



Stanford CS193p

Developing Applications for iOS
Fall 2017-18



CS193p
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Today

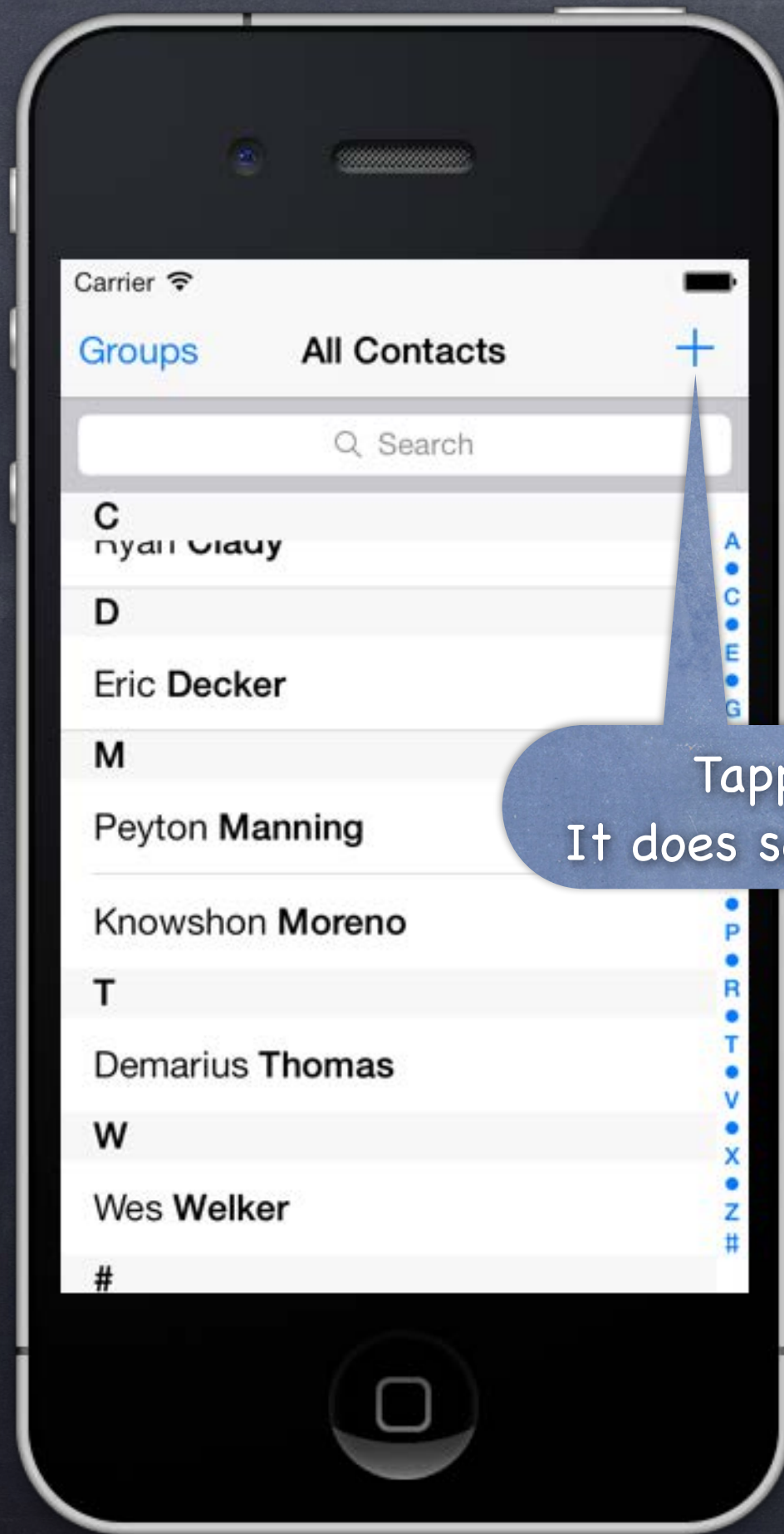
- Segues
 - Modal
 - Popover
 - Unwind
 - Embed



Modal View Controllers

- A way of segueing that takes over the screen
Should be used with care.
- Example
Contacts application.

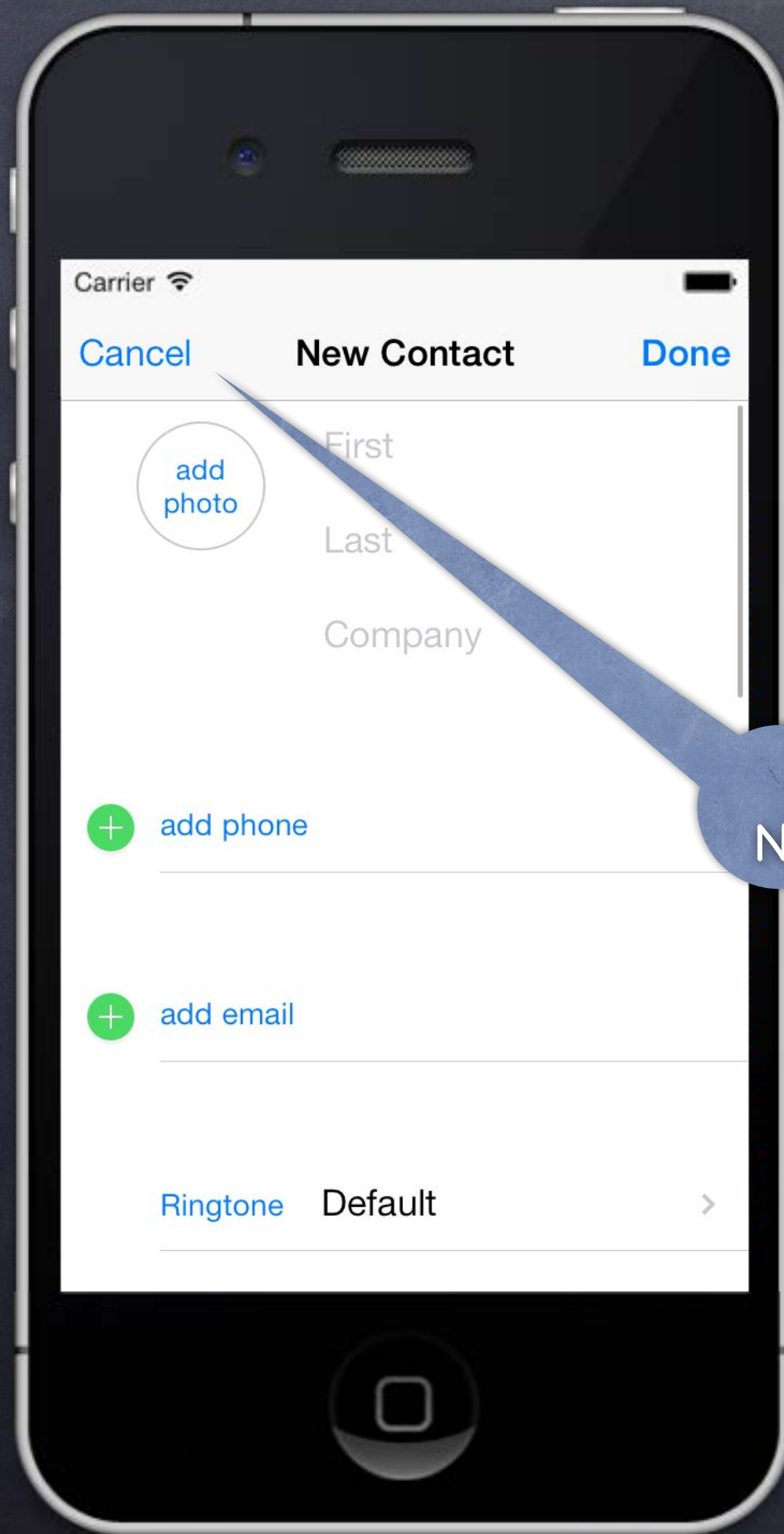
Tapping here adds a new contact.
It does so by taking over the entire screen.



Modal View Controllers

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Contacts application.

This is not a push.
Notice, no back button (only Cancel).



Modal View Controllers

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Contacts application.

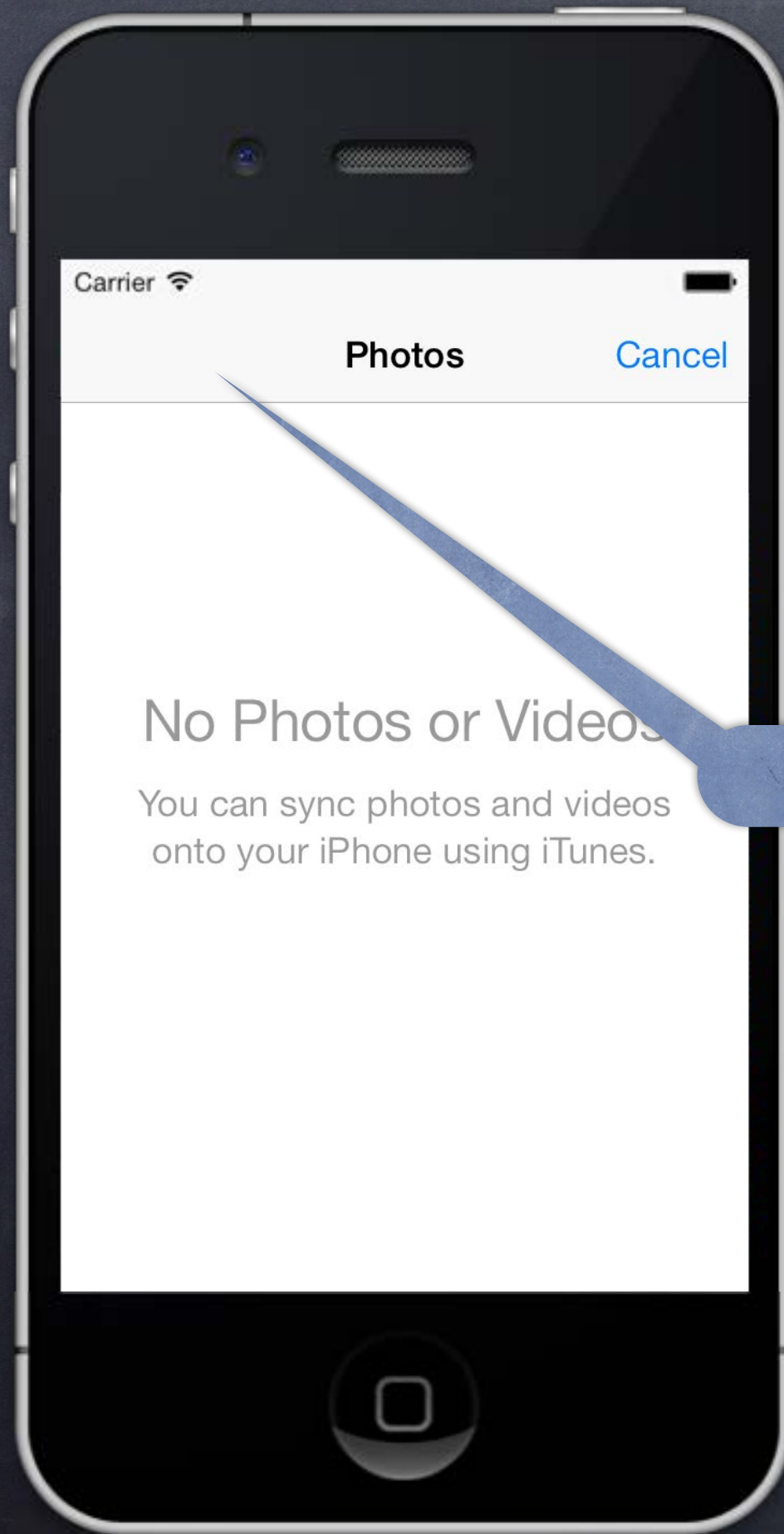


Tapping here adds a photo to this contact.
It also does so by taking over the entire screen.



Modal View Controllers

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Contacts application.



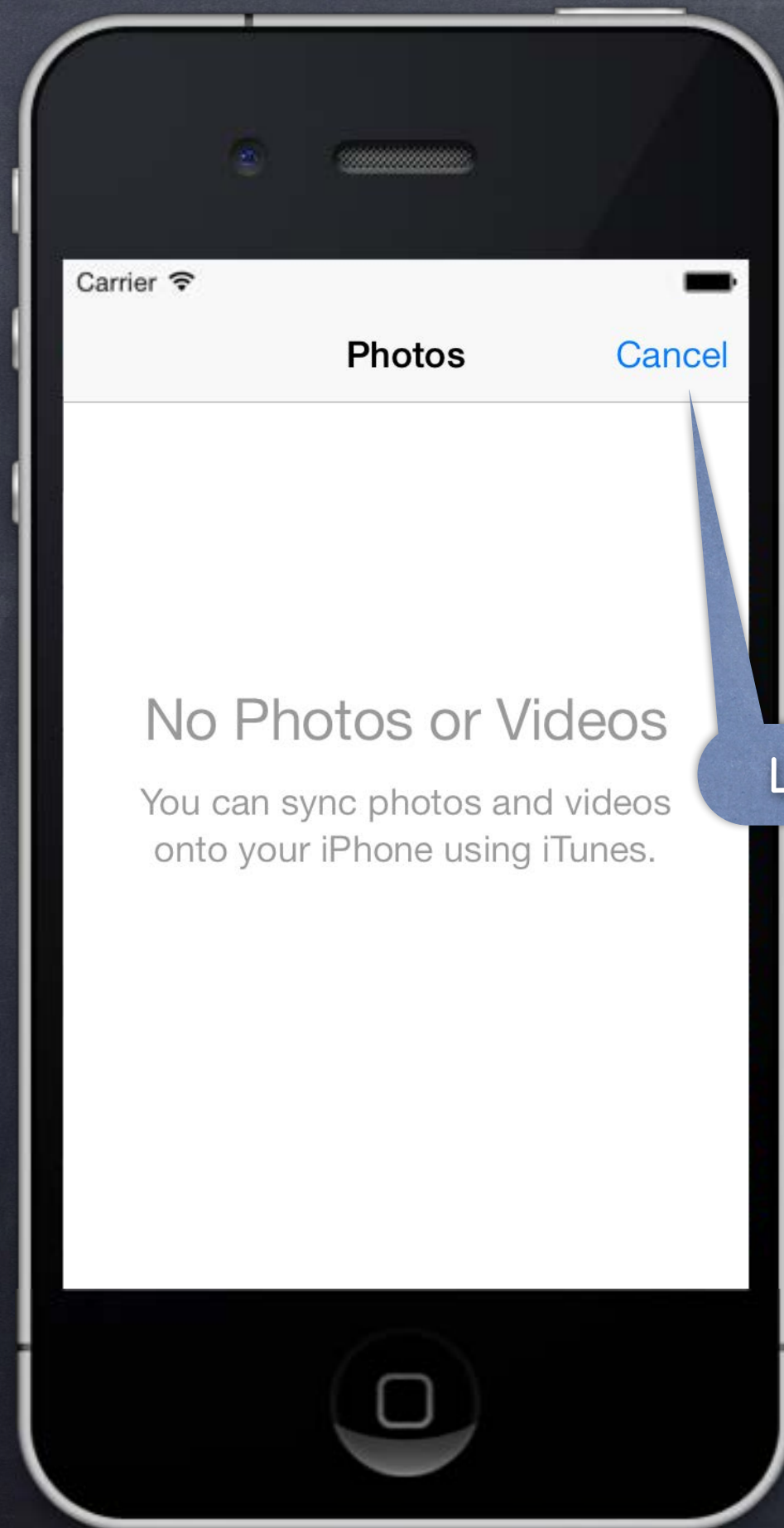
Again, no back button.



Modal View Controllers

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Contacts application.

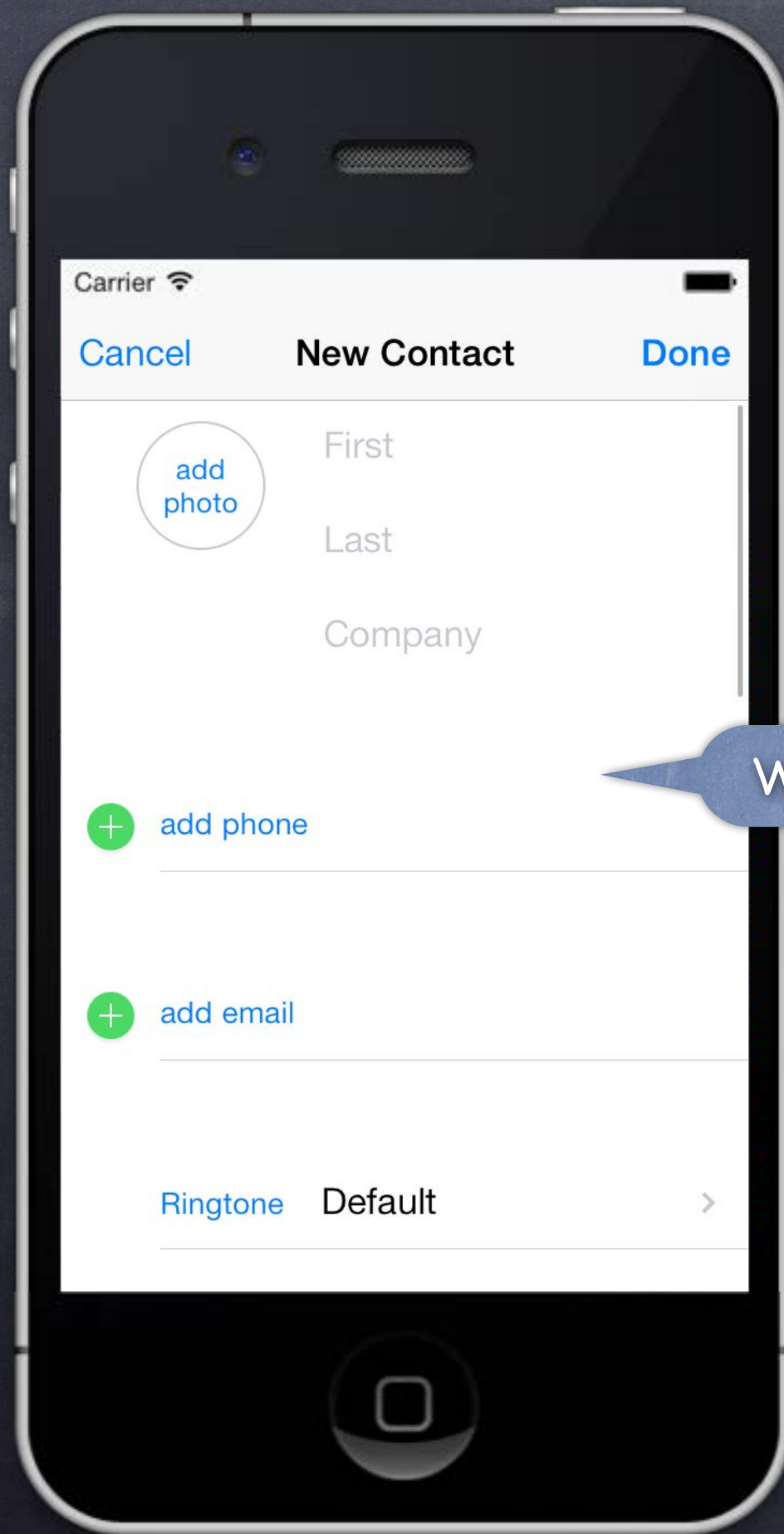
Let's Cancel and see what happens.



Modal View Controllers

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Contacts application.

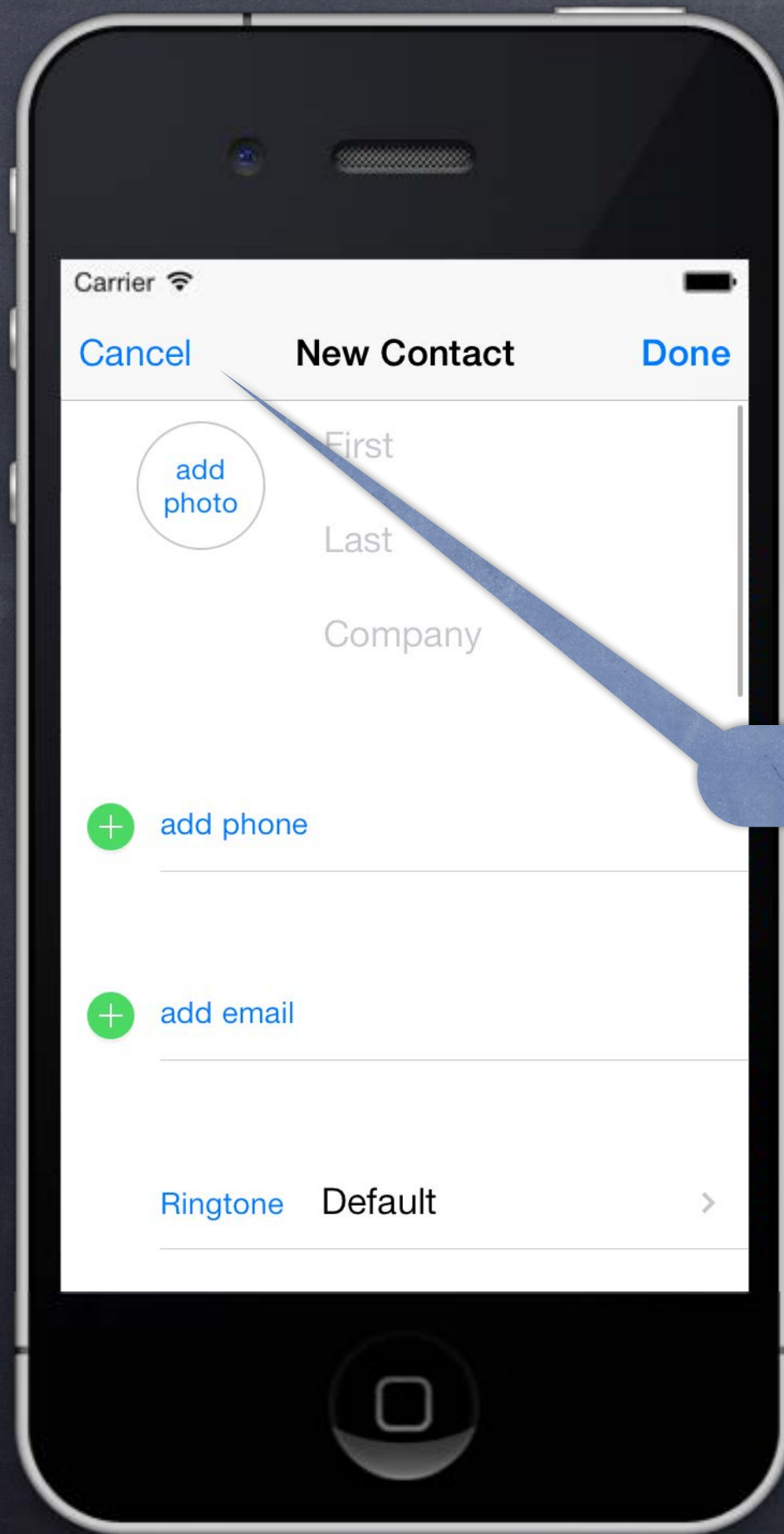
We're back to the last Modal View Controller.



Modal View Controllers

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- Example
Contacts application.

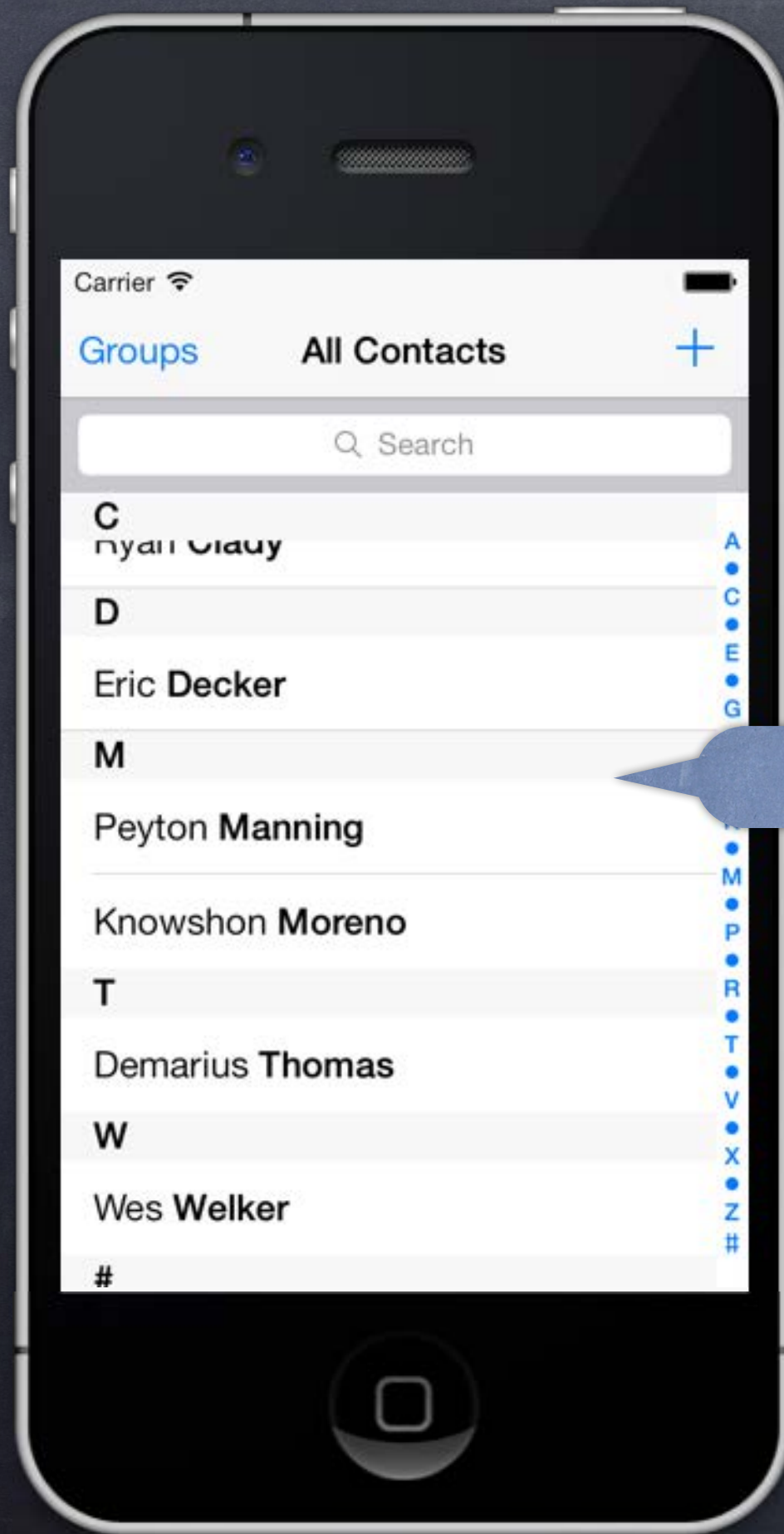
And Cancel again ...



Modal View Controllers

- A way of segueing that takes over the screen
Should be used with care.
- Example
Contacts application.

Back to where we started.



Modal View Controllers

• Considerations

The view controller we segue to using a Modal segue will take over the entire screen
This can be rather disconcerting to the user, so use this carefully

• How do we set a Modal segue up?

Just ctrl-drag from a button to another View Controller & pick segue type "Modal"

If you need to present a Modal VC not from a button, use a manual segue ...

```
func performSegue(withIdentifier: String, sender: Any?)
```

... or, if you have the view controller itself (e.g. Alerts or from instantiateViewController) ...

```
func present(UIViewController, animated: Bool, completion: (() -> Void)? = nil)
```



Modal View Controllers

• Preparing for a Modal segue

You prepare for a Modal segue just like any other segue ...

```
func prepare(for: UIStoryboardSegue, sender: Any?) {  
    if segue.identifier == "GoToMyModalVC" {  
        let vc = segue.destination as MyModalVC  
        // set up the vc to run here  
    }  
}
```

• Hearing back from a Modally segued-to View Controller

When the Modal View Controller is "done", how does it communicate results back to presenter?

If there's nothing to be said, just dismiss the segued-to MVC (next slide).

To communicate results, generally you would Unwind (more on that in a moment).



Modal View Controllers

• How to dismiss a view controller

The presenting view controller is responsible for dismissing (not the presented).

You do this by sending the presenting view controller this message ...

```
func dismiss(animated: Bool, completion: (() -> Void)? = nil)
```

... which will dismiss whatever MVC it has presented (if any).

You can get at your presenting view controller with this `UIViewController` property ...

```
var presentingViewController: UIViewController?
```

If you send this to a presented view controller, for convenience, it will forward to its presenter (unless it itself has presented an MVC, in which case it will dismiss that MVC).

But to reduce confusion in your code, only send `dismiss` to the presenting controller.

Unwind Segues (coming up soon) automatically dismiss (you needn't call the above method).



Modal View Controllers

Controlling the appearance of the presented view controller

In horizontally regular environments, this var determines what a presented VC looks like ...

```
var modalPresentationStyle: UIModalPresentationStyle
```

In addition to the default, `.fullScreen`, there's `.overFullScreen` (presenter visible behind)

On iPad, if full screen is "too much real estate", there's `.formSheet` and `.pageSheet`

(these two use a smaller space and with a "grayed out" presenting view controller behind)

In horizontally compact environments, these will all adapt to always be full screen!

How is the modal view controller animated onto the screen?

Depends on this property in the view controller that is being presented ...

```
var modalTransitionStyle: UIModalTransitionStyle
```

```
.coverVertical // slides the presented modal VC up from bottom of screen (the default)
```

```
.flipHorizontal // flips the presenting view controller over to show the presented modal VC
```

```
.crossDissolve // presenting VC fades out as the presented VC fades in
```

```
.partialCurl // only if presenting VC is full screen (& no more modal presentations coming)
```

The presentation & transition styles can be set in the storyboard by inspecting the segue.



Demo

• Modal Segue

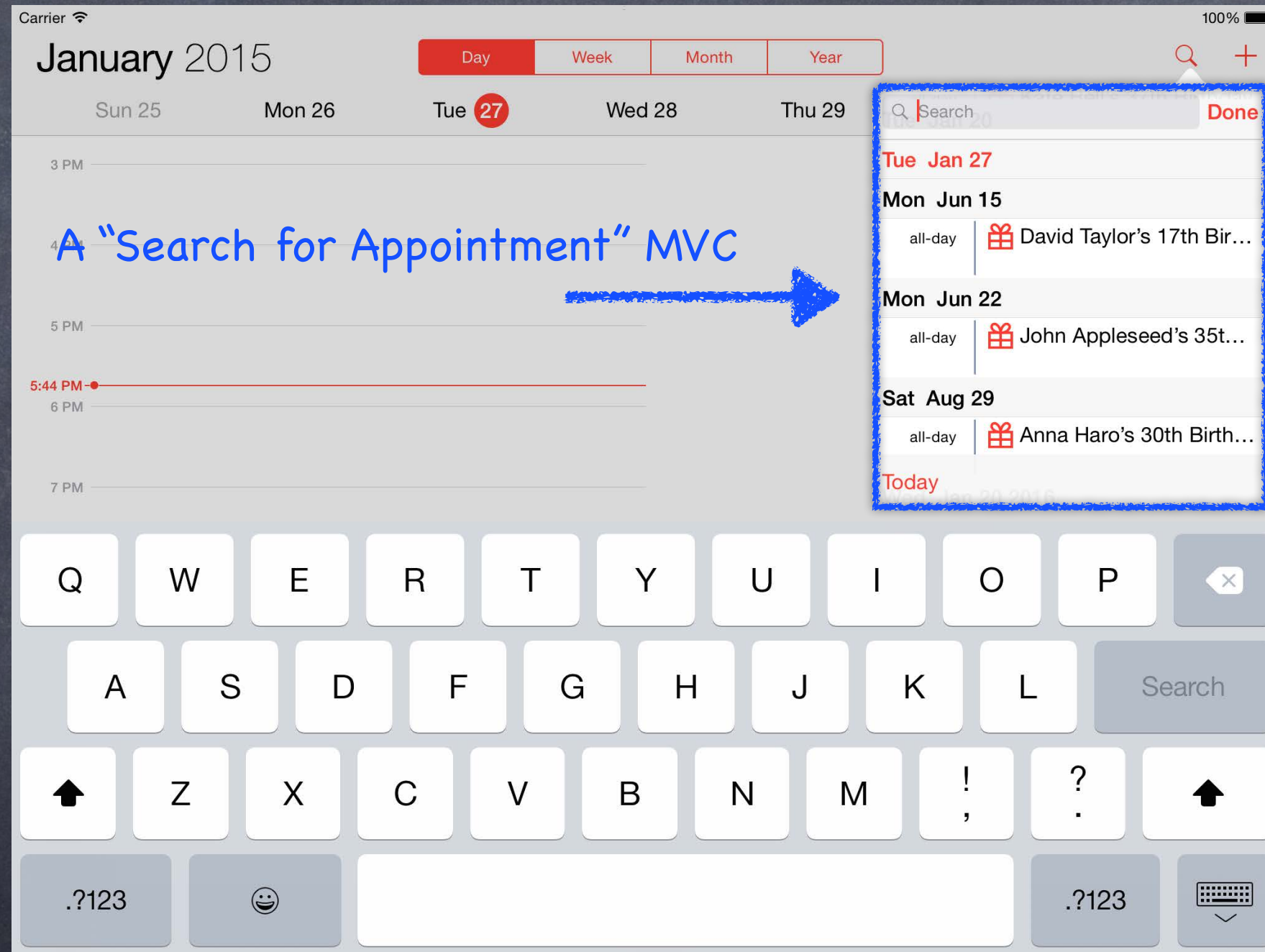
Let's add an Inspector to our EmojiArt app.

It will display the size and created date of the EmojiArt document.



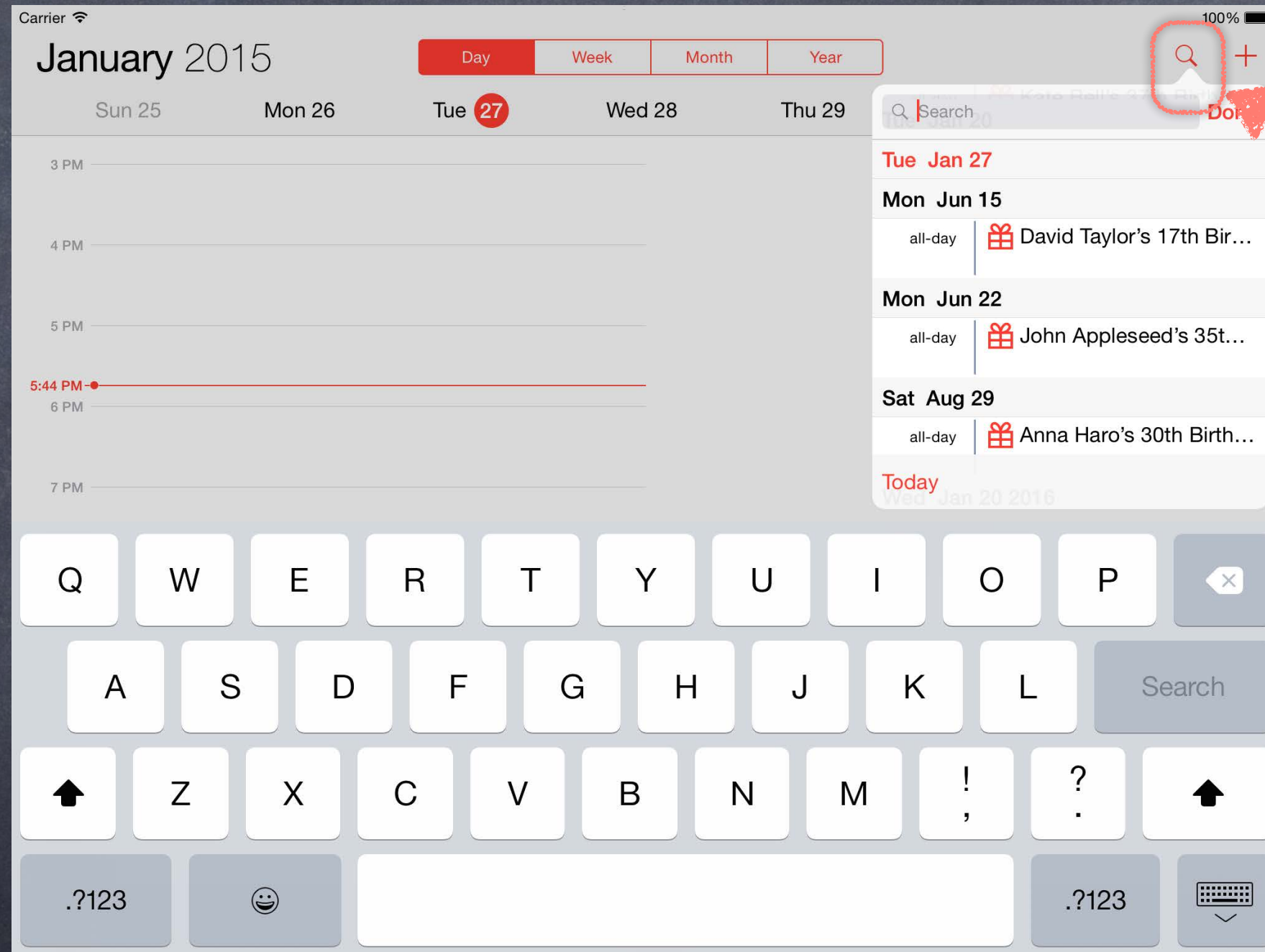
Popover

- Popovers pop an entire MVC over the rest of the screen



Popover

- Popovers pop an entire MVC over the rest of the screen

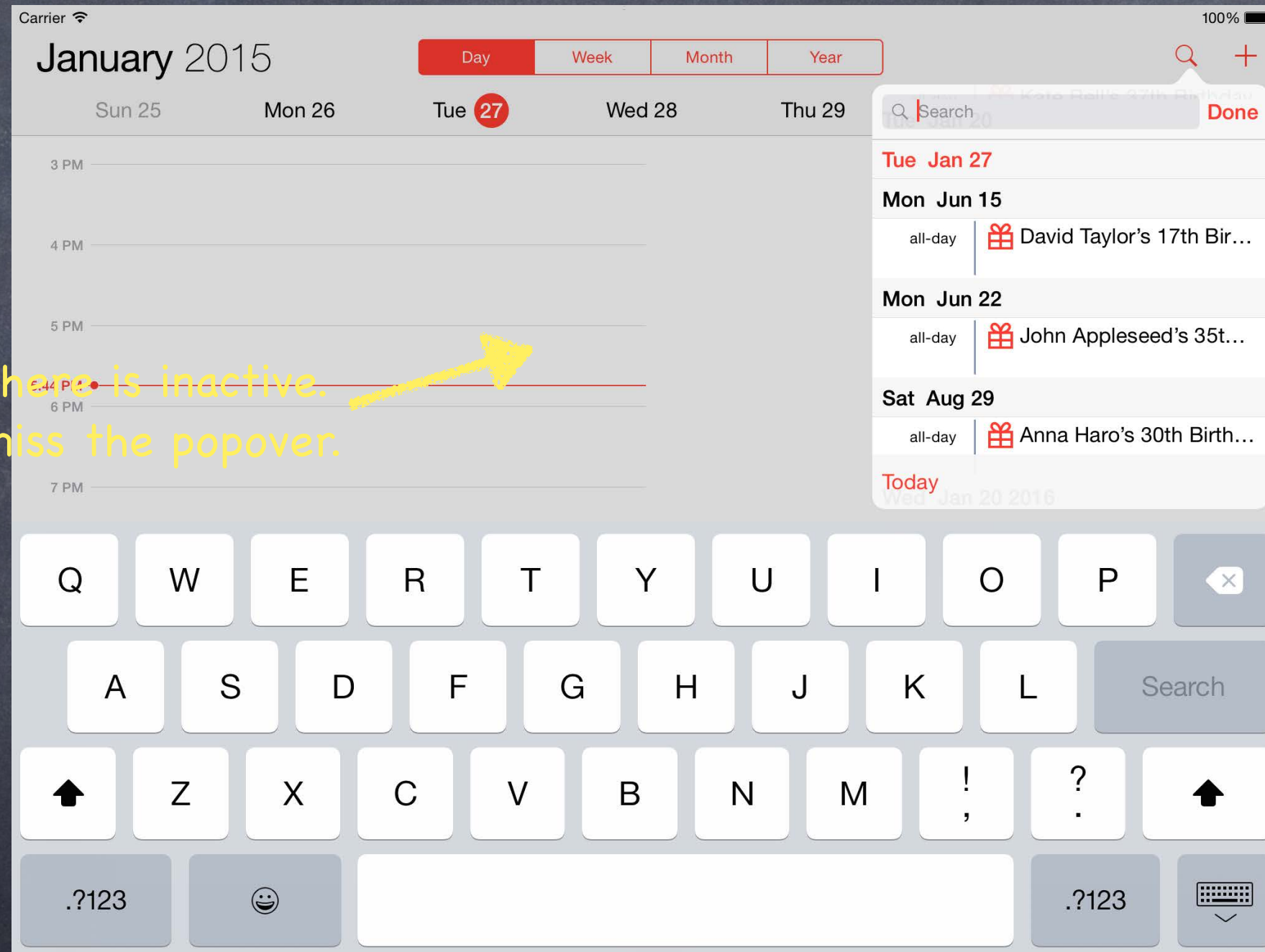


Popover's arrow pointing to what caused it to appear



Popover

- Popovers pop an entire MVC over the rest of the screen



The grayed out area here is inactive.
Touching in it will dismiss the popover.



Popover

- A popover is almost exactly the same as a Modal segue

You still ctrl-drag, you still have an identifier, you still get to prepare

It just looks a little different (but it's still "modal" in that you can't do anything else)

- Things to note when preparing for a popover segue

All segues are managed via a UIPresentationController (but we're not going to cover that)

But we are going to talk about a popover's UIPopoverPresentationController

It notes what caused the popover to appear (a bar button item or just a rectangle in a view)

You can also control what direction the popover's arrow is allowed to point

Or you can control how a popover adapts to different sizes classes (e.g. iPad vs iPhone)



Popover Prepare

- Here's a prepare(for segue:) that prepares for a Popover segue

```
func prepare(for segue: UIStoryboardSegue, sender: Any?) {
    if let identifier = segue.identifier {
        switch identifier {
            case "Do Something in a Popover Segue":
                if let vc = segue.destination as? MyController {
                    if let ppc = vc.popoverPresentationController {
                        ppc.permittedArrowDirections = UIPopoverArrowDirection.any
                        ppc.delegate = self
                    }
                    // more preparation here
                }
            default: break
        }
    }
}
```

One thing that is different is that we are retrieving the popover's presentation controller



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}
```

We can use it to set some properties that will control how the popover pops up



Popover Prepare

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                        ppc.delegate = self
                    }
                    // more preparation here
                }
            default: break
        }
    }
}
```

And we can control the presentation by setting ourself (the Controller) as the delegate



Popover Presentation Controller

• Adaptation to different size classes

One very interesting thing is how a popover presentation can “adapt” to different size classes. When a popover is presenting itself in a horizontally compact environment (e.g. iPhone), there might not be enough room to show a popover window comfortably, so by default it “adapts” and shows the MVC in full screen modal instead.

But the popover presentation controller’s delegate can control this “adaptation” behavior. Either by preventing it entirely ...

```
func adaptivePresentationStyle(
    for controller: UIPresentationController,
    traitCollection: UITraitCollection
) -> UIModalPresentationStyle {
    return UIModalPresentationStyle.none // don't adapt
    // the default in horizontally compact environments (iPhone) is .fullScreen
}
```



Popover Presentation Controller

• Adaptation to different size classes

One very interesting thing is how a popover presentation can “adapt” to different size classes. When a popover is presenting itself in a horizontally compact environment (e.g. iPhone), there might not be enough room to show a popover window comfortably, so by default it “adapts” and shows the MVC in full screen modal instead.

But the popover presentation controller’s delegate can control this “adaptation” behavior. ... or by modifying the adaptation ...

You can control the view controller that is used to present in the adapted environment

Best example: wrapping a UINavigationController around the MVC that is presented

```
func presentationController(controller: UIPresentationController,  
    viewControllerForAdaptivePresentationStyle: UIModalPresentationStyle)  
    -> UIViewController?  
{  
  
    // return a UIViewController to use (e.g. wrap a Navigation Controller around your MVC)  
}
```



Popover Size

● Important Popover Issue: Size

A popover will be made pretty large unless someone tells it otherwise.

The MVC being presented knows best what its “preferred” size inside a popover would be.

It expresses that via this property in itself (i.e. in the Controller of the MVC being presented) ...

```
var preferredContentSize: CGSize
```

The MVC is not guaranteed to be that size, but the system will try its best.

You can set or override the var to always return an appropriate size.



Demo

- Popover Segue

Let's put our inspector into a popover.



Unwind Segue

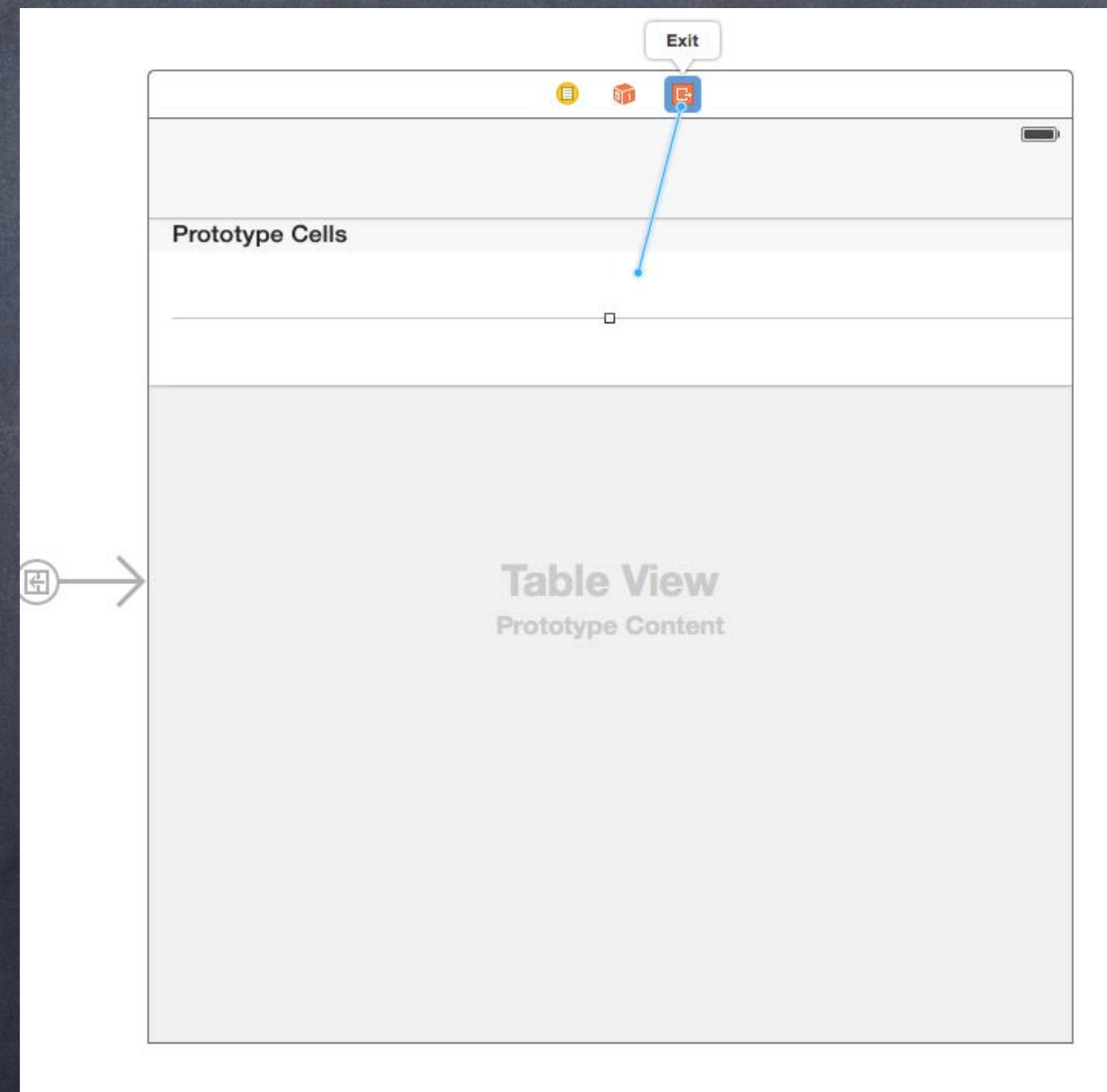
- The only segue that does NOT create a new MVC
 - It can only segue to other MVCs that (directly or indirectly) presented the current MVC
- What's it good for?
 - Jumping up the stack of cards in a navigation controller (other cards are considered presenters)
 - Dismissing a Modally segued-to MVC while reporting information back to the presenter



Unwind Segue

- How does it work?

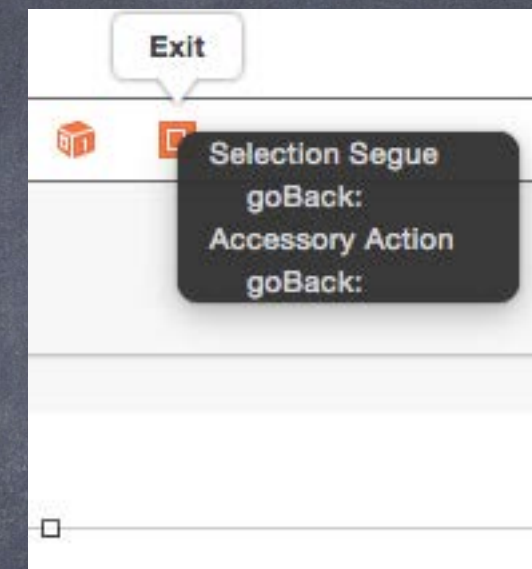
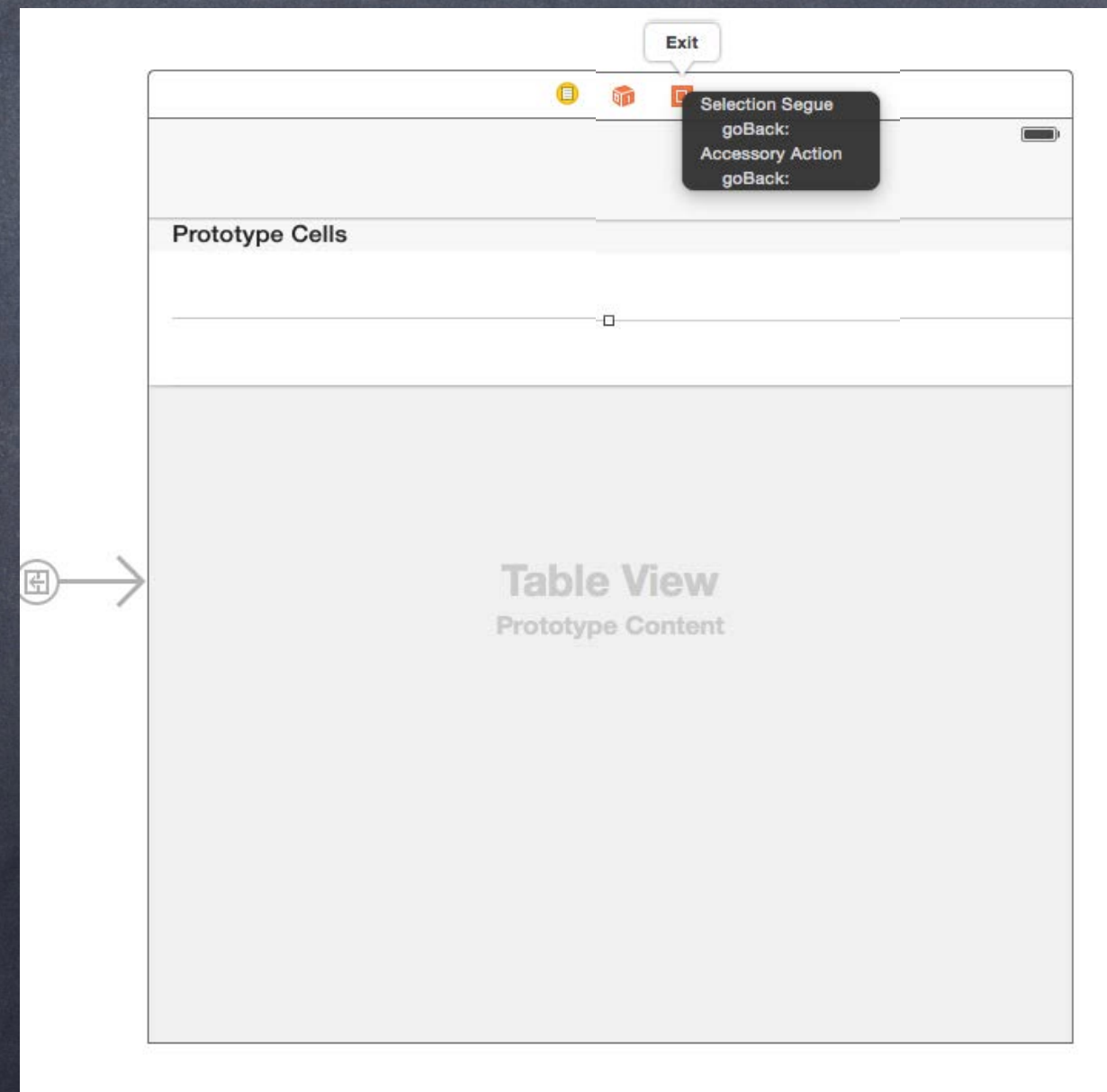
Instead of ctrl-dragging to another MVC, you ctrl-drag to the "Exit" button in the same MVC



Unwind Segue

How does it work?

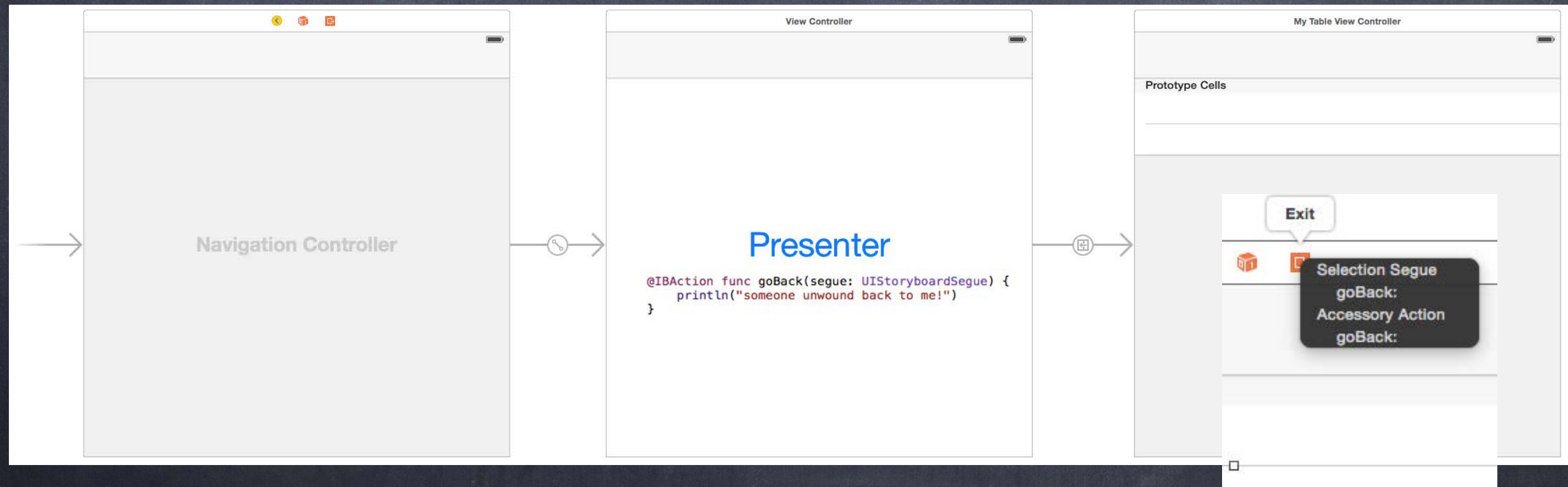
Instead of ctrl-dragging to another MVC, you ctrl-drag to the "Exit" button in the same MVC
Then you can choose a special @IBAction method you've created in another MVC



Unwind Segue

How does it work?

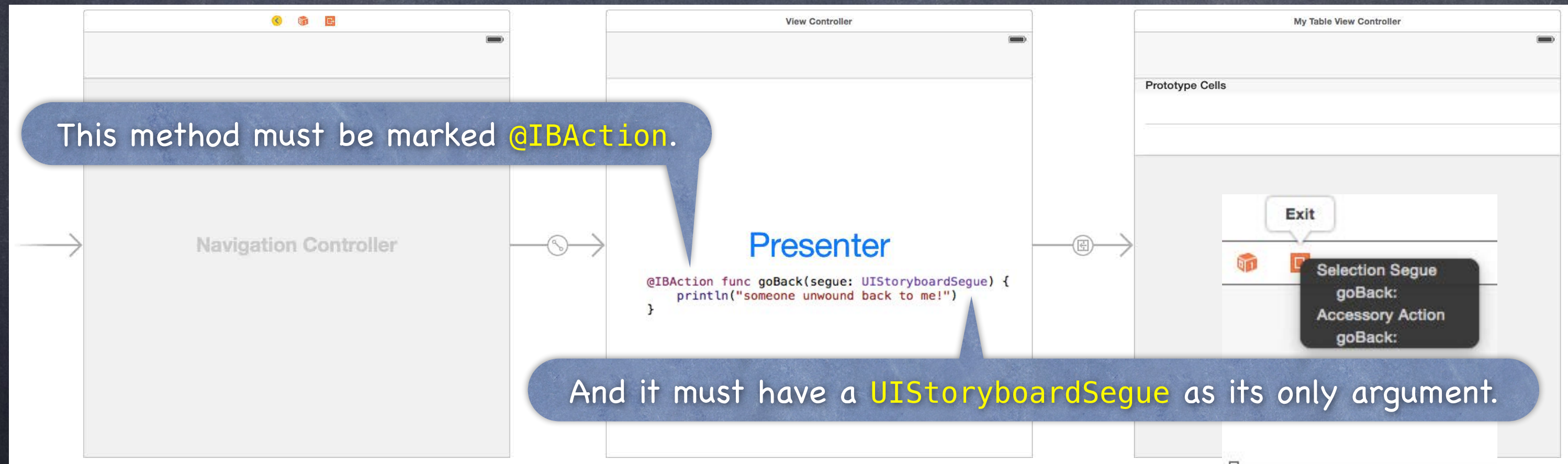
Instead of ctrl-dragging to another MVC, you ctrl-drag to the "Exit" button in the same MVC
Then you can choose a special @IBAction method you've created in another MVC
This means "segue by exiting me and finding a presenter who implements that method"
If no presenter (directly or indirectly) implements that method, the segue will not happen



Unwind Segue

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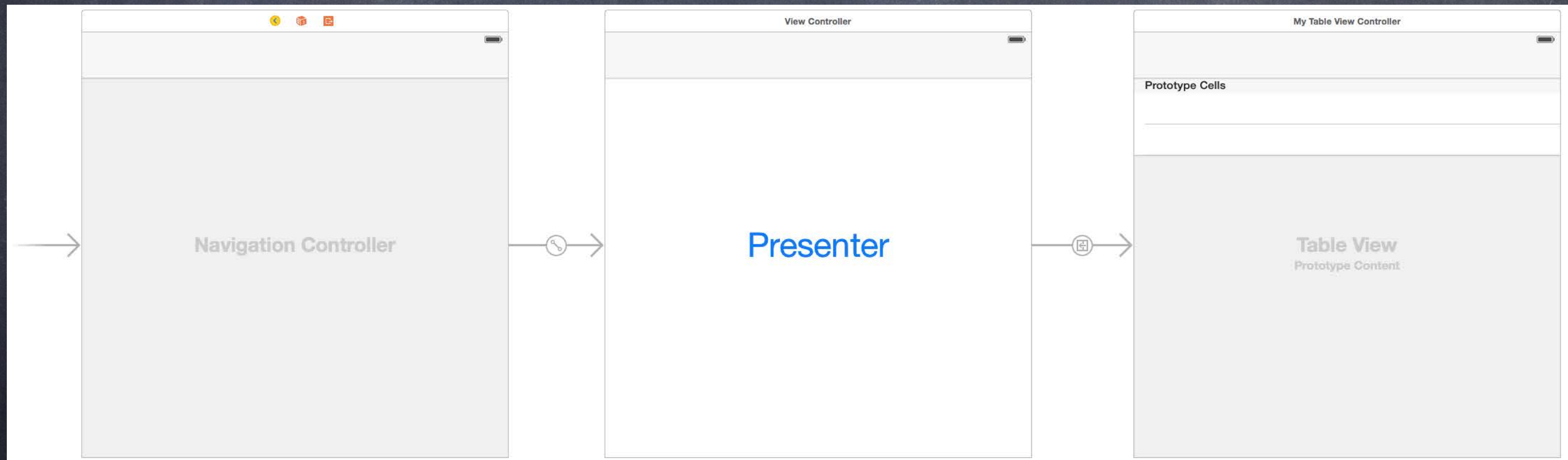


Unwind Segue

How does it work?

If the @IBAction can be found, you (i.e. the presented MVC) will get to **prepare** as normal

```
override func prepare(for segue: UIStoryboardSegue, sender: Any?) {  
    if segue.identifier == "GoBack Unwind Segue" {  
        unwoundToMVC = segue.destination as? MyPresentingMVC  
        unwoundToMVC?.publicAPI = infoToCommunicateBack  
    }  
}
```

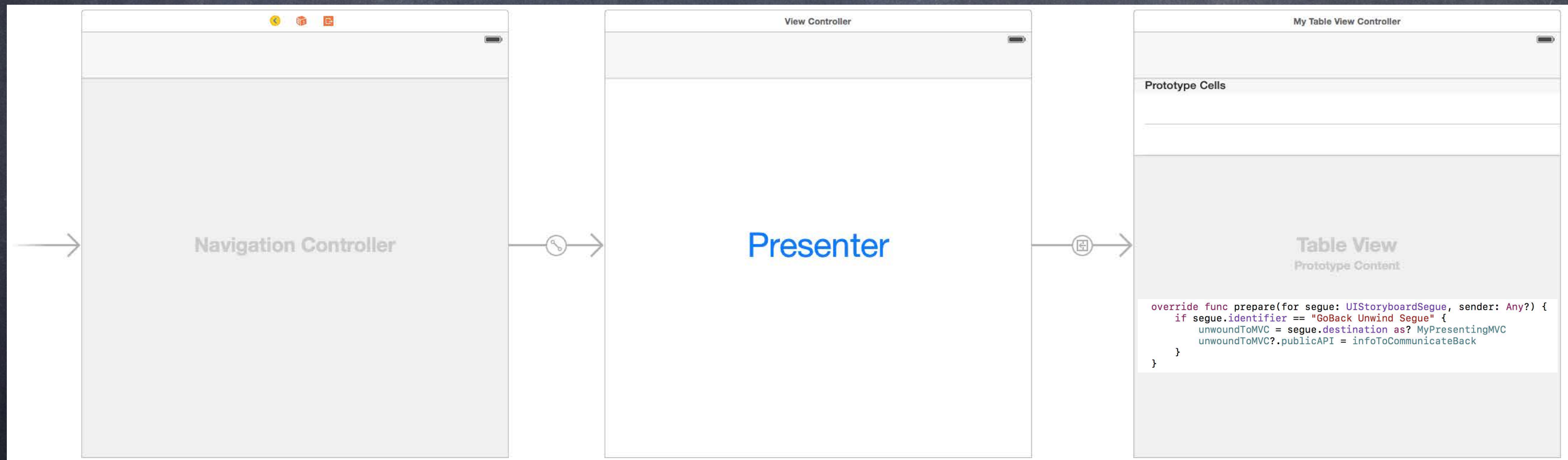


Unwind Segue

How does it work?

If the @IBAction can be found, you (i.e. the presented MVC) will get to **prepare** as normal
Then the special @IBAction will be called in the other MVC and that MVC will be shown on screen

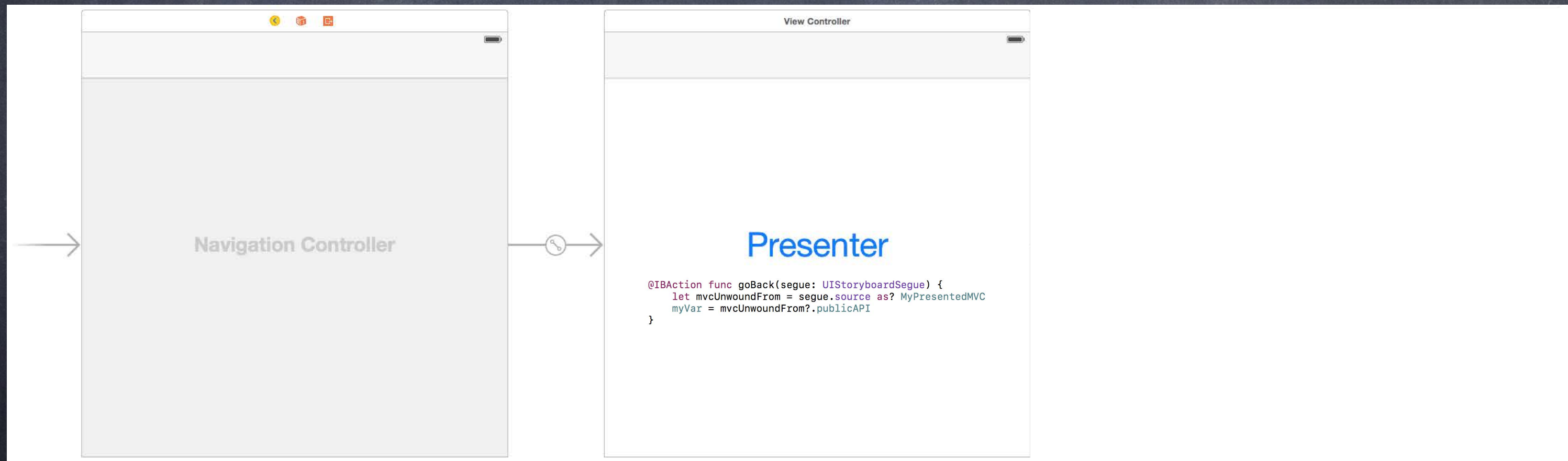
```
@IBAction func goBack(segue: UIStoryboardSegue) {  
    let mvcUnwoundFrom = segue.source as? MyPresentedMVC  
    myVar = mvcUnwoundFrom?.publicAPI  
}
```



Unwind Segue

👁️ How does it work?

If the @IBAction can be found, you (i.e. the presented MVC) will get to **prepare** as normal
Then the special @IBAction will be called in the other MVC and that MVC will be shown on screen
You will be dismissed in the process (i.e. you'll be "unpresented" and thrown away)



Demo

- Unwind Segue

We're going to add a "Close Document" button to our inspector.



Embed Segue

- Putting a VC's `self.view` in another VC's view hierarchy!

This can be a very powerful encapsulation technique.

- Xcode makes this easy

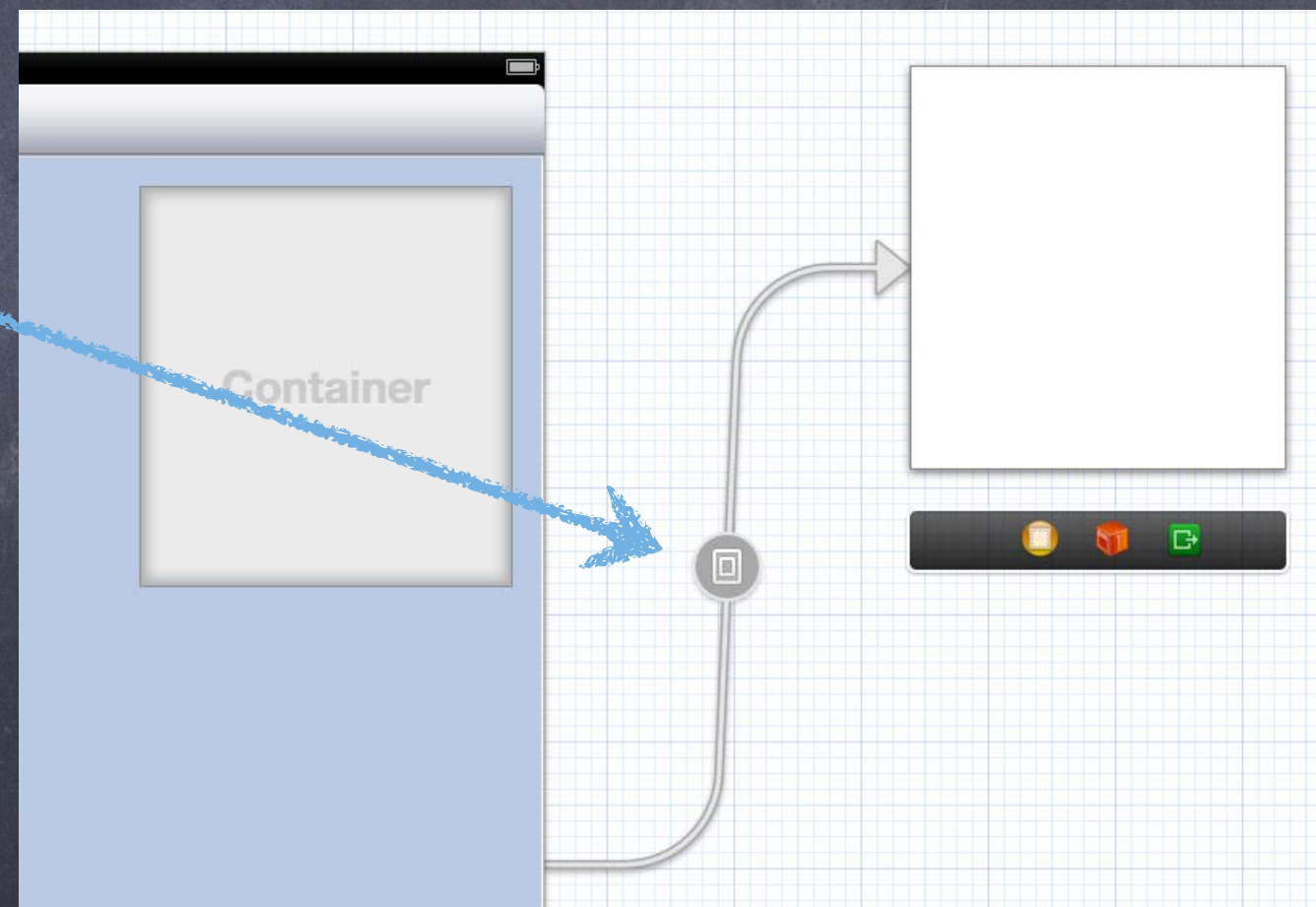
Drag out a **Container View** from the object palette into the scene you want to embed it in.

Automatically sets up an "Embed Segue" from container VC to the contained VC.

- Embed Segue

Works just like other segues.

`prepare(for segue:, sender:), et. al.`



Embed Segue

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- Embed Segue

Works just like other segues.

`prepare(for segue:, sender:), et. al.`

- View Loading Timing

Don't forget, though, that just like other segued-to VCs,

the embedded VC's outlets are not set at the time `prepare(for segue:, sender:)` is called.

So often we will just grab a pointer to the embedded VC in `prepare`.



Demo Code

Download the [demo code](#) from today's lecture.

