

**CSC 471 / 371**  
**Mobile Application**  
**Development for iOS**



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**Building UI**  
**with Segues**

**Outline**

- Multiple view apps
- Segues



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**An App with**  
**Two Scenes**

**An App with Two Scenes –**  
**Using Segue**

- Multiple scenes in a storyboard
- Using segue to switch between scenes
- The architecture
  - A storyboard with two scenes
    - The *Blue* and *Yellow* view controller
    - Each view controller has a toolbar and a button
  - The *Blue* view controller is the initial scene
  - A segue from the *Blue* scene to the *Yellow* scene

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**The Blue and Yellow Screens**



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### The Initial Scene in Storyboard

- Start with a single view app
- Edit the initial scene in the storyboard
  - Set the background color
  - Add a Toolbar and a Bar Button Item
  - Add a Label and Buttons
  - Add constraints

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### Add a New View Controller

- New File | iOS | Source | Cocoa Touch Class
- Choose options for the file
  - Class: **YellowViewController**
  - Subclass of: **UIViewController**
  - Uncheck “Also create XIB file”
  - Language: Swift

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### Add a New Scene

- Add a scene in the storyboard
  - Drag a *view controller*
- Set class to **YellowViewController**
- Edit the scene
  - Set the background color
  - Add a Toolbar and a Bar Button Item
  - Add a Label and Buttons
  - Add constraints

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### The Storyboard with Two Scenes

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### Add a Segue – Connect the Scenes

- Control-drag from the “To Yellow” button to the the *Yellow* scene

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### Add a Segue – Choose Action

- Control-drag from the “To Yellow” button to the the *Yellow* scene
  - Action segue: *Show*

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## Storyboard with a Segue

The storyboard displays two view controllers: a blue one on the left and a yellow one on the right. A segue arrow points from the blue view controller to the yellow one. The storyboard's navigation bar shows "Main.storyboard" and "View Controller Scene". The blue view controller has a label "Type a message:" and a text field. The yellow view controller has a label "Label" and a text field.

- Run, press *To Yellow* – perform the segue
  - but no return (yet).

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## Switch Back to the Blue Scene

- Connect an action to the *To Blue* button in the *YellowViewController*

- Implement the action

```
@IBAction func switchToBlue(sender: UIBarButtonItem) {
    dismissViewControllerAnimated(true, completion: nil)
}
```

- Run,

*To Yellow* – perform the segue

*To Blue* – invoke the action to dismiss view controller

## Passing Data Through Segues

The storyboard contains three view controllers: "Blue View Controller", "Yellow View Controller", and "Green View Controller". Each controller has a label and a text field. Segue arrows show transitions from Blue to Yellow and from Yellow to Green. The storyboard's navigation bar shows "Main.storyboard" and "View Controller Scene".

## The Segue App

- Three scenes and three view controllers
  - Blue, Yellow, Green
- Segues
  - Blue → Yellow
  - Yellow → Green
- Return action by dismissing view controllers
  - Yellow → Blue
  - Green → Yellow
  - Green → Blue

## Scenes and View Controllers

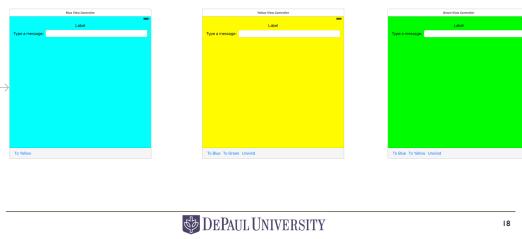
The storyboard shows a single scene with a blue background. It features a toolbar at the top with a button labeled "Type a message:". Below the toolbar is a text field and a label "Label". The storyboard's navigation bar shows "Main.storyboard" and "View Controller Scene".

- Start with a single view app
- Edit the initial scene in the storyboard
  - Set the background to blue
  - Add a toolbar and button
  - Add labels and a text field
- Change the view controller name to *BlueViewController*

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## Scenes and View Controllers

- Add two similar scenes to the storyboard and add two new view controller classes



## Add Segues

- Add “Show” segues
  - From the “To Yellow” button of the *Blue* scene to the *Yellow* scene
  - From the “To Green” button of the *Yellow* scene to the *Green* scene

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## Dismiss View Controllers

- Connect the “To Blue” button of the *Yellow* scene to an action in the *YellowViewController*
  - The return action to the *Blue* scene

```
@IBAction func switchToBlue(sender: UIBarButtonItem) {
    dismissViewControllerAnimated(true, completion: nil)
}
```

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## Dismiss View Controllers

- Connect the “To Blue” and “To Yellow” buttons of the *Green* scene to actions in the *GreenViewController*
  - The return actions to the *Yellow* scene and the *Blue* scene

```
@IBAction func switchToBlue(sender: UIBarButtonItem) {
    var top: UIViewController = self;
    while top.presentingViewController != nil {
        top = top.presentingViewController!;
    }
    top.dismissViewControllerAnimated(true, completion: nil)
}

@IBAction func switchToYellow(sender: UIBarButtonItem) {
    dismissViewControllerAnimated(true, completion: nil)
}
```

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## Run ...

- To *Yellow*
- To *Green*
- And back

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## Passing Data Through Segues

- Use the method in the *presenting* view controller, i.e., the *source*

```
func prepareForSegue(segue: UIStoryboardSegue,
                    sender: AnyObject?)
```
- Invoked before the segue is performed
- The *destination* view controller can be accessed as `segue.destinationViewController`
- The presenting view controller can put data directly in the destination view controller

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## Connecting Outlets

- For each view controller
  - Connect outlets to the message label and the text field
  - Connect an action to the “Did End on Exit” of the text field to dismiss keyboard

```
class BlueViewController: UIViewController {
    @IBOutlet weak var label: UILabel!
    @IBOutlet weak var textField: UITextField!
    @IBAction func doneEditing(sender: UITextField) {
        sender.resignFirstResponder()
    }
    ...
}
```

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## Prepare for Segue

- Define the method `prepareForSegue` in the `BlueViewController`
- To prepare for the segue from the `Blue` scene to the `Yellow` scene

```
override func prepareForSegue(segue: UIStoryboardSegue,
                             sender: AnyObject?) {
    if let target = segue.destinationViewController as?
        YellowViewController {
        target.label.text = "From BlueViewController"
    }
}
```

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## Prepare for Segue

- Let's run the app
  - Press the “`To Yellow`” button
  - Crash!

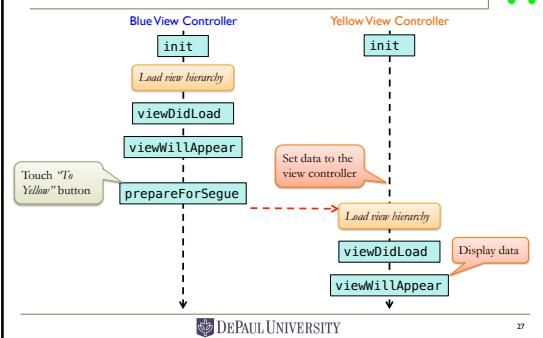
**fatal error: unexpectedly found nil while unwrapping an Optional value**

- Why?
  - The `Yellow` view controller has been initialized, but not its view hierarchy
  - The view hierarchy is initialize when the view becomes visible.
  - Important:** Access the view objects only from within the view controller associated with the view.

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## View Controllers and View Hierarchies



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## Passing Data

- Store data in the properties of view controllers**, not in view objects.
- For each view controller,
  - Add a property `message` for storing data
  - Implement the lifecycle callback `viewWillAppear`

```
class BlueViewController: UIViewController {
    @IBOutlet weak var label: UILabel!
    var message: String = "BlueViewController"
    override func viewWillAppear(animated: Bool) {
        label.text = message
    }
    ...
}
```

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## Prepare for Segue, 2nd Attempt

- Define the method `prepareForSegue` in the `BlueViewController`

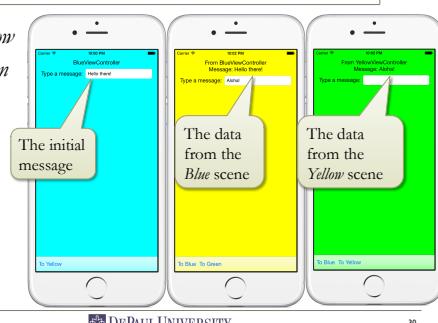
```
override func prepareForSegue(segue: UIStoryboardSegue,
                             sender: AnyObject?) {
    if let target = segue.destinationViewController as?
        YellowViewController {
        target.message = "From BlueViewController"
        if let text = textField.text {
            target.message += "\nMessage: \(text)"
        }
    }
}
```

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## Run ...

- `To Yellow`
- `To Green`



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## Passing Data in Return

- Revised dismiss action from the *Yellow* scene to the *Blue* scene
- The *presenting view controller*

```
@IBAction func switchToBlue(sender: UIBarButtonItem) {
    if let from = presentingViewController as?
        BlueViewController {
        from.message = "From YellowViewController"
        if let text = textField.text {
            from.message += "\nMessage: \(text)"
        }
        dismissViewControllerAnimated(true, completion: nil)
}
```

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## Passing Data in Return

- Revised dismiss actions of the *Green* scene
- The *presenting view controller*

```
@IBAction func switchToYellow(sender: UIBarButtonItem) {
    if let from = presentingViewController as?
        YellowViewController {
        from.message = "From GreenViewController"
        if let text = textField.text {
            from.message += "\nMessage: \(text)"
        }
        dismissViewControllerAnimated(true, completion: nil)
}
```

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## Passing Data in Return

```
@IBAction func switchToBlue(sender: UIBarButtonItem) {
    var top: UIViewController = self;
    while top.presentingViewController != nil {
        top = top.presentingViewController!
    }
    if let blue = top as? BlueViewController {
        blue.message = "From YellowViewController"
        if let text = textField.text {
            blue.message += "\nMessage: \(text)"
        }
        top.dismissViewControllerAnimated(true, completion: nil)
}
```

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## Run ...

- Return from *Green* to *Yellow*



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## Unwind Segues

## Unwind Segue

- You can *unwind* a segue, i.e., return to the previous scene, using an *unwind segue*
- You can also *unwind* to any previous scenes, one or more steps away
- How:
  - Define one or more *unwind actions*
    - In swift code, the destination of unwinding
  - Add *unwind segues*
    - In storyboard

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## Unwind Action & Unwind Segue

- Add an *unwind action* in the destination view controller, i.e., the view controller you want to unwind to
  - Unwind action is a method with the following signature:  
`@IBAction func name(segue : UIStoryboardSegue)`
  - The *name* must be unique within the context of application.
- Add an *unwind segue*
  - Control-drag from the trigger button to the *Exit* icon of the source view controller
  - Select the name of the unwind action

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## Unwind Action

- Define an unwind action in the *BlueViewController*

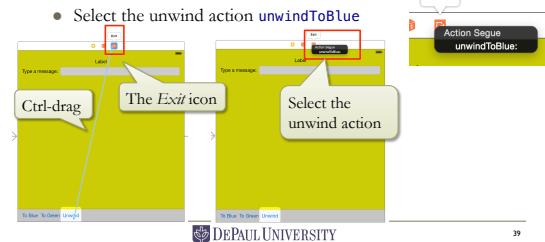
```
@IBAction func unwindToBlue(segue : UIStoryboardSegue) {
    if let from = segue.sourceViewController as?
        YellowViewController {
        message = "Unwind from YellowViewController"
        if !from.textField.text.isEmpty {
            message += "\nMessage: \(from.textField.text)"
        }
    }
}
```

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## Add an Unwind Segue

- In storyboard, add an unwind segue in the *YellowViewController*, from the “Unwind” button to the *Exit* icon
- Select the unwind action *unwindToBlue*

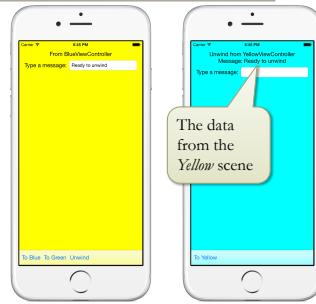


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## Run ...

- Unwind from *Yellow* to *Blue*



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## Sample Code

- TwoViews.zip
- Segues.zip

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## Next ...

- Tabbed views
- Pickers
- Table views, static and dynamic
- Navigation views

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