WordCollage
Lesson 4

Description

Add two more buttons that change the background to different colors.

Learning Outcomes

- Repeat adding buttons to the interface with Interface Builder, defining layout constraints, and establishing action connections to controller code.
- Analyze how Xcode indicates when interface controls are connected to controller methods.
- Describe why connections between interface controls must change when their corresponding controller method names change.
- Differentiate multiple ways of establishing and managing connections between interface controls and controller code.
- Distinguish different connections between individual interface elements and code.

Vocabulary

Interface Builder	Assistant Editor	user interface
Button	constraint	controller
connection	implement	connection well
connection overlay	`@IBAction`	`UIColor`

Materials

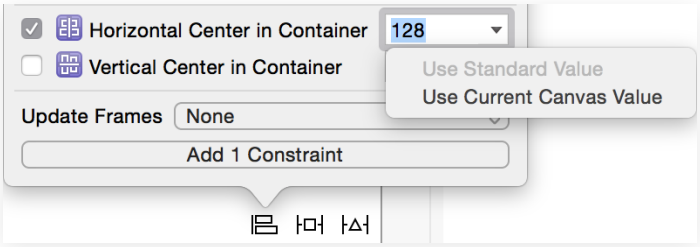
- **WordCollage Lesson 4** Xcode project

Opening

How do you create two more buttons that change the background to different colors?

Agenda

- Change the label of the existing Button contents to "Black."
- Using Interface Builder and the Object Library (⌥⌘L), add a Button to the bottom left of the interface, labeled "White."
- Using Interface Builder, Control-drag from the Button downward to the View, and select Bottom Space to Bottom Layout Guide to create a Vertical Space constraint.
- With the Button still selected, use the Align control and select Horizontal Center in Container using the Current Canvas Value to create a Center X Alignment constraint.



- Add another button, labeled "Magenta," to the bottom right of the interface, and add constraints similar to the previous Button.
- Using Interface Builder and the Assistant Editor (⌥⌘↩), establish connections between each button and two new controller methods, `changeBackgroundColorToWhite:` and `changeBackgroundColorToMagenta:`.

```
@IBAction func changeBackgroundColorToWhite(sender: UIButton) {
}

@IBAction func changeBackgroundColorToMagenta(sender: UIButton) {
}
```

- Implement the two methods.

```
@IBAction func changeBackgroundColorToWhite(sender: UIButton) {
    view.backgroundColor = UIColor.whiteColor()
}

@IBAction func changeBackgroundColorToMagenta(sender: UIButton) {
    view.backgroundColor = UIColor.magentaColor()
}
```

- Rename `changeBackgroundColor:` to `changeBackgroundColorToBlack:`, and observe that the adjacent connection well appears hollow.
- Run the app (⌘R), tap the Black button, and witness the app crash. Stop the app (⌘.).
- Explain that the app crashed because Interface Builder still tries to connect the button to the `changeBackgroundColor:` method, which no longer exists.
- Using Interface Builder and the connection overlay, delete the old connection, establish a new connection to `changeBackgroundColorToBlack:`, and observe the connection well reappear.
- Run the app (⌘R), tap the buttons and witness the background color changing.

Closing

Cool apps require lots more code. What should we learn about Swift so we can build more sophisticated, meaningful apps?

Modifications and Extensions

- When tapped, change the button colors themselves in addition to the background color.
- Replace the three separate controller actions with a single `changeBackgroundColor:` method, connected to all three buttons. Implement the method such that it distinguishes between which button is tapped, and changes the background color accordingly.

Resources

iOS Developer Program https://developer.apple.com/programs/ios/

Start Developing iOS Apps Today https://developer.apple.com/library/ios/referencelibrary/GettingStarted/RoadMapiOS/

iOS Technology Overview https://developer.apple.com/library/ios/documentation/Miscellaneous/Conceptual/iPhoneOSTechOverview/

iOS App Programming Guide: About iOS App Programming https://developer.apple.com/library/ios/documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/Introduction/Introduction.html

Xcode Overview: Build a User Interface https://developer.apple.com/library/ios/documentation/ToolsLanguages/Conceptual/Xcode_Overview/edit_user_interface.html

Adding an Object to Your Interface https://developer.apple.com/library/ios/recipes/xcode_help-IB_objects_media/Chapters/AddingObject.html

Xcode Overview: Connect User Interface Objects to Code https://developer.apple.com/library/ios/documentation/ToolsLanguages/Conceptual/Xcode_Overview/edit_user_interface.html#//apple_ref/doc/uid/TP40010215-CH6-SW3

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

Using Swift with Cocoa and Objective-C: Working with Outlets and Actions https://developer.apple.com/library/ios/documentation/Swift/Conceptual/BuildingCocoaApps/WritingSwiftClassesWithObjective-CBehavior.html#//apple_ref/doc/uid/TP40014216-CH5-XID_62

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