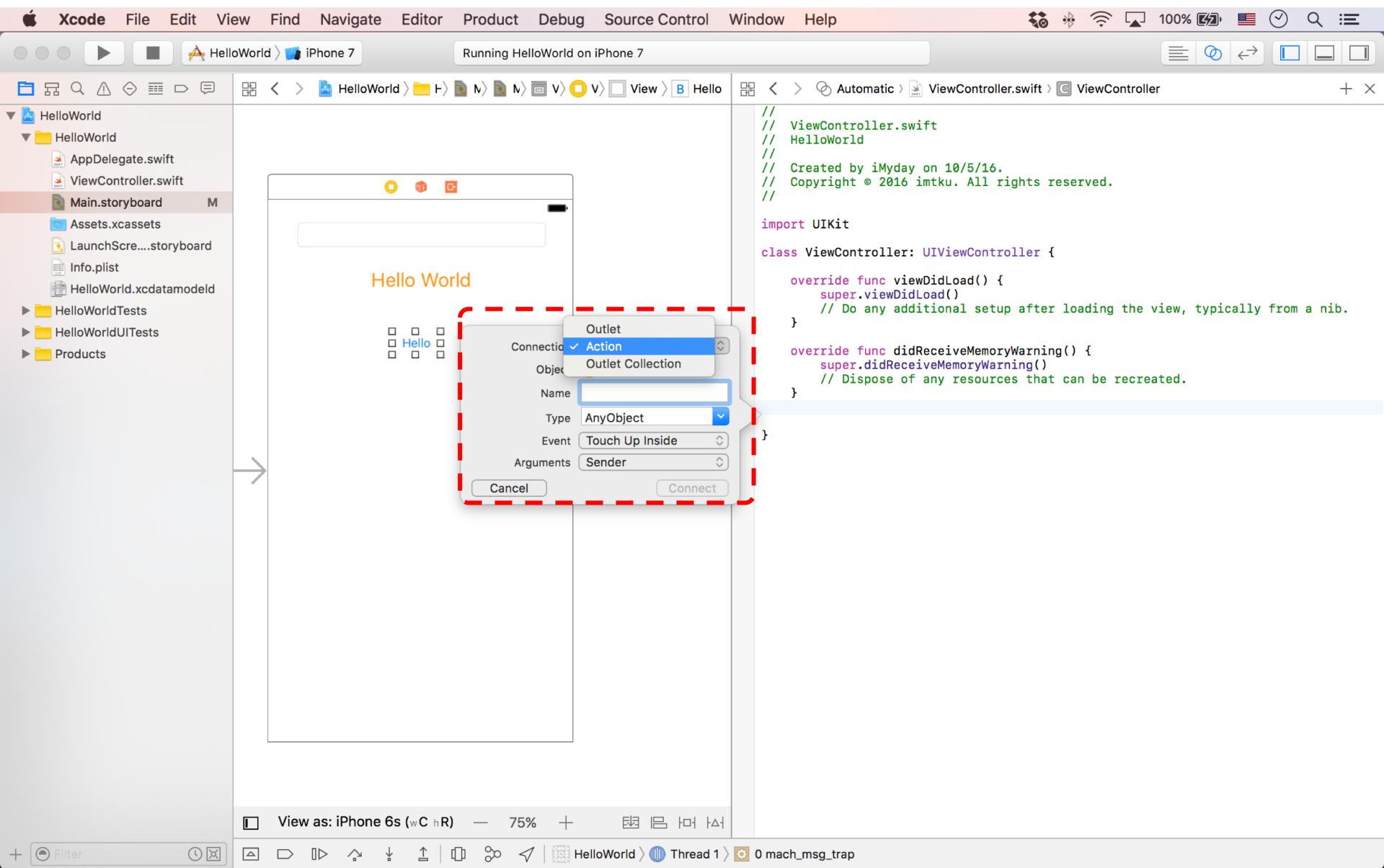




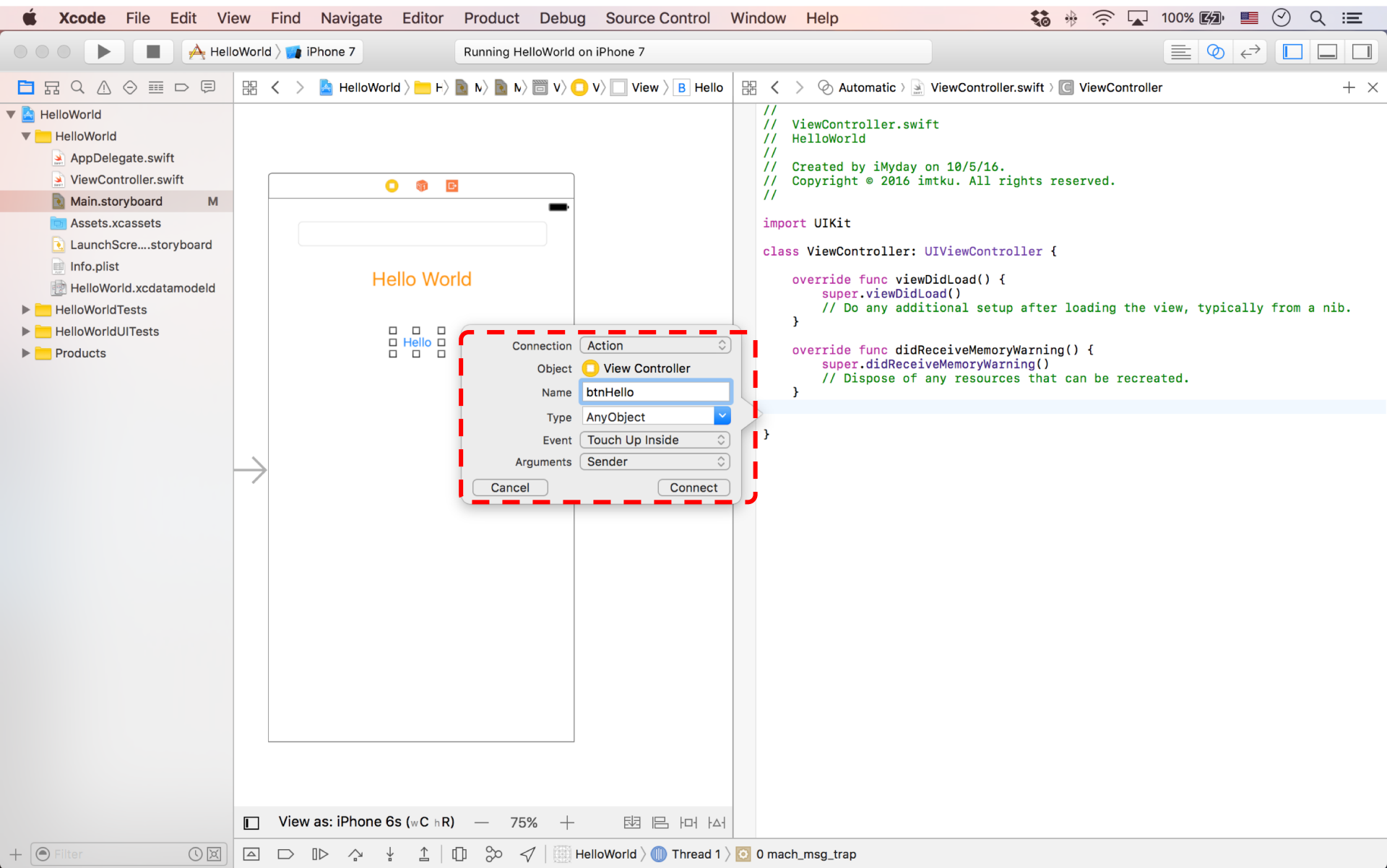




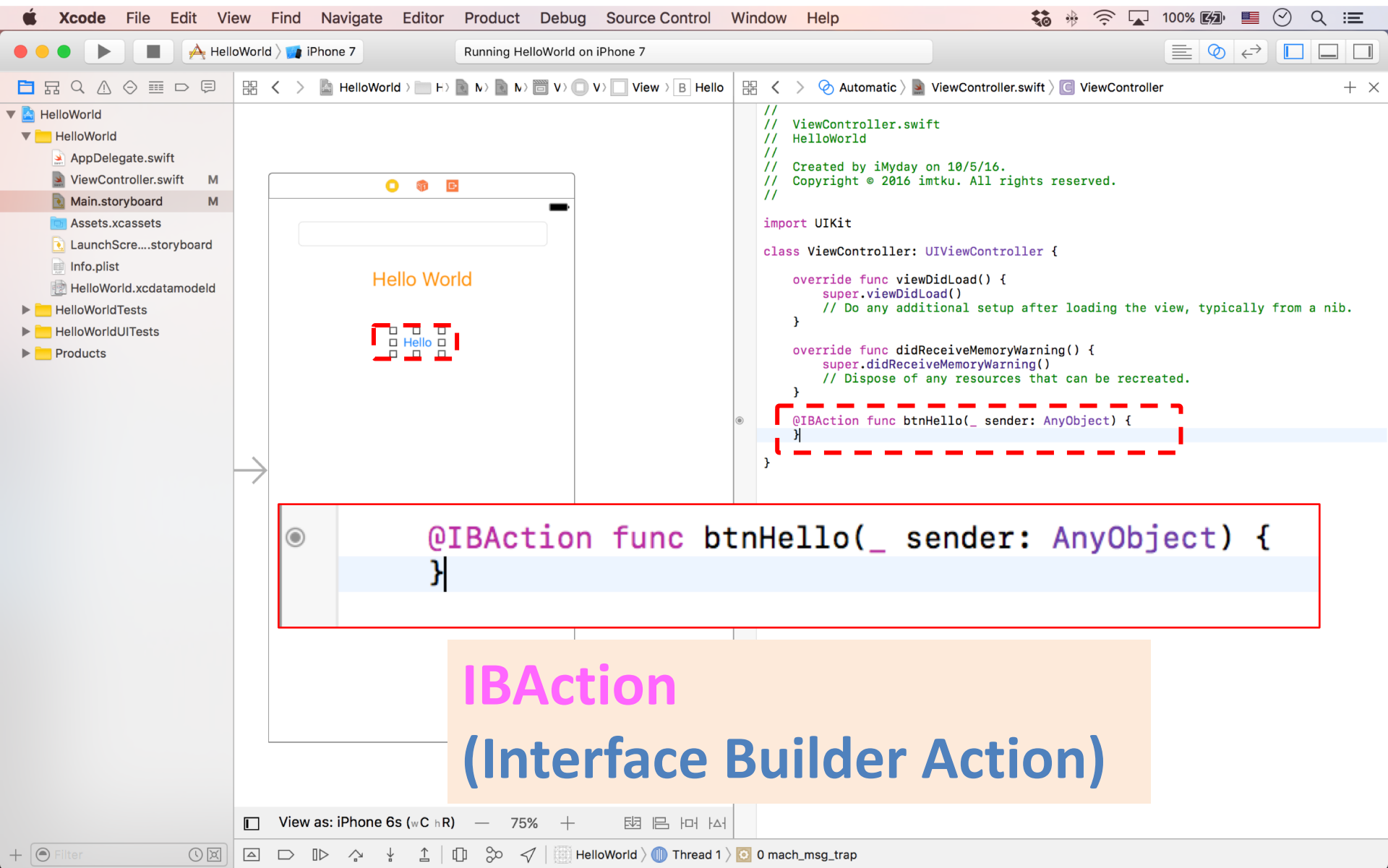


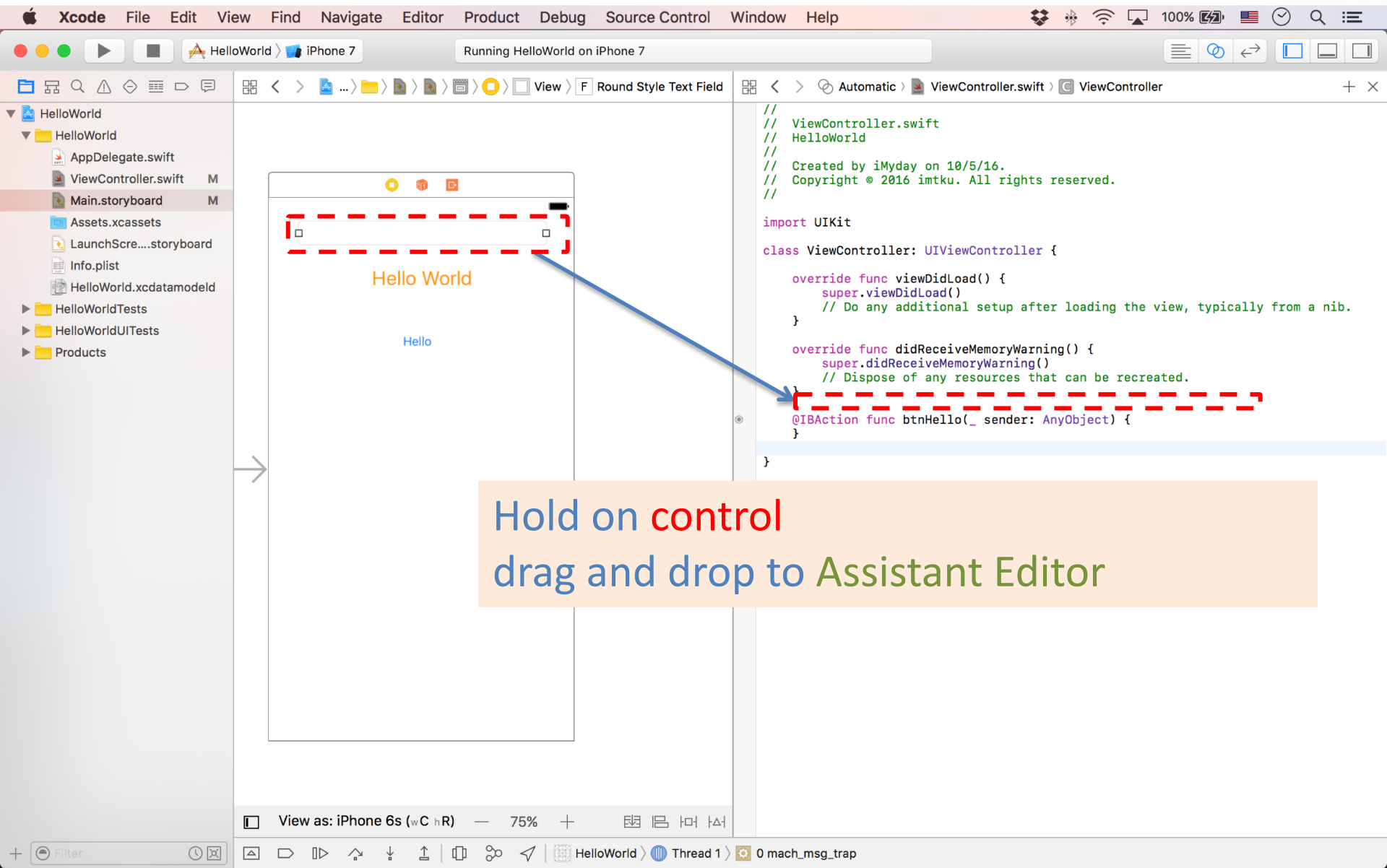


btnHello

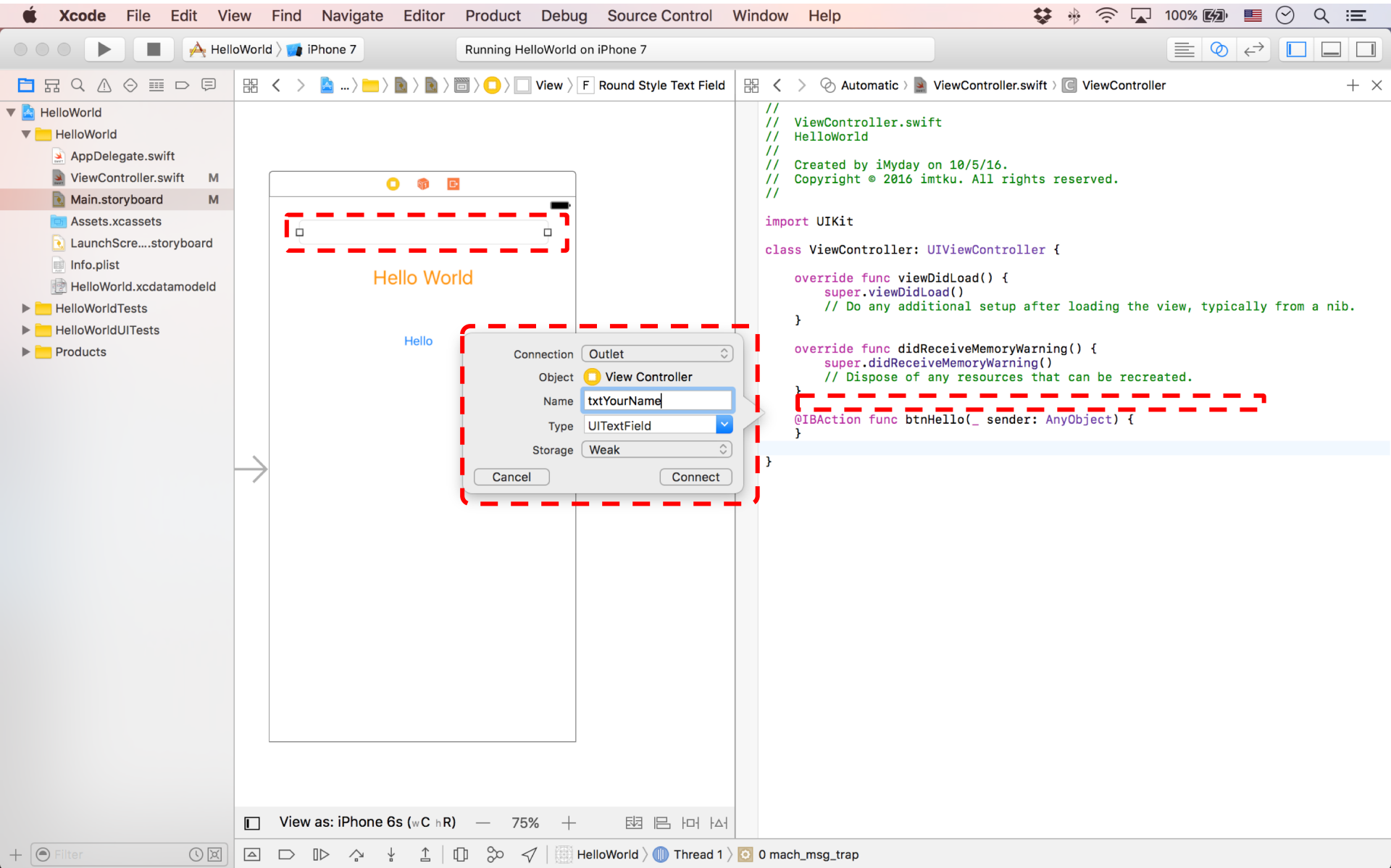


btnHello

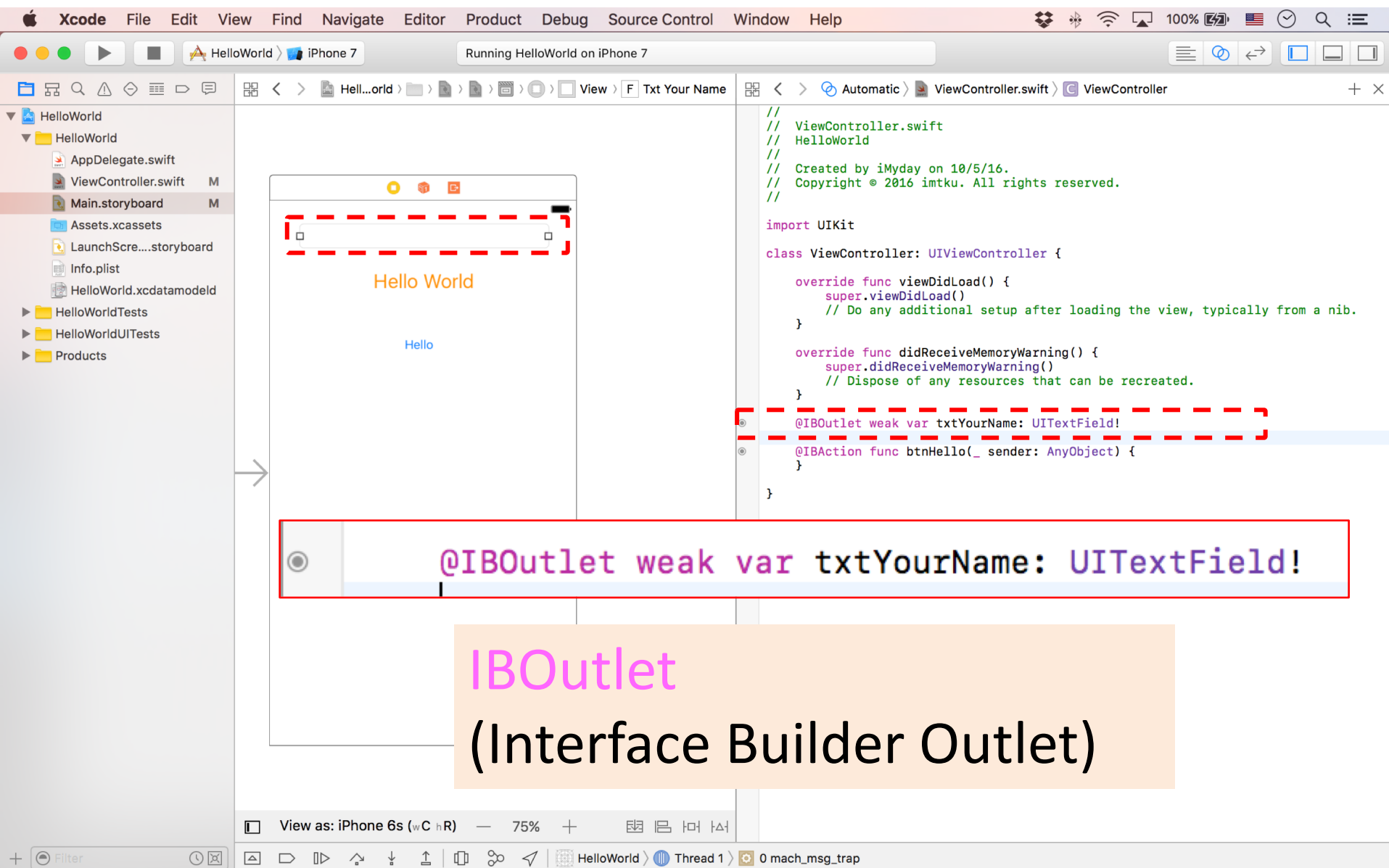


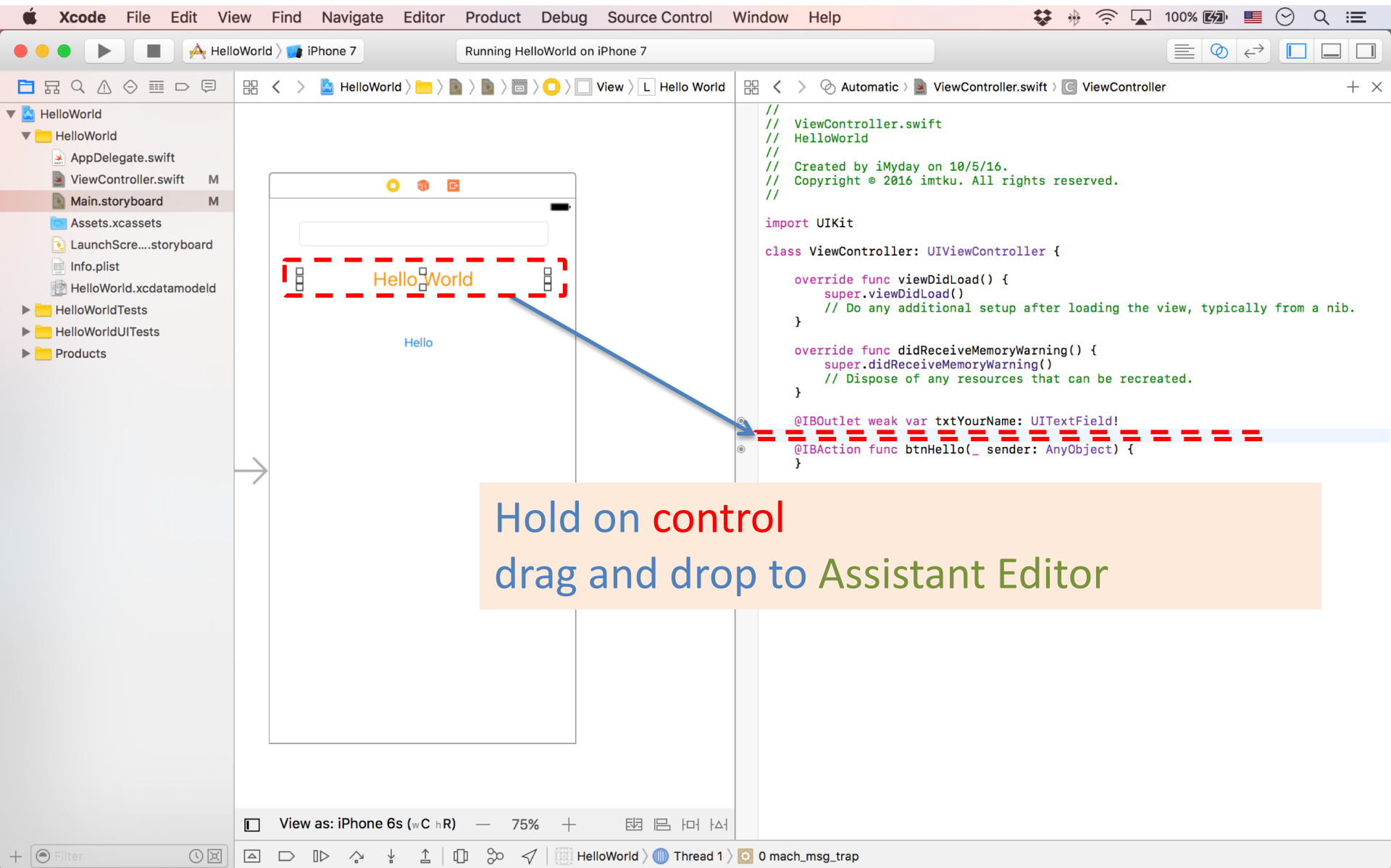


txtYourName

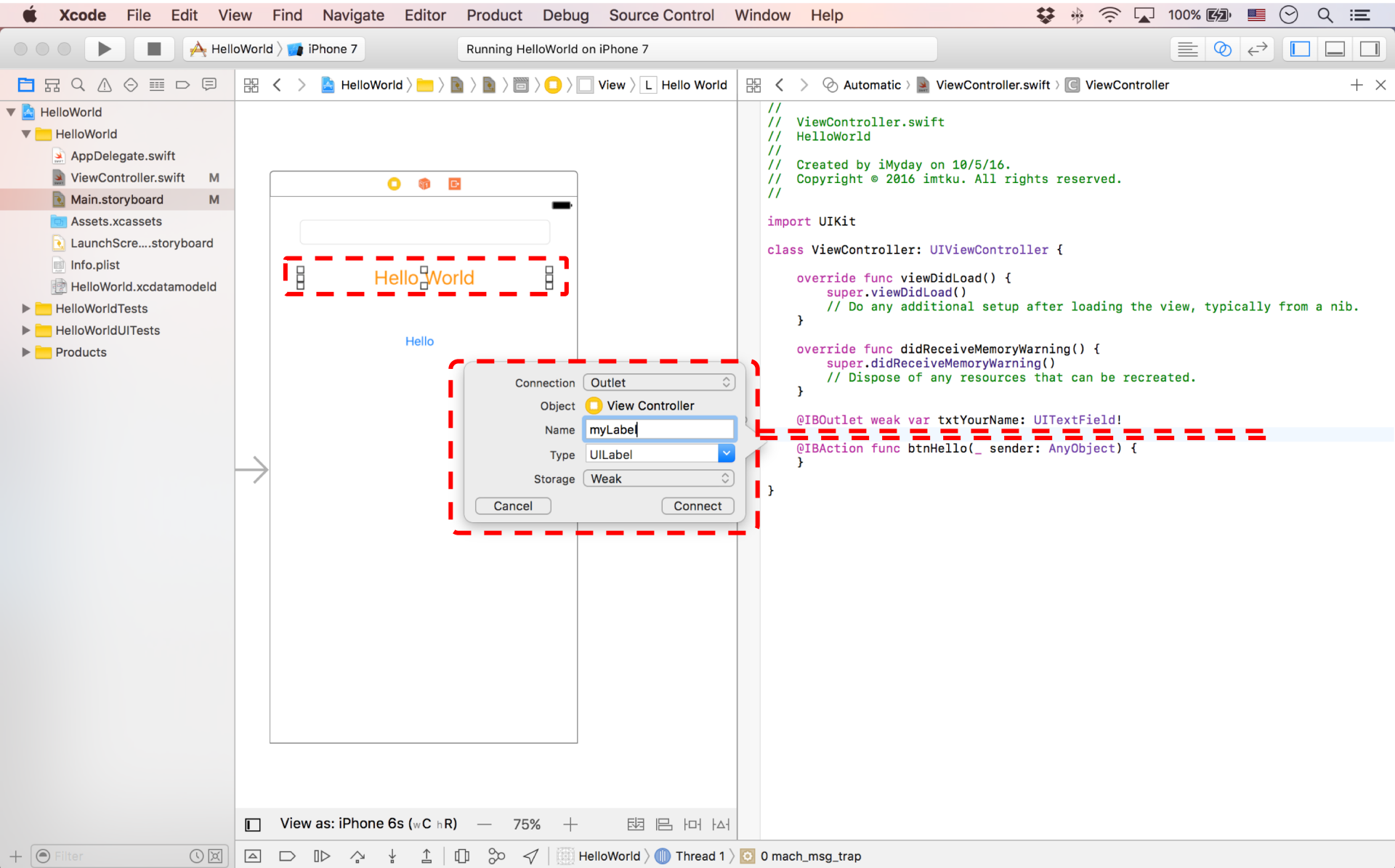


txtYourName

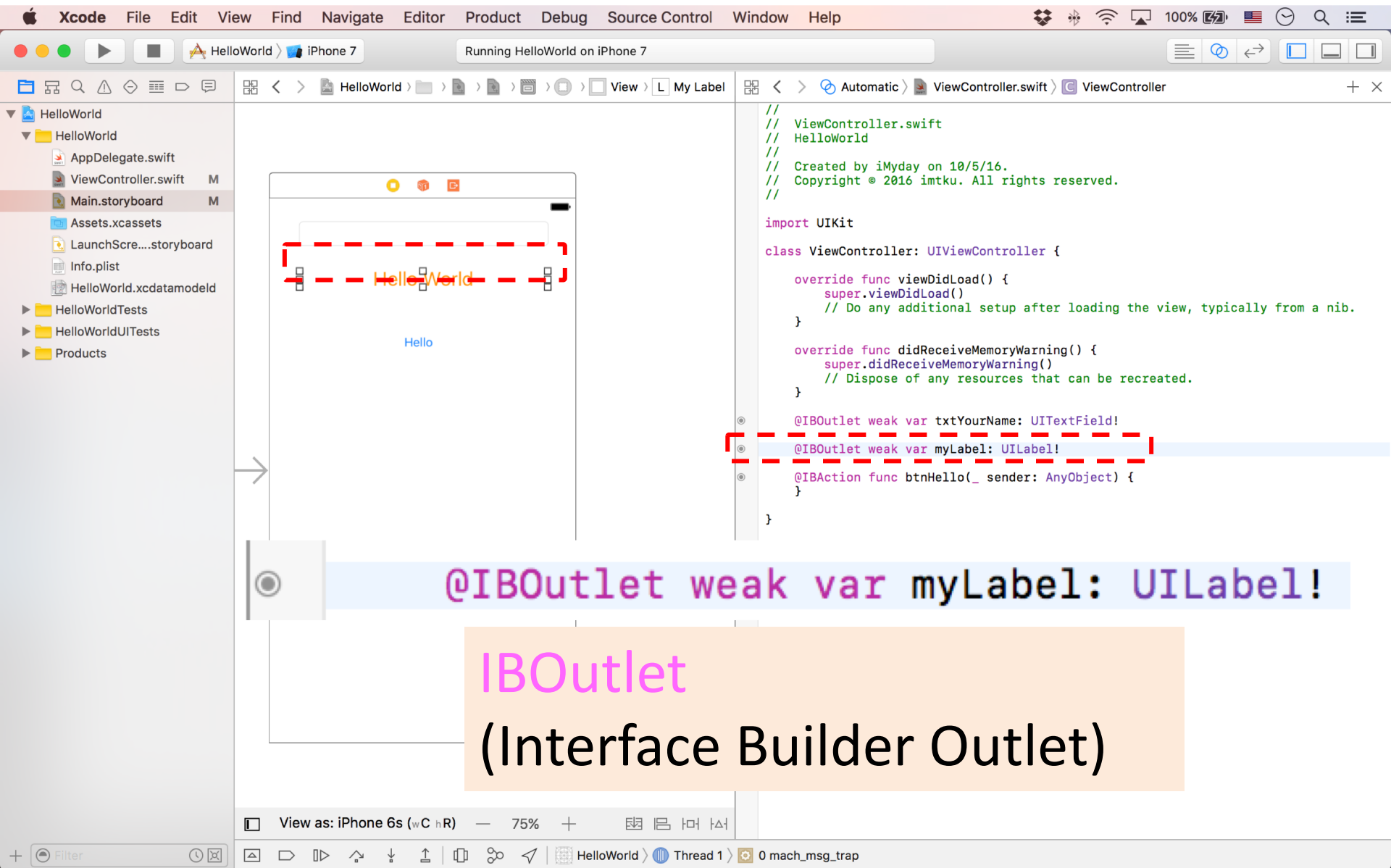


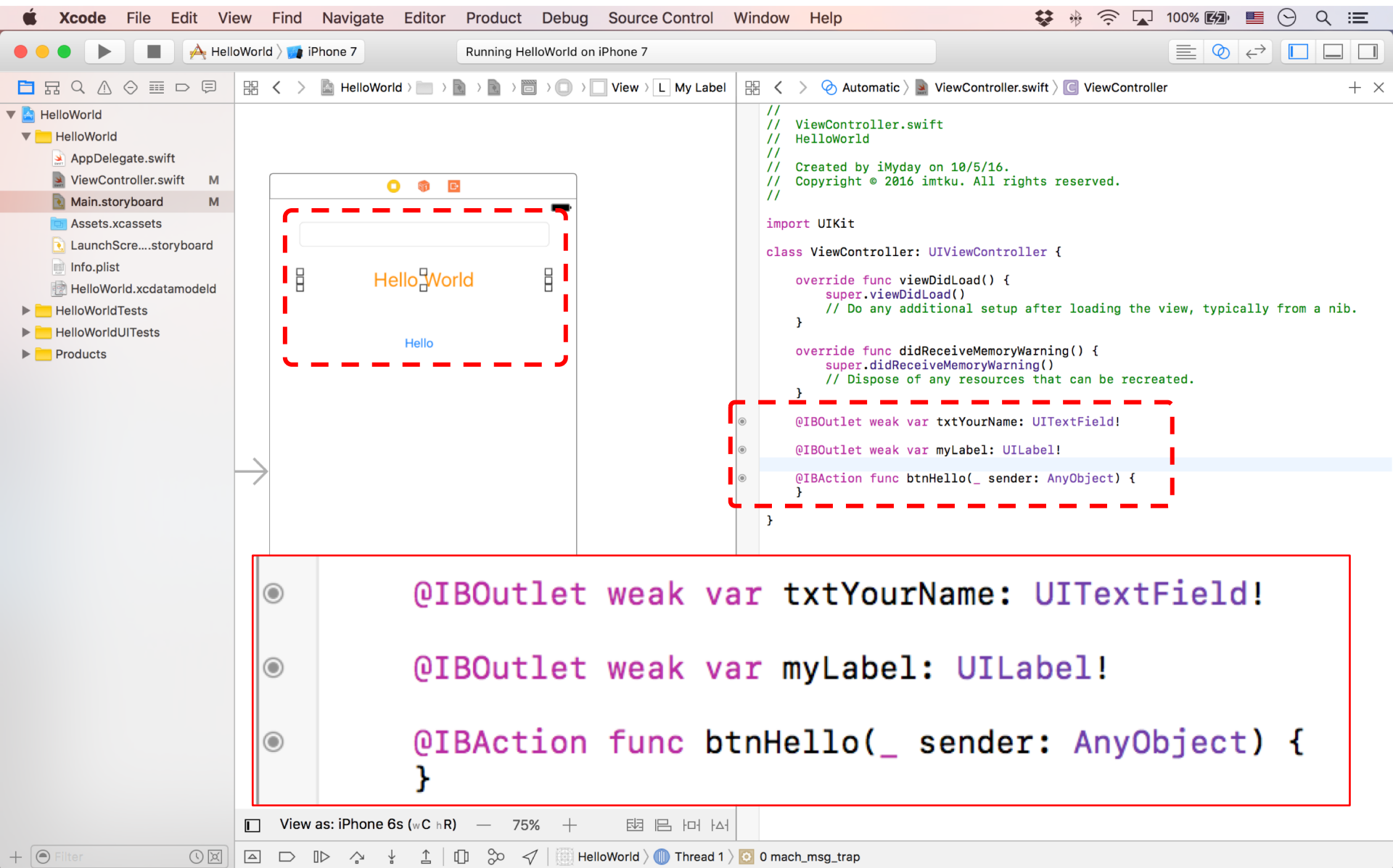


myLabel

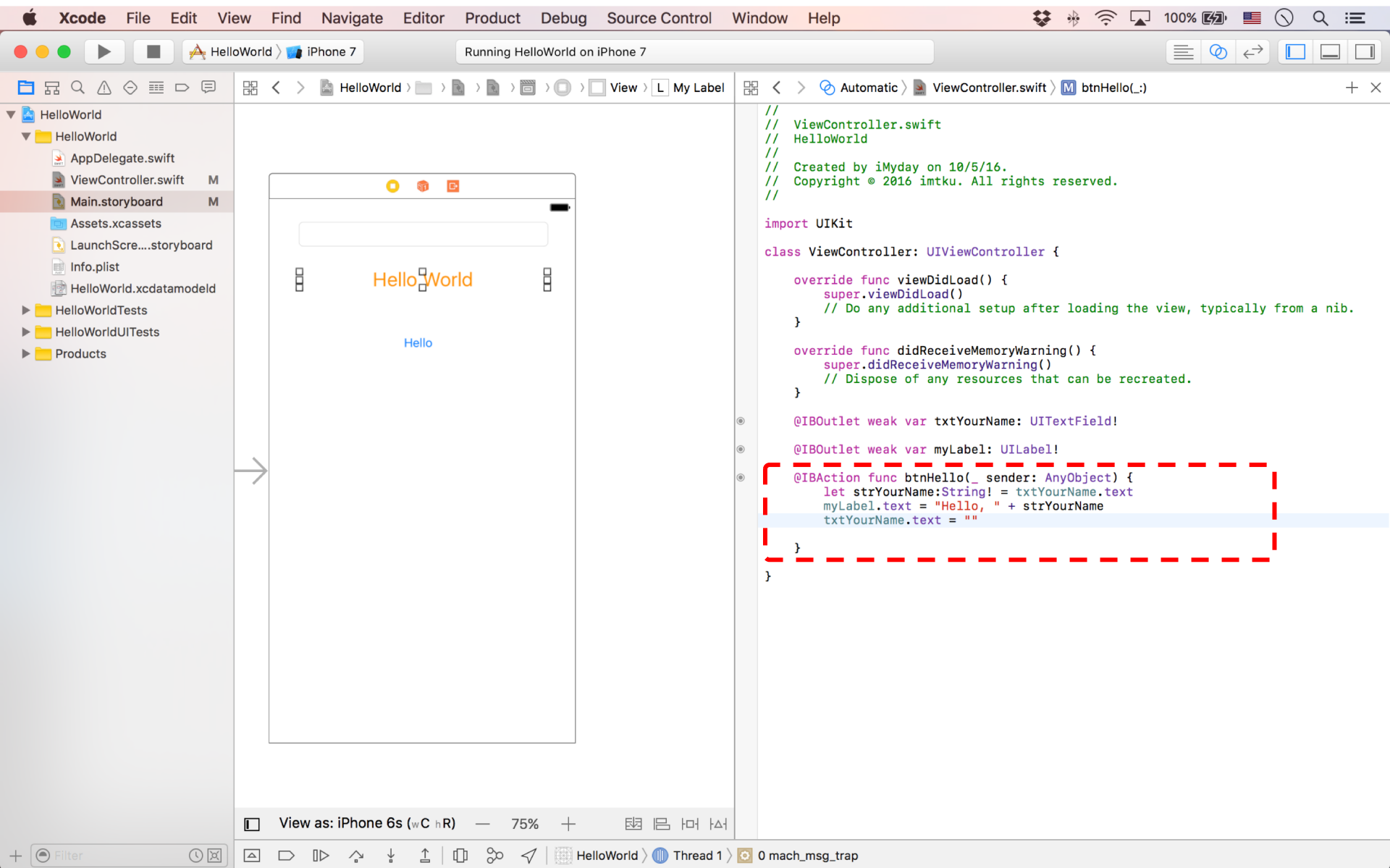


myLabel





@IBAction func btnHello()



@IBAction func btnHello()

The screenshot shows the Xcode IDE with a project named 'HelloWorld' for an iPhone 7. The interface consists of a text field, a button labeled 'Hello World', and a label labeled 'Hello'. The code for the 'btnHello()' action is highlighted in a red box.

```
// ViewController.swift
// HelloWorld
//
// Created by iMyday on 10/5/16.
// Copyright © 2016 imtku. All rights reserved.

import UIKit

class ViewController: UIViewController {

    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

    @IBOutlet weak var txtYourName: UITextField!

    @IBOutlet weak var myLabel: UILabel!

    @IBAction func btnHello(_ sender: AnyObject) {
        let strYourName:String! = txtYourName.text
        myLabel.text = "Hello, " + strYourName
        txtYourName.text = ""
    }
}
```

View as: iPhone 6s (w C h R) — 75% +

@IBAction func btnHello()

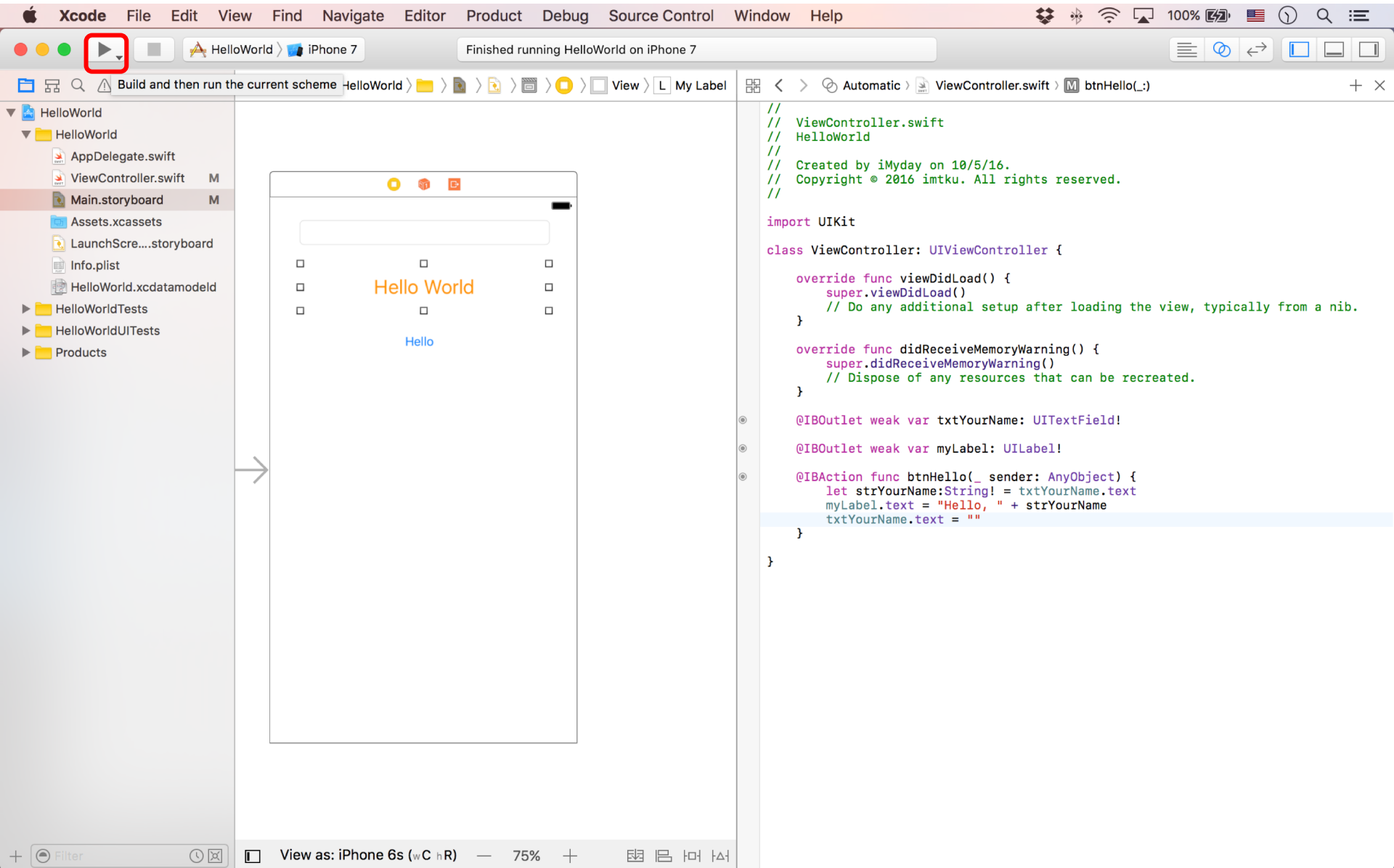
```

@IBOutlet weak var txtYourName: UITextField!

@IBOutlet weak var myLabel: UILabel!

@IBAction func btnHello(_ sender: AnyObject) {
    let strYourName:String! = txtYourName.text
    myLabel.text = "Hello, " + strYourName
    txtYourName.text = ""
}
```

Build and Run



Apple Xcode interface showing a successful build of a Hello World application.

Left Panel (Project Navigator): Shows the project structure for "HelloWorld". The "Main.storyboard" file is selected.

Center Panel (Storyboard): Displays the storyboard for "Main.storyboard". It shows a single view with a text field at the top, a label with the text "Hello World" in orange, and a button with the text "Hello" in blue.

Right Panel (Code Editor): Shows the Swift code for "ViewController.swift". The code includes comments and the implementation of the view lifecycle methods.

```
// ViewController.swift
// HelloWorld
//
// Created by iMyday on 10/5/16.
// Copyright © 2016 imtku. All rights reserved.

import UIKit

class ViewController: UIViewController {

    override func viewDidLoad() {
        super.viewDidLoad()
        // Do any additional setup after loading the view, typically from a nib.
    }

    override func didReceiveMemoryWarning() {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recreated.
    }

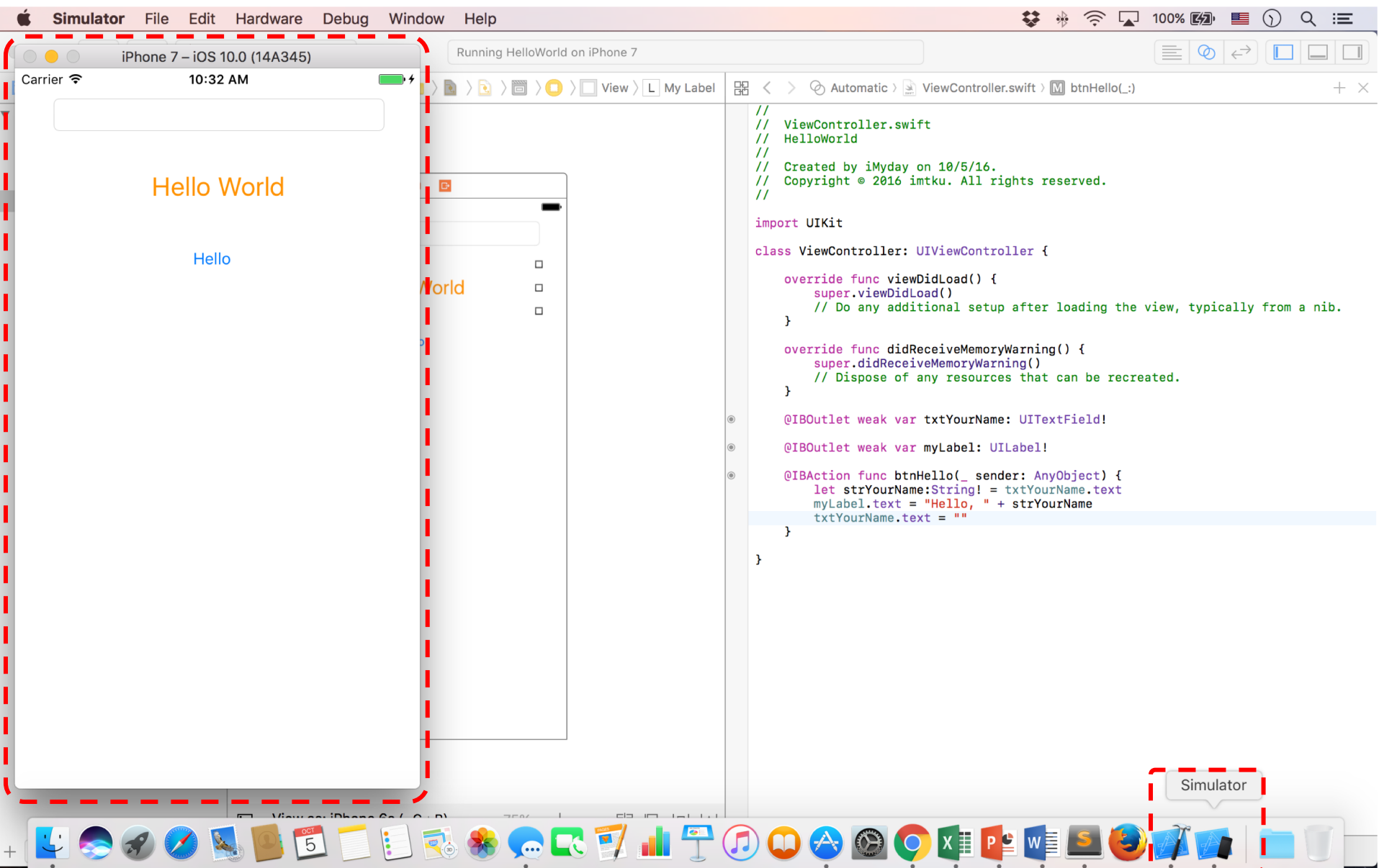
    @IBOutlet weak var txtYourName: UITextField!

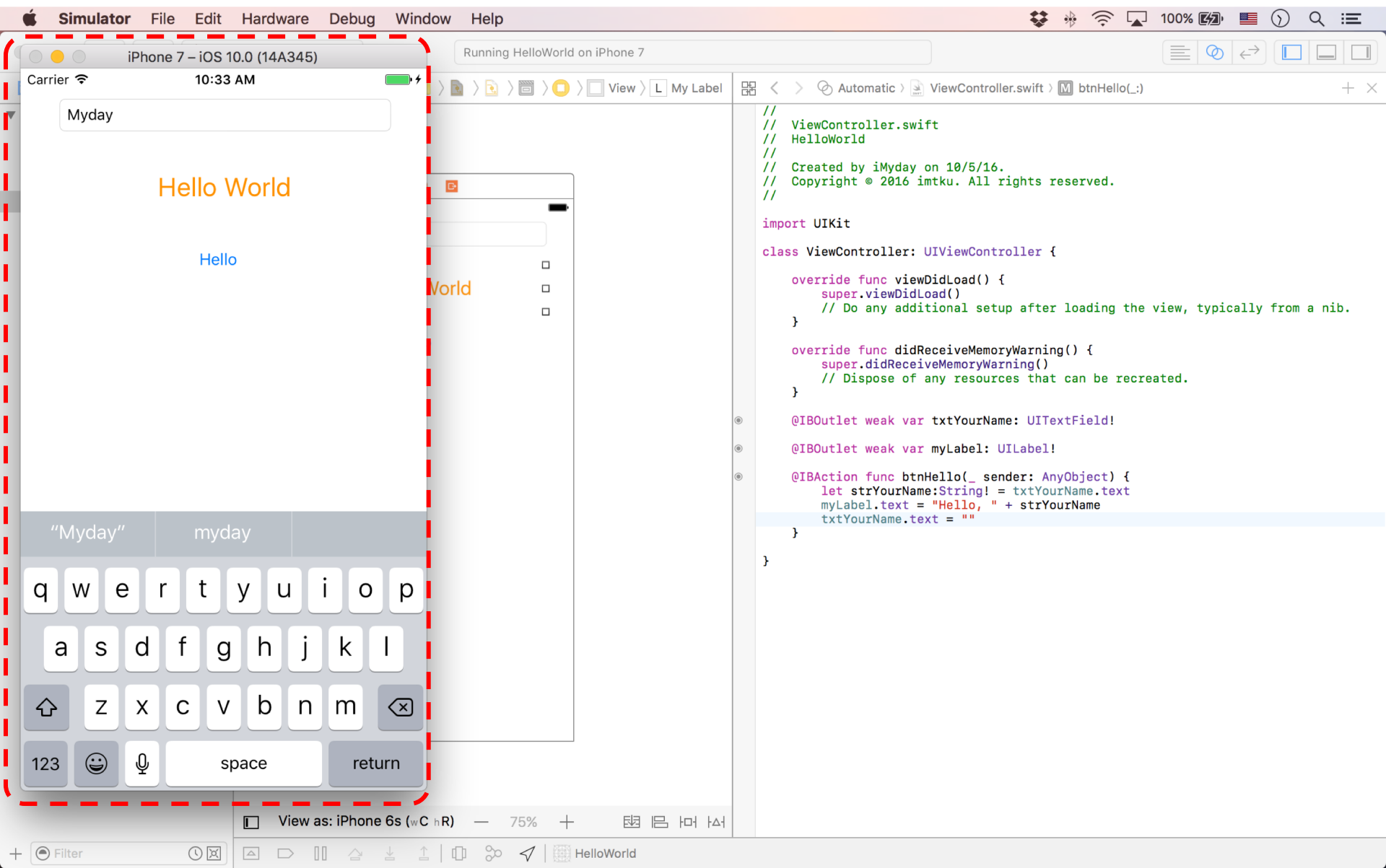
    @IBOutlet weak var myLabel: UILabel!

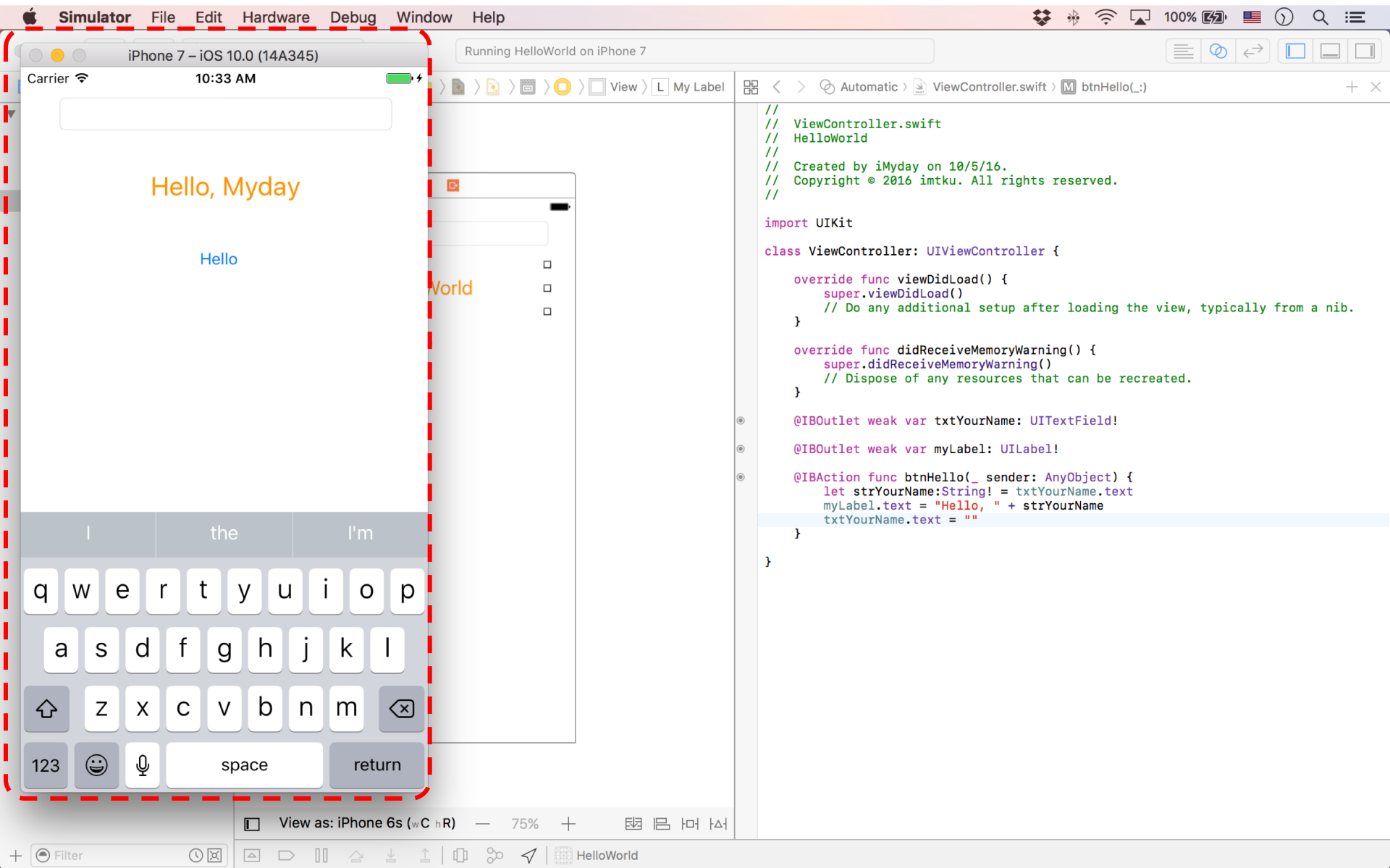
    @IBAction func btnHello(_ sender: AnyObject) {
        let strYourName:String! = txtYourName.text
        myLabel.text = "Hello, " + strYourName
        txtYourName.text = ""
    }
}
```

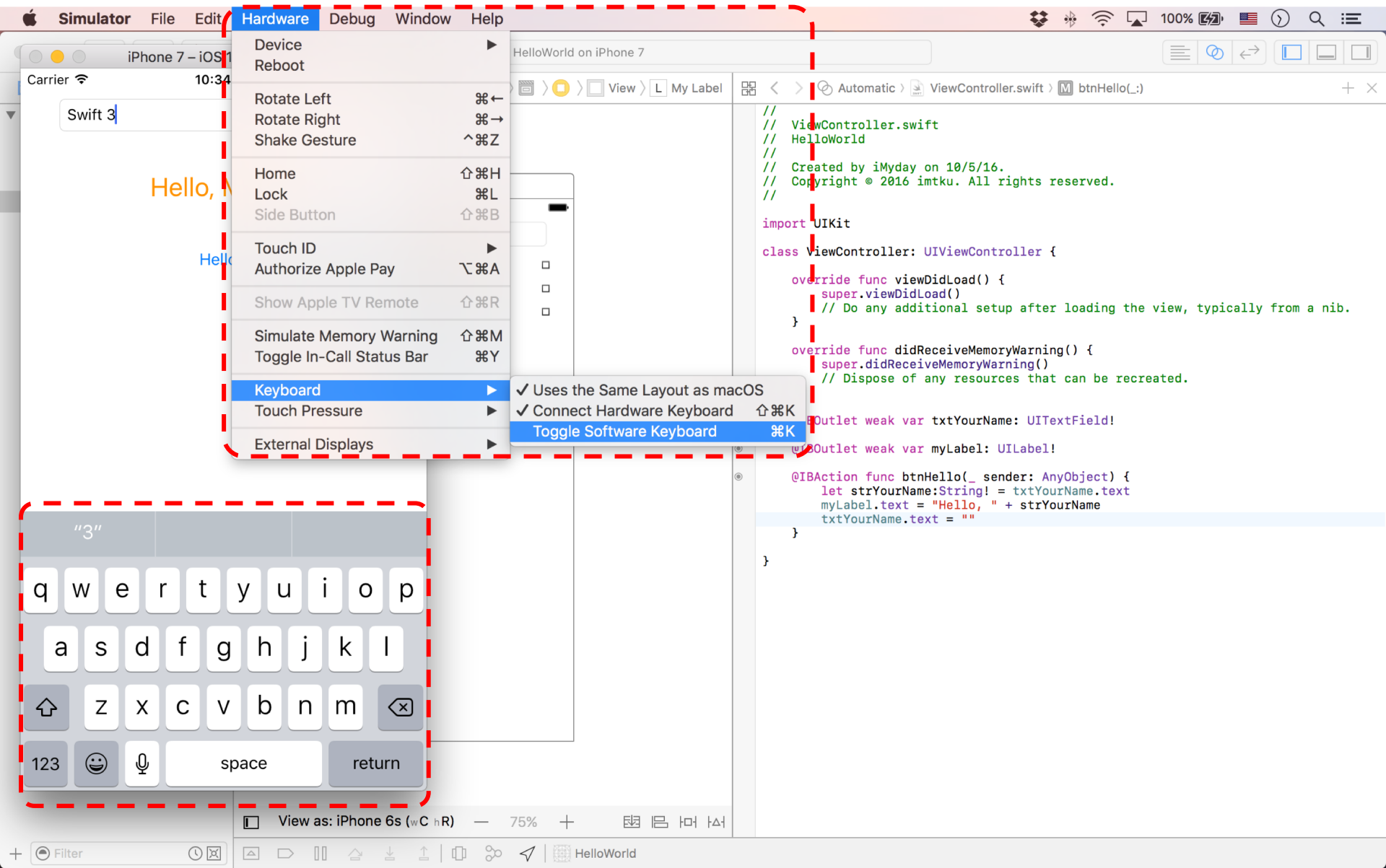
Bottom Panel (Status Bar): Shows the status bar with the text "View as: iPhone 6s (w C h R)" and a zoom level of 75%.

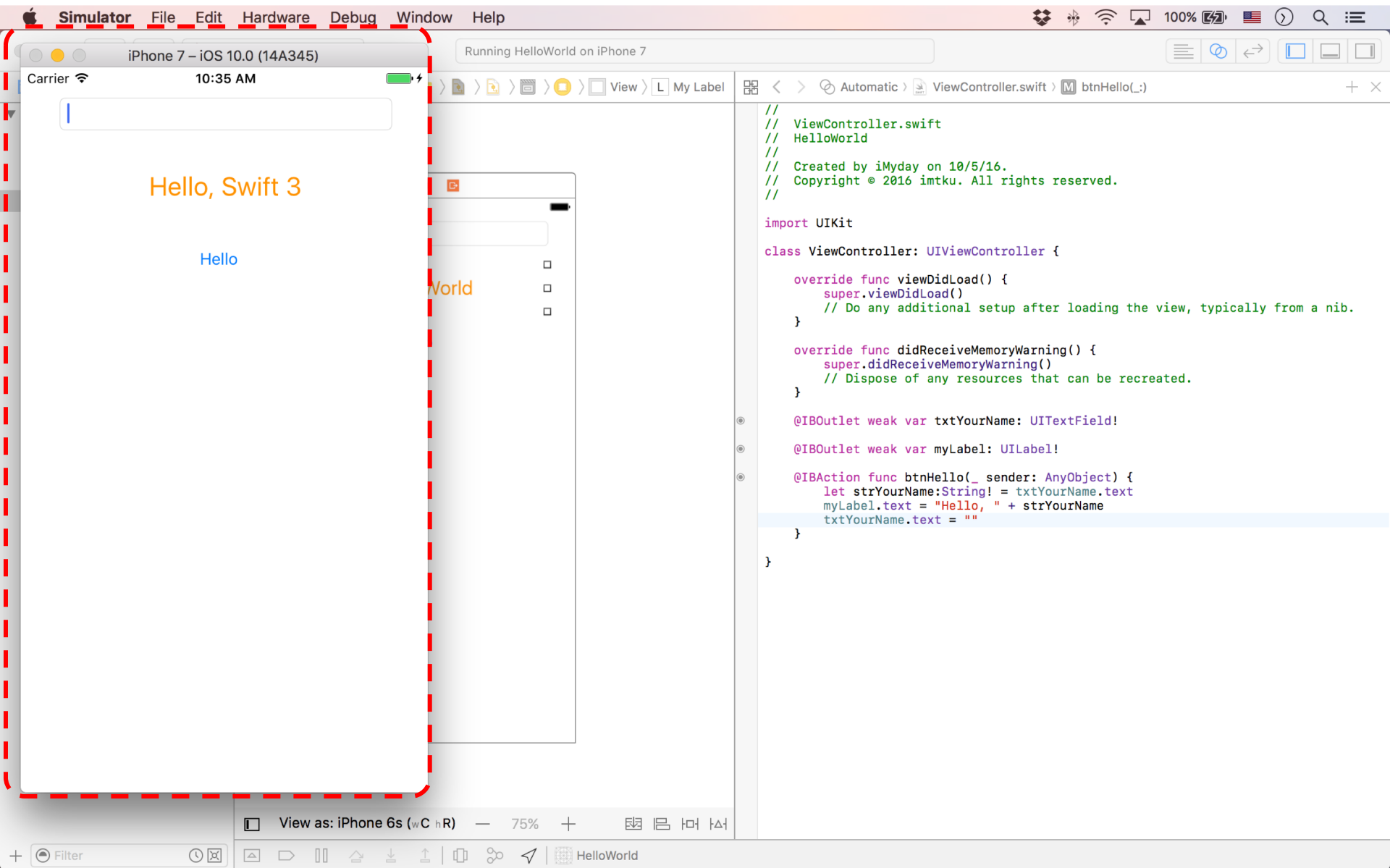
Build Succeeded Notification: A gray box with a hammer icon and the text "Build Succeeded" is overlaid on the bottom right of the interface.

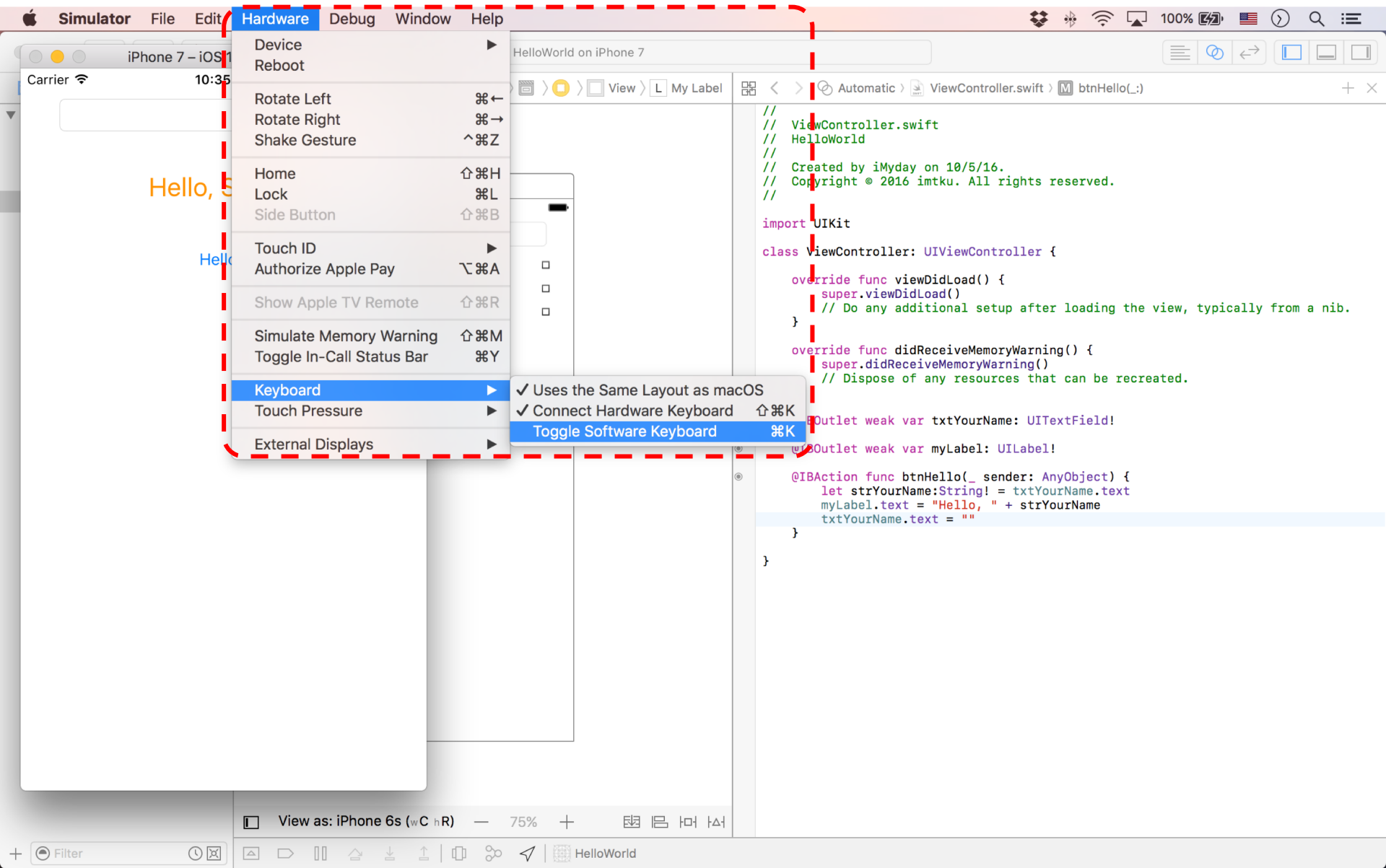


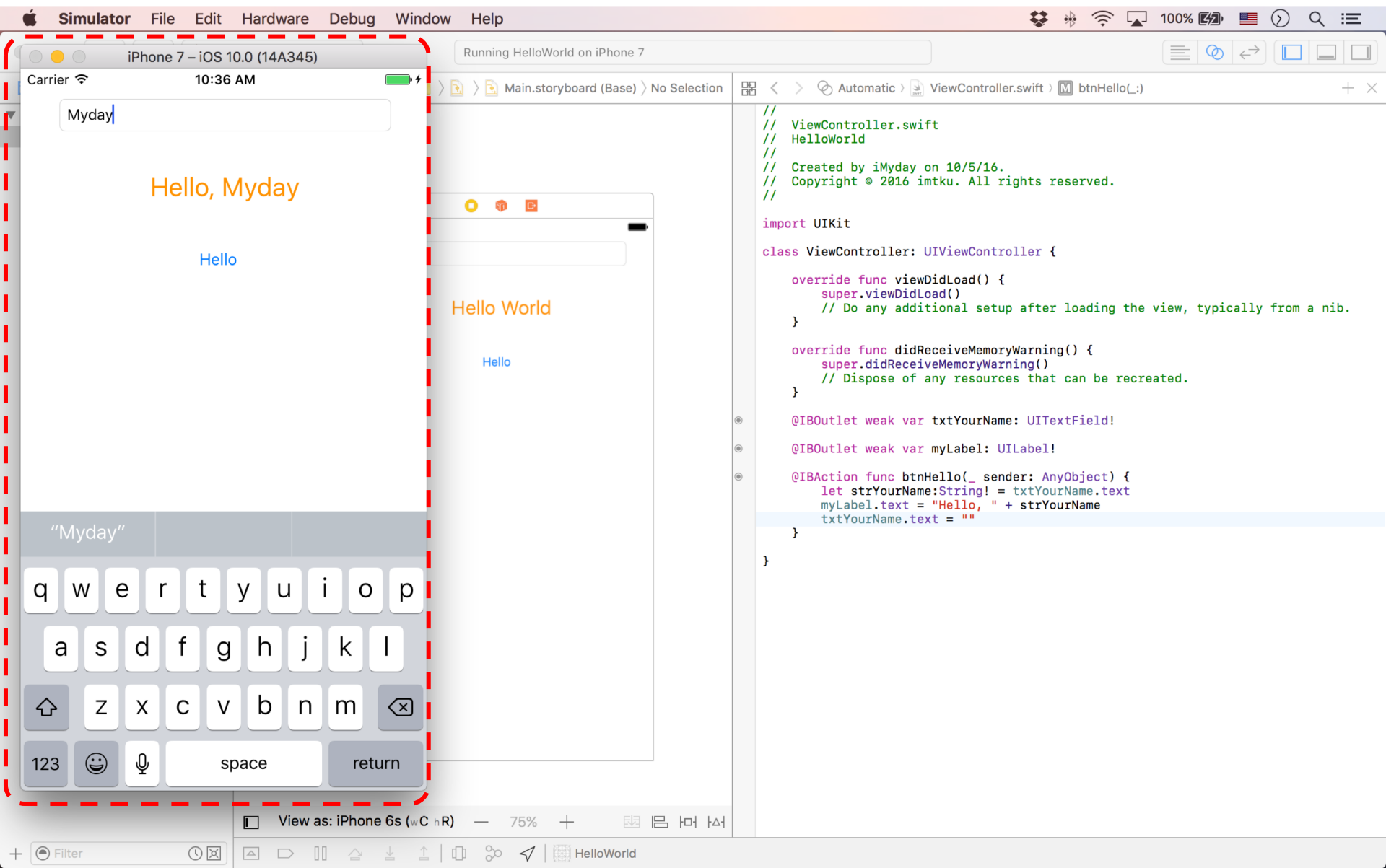


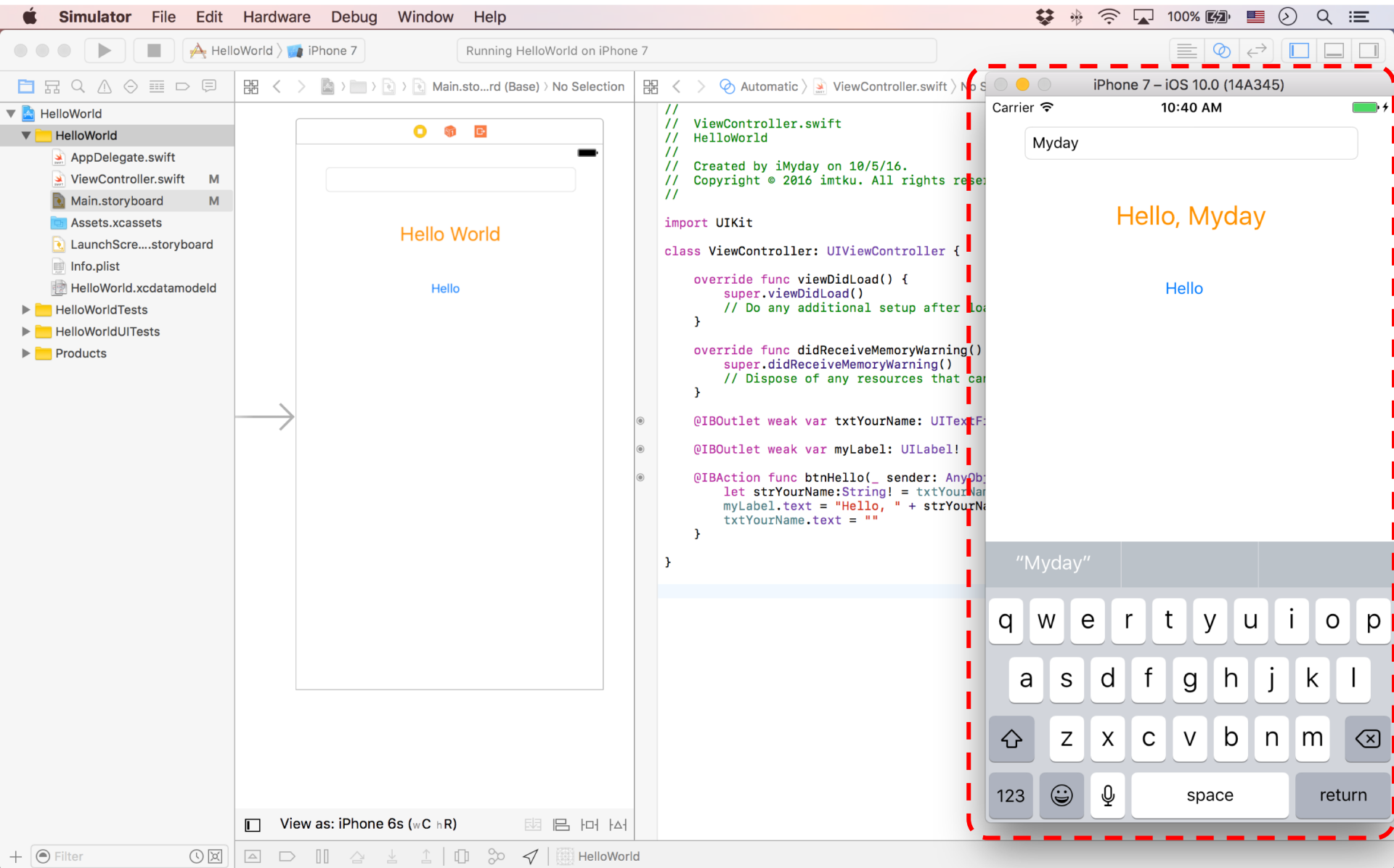




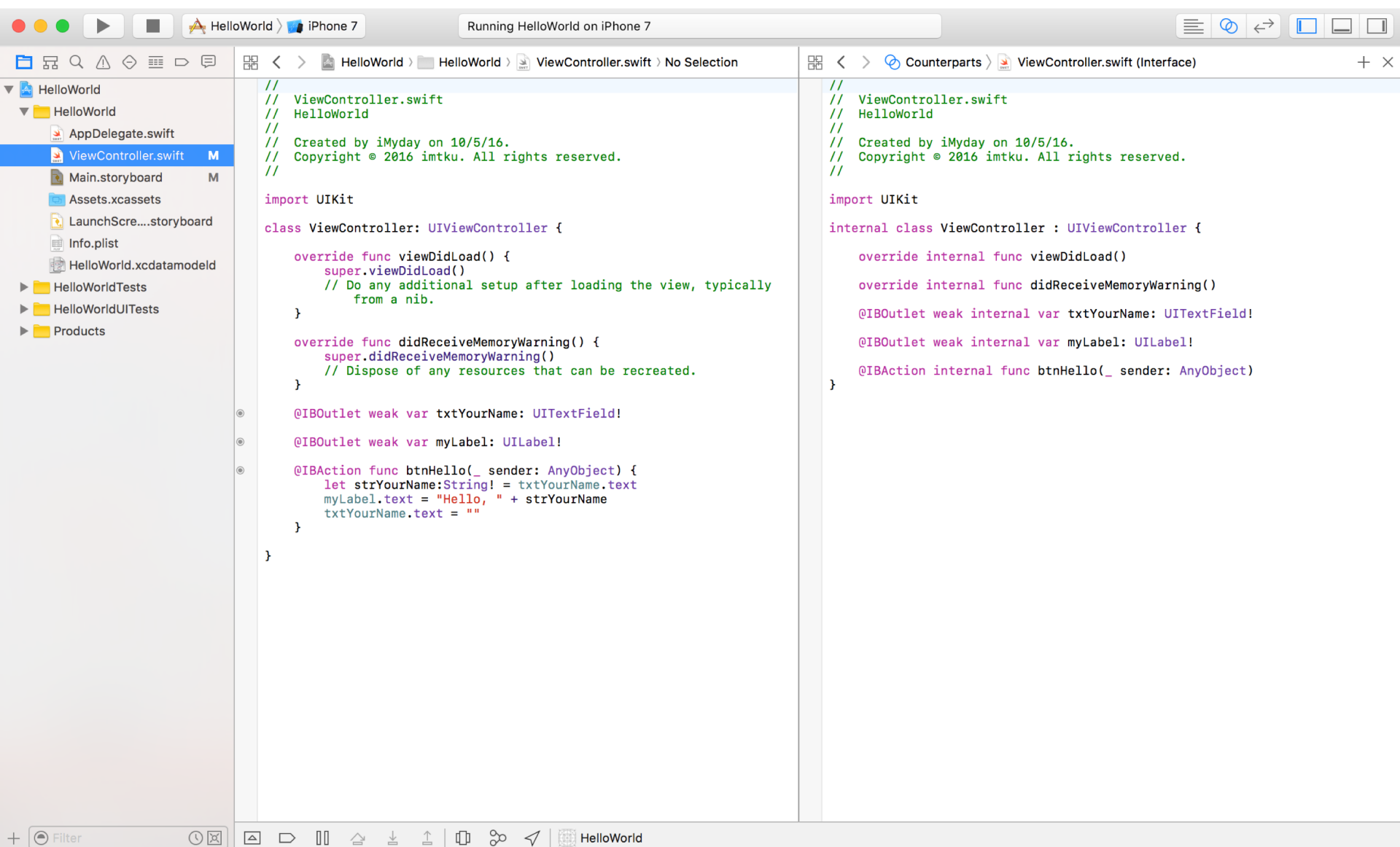








ViewController.swift



ViewController.swift

```
//  
// ViewController.swift  
// HelloWorld  
//  
// Created by iMyday on 10/5/16.  
// Copyright © 2016 imtku. All rights reserved.  
//  
  
import UIKit  
  
class ViewController: UIViewController {  
  
    override func viewDidLoad() {  
        super.viewDidLoad()  
        // Do any additional setup after loading the view, typically from a nib.  
    }  
  
    override func didReceiveMemoryWarning() {  
        super.didReceiveMemoryWarning()  
        // Dispose of any resources that can be recreated.  
    }  
  
    @IBOutlet weak var txtYourName: UITextField!  
  
    @IBOutlet weak var myLabel: UILabel!  
  
    @IBAction func btnHello(_ sender: AnyObject) {  
        let strYourName:String! = txtYourName.text  
        myLabel.text = "Hello, " + strYourName  
        txtYourName.text = ""  
    }  
  
}
```

ViewController.swift

```
@IBOutlet weak var txtYourName: UITextField!

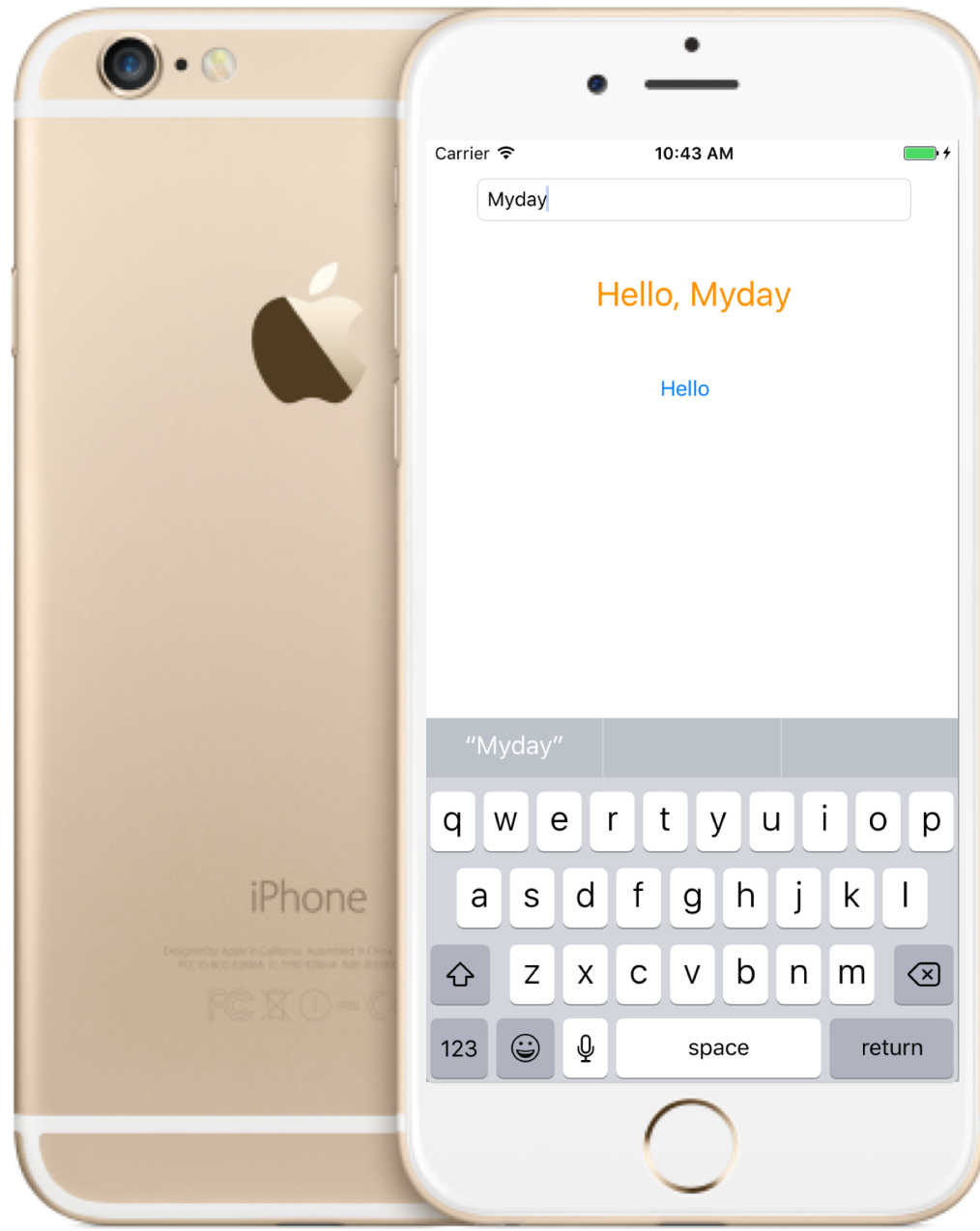
@IBOutlet weak var myLabel: UILabel!

@IBAction func btnHello(_ sender: AnyObject) {
    let strYourName:String! = txtYourName.text
    myLabel.text = "Hello, " + strYourName
    txtYourName.text = ""
}
```

ViewController.swift (Interface)

```
//  
//  ViewController.swift  
//  HelloWorld  
//  
//  Created by iMyday on 10/5/16.  
//  Copyright © 2016 imtku. All rights reserved.  
//  
  
import UIKit  
  
internal class ViewController : UIViewController {  
    override internal func viewDidLoad()  
  
    override internal func didReceiveMemoryWarning()  
  
    @IBOutlet weak internal var txtYourName: UITextField!  
  
    @IBOutlet weak internal var myLabel: UILabel!  
  
    @IBAction internal func btnHello(_ sender: AnyObject)  
}
```





Summary

- **Developing iPhone / iPad Native Apps with Swift 4 (Xcode 9)**
 - Mac OS X 10.8, 10.9, 10.10, 10.11, 10.12, 10.13
 - Xcode 6, Xcode 7, Xcode 8, Xcode 9, Xcode 10
 - iOS 8, iOS 9, iOS 10, iOS 11, iOS 12
- **Building Your First iOS App with Xcode 9**



Xcode 8



Swift 3



Xcode 9



Swift 4

References

- Apple Developers, <https://developer.apple.com/>
- Start Developing iOS Apps Today,
 - <https://developer.apple.com/library/ios/referencelibrary/GettingStarted/RoadMapiOS/>
 - <https://developer.apple.com/library/ios/referencelibrary/GettingStarted/RoadMapiOS/RoadMapiOS.pdf>
- Rory Lewis and Laurence Moroney,
iPhone and iPad Apps for Absolute Beginners,
4th Edition, Apress, 2013
- The Swift Programming Language,
 - <https://itunes.apple.com/us/book/the-swift-programming-language/id881256329>
 - https://developer.apple.com/library/ios/documentation/Swift/Conceptual/Swift_Programming_Language/
- Apple - WWDC 2014
 - <https://www.youtube.com/watch?v=w87fOAG8fjk>
- Apple - WWDC 2015
 - https://www.youtube.com/watch?v=_p8AsQhaVKI
- Apple - WWDC 2016 Keynote
 - https://www.youtube.com/watch?v=n5jXg_NNiCA
- What's New in Swift 4 - Apple WWDC 2017
 - <https://www.youtube.com/watch?v=3y42Qg6MTvk>