BUILDING YOUR FIRST IOS APP

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Fall 2015
talentspark.io

APP LIFECYCLE (SIMPLIFIED)

```
#import <UIKit/UIKit.h>
#import "AppDelegate.h"

int main(int argc, char * argv[]) {
    @autoreleasepool {
        return UIApplicationMain(argc, argv, nil,
NSStringFromClass([AppDelegate class]));
    }
}
```

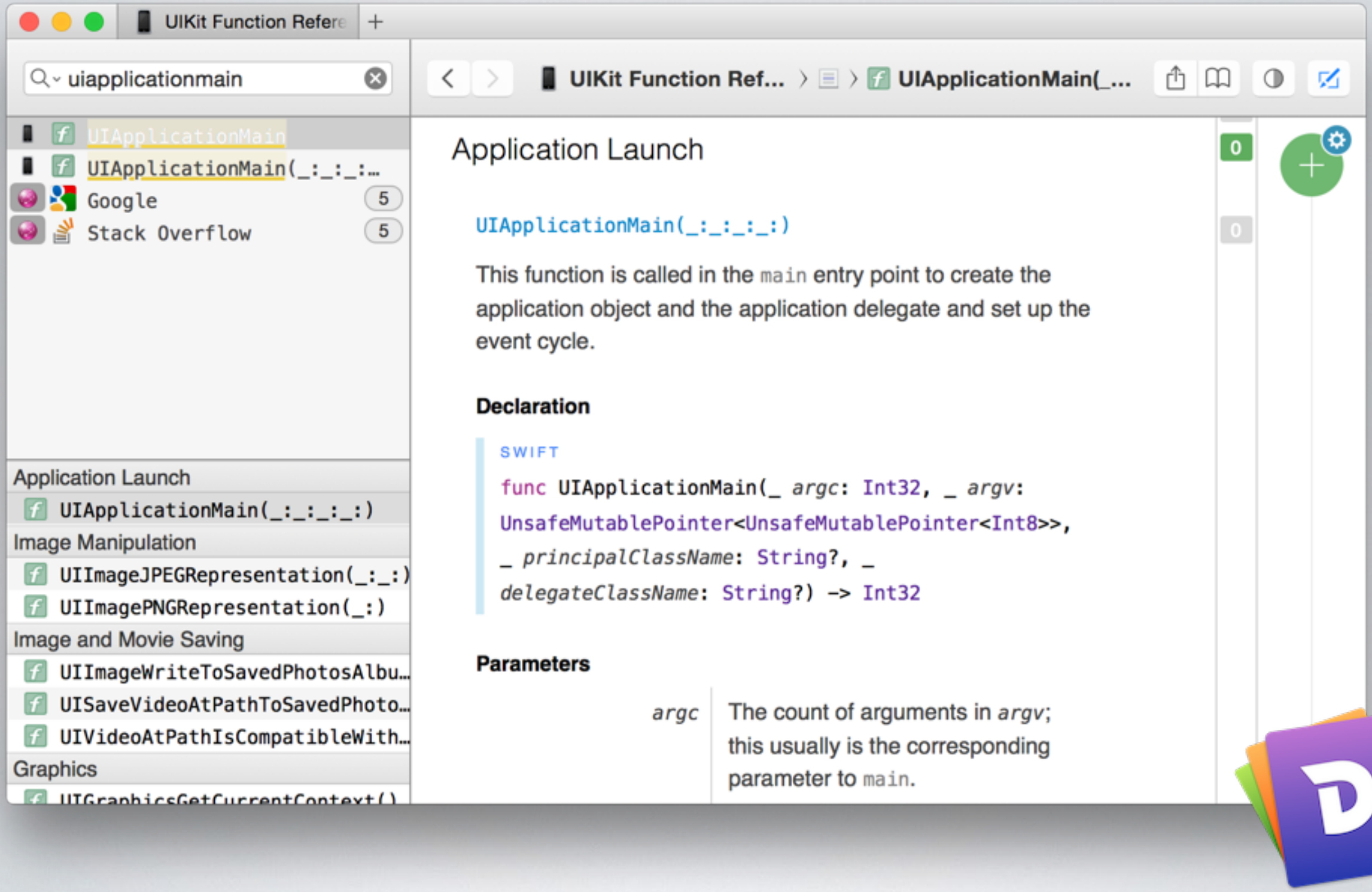
APP LIFECYCLE (SIMPLIFIED)

As usual, main is the entry point…

```
#import <UIKi
#import "App
```

```
int main(int argc, char * argv[]) {
    @autoreleasepool {
        return UIApplicationMain(argc, argv, nil,
NSStringFromClass([AppDelegate class]));
    }
}
```

APP LIFECYCLE (SIMPLIFIED)



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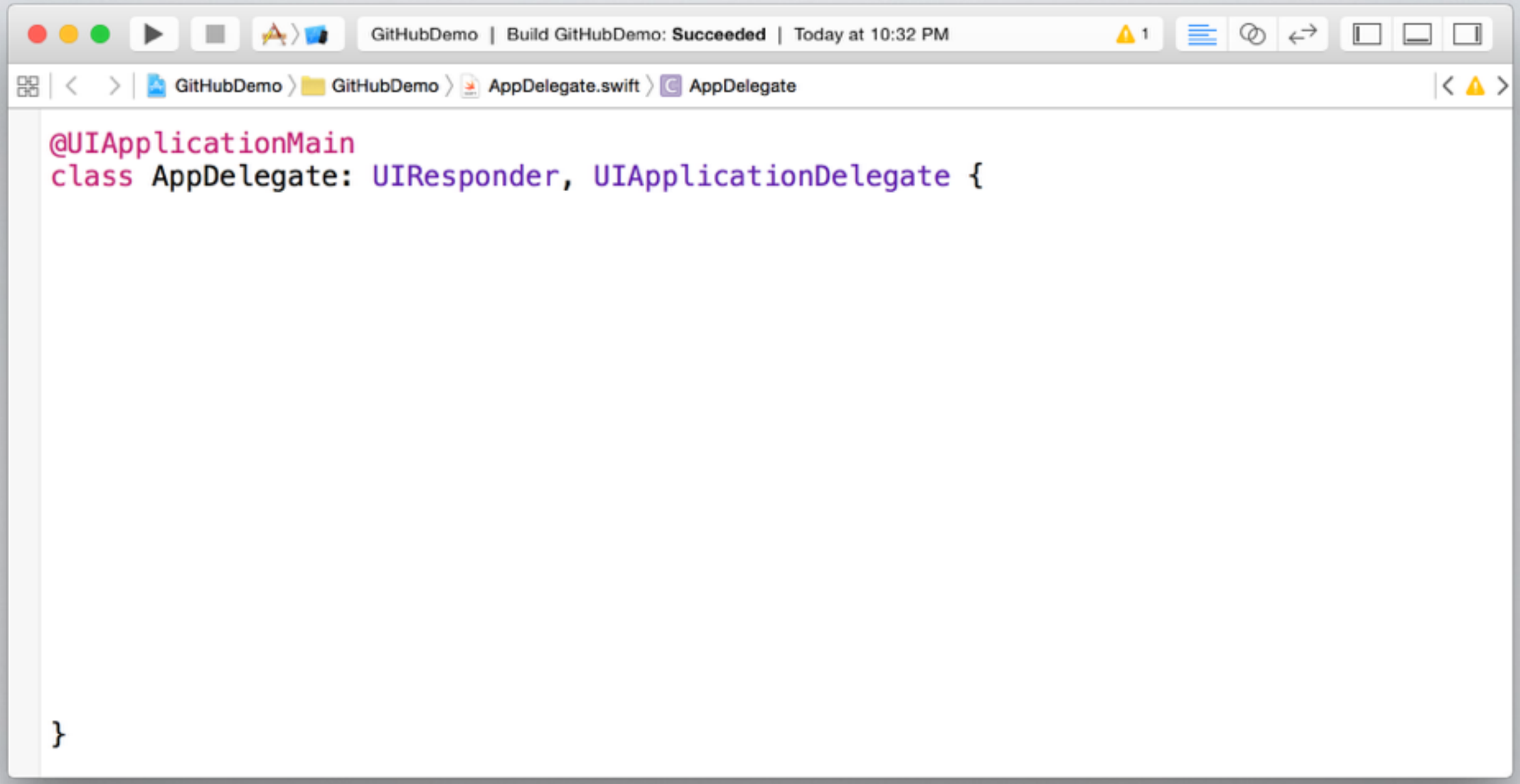
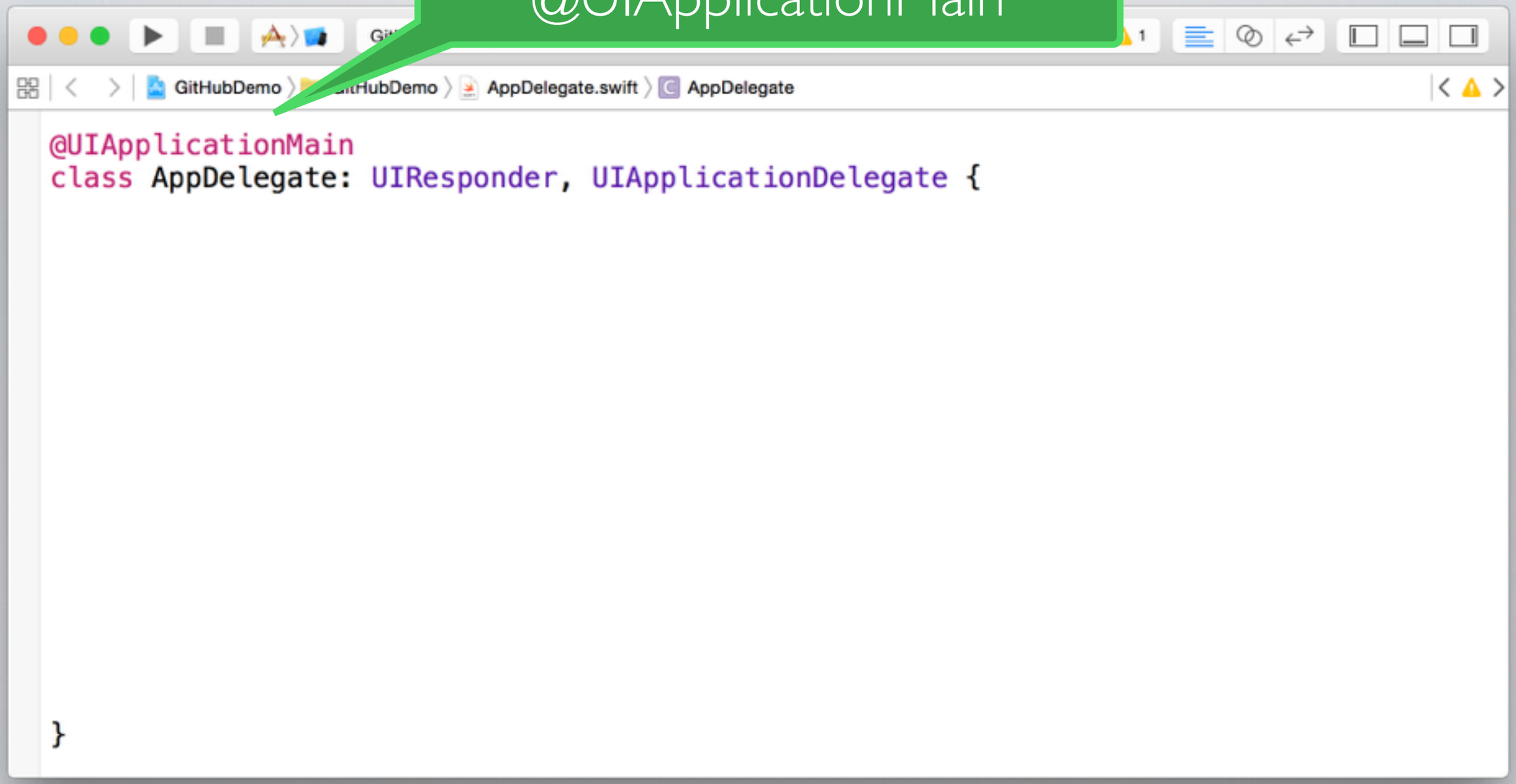


APP LIFECYCLE (SIMPLIFIED)

In Swift, we use
@UIApplicationMain



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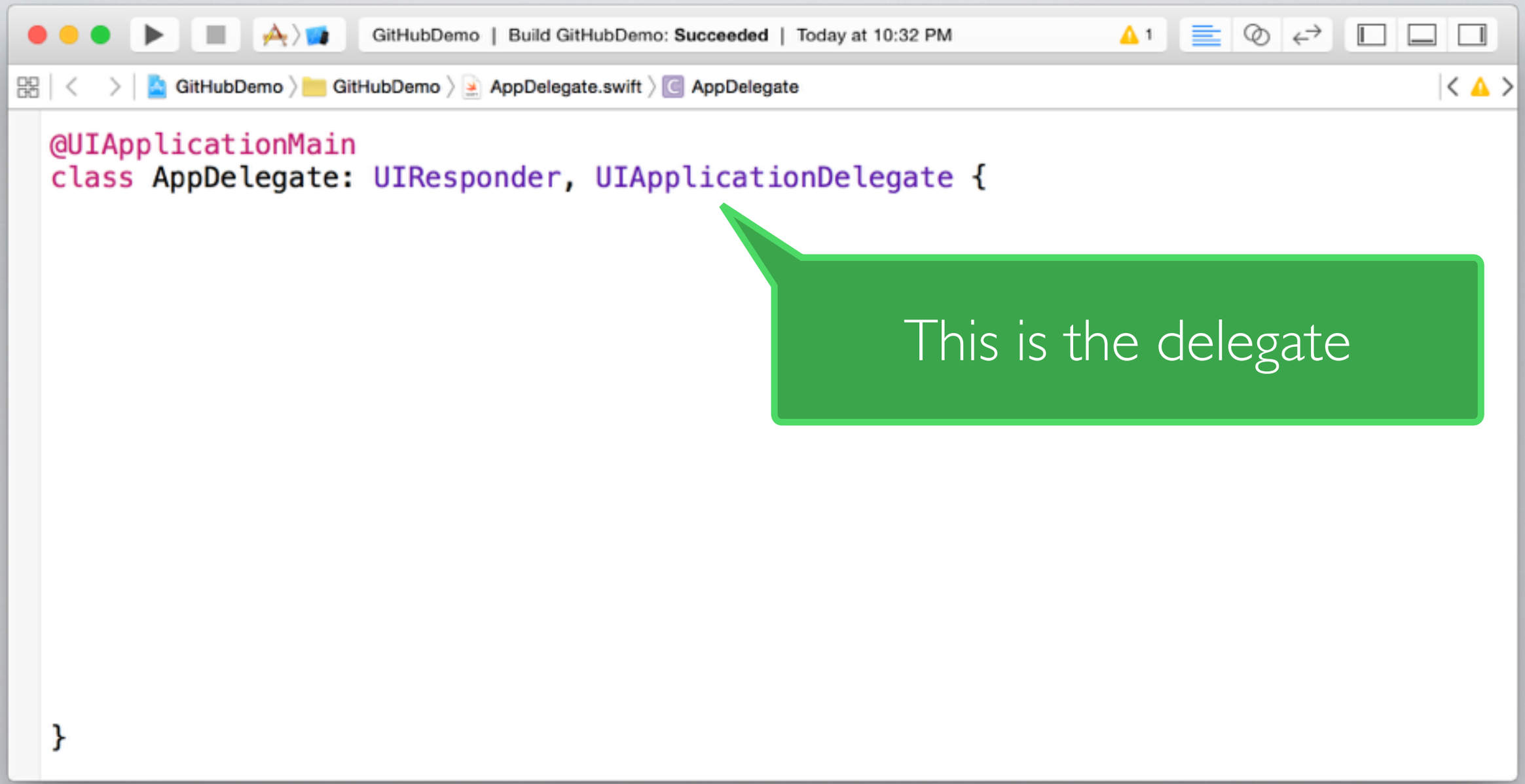

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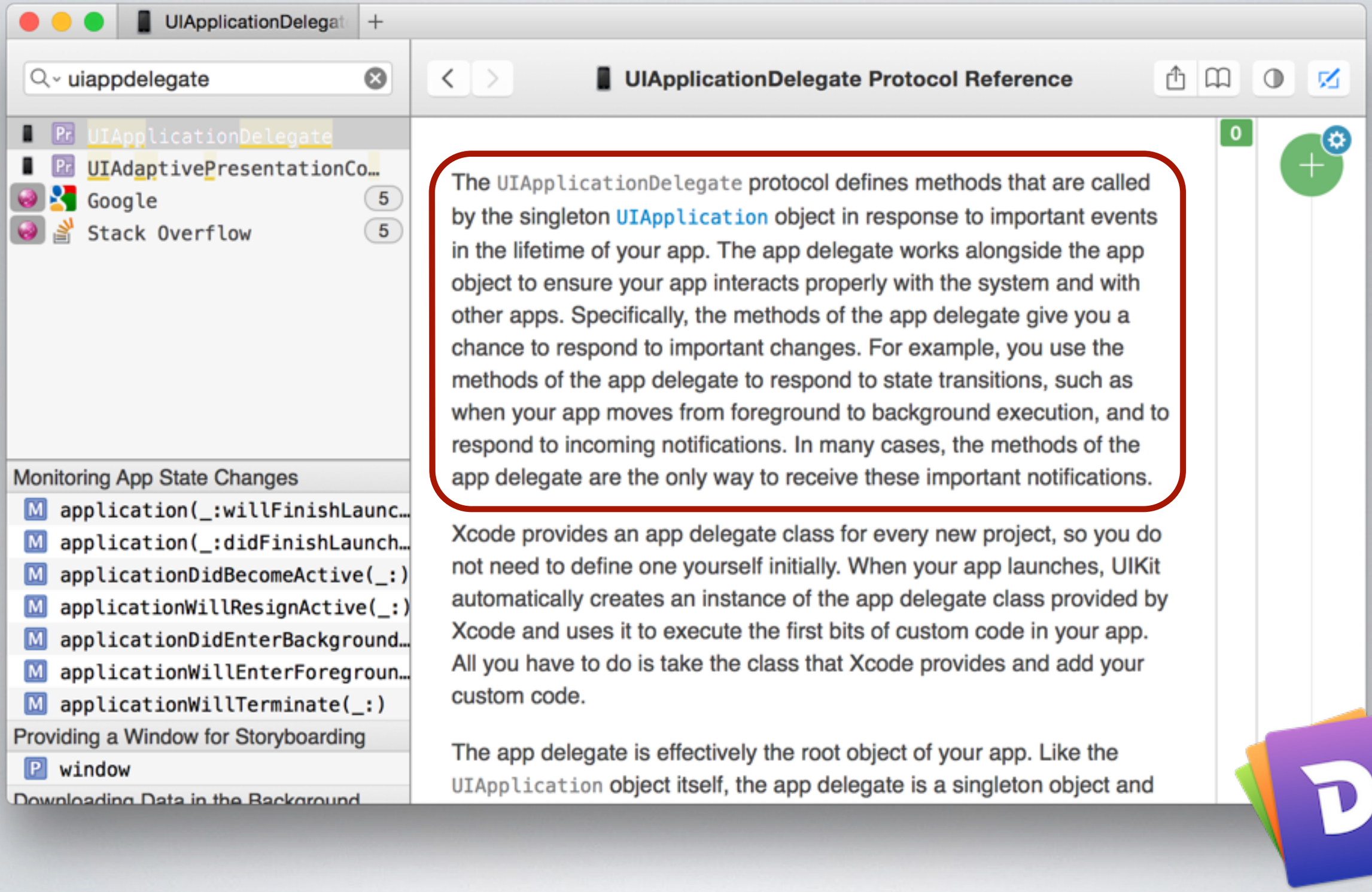

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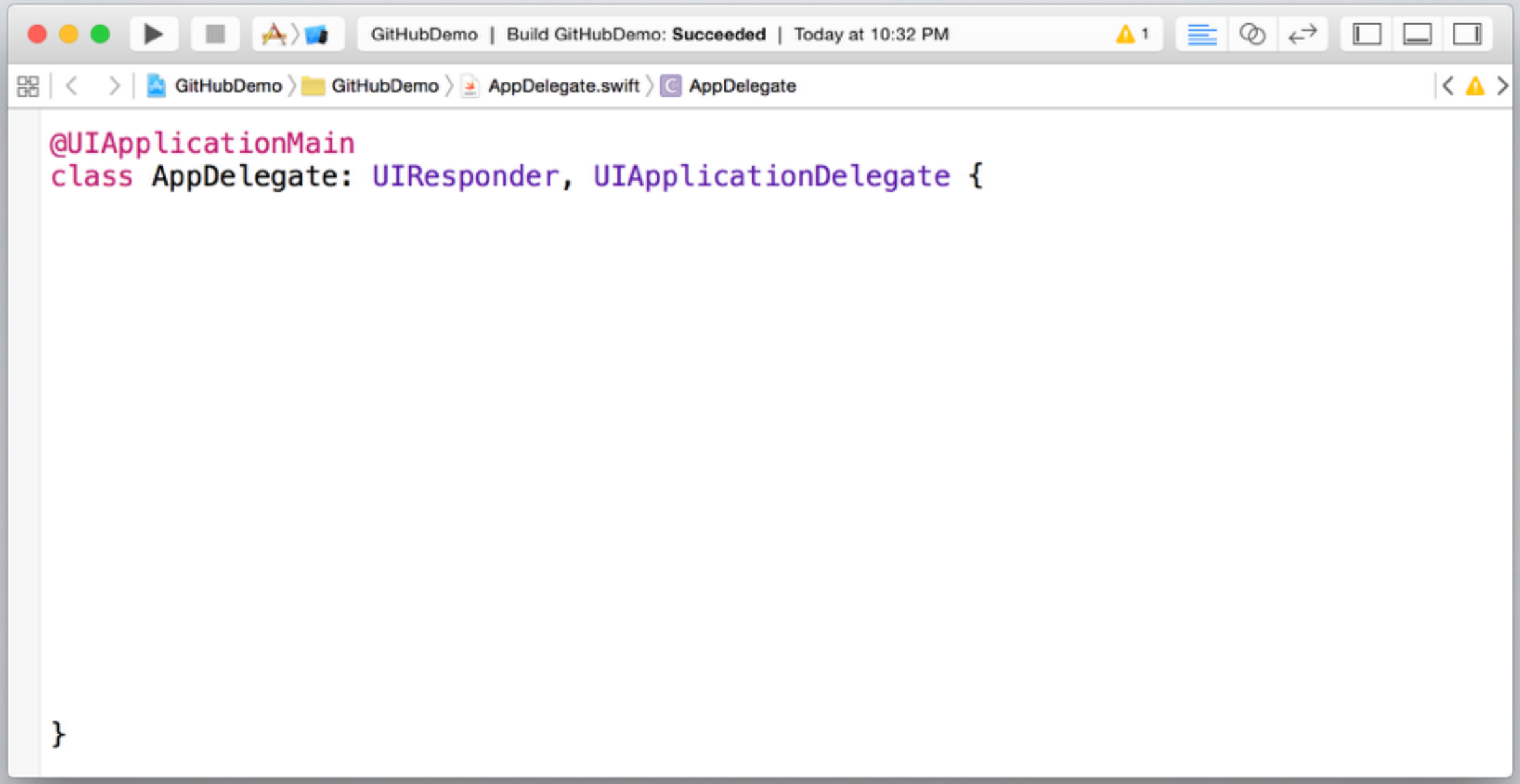

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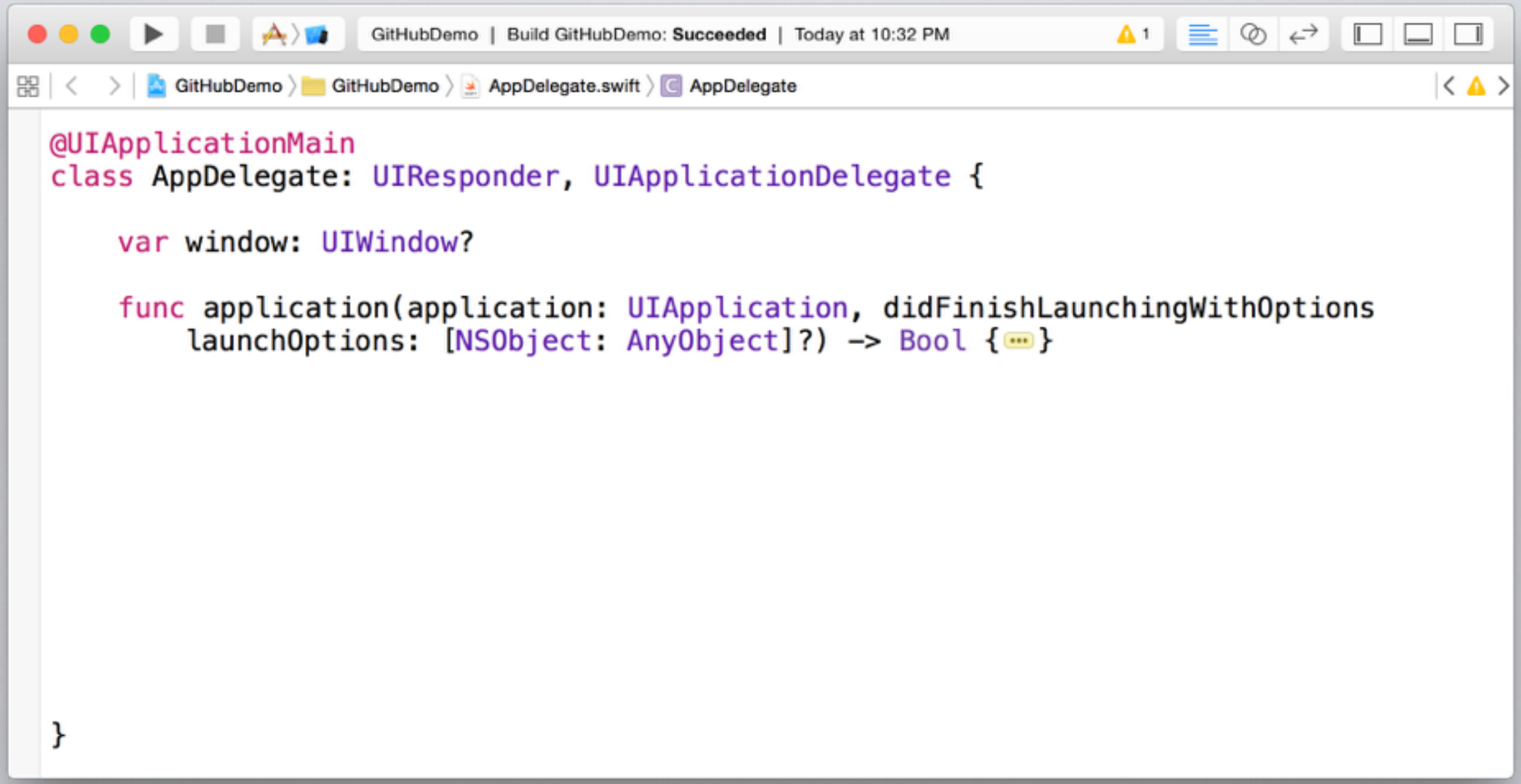

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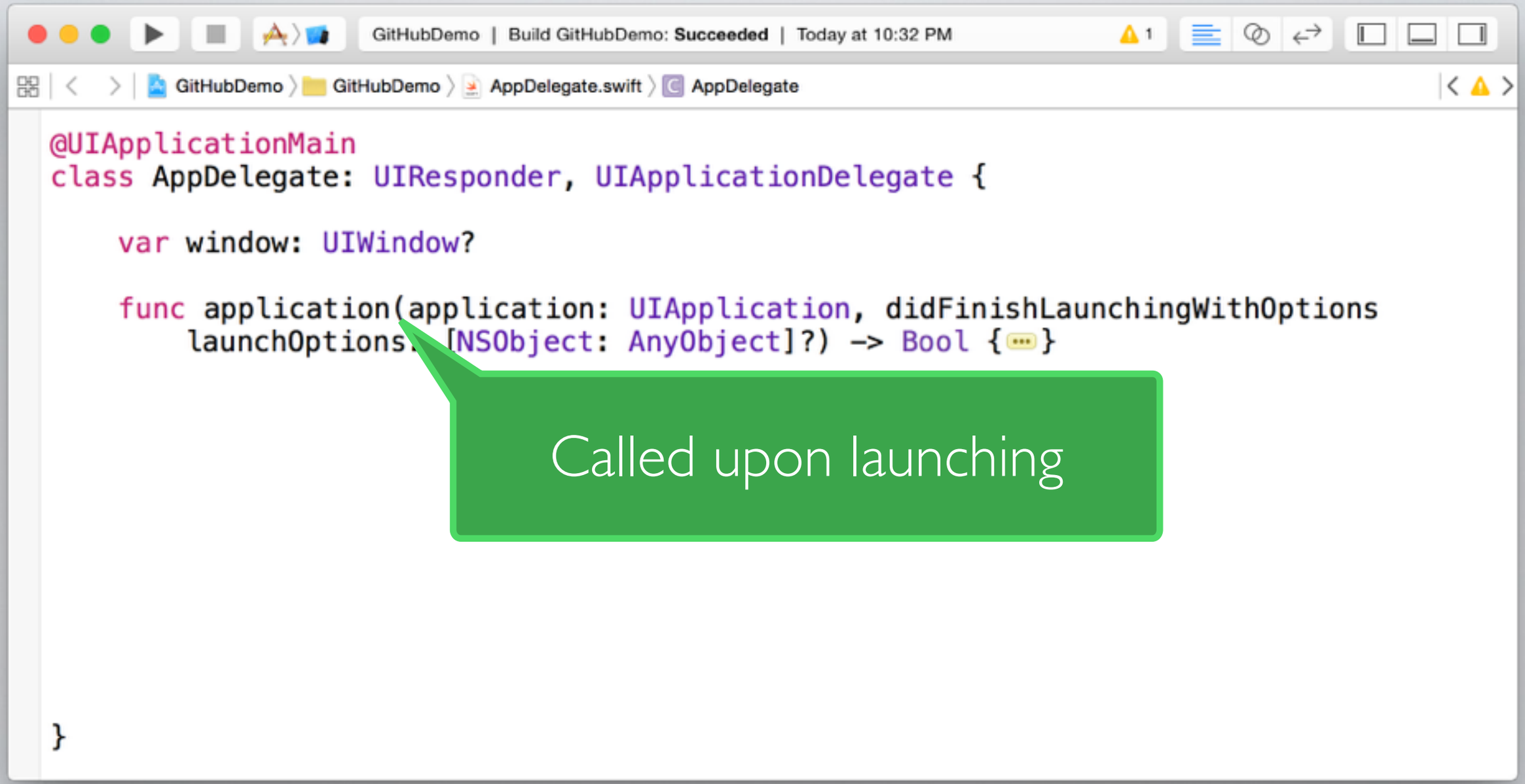

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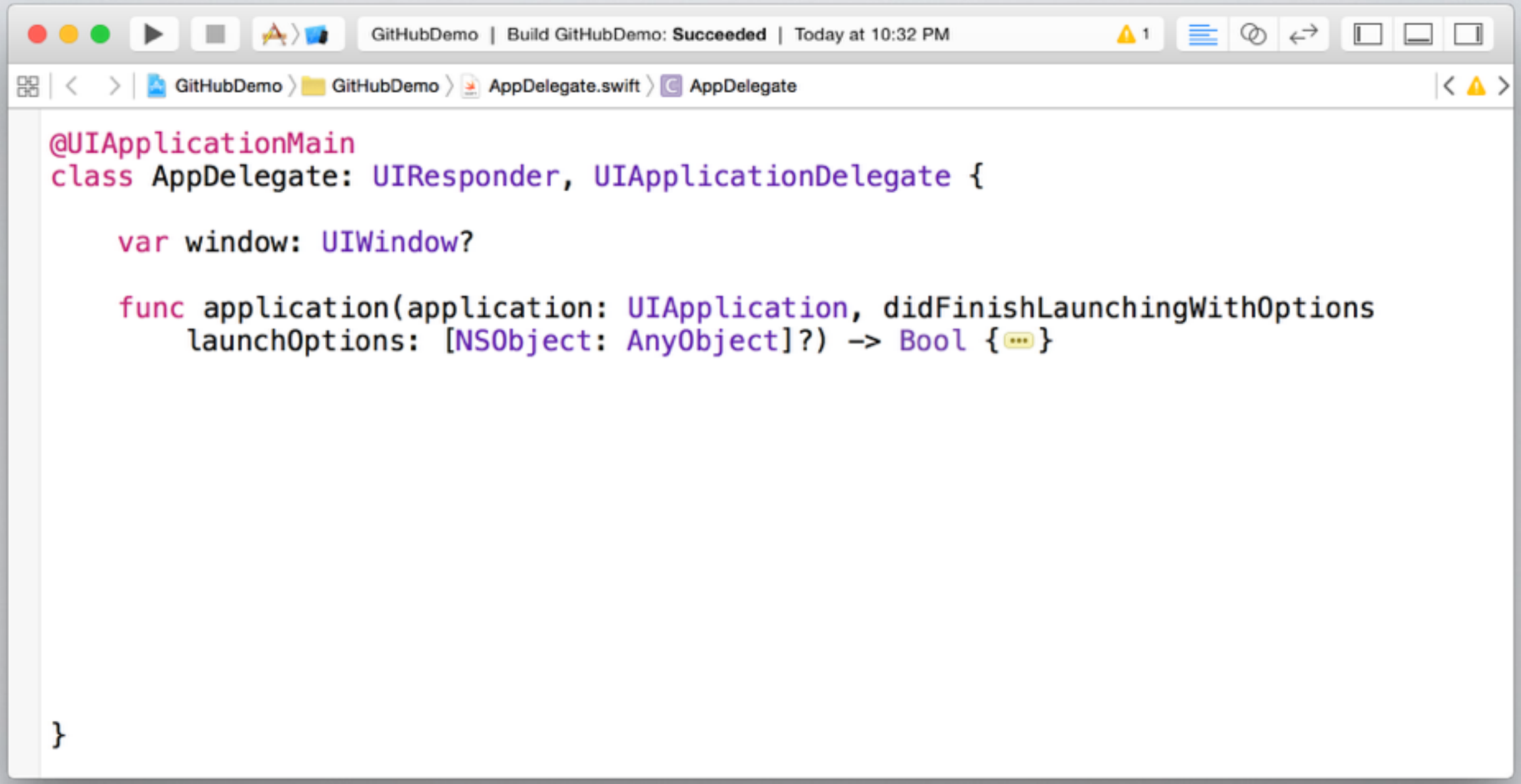

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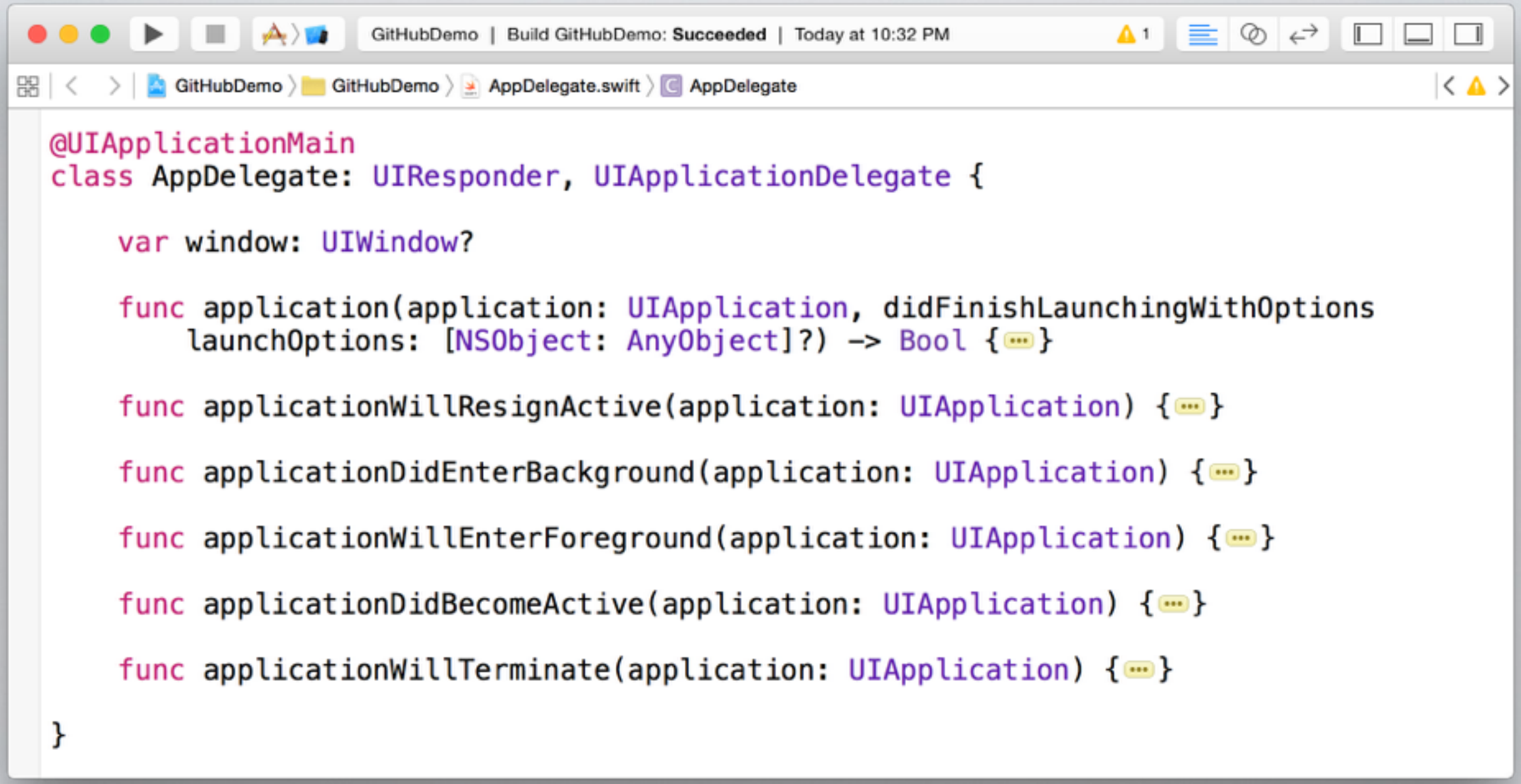

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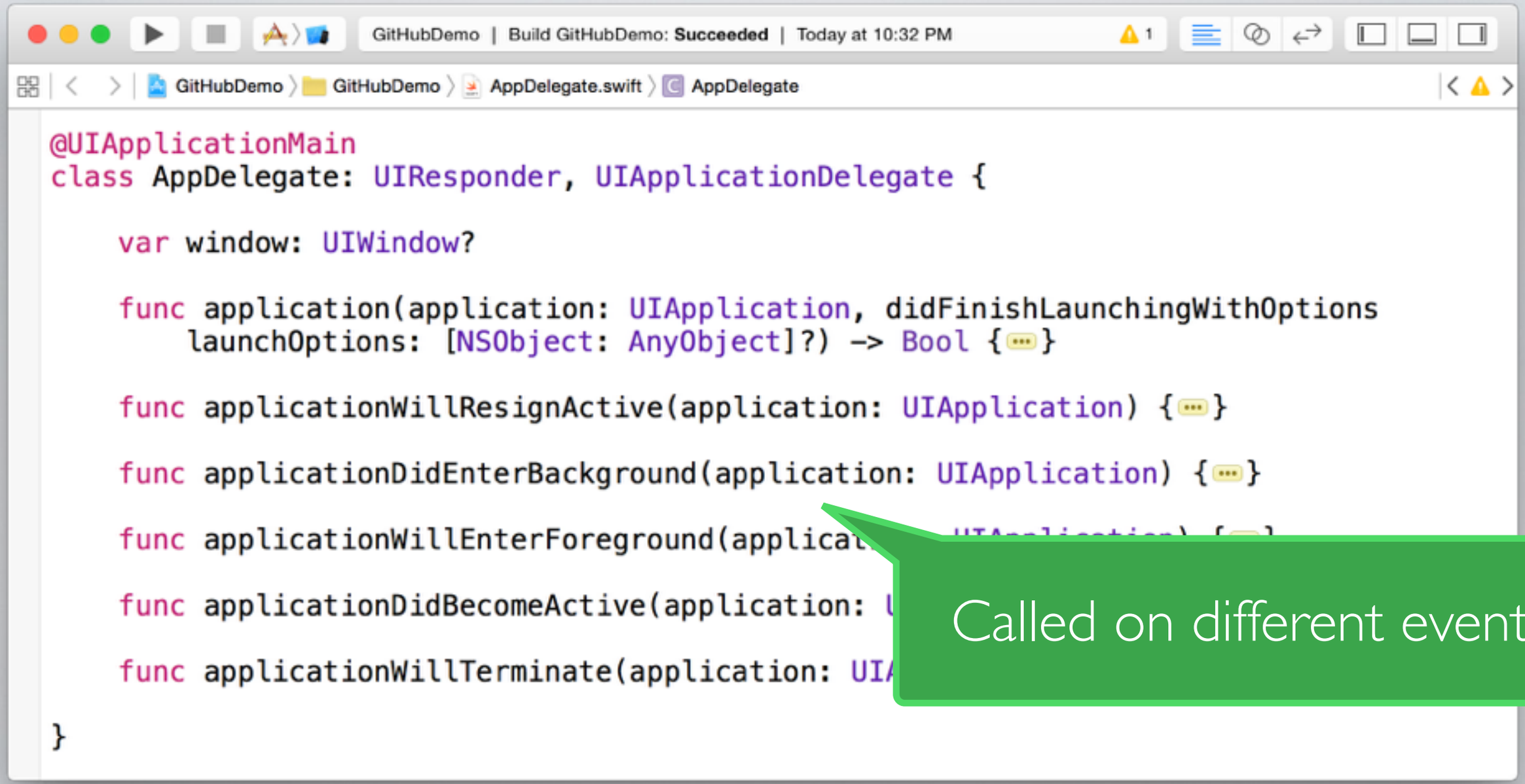

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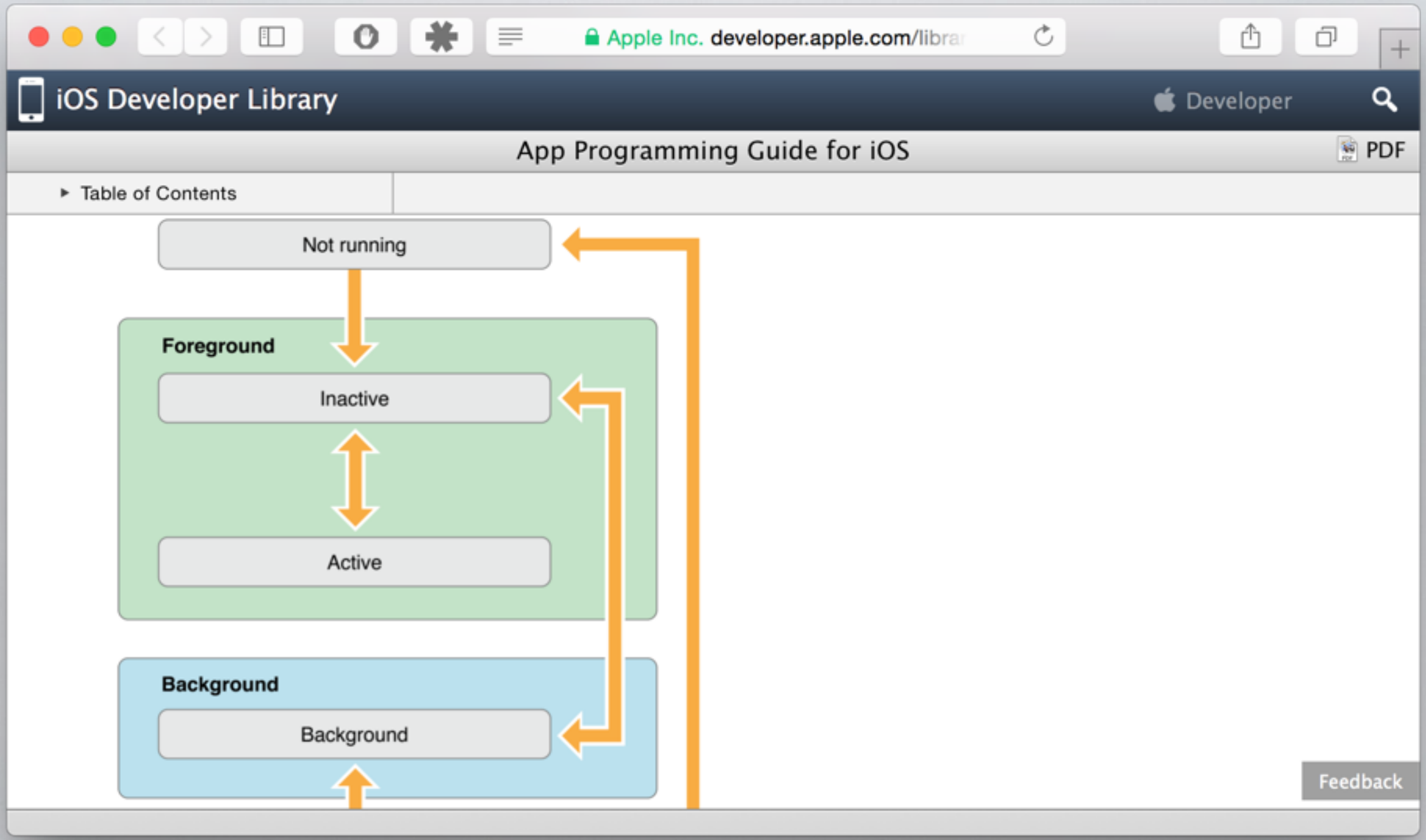
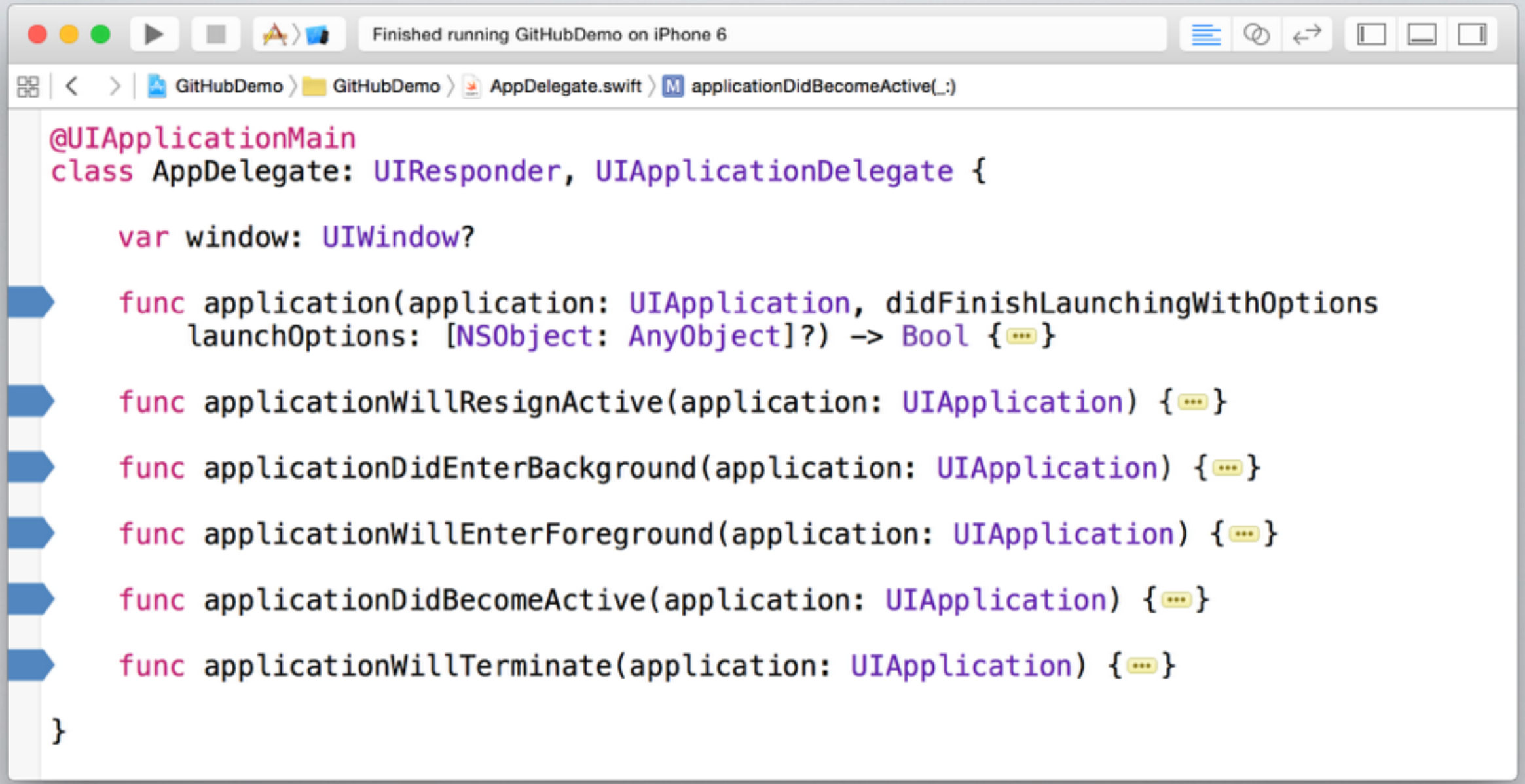
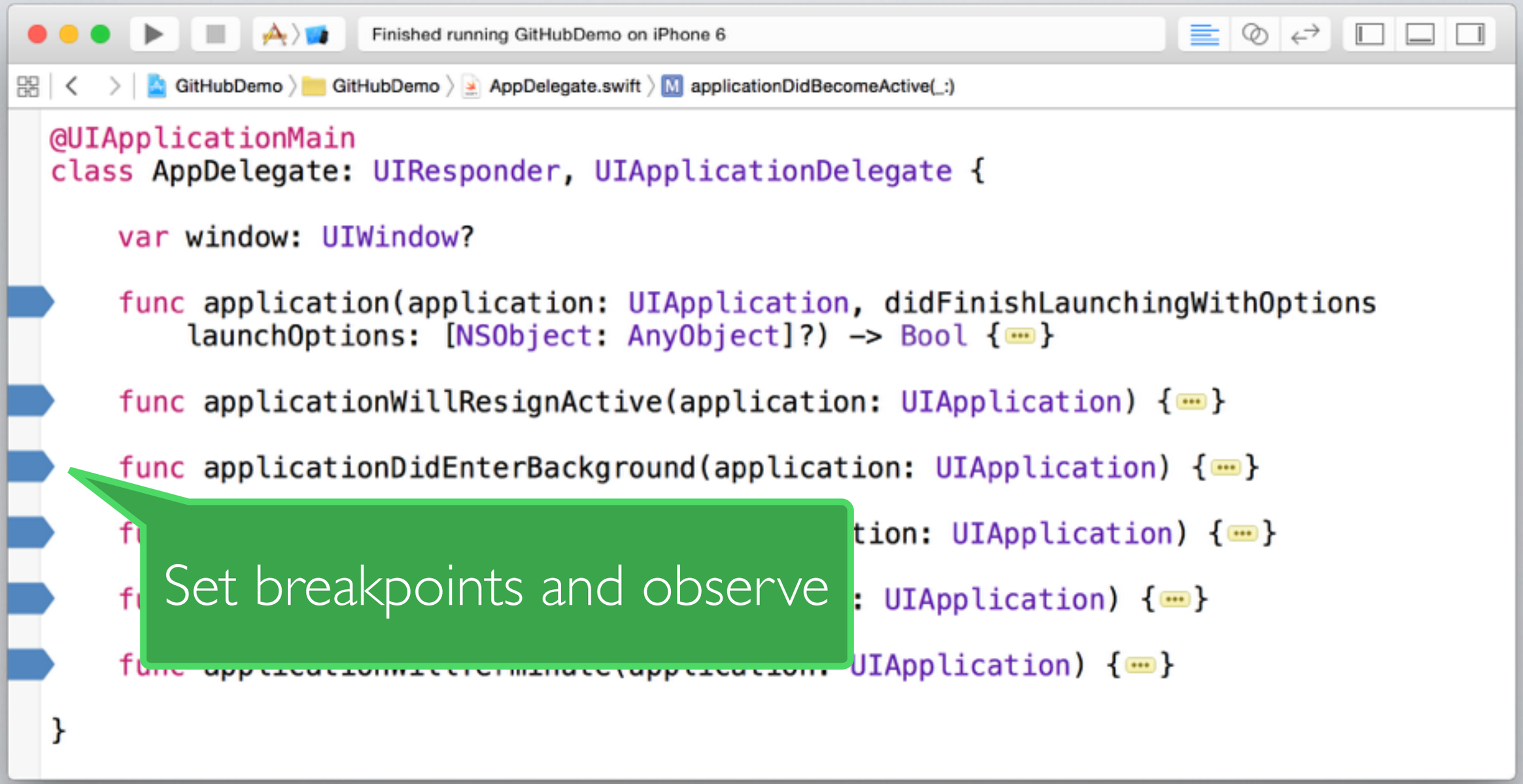


DEMO


Finished running GitHubDemo on iPhone 6
GitHubDemo
GitHubDemo
AppDelegate.swift
applicationDidBecomeActive(_:)
@UIApplicationMain
class AppDelegate: UIResponder, UIApplicationDelegate {
var window: UIWindow?
func application(application: UIApplication, didFinishLaunchingWithOptions
launchOptions: [NSObject: AnyObject]?) -> Bool {...}
func applicationWillResignActive(application: UIApplication) {...}
func applicationDidEnterBackground(application: UIApplication) {...}
func applicationWillEnterForeground(application: UIApplication) {...}
func applicationDidBecomeActive(application: UIApplication) {...}
func applicationWillTerminate(application: UIApplication) {...}
}

DEMO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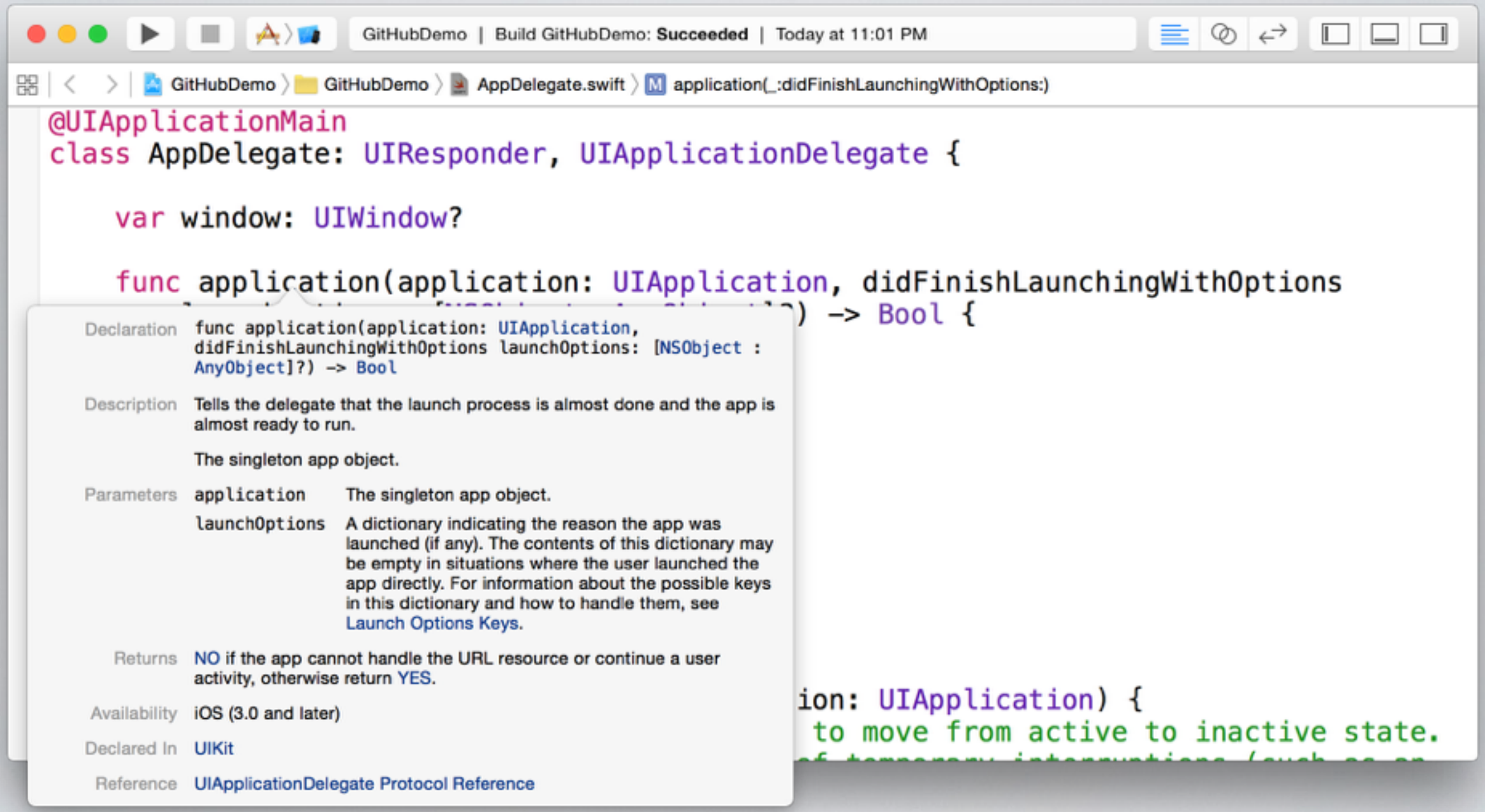
AppDelegate.swift
applicationDidBecomeActive(_:)
@UIApplicationMain
class AppDelegate: UIResponder, UIApplicationDelegate {
var window: UIWindow?
func application(application: UIApplication, didFinishLaunchingWithOptions
launchOptions: [NSObject: AnyObject]?) -> Bool {...}
func applicationWillResignActive(application: UIApplication) {...}
func applicationDidEnterBackground(application: UIApplication) {...}
Set breakpoints and observe
}

PROGRAMMATICALLY



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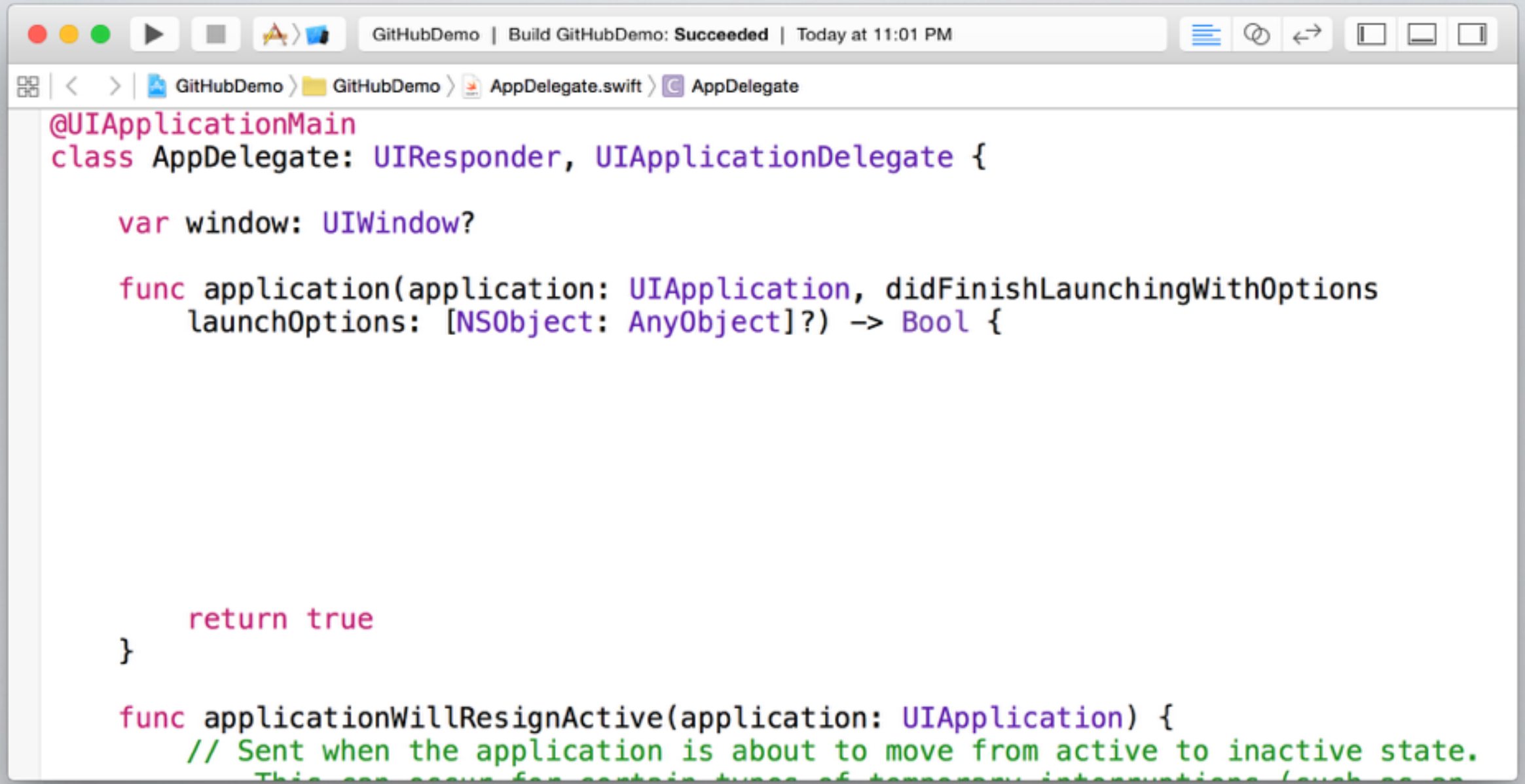

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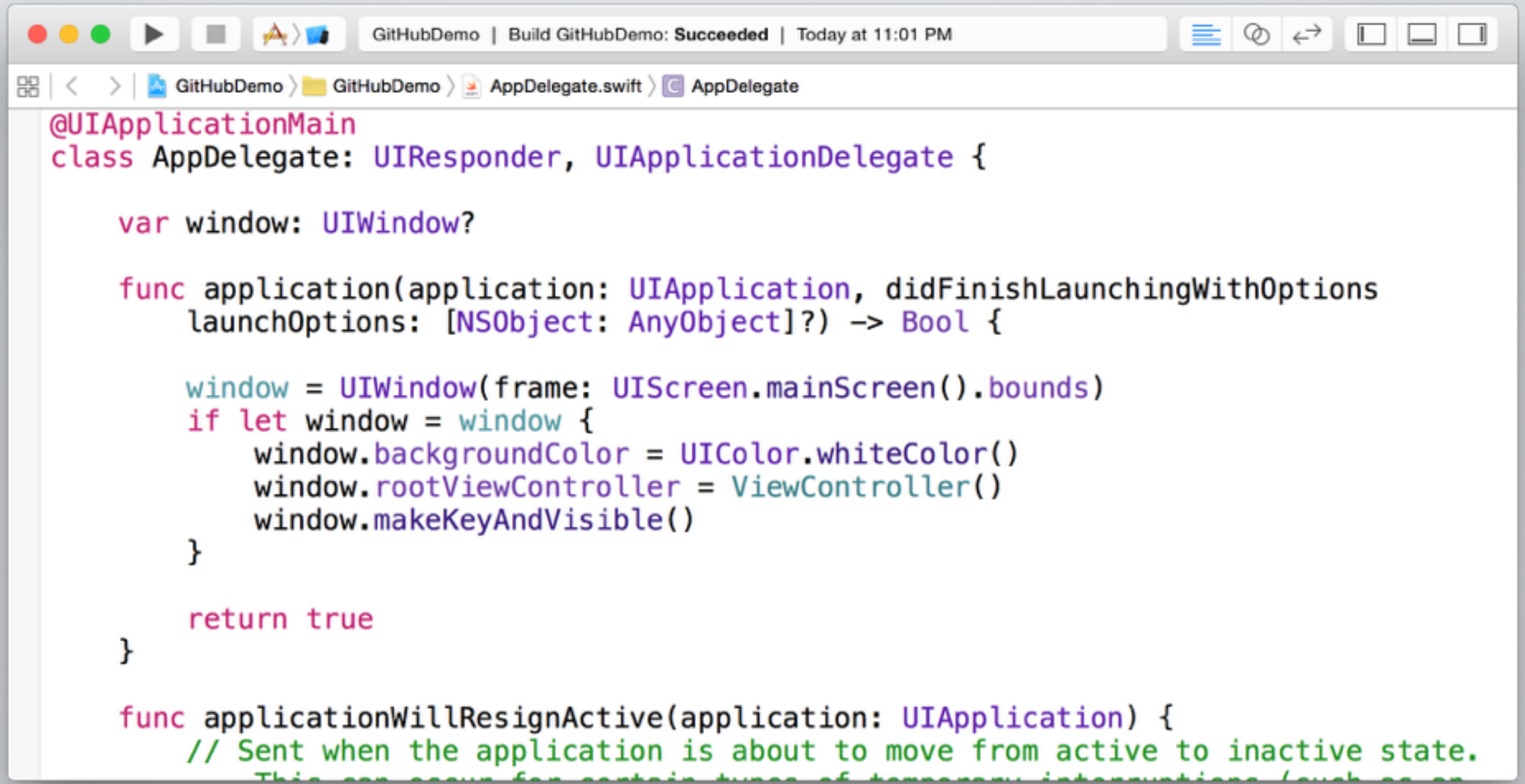

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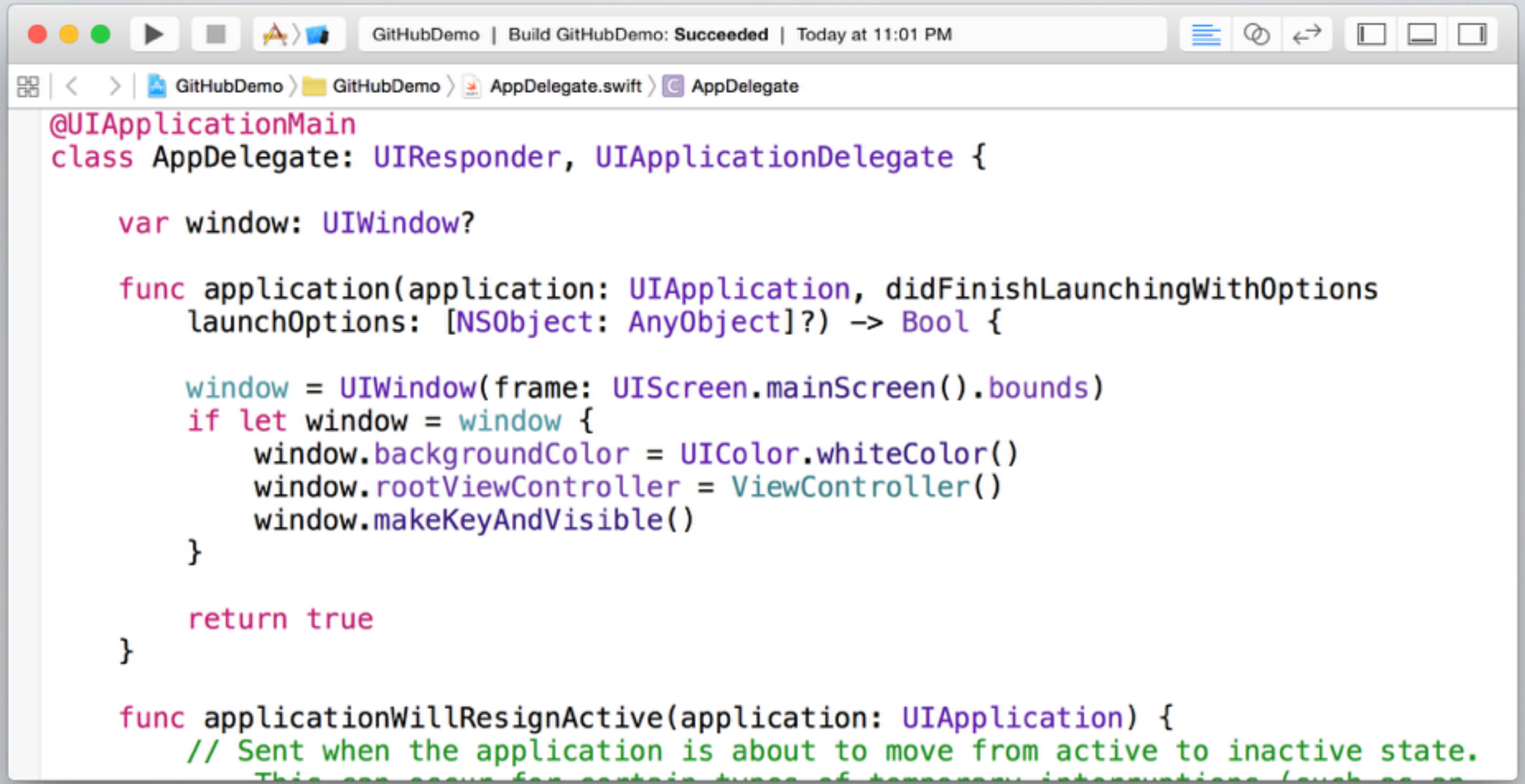

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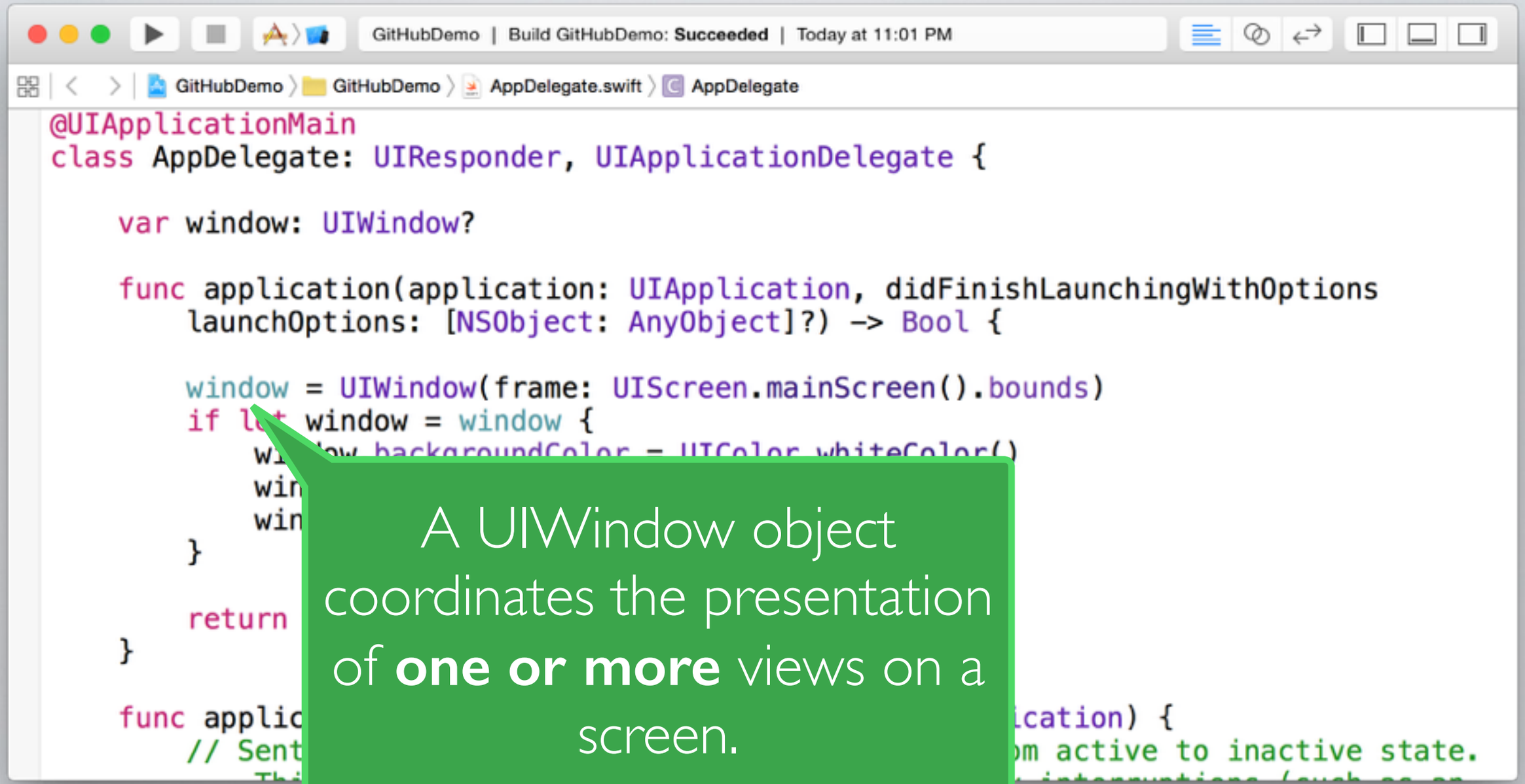

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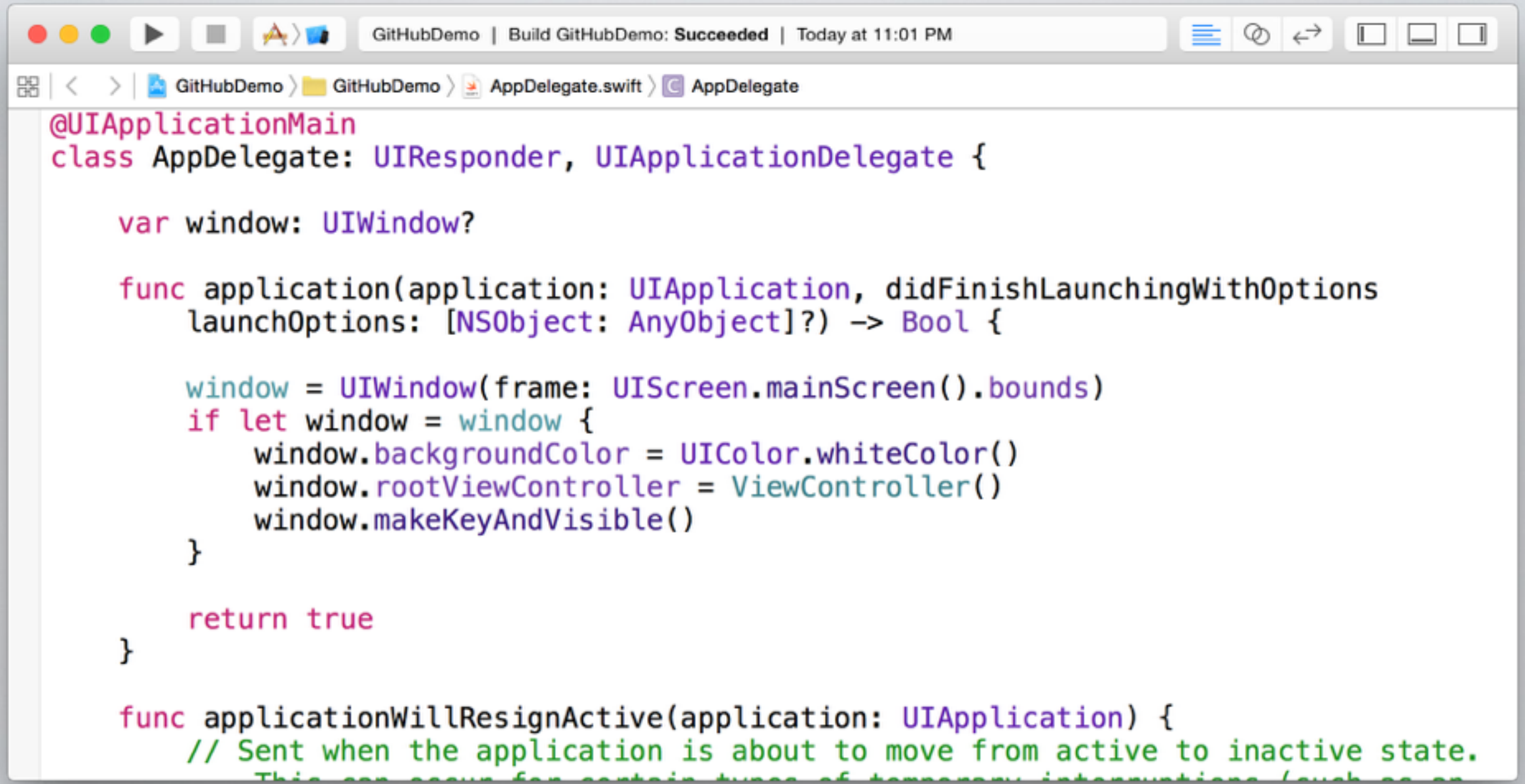

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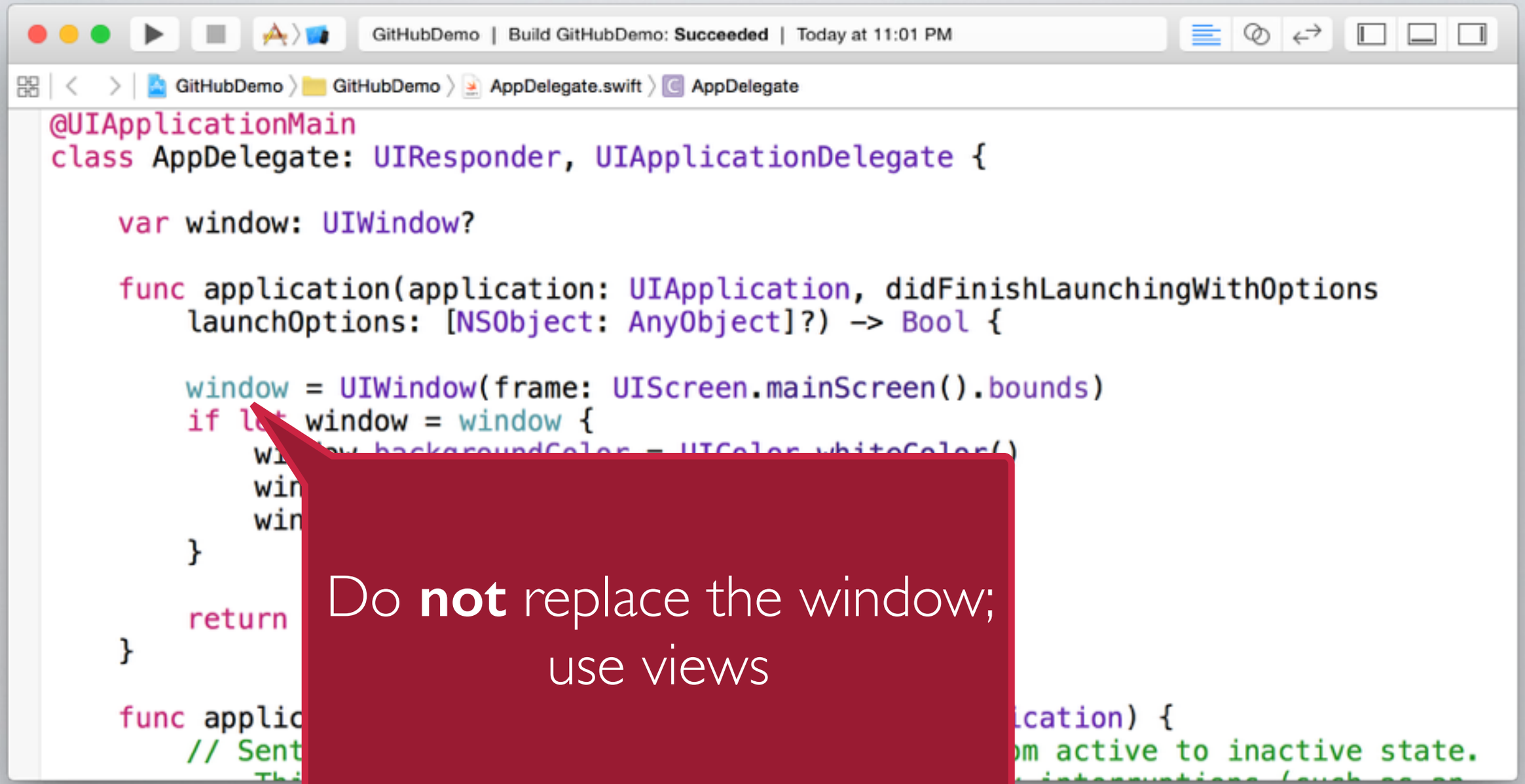

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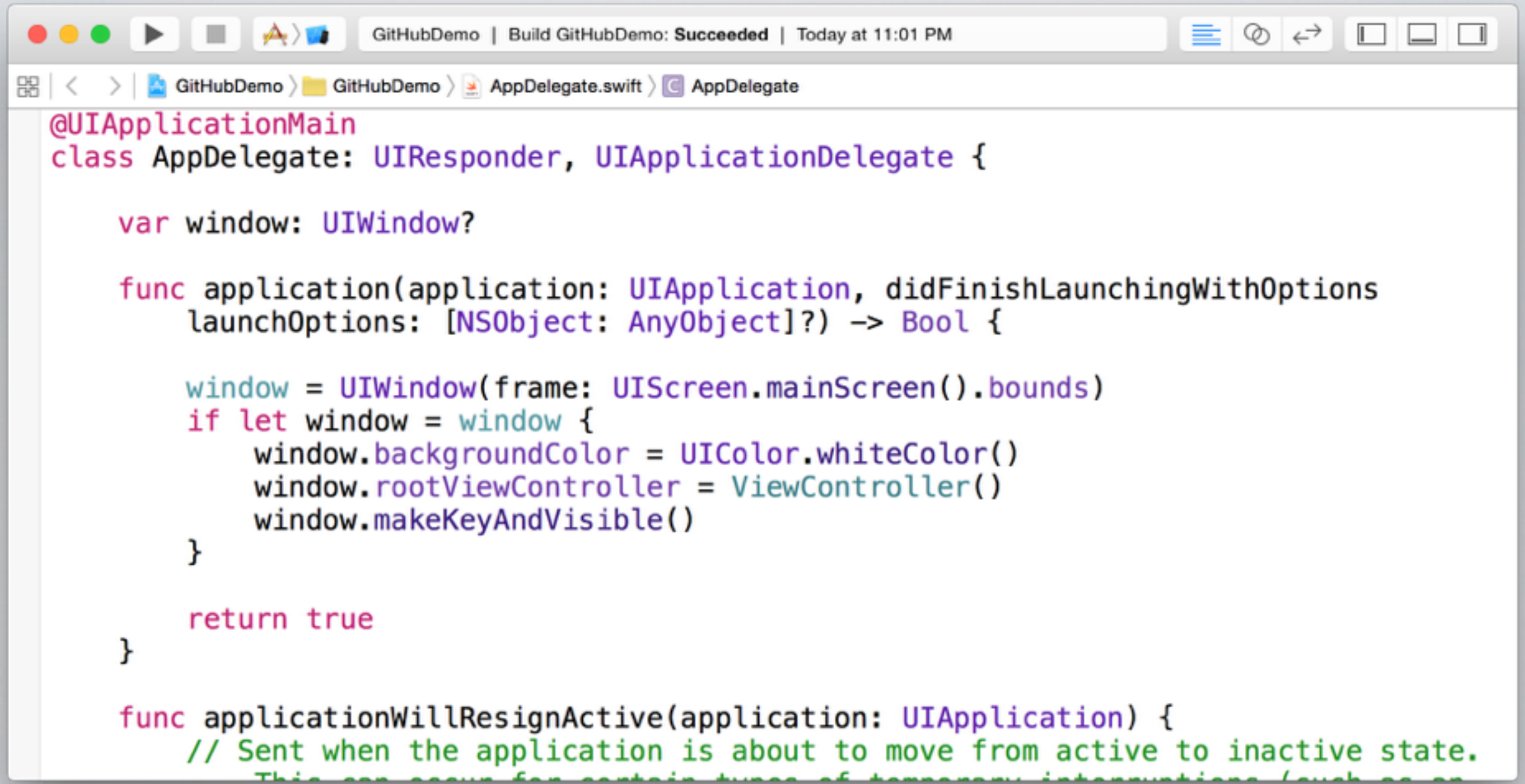

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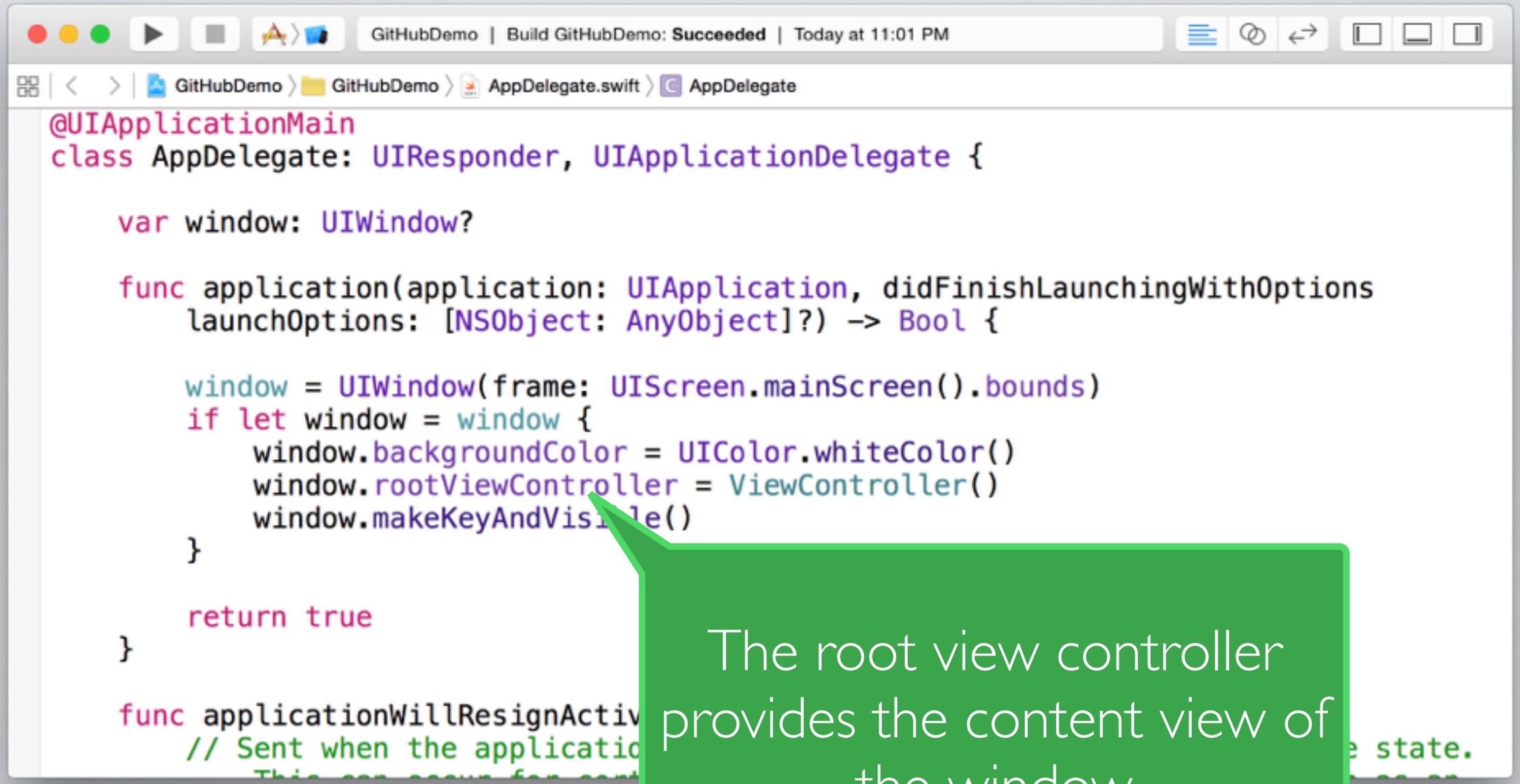

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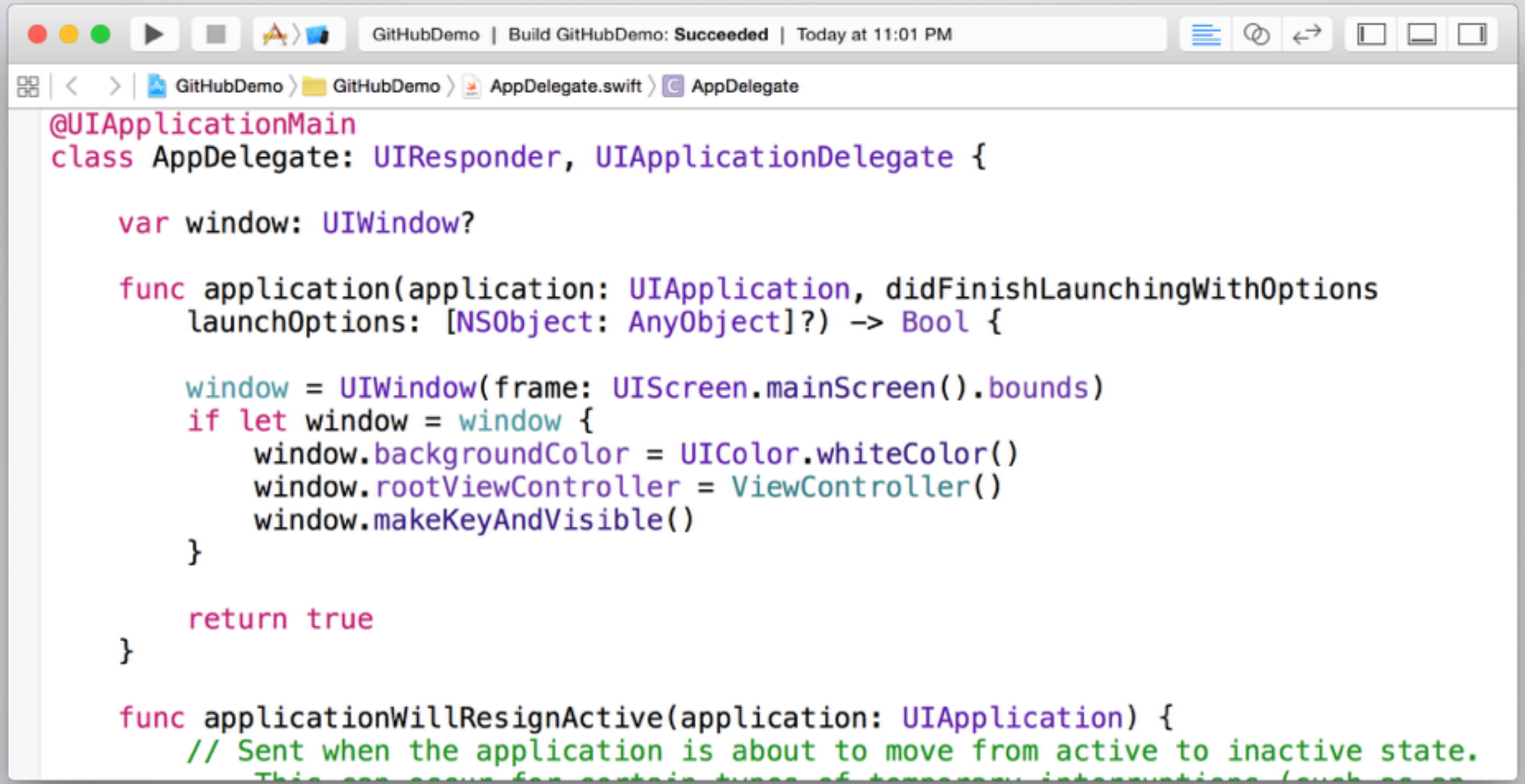

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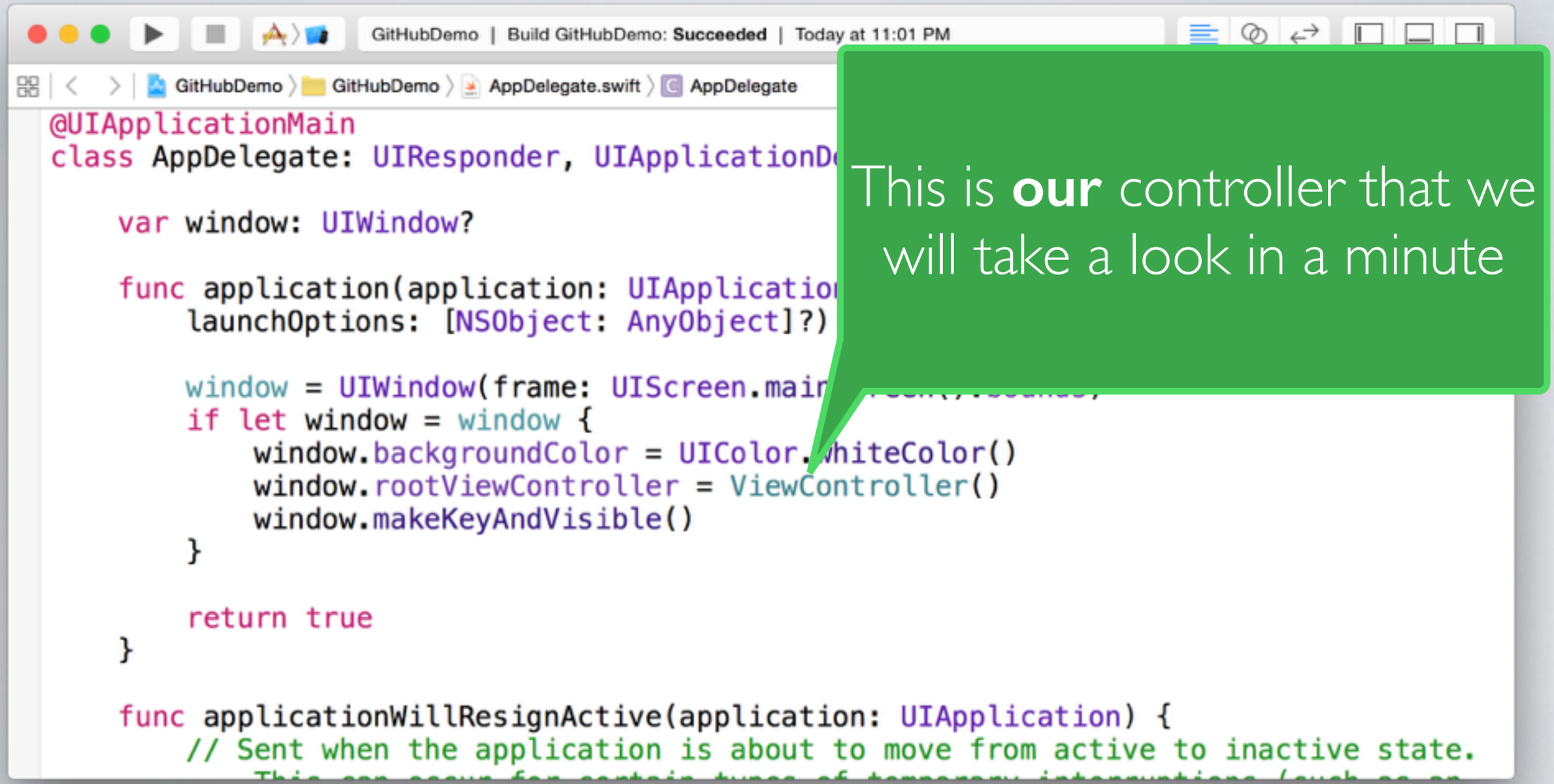

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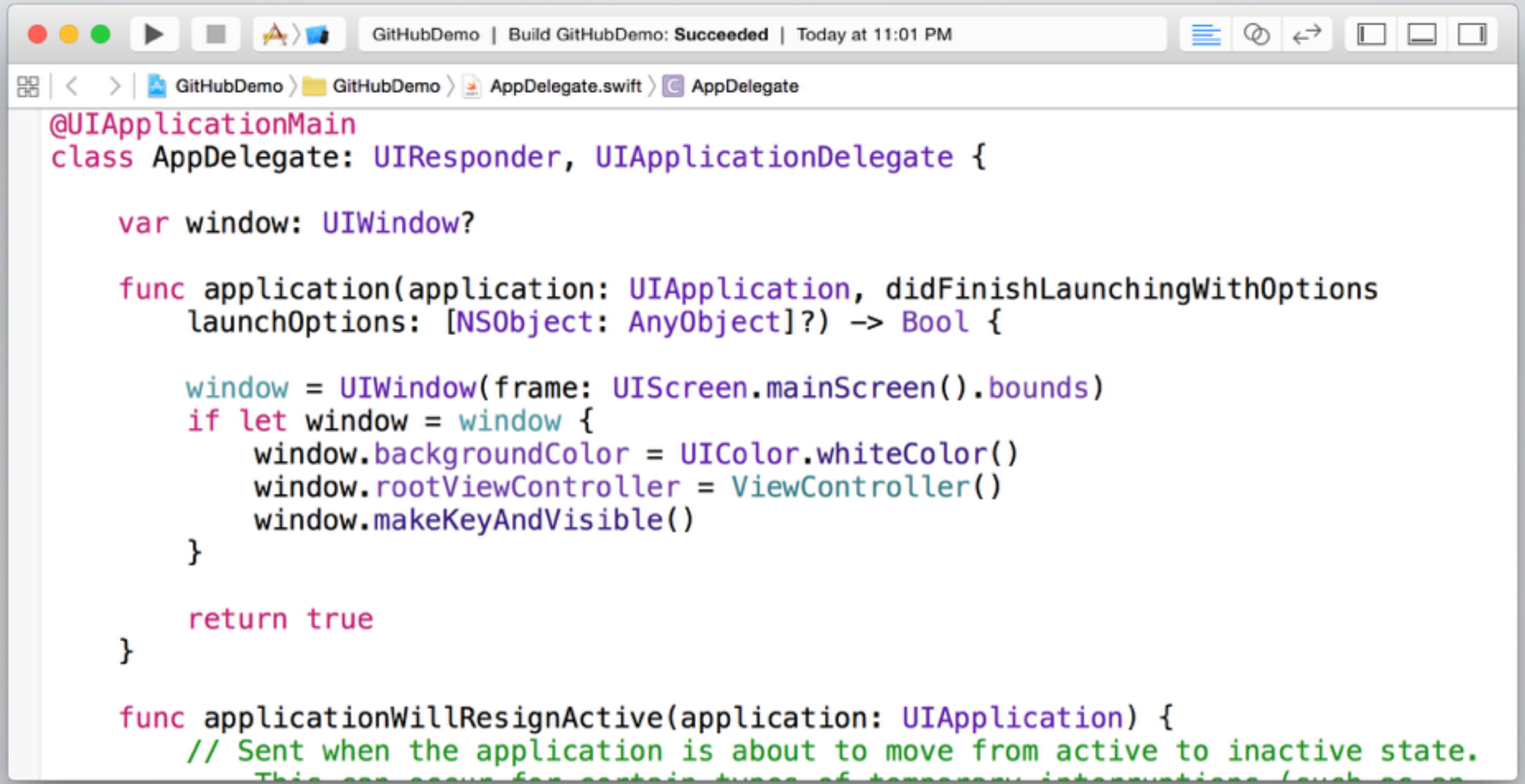

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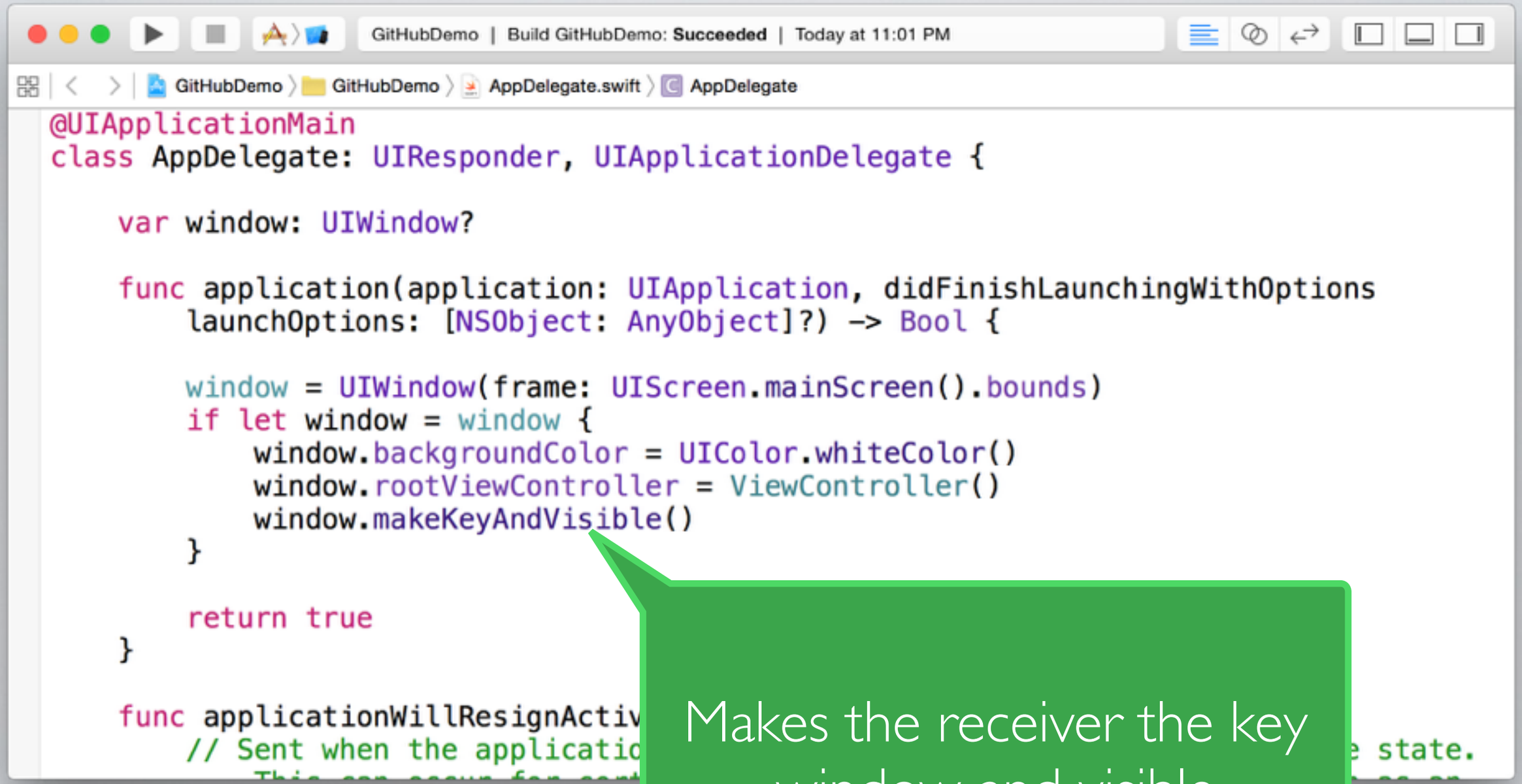

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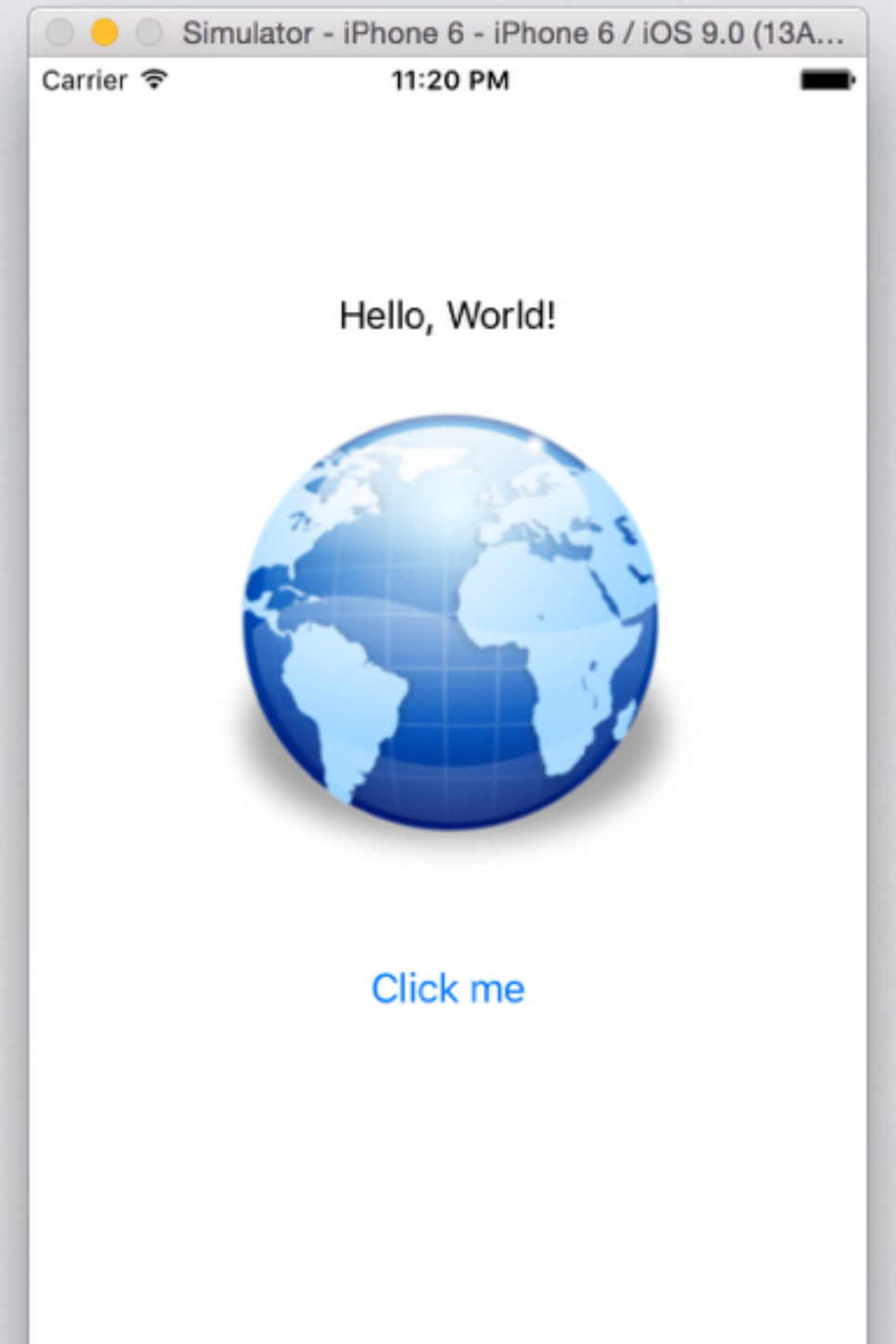
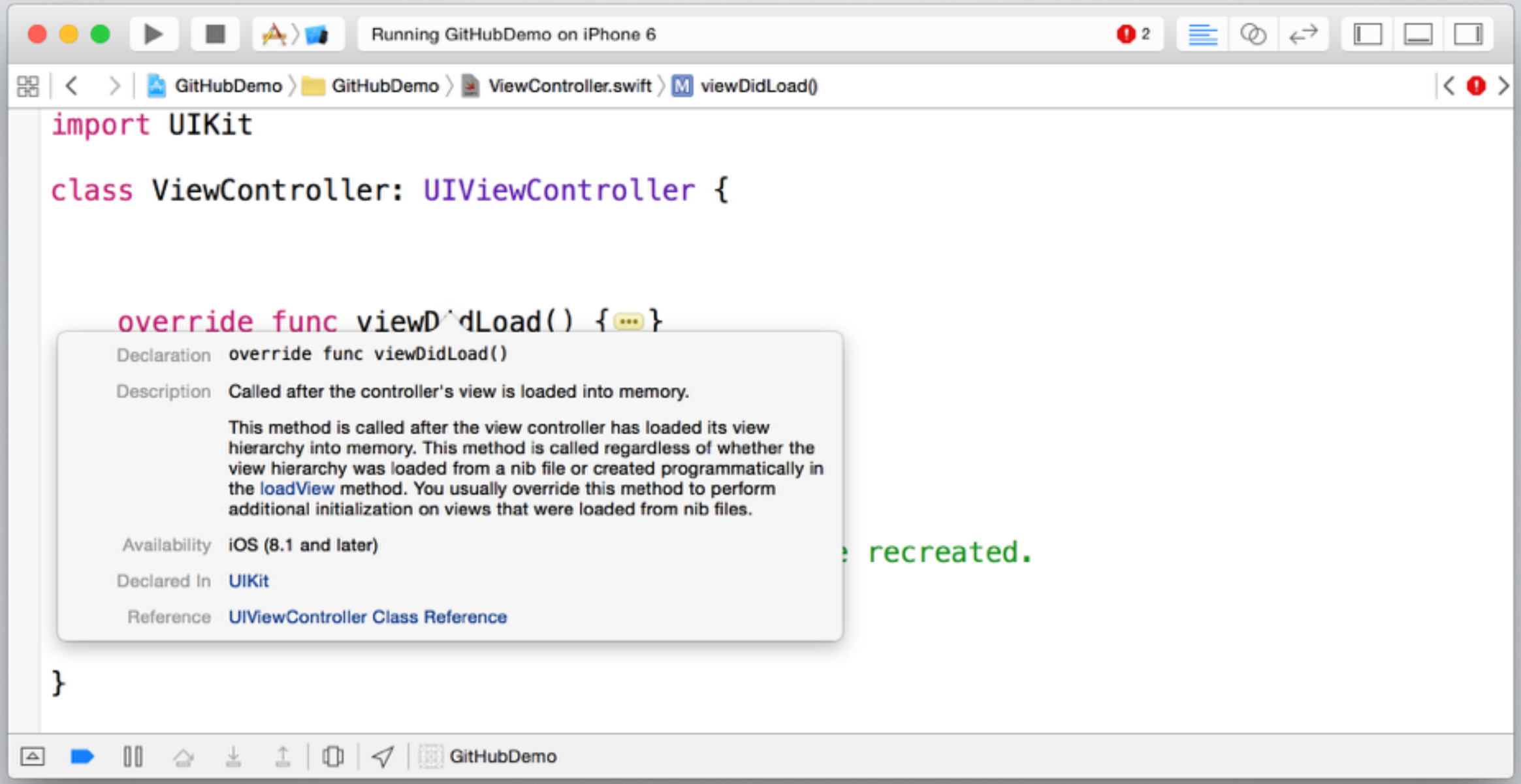


PROGRAMMATICALLY

This is just an example. Don't do this programmatically; use storyboards as we shall see

PROGRAMMATICALLY



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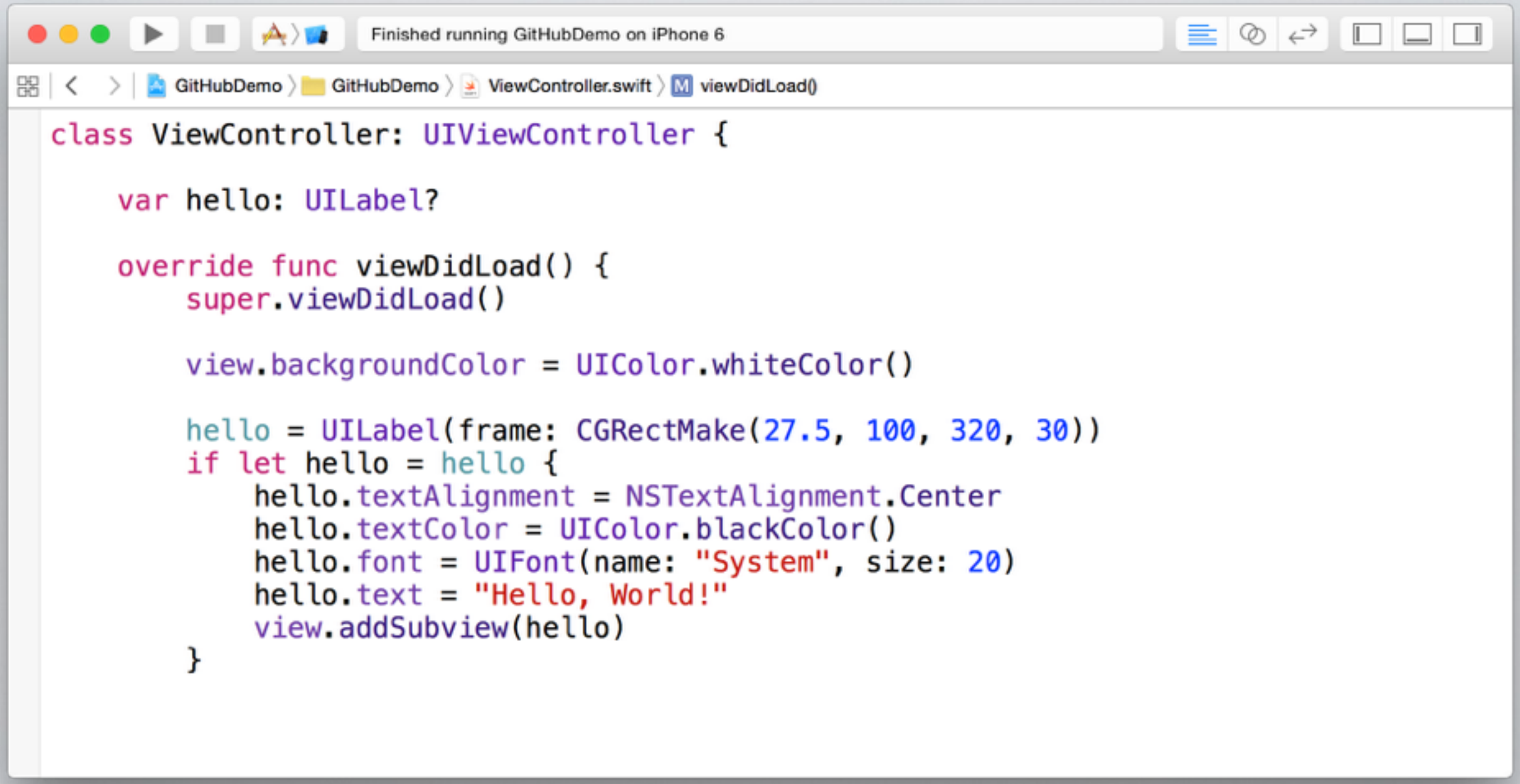

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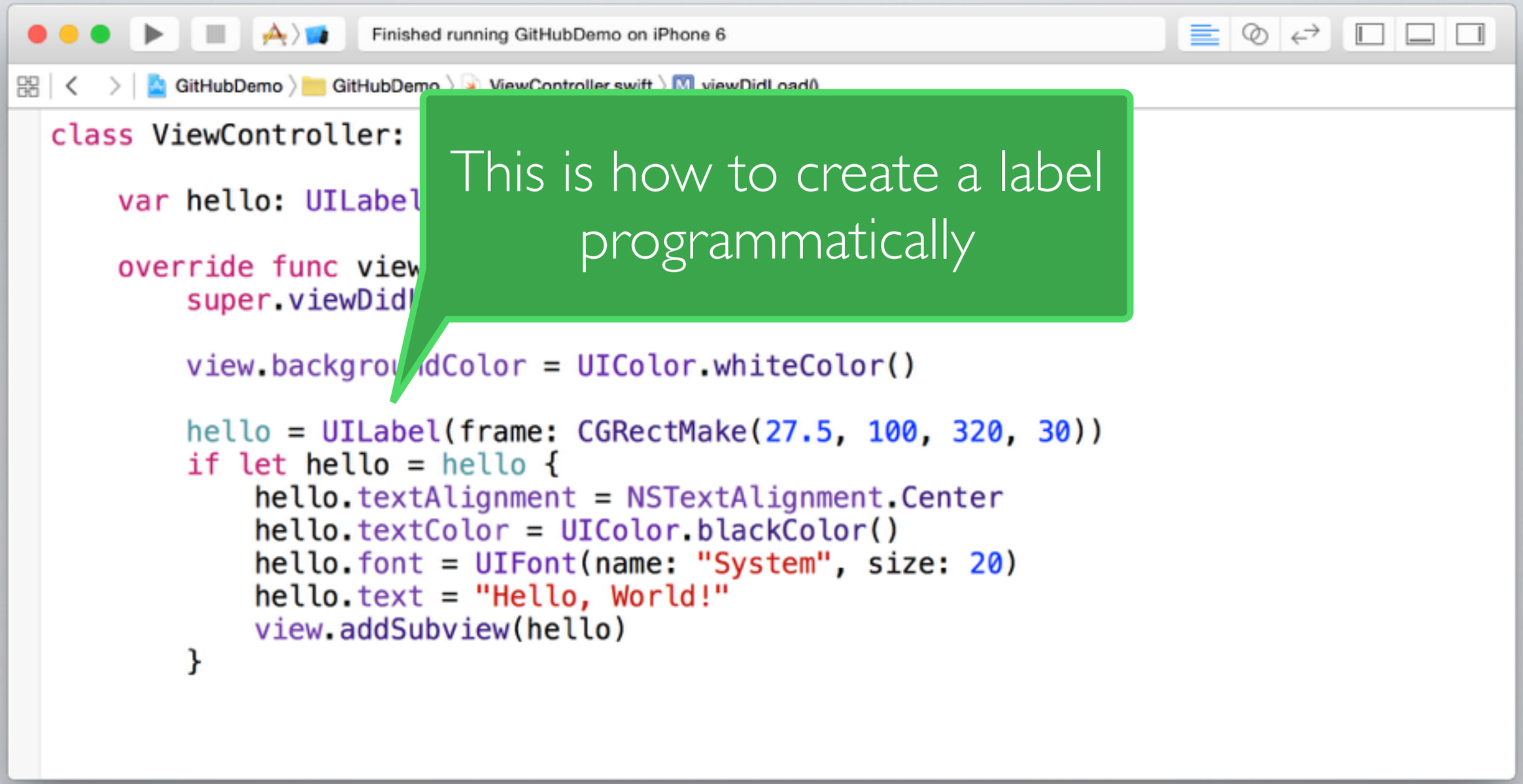

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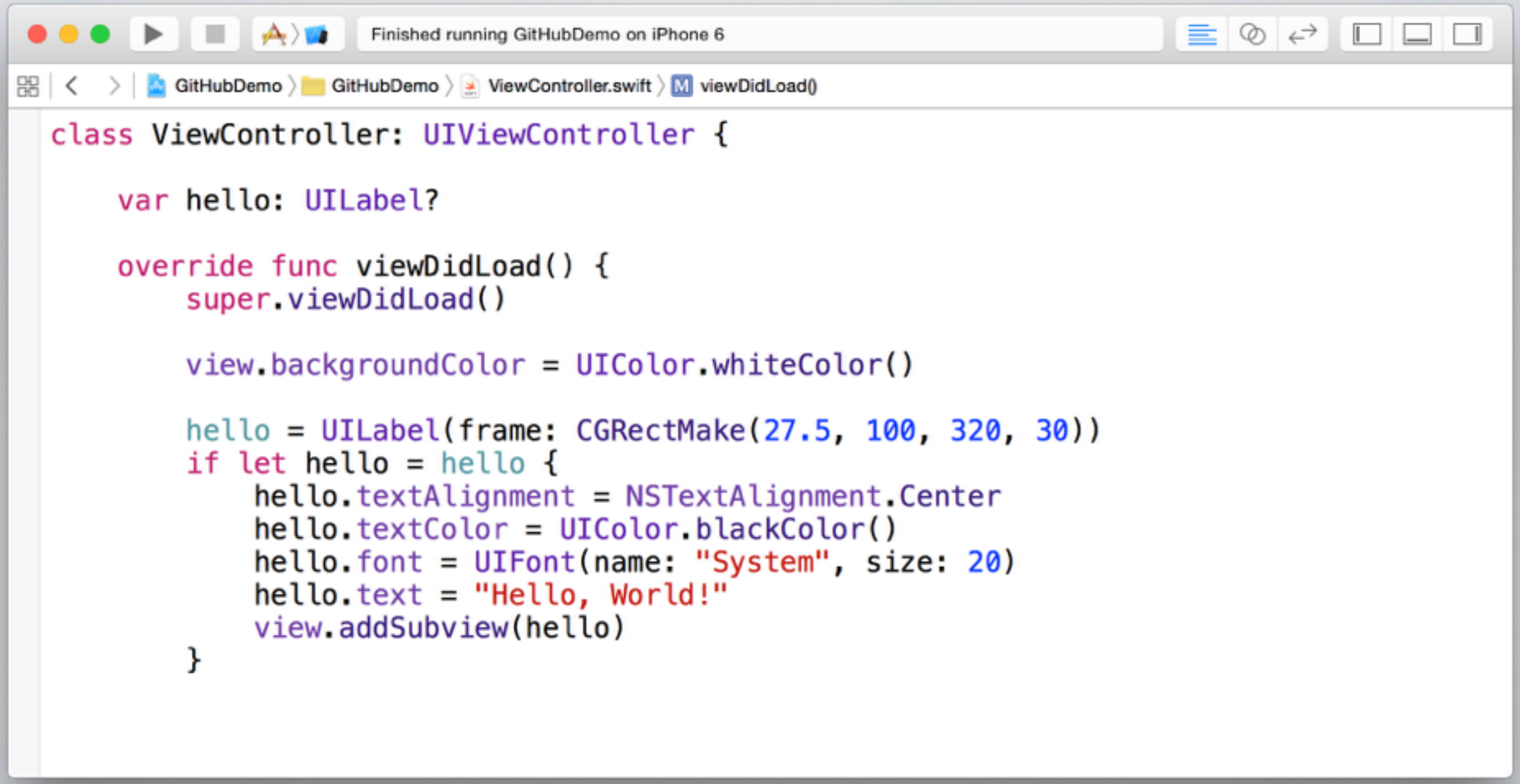

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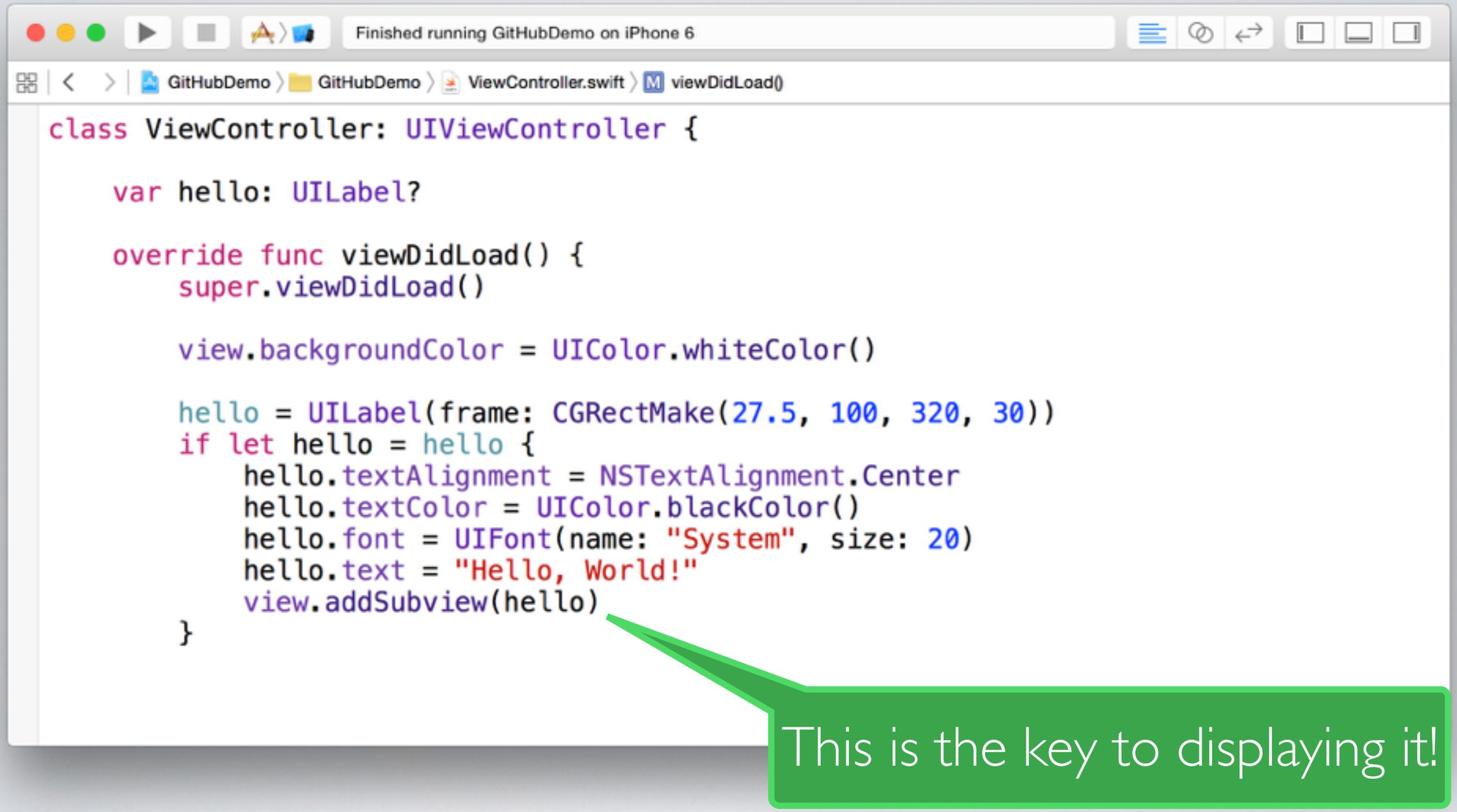
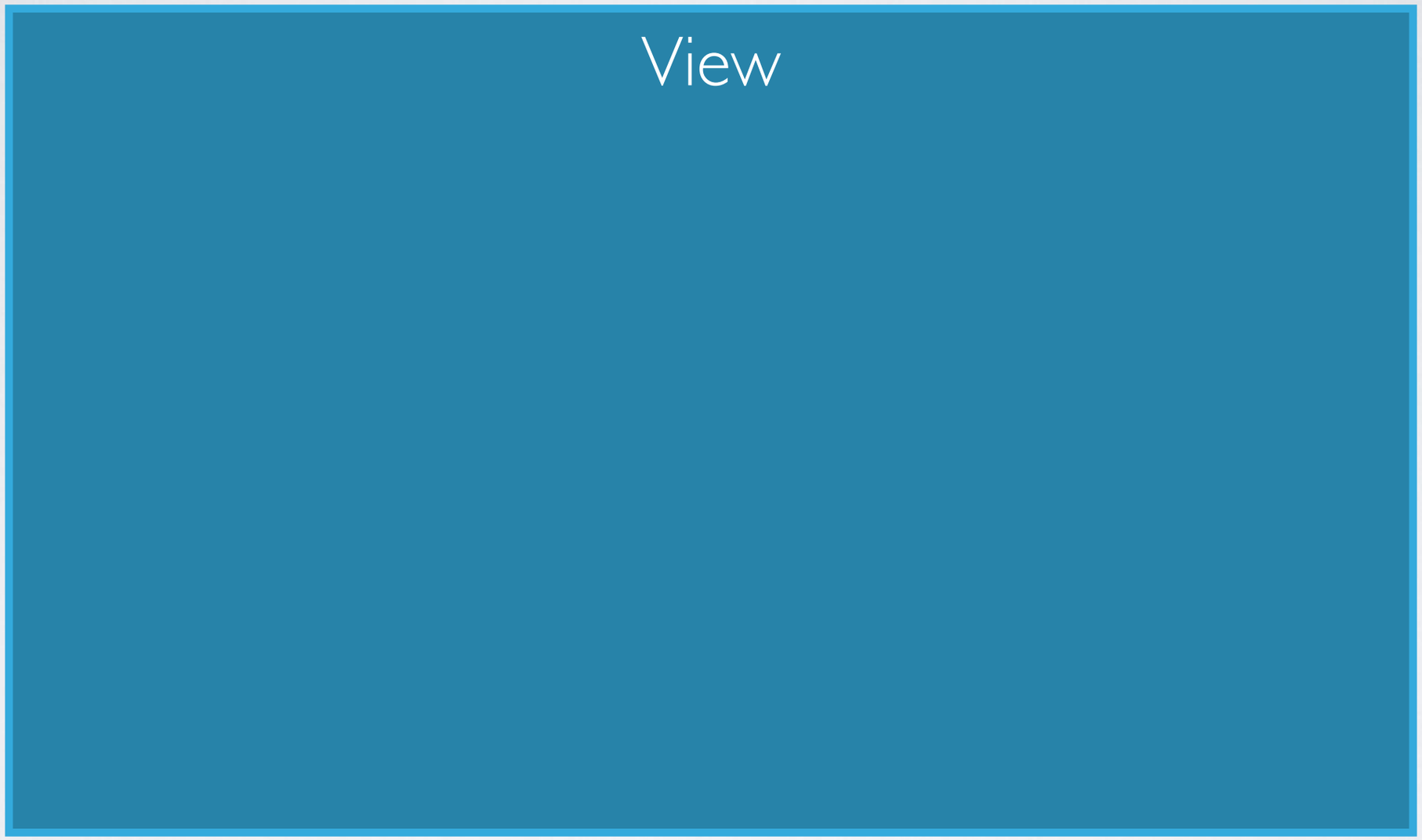


DETOUR – COMPOSITE PATTERN



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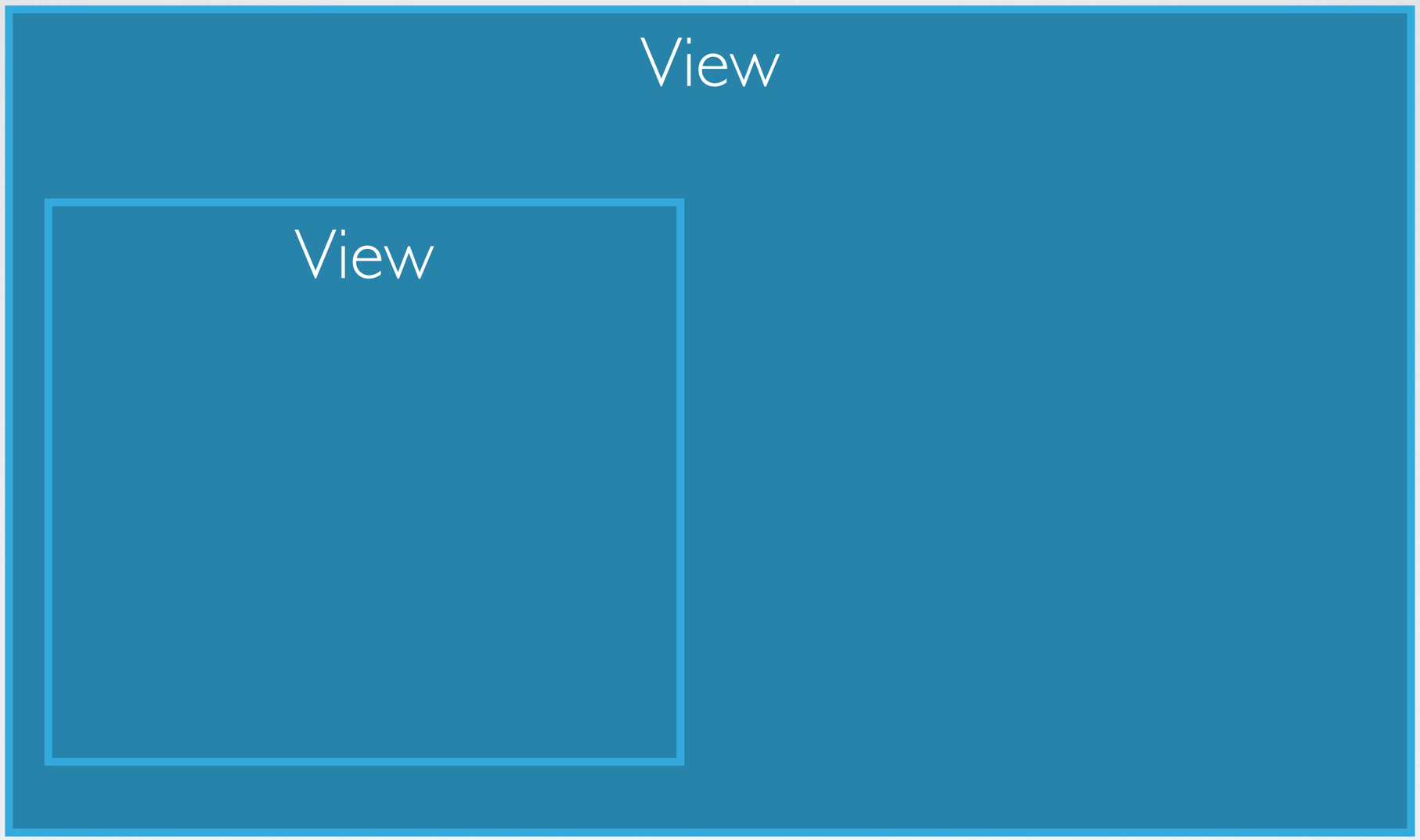

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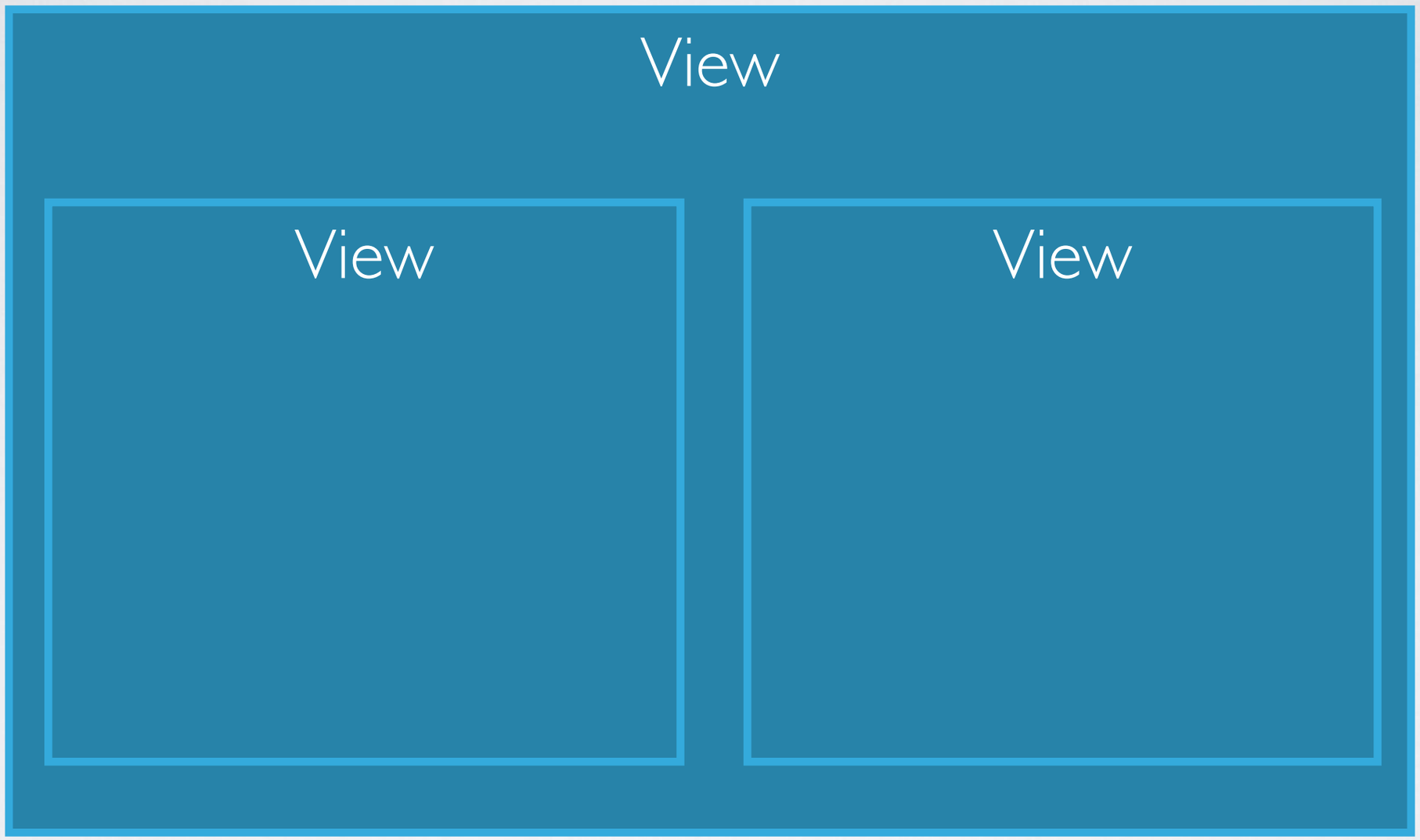

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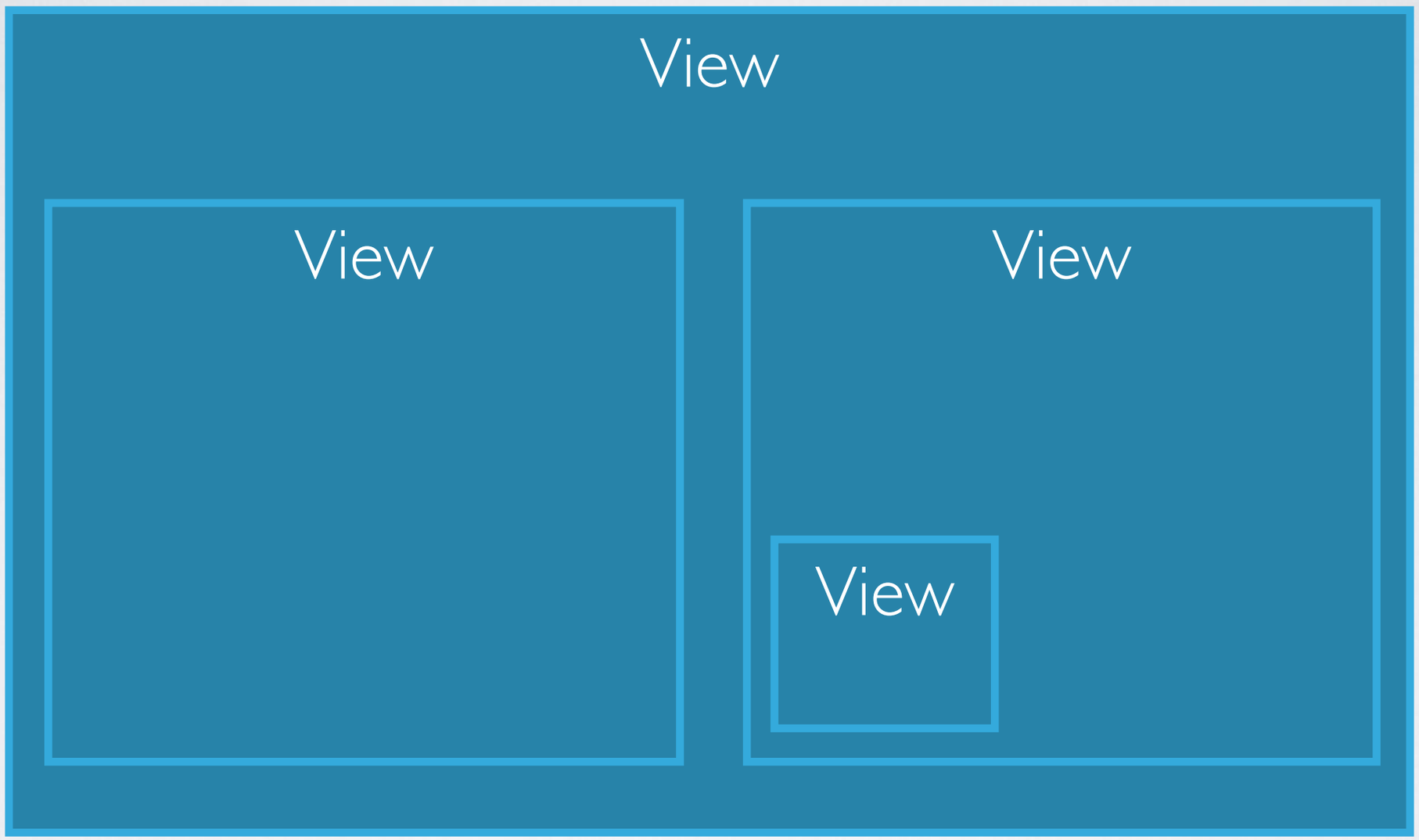

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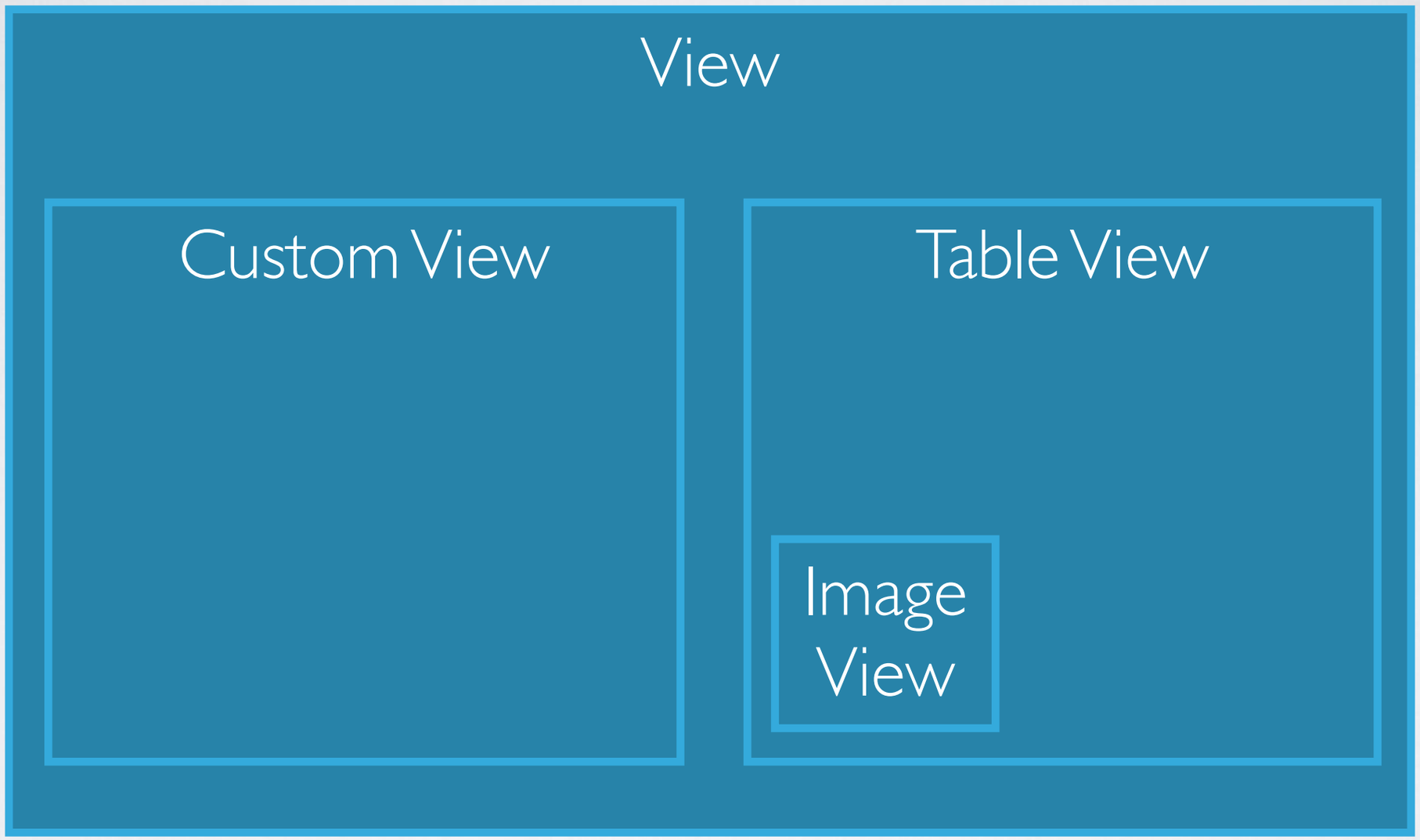

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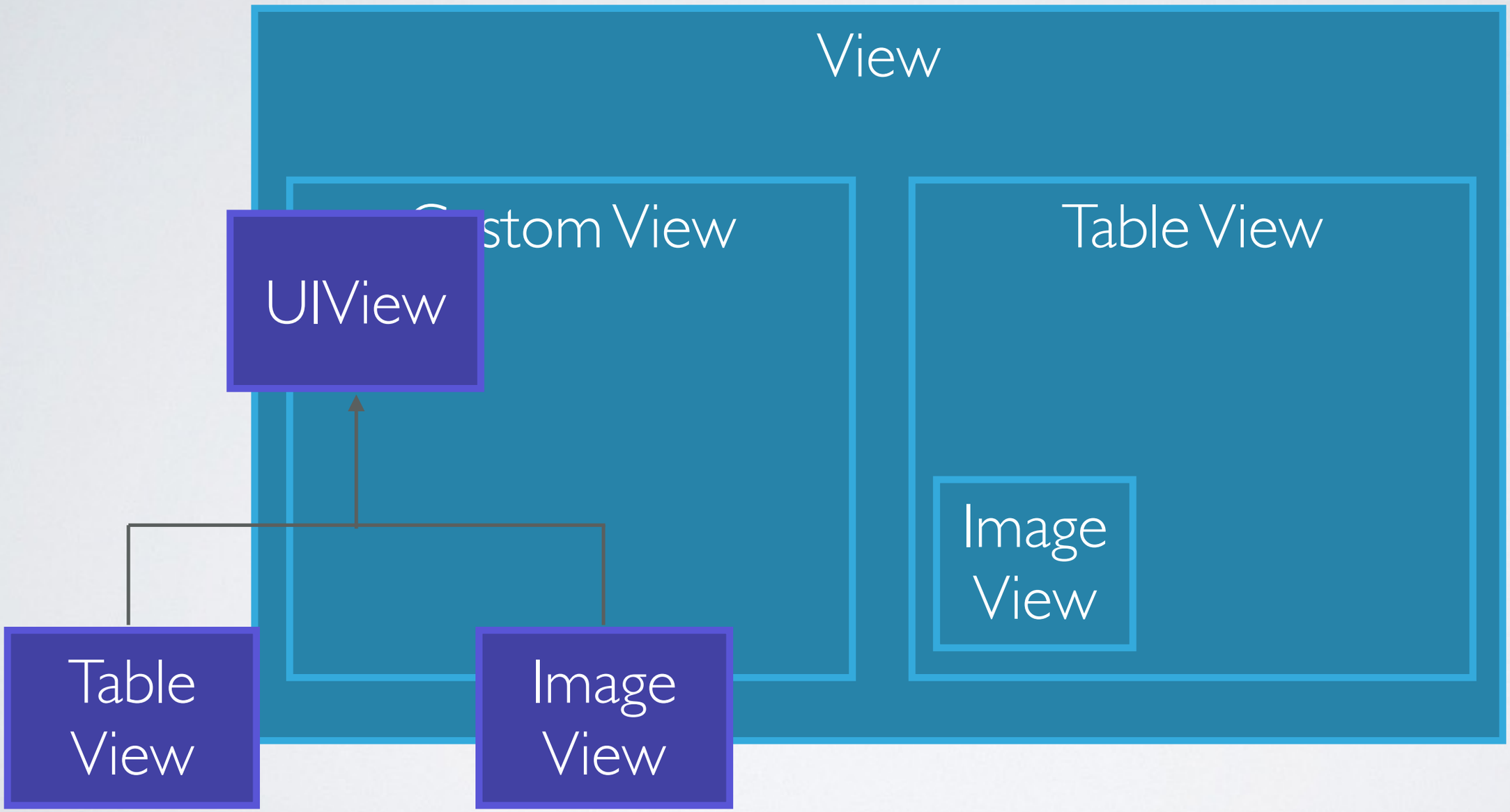

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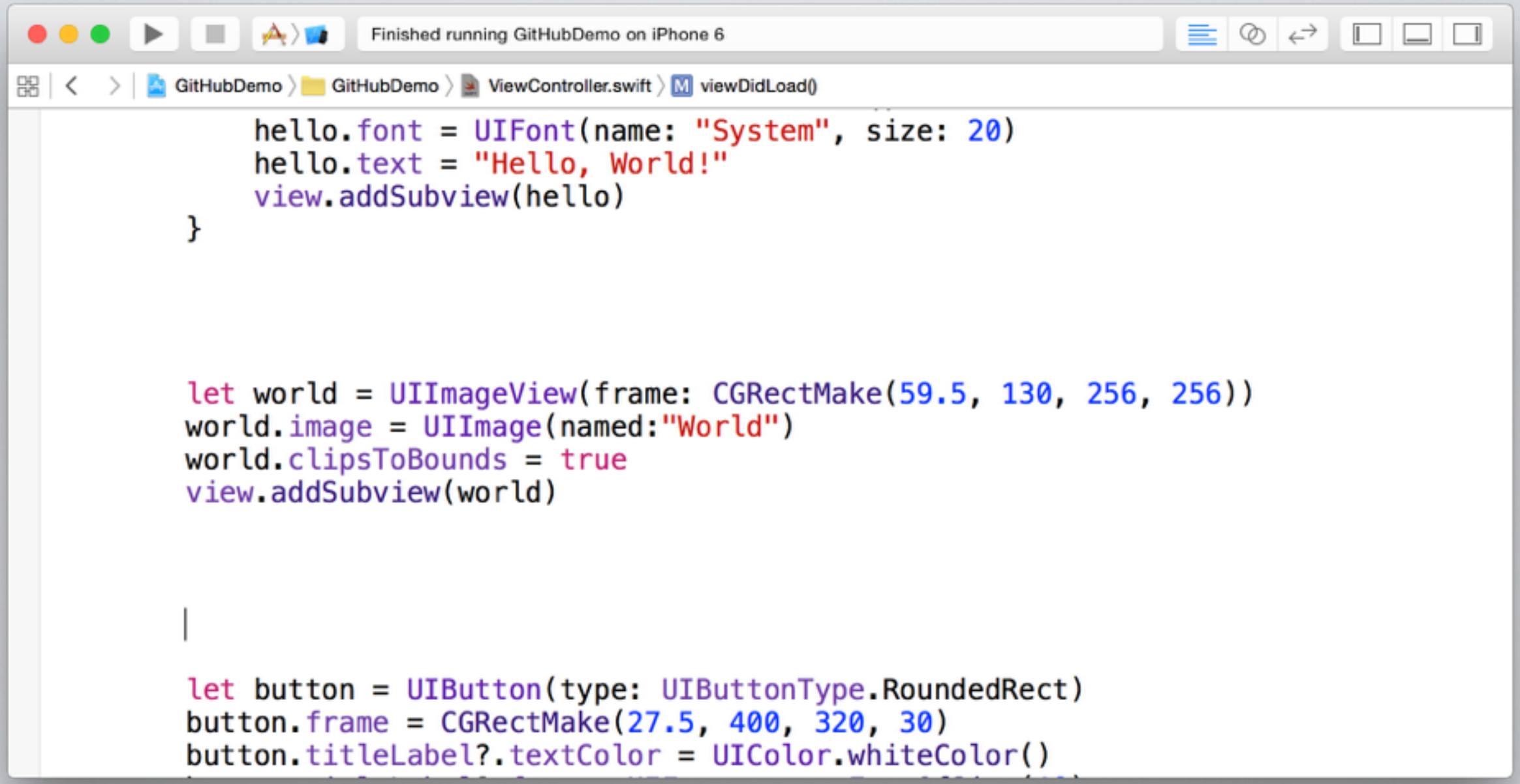

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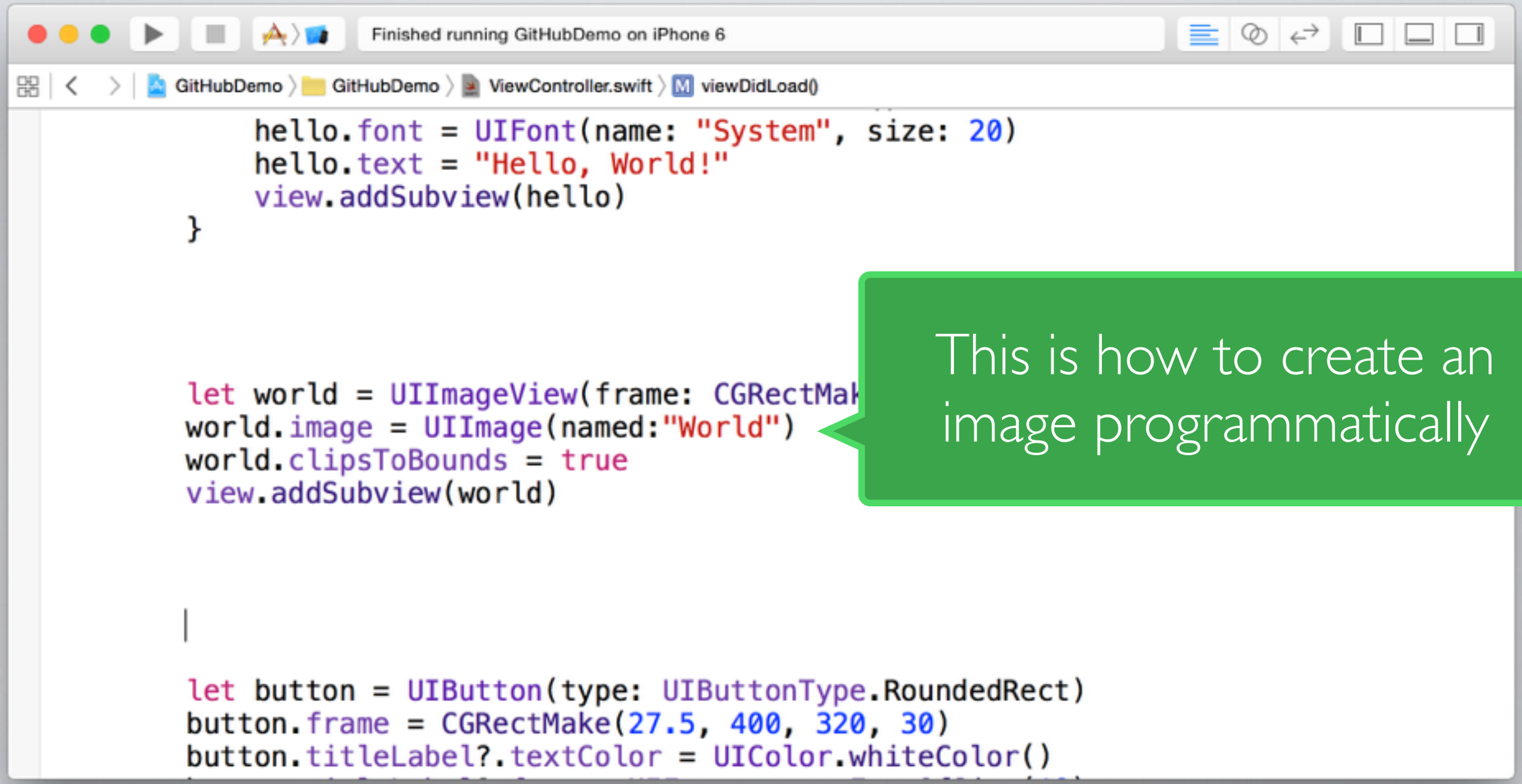

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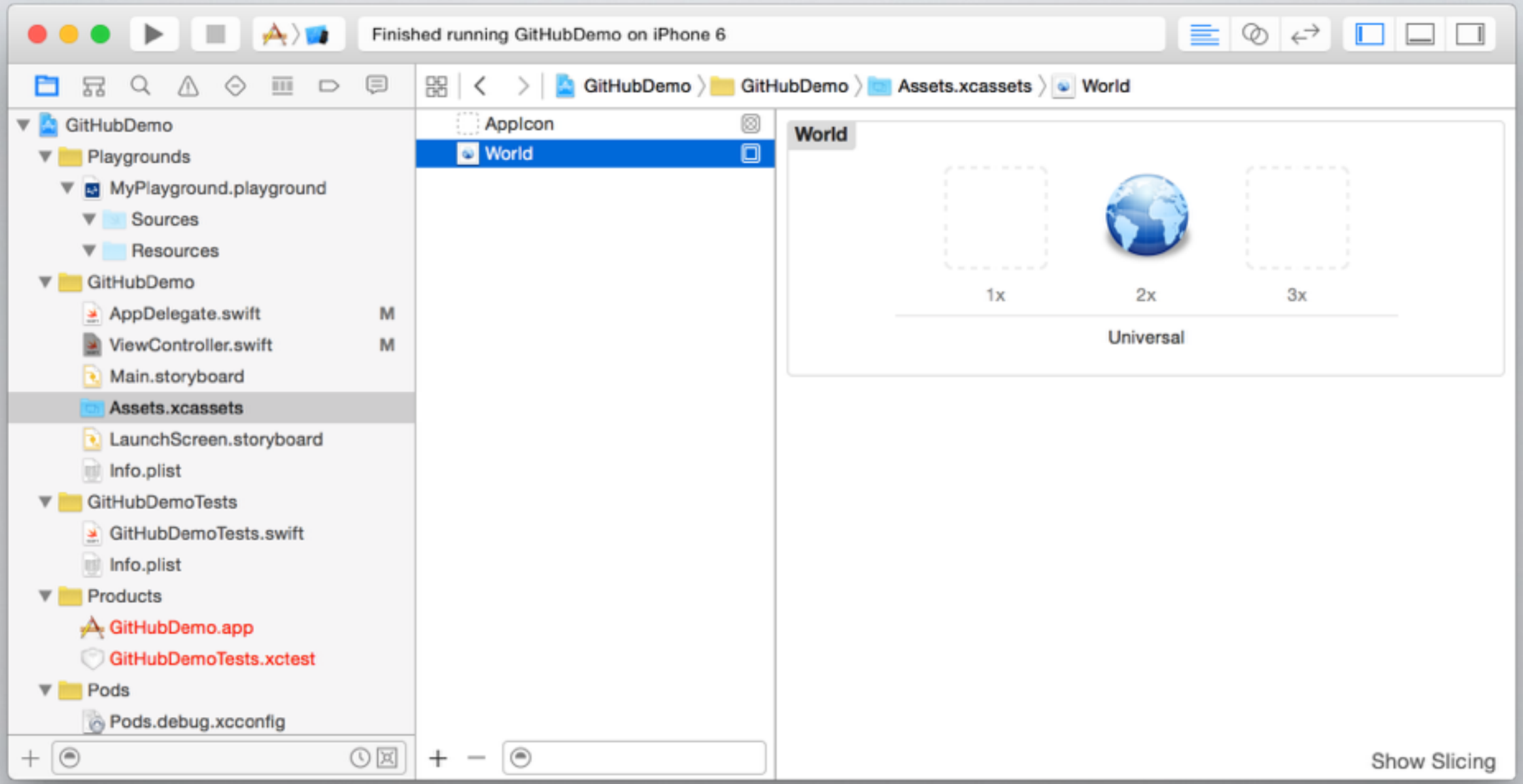

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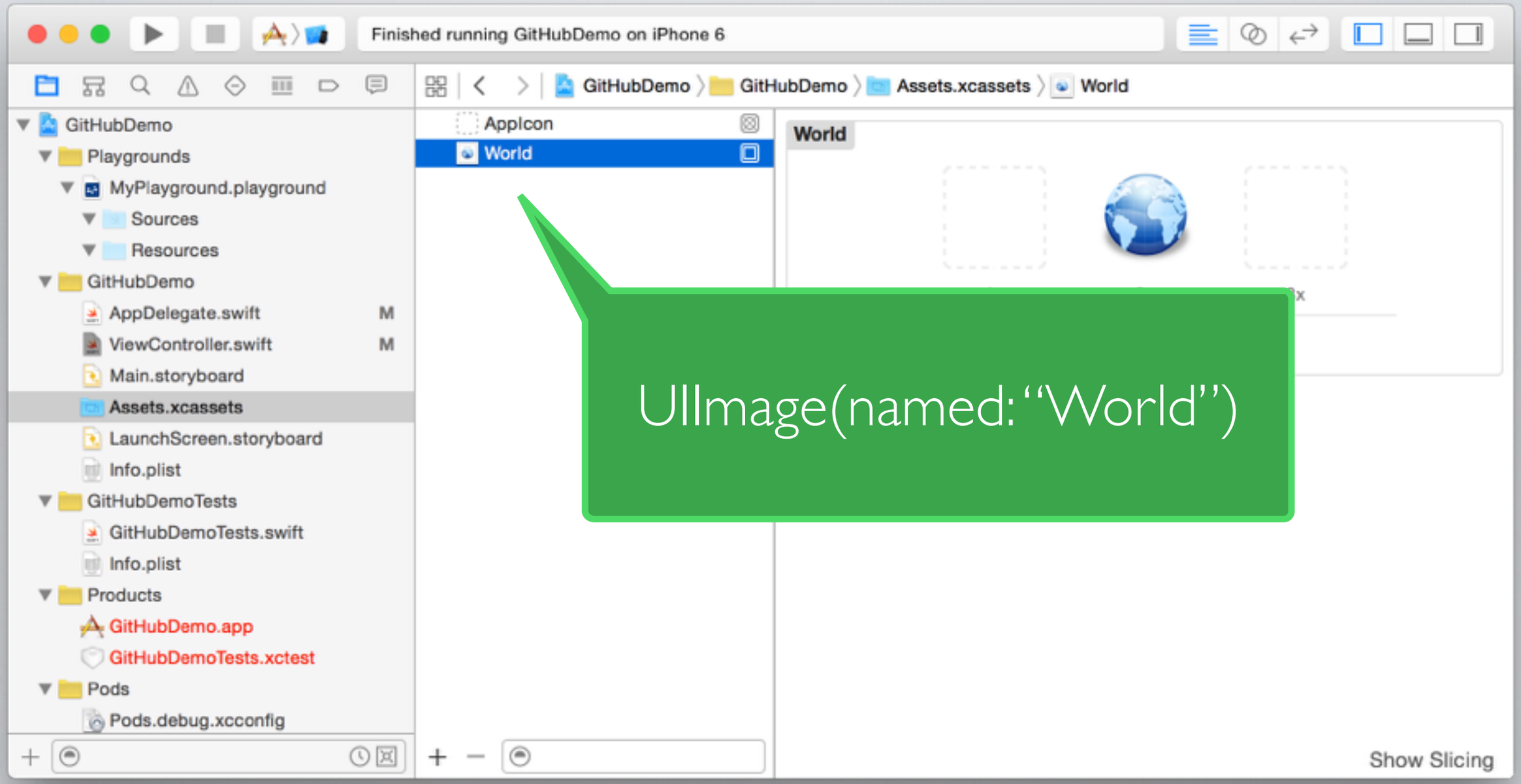

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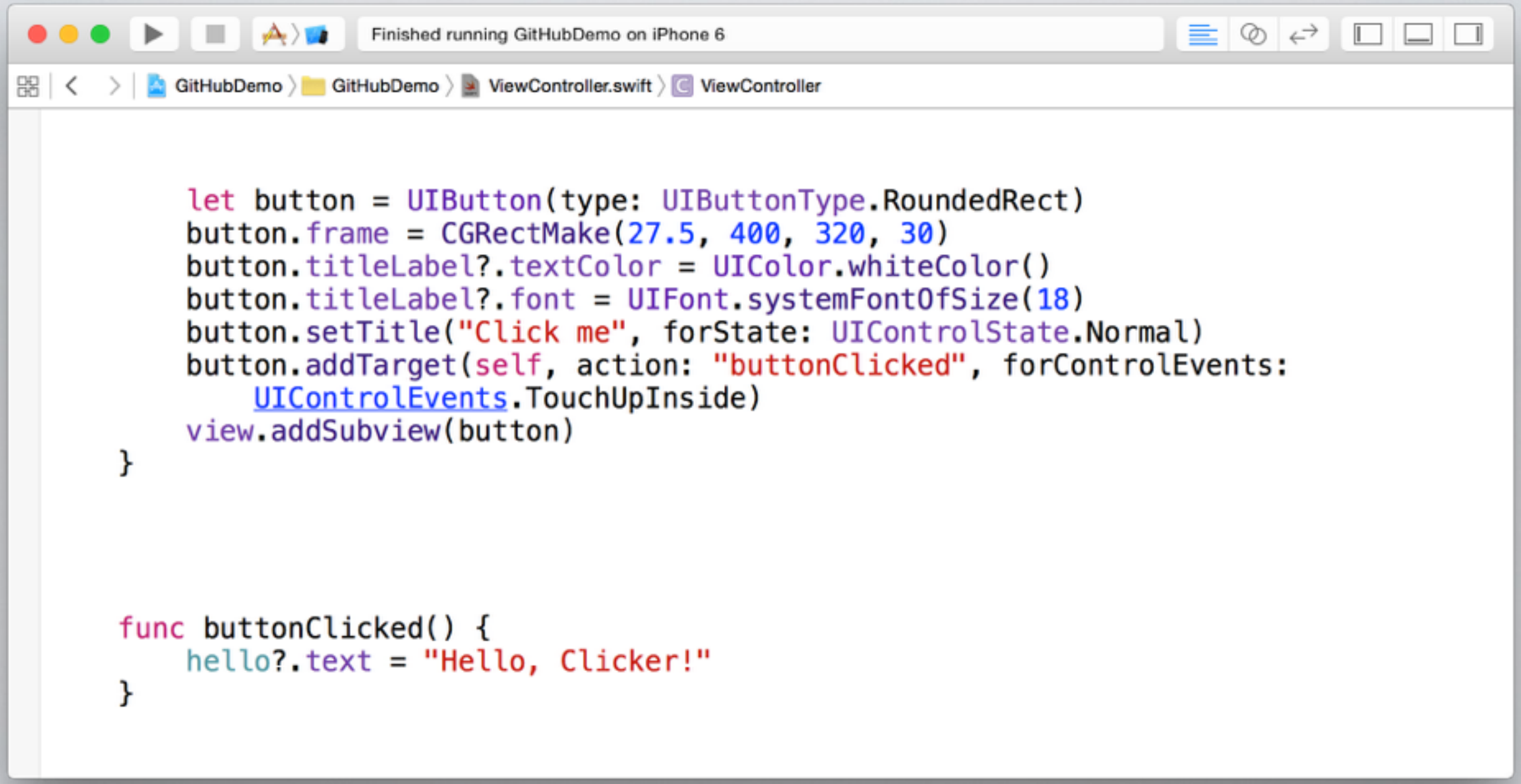


PROGRAMMATICALLY

This is how to create an button programmatically

Finished running GitHubDemo on iPhone 6

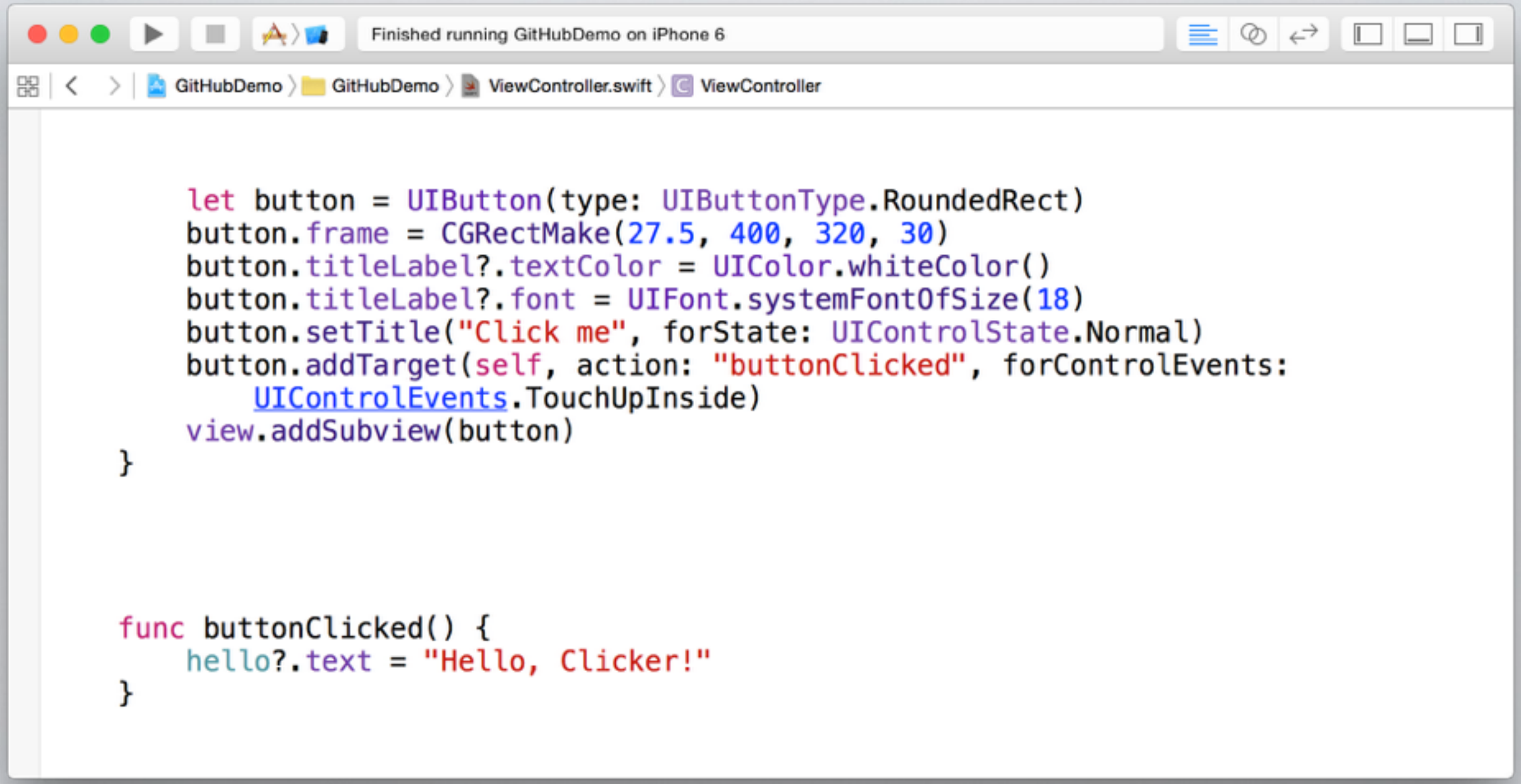
GitHubDemo 〉 GitHubDemo 〉 ViewController.swift 〉 ViewController

```
    let button = UIButton(type: UIButtonType.RoundedRect)
    button.frame = CGRectMake(27.5, 400, 320, 30)
    button.titleLabel?.textColor = UIColor.whiteColor()
    button.titleLabel?.font = UIFont.systemFontOfSize(18)
    button.setTitle("Click me", forState: UIControlState.Normal)
    button.addTarget(self, action: "buttonClicked", forControlEvents:
        UIControlEvents.TouchUpInside)
    view.addSubview(button)
}



func buttonClicked() {
    hello?.text = "Hello, Clicker!"
}
```

PROGRAMMATICALLY



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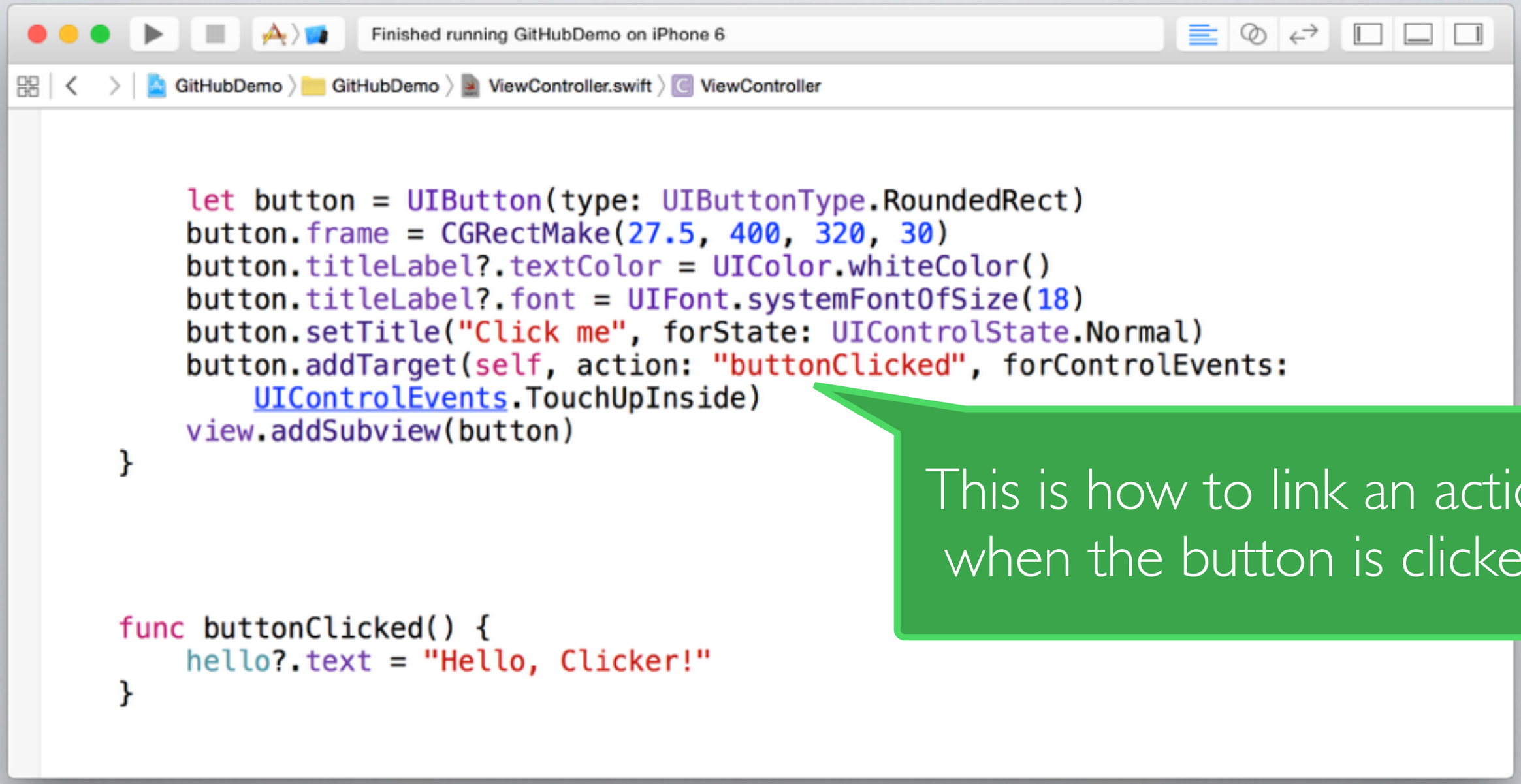
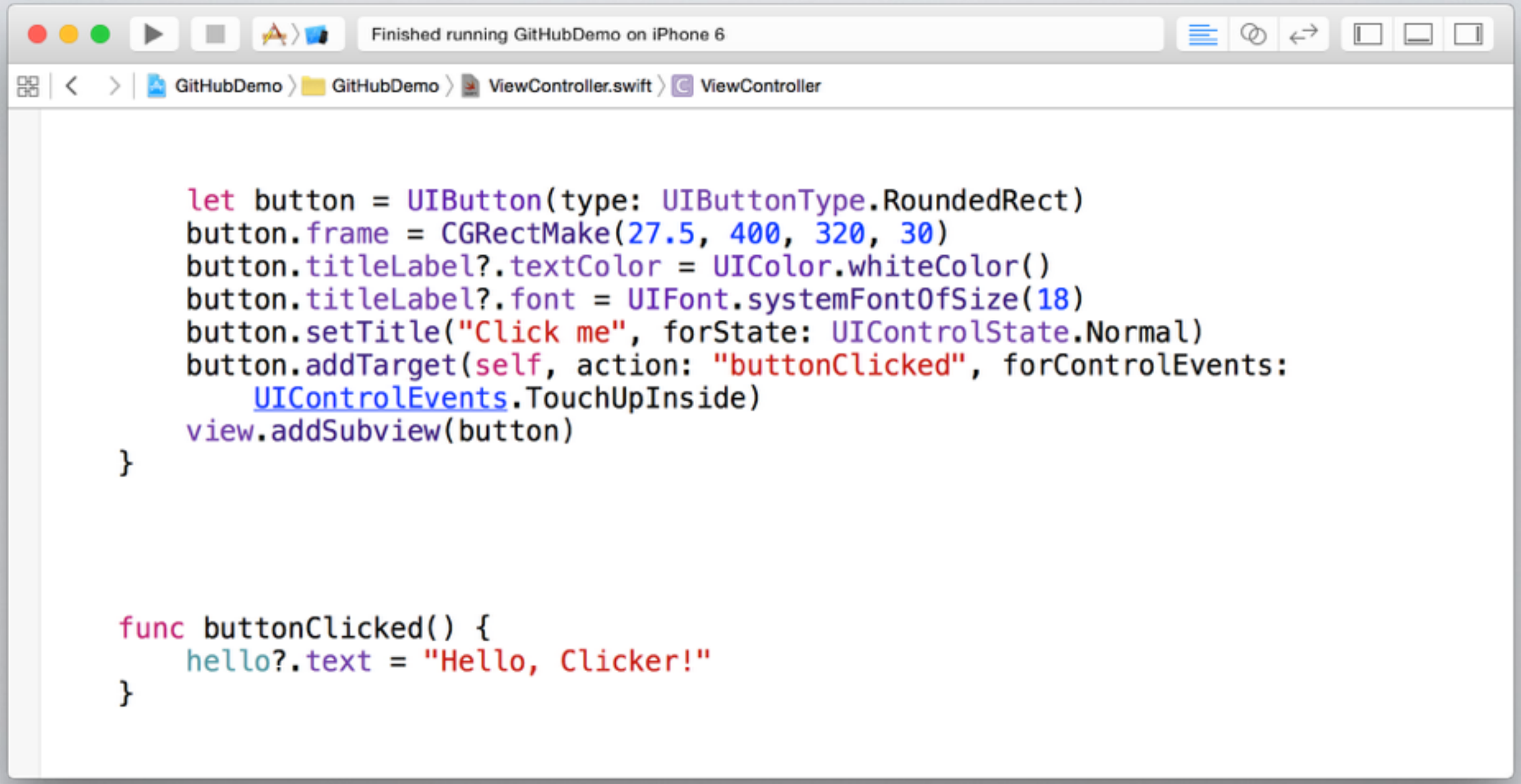
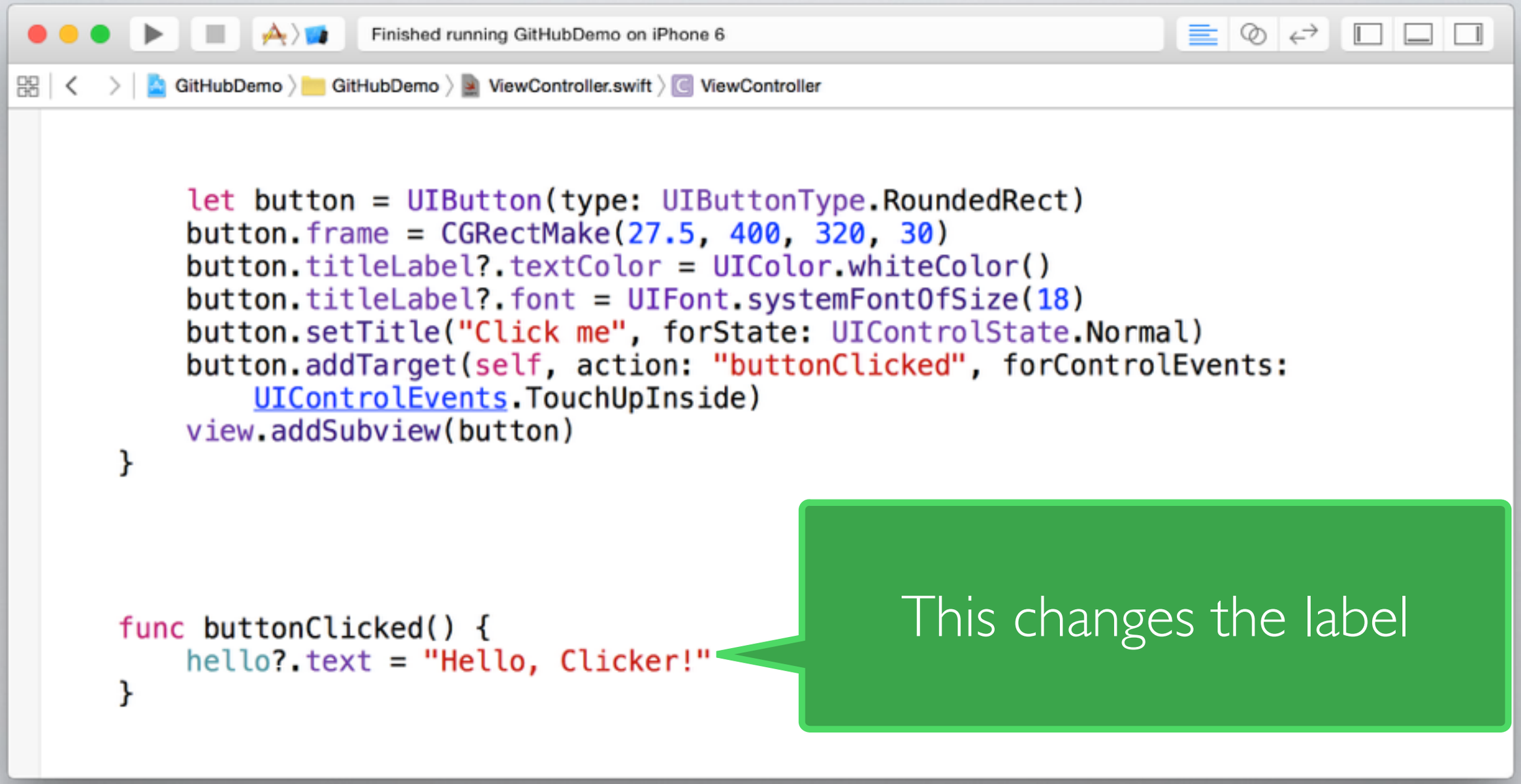


PROGRAMMATICALLY



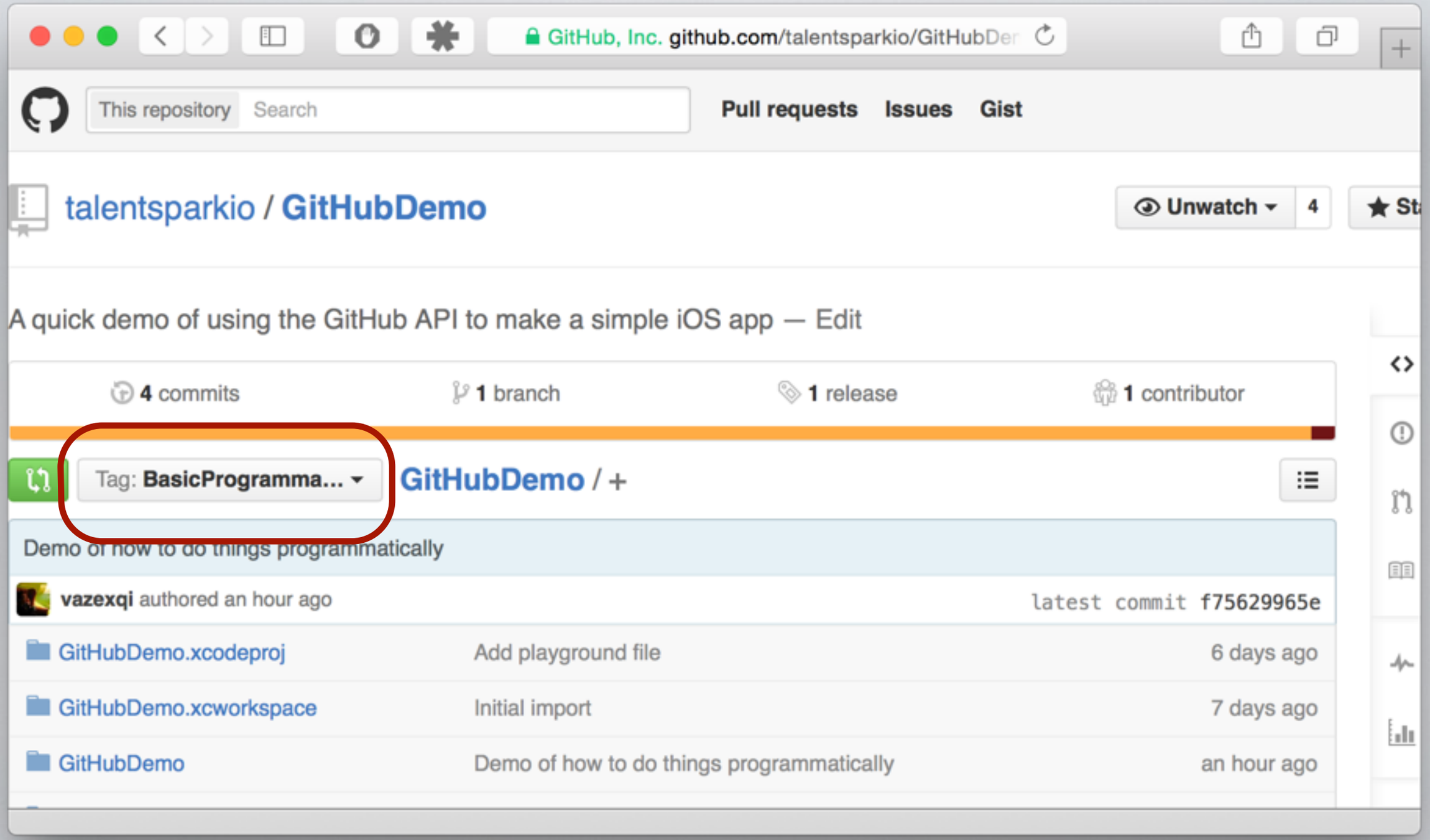
PROGRAMMATICALLY



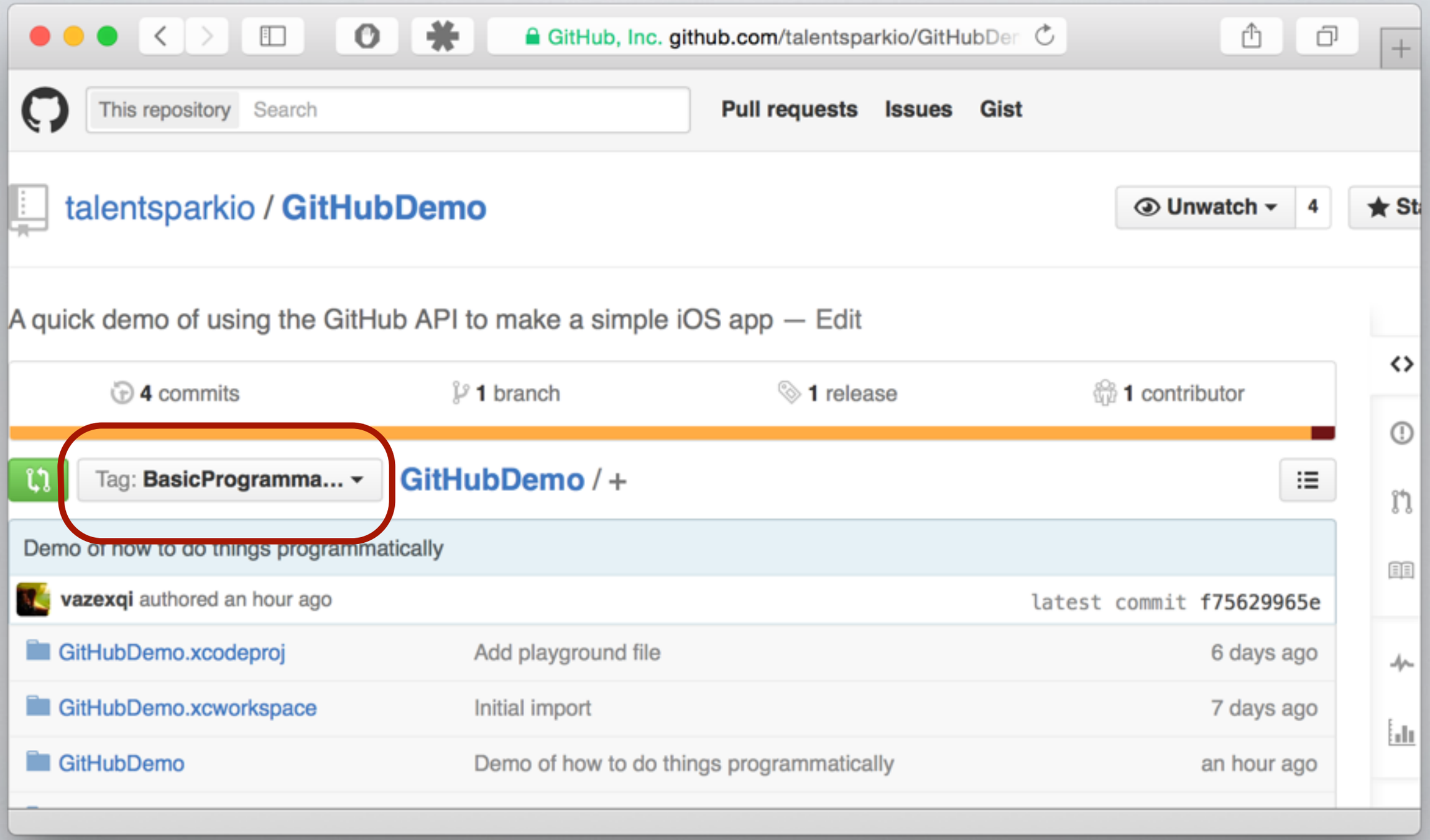
EXERCISE

- Add a UITextField programmatically
- Change text of the UILabel based on what you entered in the UITextField

CODE

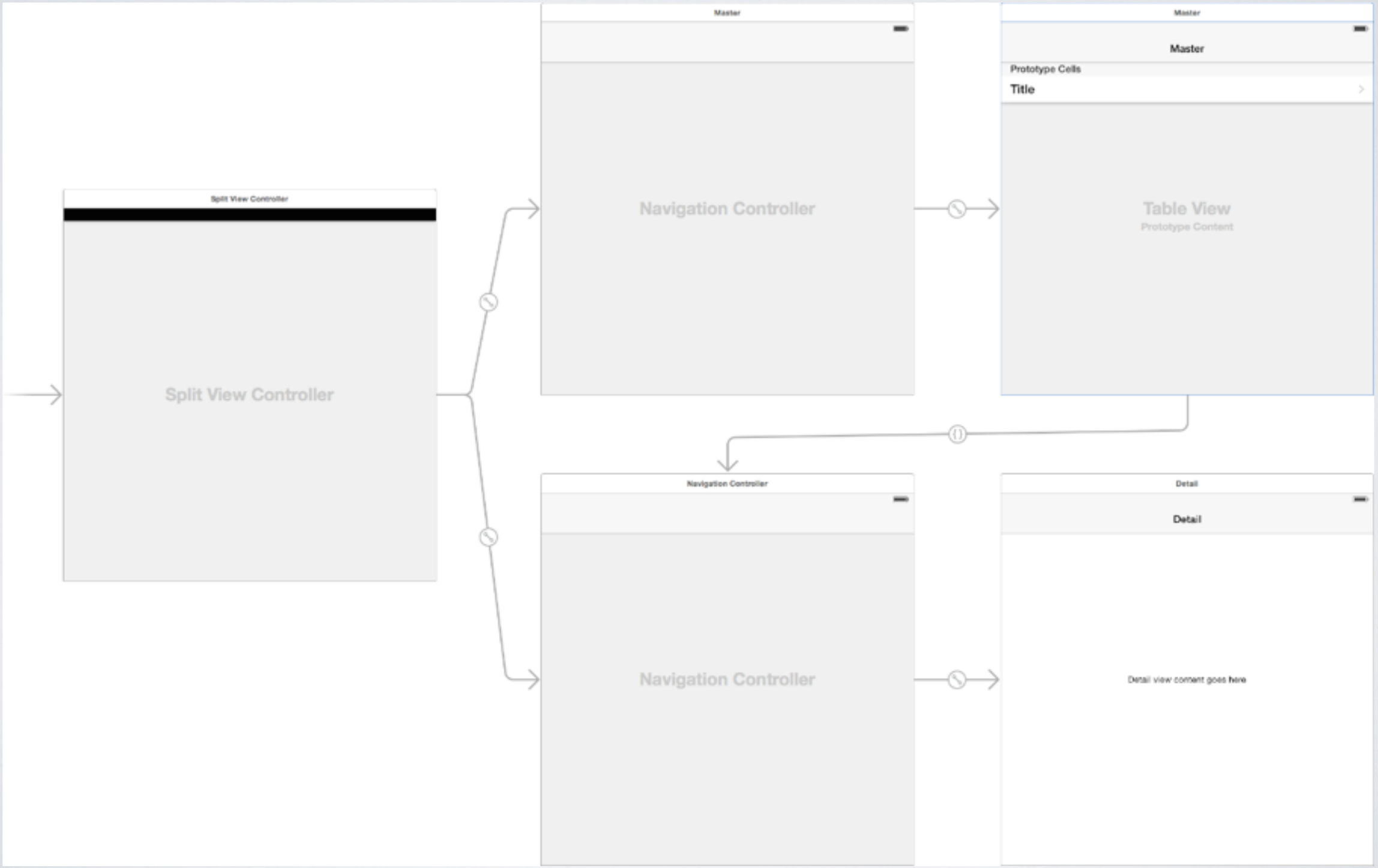

GitHub, Inc. github.com/talentsparkio/GitHubDer
This repository
Search
Pull requests
Issues
Gist
talentsparkio / GitHubDemo
Unwatch
4
A quick demo of using the GitHub API to make a simple iOS app — Edit
4 commits
1 branch
1 release
1 contributor
Tag: BasicProgramma...
GitHubDemo / +
Demo of how to do things programmatically
vazexqi authored an hour ago
latest commit f75629965e
GitHubDemo.xcodeproj
Add playground file
6 days ago
GitHubDemo.xcworkspace
Initial import
7 days ago
GitHubDemo
Demo of how to do things programmatically
an hour ago

CODE

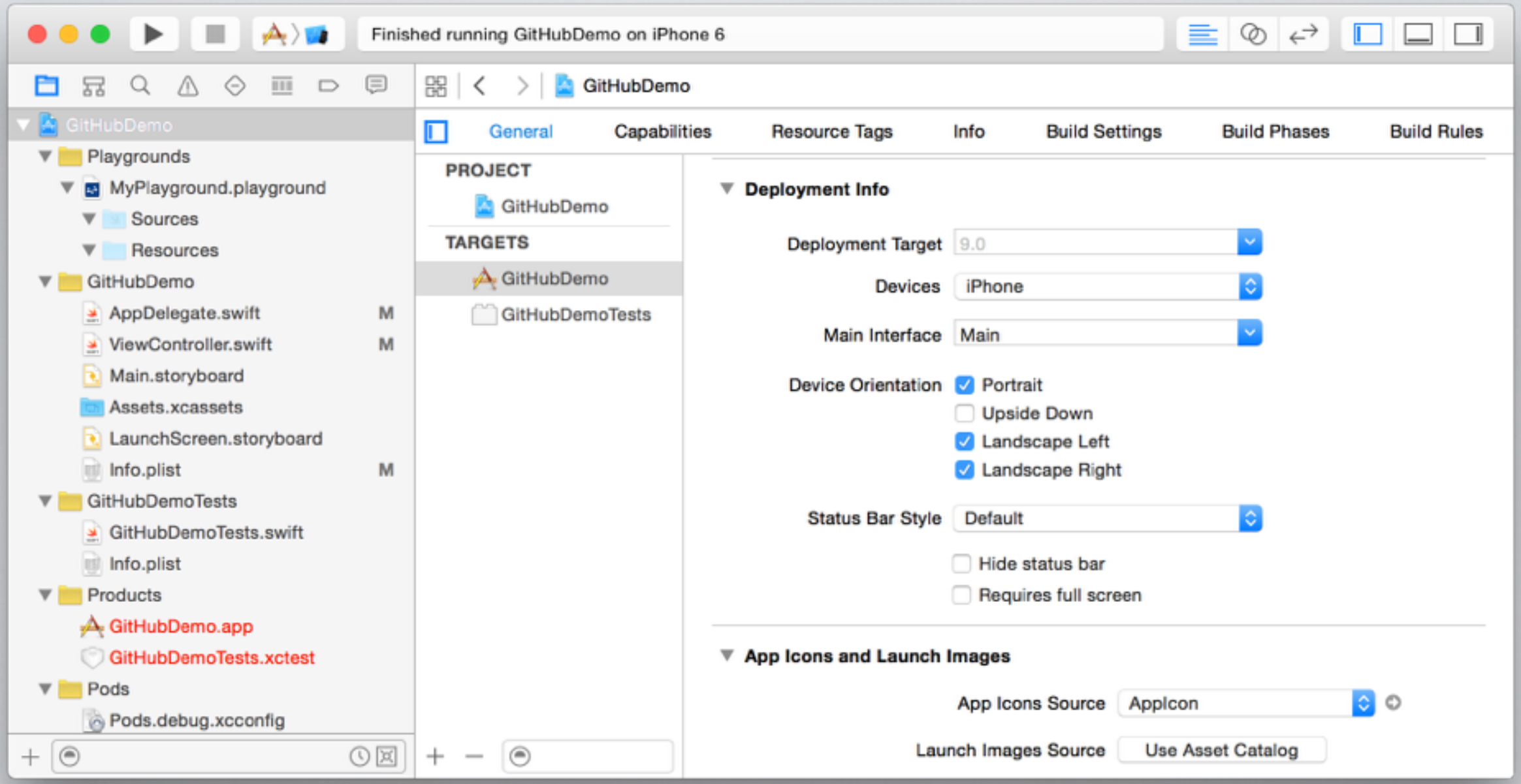

GitHub, Inc. github.com/talentsparkio/GitHubDer
This repository
Search
Pull requests
Issues
Gist
talentsparkio / GitHubDemo
Unwatch
4
A quick demo of using the GitHub API to make a simple iOS app — Edit
4 commits
1 branch
1 release
1 contributor
Tag: BasicProgramma...
GitHubDemo / +
Demo of how to do things programmatically
vazexqi authored an hour ago
latest commit f75629965e
GitHubDemo.xcodeproj
Add playground file
6 days ago
GitHubDemo.xcworkspace
Initial import
7 days ago
GitHubDemo
Demo of how to do things programmatically
an hour ago

LET'S DO THIS WITH STORYBOARDS!

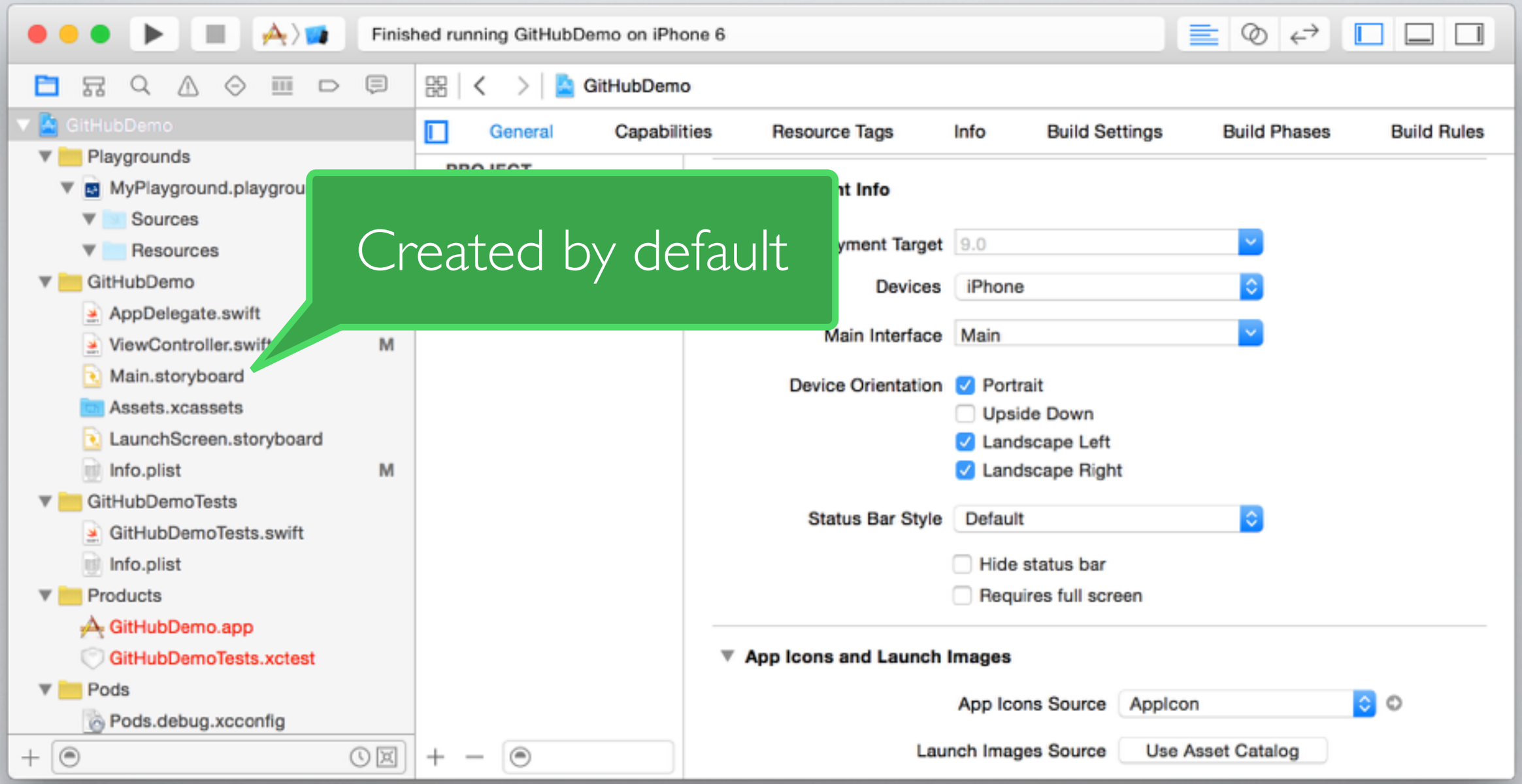
STORYBOARDS



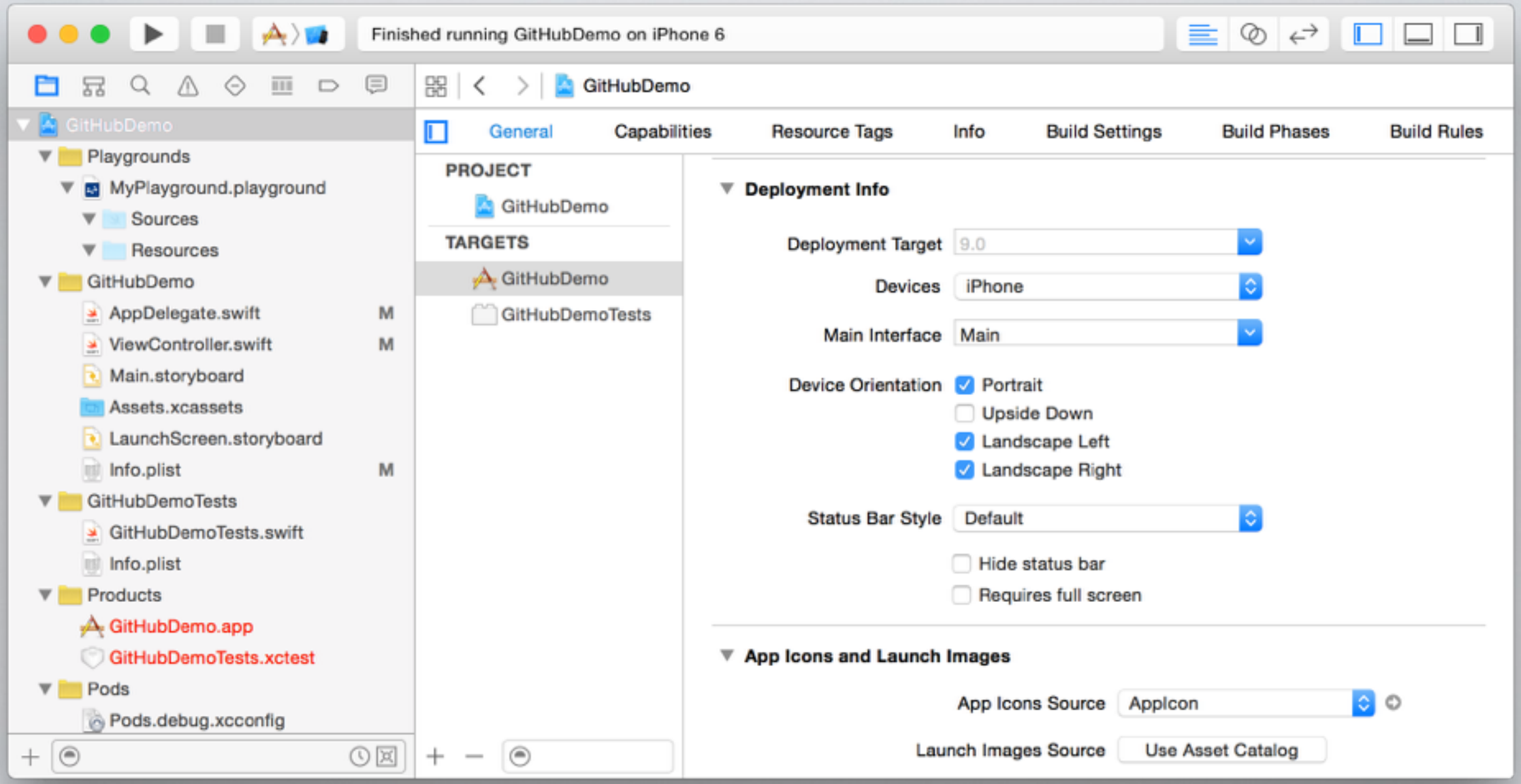
STORYBOARDS



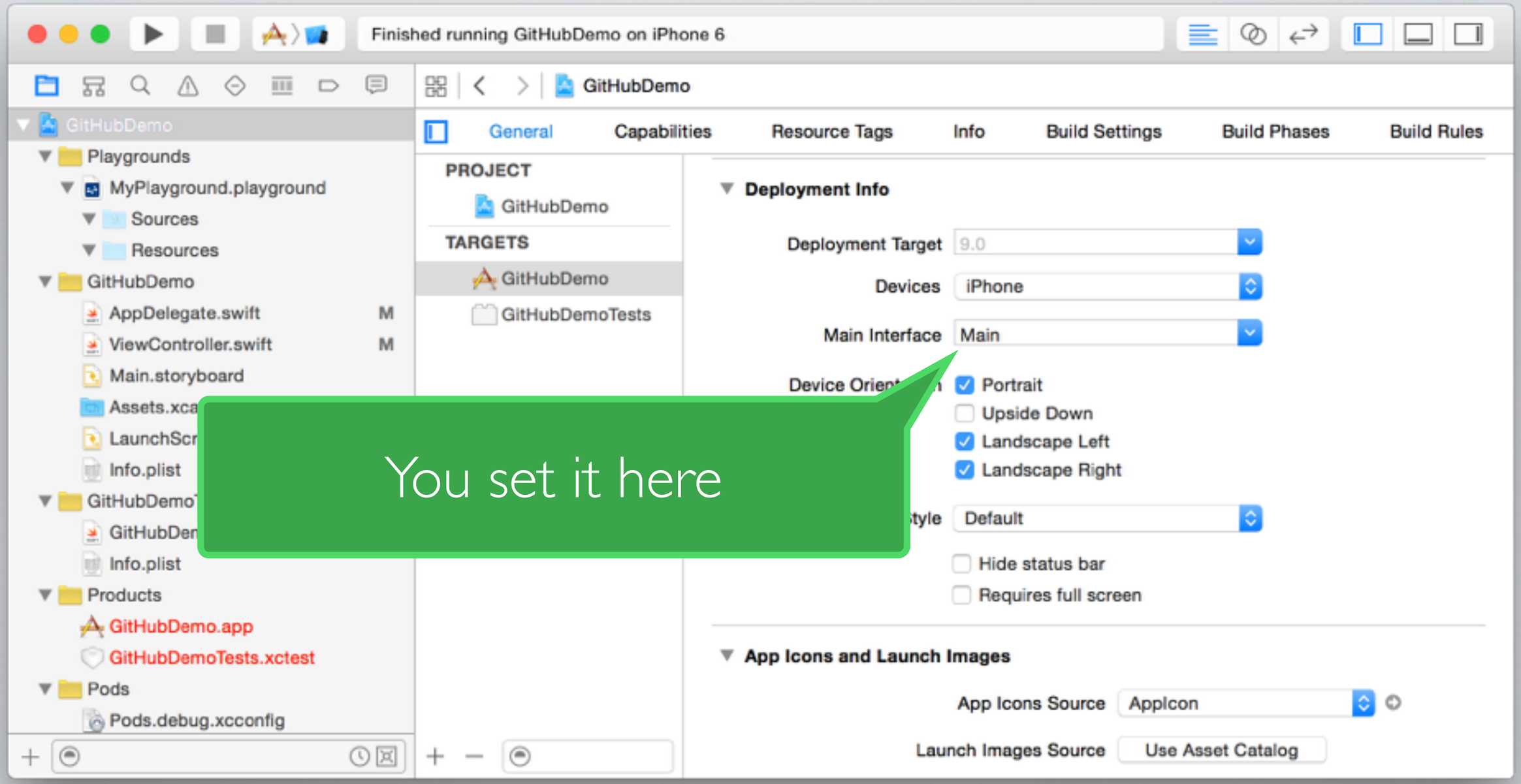
STORYBOARDS



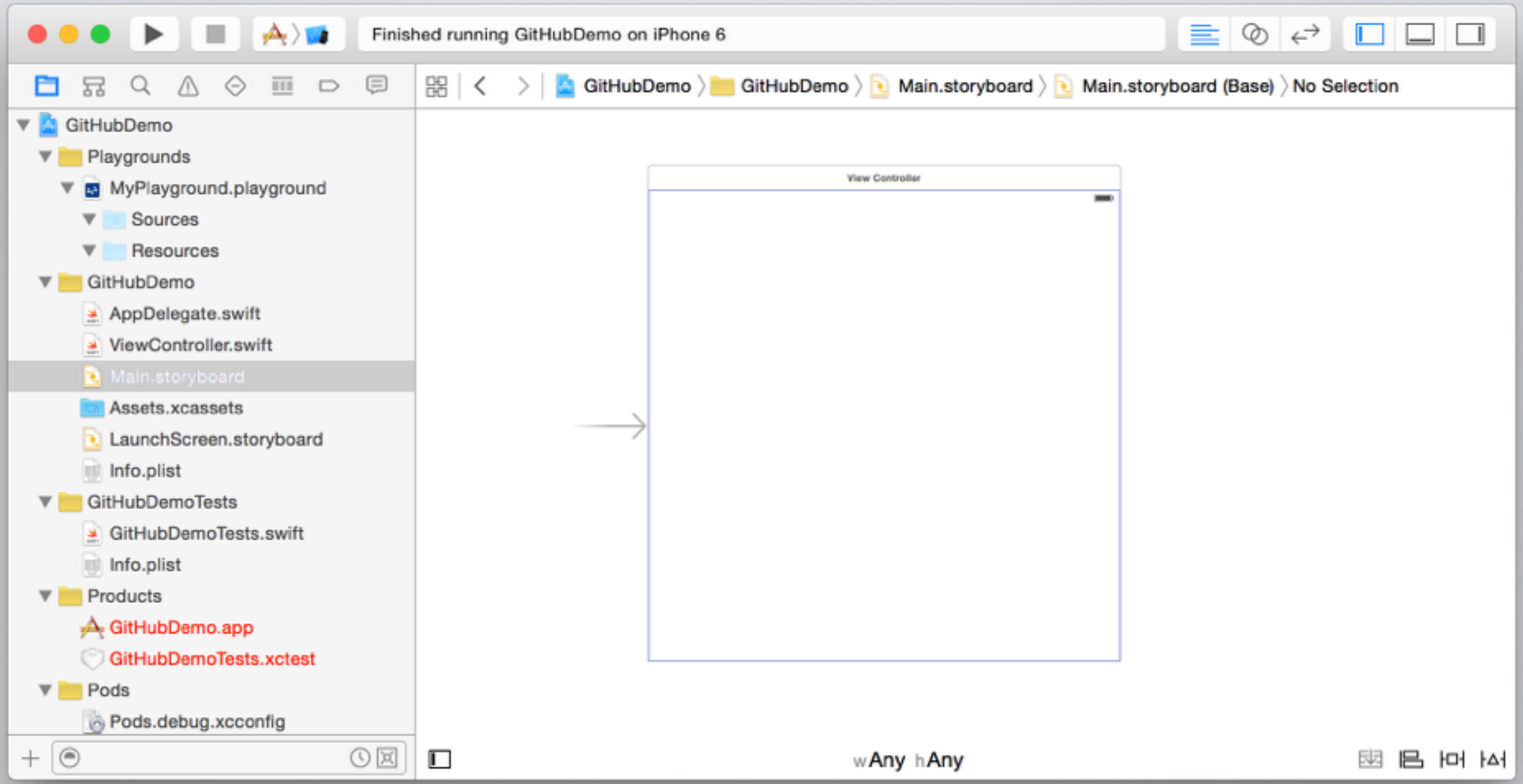
STORYBOARDS



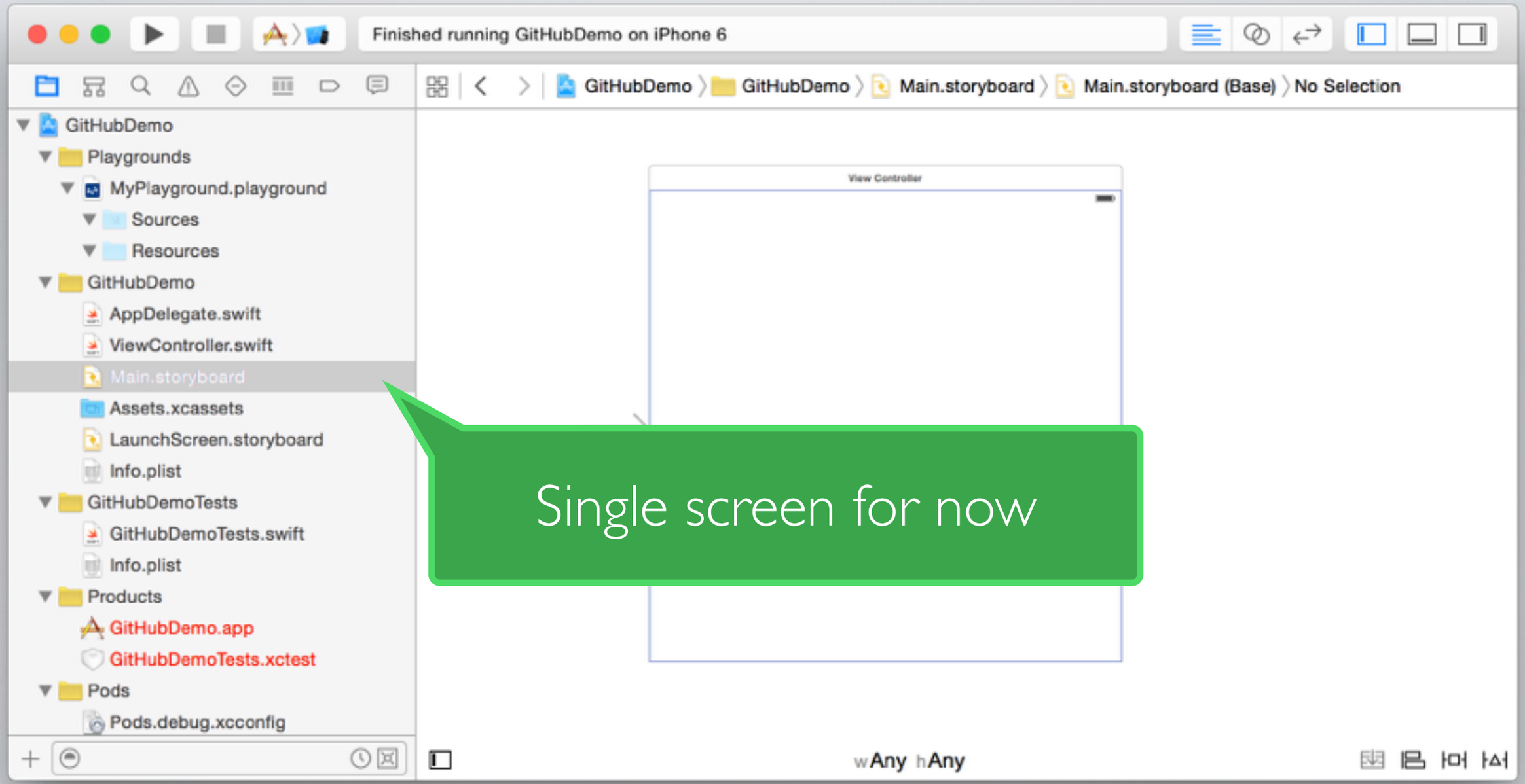
STORYBOARDS



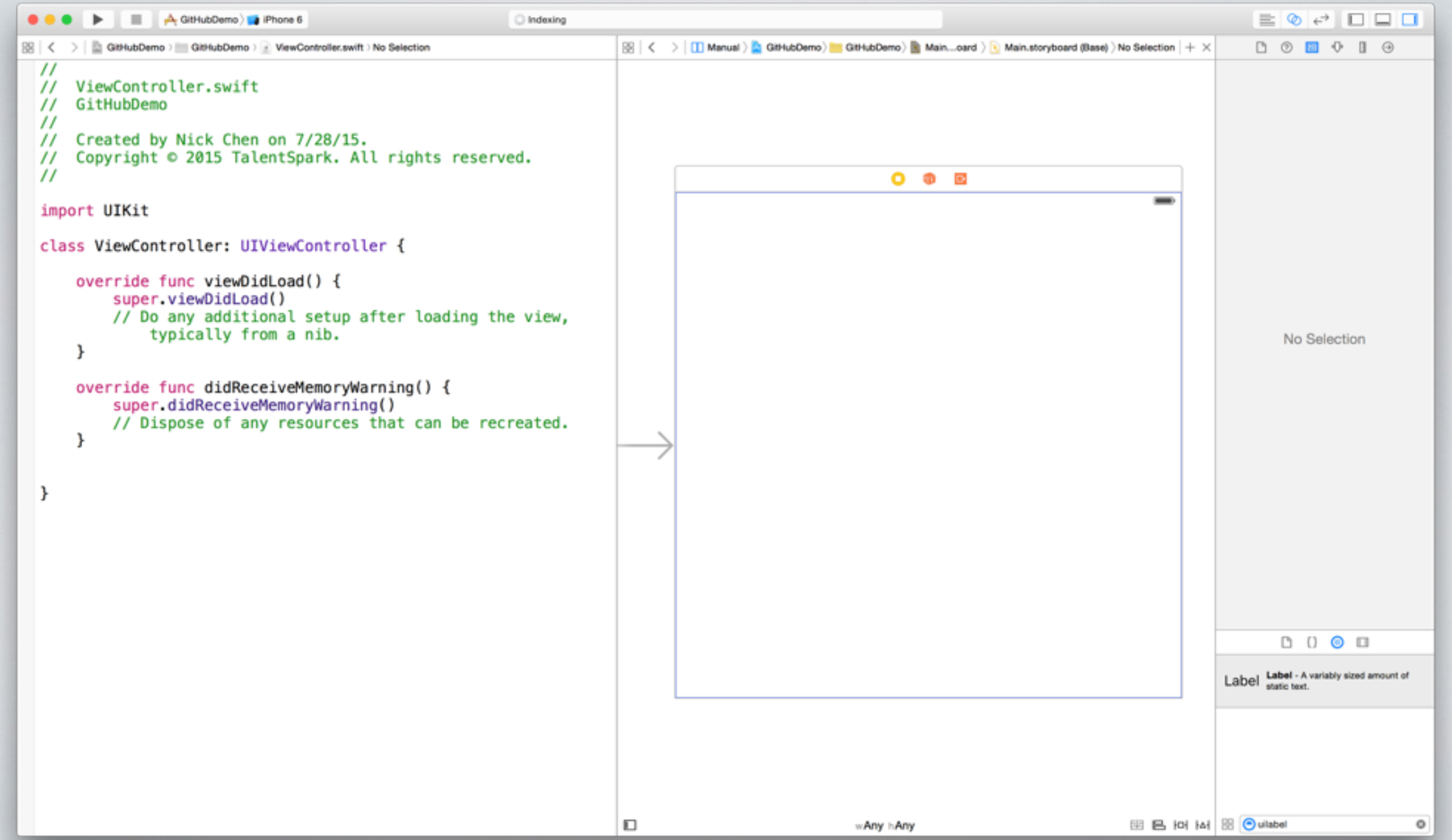
STORYBOARDS



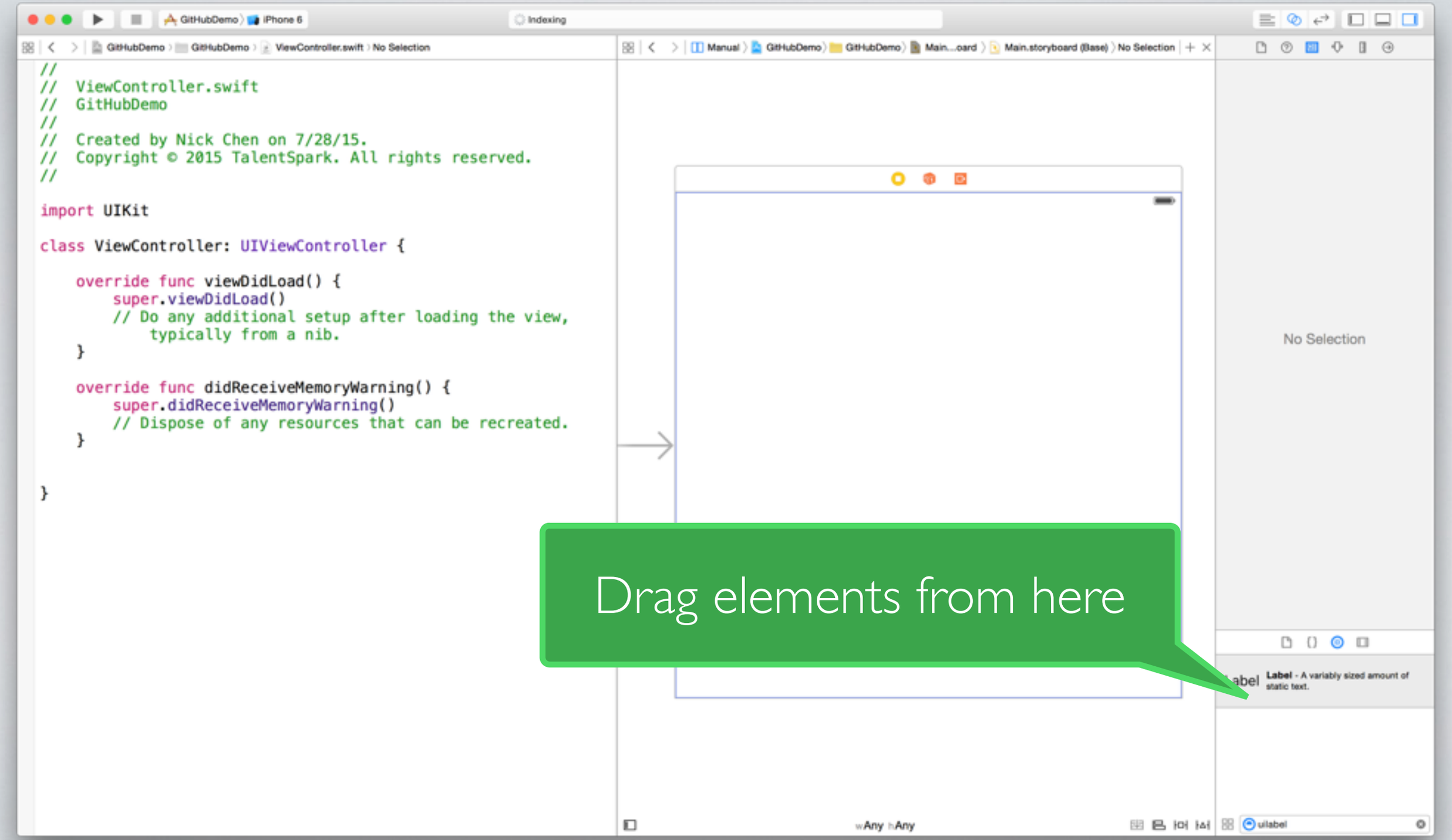
STORYBOARDS



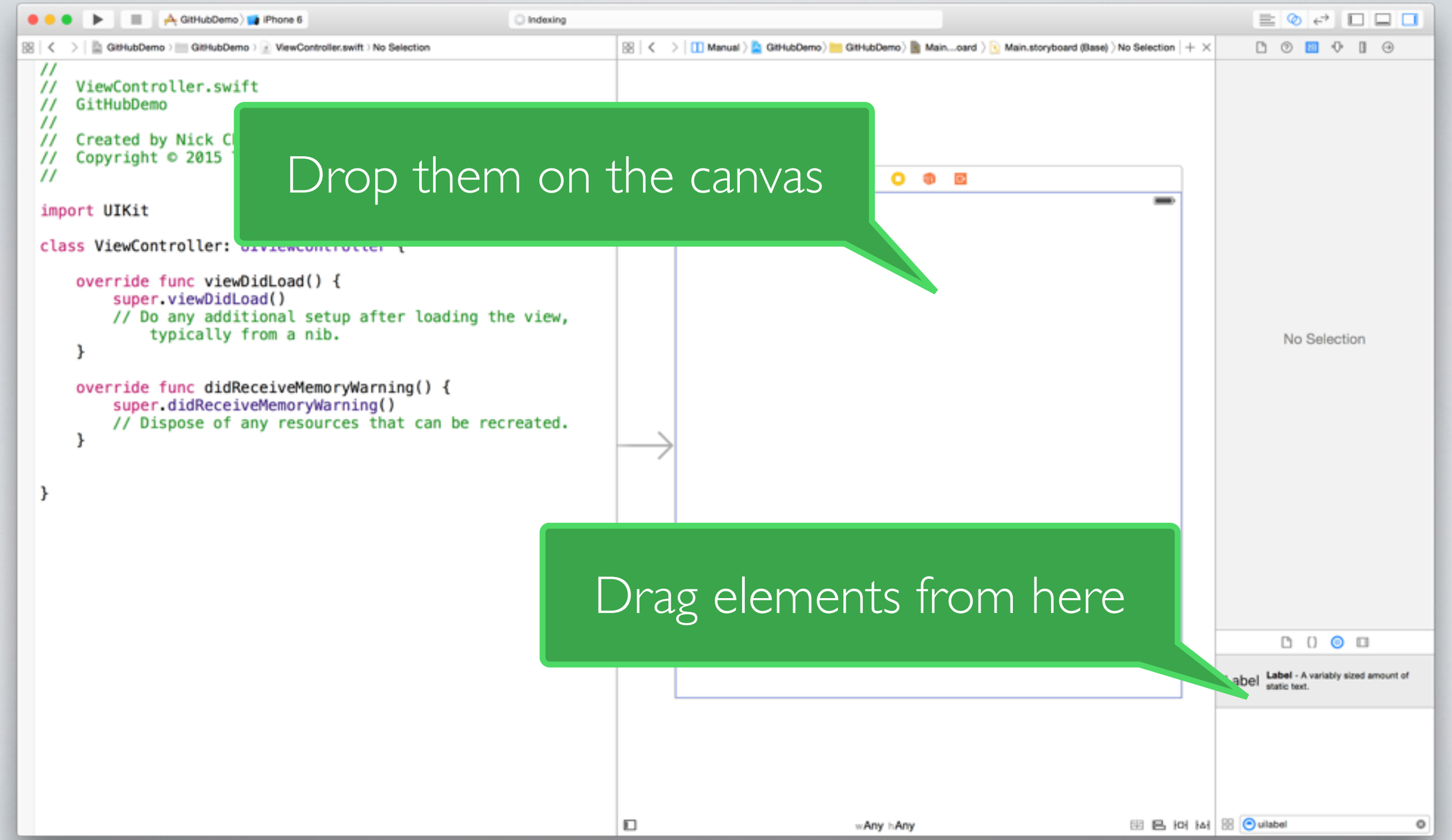
STORYBOARDS



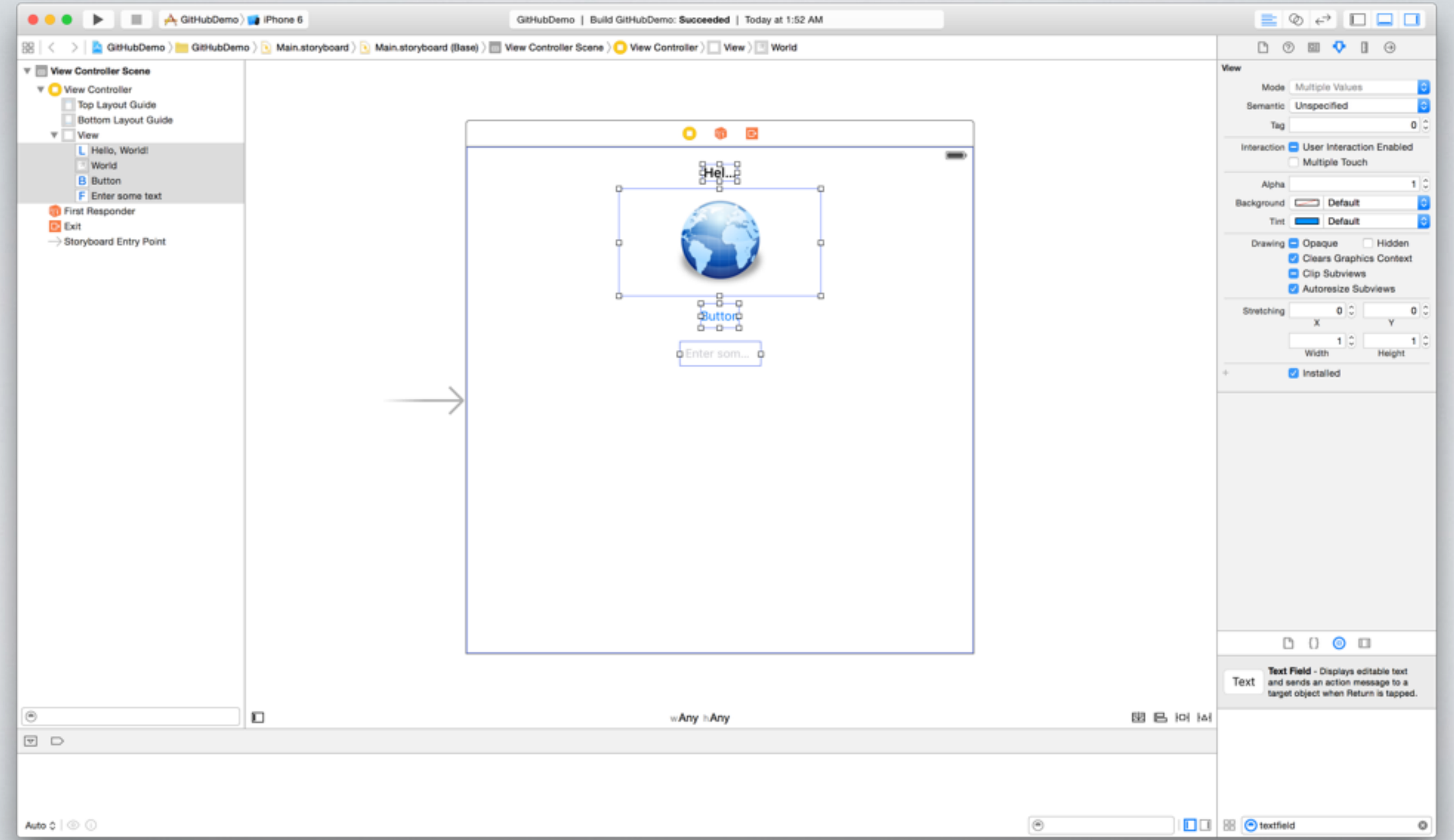
STORYBOARDS



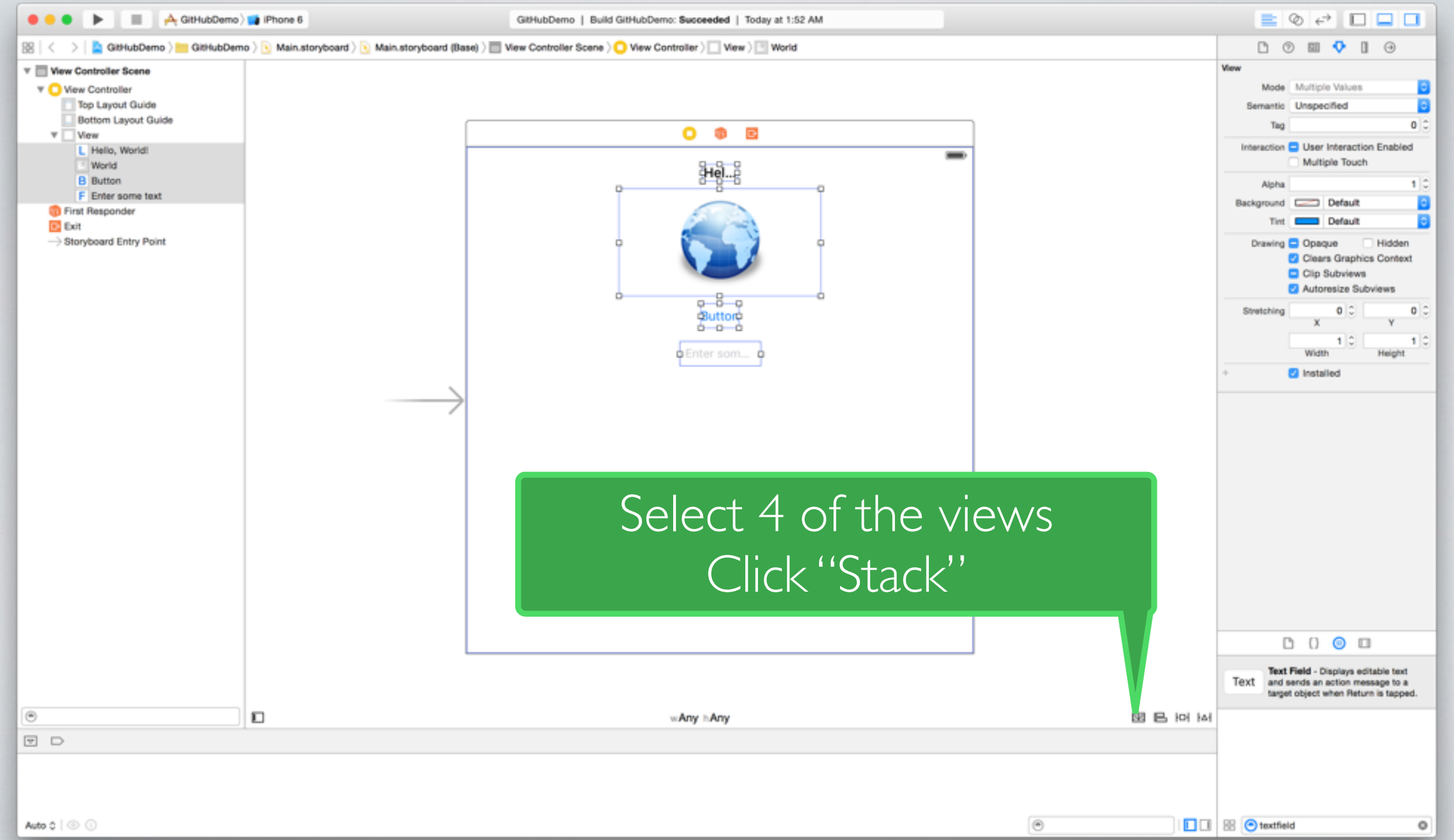
STORYBOARDS



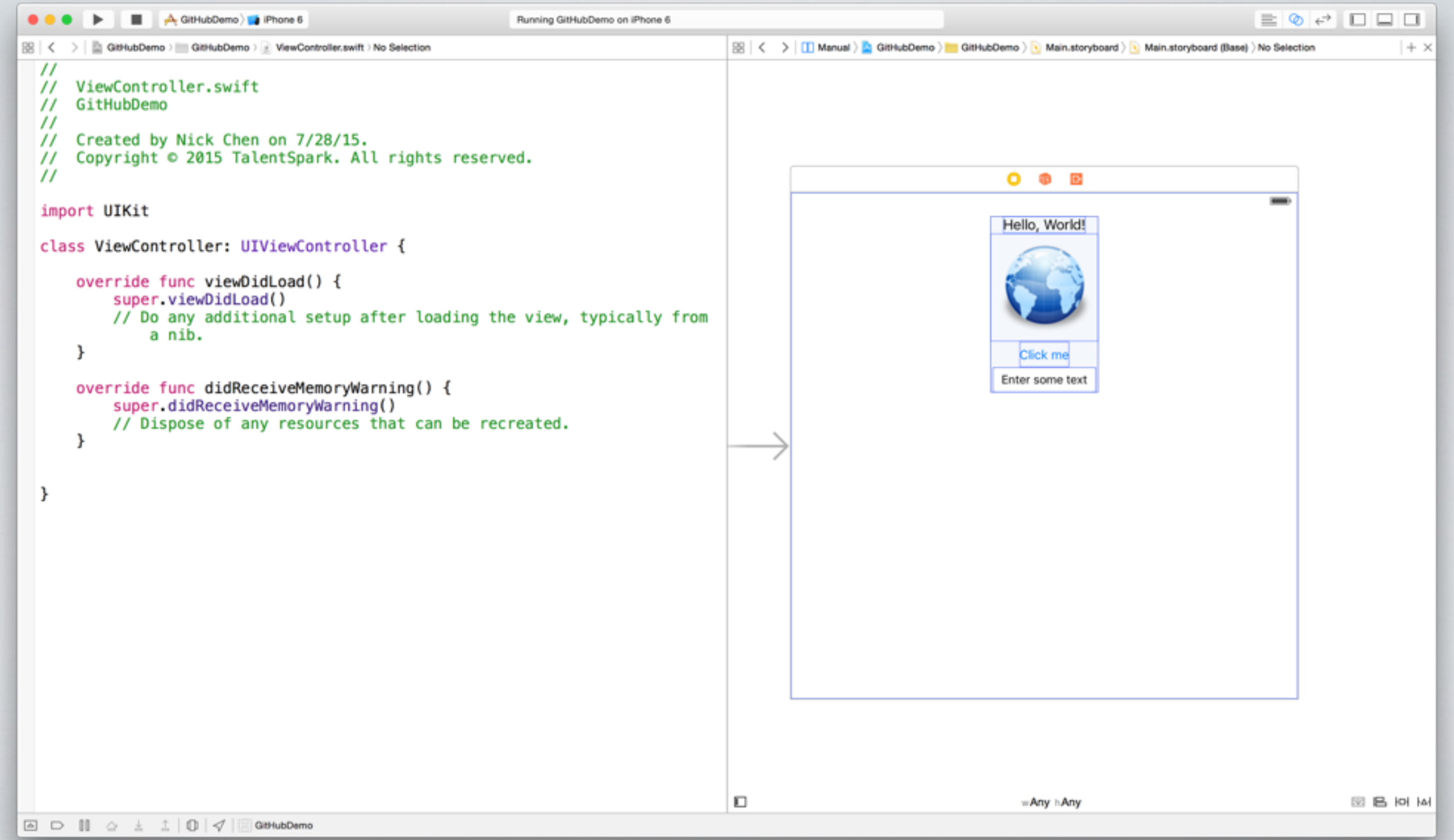
STORYBOARDS



STORYBOARDS



STORYBOARDS



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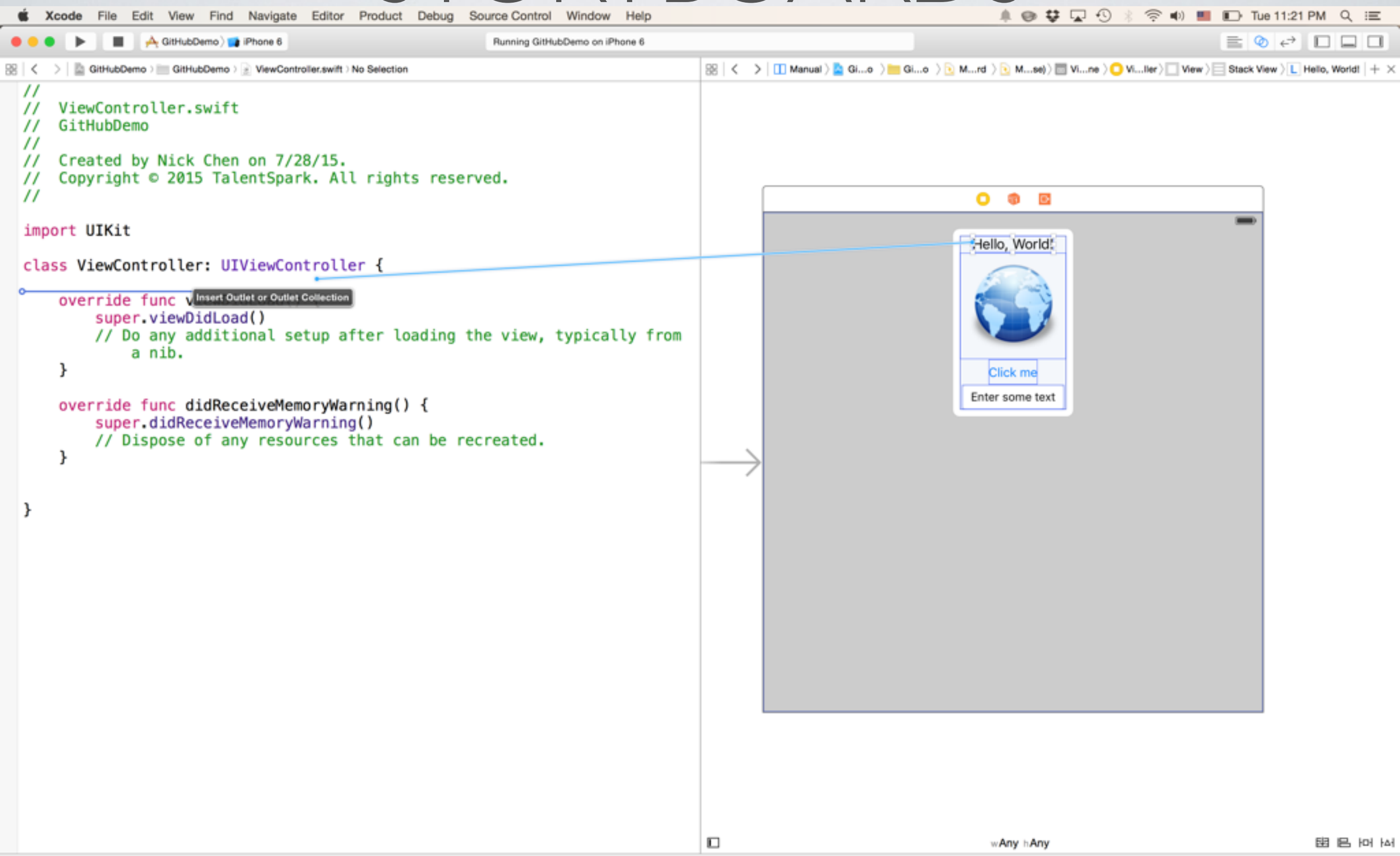

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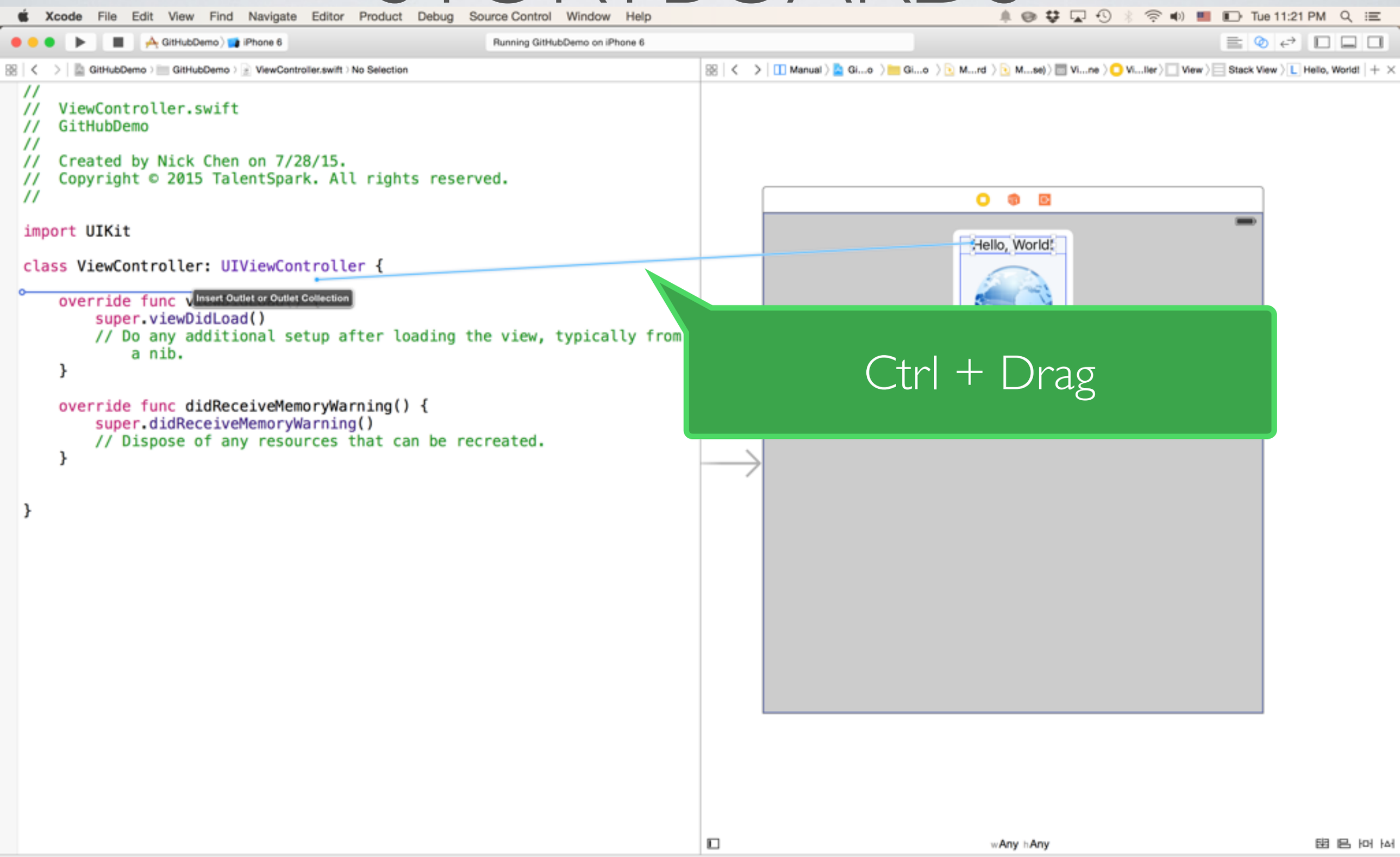

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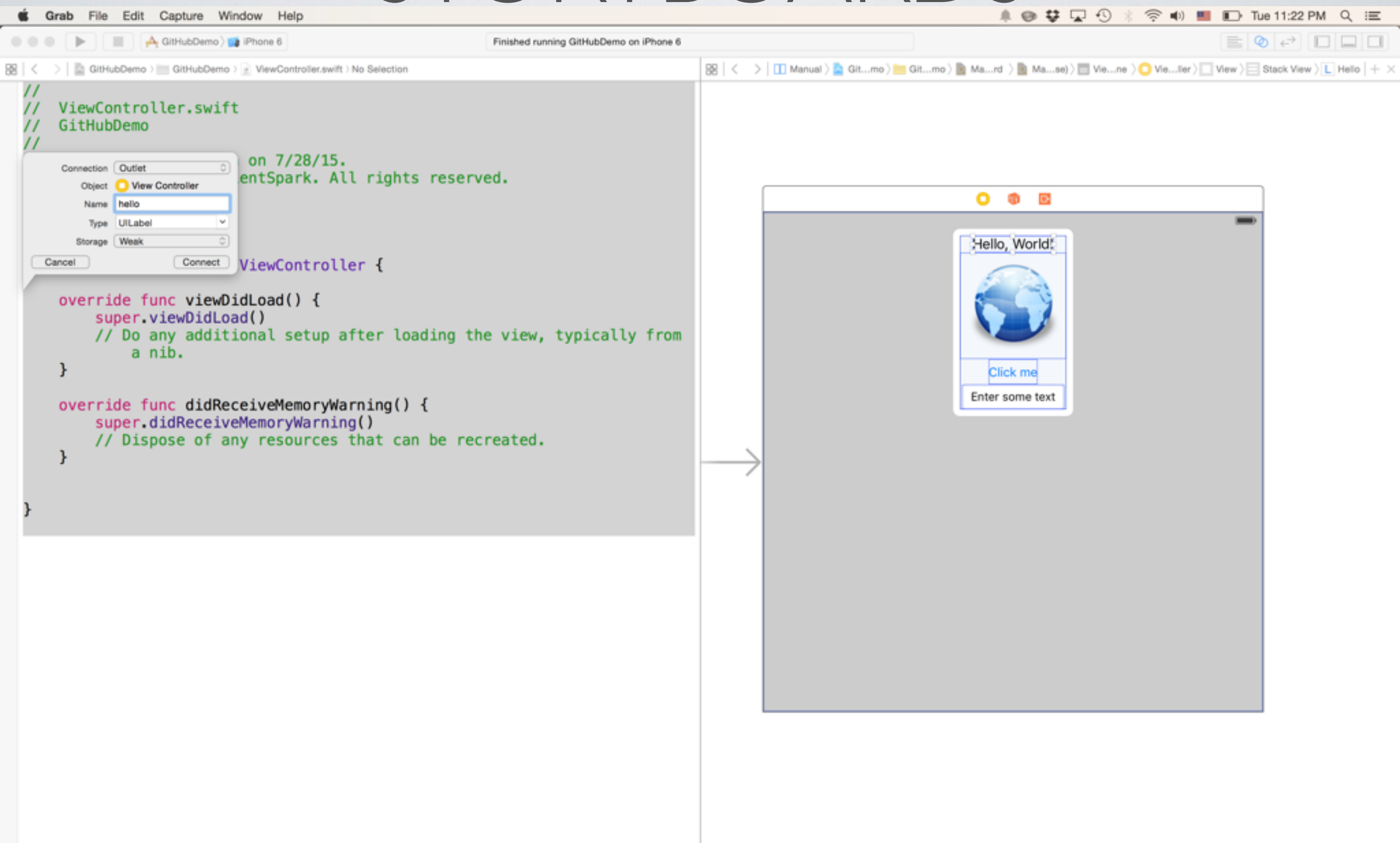

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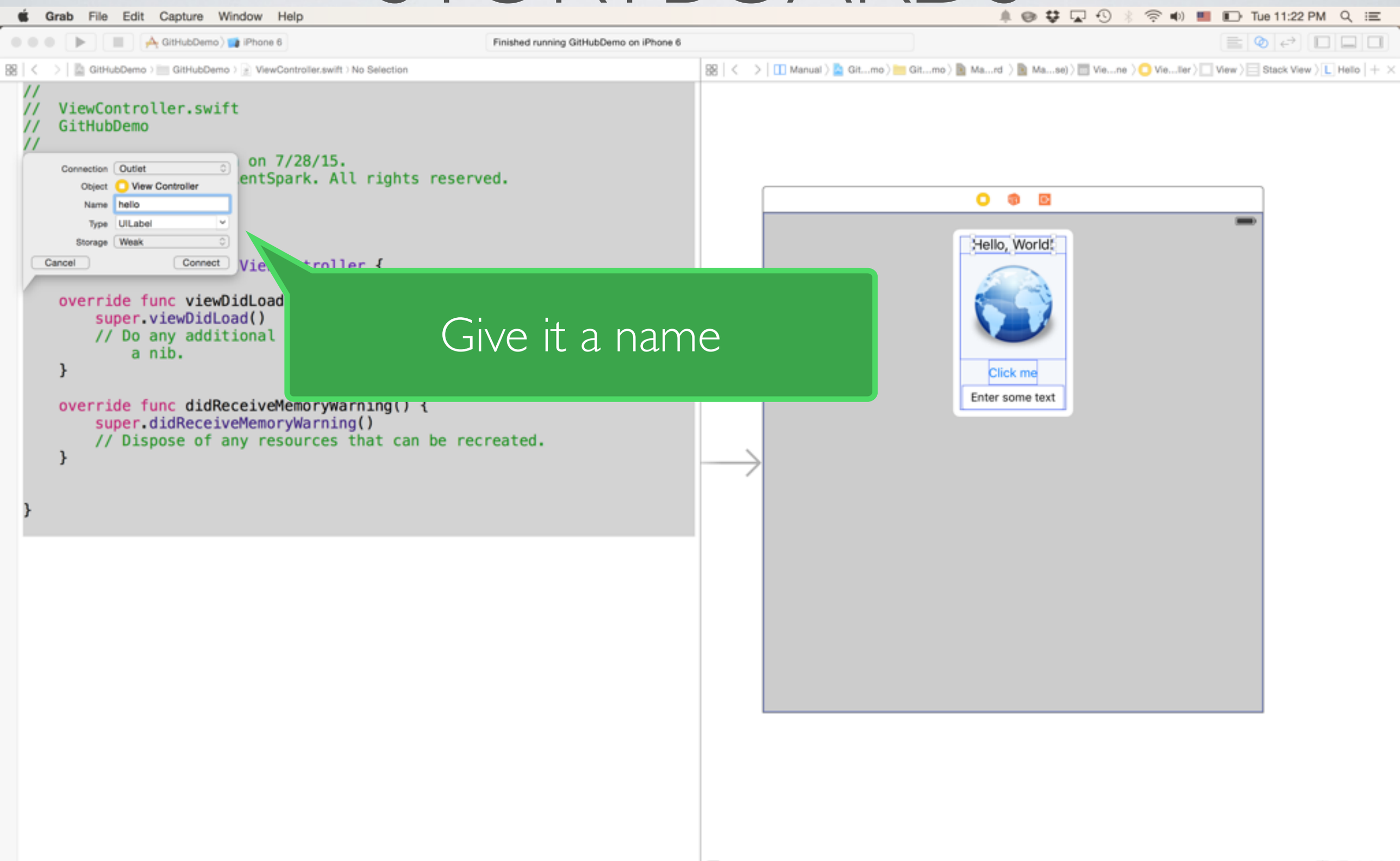

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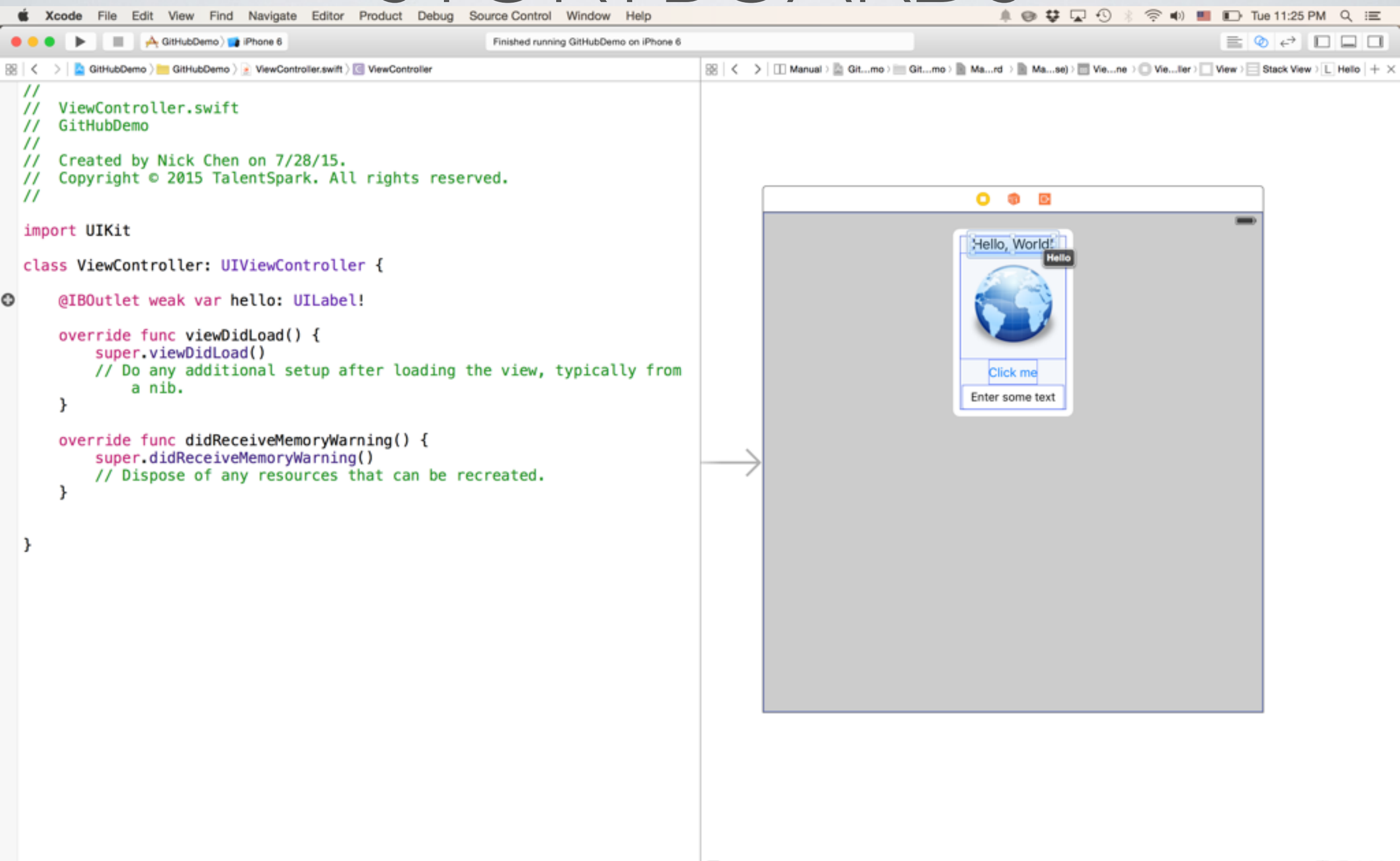

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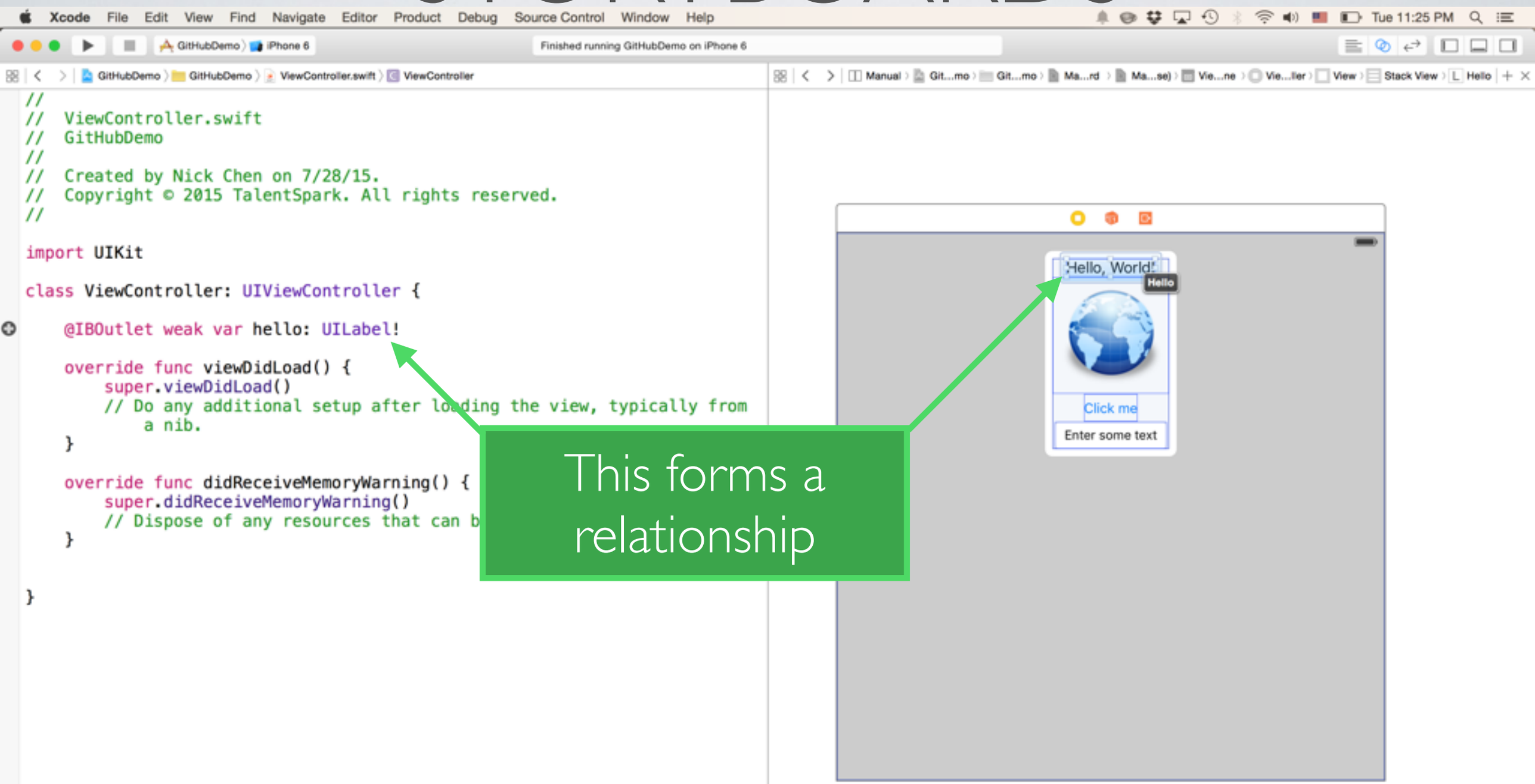

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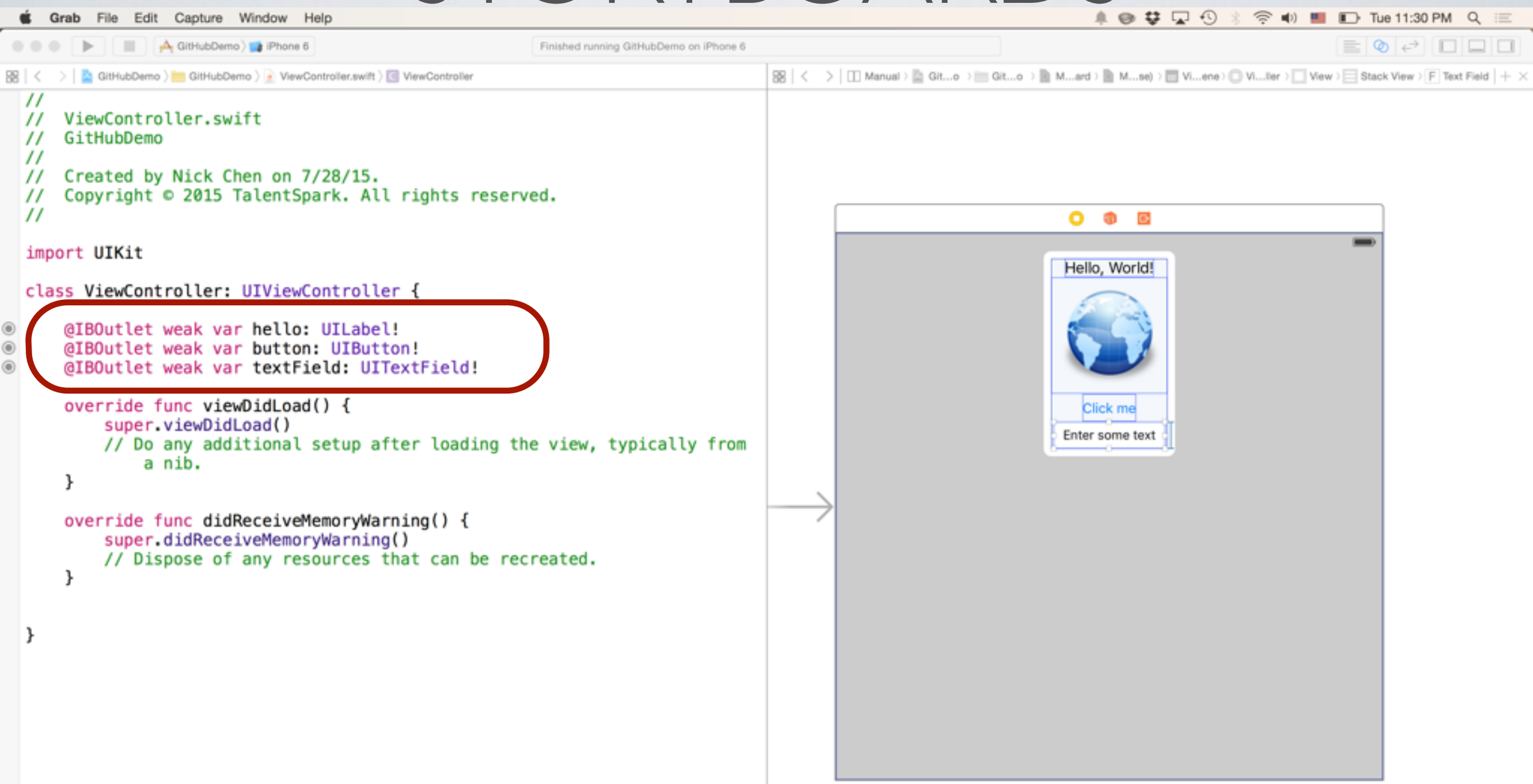

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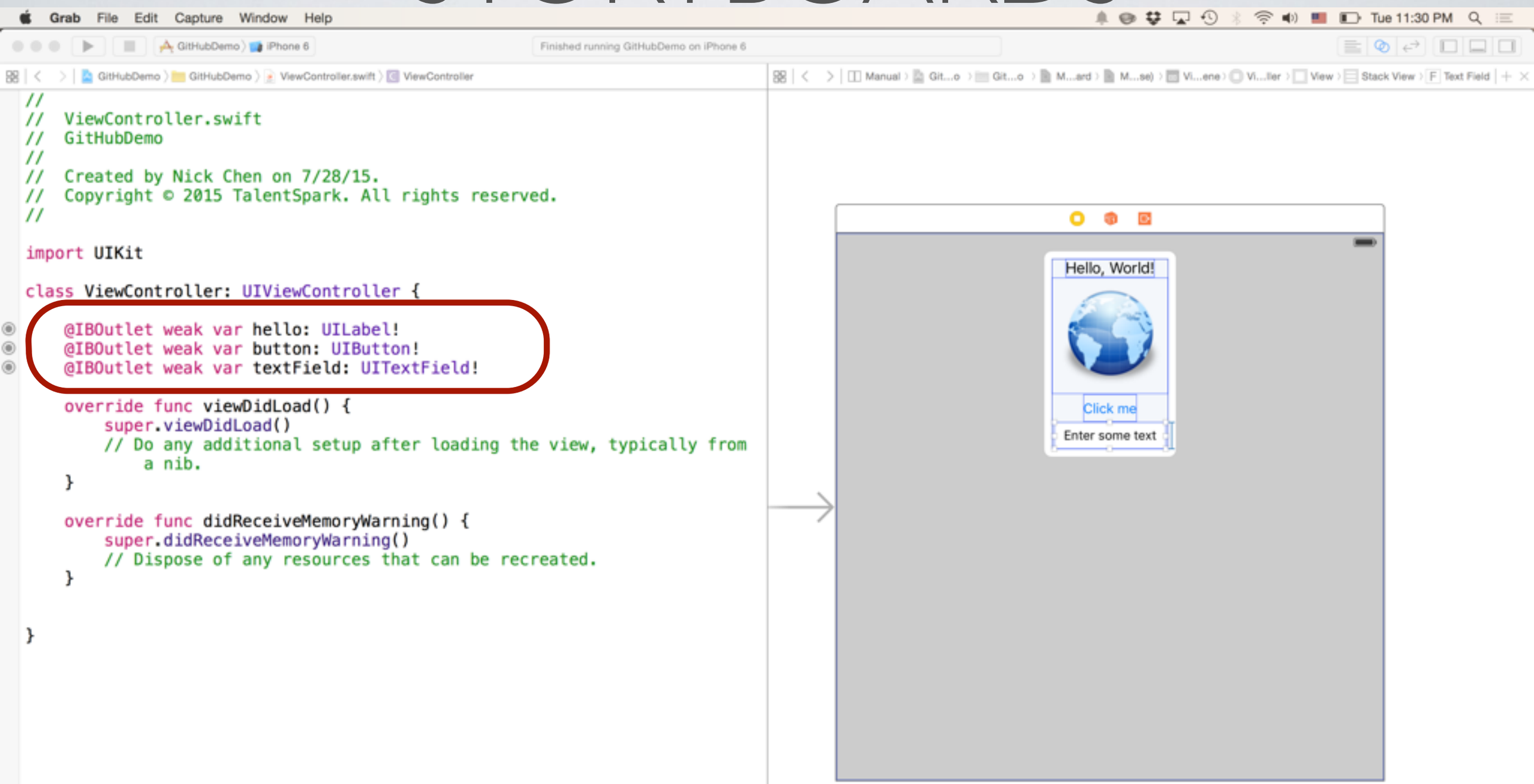
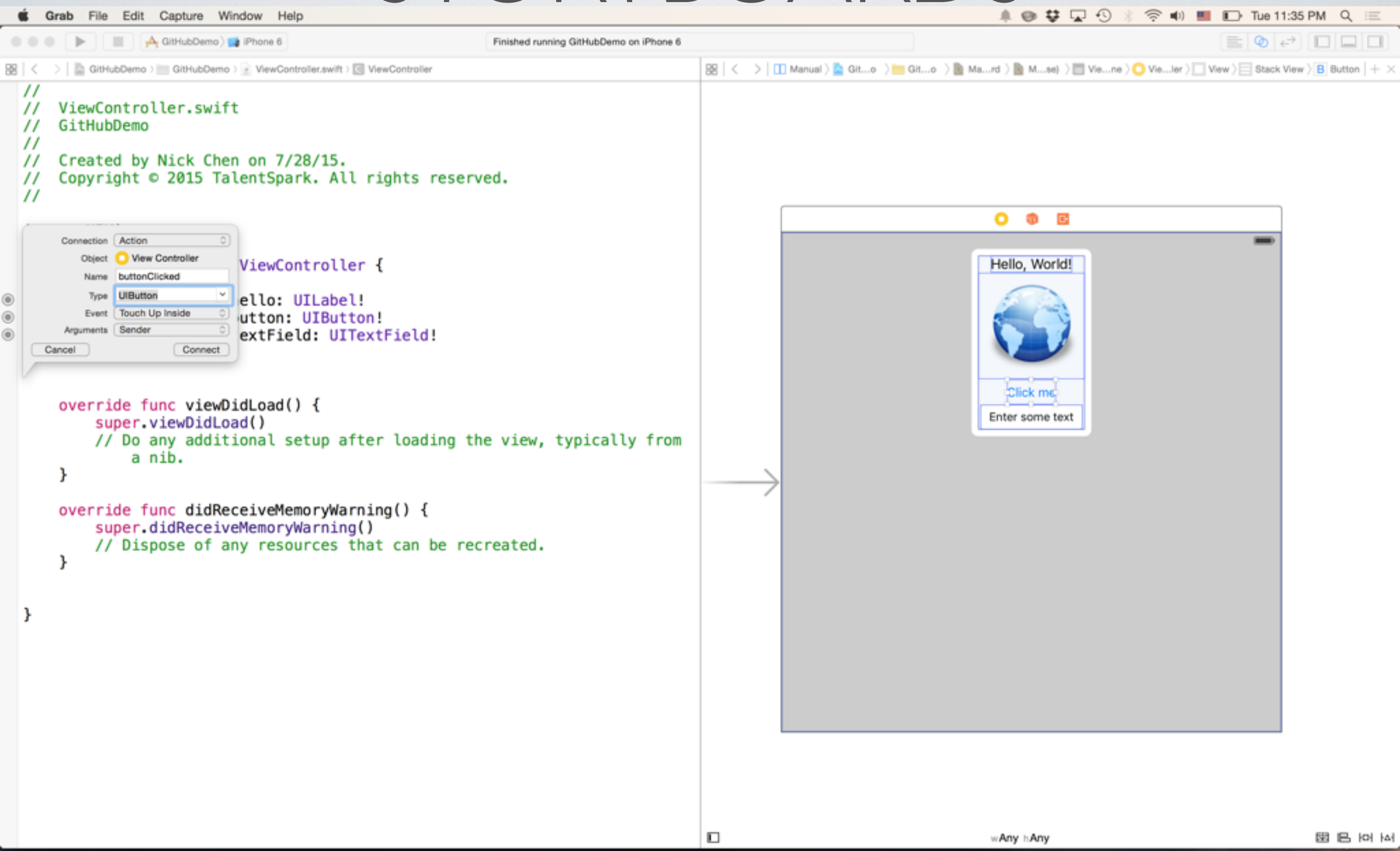
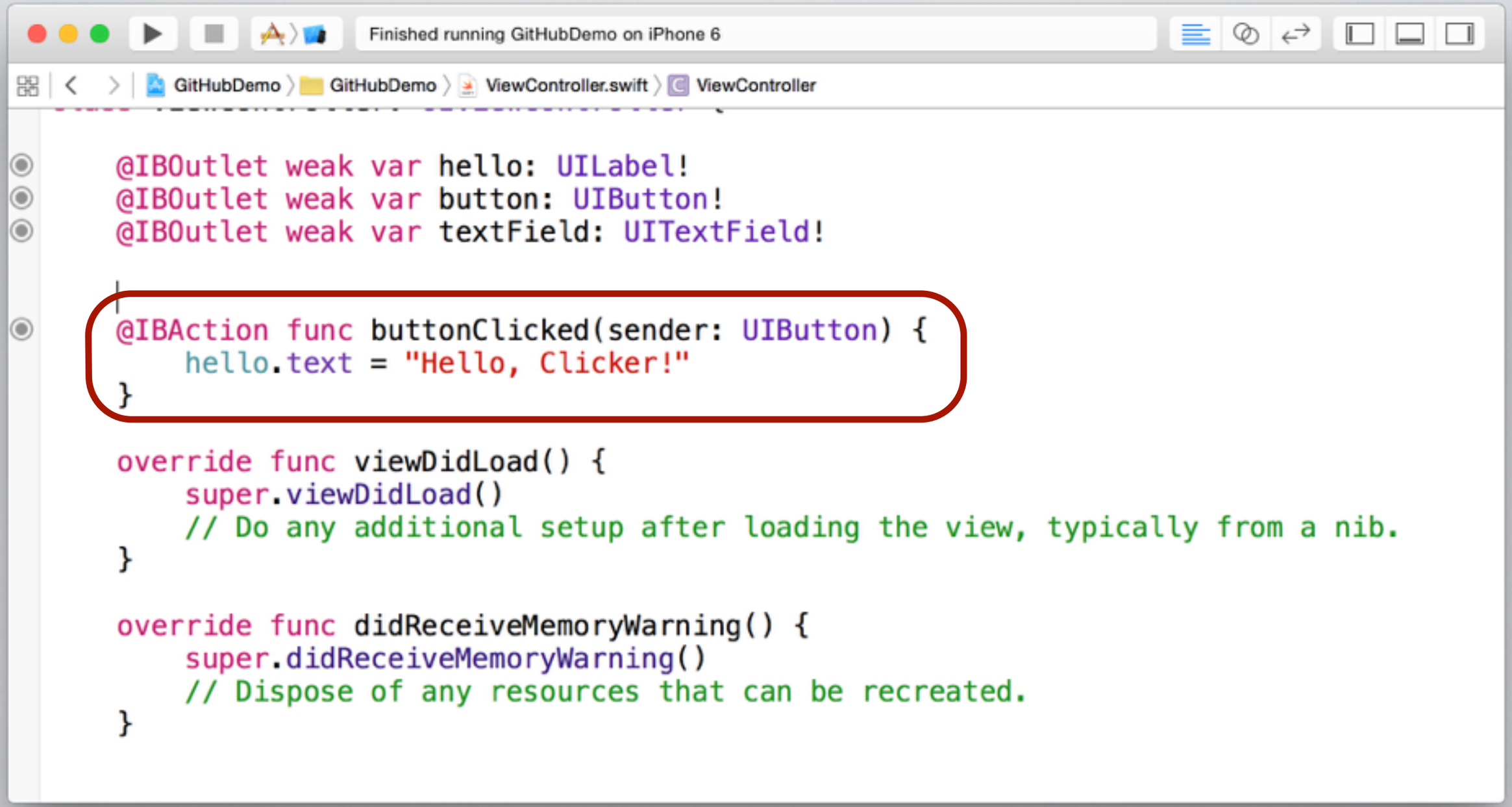


Renaming these are tricky. I'll demonstrate.

STORYBOARDS



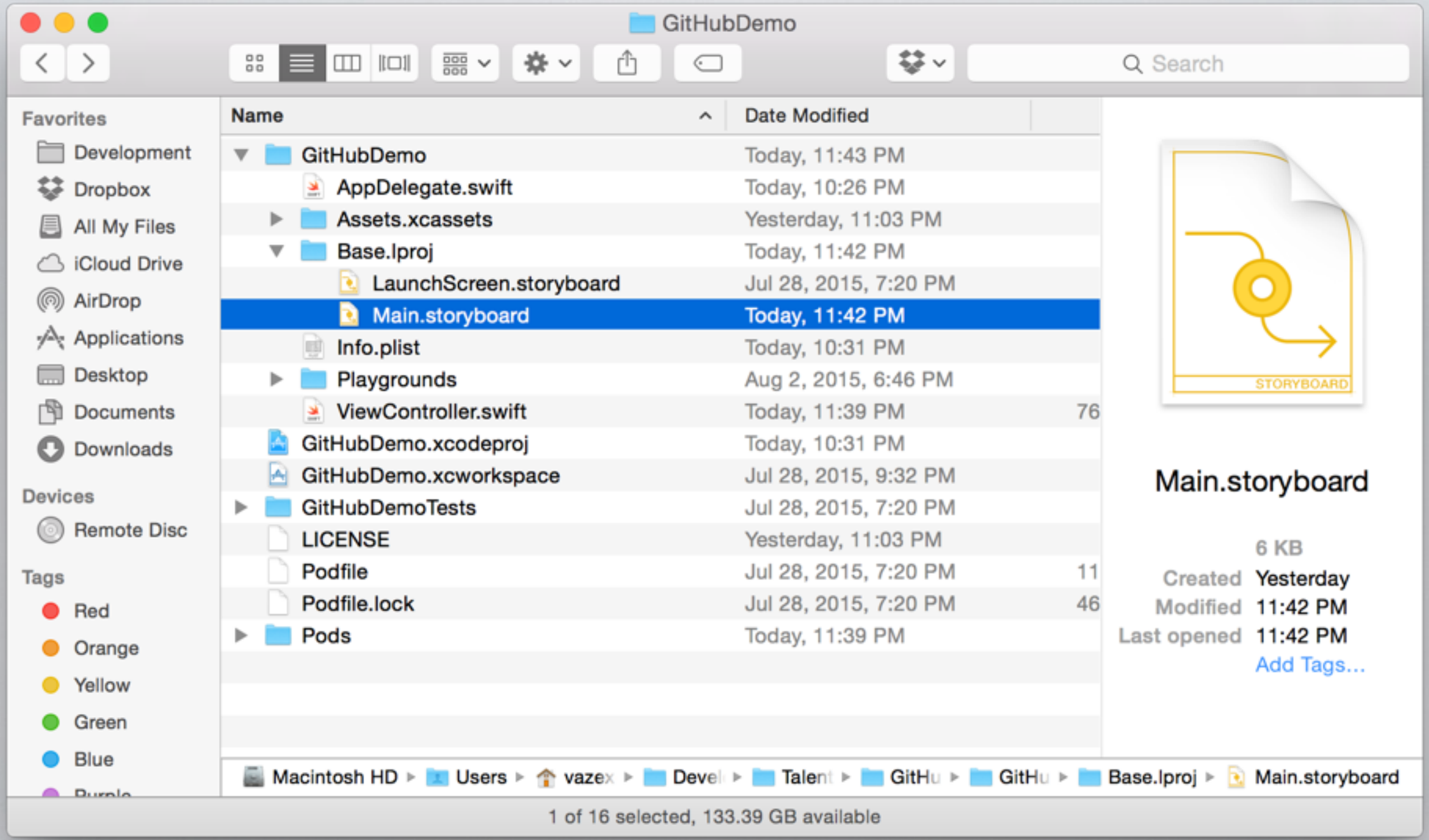
STORYBOARDS



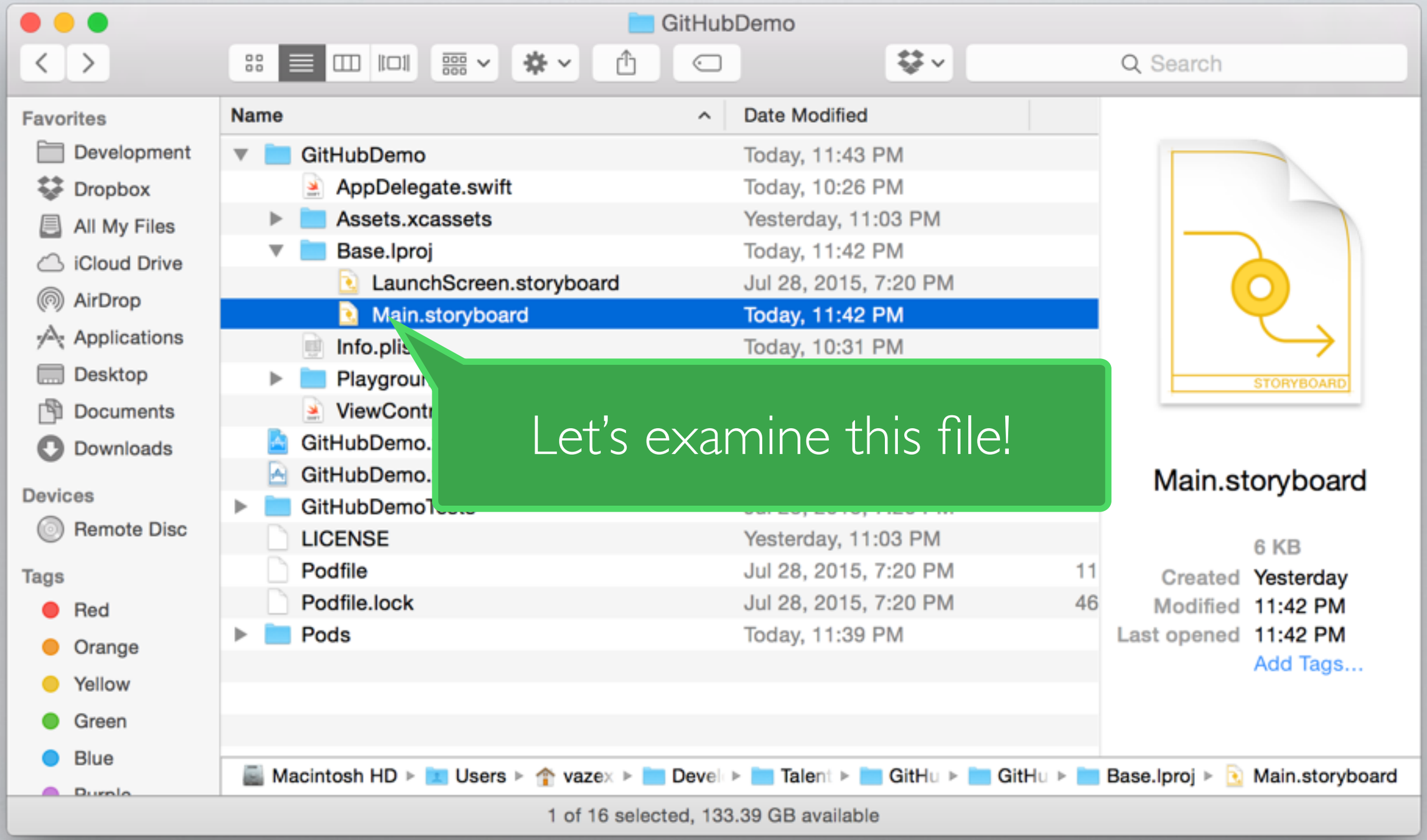
EXERCISE

- Change text of the UILabel based on what you entered in the UITextField

HOW DOES IT WORK?



HOW DOES IT WORK?



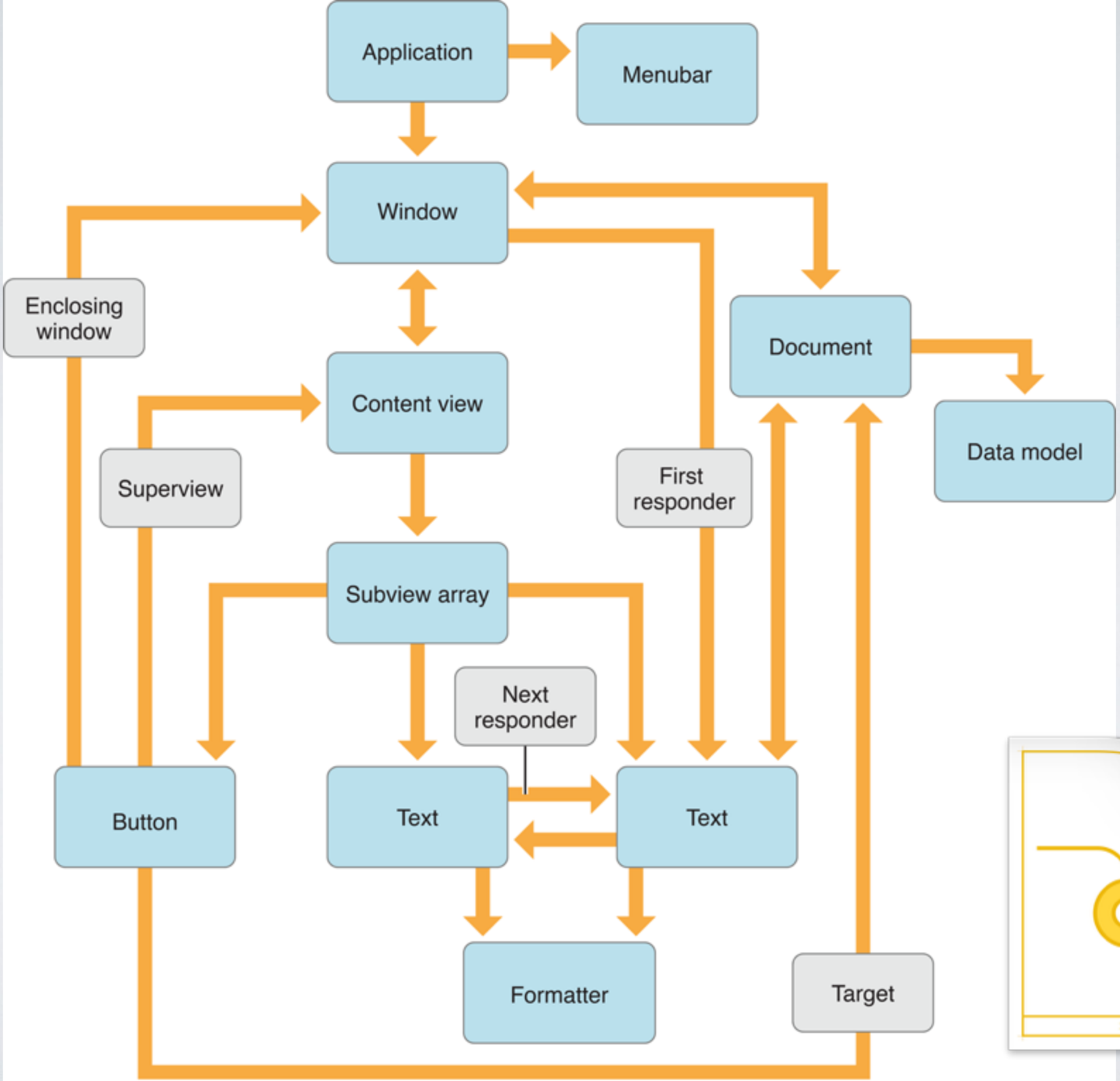
“ANY SUFFICIENTLY ADVANCED TECHNOLOGY IS INDISTINGUISHABLE FROM MAGIC”

– Arthur C. Clarke

DEMYSTIFYING THE MAGIC – HOW DOES IT WORK?


STORYBOARD


STORYBOARD


Application
Menubar
Window
Enclosing window
Document
Content view
Data model
Superview
First responder
Subview array
Next responder
Button
Text
Text
Formatter
Target


STORYBOARD

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<document type="com.apple.InterfaceBuilder3.CocoaTouch.Storyboard.XIB" version="3.0" toolsVersion="8164.2" systemVersion="14E46" targetRuntime="iOS.CocoaTouch" propertyAccessControl="none" useAutolayout="YES" useTraitCollections="YES" initialViewController="BYZ-38-t0r">
    <dependencies>
        <plugIn identifier="com.apple.InterfaceBuilder.IBCocoaTouchPlugin" version="8135.1"/>
    </dependencies>
    <scenes>
        <!--View Controller-->
        <scene sceneID="tne-QT-ifu">
            <objects>
                <viewController id="BYZ-38-t0r" customClass="ViewController" customModule="GitHubDemo" customModuleProvider="target" sceneMemberID="viewController">
                    <layoutGuides>
                        <viewControllerLayoutGuide type="top" id="y3c-jy-aDJ"/>
                        <viewControllerLayoutGuide type="bottom" id="wfy-db-euE"/>
                    </layoutGuides>
                    <view key="view" contentMode="scaleToFill" id="8bC-Xf-vdC">
                        <rect key="frame" x="0.0" y="0.0" width="600" height="600"/>
                        <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
                        <subviews>
                            <stackView opaque="NO" contentMode="scaleToFill" axis="vertical" alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
                                <rect key="frame" x="236" y="28" width="128" height="209"/>
                                <subviews>
                                    <label opaque="NO" userInteractionEnabled="NO" contentMode="center" horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!" textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines" minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                        <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                        <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                        <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                        <nil key="highlightedColor"/>
                                    </label>
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard                    unix < utf-8 < xml  15%  11:34
:set wrap linebreak nolist
```

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<document type="com.apple.InterfaceBuilder3.CocoaTouch.Storyboard.XIB" version="3.0" toolsVersion="8164.2" systemVersion="14E46" targetRuntime="iOS.CocoaTouch" propertyAccessControl="none" useAutolayout="YES" useTraitCollections="YES" initialViewController="BYZ-38-t0r">
    <dependencies>
        <plugIn identifier="com.apple.InterfaceBuilder.IBCocoaTouchPlugin" version="8135.1"/>
    </dependencies>
    <scenes>
        <!--View Controller-->
        <scene sceneID="tne-QT-ifu">
            <objects>
                <viewController id="BYZ-38-t0r" customClass="ViewController" customModule="GitHubDemo" customModuleProvider="target" sceneMemberID="viewController">
                    <layoutGuides>
                        <viewControllerLayoutGuide type="top" id="y3c-jy-aDJ"/>
                        <viewControllerLayoutGuide type="bottom" id="wfy-db-euE"/>
                    </layoutGuides>
                    <view key="view" contentMode="scaleToFill" id="8bC-Xf-vdC">
                        <rect key="frame" x="0.0" y="0.0" width="600" height="600"/>
                        <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
                        <subviews>
                            <stackView opaque="NO" contentMode="scaleToFill" axis="vertical" alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
                                <rect key="frame" x="236" y="28" width="128" height="209"/>
                                <subviews>
                                    <label opaque="NO" userInteractionEnabled="NO" contentMode="center" horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!" textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines" minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                        <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                        <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                        <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                        <nil key="highlightedColor"/>
NORMAL  ma                                                                  11:34
:set wrap lin
```

Yucky XML!

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<document type="com.apple.InterfaceBuilder3.CocoaTouch.Storyboard.XIB" version="3.0" toolsVersion="8164.2" systemVersion="14E46" targetRuntime="iOS.CocoaTouch" propertyAccessControl="none" useAutolayout="YES" useTraitCollections="YES" initialViewController="BYZ-38-t0r">
    <dependencies>
        <plugIn identifier="com.apple.InterfaceBuilder.IBCocoaTouchPlugin" version="8135.1"/>
    </dependencies>
    <scenes>
        <!--View Controller-->
        <scene sceneID="tne-QT-ifu">
            <objects>
                <viewController id="BYZ-38-t0r" customClass="ViewController" customModule="GitHubDemo" customModuleProvider="target" sceneMemberID="viewController">
                    <layoutGuides>
                        <viewControllerLayoutGuide type="top" id="y3c-jy-aDJ"/>
                        <viewControllerLayoutGuide type="bottom" id="wfy-db-euE"/>
                    </layoutGuides>
                    <view key="view" contentMode="scaleToFill" id="8bC-Xf-vdC">
                        <rect key="frame" x="0.0" y="0.0" width="600" height="600"/>
                        <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
                        <subviews>
                            <stackView opaque="NO" contentMode="scaleToFill" axis="vertical" alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
                                <rect key="frame" x="236" y="28" width="128" height="209"/>
                                <subviews>
                                    <label opaque="NO" userInteractionEnabled="NO" contentMode="center" horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!" textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines" minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                        <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                        <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                        <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                        <nil key="highlightedColor"/>
                                    </label>
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard                    unix < utf-8 < xml  11%  8:34
search hit BOTTOM, continuing at TOP
```

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<document type="com.apple.InterfaceBuilder3.CocoaTouch.Storyboard.XIB" version="3.0" toolsVersion="8164.2" systemVersion="14E46" targetRuntime="iOS.CocoaTouch" propertyAccessControl="none" useAutolayout="YES" useTraitCollections="YES" initialViewController="BYZ-38-t0r">
    <dependencies>
        <plugIn identifier="com.apple.InterfaceBuilder.IBCocoaTouchPlugin" version="8135.1"/>
    </dependencies>
    <scenes>
        <!--View Controller-->
        <scene sceneID="tne-QT-ifu">
            <objects>
                <viewController id="BYZ-38-t0r" customClass="ViewController" customModule="GitHubDemo" customModuleProvider="target" sceneMemberID="viewController">
                    <layoutGuides>
                        <viewCon
                        <viewCo
                    </layoutGui
                    <view key="
                        <rect k
                        <autores                                                    htSizable="YES"/>
                        <subvie
                            <stackView opaque="NO" contentMode="scaleToFill" axis="vertical" alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
                                <rect key="frame" x="236" y="28" width="128" height="209"/>
                                <subviews>
                                    <label opaque="NO" userInteractionEnabled="NO" contentMode="center" horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!" textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines" minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                        <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                        <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                        <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                        <nil key="highlightedColor"/>
                                    </label>
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard                    unix < utf-8 < xml   11%  8:34
search hit BOTTOM, continuing at TOP
```

Look! It refers to our ViewController!

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                      <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                      <subviews>
19                          <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                              <rect key="frame" x="236" y="28" width="128" height="209"/>
21                              <subviews>
22                                  <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
23                                      <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
24                                      <fontDescription key="fontDescription" type="system" pointSize="17"/>
25                                      <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
26                                      <nil key="highlightedColor"/>
27                                  </label>
28                                  <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
    translatesAutoresizingMaskIntoConstraints="NO" id="QdP-zk-YO4">
29                                      <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
30                                  </imageView>
31                                  <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
    contentHorizontalAlignment="center" contentVerticalAlignment="center" buttonType="roundedRect"
    lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                      <rect key="frame" x="34.5" y="148.5" width="59" height="30.5"/>
33                                      <state key="normal" title="Click me"/>
34                                      <connections>
35                                          <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                      </connections>
37                                  </button>
38                                  <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

HOW DOES IT WORK?

XML representation of UIViews!

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                      <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                      <subviews>
19                          <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                              <rect key="frame" x="236" y="28" width="128" height="209"/>
21                              <subviews>
22                                  <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                      <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                      <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                      <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                      <nil key="highlightedColor"/>
                                  </label>
                                  <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
                                      y="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
                                      askIntoConstraints="NO" id="QdP-zk-YO4">
                                      <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
                                  </imageView>
                                  <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
                                      ent="center" contentVerticalAlignment="center" buttonType="roundedRect"
                                      lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                      <rect key="frame" x="34.5" y="148.5" width="59" height="30.5"/>
33                                      <state key="normal" title="Click me"/>
34                                      <connections>
35                                          <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                      </connections>
37                                  </button>
38                                  <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

HOW DOES IT WORK?

XML representation of UIViews!

Label

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                      <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                      <subviews>
19                          <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                              <rect key="frame" x="236" y="28" width="128" height="209"/>
21                              <subviews>
22                                  <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                      <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                      <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                      <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                      <nil key="highlightedColor"/>
                                  </label>
                                  <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
                                      251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
                                      askIntoConstraints="NO" id="QdP-zk-YO4">
                                      <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
                                  </imageView>
                                  <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
                                      ent="center" contentVerticalAlignment="center" buttonType="roundedRect"
                                      uncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                      <rect key="frame" x="34.5" y="148.5" width="59" height="30.5"/>
33                                      <state key="normal" title="Click me"/>
34                                      <connections>
35                                          <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                      </connections>
37                                  </button>
38                                  <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

HOW DOES IT WORK?

XML representation of UIViews!

Label

ImageView

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                          <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                          <subviews>
19                              <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                                  <rect key="frame" x="236" y="28" width="128" height="209"/>
21                                  <subviews>
22                                      <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
                                          <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                          <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                          <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                          <nil key="highlightedColor"/>
                                      </label>
                                      <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
                                          y="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
                                          askIntoConstraints="NO" id="QdP-zk-YOP">
                                          <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
                                      </imageView>
                                      <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
                                          ent="center" contentVerticalAlignment="center" buttonType="roundedRect"
                                          lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                        <rect key="frame" x="34.5" y="148.5" width="59" height="30.5"/>
33                                        <state key="normal" title="Click me"/>
34                                        <connections>
35                                            <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                        </connections>
37                                    </button>
38                                    <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

HOW DOES IT WORK?

XML representation of UIViews!

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                          <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                          <subviews>
19                              <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                                  <rect key="frame" x="236" y="28" width="128" height="209"/>
21                                  <subviews>
22                                      <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Ioh-GC-vzh">
                                          <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                          <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                          <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                          <nil key="highlightedColor"/>
                                      </label>
                                      <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
                                          y="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
                                          askIntoConstraints="NO" id="QdP-zk-YOR">
                                          <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
                                      </imageView>
                                      <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
                                          ent="center" contentVerticalAlignment="center" buttonType="roundedRect"
    lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                          <rect key="frame" x="34.5" y="[illegible]" width="59" height="30.5"/>
33                                          <state key="normal" title="Click me"/>
34                                          <connections>
35                                              <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                          </connections>
37                                      </button>
38                                      <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

Label

ImageView

Button

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                      <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                      <subviews>
19                          <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                              <rect key="frame" x="236" y="28" width="128" height="209"/>
21                              <subviews>
22                                  <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Boh-GC-vzh">
23                                      <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
24                                      <fontDescription key="fontDescription" type="system" pointSize="17"/>
25                                      <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
26                                      <nil key="highlightedColor"/>
27                                  </label>
28                                  <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
    translatesAutoresizingMaskIntoConstraints="NO" id="QdP-zk-YOe">
29                                      <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
30                                  </imageView>
31                                  <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
    contentHorizontalAlignment="center" contentVerticalAlignment="center" buttonType="roundedRect"
    lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                      <rect key="frame" x="34.5" y="148.5" width="59" height="30.5"/>
33                                      <state key="normal" title="Click me"/>
34                                      <connections>
35                                          <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                      </connections>
37                                  </button>
38                                  <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

Label

ImageView

Button

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
17                          <autoresizingMask key="autoresizingMask" widthSizable="YES" heightSizable="YES"/>
18                          <subviews>
19                              <stackView opaque="NO" contentMode="scaleToFill" axis="vertical"
    alignment="center" translatesAutoresizingMaskIntoConstraints="NO" id="GOj-cU-Mzs">
20                                  <rect key="frame" x="236" y="28" width="128" height="209"/>
21                                  <subviews>
22                                      <label opaque="NO" userInteractionEnabled="NO" contentMode="center"
    horizontalHuggingPriority="251" verticalHuggingPriority="251" fixedFrame="YES" text="Hello, World!"
    textAlignment="center" lineBreakMode="tailTruncation" baselineAdjustment="alignBaselines"
    minimumScaleFactor="0.5" translatesAutoresizingMaskIntoConstraints="NO" id="Ioh-GC-vzh">
                                          <rect key="frame" x="15" y="0.0" width="98" height="20.5"/>
                                          <fontDescription key="fontDescription" type="system" pointSize="17"/>
                                          <color key="textColor" cocoaTouchSystemColor="darkTextColor"/>
                                          <nil key="highlightedColor"/>
                                      </label>
                                      <imageView userInteractionEnabled="NO" contentMode="scaleAspectFit"
                                          y="251" verticalHuggingPriority="251" fixedFrame="YES" image="World"
                                          askIntoConstraints="NO" id="QdP-zk-YOR">
                                          <rect key="frame" x="0.0" y="20.5" width="128" height="128"/>
                                      </imageView>
                                      <button opaque="NO" contentMode="scaleToFill" fixedFrame="YES"
                                          ent="center" contentVerticalAlignment="center" buttonType="roundedRect"
    lineBreakMode="middleTruncation" translatesAutoresizingMaskIntoConstraints="NO" id="Hj4-gW-8Jg">
32                                          <rect key="frame" x="34.5" y="[illegible]" width="59" height="30.5"/>
33                                          <state key="normal" title="Click me"/>
34                                          <connections>
35                                              <action selector="buttonClicked:" destination="BYZ-38-t0r"
    eventType="touchUpInside" id="w6w-QB-YHF"/>
36                                          </connections>
37                                      </button>
38                                      <textField opaque="NO" clipsSubviews="YES" contentMode="scaleToFill"
    contentHorizontalAlignment="left" contentVerticalAlignment="center" text="Enter some text"
    borderStyle="roundedRect" textAlignment="center" minimumFontSize="17"
    translatesAutoresizingMaskIntoConstraints="NO" id="20D-2W-ph5">
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  40%  28:285
```

Label

ImageView

Button

Storyboards just encode the info in XML!

HOW DOES IT WORK?

Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
42                                      </constraints>
43                                      <fontDescription key="fontDescription" type="system" pointSize="14"/>
44                                      <textInputTraits key="textInputTraits"/>
45                                  </textField>
46                              </subviews>
47                          </stackView>
48                      </subviews>
49                      <color key="backgroundColor" white="1" alpha="1" colorSpace="custom"
    customColorSpace="calibratedWhite"/>
50                      <constraints>
51                          <constraint firstItem="GOj-cU-Mzs" firstAttribute="top" secondItem="y3c-jy-aDJ"
    secondAttribute="bottom" constant="8" symbolic="YES" id="GYI-aP-E2R"/>
52                          <constraint firstItem="wfy-db-euE" firstAttribute="top" secondItem="GOj-cU-Mzs"
    secondAttribute="bottom" constant="363" id="cBT-yC-gZ3"/>
53                          <constraint firstItem="GOj-cU-Mzs" firstAttribute="centerX" secondItem="8bC-Xf-
    vdC" secondAttribute="centerX" id="xTF-5X-L69"/>
54                      </constraints>
55                  </view>
56                  <connections>
57                      <outlet property="button" destination="Hj4-gW-8Jg" id="PmB-oS-Fg3"/>
58                      <outlet property="hello" destination="Boh-GC-vzh" id="xNy-cG-W7S"/>
59                      <outlet property="textField" destination="20D-2W-ph5" id="VPH-NS-JJn"/>
60                  </connections>
61              </viewController>
62              <placeholder placeholderIdentifier="IBFirstResponder" id="dkx-z0-nzr"
    sceneMemberID="firstResponder"/>
63          </objects>
64          <point key="canvasLocation" x="43" y="5"/>
65      </scene>
66  </scenes>
67  <resources>
68      <image name="World" width="128" height="128"/>
69  </resources>
70 </document>
```

NORMAL master GitHubDemo/Base.lproj/**Main.storyboard** unix utf-8 xml 84% 59:1

:nohl

HOW DOES IT WORK?

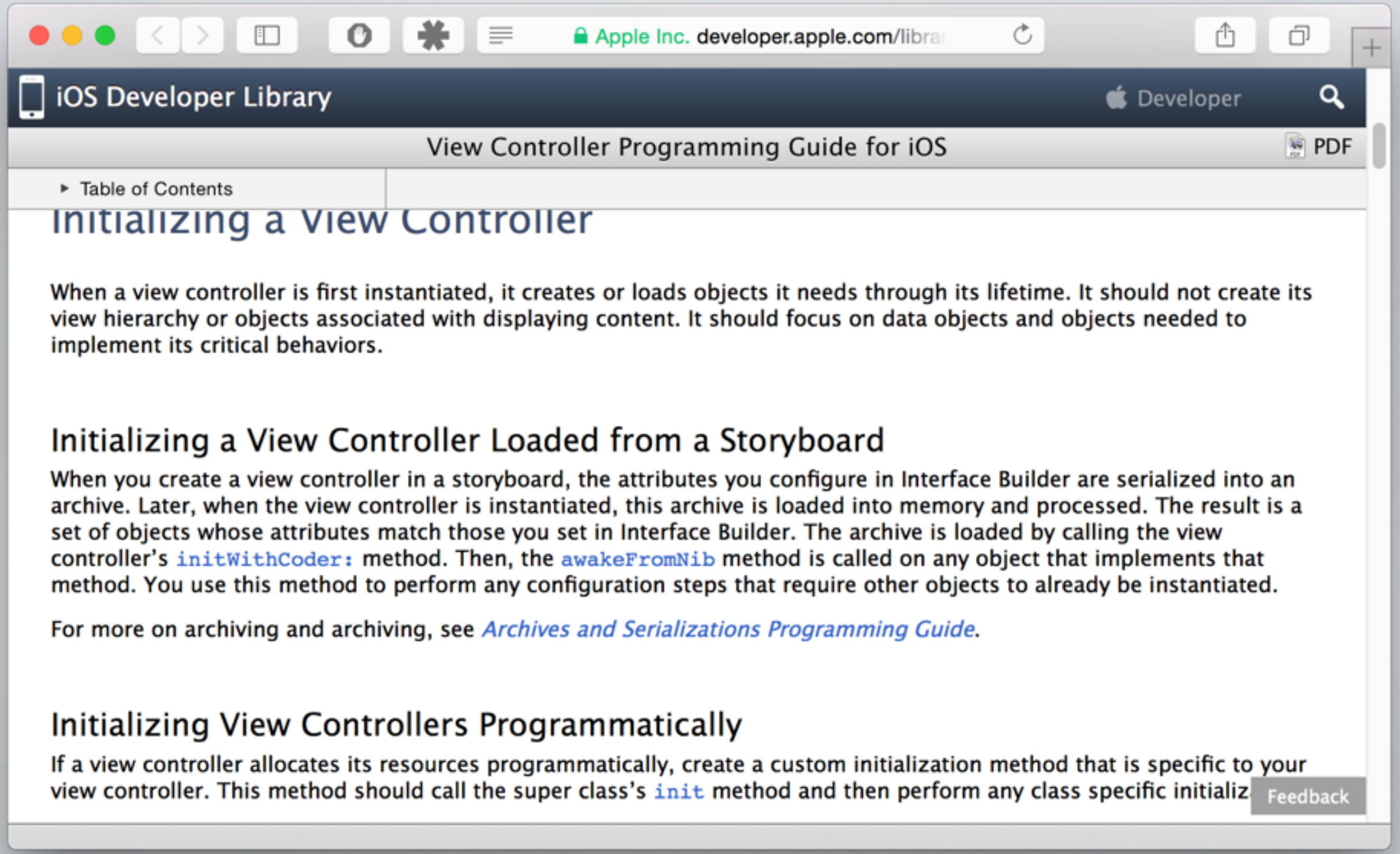
Main.storyboard (~/Development/TalentSpark/GitHubDemo/GitHubDemo/Base.lproj) - VIM2

```
42                                      </constraints>
43                                      <fontDescription key="fontDescription" type="system" pointSize="14"/>
44                                      <textInputTraits key="textInputTraits"/>
45                                  </textField>
46                              </subviews>
47                          </stackView>
48                      </subviews>
49                      <color key="backgroundColor" white="1" alpha="1" colorSpace="custom"
    customColorSpace="calibratedWhite"/>
50                      <constraints>
51                          <constraint firstItem="GOj-cU-Mzs" firstAttribute="top" secondItem="y3c-jy-aDJ"
    secondAttribute="bottom" constant="8" symbolic="YES" id="GYI-aP-E2R"/>
52                          <constraint firstItem="wfy-db-euE" firstAttribute="top" secondItem="GOj-cU-Mzs"
    secondAttribute="bottom" constant="363" id="cBT-yC-gZ3"/>
                            <constraint firstItem="GOj-cU-Mzs" firstAttribute="centerX" secondItem="8bC-Xf-
    ="centerX" id="xTF-5X-L69"/>
                        </constraints>
    </view>
    <connections>
                        <outlet property="button" destination="Hj4-gW-8Jg" id="PmB-oS-Fg3"/>
                        <outlet property="hello" destination="Boh-GC-vzh" id="xNy-cG-W7S"/>
                        <outlet property="textField" destination="20D-2W-ph5" id="VPH-NS-JJn"/>
    </connections>
    ewController>
    ceholder placeholderIdentifier="IBFirstResponder" id="dkx-z0-nzr"
    Responder"/>
    s>
64              <point key="canvasLocation" x="43" y="5"/>
65          </scene>
66      </scenes>
67      <resources>
68          <image name="World" width="128" height="128"/>
69      </resources>
70  </document>
```

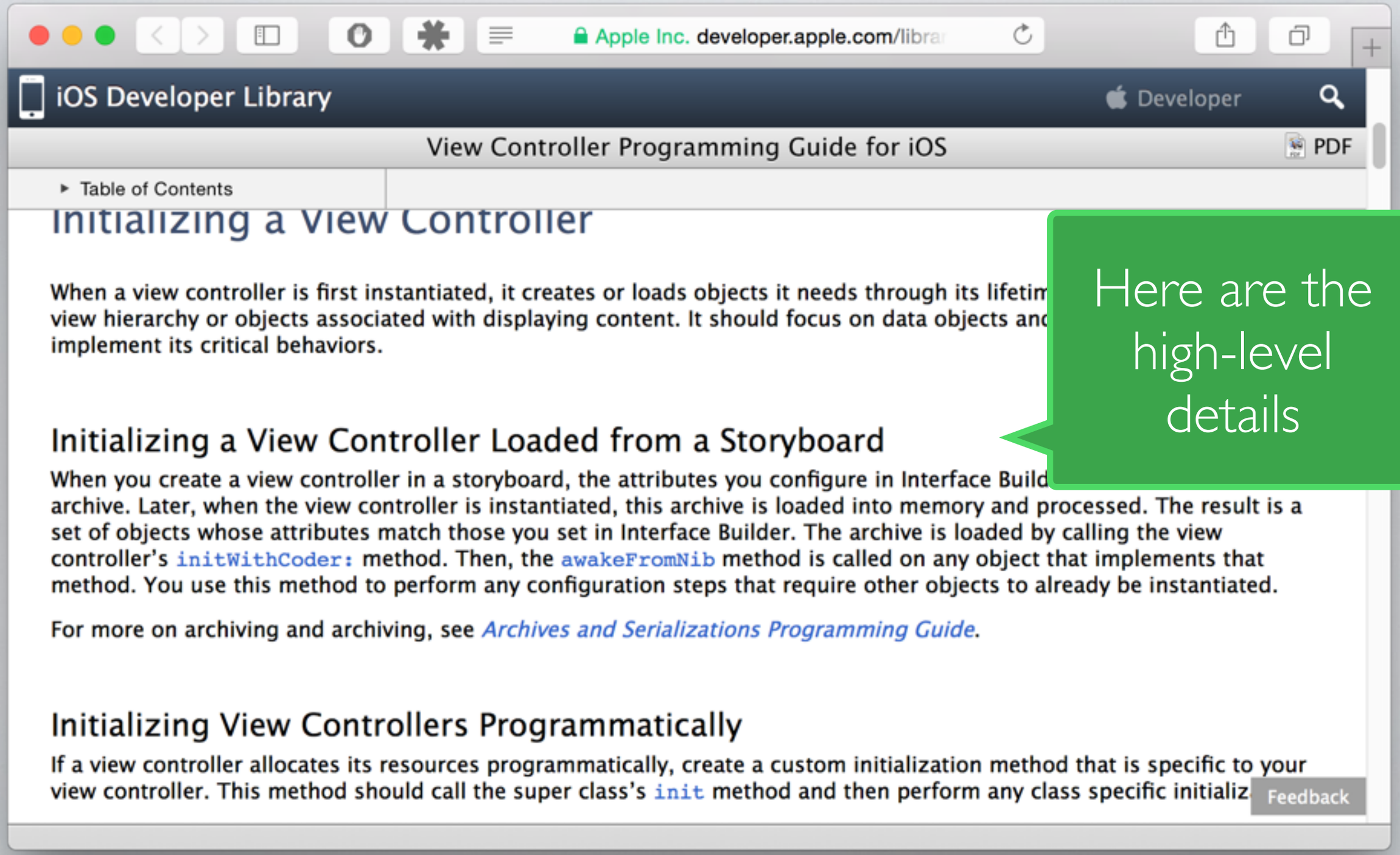
```
NORMAL  master > GitHubDemo/Base.lproj/Main.storyboard        unix < utf-8 < xml  84%  59:1
:nohl
```

Here are the @IBOutlets

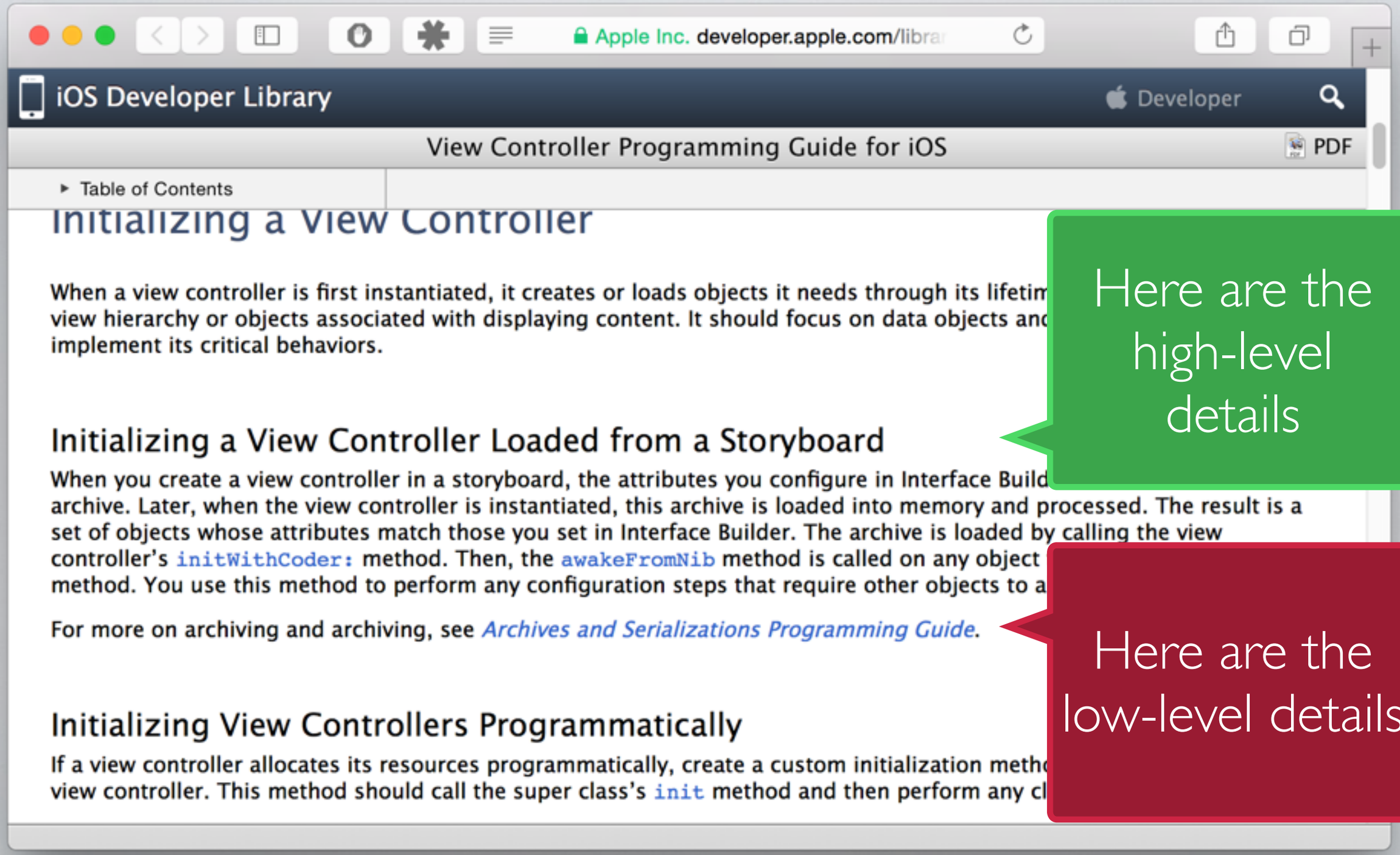
HOW DOES IT WORK?



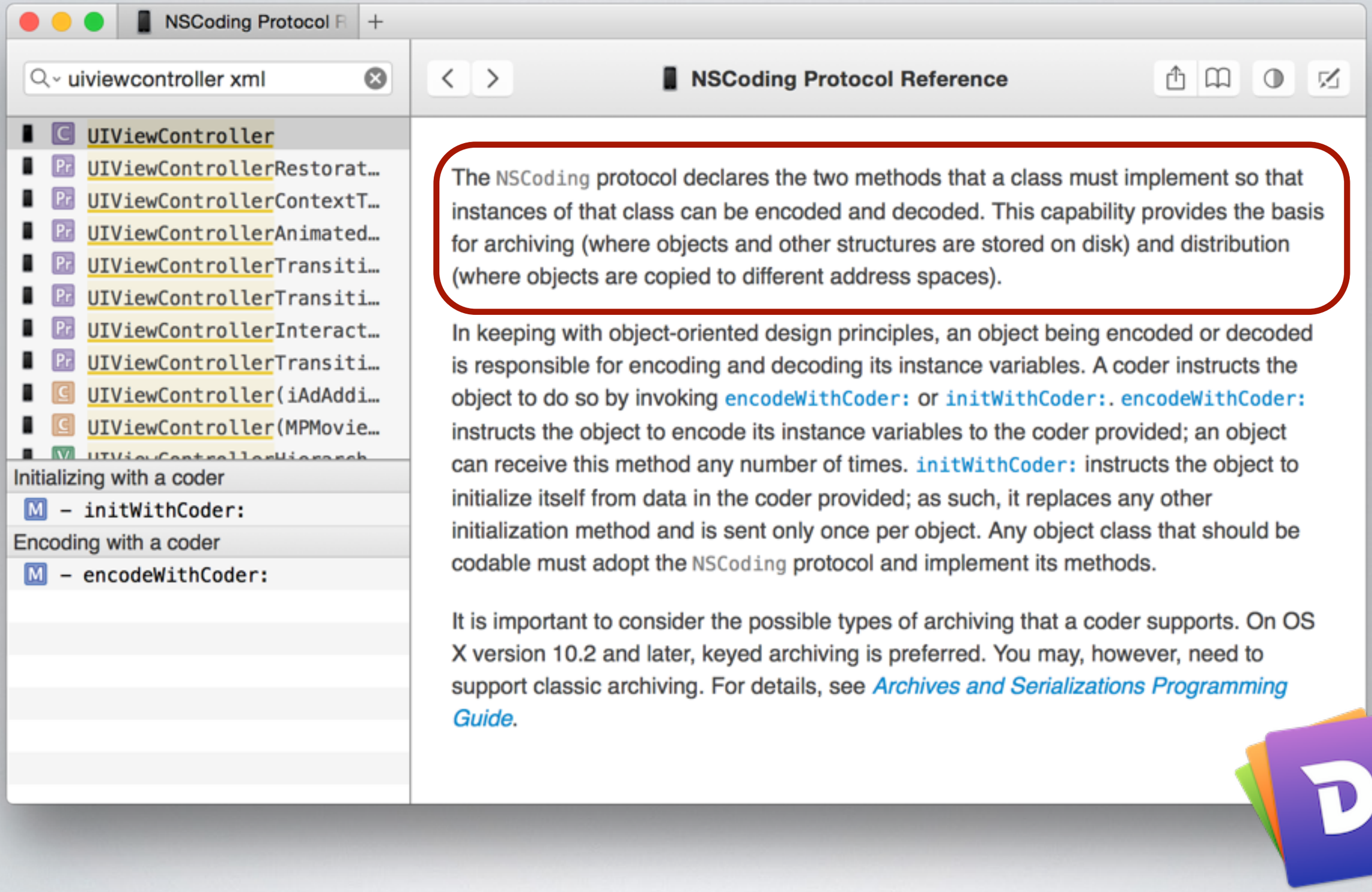
HOW DOES IT WORK?



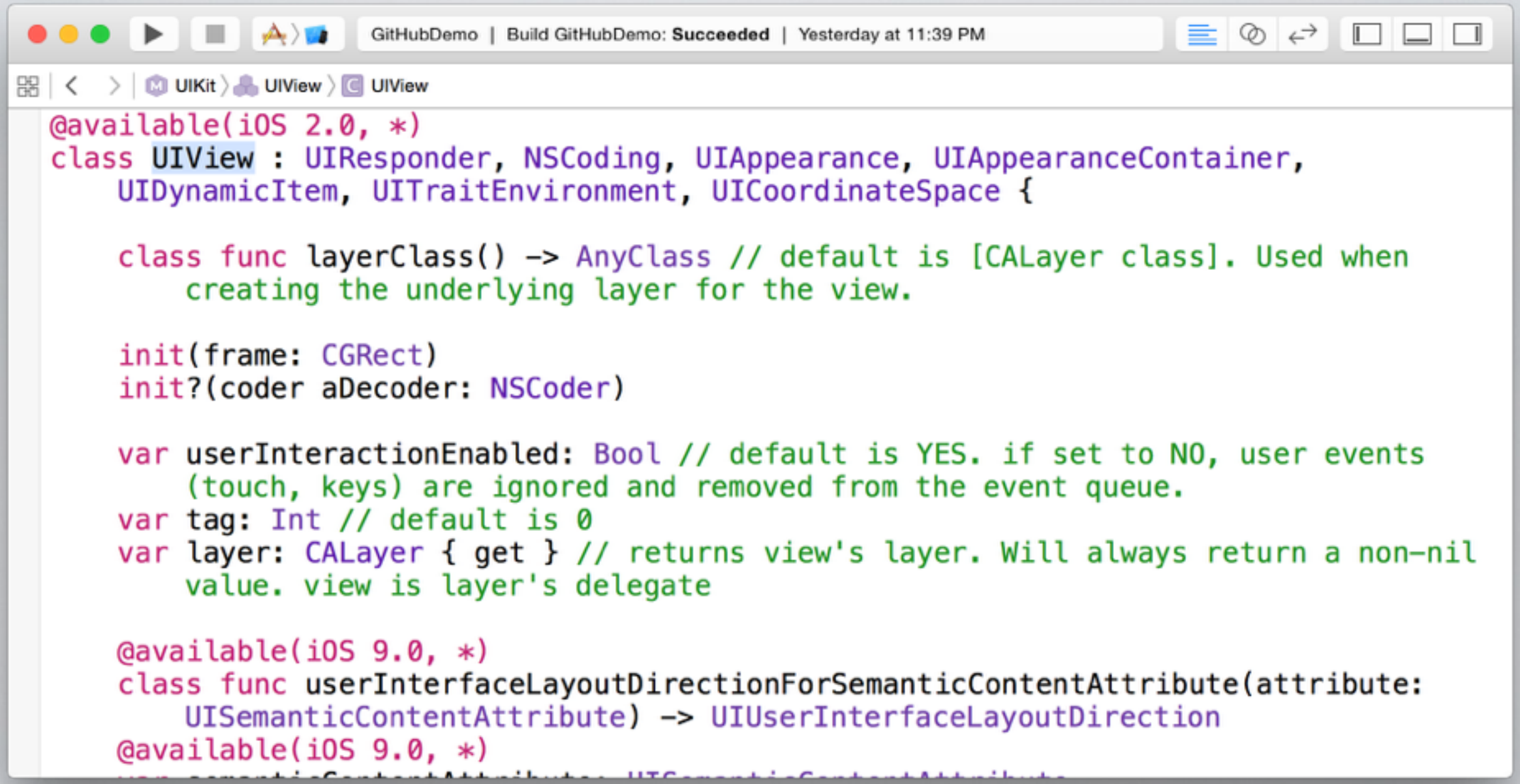
HOW DOES IT WORK?



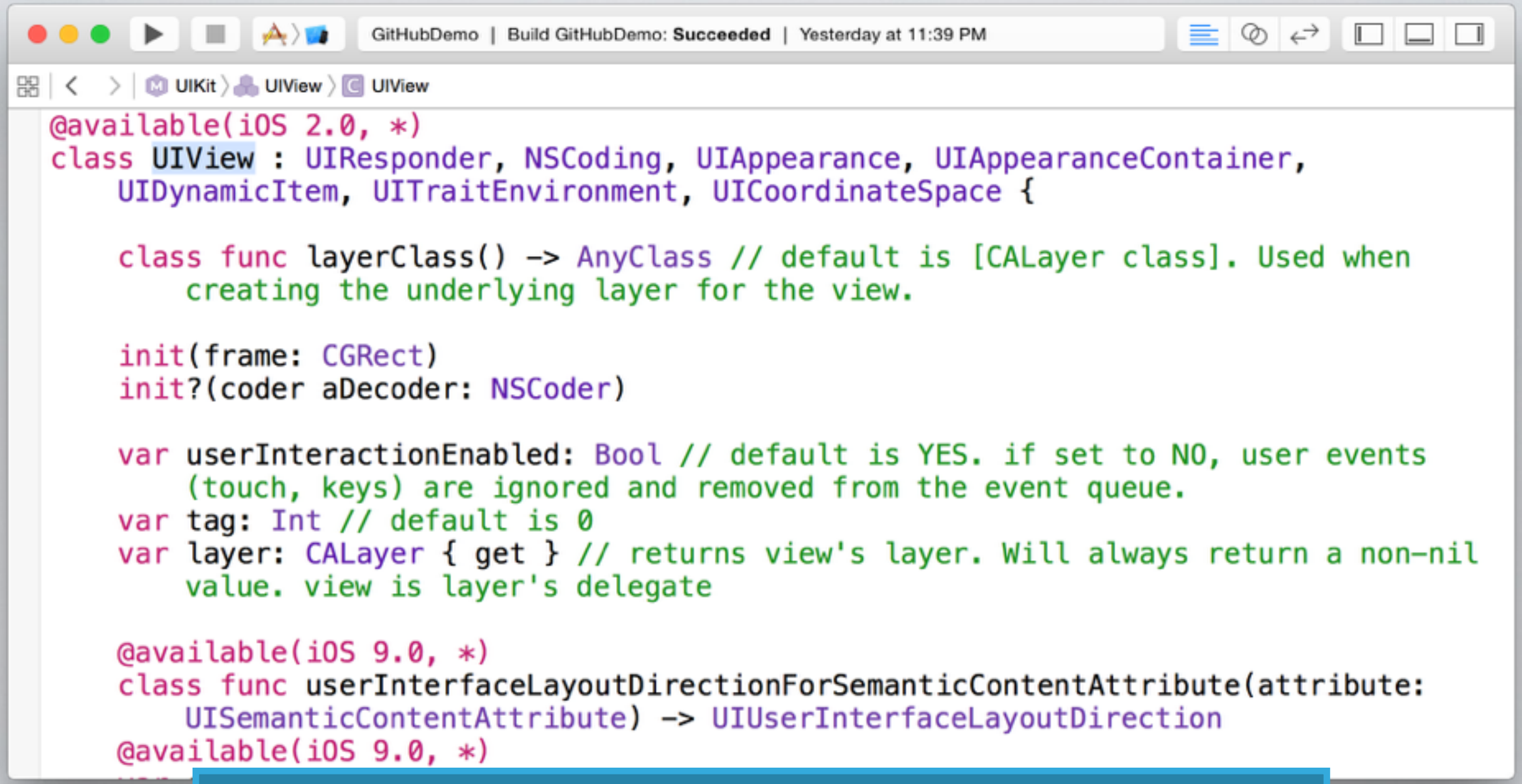
HOW DOES IT WORK?



HOW DOES IT WORK?

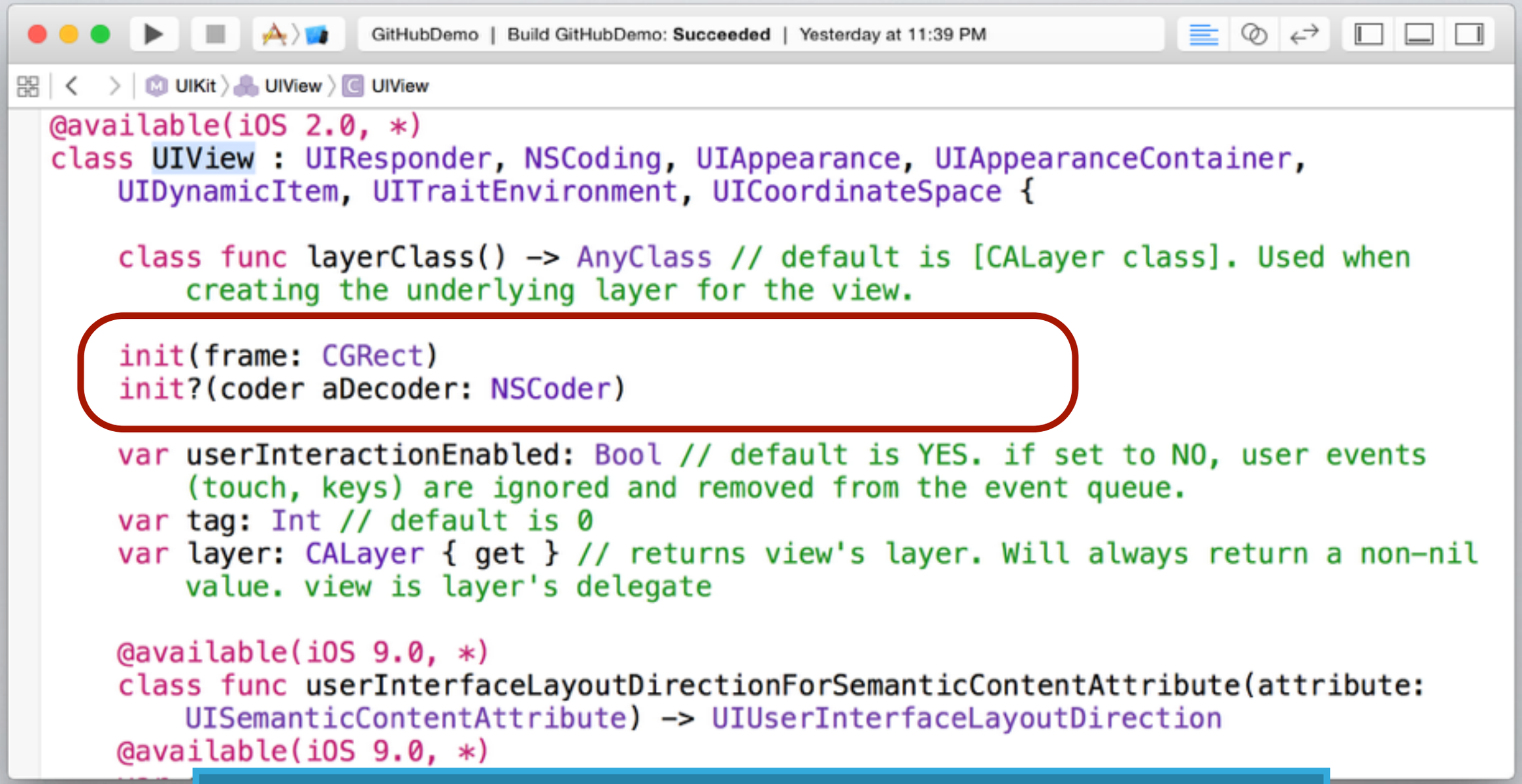


HOW DOES IT WORK?



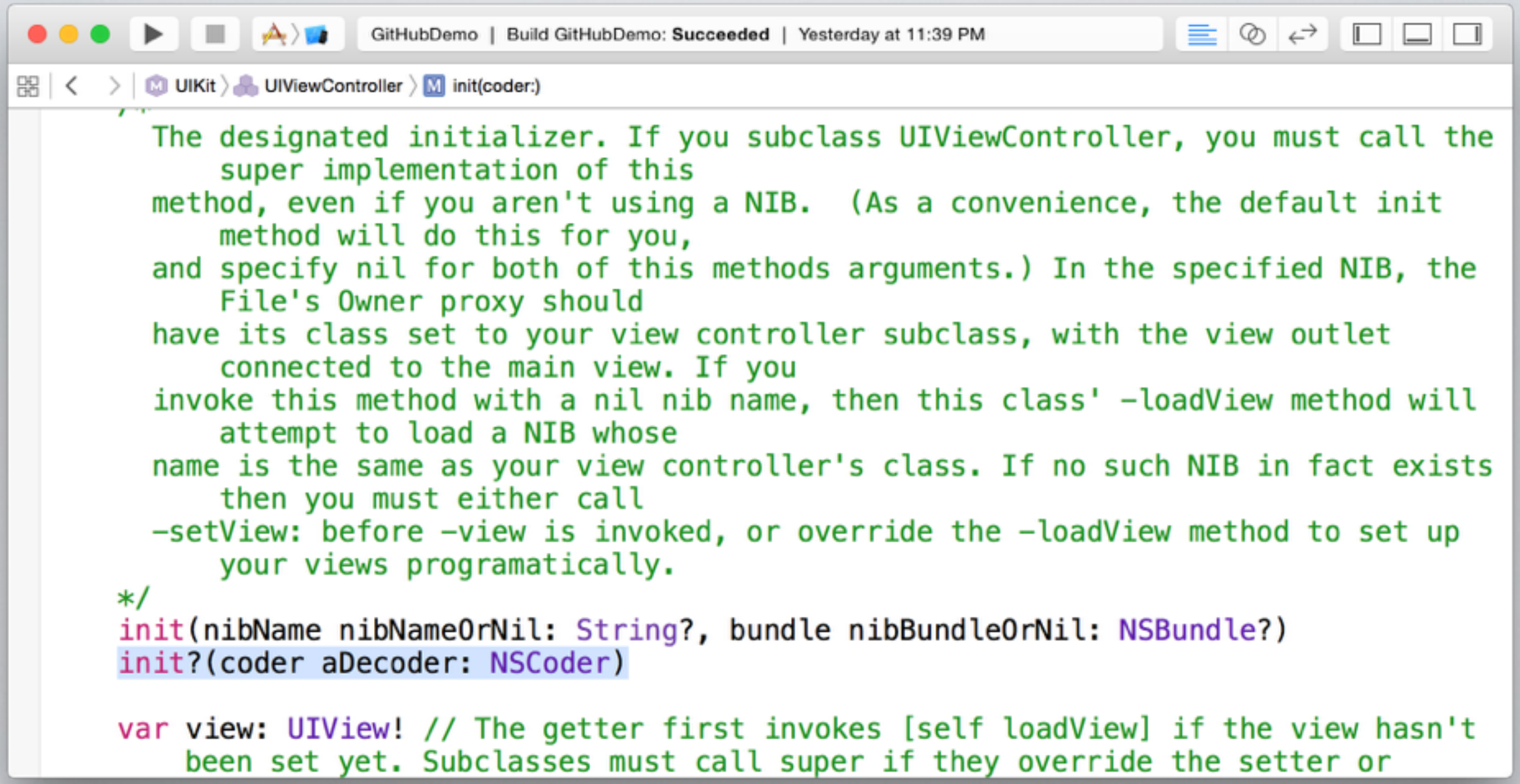
UIView

HOW DOES IT WORK?

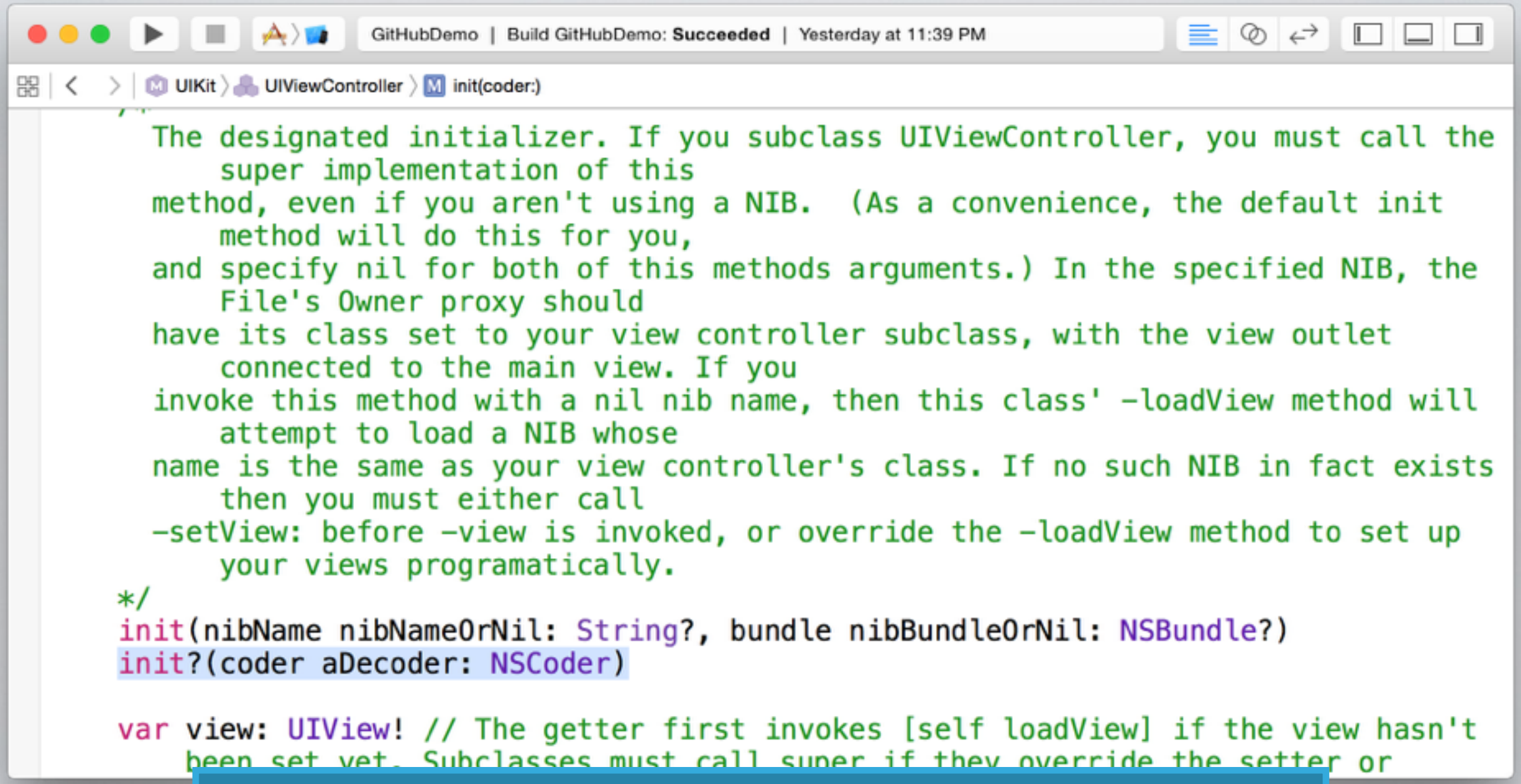


UIView

HOW DOES IT WORK?

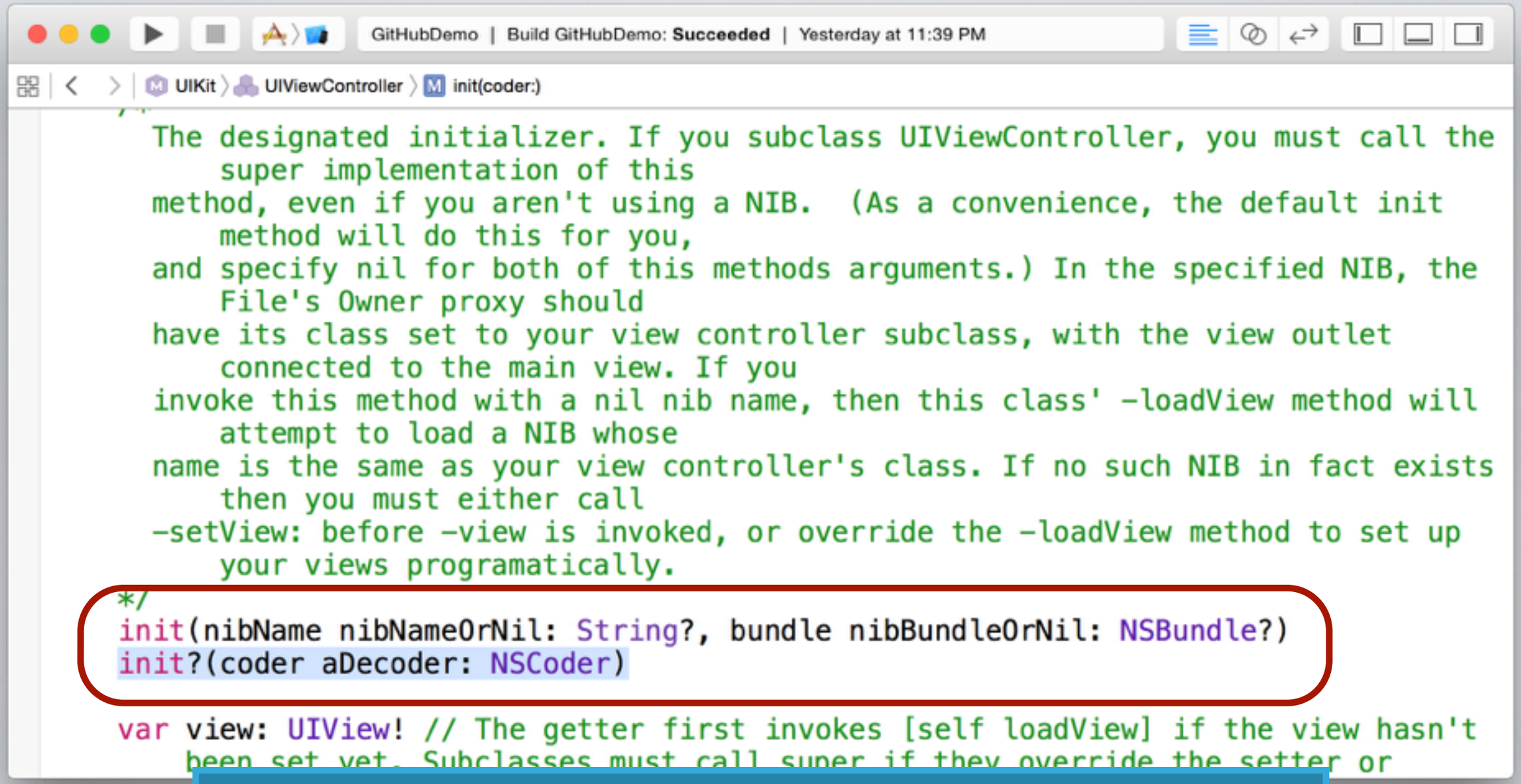


HOW DOES IT WORK?



UIViewController

HOW DOES IT WORK?



WHY DO YOU NEED THIS?

- Because you might need to resolve *merge conflicts* when many people edit the **same** storyboard at the **same** time. It's painful but necessary.

- Read http://www.toptal.com/ios/ios-user-interfaces-storyboards-vs-nibs-vs-custom-code

NEXT TIME

- Design of code

- Presenting information in TableView