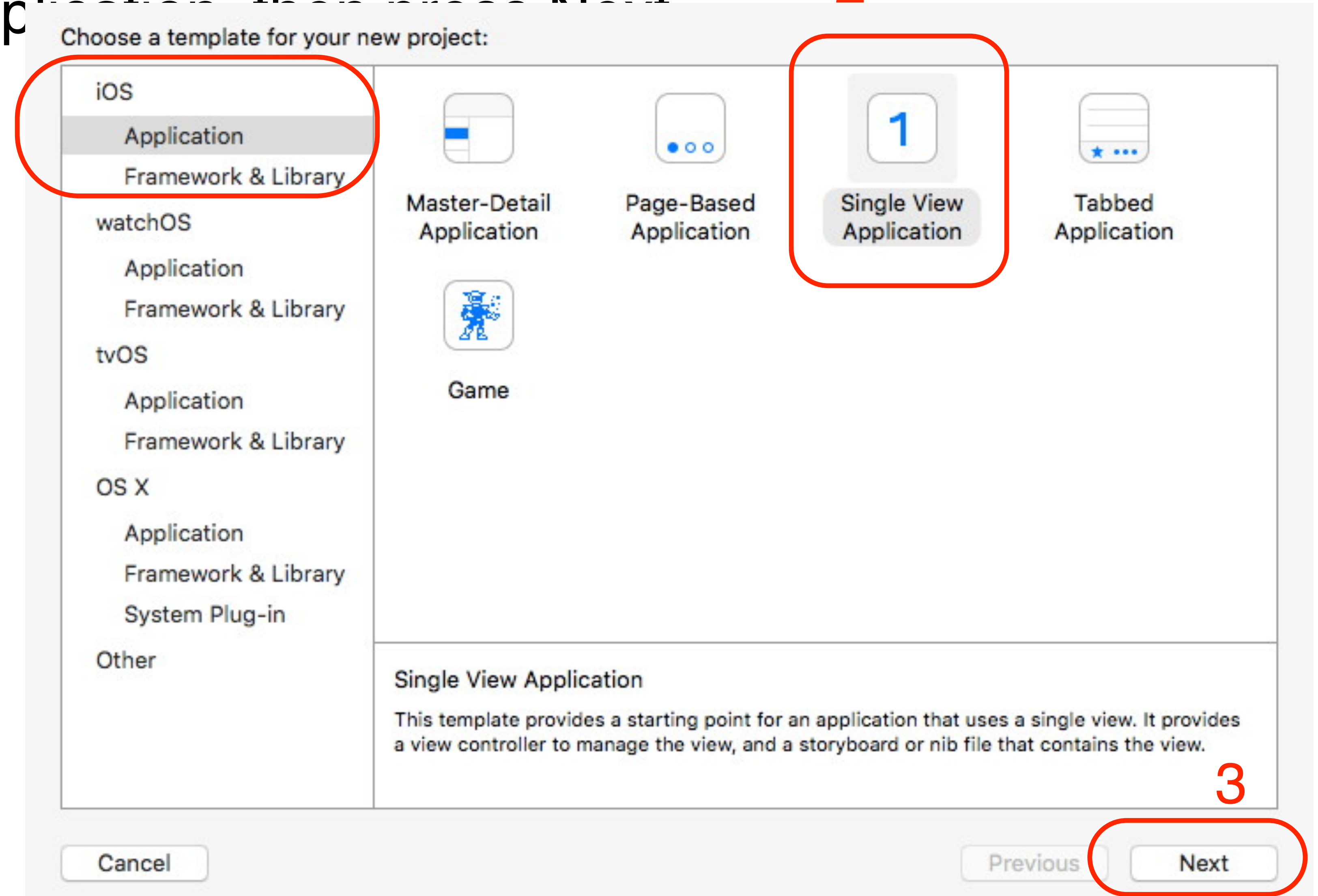
Step 1

- Start XCode and choose New Project from the File/New menu
- Choose iOS/Application and select Single View application, then press Next



Choose a template for your new project:

iOS
- Application
- Framework & Library

watchOS
- Application
- Framework & Library

tvOS
- Application
- Framework & Library

OS X
- Application
- Framework & Library
- System Plug-in

Other

Master-Detail Application
Page-Based Application
Single View Application
Tabbed Application
Game

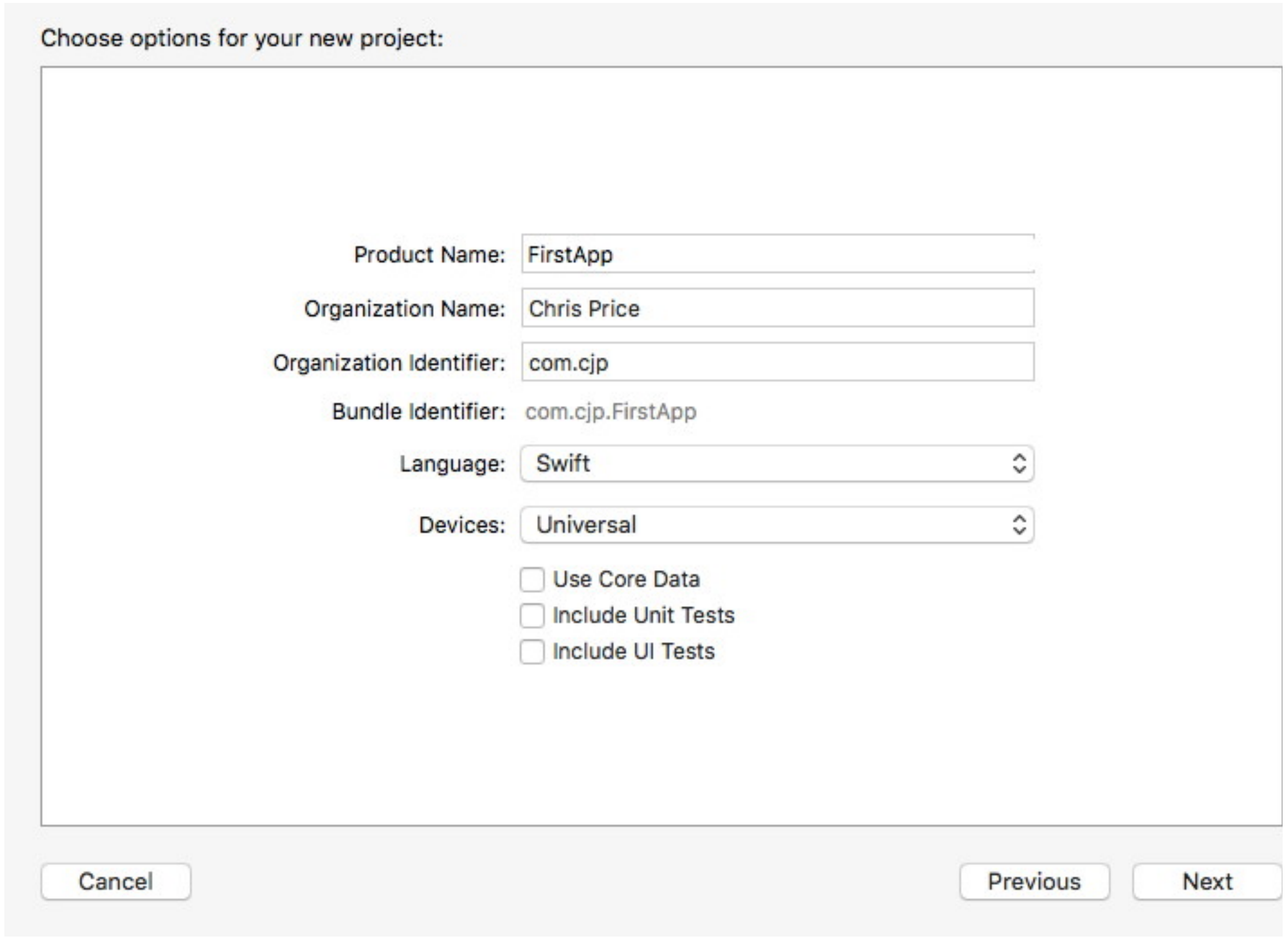
Single View Application

This template provides a starting point for an application that uses a single view. It provides a view controller to manage the view, and a storyboard or nib file that contains the view.

Cancel
Previous
Next

Step 2

- You will see another screen where you need to fill in several details
- Name the project FirstApp
- You need an organisation identifier - something like com.companyName
- Choose Swift for language, Universal for device family, and untick other items
- Press Next



Choose options for your new project:

Product Name: FirstApp

Organization Name: Chris Price

Organization Identifier: com.cjp

Bundle Identifier: com.cjp.FirstApp

Language: Swift

Devices: Universal

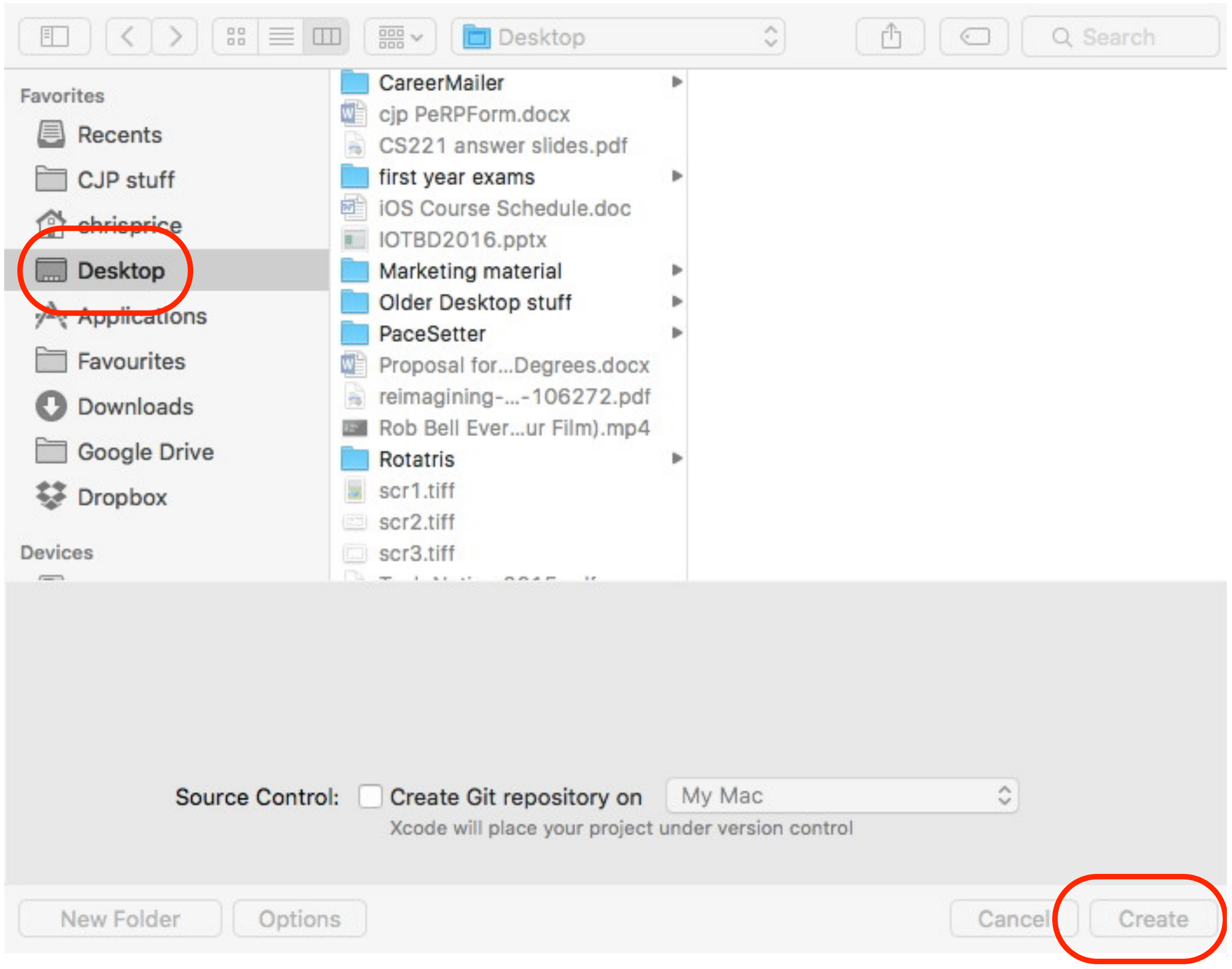
☐ Use Core Data

☐ Include Unit Tests

☐ Include UI Tests

Step 3

- Final setup screen
- Choose a sensible folder to put it in
- Choosing the desktop and clicking Create will set up the project in a folder called FirstApp on your desktop
- Again, for a real project you might tick it, to get version control for your project
- Now we are ready to start making our first project



Source Control: ☐ Create Git repository on My Mac
Xcode will place your project under version control

Step 4

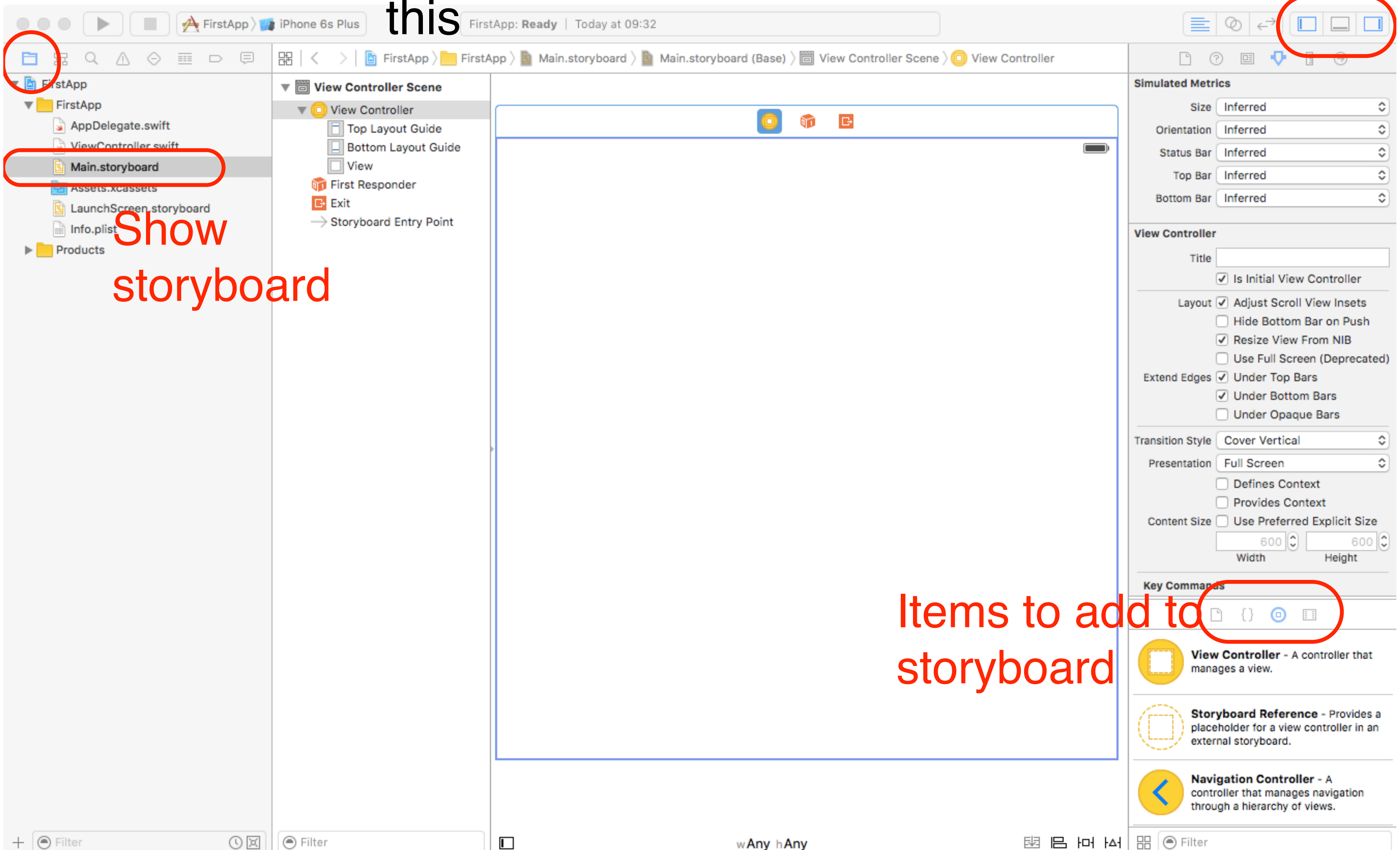
- Set your screen to look like this

Show files in app

Toggle left, bottom and right panes

Show storyboard

Items to add to storyboard



Simulated Metrics

Size	Inferred
Orientation	Inferred
Status Bar	Inferred
Top Bar	Inferred
Bottom Bar	Inferred

View Controller

Title:

- [✓] Is Initial View Controller
- Layout [✓] Adjust Scroll View Insets
- [ ] Hide Bottom Bar on Push
- [✓] Resize View From NIB
- [ ] Use Full Screen (Deprecated)
- Extend Edges [✓] Under Top Bars
- [✓] Under Bottom Bars
- [ ] Under Opaque Bars

Transition Style	Cover Vertical
Presentation	Full Screen

- [ ] Defines Context
- [ ] Provides Context
- Content Size [ ] Use Preferred Explicit Size

Width 600 Height 600

Key Commands

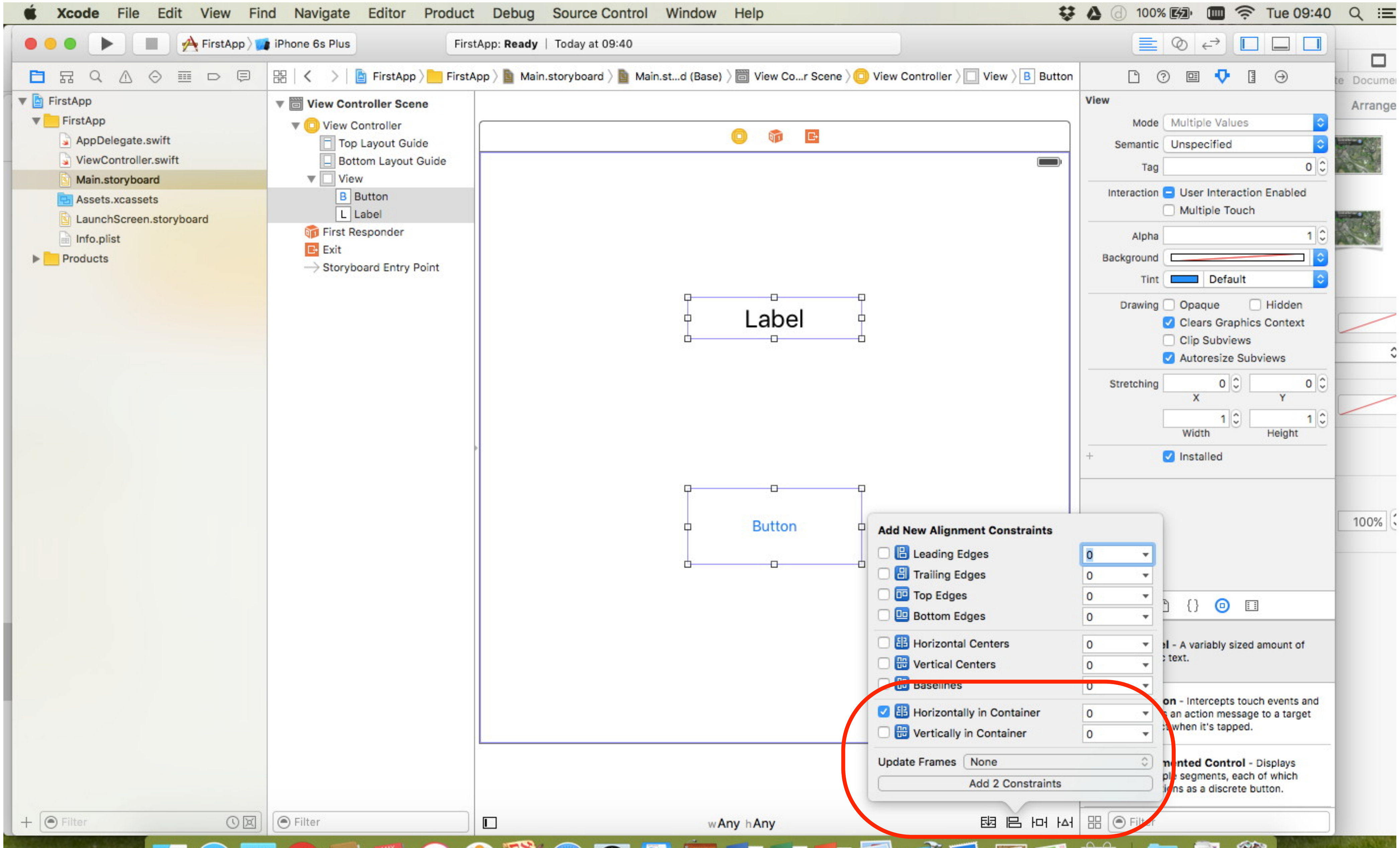
View Controller - A controller that manages a view.

Storyboard Reference - Provides a placeholder for a view controller in an external storyboard.

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

Step 5

- Add a label and a button from items to add (bottom right)
- Resize and select, then add constraints as shown



View

Mode: Multiple Values
Semantic: Unspecified
Tag: 0
Interaction: ✓ User Interaction Enabled; ☐ Multiple Touch
Alpha: 1
Background
Tint: Default
Drawing: ☐ Opaque; ☐ Hidden; ✓ Clears Graphics Context; ☐ Clip Subviews; ✓ Autoresize Subviews
Stretching: X 0, Y 0, Width 1, Height 1
✓ Installed

Add New Alignment Constraints

☐ Leading Edges	0
☐ Trailing Edges	0
☐ Top Edges	0
☐ Bottom Edges	0
☐ Horizontal Centers	0
☐ Vertical Centers	0
☐ Baselines	0
✓ Horizontally in Container	0
☐ Vertically in Container	0

Update Frames: None

Add 2 Constraints

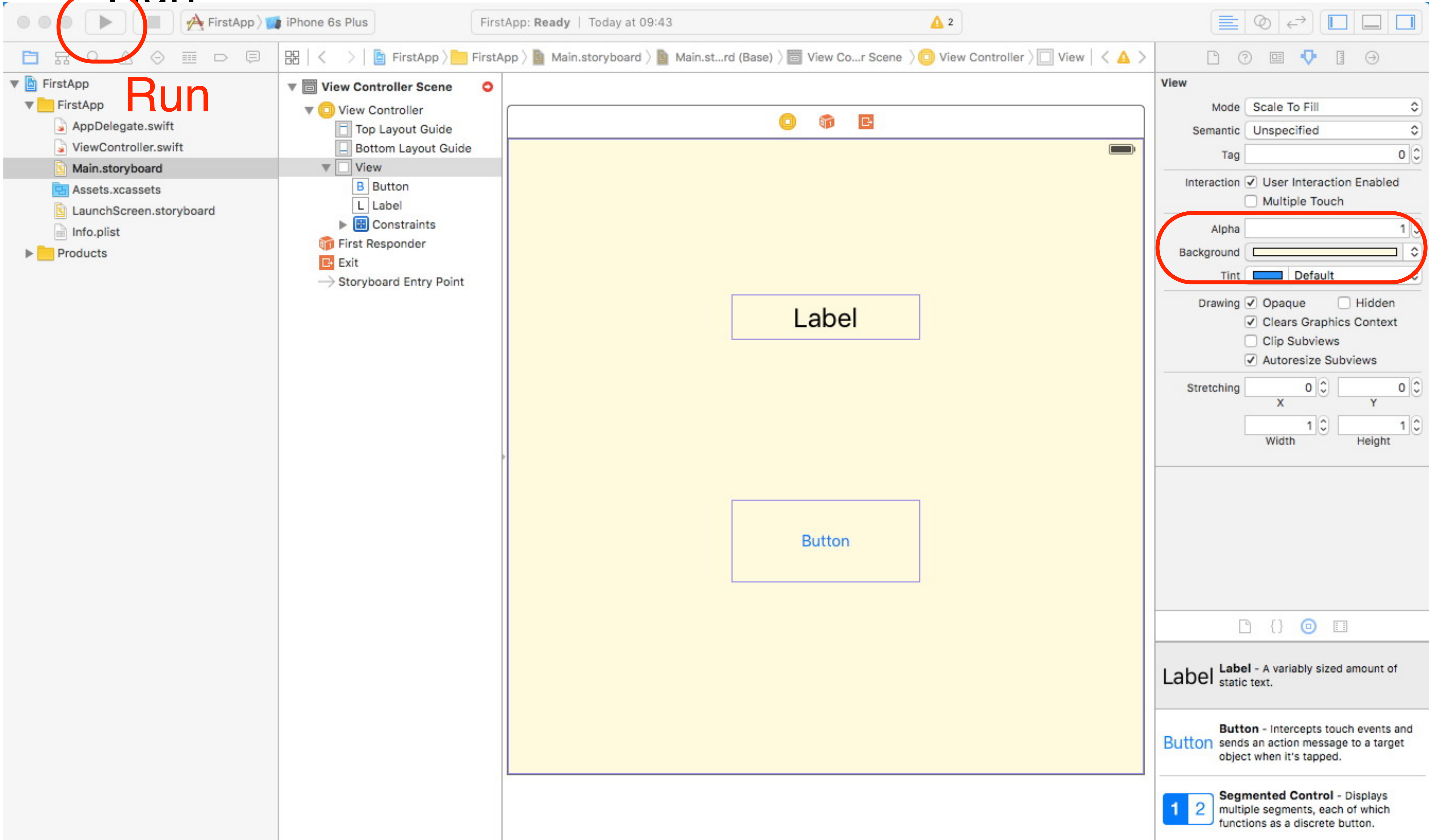
l - A variably sized amount of text.

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

nted Control - Displays segments, each of which ns as a discrete button.

Step 6

- Click on background of screen, then colour it, then press Run



View

Mode	Scale To Fill
Semantic	Unspecified
Tag	0
Interaction	✓ User Interaction Enabled
	Multiple Touch
Alpha	1
Background	
Tint	Default
Drawing	✓ Opaque Hidden
	✓ Clears Graphics Context
	Clip Subviews
	✓ Autoresize Subviews
Stretching	0 X 0 Y
	1 Width 1 Height

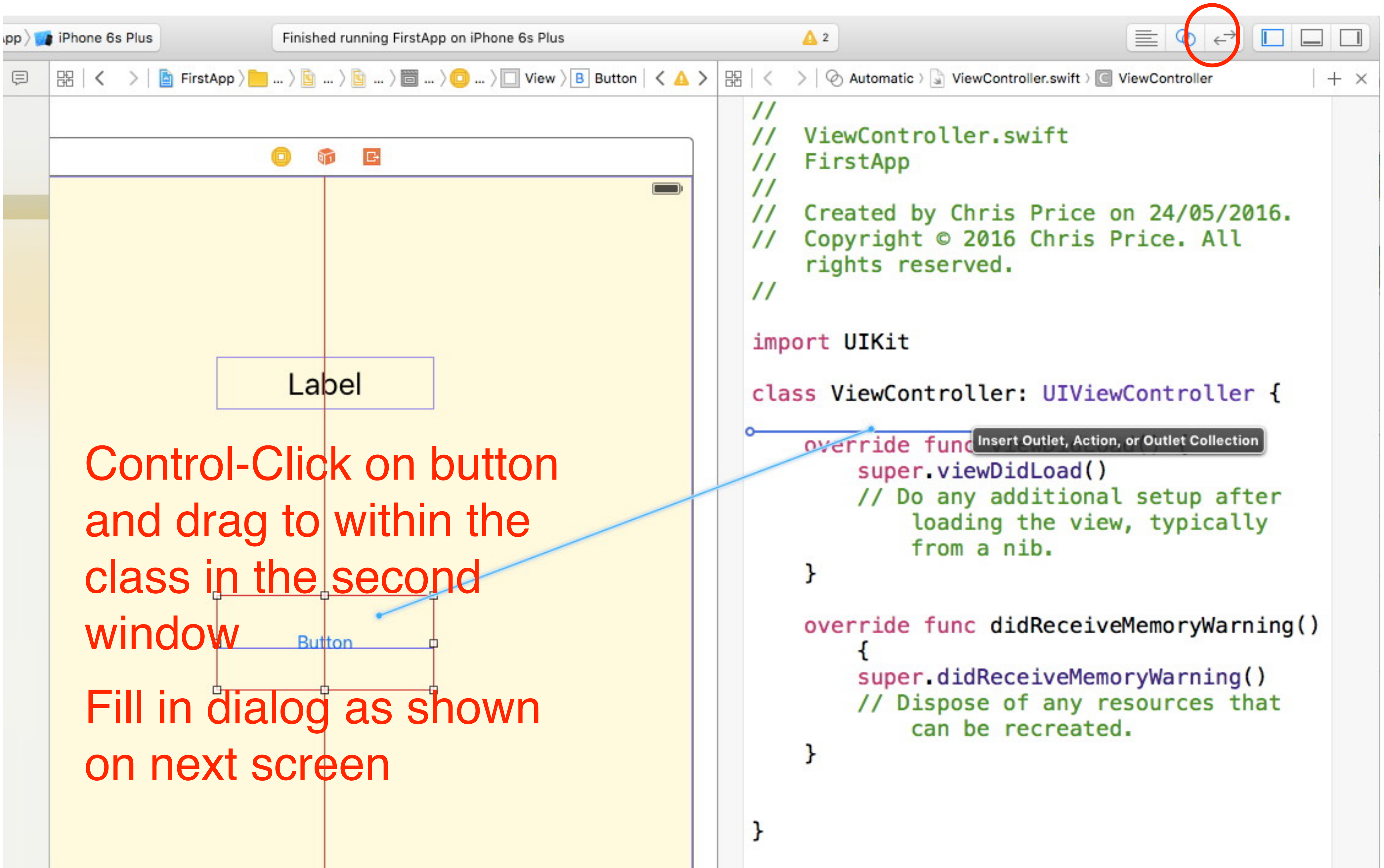
Label **Label** - A variably sized amount of static text.

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

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

Step 7

Click here to get a second window

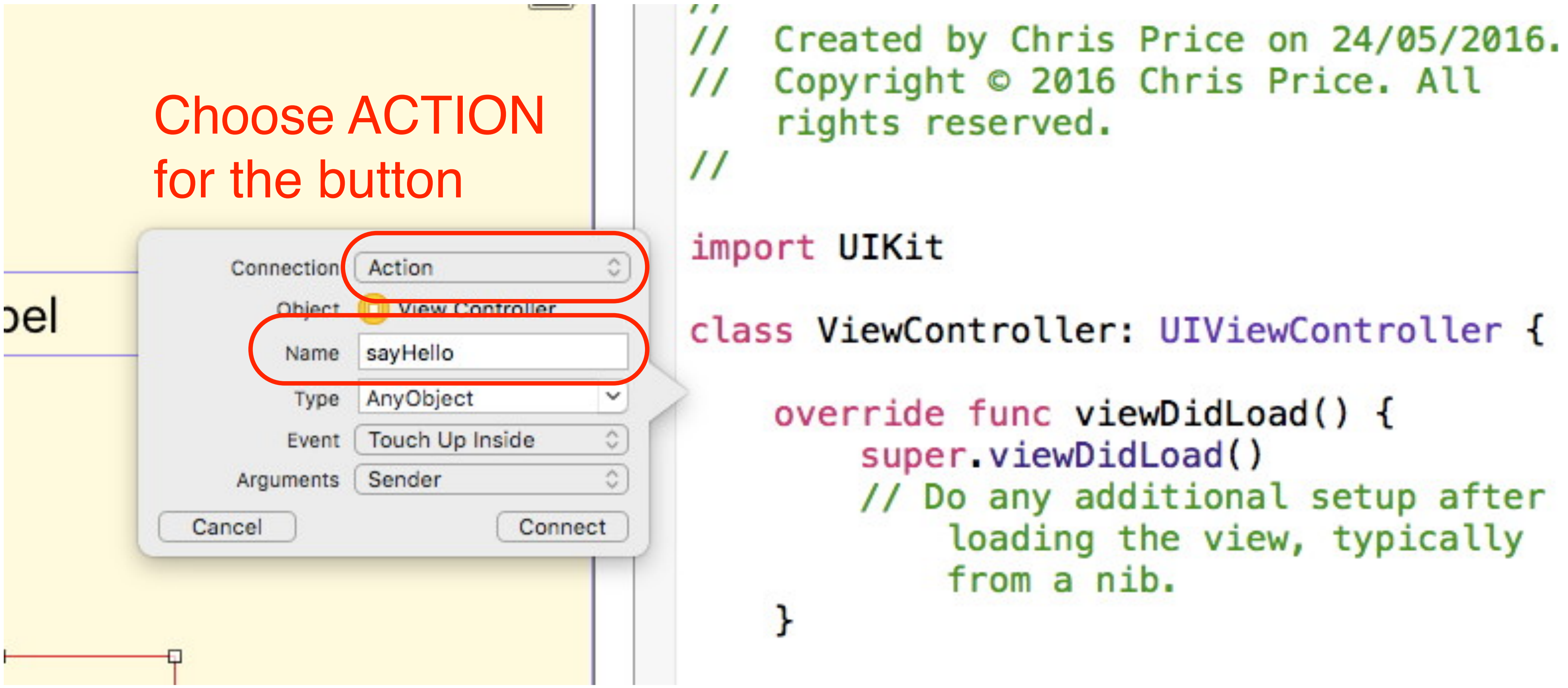


```
//
//  ViewController.swift
//  FirstApp
//
//  Created by Chris Price on 24/05/2016.
//  Copyright © 2016 Chris Price. All
    rights reserved.
//

import UIKit

class ViewController: UIViewController {

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

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

}
```

Control-Click on button and drag to within the class in the second window

Fill in dialog as shown on next screen

Step 8

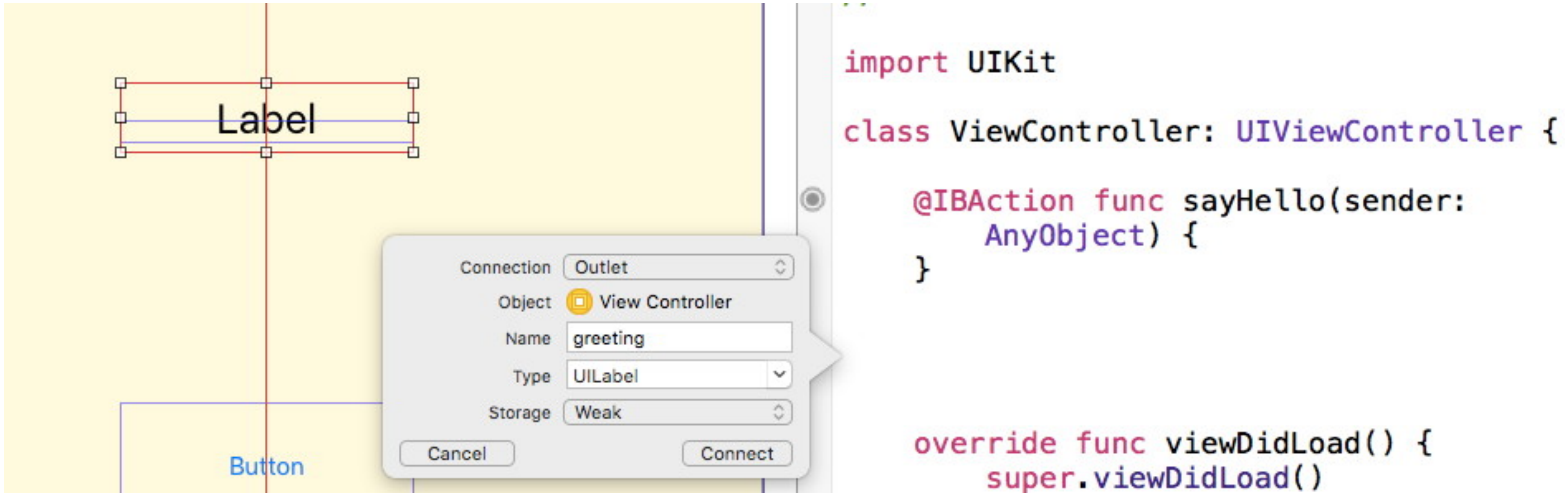


```
//
//  Created by Chris Price on 24/05/2016.
//  Copyright © 2016 Chris Price. All
    rights reserved.
//

import UIKit

class ViewController: UIViewController {

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

Call the ACTION sayHello - this will create a method called sayHello where we can do things when the button is pressed.

Step 9

- Click and drag from the label
- This time make the connection an OUTLET
- Call it “greeting”
- This gives us a variable which we can use to change the value of the label

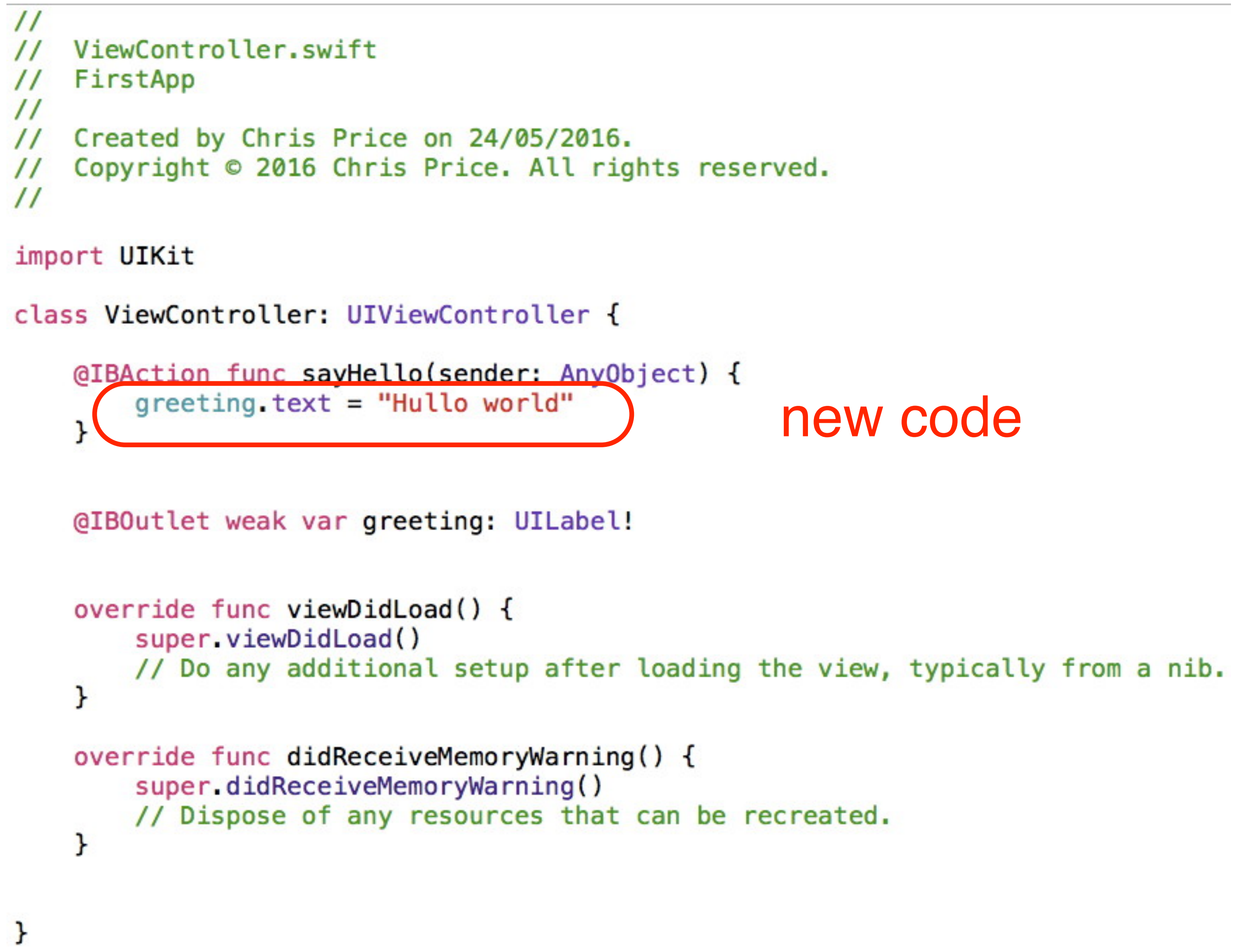


Connection: Outlet
Object: View Controller
Name: greeting
Type: UILabel
Storage: Weak

```
import UIKit

class ViewController: UIViewController {

    @IBAction func sayHello(sender:
        AnyObject) {
    }


    override func viewDidLoad() {
        super.viewDidLoad()
```

Step 10

- Finally, add code to method “sayHello” to change the label when the button is pressed.



```
//
//  ViewController.swift
//  FirstApp
//
//  Created by Chris Price on 24/05/2016.
//  Copyright © 2016 Chris Price. All rights reserved.
//

import UIKit

class ViewController: UIViewController {

    @IBAction func sayHello(sender: AnyObject) {
        greeting.text = "Hullo world"
    }


    @IBOutlet weak var greeting: UILabel!


    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.
    }


}
```

new code

Model - View - Controller abstraction

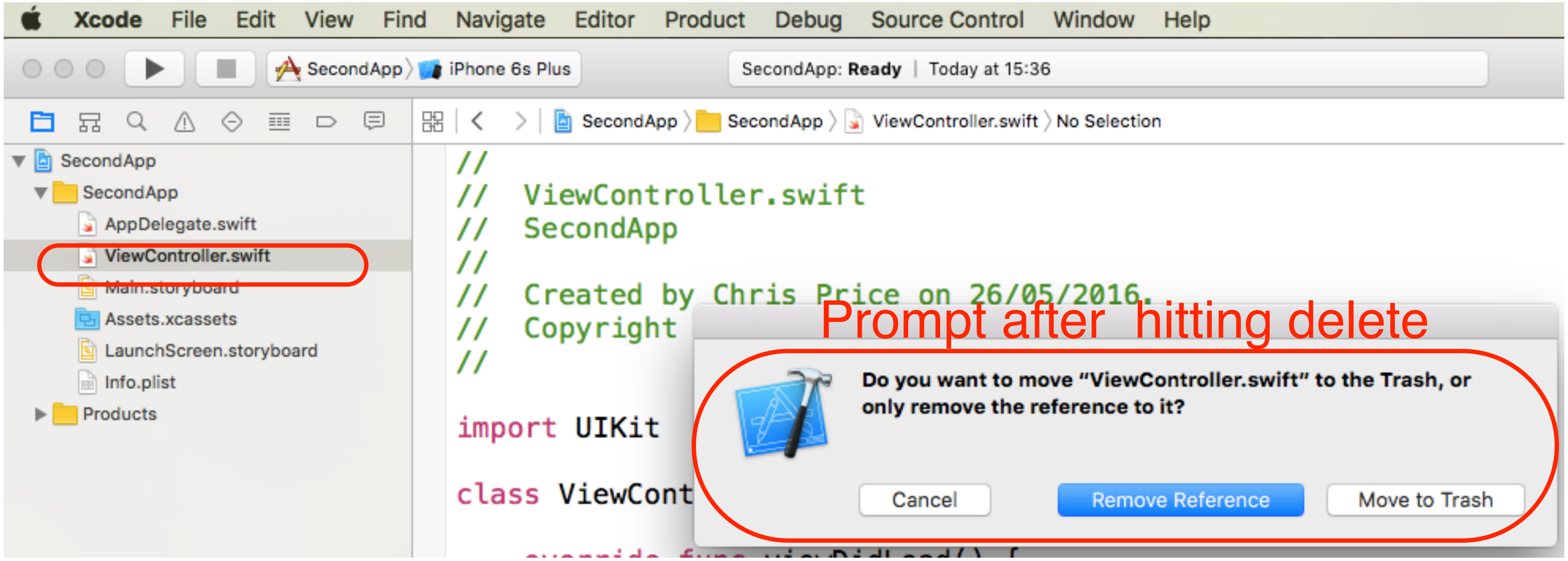
- Xcode helps you separate parts of your App
- Model is the state of your App (we don’t have one here)
- Views are what you see on the screen, and are defined in the Storyboard
- Controller is the code that gets data from the Model, and reacts to changes in the View
- Typically there is Controller code associated with each view

Second App - Prototyping with Views

- We will build an app with four screens, where the first screen leads to the other three, and you can get back to the main one
- We will use no code to do this - you can often show what your app might look like without actually writing any code by putting in dummy data
- When you are happy (and know what you are doing), you can replace the dummy text by writing code

Step 1

- Choose New Project from the File/New menu and make a Single View app as before
- Call it SecondApp
- Select the file ViewController.swift, and hit delete, then choose “Move to Trash” at the prompt (we are not writing any code for this app)

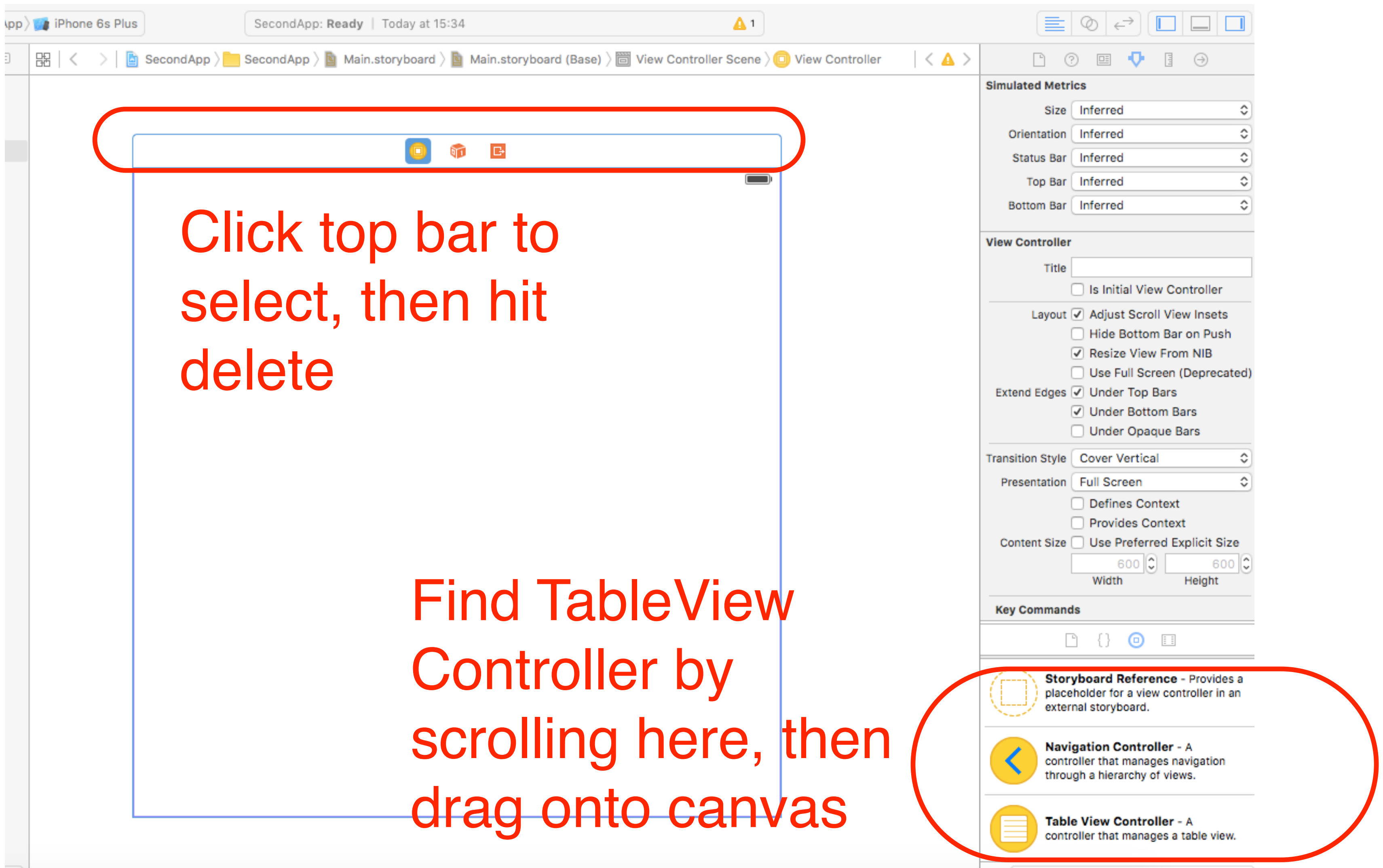

Xcode File Edit View Find Navigate Editor Product Debug Source Control Window Help
SecondApp 〉 iPhone 6s Plus
SecondApp: Ready | Today at 15:36
SecondApp 〉 SecondApp 〉 ViewController.swift 〉 No Selection
SecondApp
SecondApp
AppDelegate.swift
ViewController.swift
Main.storyboard
Assets.xcassets
LaunchScreen.storyboard
Info.plist
Products
Prompt after hitting delete
Cancel
Remove Reference
Move to Trash

```
//
//  ViewController.swift
//  SecondApp
//
//  Created by Chris Price on 26/05/2016.
//  Copyright
//

import UIKit

class ViewCont
```

Do you want to move “ViewController.swift” to the Trash, or only remove the reference to it?

Step 2

- Select Main.storyboard, then select the view controller shown in the storyboard, and hit delete again.
- Drag and drop a TableView Controller onto the canvas



Click top bar to select, then hit delete

Find TableView Controller by scrolling here, then drag onto canvas

iPhone 6s Plus
SecondApp: Ready | Today at 15:34
SecondApp 〉 SecondApp 〉 Main.storyboard 〉 Main.storyboard (Base) 〉 View Controller Scene 〉 View Controller

Simulated Metrics

Size	Inferred
Orientation	Inferred
Status Bar	Inferred
Top Bar	Inferred
Bottom Bar	Inferred

View Controller

- Title
- ☐ Is Initial View Controller
- Layout ☑ Adjust Scroll View Insets
- ☐ Hide Bottom Bar on Push
- ☑ Resize View From NIB
- ☐ Use Full Screen (Deprecated)
- Extend Edges ☑ Under Top Bars
- ☑ Under Bottom Bars
- ☐ Under Opaque Bars
- Transition Style: Cover Vertical
- Presentation: Full Screen
- ☐ Defines Context
- ☐ Provides Context
- Content Size ☐ Use Preferred Explicit Size
- Width 600, Height 600

Key Commands

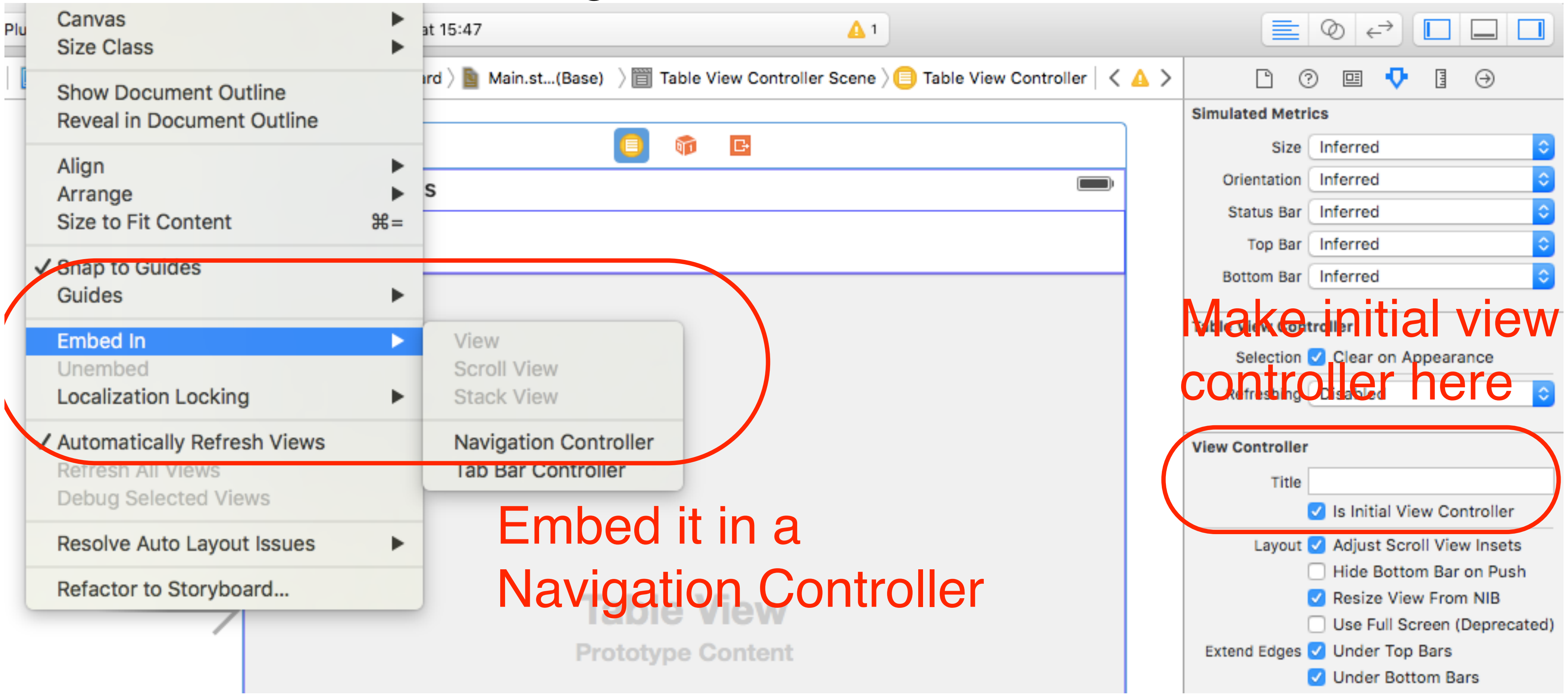
Storyboard Reference - Provides a placeholder for a view controller in an external storyboard.

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

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

Step 3

- Select the TableView controller in the storyboard, and choose to make it the Initial View Controller
- In the Editor menu, choose to embed the Table View Controller in a Navigation Controller



Simulated Metrics
Size: Inferred
Orientation: Inferred
Status Bar: Inferred
Top Bar: Inferred
Bottom Bar: Inferred

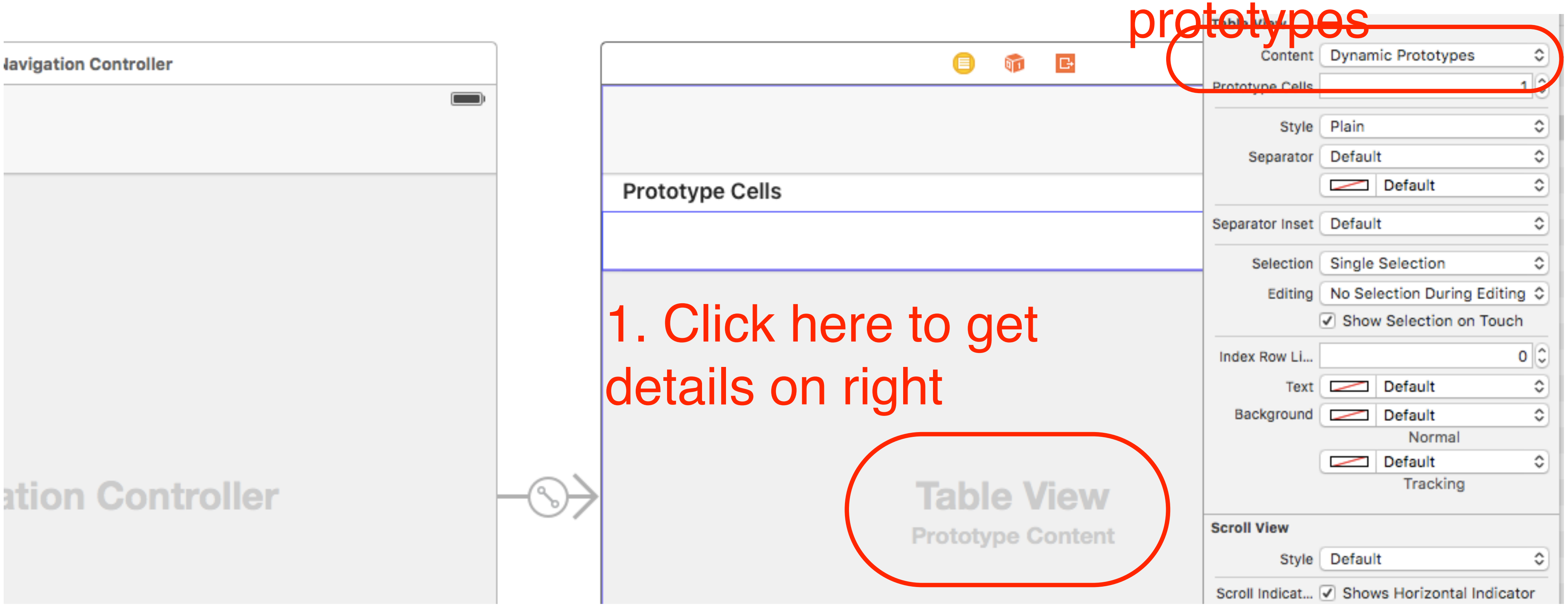
Table View Controller
Selection: ✓ Clear on Appearance
Refreshing: Disabled

View Controller
Title:
✓ Is Initial View Controller
Layout: ✓ Adjust Scroll View Insets
☐ Hide Bottom Bar on Push
✓ Resize View From NIB
☐ Use Full Screen (Deprecated)
Extend Edges: ✓ Under Top Bars
✓ Under Bottom Bars

Step 4

- Click where it says “Table View Prototype Content” to see info about the Table on the right
- Change Content from “Dynamic Prototypes” to be “Static Cells” instead

2. Change to Static prototypes



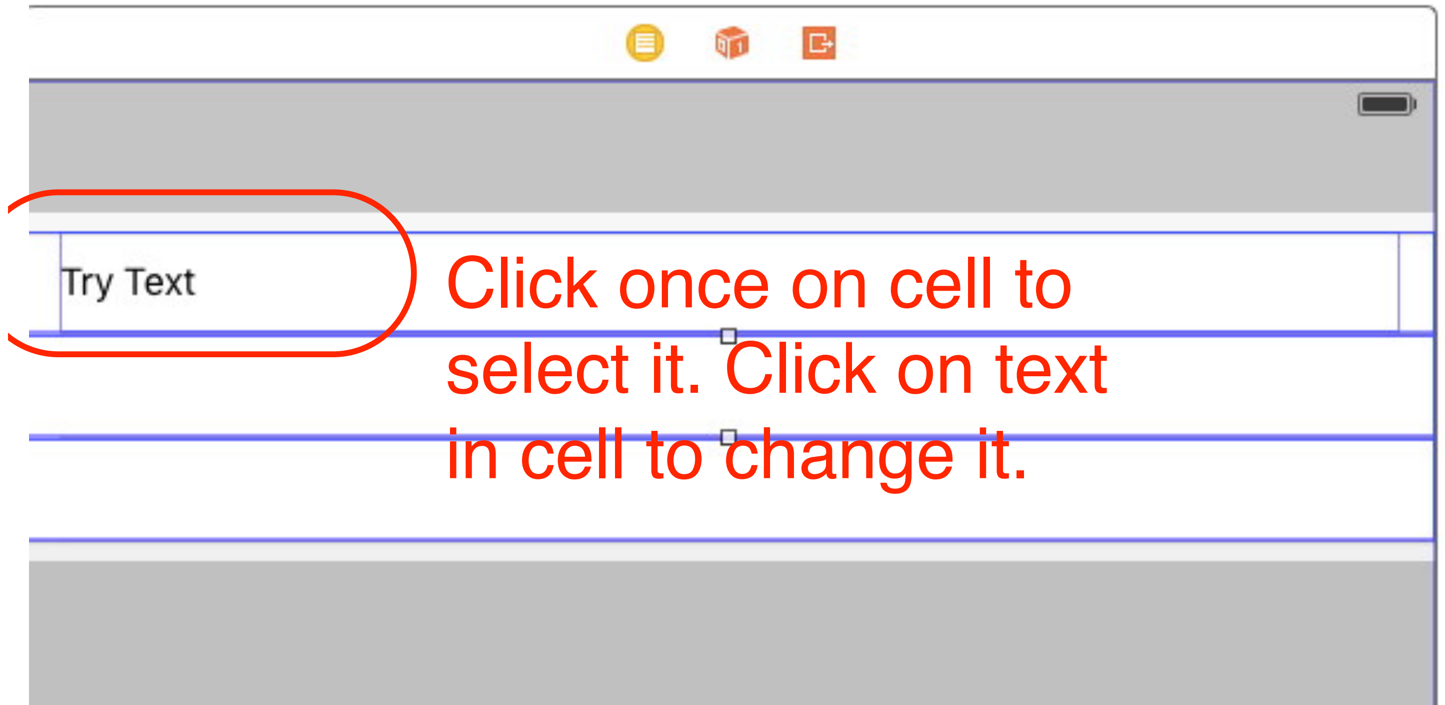
1. Click here to get details on right

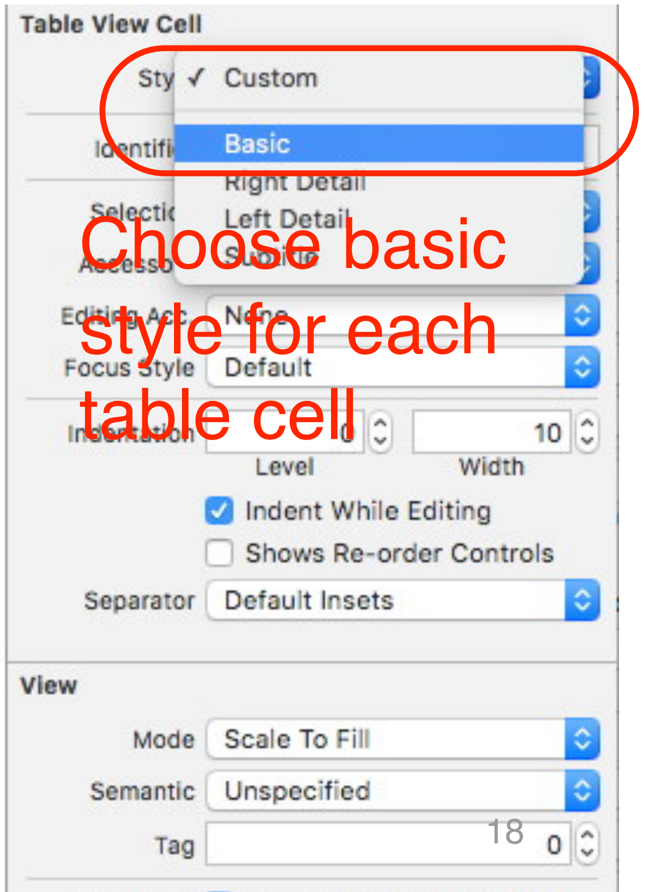
Content: Dynamic Prototypes
Prototype Cells: 1
Style: Plain
Separator: Default
Default
Separator Inset: Default
Selection: Single Selection
Editing: No Selection During Editing
✓ Show Selection on Touch
Index Row Li...: 0
Text: Default
Background: Default
Normal: Default
Tracking

Scroll View
Style: Default
Scroll Indicat...: ✓ Shows Horizontal Indicator

Step 5

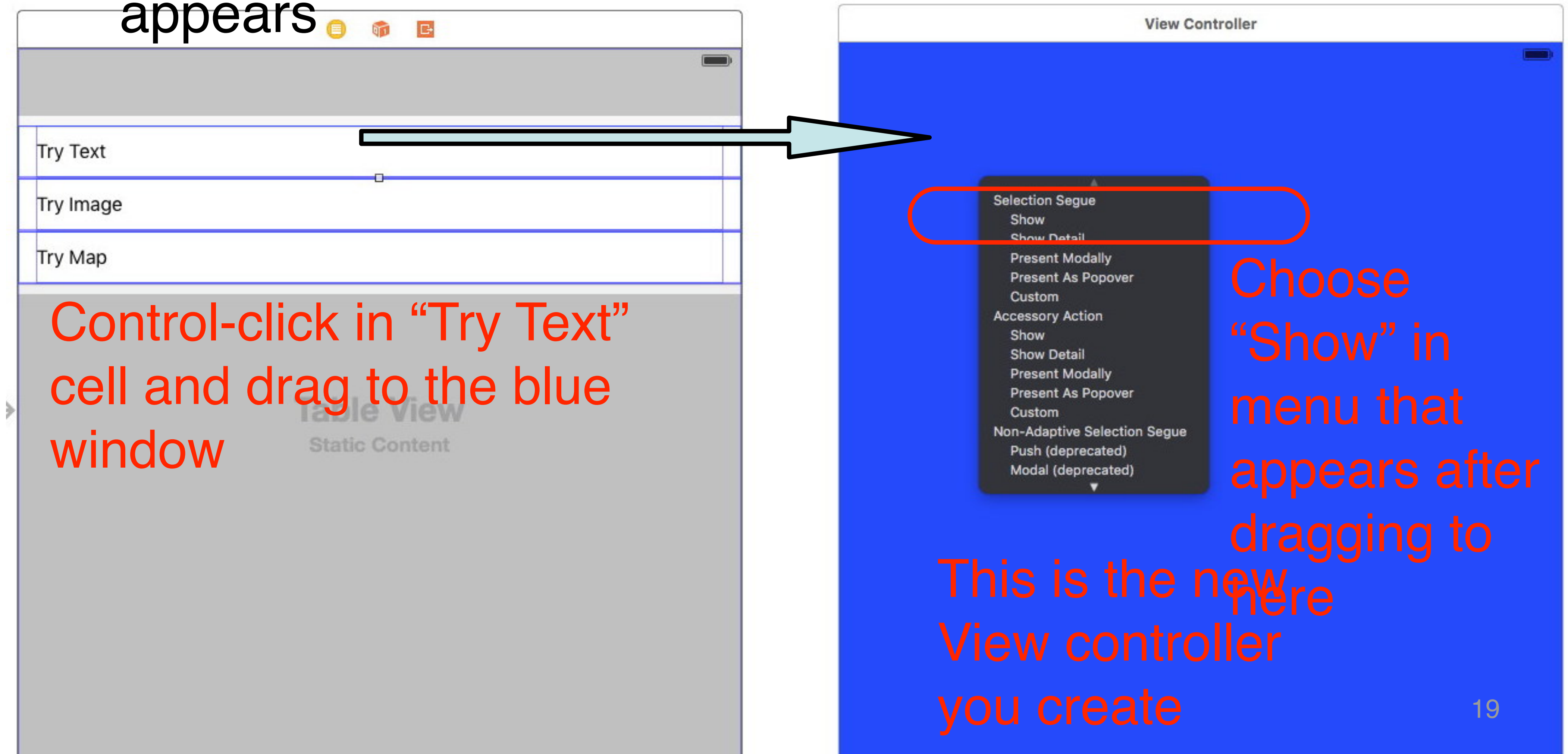
- Click on the top table cell, change Style to Basic, then click on the text in the cell saying "Title", and change it to "Try Text"
- Repeat with other two cells, giving them labels "Try Image" and "Try Map"


Try Text
Click once on cell to select it. Click on text in cell to change it.



Step 6

- Add an extra view controller to the Main storyboard
- Colour its background Blue so we can see it on screen
- Control-Click on the “Try text” cell and drag to the new view controller. Let go, and choose “Show” in menu that appears



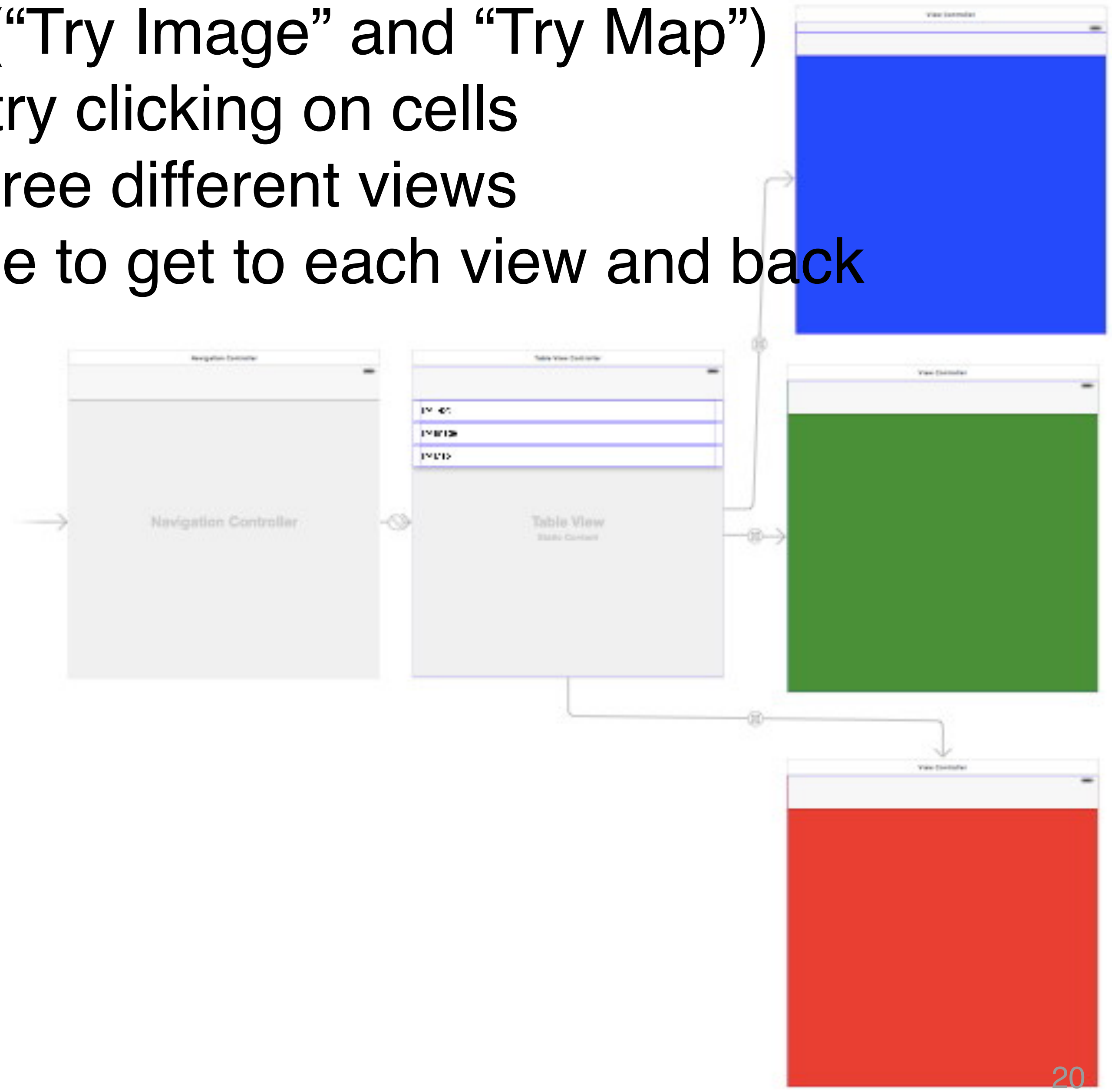
Control-click in “Try Text” cell and drag to the blue window

Choose “Show” in menu that appears after dragging to here

This is the new View controller you create

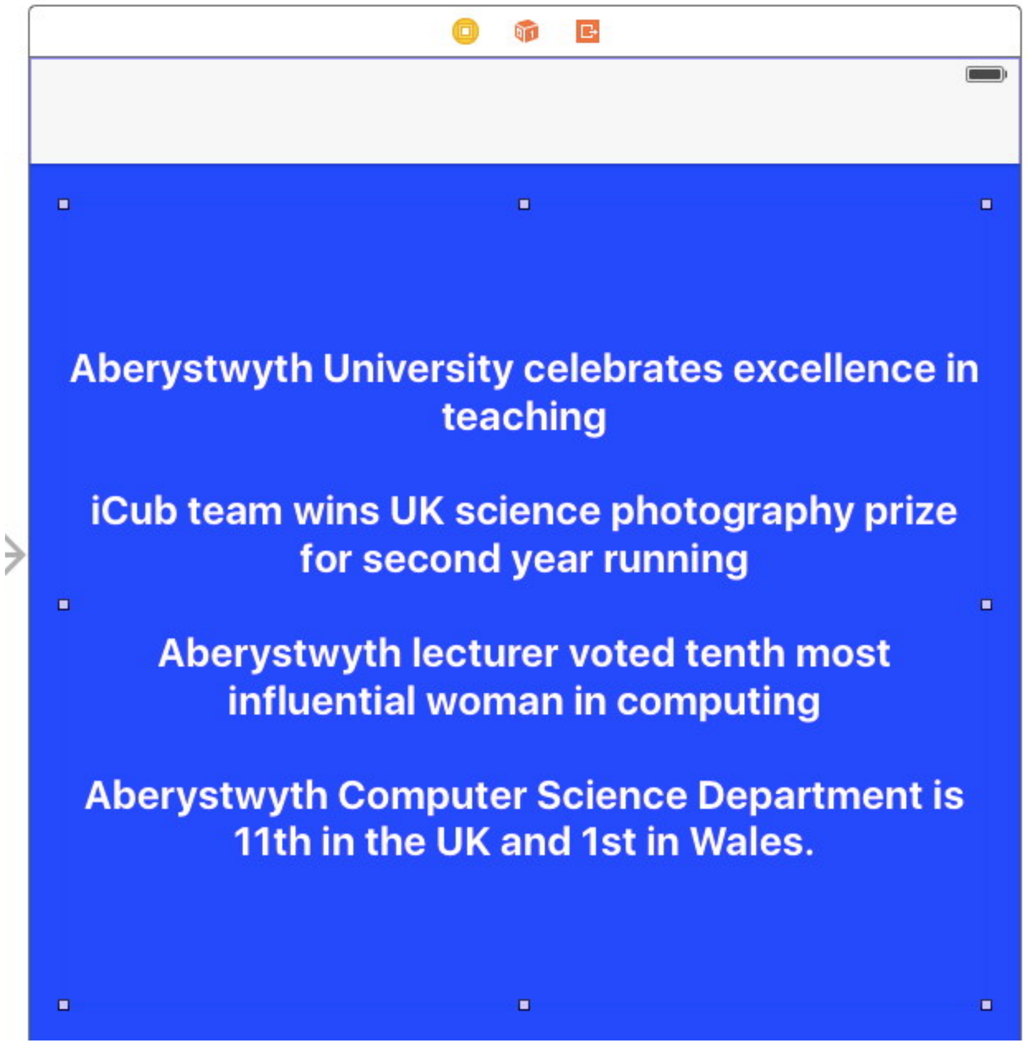
Step 7

- Repeat step 6 to two new View controllers - one for each of the other cells ("Try Image" and "Try Map")
- Run the app and try clicking on cells
- They link to the three different views
- You should be able to get to each view and back



Step 8

- Add a label to the blue view, paste the text about Aberystwyth into it, and resize it to fit within the screen.
- Make it white, bold, centered and showing 0 lines of text.

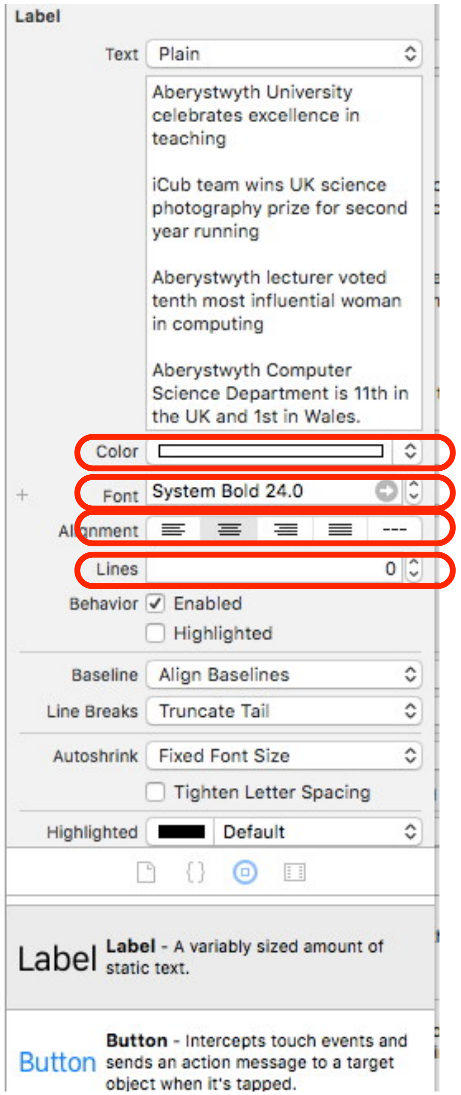


Aberystwyth University celebrates excellence in teaching

iCub team wins UK science photography prize for second year running

Aberystwyth lecturer voted tenth most influential woman in computing

Aberystwyth Computer Science Department is 11th in the UK and 1st in Wales.



Label

Text: Plain

Aberystwyth University celebrates excellence in teaching

iCub team wins UK science photography prize for second year running

Aberystwyth lecturer voted tenth most influential woman in computing

Aberystwyth Computer Science Department is 11th in the UK and 1st in Wales.

Color:

Font: System Bold 24.0

Alignment:

Lines: 0

Behavior: ✓ Enabled

Highlighted

Baseline: Align Baselines

Line Breaks: Truncate Tail

Autoshrink: Fixed Font Size

Tighten Letter Spacing

Highlighted: Default

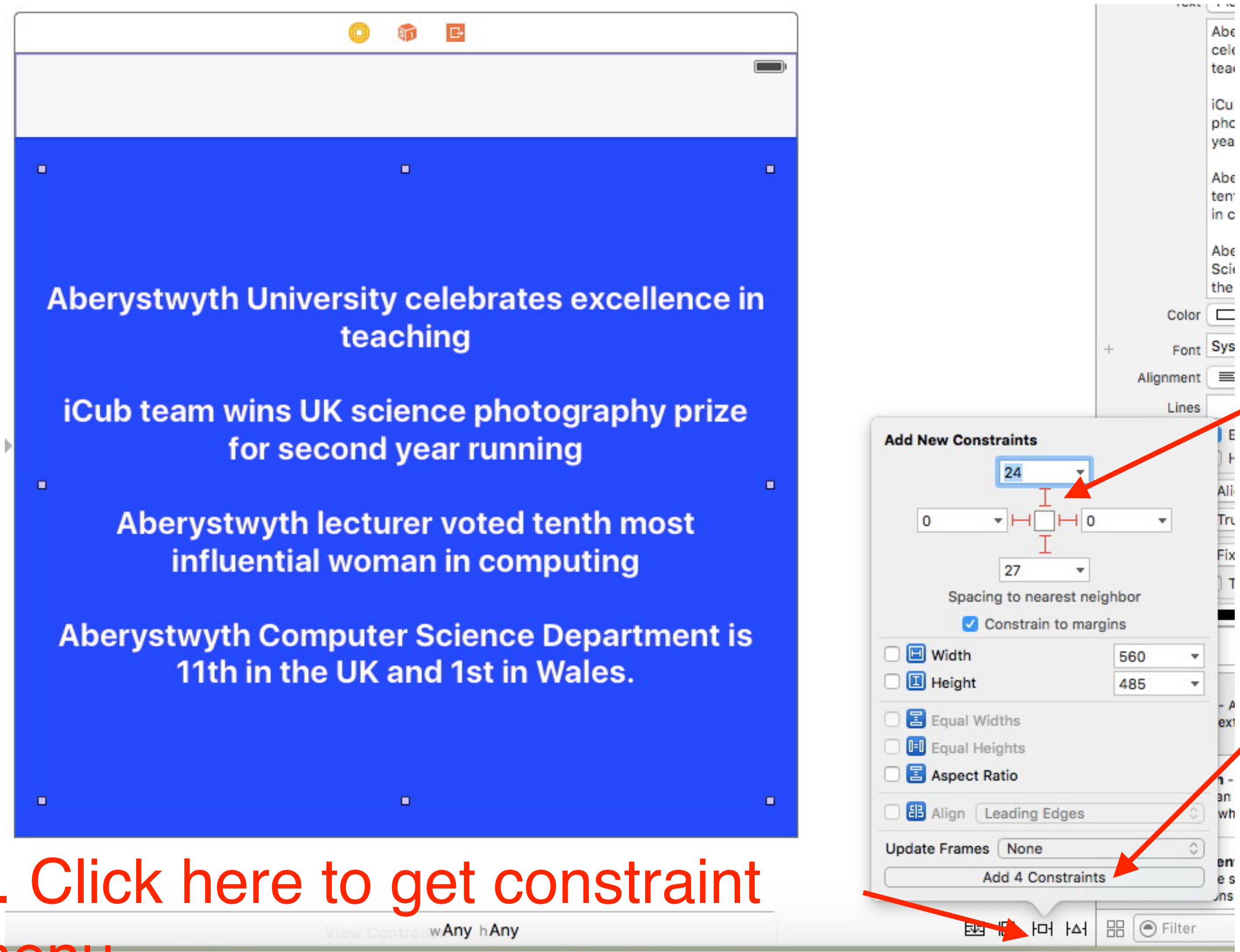
Label - A variably sized amount of static text.

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

White text
Bold, 24 point
Centered
Zero lines

Step 9

- If you run at this point, text will not all be on phone screen - you need to add constraints to make it fit correctly
- Select label, then click at bottom to add constraints



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Add New Constraints

Top	24
Left	0
Right	0
Bottom	27

Spacing to nearest neighbor

✓ Constrain to margins

☐	Width	560
☐	Height	485
☐	Equal Widths	
☐	Equal Heights	
☐	Aspect Ratio	
☐	Align	Leading Edges

Update Frames: None

Add 4 Constraints

2. Click on each bar to choose constraints

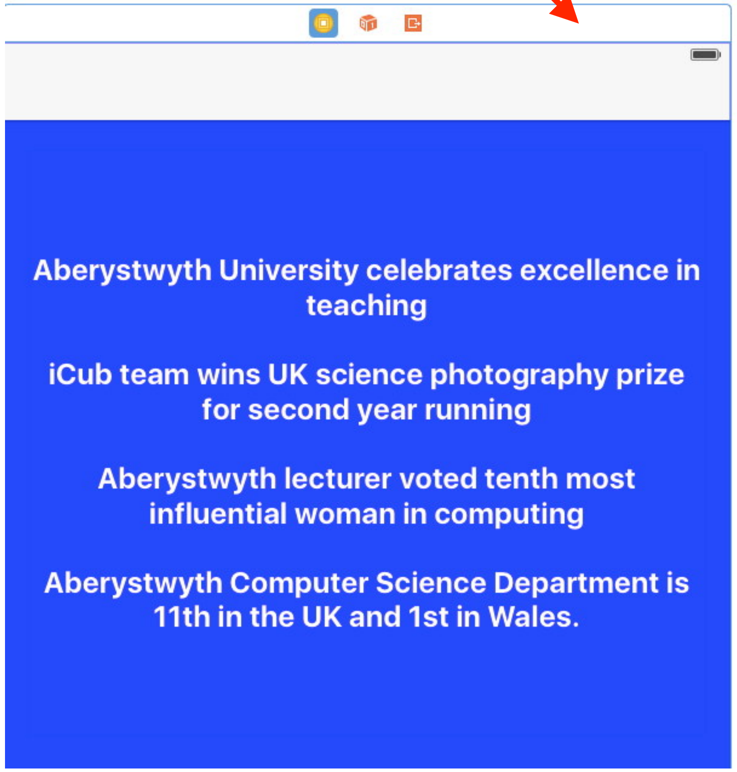
3. Click here to add chosen constraints

1. Click here to get constraint menu

Step 10

- Click on bar at top of view to see details of the view controller - then add a title for the view. Do the same for the table view controller - this title will be seen at top of running app
- Run the app - first window should now be finished

1. Click here to see view controller details

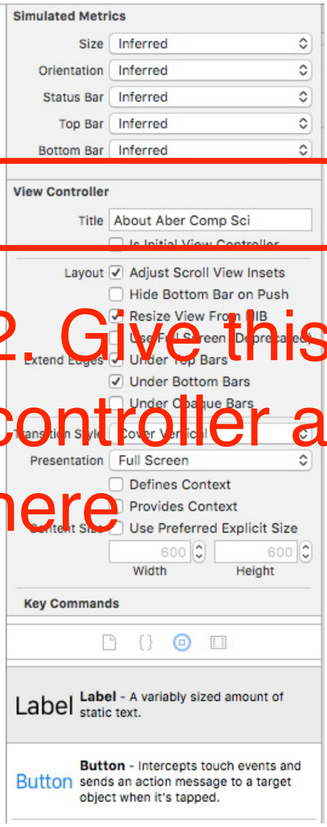


Aberystwyth University celebrates excellence in teaching

iCub team wins UK science photography prize for second year running

Aberystwyth lecturer voted tenth most influential woman in computing

Aberystwyth Computer Science Department is 11th in the UK and 1st in Wales.



Simulated Metrics
Size: Inferred
Orientation: Inferred
Status Bar: Inferred
Top Bar: Inferred
Bottom Bar: Inferred

View Controller
Title: About Aber Comp Sci
Is Initial View Controller

Layout: ✓ Adjust Scroll View Insets
Hide Bottom Bar on Push
✓ Resize View From NIB
Use Full Screen (Deprecated)
Extend Edges: ✓ Under Top Bars
✓ Under Bottom Bars
Under Opaque Bars
Transition Style: Cover Vertical
Presentation: Full Screen
Defines Context
Provides Context
Content Size: Use Preferred Explicit Size
600 Width, 600 Height

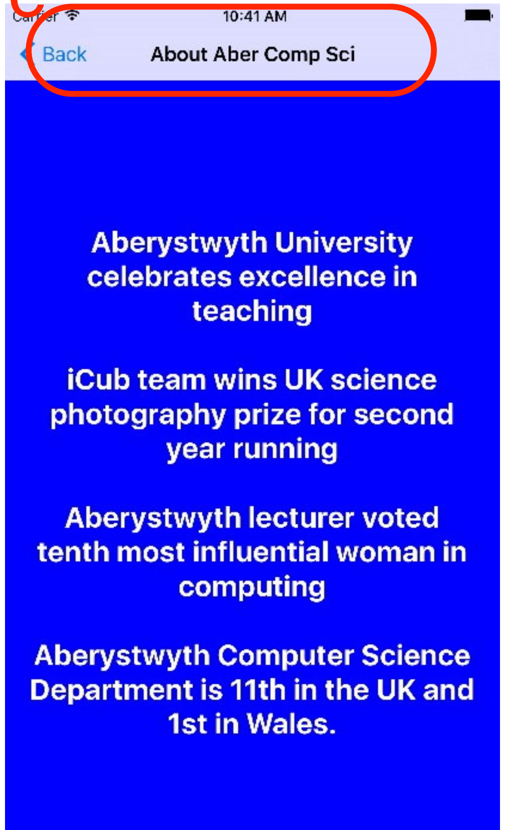
Key Commands

Label - A variably sized amount of static text.

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

2. Give this view controller a title here

3. Run, and title is here



Carrier 10:41 AM
Back About Aber Comp Sci

Aberystwyth University celebrates excellence in teaching

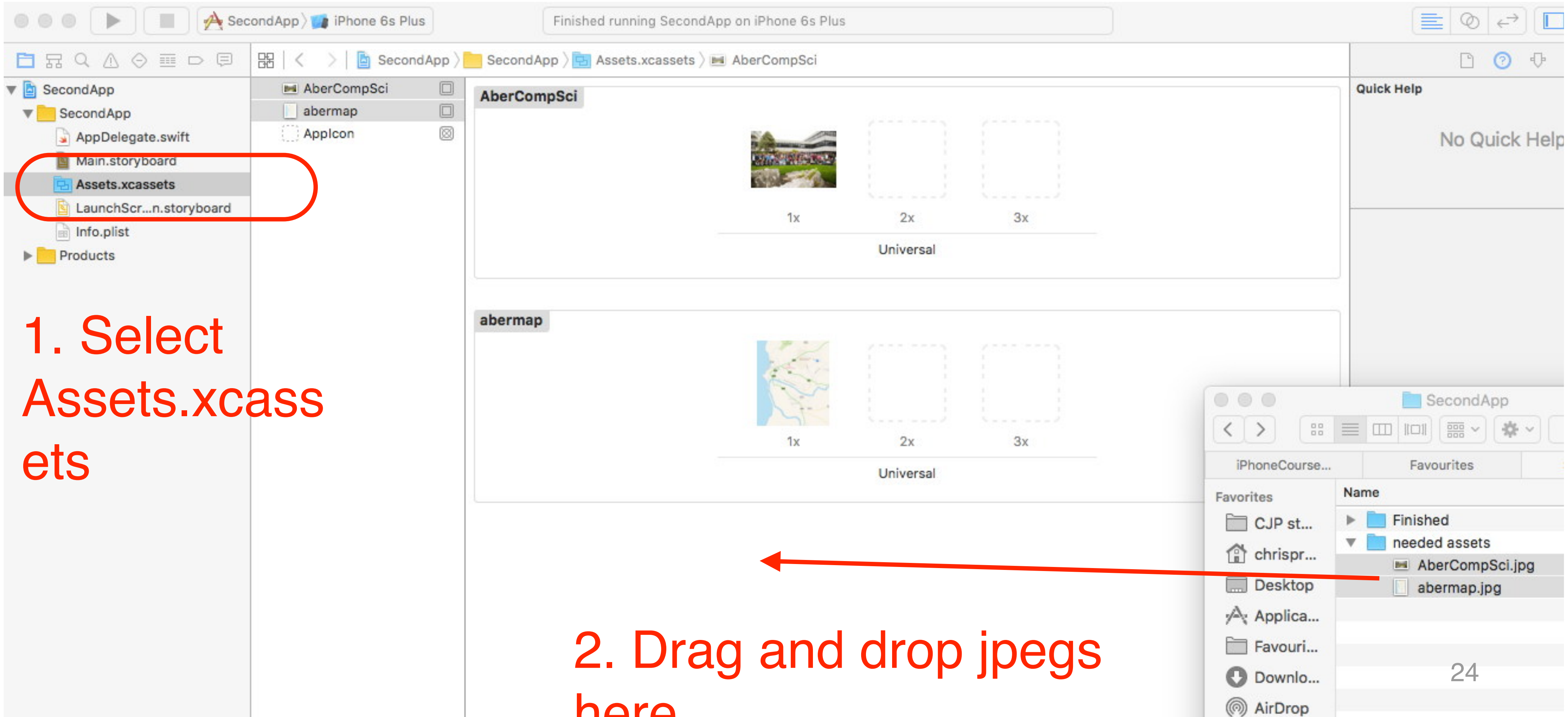
iCub team wins UK science photography prize for second year running

Aberystwyth lecturer voted tenth most influential woman in computing

Aberystwyth Computer Science Department is 11th in the UK and 1st in Wales.

Step 11

- To complete the other two views, we need to add some assets to the project. They will then be available to show in the app.
- Find the two jpeg pictures in the "needed assets" folder supplied
- Select the "Assets.xcassets" folder within the project, then drag and drop the two jpegs onto the main window



Step 12

- Add an Image View to the green screen, and choose AberCompSci from the drop down list of images available
- Name the view controller and put constraints on the window as done for the previous view controller

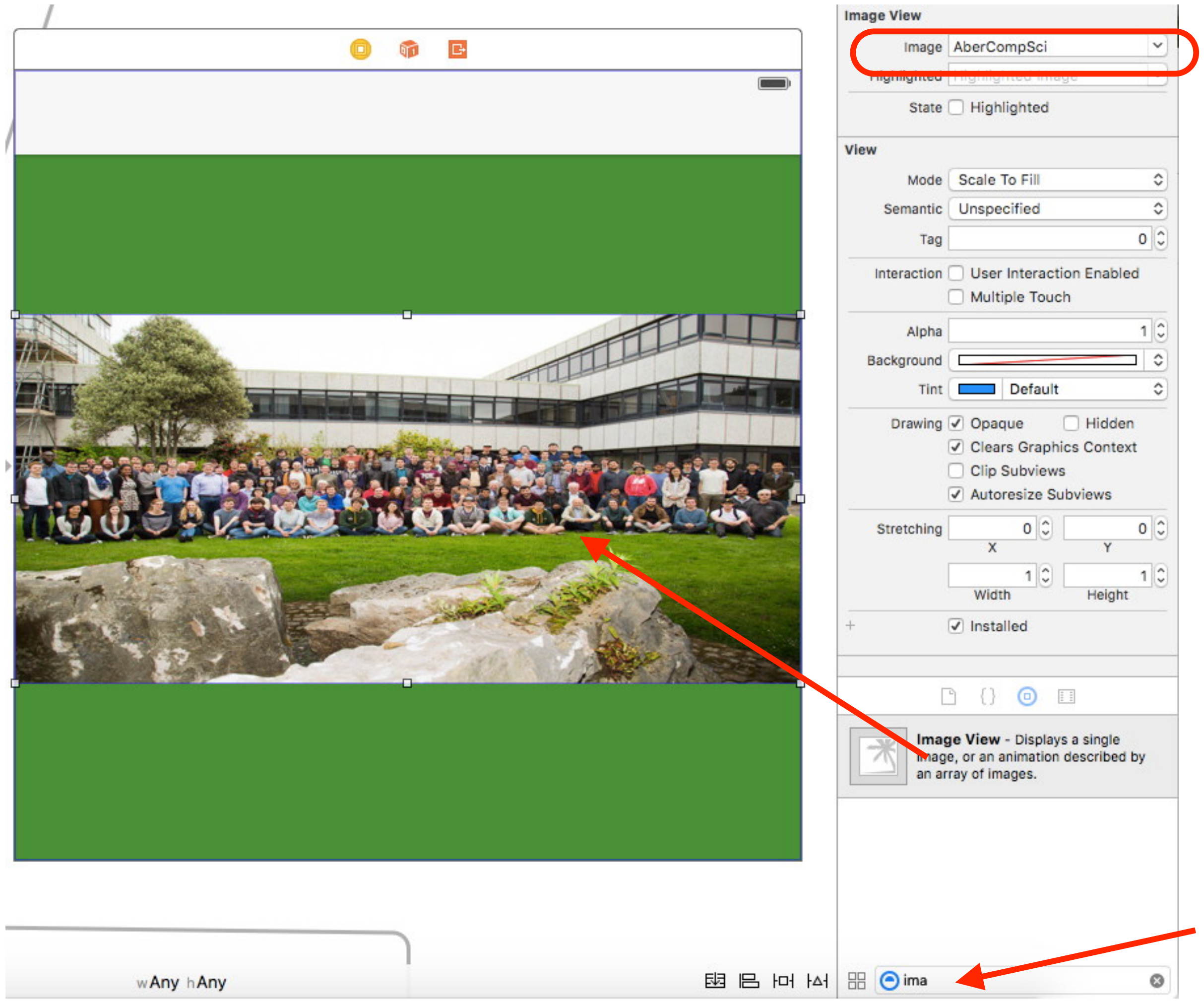


Image View

Image: AberCompSci

Highlighted: Highlighted Image

State: ☐ Highlighted

View

Mode: Scale To Fill

Semantic: Unspecified

Tag: 0

Interaction: ☐ User Interaction Enabled
☐ Multiple Touch

Alpha: 1

Background

Tint: Default

Drawing: ✓ Opaque ☐ Hidden
✓ Clears Graphics Context
☐ Clip Subviews
✓ Autoresize Subviews

Stretching: 0 X, 0 Y
1 Width, 1 Height

✓ Installed

Image View - Displays a single image, or an animation described by an array of images.

3. Choose AberCompSci from the list of images available

2. Drag an Image View on to the view controller

1. Search for Image view if you can't find it

Final Step

- Add image view to the third screen, and show AberMap as the image
- You have now made an app with a main table view, where each table cell goes to a different view

Reflection

- This kind of technique can be used to build a working prototype of an app design without actually writing any code
- The storyboard can then be used to drive development - you need to write code that changes what each screen looks like depending on available data

Next

- We need to learn more about how to write the controller code in Swift that goes with each screen

PRIFYSGOL ABERYSTWYTH UNIVERSITY

Free Resources for Swift and iOS

Apple's Swift Programming Series in iBooks

raywenderlich.com: for all your iOS learning needs
Apple Docs: https://developer.apple.com/documentation/
WWDC videos from Apple: https://developer.apple.com/videos