

Interface Builder Core Concepts

Session 405

Kelly Keenan

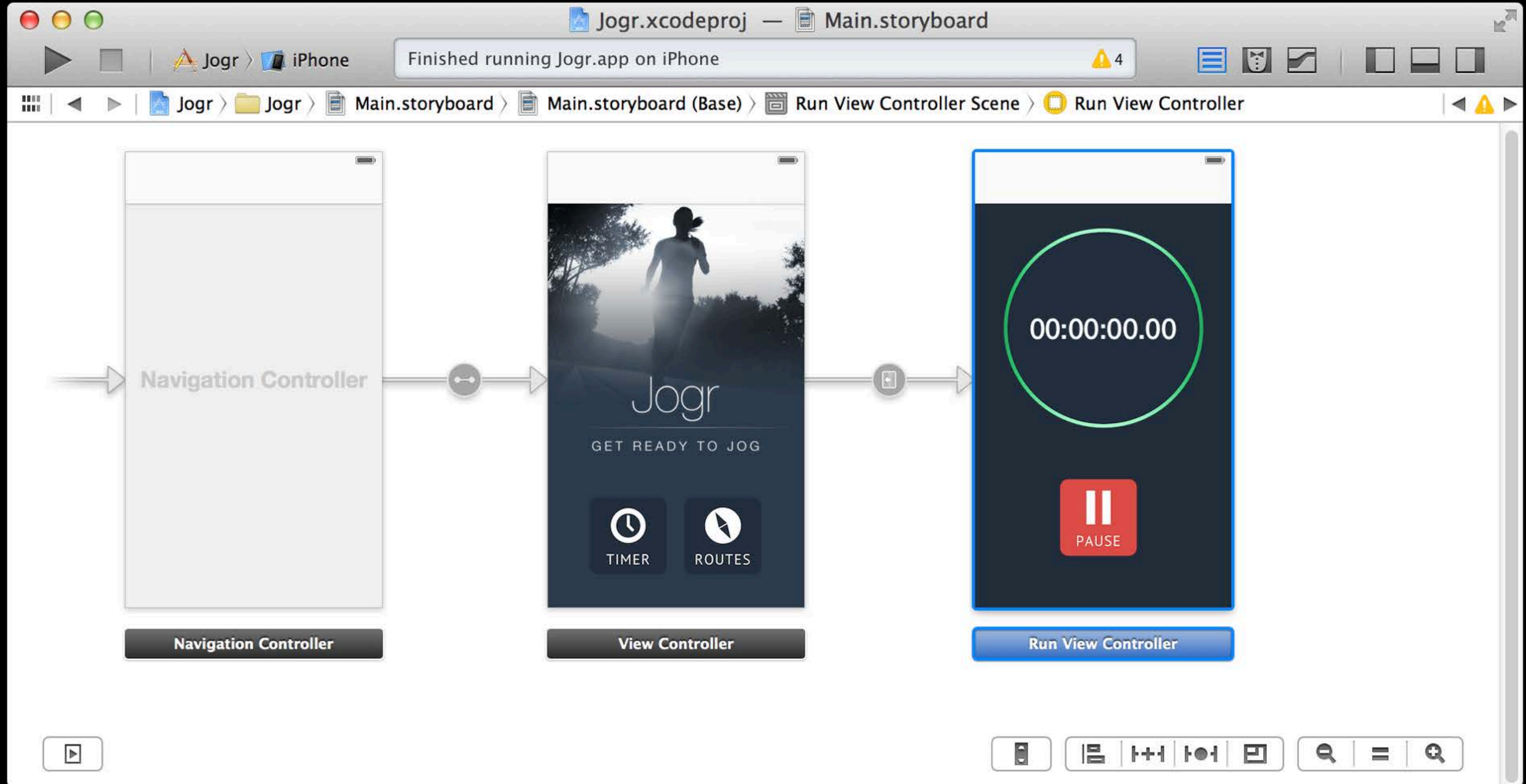
Engineer

These are confidential sessions—please refrain from streaming, blogging, or taking pictures

Introduction



Introduction



“We build interfaces by dragging and dropping controls and views, configuring properties, and making connections.”

```
float insetFromEdge = 10.0;
float sizeAdjustment = insetFromEdge * 2;
UIImage * buttonImage = [UIImage imageNamed:@"info.png"];
CGRect buttonFrame = CGRectMake(applicationFrame.size.width-40,
applicationFrame.size.height-40, buttonImage.size.width +
sizeAdjustment, buttonImage.size.height + sizeAdjustment);

UIButton * infoButton = [[UIButton alloc] initWithFrame:buttonFrame];
infoButton.contentEdgeInsets = UIEdgeInsetsMake(insetFromEdge,
insetFromEdge, insetFromEdge, insetFromEdge);
infoButton.contentVerticalAlignment =
UIControlContentVerticalAlignmentCenter;
infoButton.contentHorizontalAlignment =
UIControlContentHorizontalAlignmentCenter;

[infoButton setImage:buttonImage forState:UIControlStateNormal];
infoButton.adjustsImageWhenHighlighted = YES;

[infoButton addTarget:self action:@selector(toggleView:)
forControlEvents:UIControlEventTouchUpInside];

[mainView addSubview:infoButton];
[infoButton release];
```

```
float insetFromEdge = 10.0;
float sizeAdjustment = insetFromEdge * 2;
UIImage * buttonImage = [UIImage imageNamed:@"info.png"];
CGRect buttonFrame = CGRectMake(applicationFrame.size.width-40,
applicationFrame.size.height-40, buttonImage.size.width +
sizeAdjustment, buttonImage.size.height + sizeAdjustment);
```

Create Image

```
UIButton * infoButton = [[UIButton alloc] initWithFrame:buttonFrame];
infoButton.contentEdgeInsets = UIEdgeInsetsMake(insetFromEdge,
insetFromEdge, insetFromEdge, insetFromEdge);
infoButton.contentVerticalAlignment =
UIControlContentVerticalAlignmentCenter;
infoButton.contentHorizontalAlignment =
UIControlContentHorizontalAlignmentCenter;
```

Create Button

```
[infoButton setImage:buttonImage forState:UIControlStateNormal];
infoButton.adjustsImageWhenHighlighted = YES;
```

Add Image to Button

```
[infoButton addTarget:self action:@selector(toggleView:)
forControlEvents:UIControlEventTouchUpInside];
```

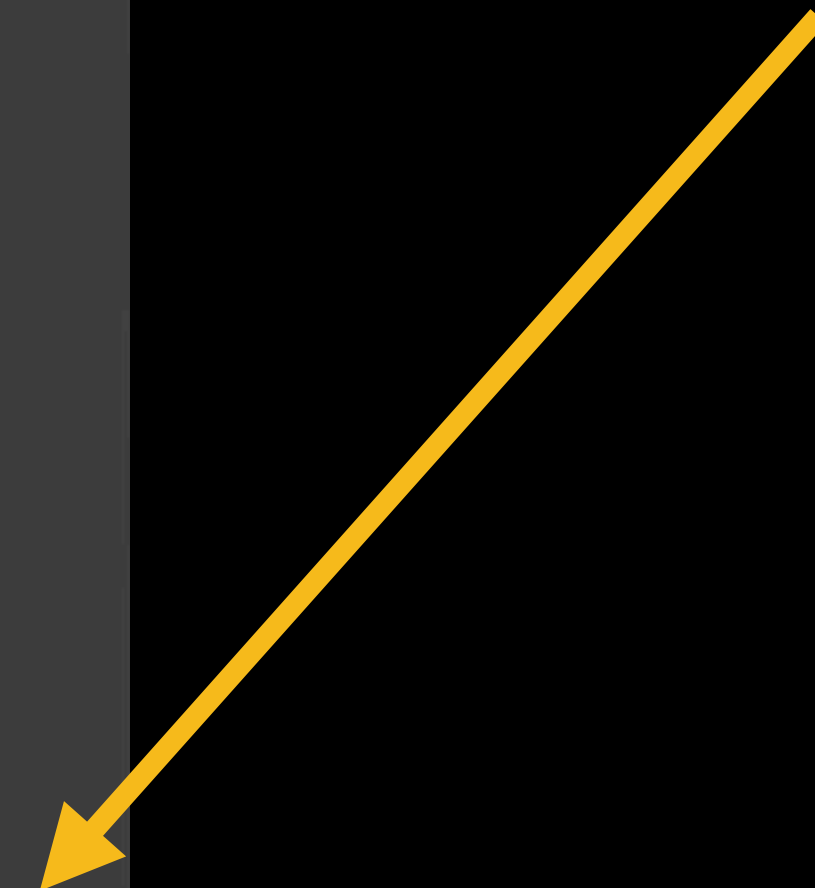
Set Button Target and Action

```
[mainView addSubview:infoButton];
[infoButton release];
```

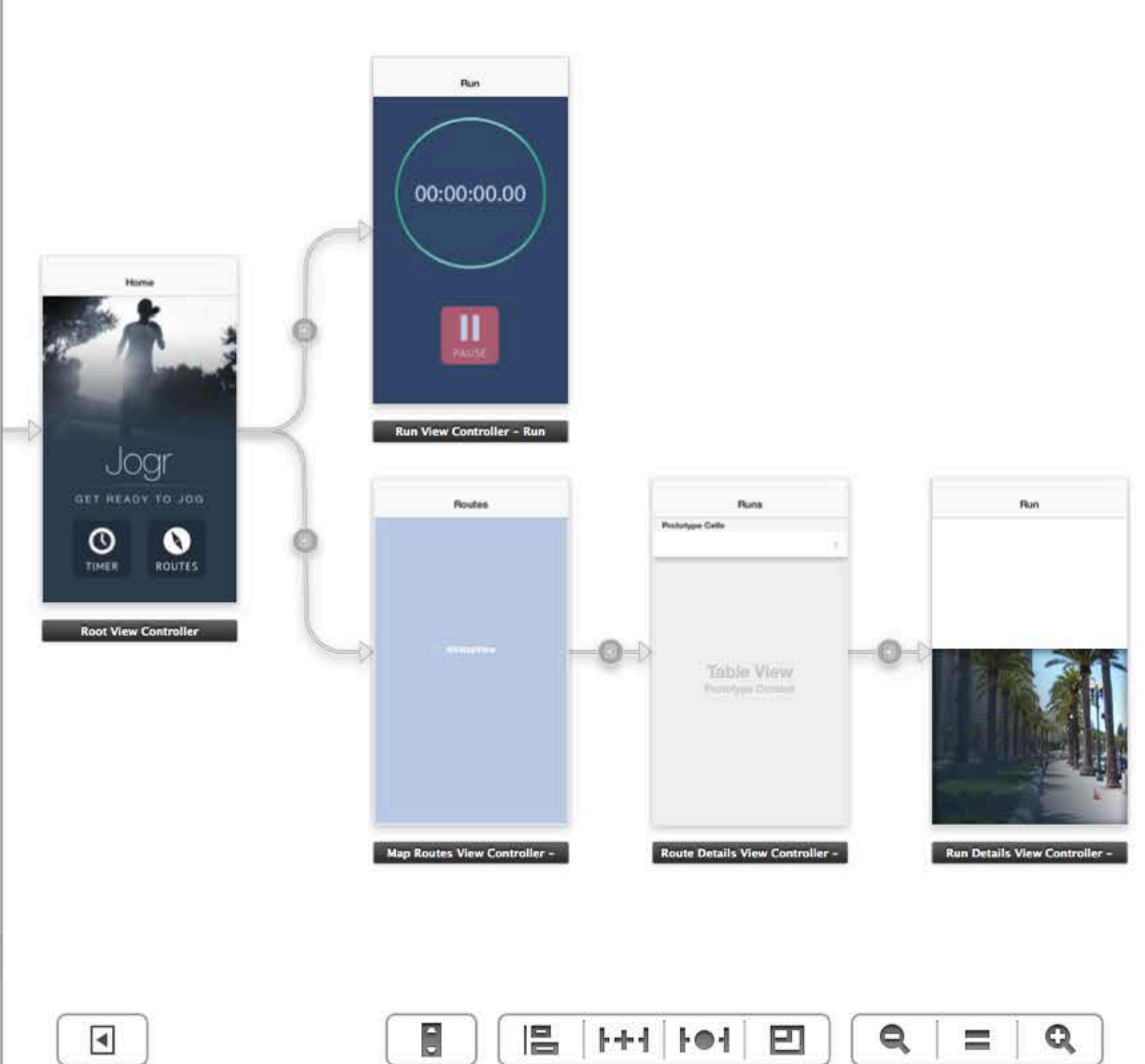
Add Button to Window



Info Button



- Map Routes View Controller...
 - Map Routes View Controller...
 - First Responder
 - Exit
 - Tap Gesture Recognizer
 - Push segue from Routes to...
- Run Details View Controller -...
 - Run Details View Controller...
 - First Responder
 - Exit
- Route Details View Controller...
 - Route Details View Controll...
 - First Responder
 - Exit
 - Push segue from RunSumm...
- Run View Controller - Run Scene
 - Run View Controller - Run
 - View
 - Image View - TimerRu...
 - Label - 00:00:00.00
 - Button
 - Constraints



Label

- Text: Plain
- Text: 00:00:00.00
- Color: White Color
- Font: System Bold 36.0
- Alignment: Left
- Lines: 1
- Behavior: Enabled, Highlighted
- Baseline: Align Baselines
- Line Breaks: Truncate Tail

- Switch** - Displays an element showing the boolean state of a value. Allows tapping the control to...
- Activity Indicator View** - Provides feedback on the progress of a task or process of unknown duration.
- Progress View** - Depicts the progress of a task over time.

Canvas

The screenshot displays the Xcode storyboard editor for an application named "Jogr". The storyboard is titled "Jogr.storyboard" and shows a sequence of five mobile app screens connected by segue arrows:

- Home:** The root view controller, featuring a silhouette of a person running, the app name "Jogr", and buttons for "TIMER" and "ROUTES".
- Run:** A screen with a large circular timer showing "00:00:00.00" and a red "PAUSE" button.
- Routes:** A screen with a blue background and a "Refresh" button.
- Route Details:** A screen with a "Table View" and a "Prototype Cells" header.
- Run Details:** A screen with a background image of a path lined with palm trees.

The right-hand panel shows the properties for a selected **Label** widget:

- Text:** Plain
- Text:** 00:00:00.00
- Color:** White Color
- Font:** System Bold 36.0
- Alignment:** Left
- Lines:** 1
- Behavior:** Enabled, Highlighted
- Baseline:** Align Baselines
- Line Breaks:** Truncate Tail

Below the storyboard, there are navigation and editing tools, including a back arrow, a mobile device icon, and zoom controls.

Document Outline

The image shows the Xcode interface for a project named 'Jogr'. The top status bar indicates 'Jogr: Ready' and 'Today at 2:34 PM'. The breadcrumb trail shows the current location: 'Jogr > Jogr > Resources > Jogr.st... > Run Vie... > Run Vie... > View > Label - 00:00:00.00'. The Document Outline panel on the left lists the following hierarchy:

- Map Routes View Controller...
 - Map Routes View Controller...
 - First Responder
 - Exit
 - Tap Gesture Recognizer
 - Push segue from Routes to...
- Run Details View Controller -...
 - Run Details View Controller...
 - First Responder
 - Exit
- Route Details View Controller...
 - Route Details View Controll...
 - First Responder
 - Exit
 - Push segue from RunSumm...
- Run View Controller - Run Scene
 - Run View Controller - Run
 - View
 - Image View - TimerRu...
 - Label - 00:00:00.00
 - Button
 - Constraints

The storyboard in the center shows a sequence of view controllers: Root View Controller, Map Routes View Controller, Route Details View Controller, and Run Details View Controller. The Run Details View Controller is currently selected, showing a 'Run' screen with a timer and a red stop button. The Attributes Inspector on the right shows the properties for the selected 'Label':

- Text: Plain
- Text: 00:00:00.00
- Color: White Color
- Font: System Bold 36.0
- Alignment: Left
- Lines: 1
- Behavior: Enabled, Highlighted
- Baseline: Align Baselines
- Line Breaks: Truncate Tail

Below the Attributes Inspector, there are descriptions for 'Switch', 'Activity Indicator View', and 'Progress View'.

Inspectors

The image shows the Xcode interface for a project named 'Jogr'. The top status bar indicates 'Jogr: Ready' and 'Today at 2:34 PM'. The breadcrumb trail shows the current location: 'Jogr > Jogr > Resources > Jogr.st... > Run Vie... > Run Vie... > View > Label - 00:00:00.00'. The main workspace displays a storyboard with several view controllers: 'Root View Controller', 'Map Routes View Controller - Run', 'Route Details View Controller - Run', and 'Run Details View Controller - Run'. A 'Label' is selected on the 'Run' view controller, and the Inspector panel on the right shows its properties.

Inspector Panel - Label

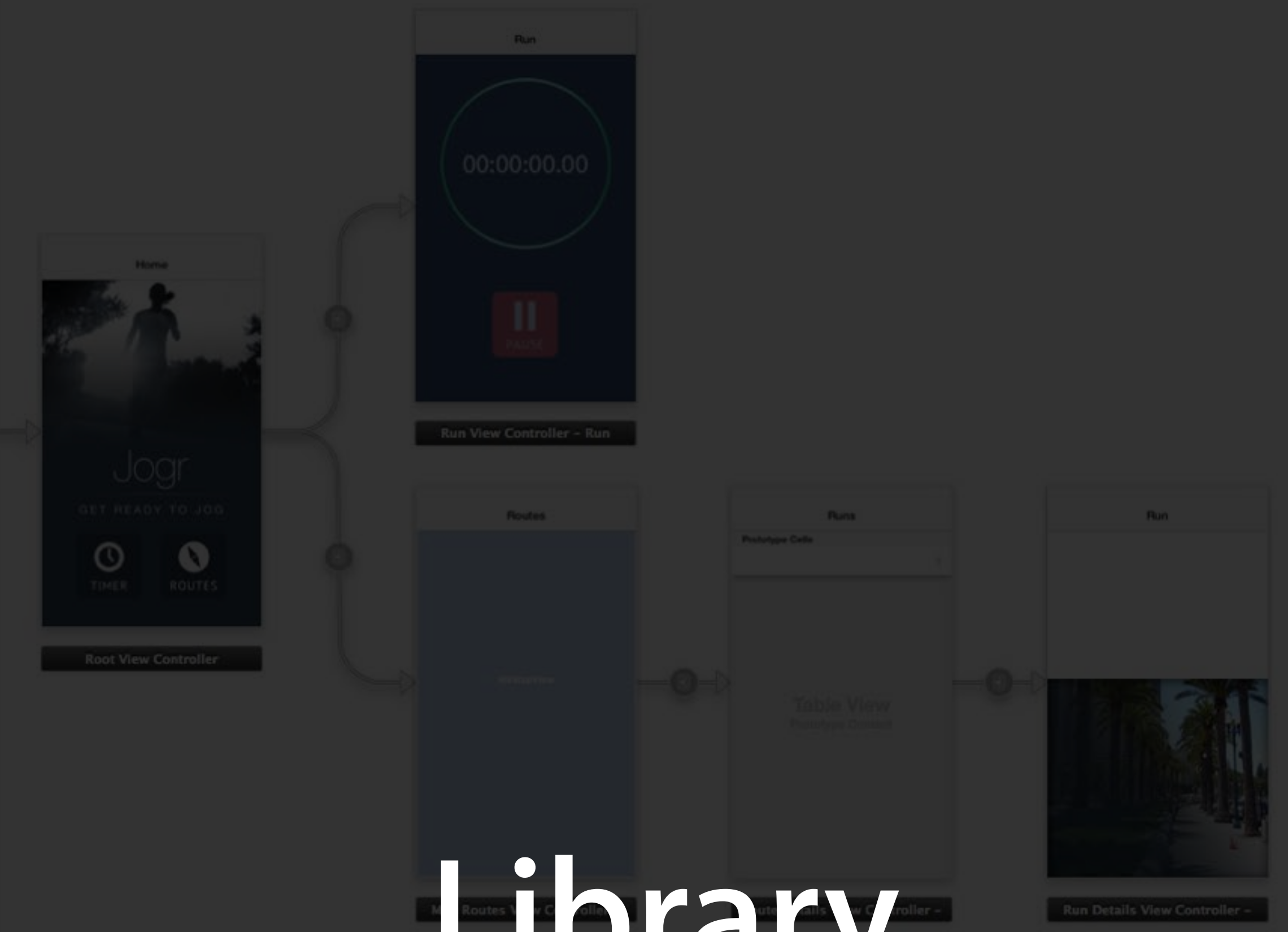
- Text: Plain
- Text: 00:00:00.00
- Color: White Color
- Font: System Bold 36.0
- Alignment: Left
- Lines: 1
- Behavior: Enabled, Highlighted
- Baseline: Align Baselines
- Line Breaks: Truncate Tail

Switch - Displays an element showing the boolean state of a value. Allows tapping the control to...

Activity Indicator View - Provides feedback on the progress of a task or process of unknown duration.

Progress View - Depicts the progress of a task over time.

- Map Routes View Controller...
 - Map Routes View Controller...
 - First Responder
 - Exit
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 - Label - 00:00:00.00
 - Button
 - Constraints



Label

Text: Plain

00:00:00.00

Color: White Color

Font: System Bold 36.0

Alignment: [Left | Center | Right]

Lines: 1

Behavior: Enabled Highlighted

Baseline: Align Baselines

Line Breaks: Truncate Tail

Library

Switch - Displays an element showing the boolean state of a value. Allows tapping the control to...

Activity Indicator View - Provides feedback on the progress of a task or process of unknown duration.

Progress View - Depicts the progress of a task over time.

MVC

Relate interface elements to code



The diagram consists of three stacked, rounded rectangular boxes. The top box is blue and contains the word 'View'. The middle box is brown and contains the word 'Controller'. The bottom box is red and contains the word 'Model'. The boxes are arranged vertically, with 'View' at the top, 'Controller' in the middle, and 'Model' at the bottom.

View

Controller

Model

MVC

Relate interface elements to code



View

Controller

Model

MVC

Relate interface elements to code



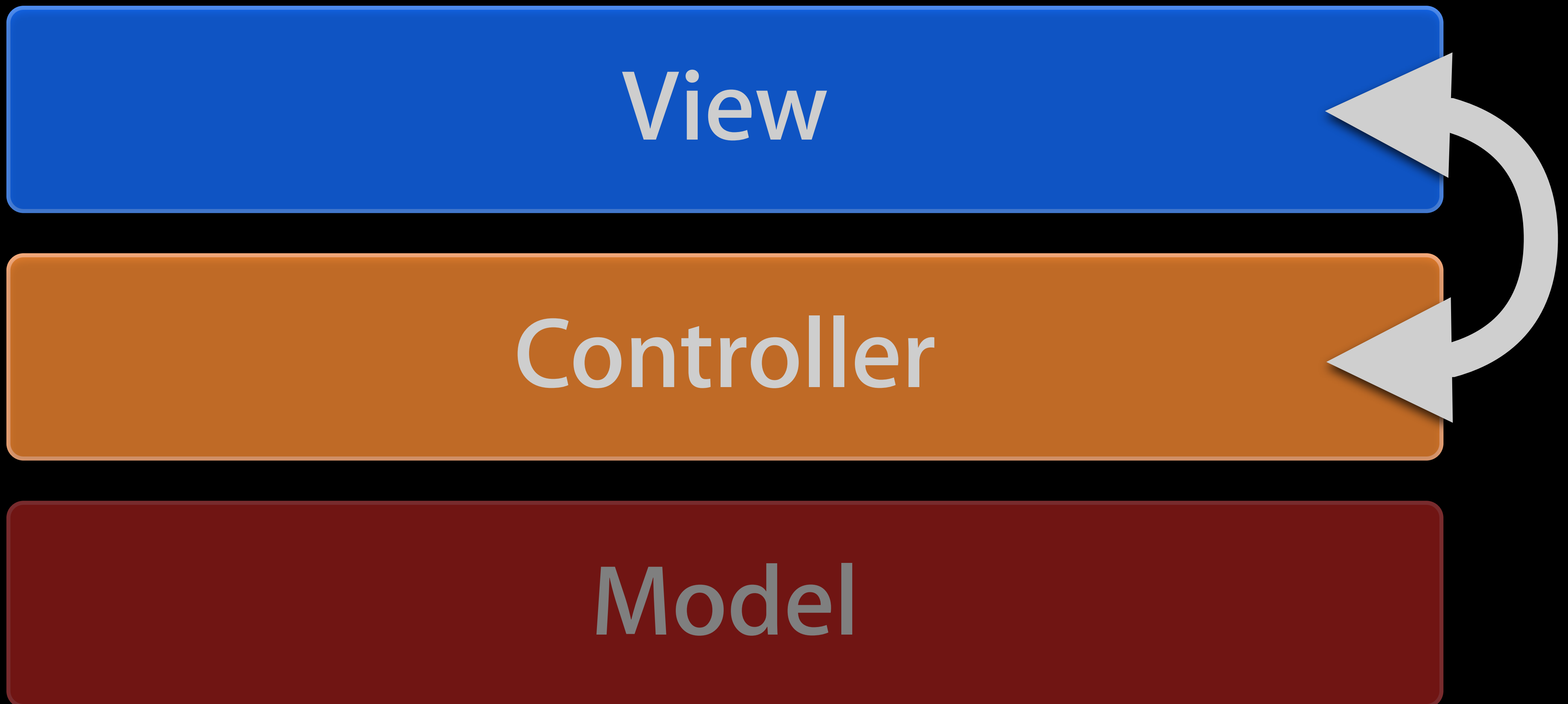
View

Controller

Model

MVC

Relate interface elements to code

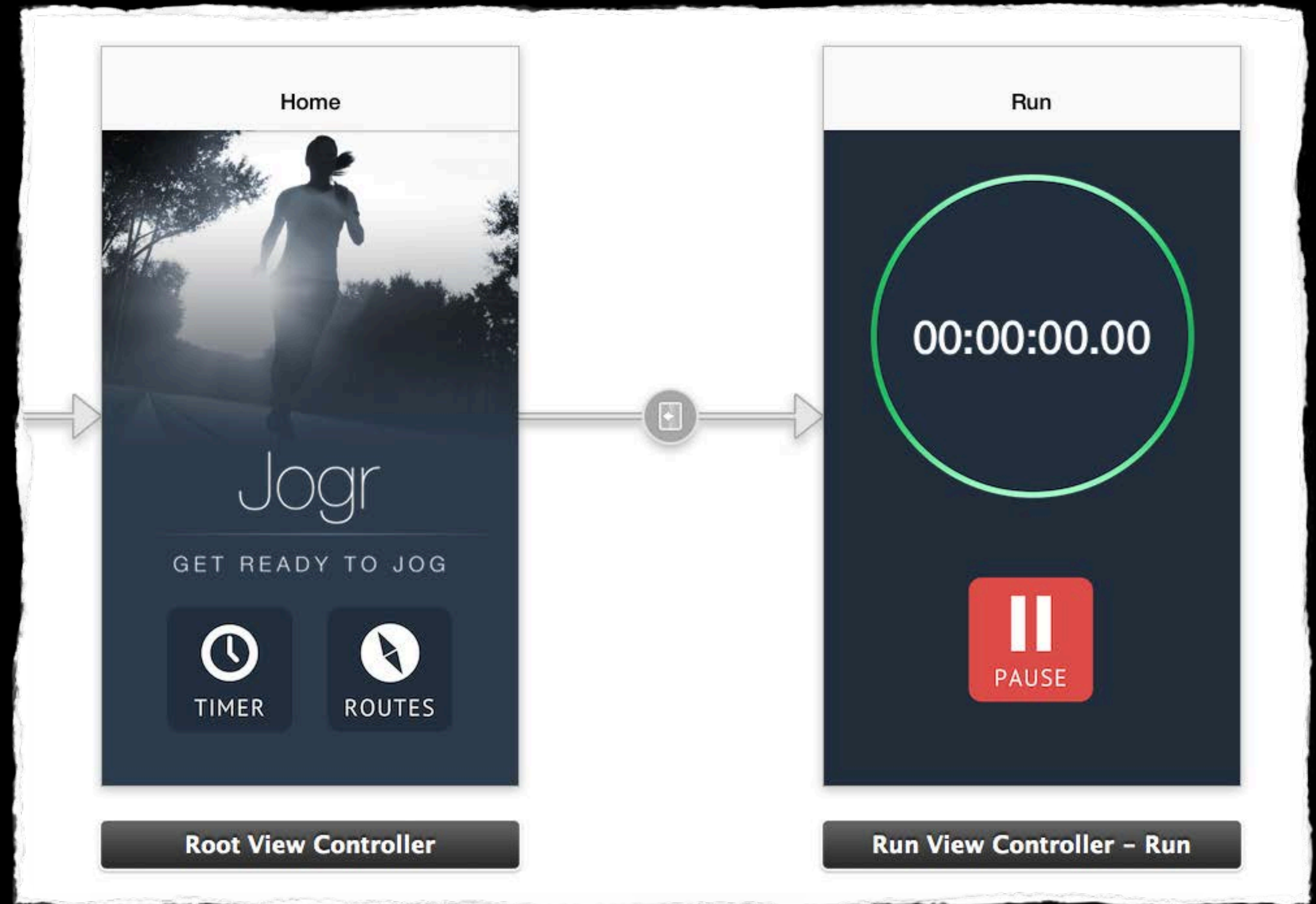


Storyboards



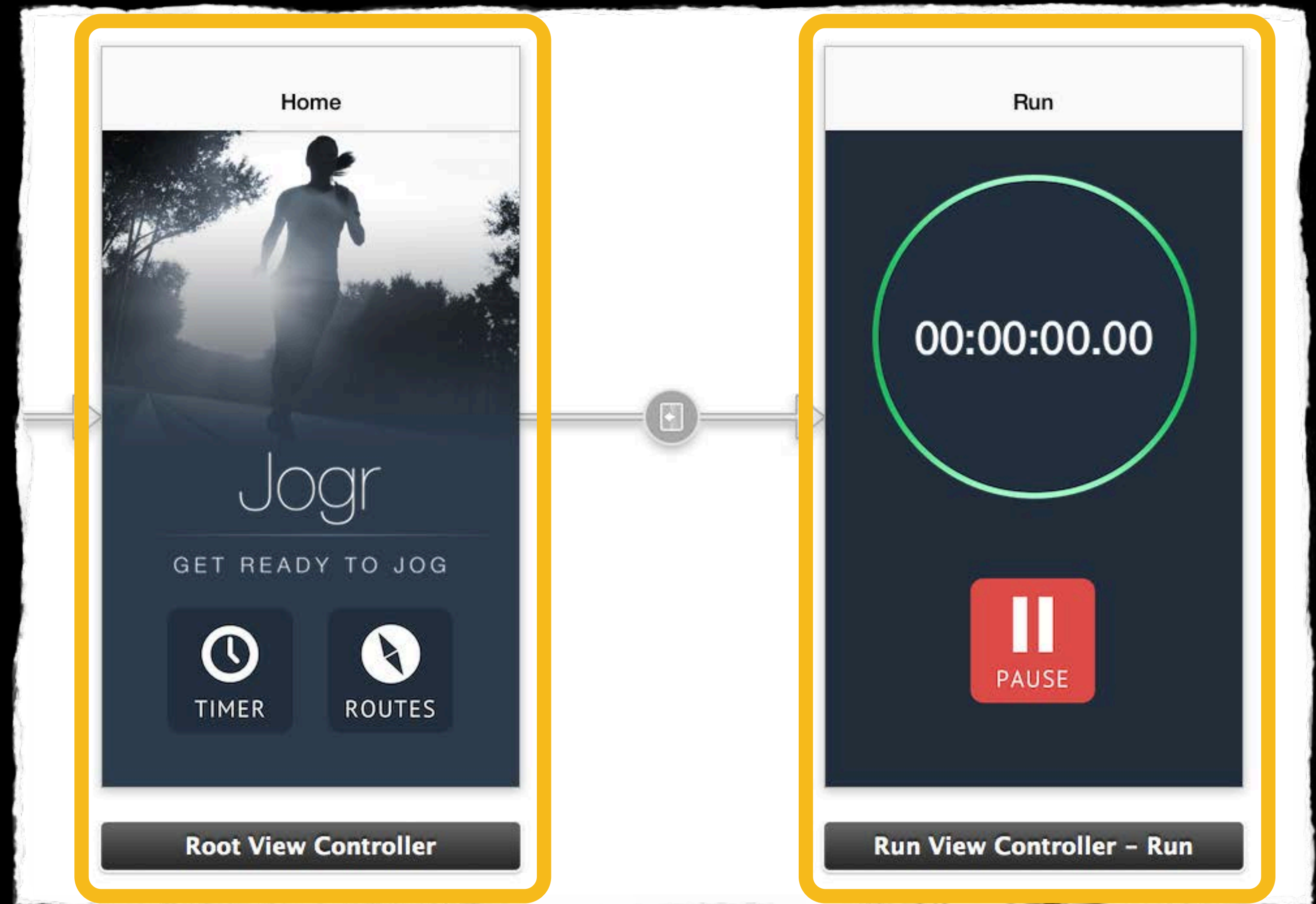
Scenes

- A screen or portion of the user interface



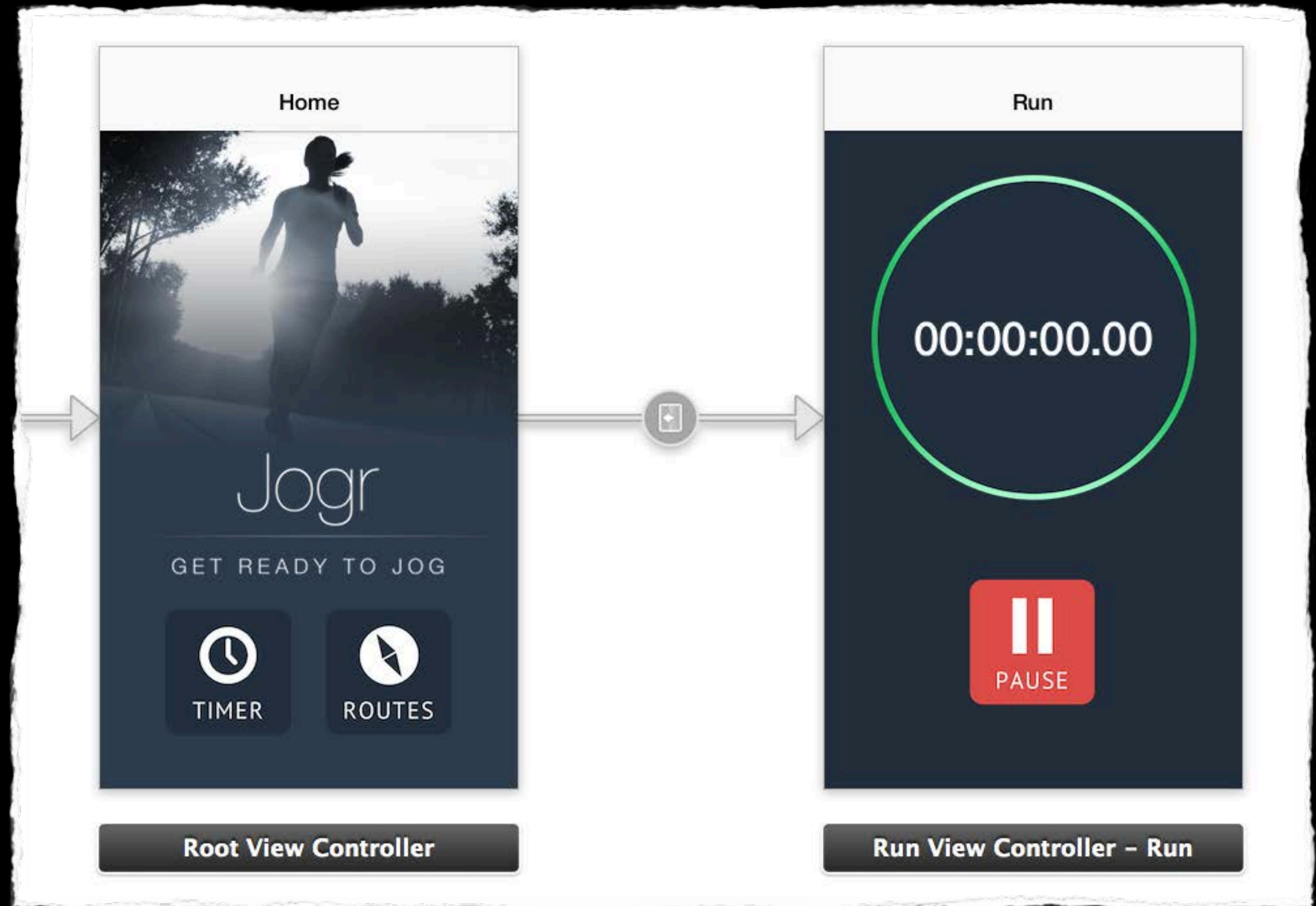
Scenes

- A screen or portion of the user interface



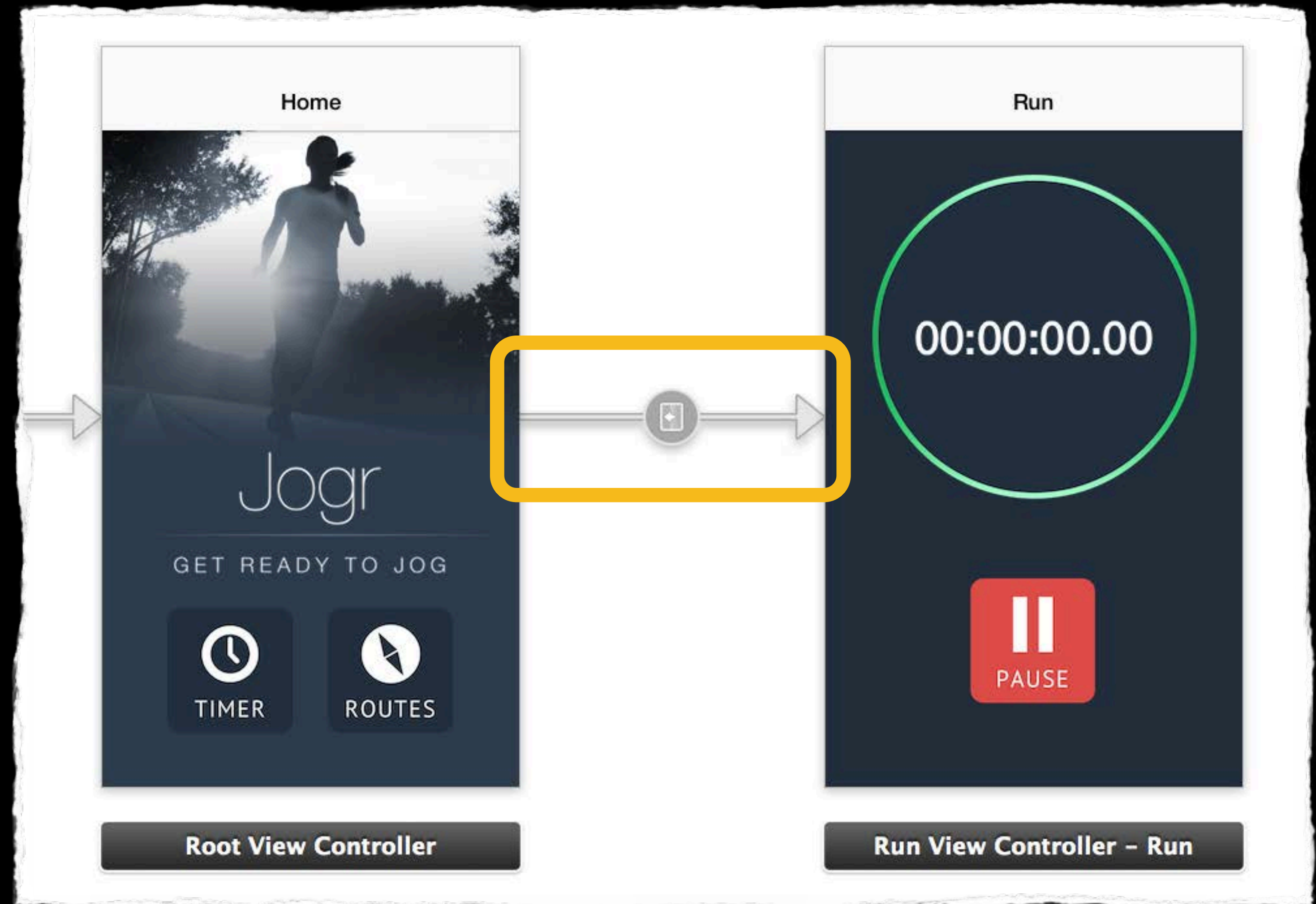
Segue

- The action to move from one scene to another
- Push data from one scene to the next



Segue

- The action to move from one scene to another
- Push data from one scene to the next



Jogr

Demo application

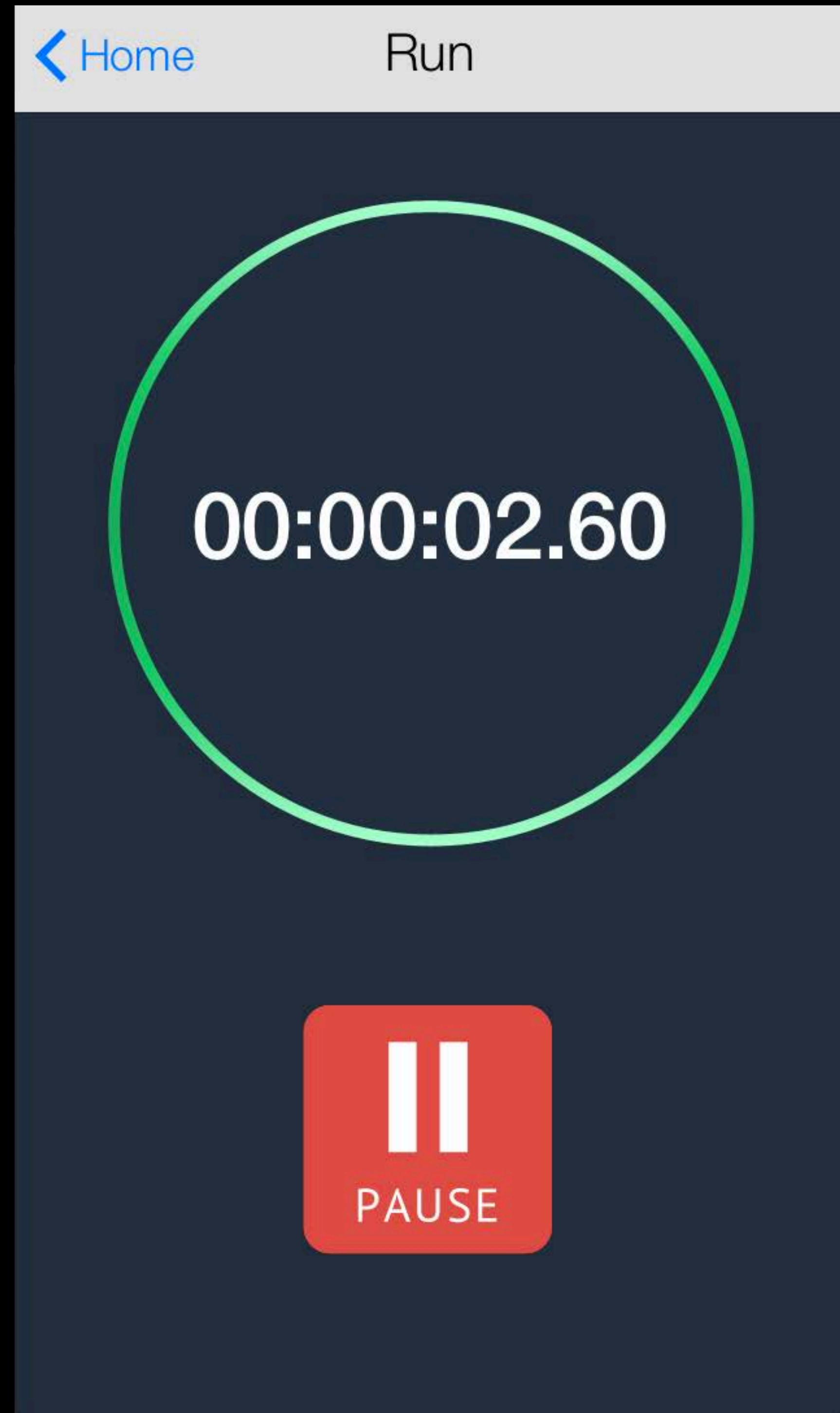
- Create simple user interfaces
- Change properties
- Resize and align objects
- Make connections
 - Between scenes
 - To code



Jogr

Demo application

- Create simple user interfaces
- Change properties
- Resize and align objects
- Make connections
 - Between scenes
 - To code



Demo

Building an interface

Outlets

Connect UI objects to properties

```
@property (weak, nonatomic) UIButton *pauseRunButton;
```

Outlets

Connect UI objects to properties

```
@property (weak, nonatomic) IBOutlet UIButton *pauseRunButton;
```

Actions

Connect controls to methods

```
- (void) pauseOrRun:(id) sender;
```

Actions

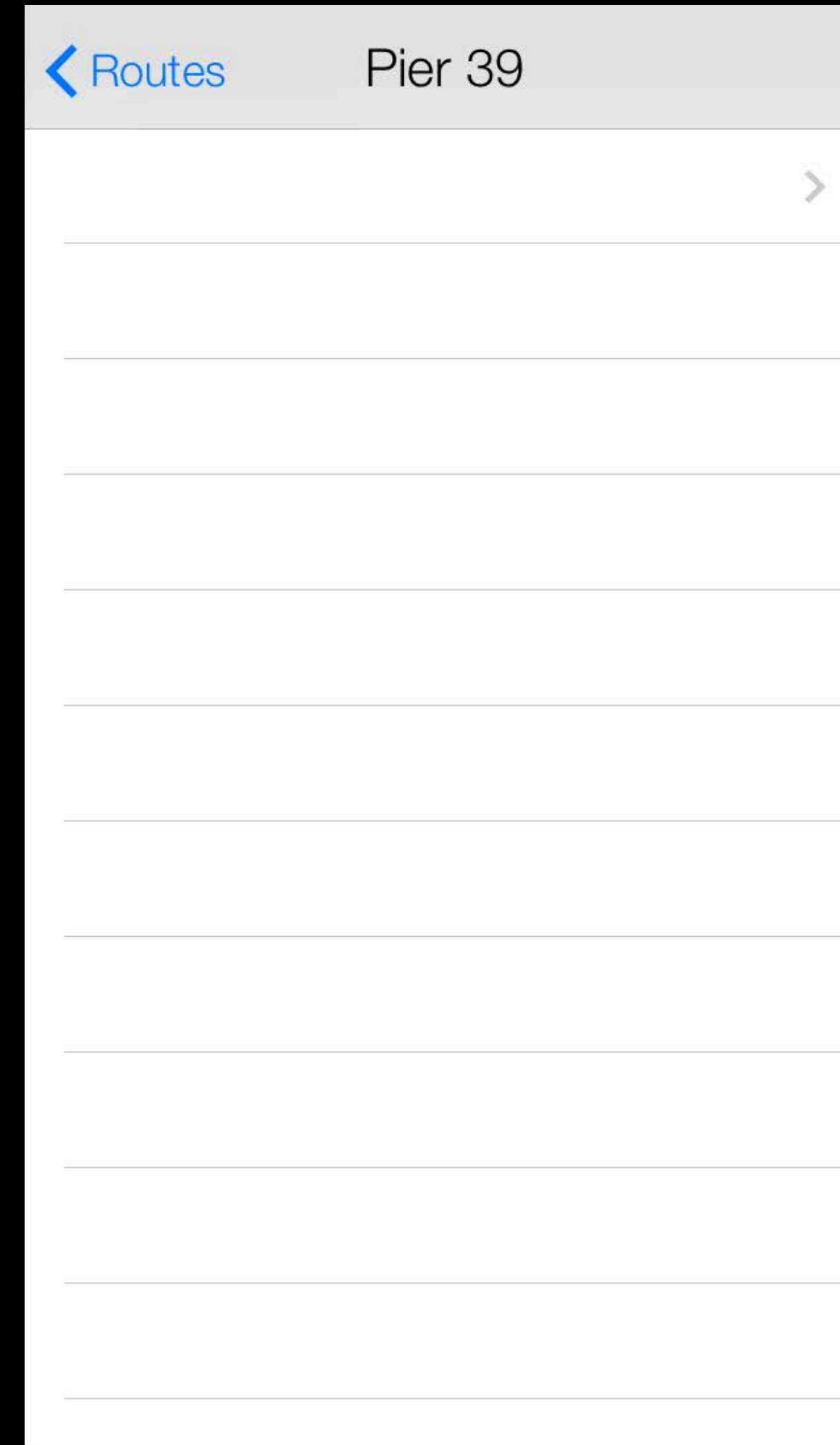
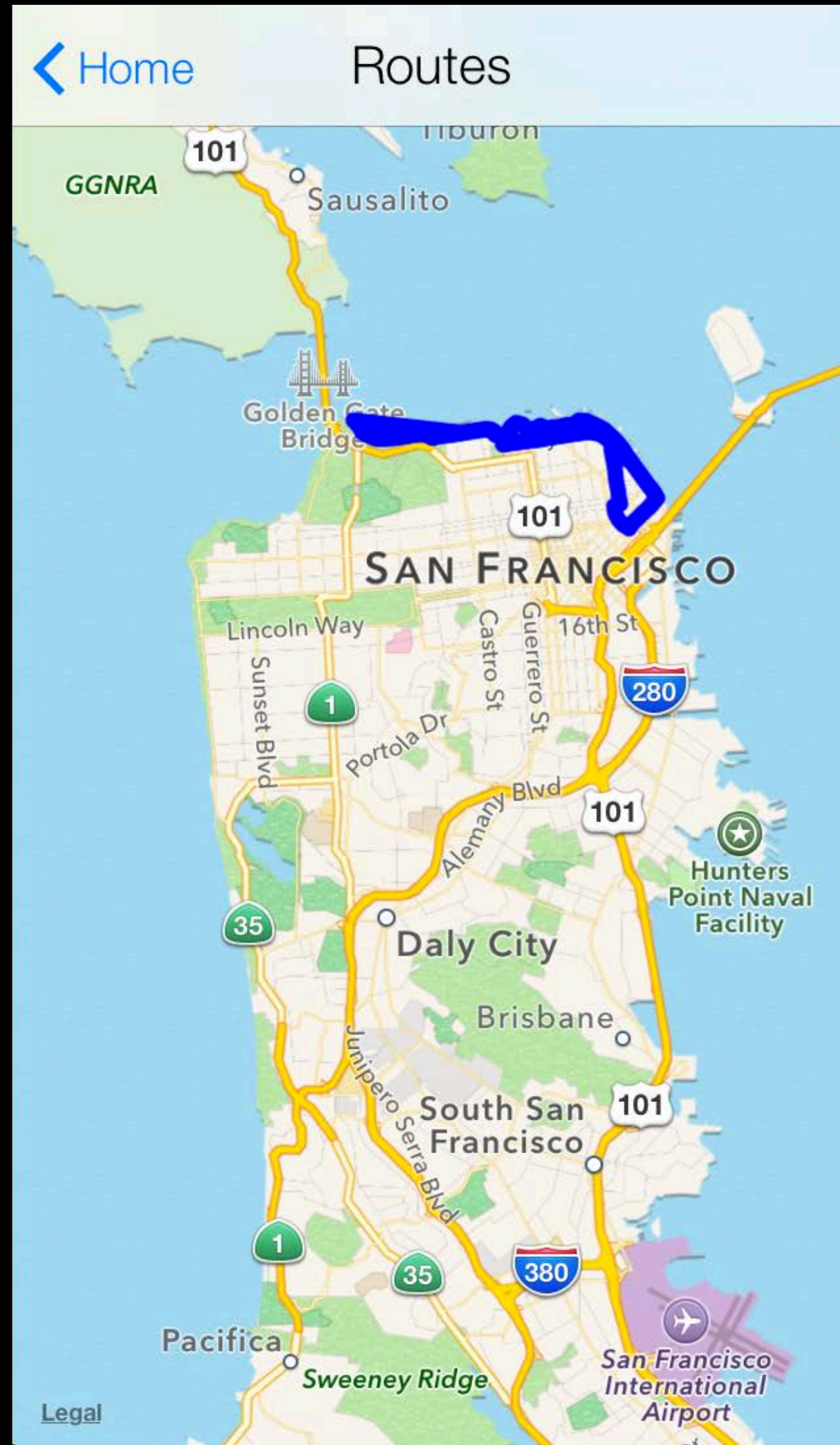
Connect controls to methods

```
- (IBAction) pauseOrRun:(id)sender;
```

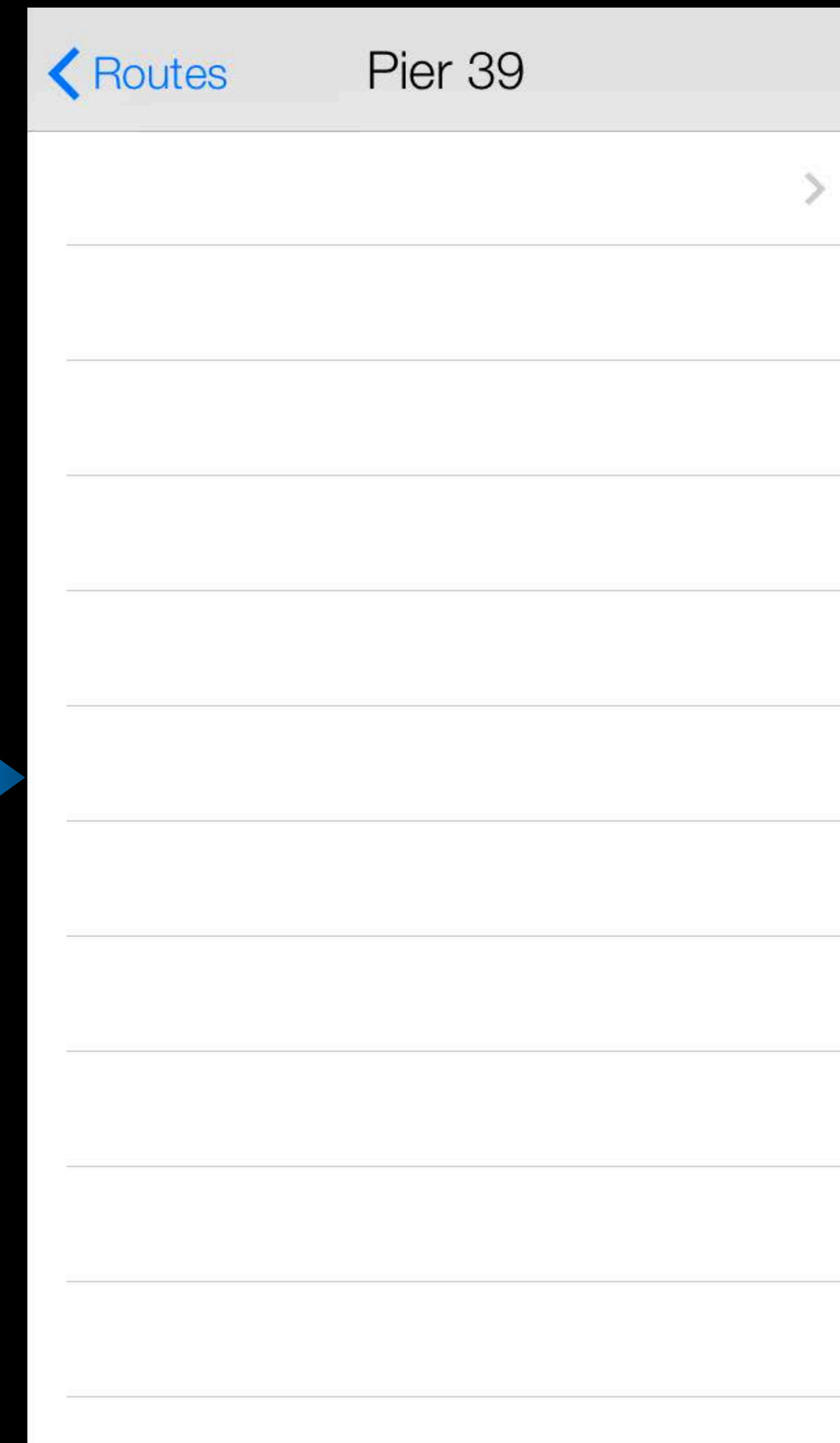
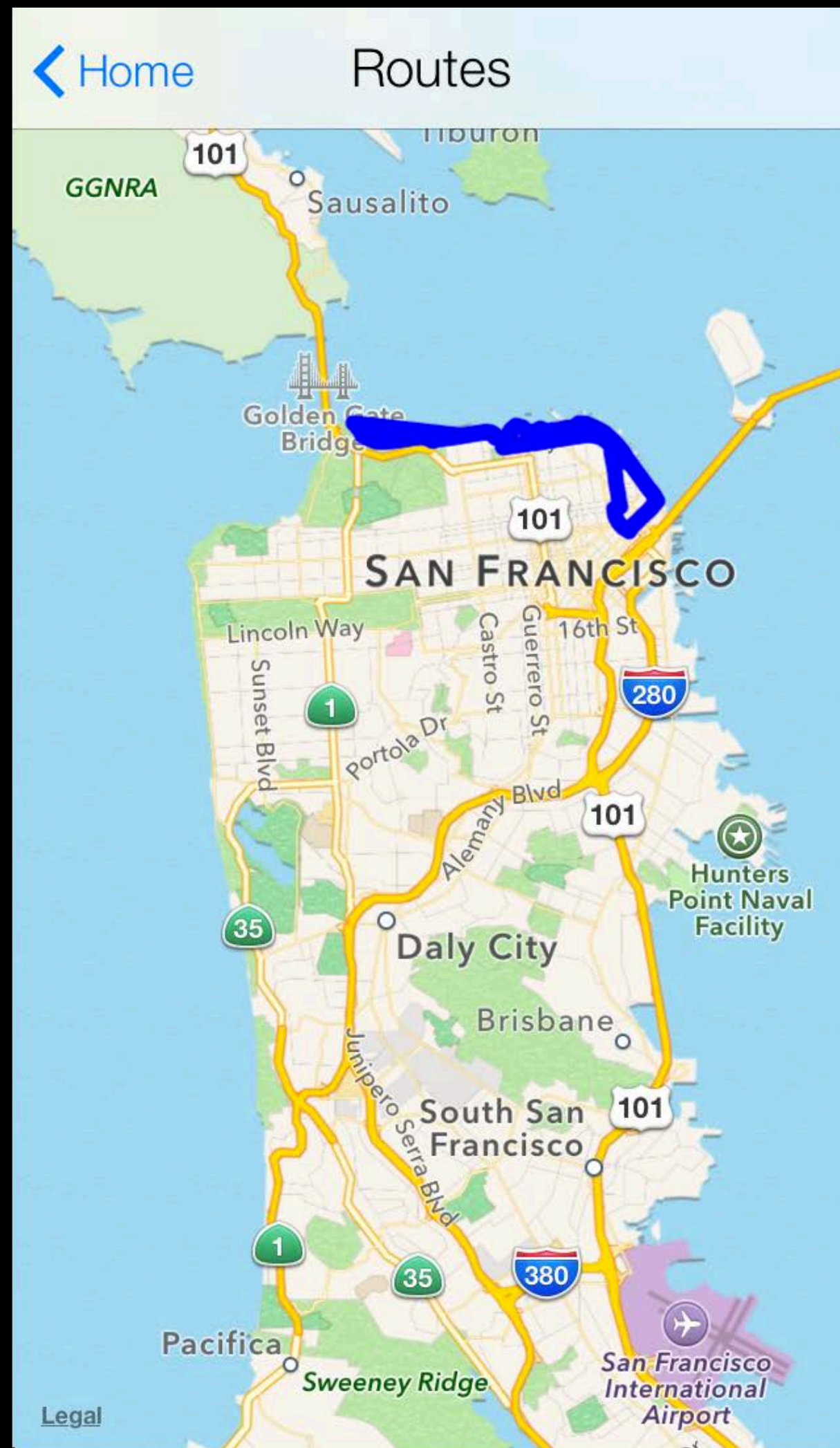
Storyboards...What's Next?

Alex Raftis

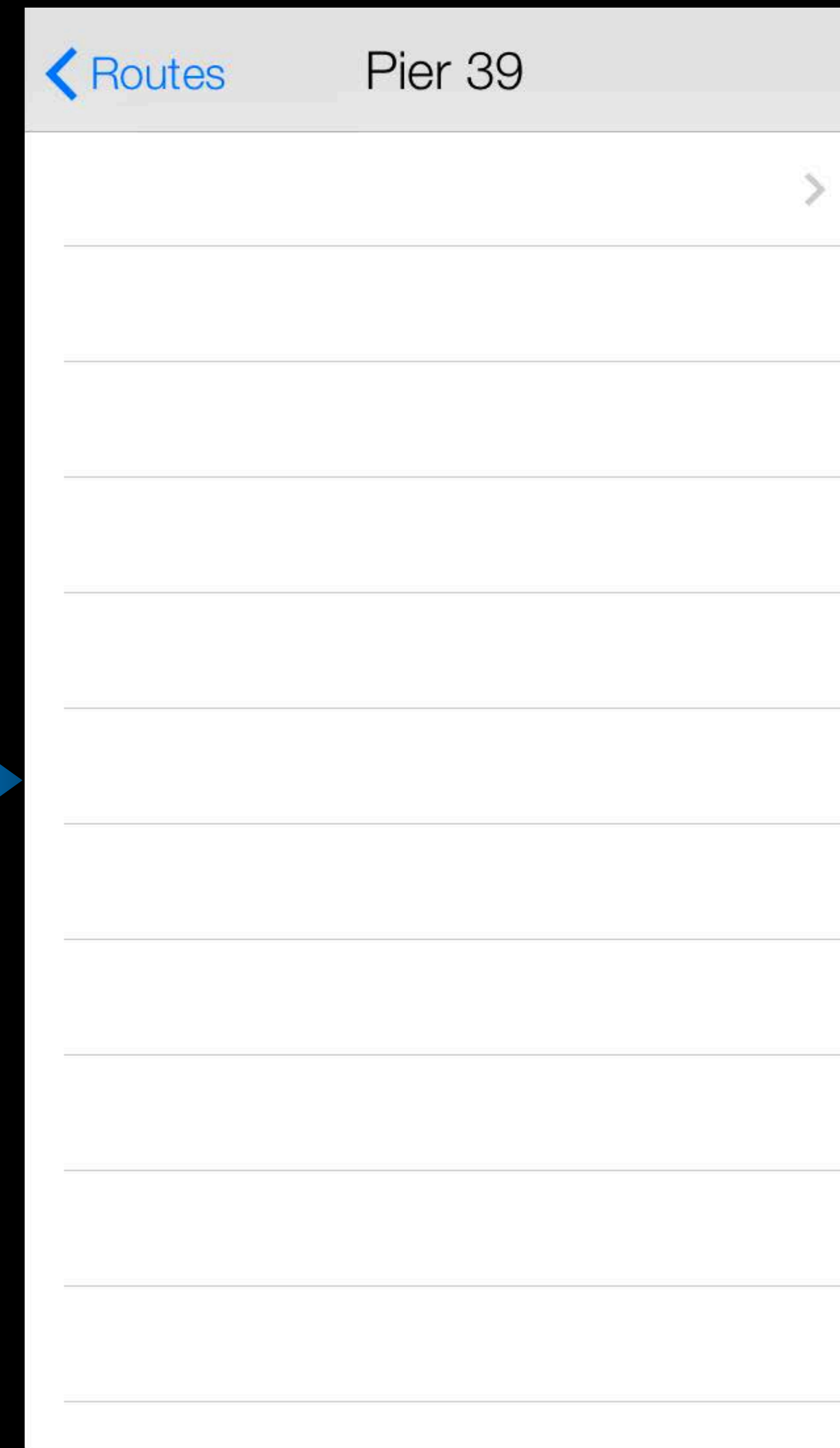
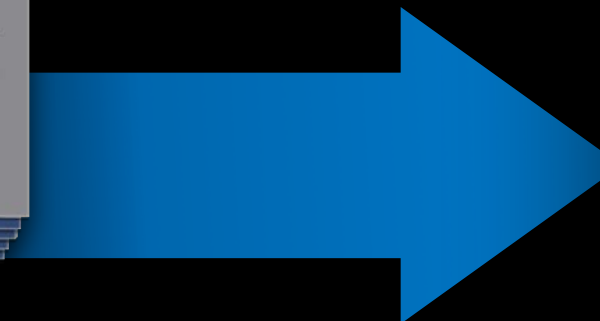
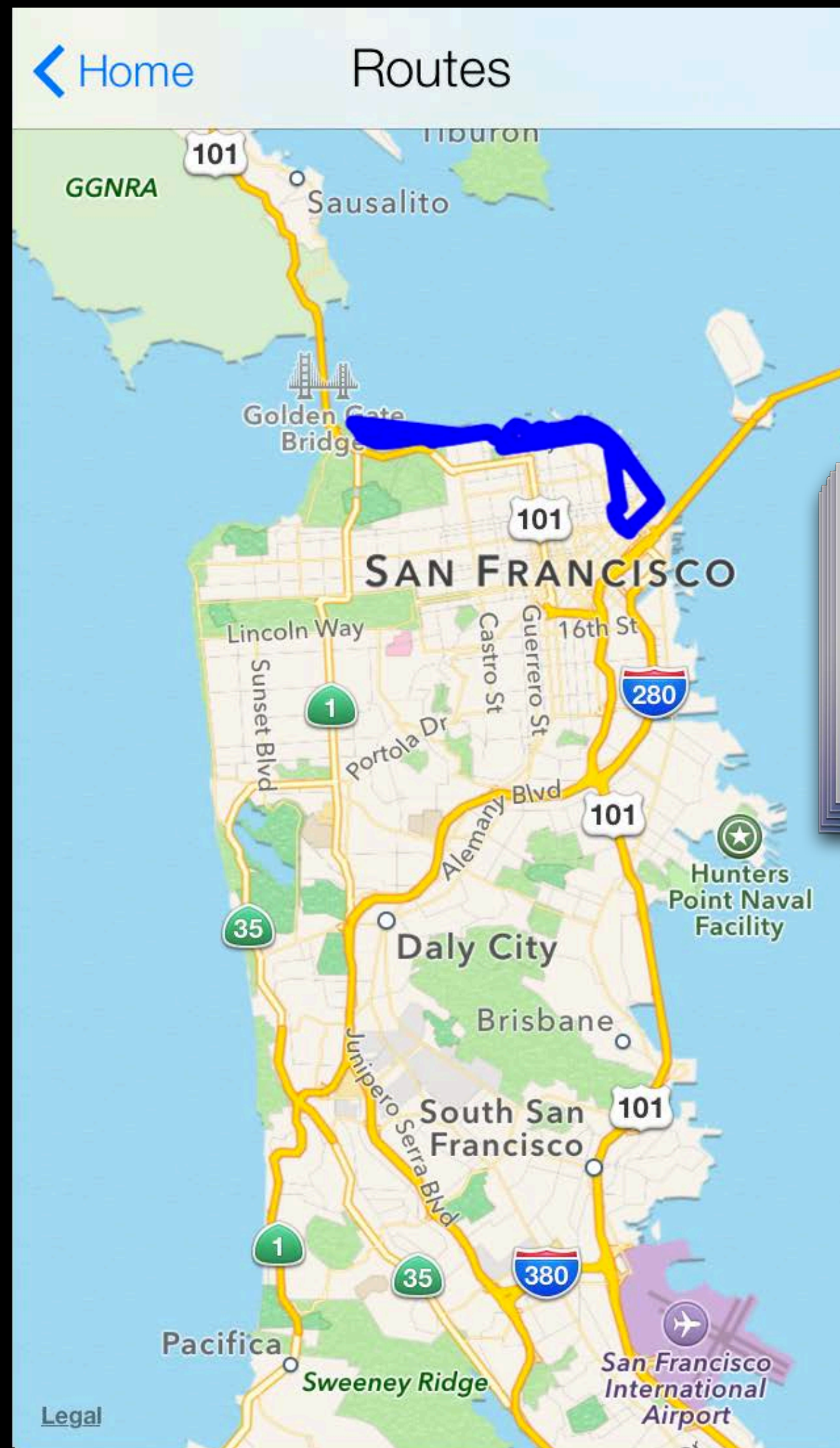
Transferring Data



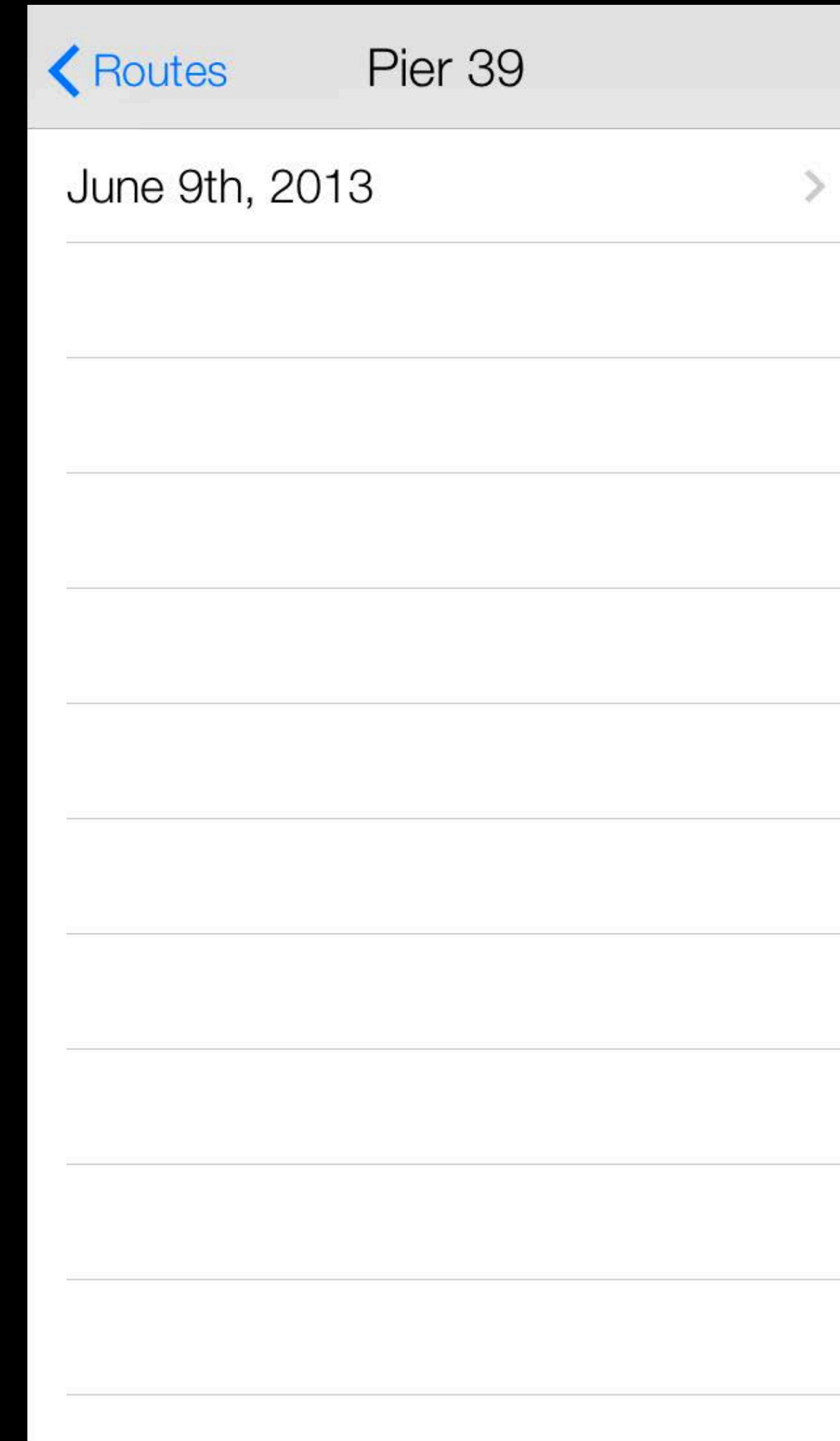
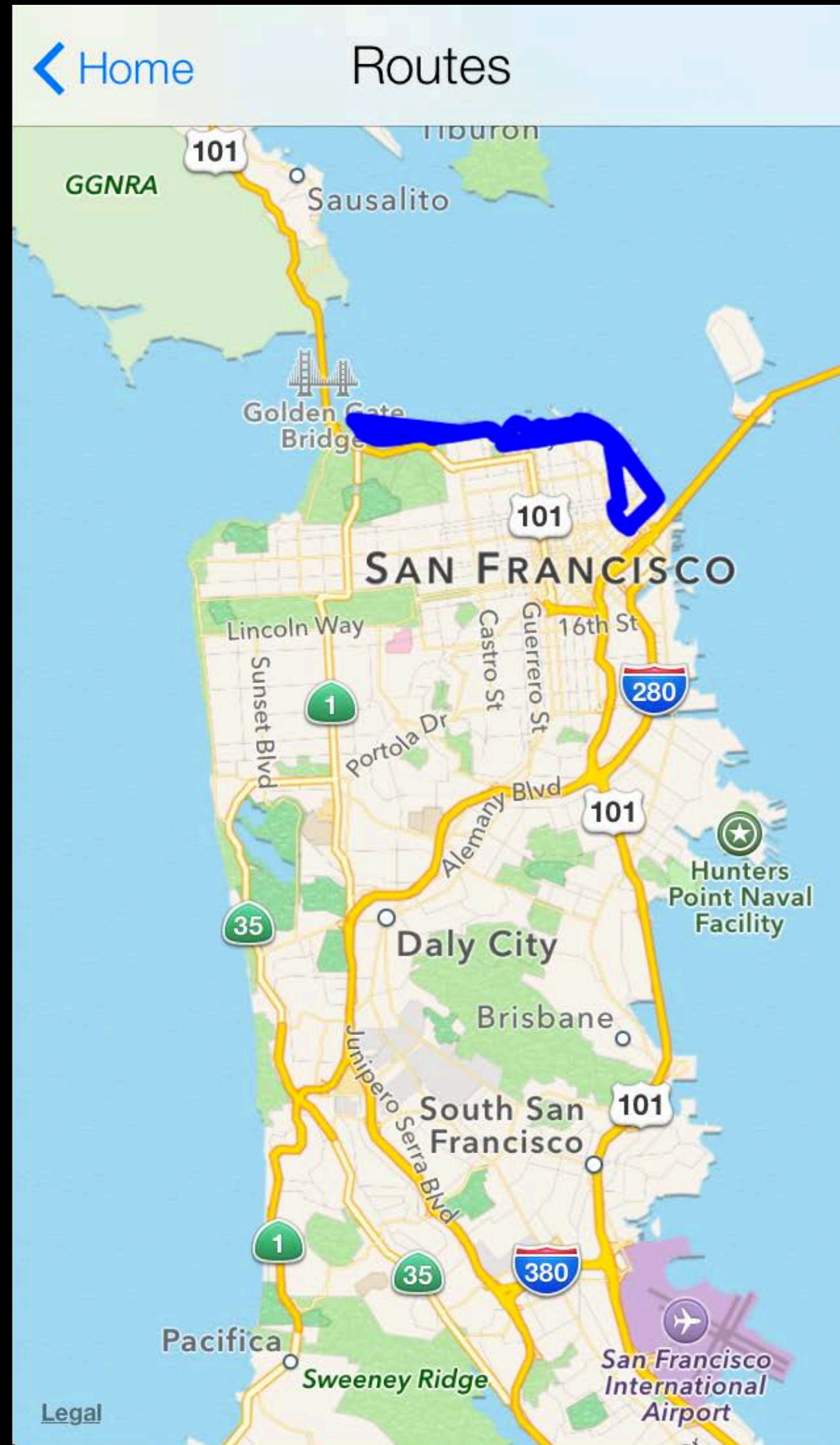
Transferring Data



Transferring Data



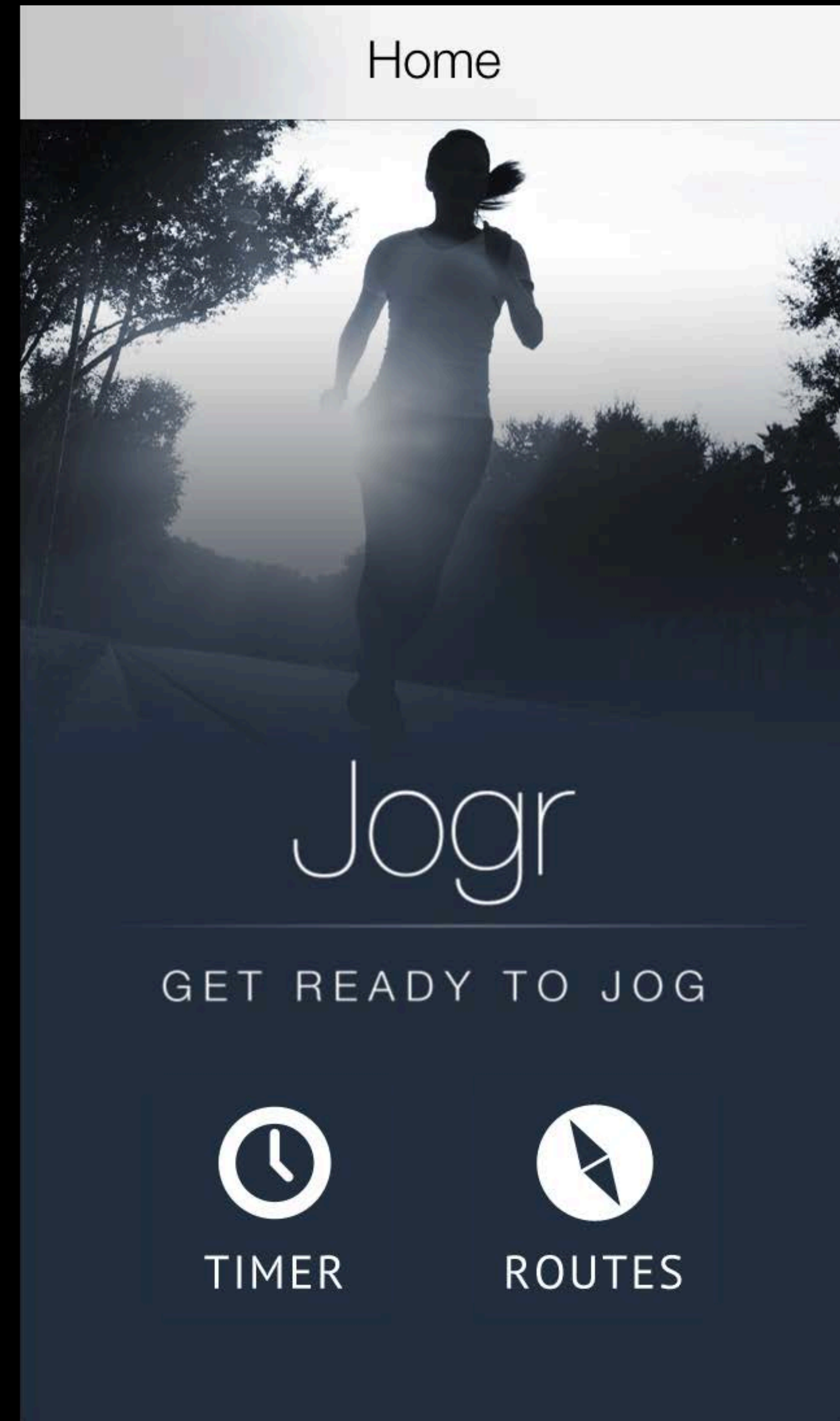
Transferring Data



Jogr

Demo application

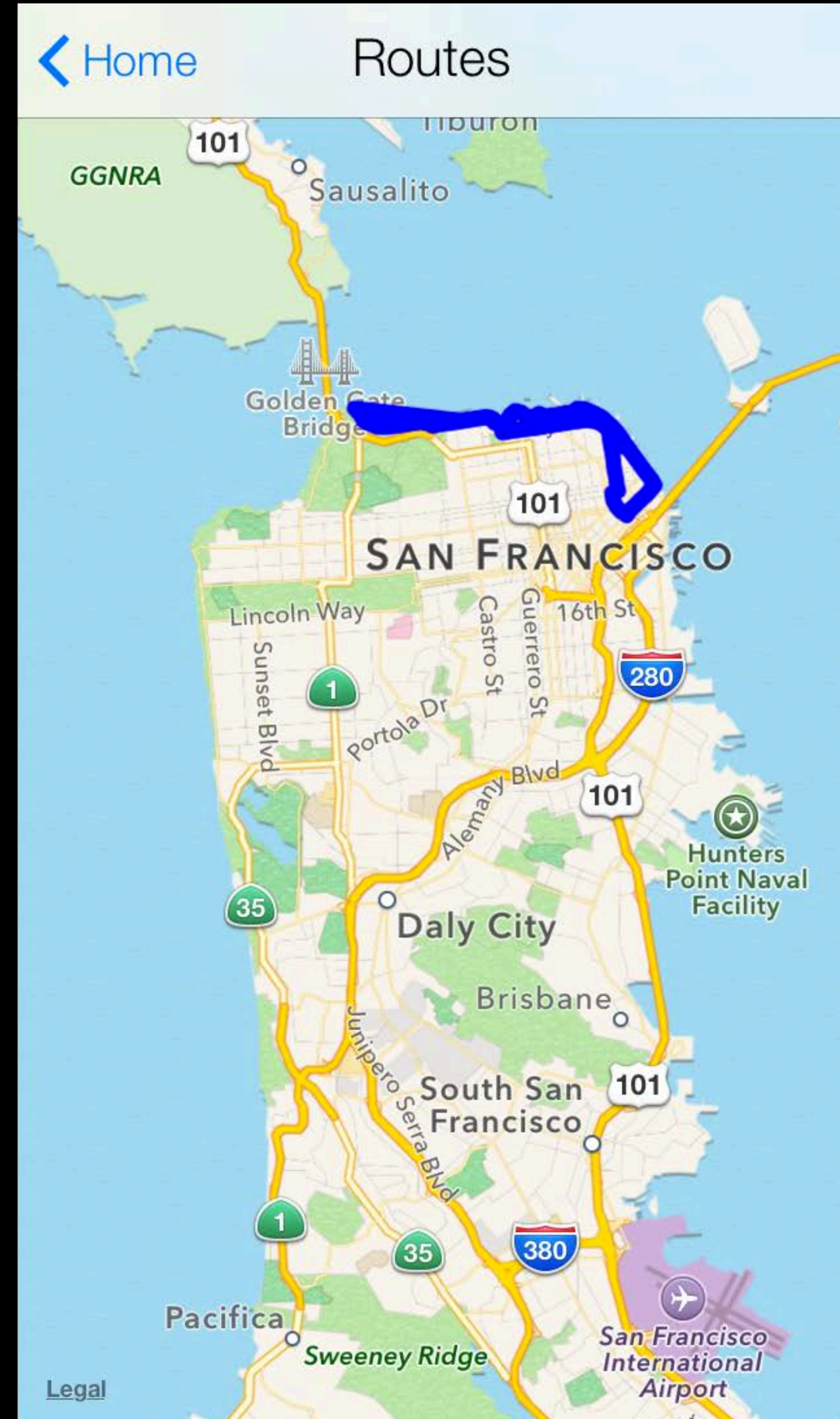
- Gesture recognizer
- Activating segues in code
- Passing data between scenes
- Setting delegates and data sources
- Create reusable table cells
- Adding custom UI elements



Jogr

Demo application

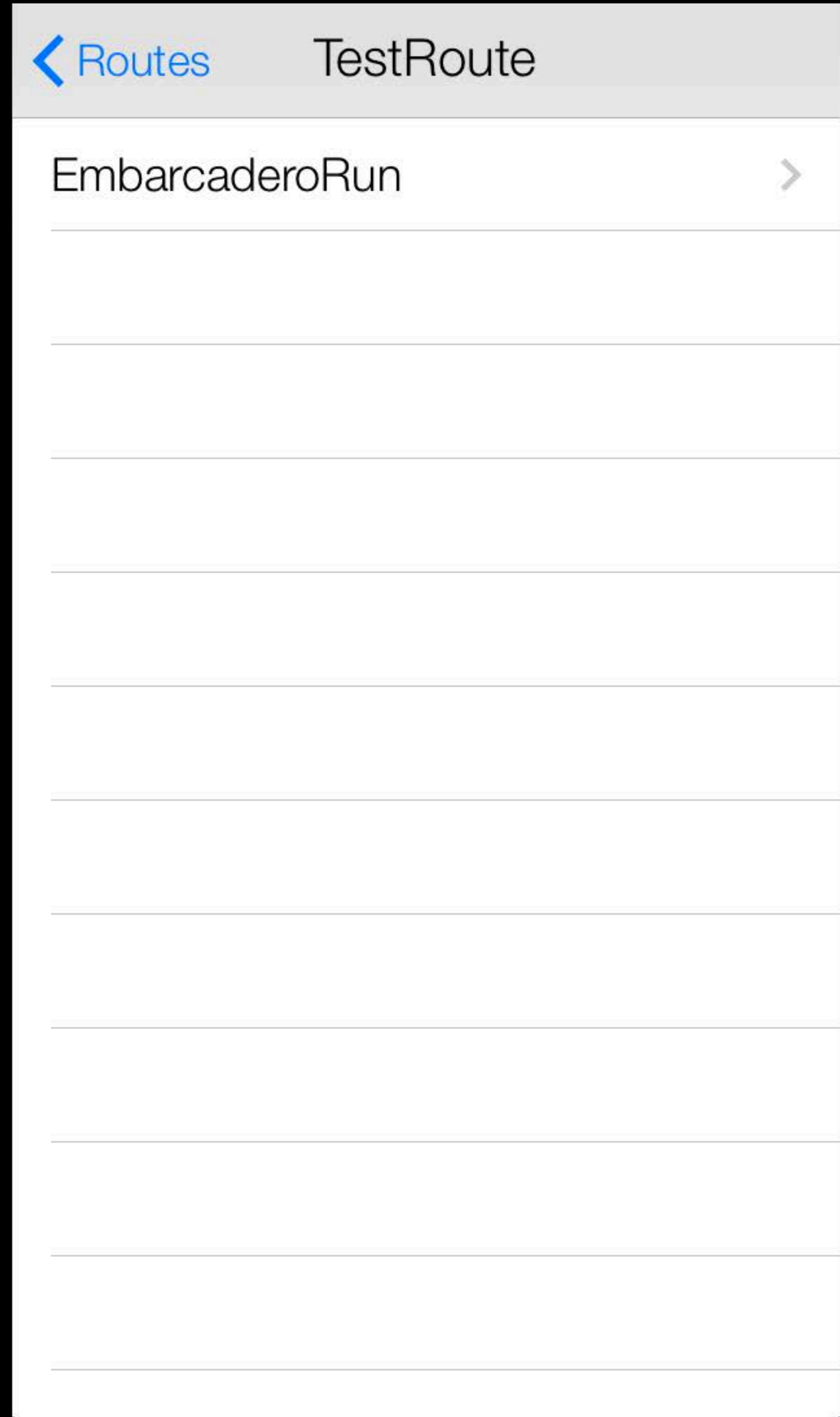
- Gesture recognizer
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Jogr

Demo application

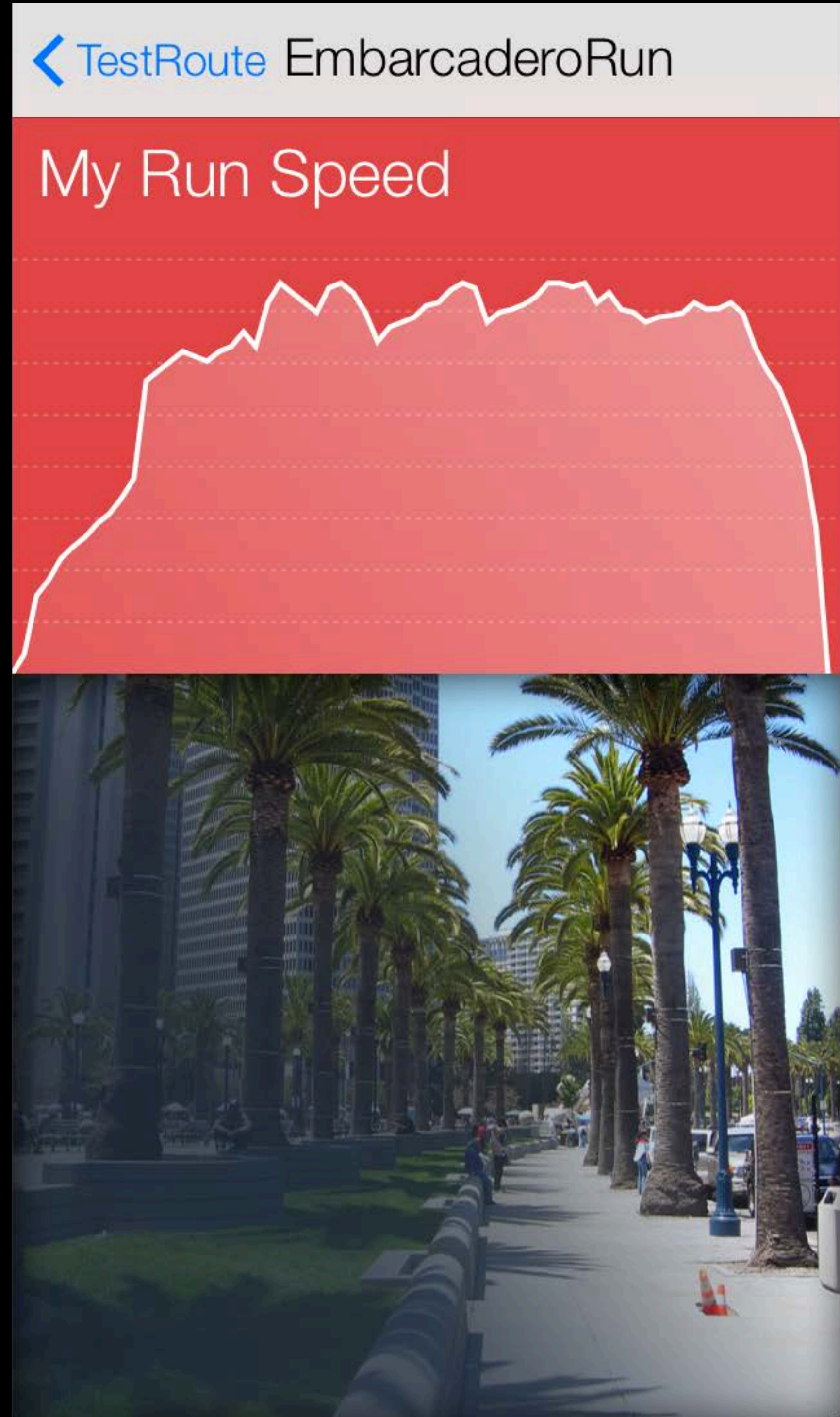
- Gesture recognizer
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Jogr

Demo application

- Gesture recognizer
- Activating segues in code
- Passing data between scenes
- Setting delegates and data sources
- Create reusable table cells
- Adding custom UI elements



Demo

Storyboards...what's next?

View Controllers and Segues

UIViewController

View Controllers and Segues

UIViewController

storyboard (property)

View Controllers and Segues

UIViewController

storyboard (property)

- The storyboard from the originating view controller

View Controllers and Segues

UIViewController

storyboard (property)

- The storyboard from the originating view controller

`-performSegueWithIdentifier:sender:`

View Controllers and Segues

UIViewController

storyboard (property)

- The storyboard from the originating view controller

-performSegueWithIdentifier:sender:

- Initiates the segue with the specified identifier from the view controller's storyboard file

View Controllers and Segues

UIViewController

storyboard (property)

- The storyboard from the originating view controller

-performSegueWithIdentifier:sender:

- Initiates the segue with the specified identifier from the view controller's storyboard file

-prepareForSegue:sender:

View Controllers and Segues

UIViewController

storyboard (property)

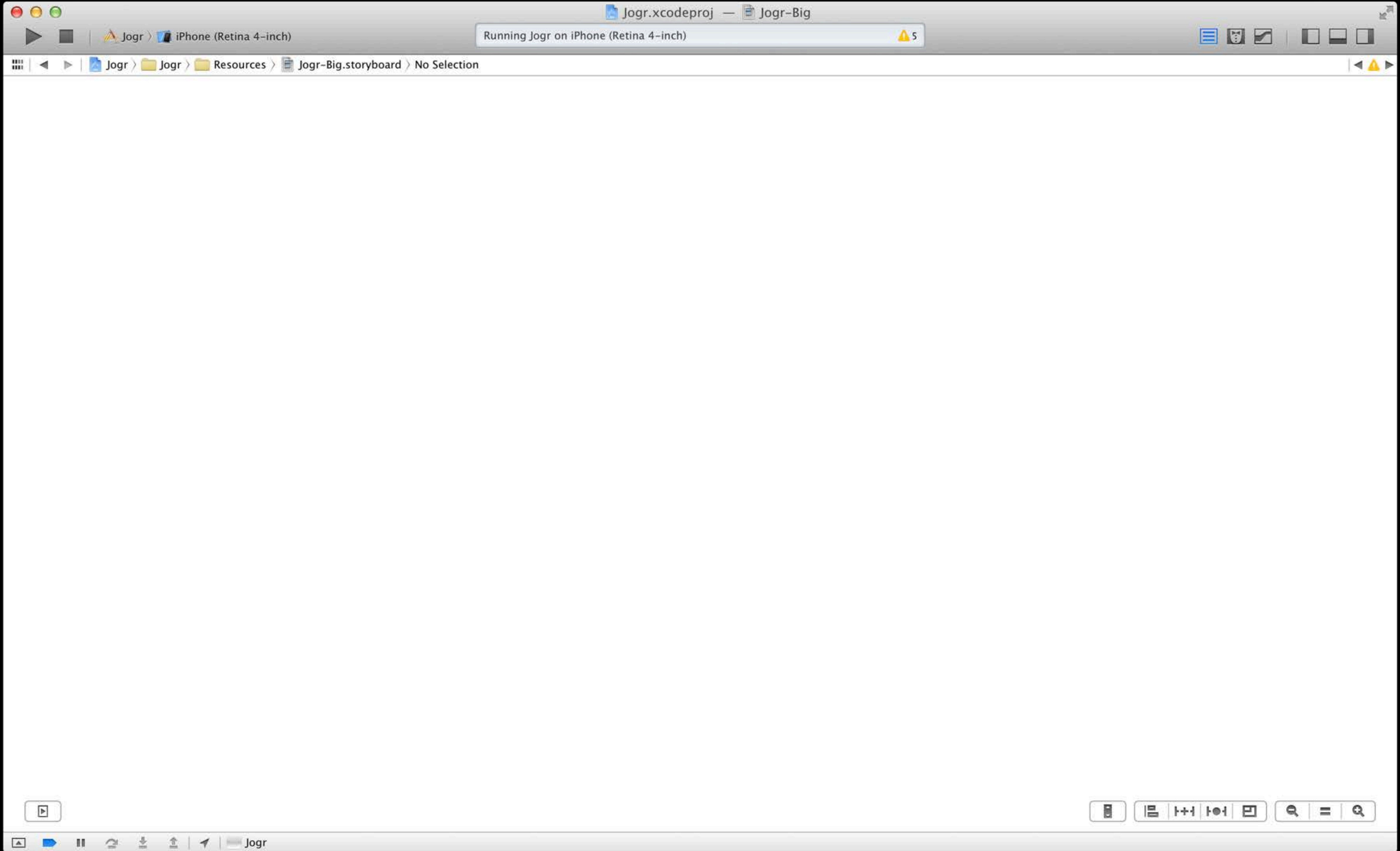
- The storyboard from the originating view controller

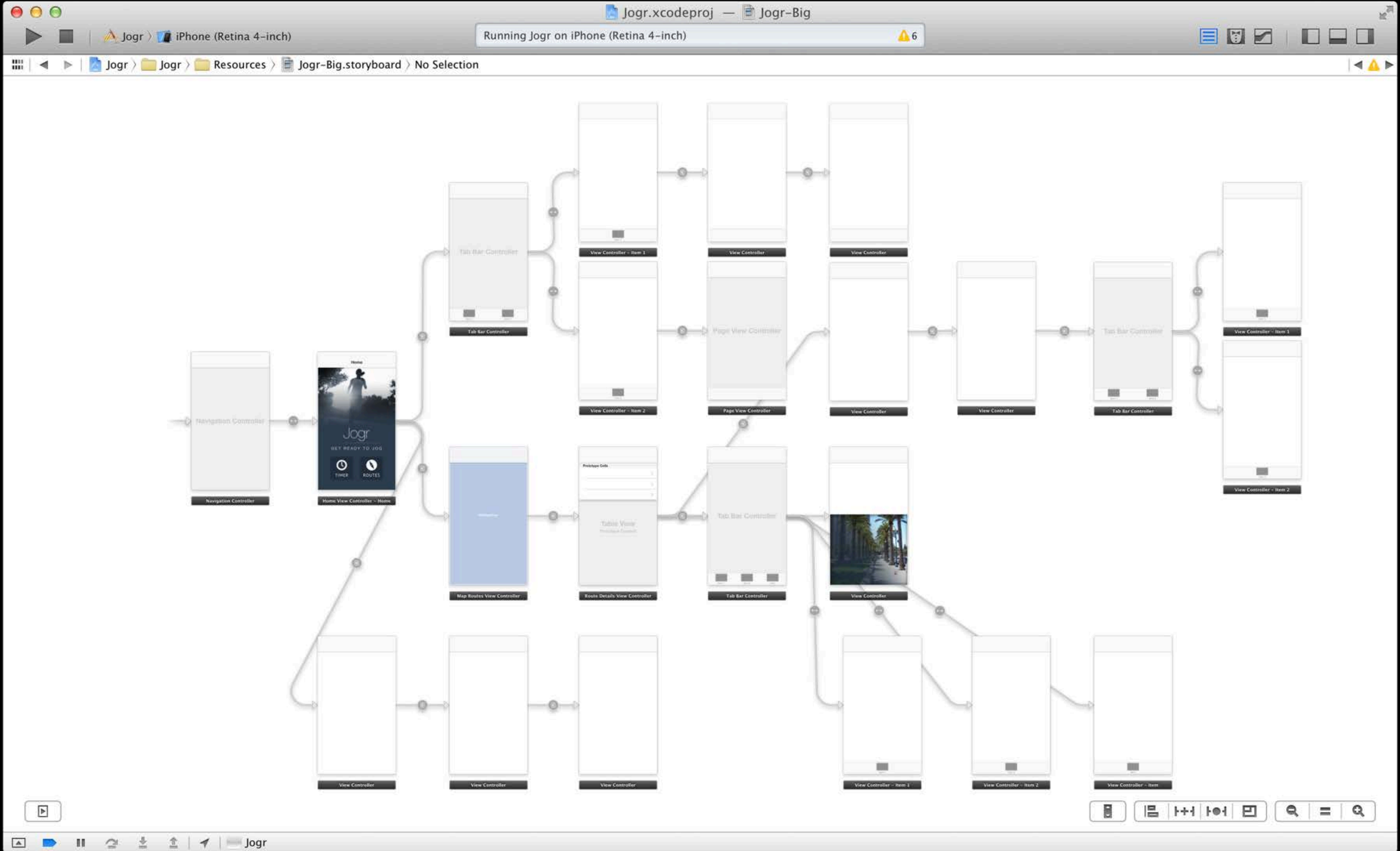
–performSegueWithIdentifier:sender:

- Initiates the segue with the specified identifier from the view controller's storyboard file

–prepareForSegue:sender:

- Notifies the view controller that a segue is about to be performed





Account Sign In



Username

Password

Cancel Sign In



Instantiating Storyboards

UIStoryboard

Instantiating Storyboards

UIStoryboard

`+storyboardWithName:bundle:`

Instantiating Storyboards

UIStoryboard

`+storyboardWithName:bundle:`

- Creates and returns a storyboard object

Instantiating Storyboards

UIStoryboard

`+storyboardWithName:bundle:`

- Creates and returns a storyboard object

`-instantiateInitialViewController`

Instantiating Storyboards

UIStoryboard

`+storyboardWithName:bundle:`

- Creates and returns a storyboard object

`-instantiateInitialViewController`

- Instantiates and returns the initial view controller

Instantiating Storyboards

UIStoryboard

`+storyboardWithName:bundle:`

- Creates and returns a storyboard object

`-instantiateInitialViewController`

- Instantiates and returns the initial view controller

`-instantiateViewControllerWithIdentifier:`

Instantiating Storyboards

UIStoryboard

+storyboardWithName:bundle:

- Creates and returns a storyboard object

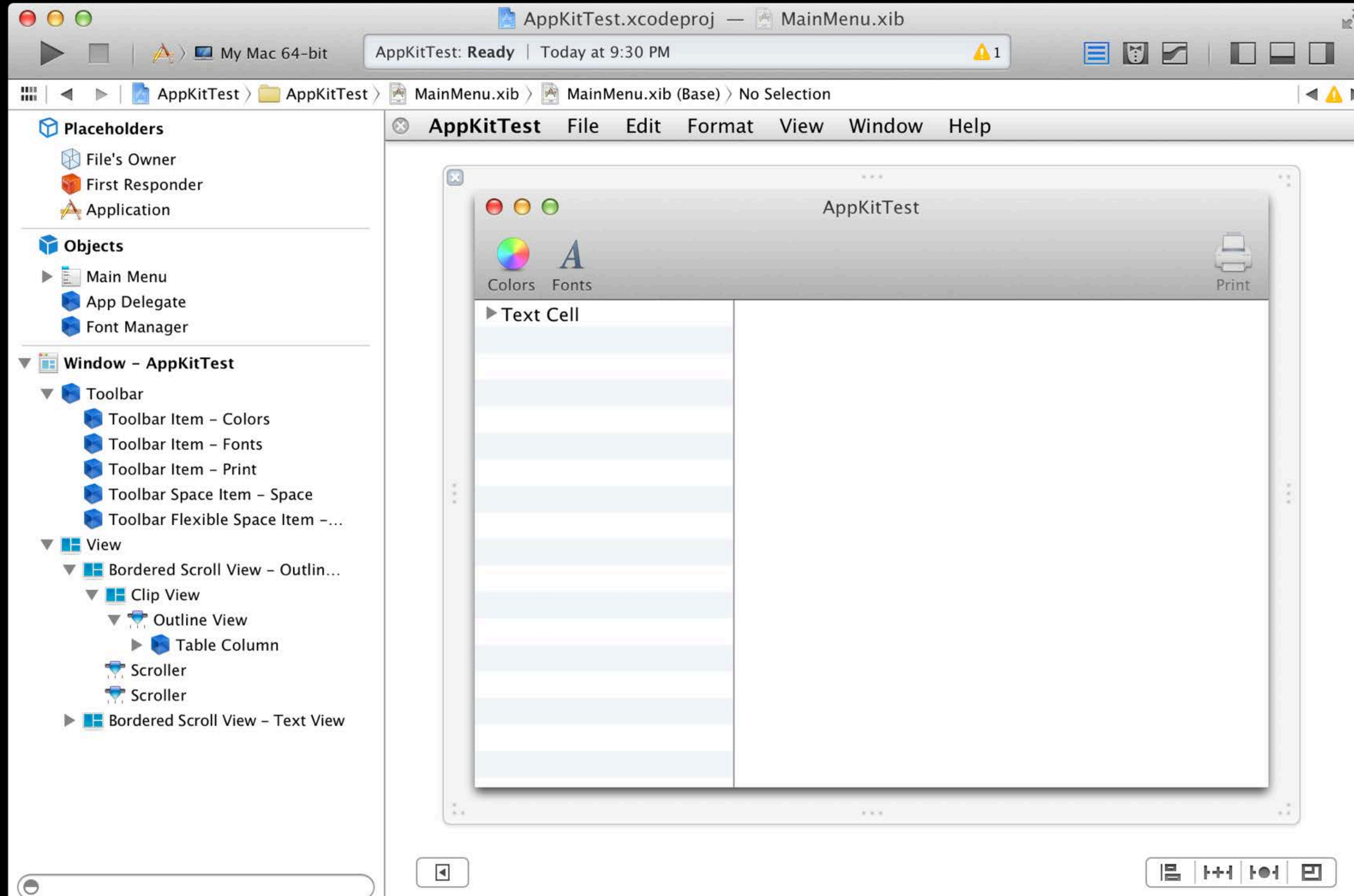
-instantiateInitialViewController

- Instantiates and returns the initial view controller

-instantiateViewControllerWithIdentifier:

- Instantiates and returns the initial view controller with the specified identifier

XIB Files



NSBundle and UINib

- Load nibs from disk once
- Instantiate nibs from memory
- Minimizes overhead

NSBundle and UINib

- Load nibs from disk once
- Instantiate nibs from memory
- Minimizes overhead

	Apple
	Pear
	Cherry
	Strawberry
	Pineapple
	Orange
	Lemon

More Information

Dave DeLong

App Frameworks and Developer Tools Evangelist
delong@apple.com

Documentation

Mac OS X Human Interface Guidelines
<http://developer.apple.com/ue>

Interface Builder Help

https://developer.apple.com/library/ios/#recipes/xcode_help-interface_builder/_index.html

Apple Developer Forums

<http://devforums.apple.com>

Related Sessions

Xcode Core Concepts

Mission
Tuesday 10:15AM

Taking Control of Auto Layout in Xcode 5

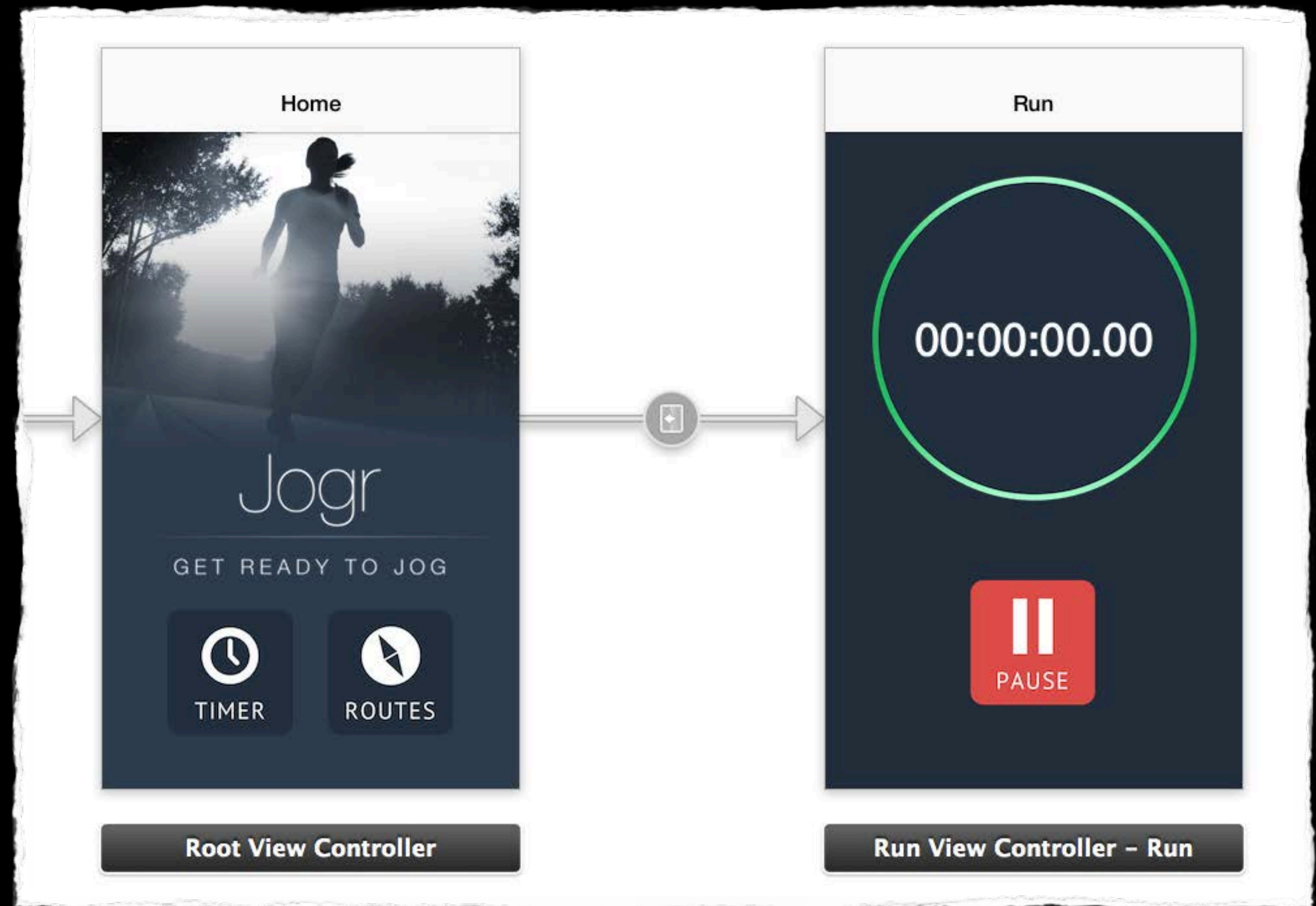
Presidio
Wednesday 10:15AM

Labs

Interface Builder Lab	Tools Lab B Wednesday 2:00PM	
Interface Builder Lab	Tools Lab B Thursday 9:00AM	

Summary

- Create a simple project
- Work with storyboards
- Connect actions and outlets
- The importance of delegates and data sources
- Manually invoke segues
- Load storyboards in code



 WWDC2013