

# MOBILE DEVELOPMENT IBOUTLETS AND IB ACTIONS

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Head of Product, Floored

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## **IBOUTLETS AND IB ACTIONS**

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## **LEARNING OBJECTIVES**

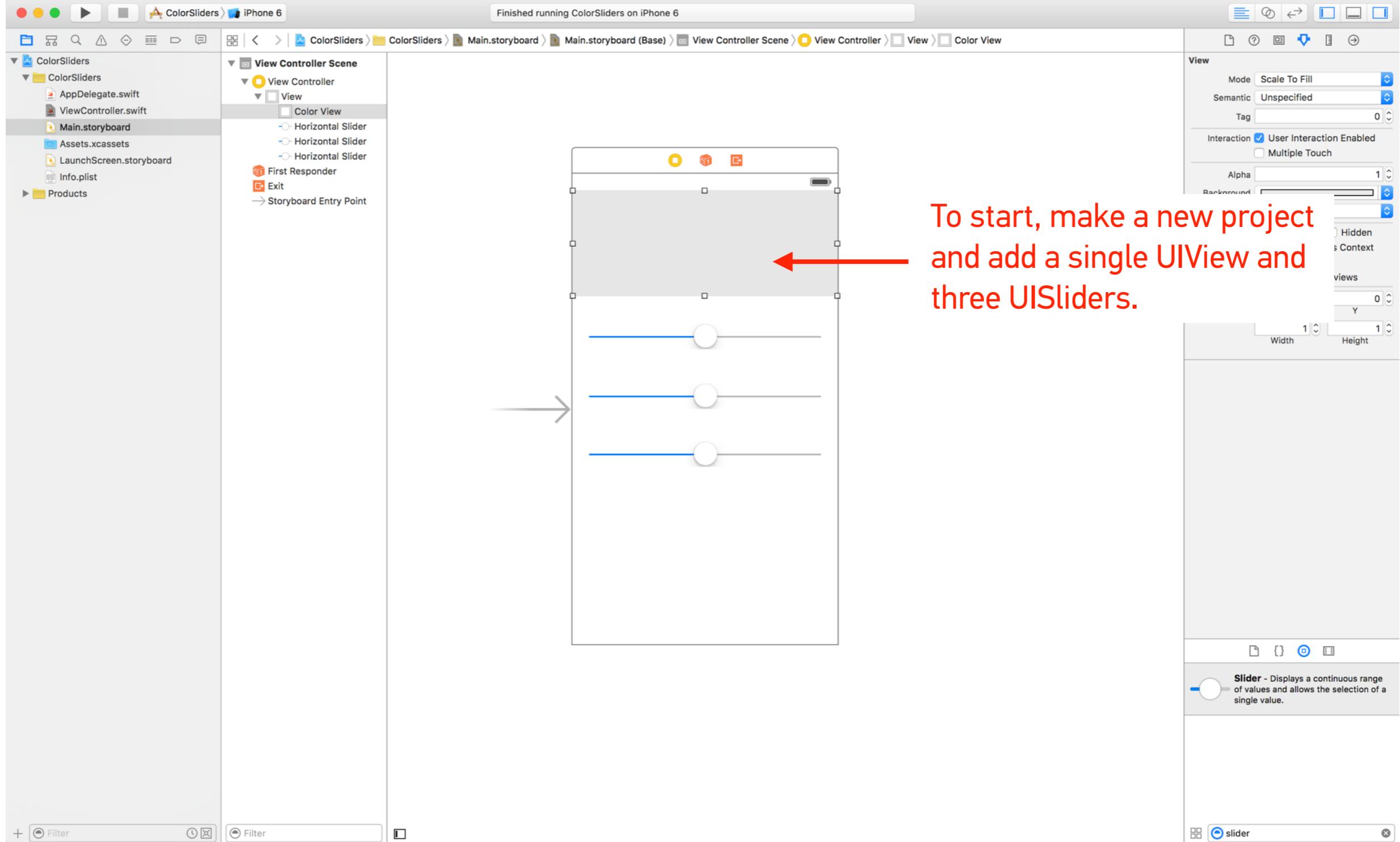
- Deploy IBOutlets to reference views added in Interface Builder.
- Deploy IBActions to respond to user-initiated UI events.
- Combine IBOutlets and IBActions to make the UI respond to user interaction.

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**IBOUTLETS AND IBACTIONS**

---

**A COLOR APP**



ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > ViewController

Identity and Type

- Name: ViewController.swift
- Type: Default - Swift Source
- Location: Relative to Group
- Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

On Demand Resource Tags

Only resources are taggable

Target Membership

ColorSliders

Text Settings

- Text Encoding: Default - Unicode (UTF-8)
- Line Endings: Default - OS X / Unix (LF)
- Indent Using: Spaces
- Widths: Tab 4 Indent 4
- Wrap lines

Source Control

- Repository --
- Type --
- Current Branch --
- Version --
- Status: No changes
- Location

Slider - Displays a continuous range of values and allows the selection of a single value.

Open ViewController.swift.

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit
class ViewController: UIViewController {

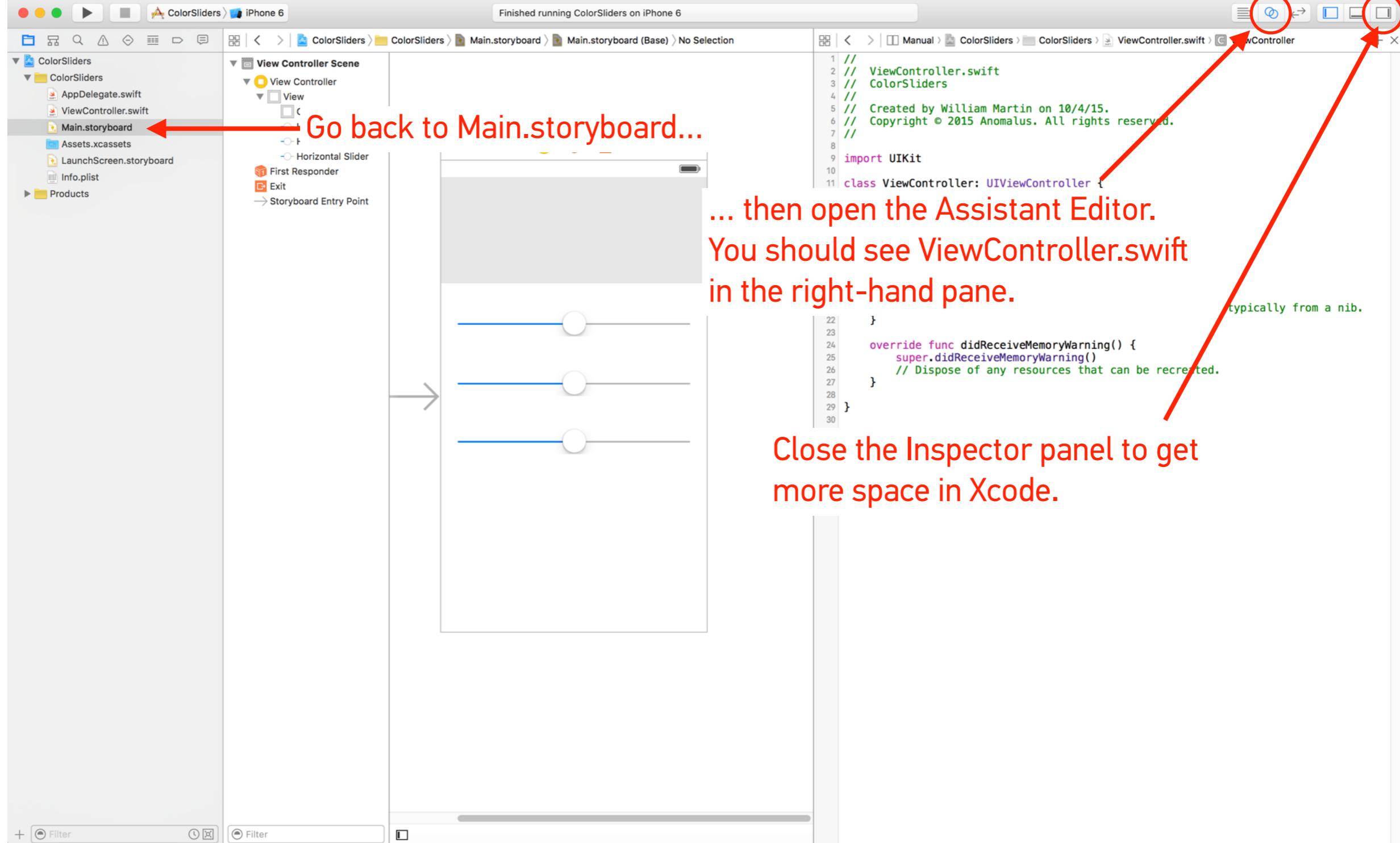
    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    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.
    }
}
```

A red arrow points to the three float variables: hue, brightness, and saturation, located on lines 15, 16, and 17 of the code.

Add three properties of type Float:  
hue, brightness, saturation.



ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > ColorSliders > ViewController.swift > ViewController

Main.storyboard

View Controller Scene

View Controller

View

Color View

Horizontal Slider

Horizontal Slider

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

Color View

Horizontal Slider

Horizontal Slider

Horizontal Slider

Insert Outlet or Outlet Collection

```
// ViewController.swift
// ColorSliders
//
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit

class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    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.
    }
}
```

CTRL+drag from the view in the left pane into the code pane on the right.

ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > Col...ders > Mai...ard > Mai...se > Vie...ene > Vie...oller > View > Color View

Main.storyboard

View Controller Scene

View Controller

View

Color View

Horizontal Slider

Horizontal Slider

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

Connection: Outlet

Object: View Controller

Name: colorView

Type: UIView

Storage: Weak

Cancel Connect

// ViewController.swift  
// ColorSliders  
// Created by William Martin on 10/4/15.  
// Copyright © 2015 Anomalus. All rights reserved.  
  
import UIKit  
  
class ViewController: UIViewController {  
  
 // The app state.  
 var hue : Float = 0.5  
 var brightness : Float = 0.5  
 var saturation : Float = 0.5  
  
 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.  
 }  
}

This popover should appear.  
The important parameters should be:  
Connection = Outlet  
Name = colorView  
Type = UIView  
Ignore "Storage" for now.  
Click "Connect."

The screenshot shows the Xcode interface with the following details:

- Top Bar:** Xcode, File, Edit, View, Find, Navigate, Editor, Product, Debug, Source Control, Window, Help.
- Toolbar:** Standard Xcode toolbar items.
- Project Navigator:** Shows the project structure for "ColorSliders".
- Document Outline:** Shows the "View Controller Scene" with a "View Controller" containing a "View" which contains a "Color View" and three "Horizontal Slider" controls.
- Main Storyboard Preview:** Displays a view controller interface with three horizontal sliders.
- Code Editor:** Displays the "ViewController.swift" file with the following code:

```
// ViewController.swift
// ColorSliders
//
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit

class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!
    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.
    }
}
```
- Annotations:** A red arrow points from the explanatory text below to the `@IBOutlet weak var colorView: UIView!` line in the code editor.

Now we have an `IBOutlet` property that references to the `UIView`.  
This is needed so we can change its color when necessary.

This behaves just like any other property on a class, but it is "connected" to the `UIView` in the storyboard on the left, meaning it holds a reference to the instance of `UIView` that is created when the app starts and the storyboard is loaded.

The screenshot shows the Xcode interface with the following components:

- Project Navigator:** Shows the project structure with files like `AppDelegate.swift`, `ViewController.swift`, and `Main.storyboard`.
- Document Outline:** Shows the `View Controller Scene` with `View Controller`, `View`, `Color View`, and three `Horizontal Slider` instances.
- Storyboard Preview:** Displays a view controller with three horizontal sliders.
- Connections Inspector:** A popover is open over the first slider, showing a "Connection" dropdown menu with "Action" selected. It also shows the `Type` as `UISlider` and `Storage` as `Weak`.
- Code Editor:** The `ViewController.swift` file contains the following code:

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit

class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    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.
    }
}
```

A red arrow points from the text "CTRL+drag from the first slider." to the first slider in the storyboard preview. Another red arrow points from the text "When the popover appears, select 'Action' from the 'Connection' dropdown menu." to the "Action" option in the Connections Inspector popover.

Instead of adding an `IBOutlet` property, we need to add an `IBAction` method, which will be called on a particular user-initiated event (namely, whenever the slider's value changes).

ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > Col...ers > Ma...ard > Ma...se > Vie...ne > Vie...ller > View > Horizontal Slider

View Controller Scene > View Controller > View > Color View > Horizontal Slider

Main.storyboard

Color Sliders

ColorSliders.swift

AppDelegate.swift

ViewController.swift

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

Connection Action

Object View Controller

Name onHueChanged

Type UISlider

Event Value Changed

Arguments Sender

Connect

Cancel

```
// ViewController.swift
// ColorSliders
//
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit

class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    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.
    }
}
```

Name the action "onHueChanged".

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

Color Sliders > Col...ers > Ma...ard > Ma...se > Vie...ne > Vie...ller > View > Horizontal Slider

View Controller Scene > View Controller > View > Color View > Horizontal Slider

Main.storyboard

Color Sliders

Color Sliders

AppDelegate.swift

ViewController.swift

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

Connection Action

Object View Controller

Name onHueChanged

Type UISlider

Event Value Changed

Arguments Send

Connect

Cancel

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit

class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    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.
    }
}
```

Select "UISlider" from the Type dropdown.

ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > Col...ers > Ma...ard > Ma...se > Vie...ne > Vie...ller > View > Horizontal Slider

ColorSliders > View Controller Scene > View Controller > View > Color View > Horizontal Slider

// ViewController.swift  
// ColorSliders  
// Created by William Martin on 10/4/15.  
// Copyright © 2015 Anomalus. All rights reserved.  
  
import UIKit  
  
class ViewController: UIViewController {  
  
 // The app state.  
 var hue : Float = 0.5  
 var brightness : Float = 0.5  
 var saturation : Float = 0.5  
  
 @IBOutlet weak var colorView: UIView!  
  
 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.  
 }  
}

Connection Action  
Object View Controller  
Name onHueChanged  
Type UISlider  
Event Value Changed  
Arguments Send

Double-check that the Event is "Value Changed."

Interactive Views come with a set of events to which we may connect one or more IBActions.

ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > ColorSliders > Col...ers > Ma...ard > Ma...se > Vie...ne > Vie...ller > View > Horizontal Slider

Color Sliders > View Controller Scene > View Controller > View > Color View > Horizontal Slider > Horizontal Slider

Main.storyboard

ColorView.swift

ViewController.swift

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

View Controller Scene

View Controller

View

Color View

Horizontal Slider

Horizontal Slider

Horizontal Slider

First Responder

Exit

Storyboard Entry Point

Connection Action

Object View Controller

Name onBrightnessChanged

Type UISlider

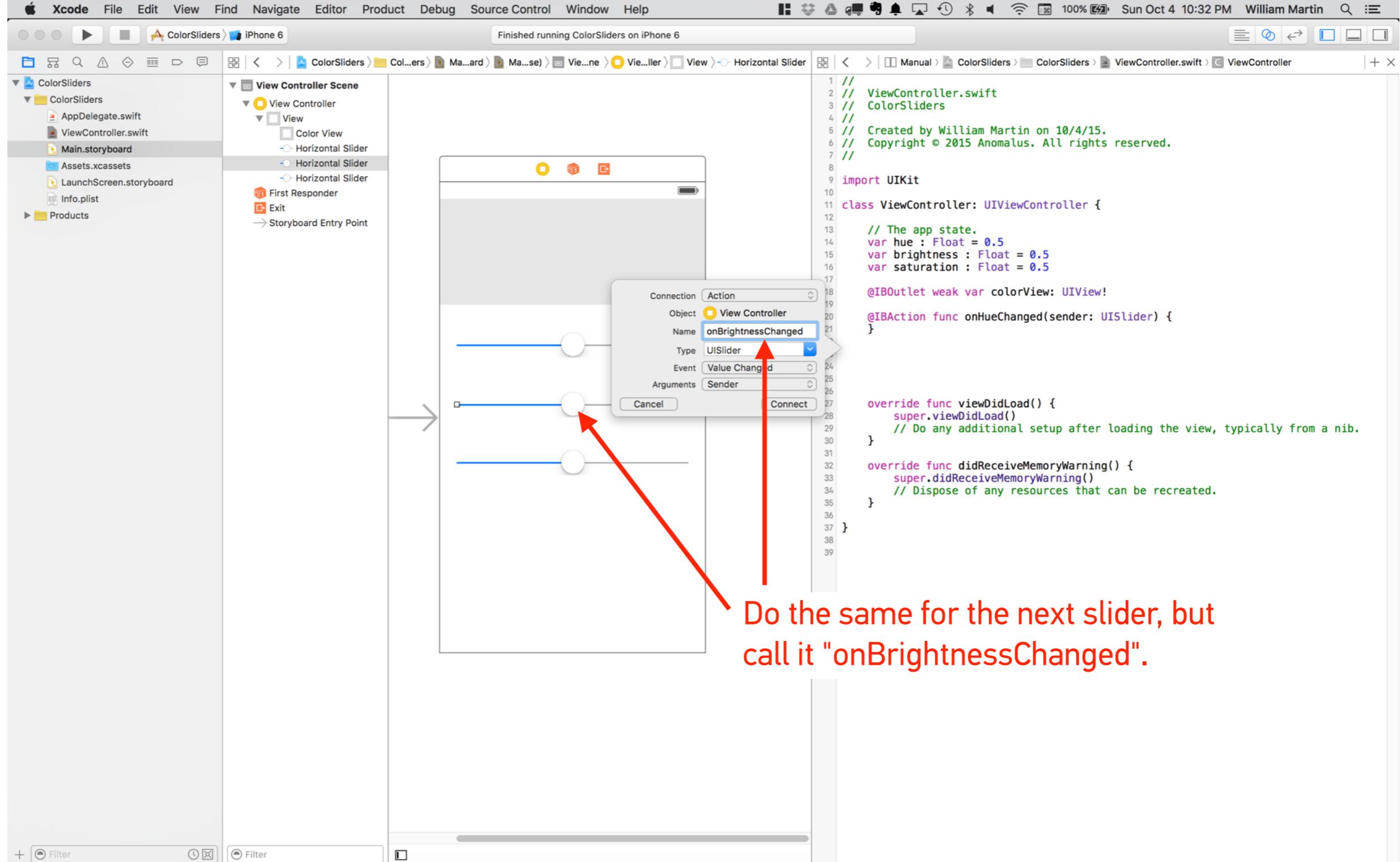
Event Value Changed

Arguments Sender

Cancel Connect

// ViewController.swift  
// ColorSliders  
// Created by William Martin on 10/4/15.  
// Copyright © 2015 Anomalus. All rights reserved.  
  
import UIKit  
  
class ViewController: UIViewController {  
  
 // The app state.  
 var hue : Float = 0.5  
 var brightness : Float = 0.5  
 var saturation : Float = 0.5  
  
 @IBOutlet weak var colorView: UIView!  
  
 @IBAction func onHueChanged(sender: UISlider) {  
 colorView.backgroundColor = UIColor(hue: hue, saturation: saturation, brightness: brightness, alpha: 1.0)  
 }  
  
 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.  
 }  
}

The IBAction should appear. It behaves like a method on a class, but we shouldn't call it ourselves. It's called when the Event occurs on the connected View (i.e. the slider).



ColorSliders > iPhone 6      Finished running ColorSliders on iPhone 6

Color Sliders > ColorSliders > Col...ers > Ma...ard > Ma...se > Vie...ne > Vie...ller > View > Horizontal Slider

Color Sliders > View Controller Scene > View Controller > View > Color View > Horizontal Slider > Horizontal Slider

Main.storyboard

View Controller Scene

First Responder

Exit

Storyboard Entry Point

Horizontal Slider

Horizontal Slider

Horizontal Slider

Connection Action

Object View Controller

Name onSaturationChanged

Type UISlider

Event Value Changed

Arguments Sender

Cancel Connect

// ViewController.swift  
// ColorSliders  
// Created by William Martin on 10/4/15.  
// Copyright © 2015 Anomalus. All rights reserved.  
  
import UIKit  
  
class ViewController: UIViewController {  
  
 // The app state.  
 var hue : Float = 0.5  
 var brightness : Float = 0.5  
 var saturation : Float = 0.5  
  
 @IBOutlet weak var colorView: UIView!  
  
 @IBAction func onHueChanged(sender: UISlider) {  
 }  
  
 @IBAction func onBrightnessChanged(sender: UISlider) {  
 }  
  
 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.  
 }  
}

Finally do the same for the last slider, which should be named "onSaturationChanged".

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > ViewController

ColorSliders

ColorSliders

ViewController.swift

Main.storyboard

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

Open ViewController.swift ...

// ViewController.swift  
// ColorSliders  
// Created by William Ma  
// Copyright © 2015 Anom  
  
import UIKit  
  
class ViewController: UIViewController {  
  
 // The app state.  
 var hue : Float = 0.5  
 var brightness : Float = 0.5  
 var saturation : Float = 0.5  
  
 @IBOutlet weak var colorView: UIView!  
  
 @IBAction func onHueChanged(sender: UISlider) {}  
 @IBAction func onBrightnessChanged(sender: UISlider) {}  
 @IBAction func onSaturationChanged(sender: UISlider) {}  
  
 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.  
 }  
}

Identity and Type

Name: ViewController.swift

Type: Default - Swift Source

Location: Relative to Group

Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

Tags:

Only resources are taggable

Target Membership

ColorSliders

Text Settings

Text Encoding: Default - Unicode (UTF-8)

Line Endings: Default - OS X / Unix (LF)

Indent Using: Spaces

Widths: 4 Tab 4 Indent

Wrap lines

Source Control

Repository --

Type --

Current Branch --

Version --

Status: No changes

Location

Slider - Displays a continuous range of values and allows the selection of a single value.

Go back to ViewController.swift in the Standard editor.  
It should look something like this.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > ViewController

Identity and Type  
Name: ViewController.swift  
Type: Default - Swift Source  
Location: Relative to Group  
ViewController.swift  
Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift  
On Demand Resource Tags

ColorSliders

ColorSliders

AppDelegate.swift

ViewController.swift

Main.storyboard

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit
class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    @IBAction func onHueChanged(sender: UISlider) {
        self.hue = sender.value
    }

    @IBAction func onBrightnessChanged(sender: UISlider) {
        self.brightness = sender.value
    }

    @IBAction func onSaturationChanged(sender: UISlider) {
        self.saturation = sender.value
    }

    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.
    }
}
```

**@IBAction func onHueChanged(sender: UISlider) {**

**self.hue = sender.value**

**}**

**@IBAction func onBrightnessChanged(sender: UISlider) {**

**self.brightness = sender.value**

**}**

**@IBAction func onSaturationChanged(sender: UISlider) {**

**self.saturation = sender.value**

**}**

**V** **Float value**

**M** AnyObject? **valueForKey(key: String)**

**M** AnyObject? **valueForKeyPath(keyPath: String)**

**M** AnyObject? **valueForUndefinedKey(key: String)**

Contains the receiver's current value. [More...](#)

Add the following lines of code to the IBActions.

Each line takes the "sender" parameter, which we're guaranteed to be of type UISlider, and gets the value of that the slider the user moved (type Float).

We take that value and set it to the corresponding property that the slider is intended to manipulate. Thus, onHueChanged will change self.hue.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > ViewController

Identity and Type

Name: ViewController.swift  
Type: Default - Swift Source  
Location: Relative to Group  
ViewController.swift  
Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit
class ViewController: UIViewController {

    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    @IBAction func onHueChanged(sender: UISlider) {
        self.hue = sender.value
    }

    @IBAction func onBrightnessChanged(sender: UISlider) {
        self.brightness = sender.value
    }

    @IBAction func onSaturationChanged(sender: UISlider) {
        self.saturation = sender.value
    }

    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.
    }
}
```

@IBAction func onHueChanged(sender: UISlider) {  
 self.hue = sender.value  
}  
  
@IBAction func onBrightnessChanged(sender: UISlider) {  
 self.brightness = sender.value  
}  
  
@IBAction func onSaturationChanged(sender: UISlider) {  
 self.saturation = sender.value  
}

Follow this pattern in the other IBActions.

Slider - Displays a continuous range of values and allows the selection of a single value.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > updateColor()

```
1 // ViewController.swift
2 // ColorSliders
3 // Created by William Martin on 10/4/15.
4 // Copyright © 2015 Anomalus. All rights reserved.
5 //
6 import UIKit
7
8 class ViewController: UIViewController {
9
10    // The app state.
11    var hue : Float = 0.5
12    var brightness : Float = 0.5
13    var saturation : Float = 0.5
14
15    @IBOutlet weak var colorView: UIView!
16
17    @IBAction func onHueChanged(sender: UISlider) {
18        self.hue = sender.value
19    }
20
21    @IBAction func onBrightnessChanged(sender: UISlider) {
22        self.brightness = sender.value
23    }
24
25    @IBAction func onSaturationChanged(sender: UISlider) {
26        self.saturation = sender.value
27    }
28
29    func updateColor() {
30        let newColor = UIColor(hue: CGFloat, saturation: CGFloat, brightness: CGFloat, alpha: CGFloat)
31    }
32
33    override func super.viewDidLoad() {
34        // Do any additional setup after loading the view, typically from a nib.
35    }
36
37    override func super.didReceiveMemoryWarning() {
38        // Dispose of any resources that can be recreated.
39    }
40
41    override func super.didReceiveMemoryWarning() {
42        // Dispose of any resources that can be recreated.
43    }
44
45    override func super.didReceiveMemoryWarning() {
46        // Dispose of any resources that can be recreated.
47    }
}
```

Identity and Type

- Name: ViewController.swift
- Type: Default - Swift Source
- Location: Relative to Group
- Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

On Demand Resource Tags

- Only resources are taggable

Target Membership

- ColorSliders

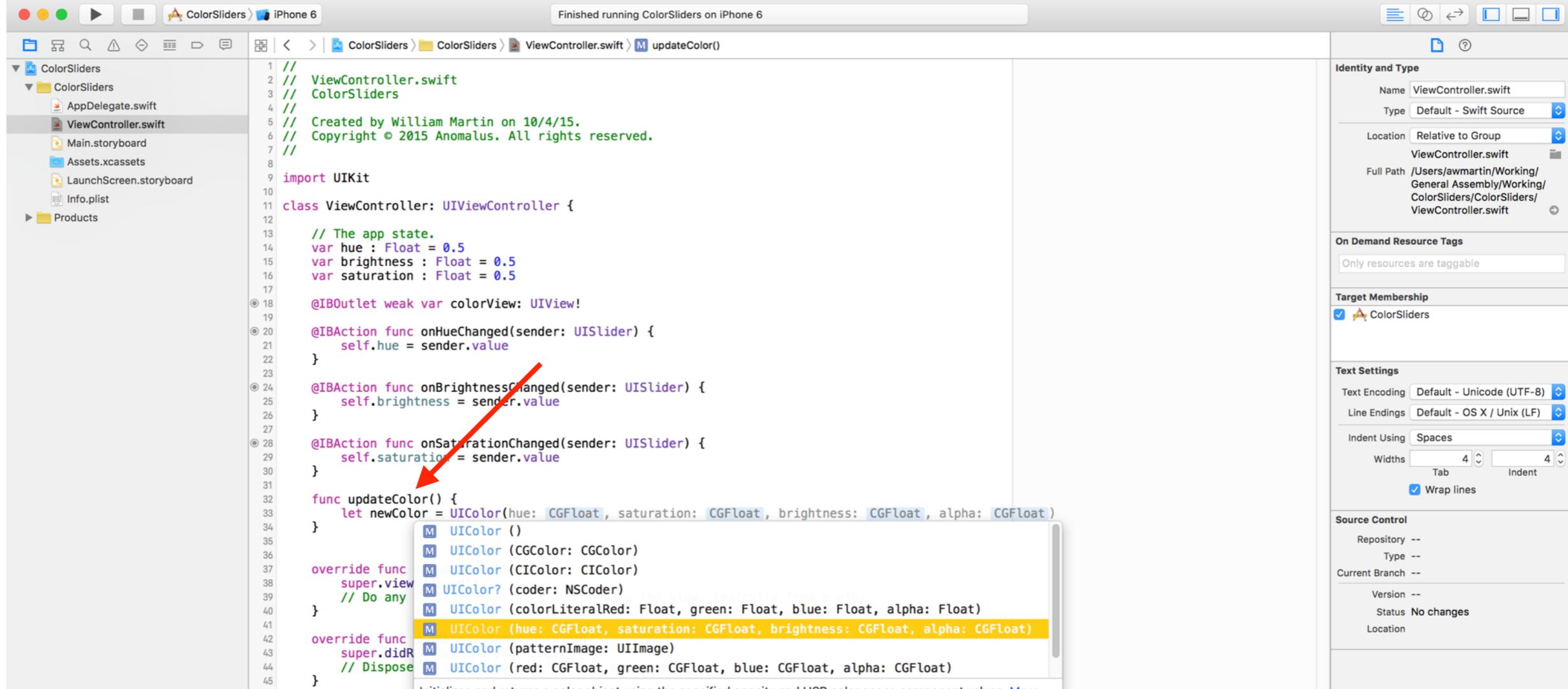
Text Settings

- Text Encoding: Default - Unicode (UTF-8)
- Line Endings: Default - OS X / Unix (LF)
- Indent Using: Spaces
- Widths: Tab 4 Indent 4
- Wrap lines

Source Control

- Repository: --
- Type: --
- Current Branch: --
- Version: --
- Status: No changes
- Location: --

Slider - Displays a continuous range of values and allows the selection of a single value.



Now, we need a method to actually update the color of the UIView when a slider is changed (and when the app starts).

Call this method `updateColor()`.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > updateColor()

```
1 // ViewController.swift
2 // ColorSliders
3 // Created by William Martin on 10/4/15.
4 // Copyright © 2015 Anomalus. All rights reserved.
5 //
6 import UIKit
7
8 class ViewController: UIViewController {
9
10    // The app state.
11    var hue : Float = 0.5
12    var brightness : Float = 0.5
13    var saturation : Float = 0.5
14
15    func updateColor() {
16        let newColor = UIColor(hue: CGFloat, saturation: CGFloat, brightness: CGFloat, alpha: CGFloat)
17    }
18
19    override func viewDidLoad() {
20        super.viewDidLoad()
21        // Do any additional setup after loading the view.
22    }
23
24    override func didReceiveMemoryWarning() {
25        super.didReceiveMemoryWarning()
26        // Dispose of any resources that can be recreated.
27    }
28 }
```

Identity and Type

- Name: ViewController.swift
- Type: Default - Swift Source
- Location: Relative to Group
- ViewController.swift
- Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

On Demand Resource Tags

Only resources are taggable

func updateColor() {  
 let newColor = UIColor(hue: CGFloat, saturation: CGFloat, brightness: CGFloat, alpha: CGFloat)  
}  
  
override func viewDidLoad() {  
 super.viewDidLoad()  
 // Do any additional setup after loading the view.  
}  
  
override func didReceiveMemoryWarning() {  
 super.didReceiveMemoryWarning()  
 // Dispose of any resources that can be recreated.  
}

UIColor ()  
UIColor (CGColor: CGColor)  
UIColor (CIColor: CIColor)  
UIColor? (coder: NSCoder)  
UIColor (colorLiteralRed: Float, green: Float, blue: Float, alpha: Float)  
UIColor (hue: CGFloat, saturation: CGFloat, brightness: CGFloat, alpha: CGFloat)  
UIColor (patternImage: UIImage)  
UIColor (red: CGFloat, green: CGFloat, blue: CGFloat, alpha: CGFloat)

Initializes and returns a color object using the specified opacity and HSB color space component values. [More...](#)

Here's a close-up. The first thing the method must do is convert our three properties (hue, saturation, brightness), into a UIColor needed by the UIView's backgroundColor property.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > updateColor()

```
// ViewController.swift
// ColorSliders
// Created by William Martin on 10/4/15.
// Copyright © 2015 Anomalus. All rights reserved.

import UIKit
class ViewController: UIViewController {
    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    @IBAction func onHueChanged(sender: UISlider) {
        self.hue = sender.value
        self.updateColor()
    }

    @IBAction func onBrightnessChanged(sender: UISlider) {
        self.brightness = sender.value
        self.updateColor()
    }

    @IBAction func onSaturationChanged(sender: UISlider) {
        self.saturation = sender.value
        self.updateColor()
    }
}

func updateColor() {
    let newColor = UIColor(
        hue: CGFloat(self.hue),
        saturation: CGFloat(self.saturation),
        brightness: CGFloat(self.brightness),
        alpha: 1.0
    )
}

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

Note that we have to convert each property (type Float) to a special type from Core Graphics, called CGFloat.

We do this because the initializer for UIColor requires this type.

The method should look like this. "alpha" represents opacity/transparency. A value of 1.0 will be 100% opaque.

ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > updateColor()

```
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23    func updateColor() {
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26            saturation: CGFloat(self.saturation),
27            brightness: CGFloat(self.brightness),
28            alpha: 1.0
29        )
30        self.colorView.backgroundColor
31    }
32
33    override
34}
```

The code shows a Swift class named ViewController. It has properties for hue, brightness, and saturation, and an outlet for a UIView named colorView. An IBAction method onHueChanged is connected to a UISlider. The updateColor() method creates a new UIColor with the specified parameters and sets it as the background color of colorView. A tooltip for the backgroundColor property is shown, describing it as "The view's background color".

The only other thing this method needs is to set the color on colorView. Start to type self.colorView.backgroundColor, and you should see the description of the property (or press ESC or CTRL+Space to reveal it).

Identity and Type

Name: ViewController.swift  
Type: Default - Swift Source  
Location: Relative to Group  
Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

On Demand Resource Tags

Only resources are taggable

Target Membership

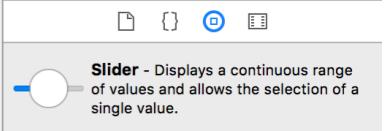
ColorSliders

Text Settings

Text Encoding: Default - Unicode (UTF-8)  
Line Endings: Default - OS X / Unix (LF)  
Indent Using: Spaces  
Widths: Tab 4 Indent 4  
Wrap lines

Source Control

Repository --  
Type --  
Current Branch --  
Version --  
Status: No changes  
Location



ColorSliders > iPhone 6 Finished running ColorSliders on iPhone 6

ColorSliders > ColorSliders > ViewController.swift > updateColor()

ColorSliders

ColorSliders

AppDelegate.swift

ViewController.swift

Main.storyboard

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

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40             alpha: 1.0
41         )
42
43         self.colorView.backgroundColor = newColor
44     }
45
46     override func viewDidLoad() {
47         super.viewDidLoad()
48         // Do any additional setup after loading the view, typically from a nib.
49     }
50
51     override func didReceiveMemoryWarning() {
52         super.didReceiveMemoryWarning()
53         // Dispose of any resources that can be recreated.
54     }
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56 }
```

Identity and Type

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Only resources are taggable

Target Membership

ColorSliders

Text Settings

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Line Endings: Default - OS X / Unix (LF)

Indent Using: Spaces

Widths: Tab 4 Indent 4

Wrap lines

Source Control

Repository --

Type --

Current Branch --

Version --

Status: No changes

Location

Slider - Displays a continuous range of values and allows the selection of a single value.

Complete the line by setting the property to newColor.

The screenshot shows the Xcode interface with the project 'ColorSliders' open. The main editor window displays the 'ViewController.swift' file. Three specific lines of code are highlighted with red arrows pointing to the call to 'updateColor()':

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    // The app state.
    var hue : Float = 0.5
    var brightness : Float = 0.5
    var saturation : Float = 0.5

    @IBOutlet weak var colorView: UIView!

    @IBAction func onHueChanged(sender: UISlider) {
        self.hue = sender.value
        self.updateColor() ←
    }

    @IBAction func onBrightnessChanged(sender: UISlider) {
        self.brightness = sender.value
        self.updateColor() ←
    }

    @IBAction func onSaturationChanged(sender: UISlider) {
        self.saturation = sender.value
        self.updateColor() ←
    }

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

The right-hand side of the Xcode window contains the 'Identity and Type' inspector, which shows the file is a 'Default - Swift Source' located at 'Relative to Group' with a full path of '/Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift'. The 'Text Settings' and 'Source Control' sections are also visible.

Call updateColor in each of the IBActions. This ensures that when the slider is changed, the color of the UIView changes.

The screenshot shows the Xcode interface with the following details:

- Project Navigator:** Shows the project structure with files: ViewController.swift, AppDelegate.swift, Main.storyboard, Assets.xcassets, LaunchScreen.storyboard, and Info.plist.
- Editor:** Displays the code for ViewController.swift. The code initializes variables for hue, brightness, and saturation, and sets up three IBAction methods for sliders. It also defines an updateColor() function to update a view's color based on these variables. A red box highlights the viewDidLoad() method, which calls updateColor().
- Identity and Type:** Shows the file is a Default - Swift Source located at /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift.
- On Demand Resource Tags:** Shows "Only resources are taggable".
- Target Membership:** Shows the file is part of the ColorSliders target.
- Text Settings:** Shows Text Encoding as Default - Unicode (UTF-8) and Line Endings as Default - OS X / Unix (LF). Indent Using is Spaces with Widths set to 4. Wrap lines is checked.
- Source Control:** Shows Repository, Type, Current Branch, Version, Status (No changes), and Location.
- Search Bar:** Shows a search result for "Slider".

```
// ViewController.swift
// ColorSliders
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import UIKit

class ViewController: UIViewController {

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    var hue : Float = 0.5
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    @IBOutlet weak var colorView: UIView!

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        self.updateColor()
    }

    @IBAction func onSaturationChanged(sender: UISlider) {
        self.saturation = sender.value
        self.updateColor()
    }

    func updateColor() {
        let newColor = UIColor(
            hue: CGFloat(self.hue),
            saturation: CGFloat(self.saturation),
            brightness: CGFloat(self.brightness),
            alpha: 1.0)
        colorView.backgroundColor = newColor
    }
}

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

Add the same method call to viewDidLoad(). This ensures that the color of the view is set properly when the app first starts.

ColorSliders > iPhone 6 Running ColorSliders on iPhone 6

ColorSliders ColorSliders ViewController.swift viewDidLoad()

ColorSliders

ColorSliders

AppDelegate.swift

ViewController.swift

Main.storyboard

Assets.xcassets

LaunchScreen.storyboard

Info.plist

Products

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```

iPhone 6 - iPhone 6 / iOS 9.1 (13B5119e) Carrier 10:35 PM

Identity and Type

Name: ViewController.swift

Type: Default - Swift Source

Location: Relative to Group

ViewController.swift

Full Path: /Users/awmartin/Working/General Assembly/Working/ColorSliders/ColorSliders/ViewController.swift

On Demand Resource Tags

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Target Membership

ColorSliders

Text Settings

Text Encoding: Default - Unicode (UTF-8)

Line Endings: Default - OS X / Unix (LF)

Indent Using: Spaces

Widths: Tab 4 Indent 4

Wrap lines

Source Control

Repository --

Type --

Current Branch --

Version --

Status: No changes

Location

Slider - Displays a continuous range of values and allows the selection of a single value.

+ Filter

ColorSliders

Now when you run the app, you should see your storyboard with a green-ish view (instead of light gray that we picked in Interface Builder).

ColorSliders > iPhone 6 Running ColorSliders on iPhone 6

ColorSliders ColorSliders ViewController.swift viewDidLoad()

ColorSliders

ColorSliders

AppDelegate.swift

ViewController.swift

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iPhone 6 - iPhone 6 / iOS 9.1 (13B5119e)

Carrier 10:35 PM

Identity and Type

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Wrap lines

Source Control

Repository --

Type --

Current Branch --

Version --

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Location

Slider - Displays a continuous range of values and allows the selection of a single value.

Filter

ColorSliders

Change the sliders and watch the color change!

ColorSliders > iPhone 6 Running ColorSliders on iPhone 6

ColorSliders ColorSliders ViewController.swift viewDidLoad()

ColorSliders

- ColorSliders
- AppDelegate.swift
- ViewController.swift
- Main.storyboard
- Assets.xcassets
- LaunchScreen.storyboard
- Info.plist
- Products

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```

iPhone 6 - iPhone 6 / iOS 9.1 (13B5119e)  
Carrier 10:35 PM

Identity and Type

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Source Control

- Repository --
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Woohoo!