



Mobile Engineering

Day 01

Getting Started & Basic Controls

Tom Crawford
moveablebytes.com
@movebytes @thcrawford

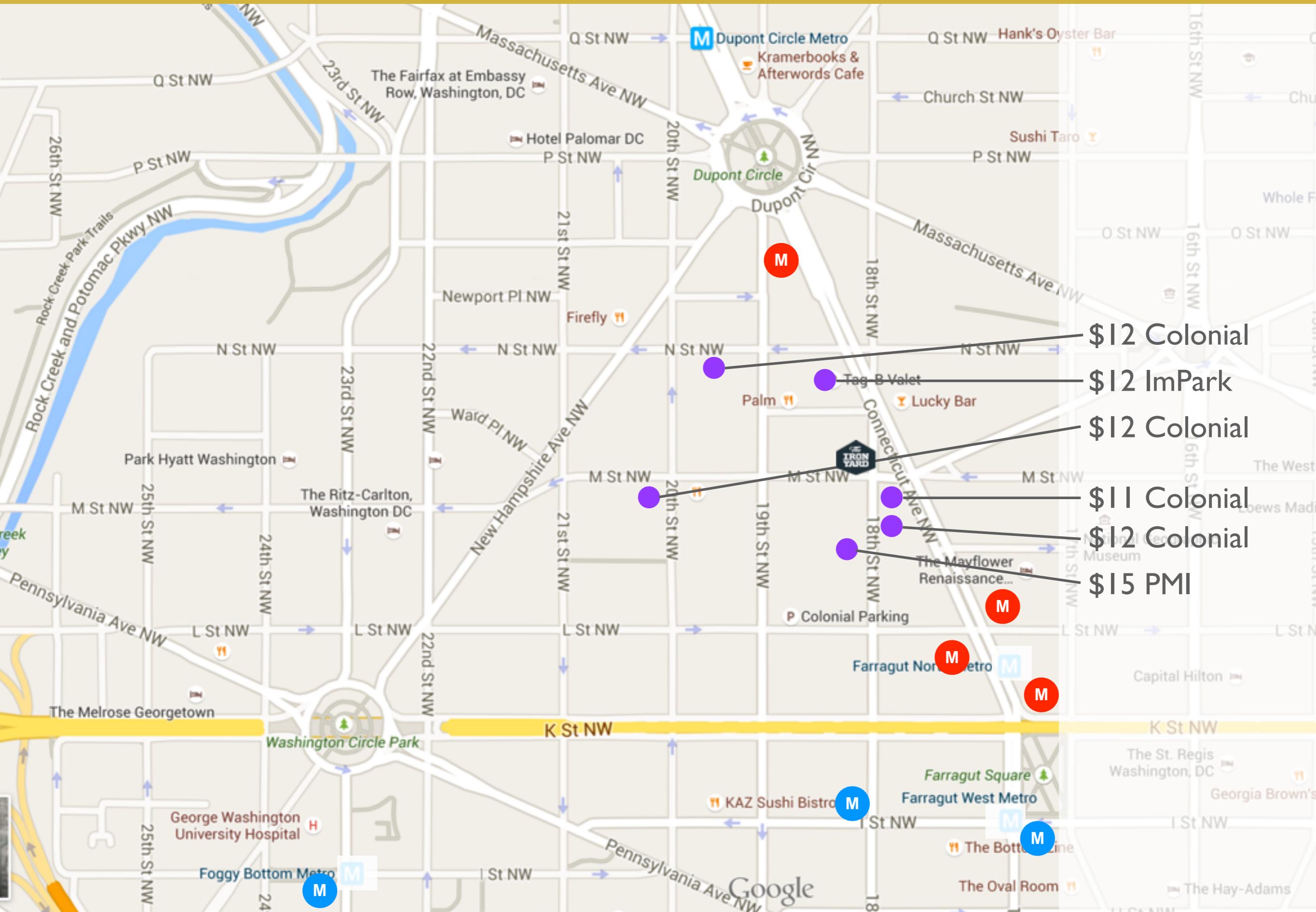
Welcome!

Excited?

Nervous?

Logistics

Location & Parking



Rough Class Schedule

Week Topic
1-4 iOS Basics
5-7 Swift & Review
8-9 Focused Topics
10-12 Final Project

General Daily Schedule

Time	Topic
9:00am -	Class
10:15am -	Break
10:30am -	Class
Noon -	Lunch
1:00pm -	Lab/Homework

Class Structure

A mix of

...Lecture/Slides

....Code Along

...Group Lab Assignments

....Individual Lab Assignments

...Homework Assignments/Reading/Videos

....Quizzes

Pacing

Want faster or slower? Tell me
Have a question? Ask it in the moment!
We may table it (write it up on the board)
Don't understand? Ask your neighbor, ask me

Today

✓ Logistics

Introductions

Xcode Intro

Version Control

Interface Builder

Controls - Labels & Buttons

Code Basics

Controls - Text Fields

Variables & Math

Life Cycle

Introductions

About You

- ▶ What's your name?
- ▶ What were you doing 3 weeks ago?
- ▶ What's your programming experience?
- ▶ What do you hope to get out of the experience?
- ▶ What do you hope to do when the course is over?

About Me



iPad 8:28 AM 55%

VizChef™

CROUTONS

Don't know what to do with bread that's a day or two old? Make croutons! Leftover Italian bread or French loaves and baguettes provide you with nearly everything you need to add crunch, substance, and flavor to soup >

19m + 10m = 29m
Author: Tom Crawford

Ingredients: Step 2

1 French Baguette

Equipment: Step 2

1 Cutting Board
1 Serrated/Bread Knife

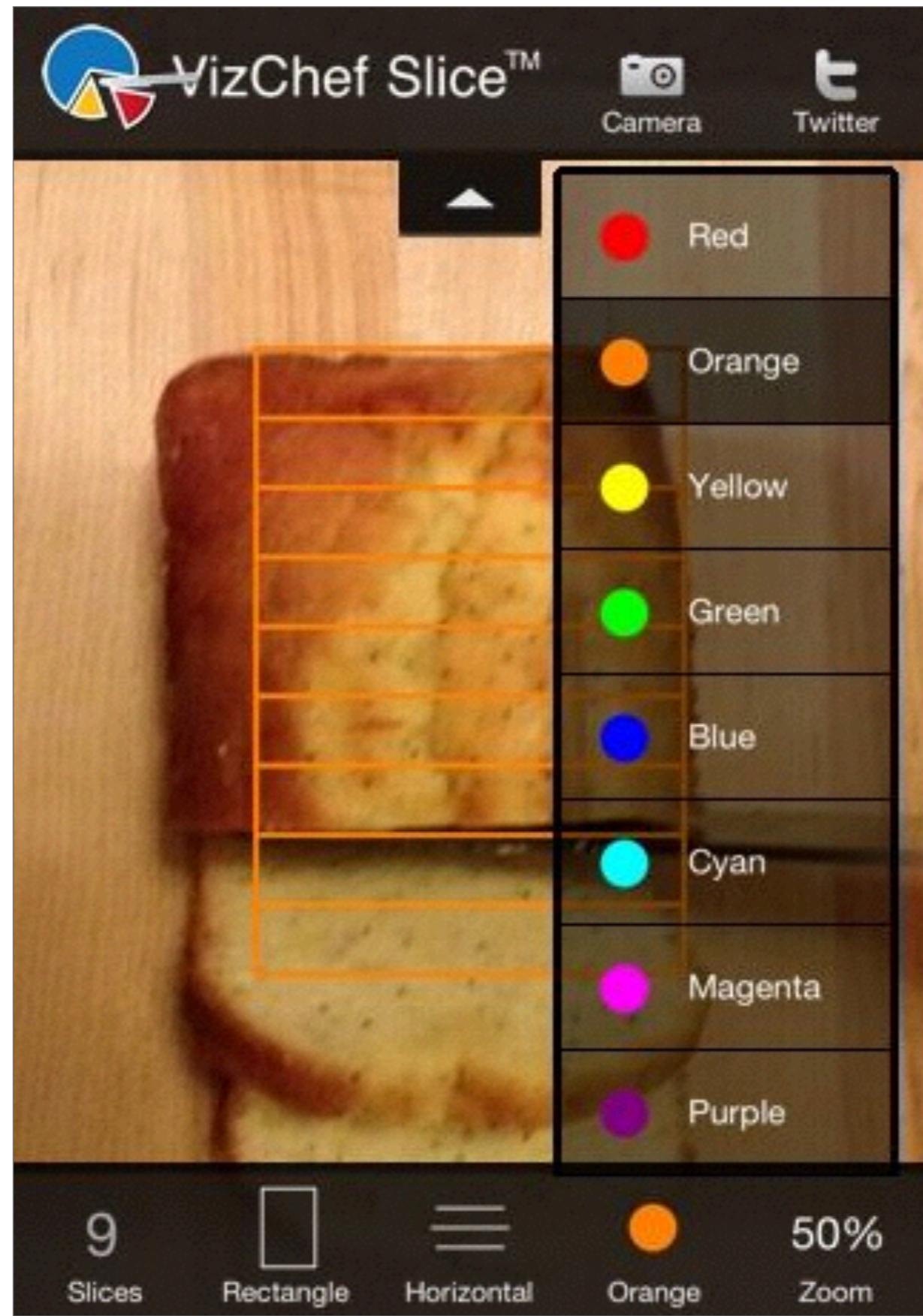
STEP 2

Slice a crusty baguette into 1/4 inch to 3/8 slice, be sure to be as consistent as possible in the slices

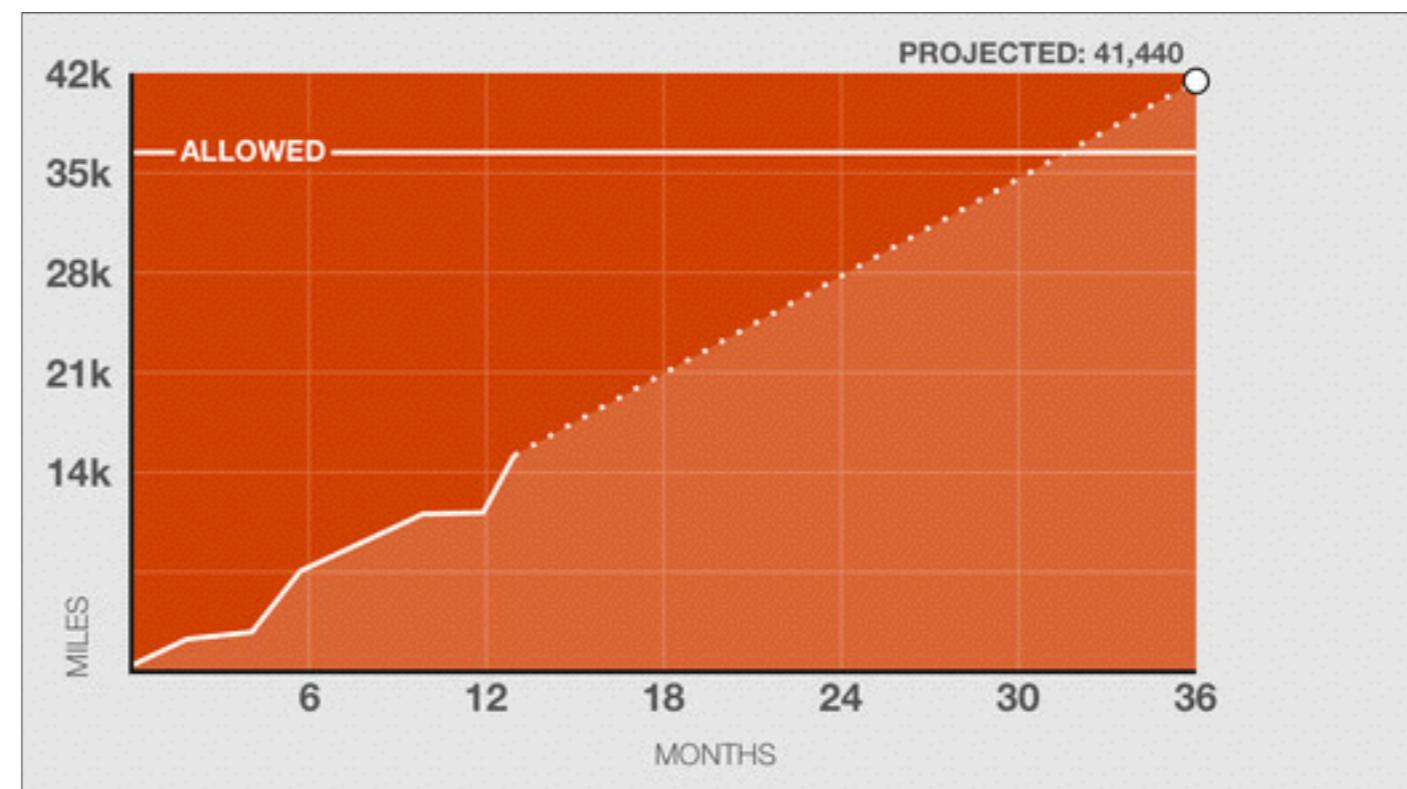
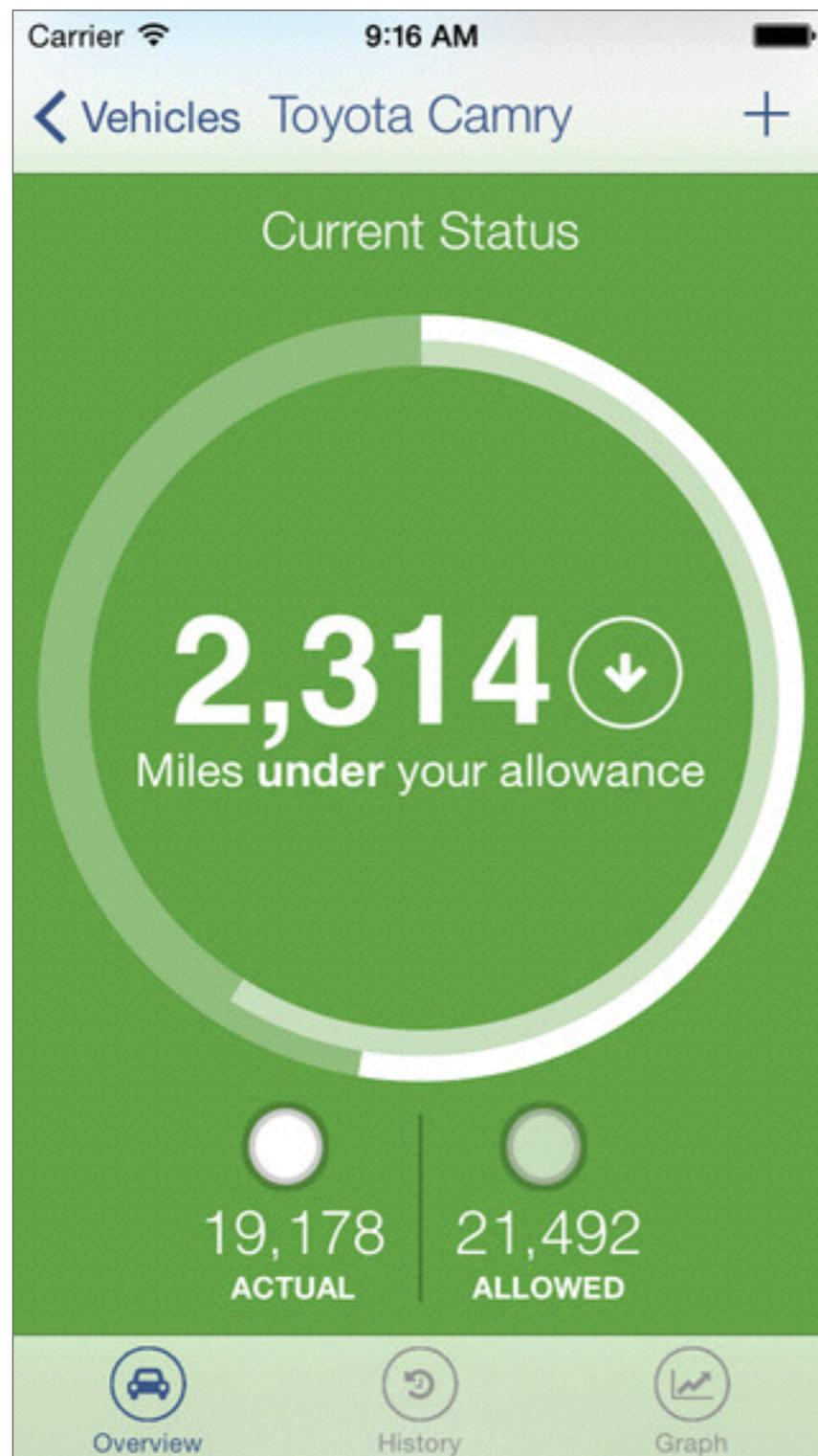
3m



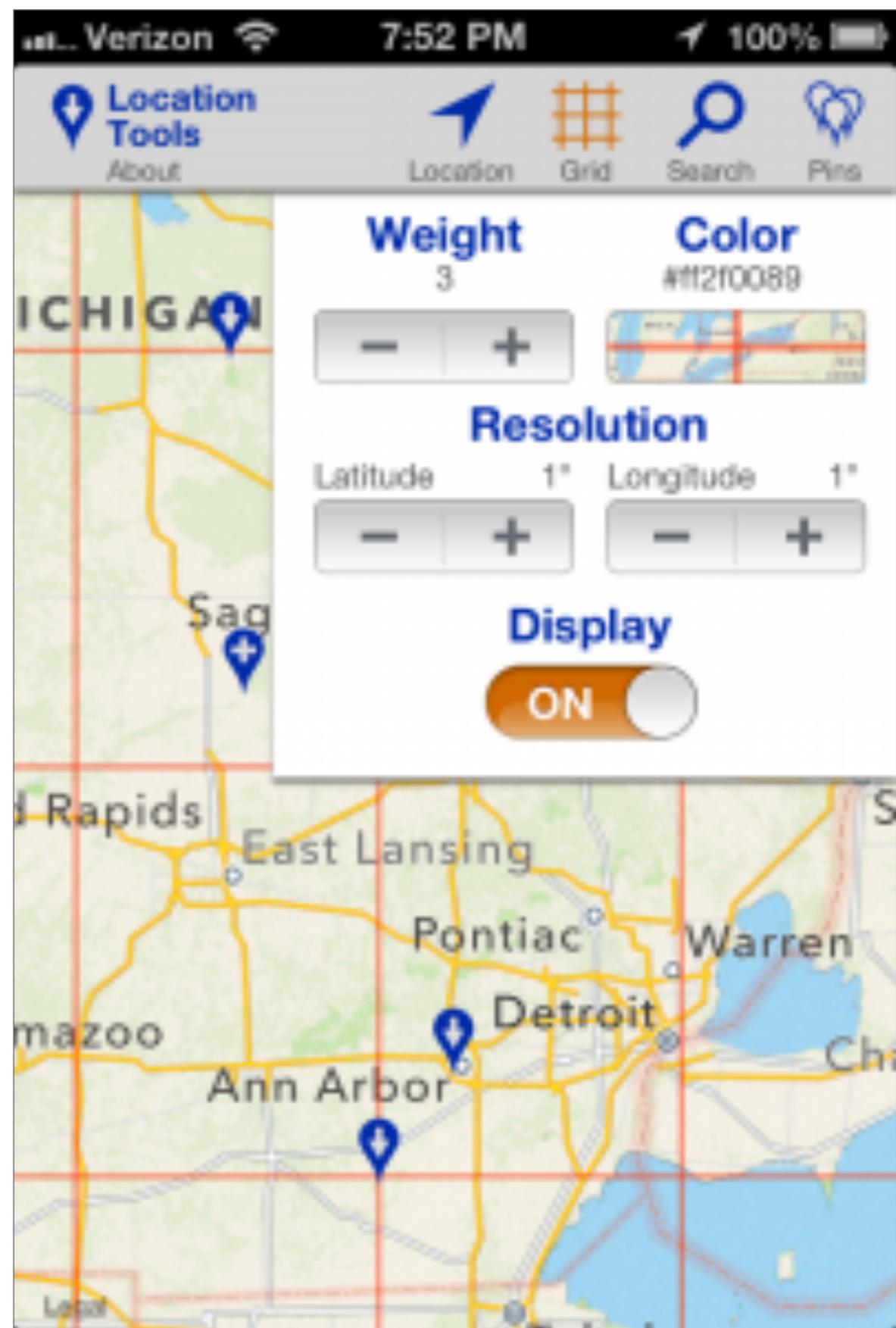
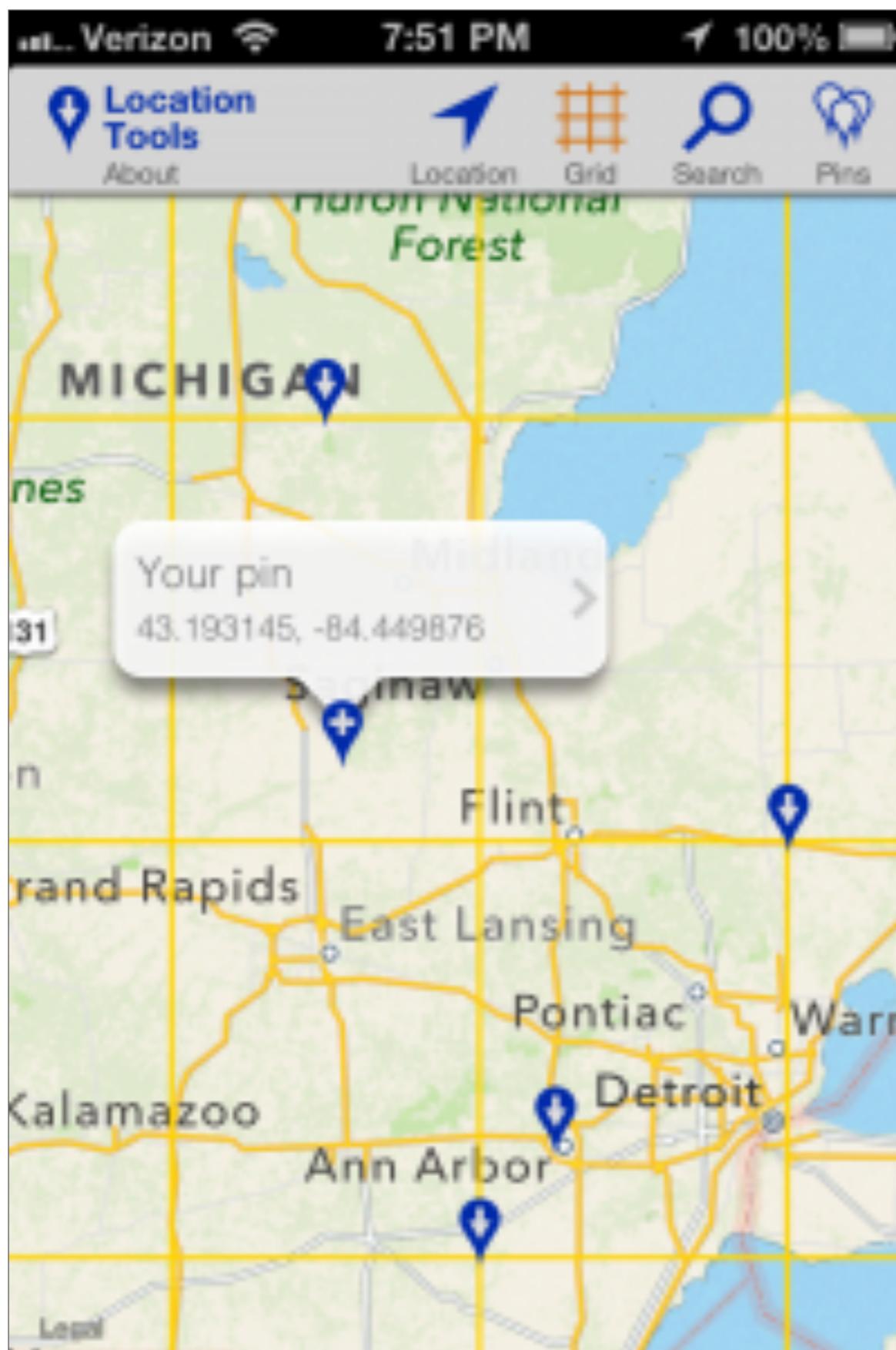
VizChef Slice



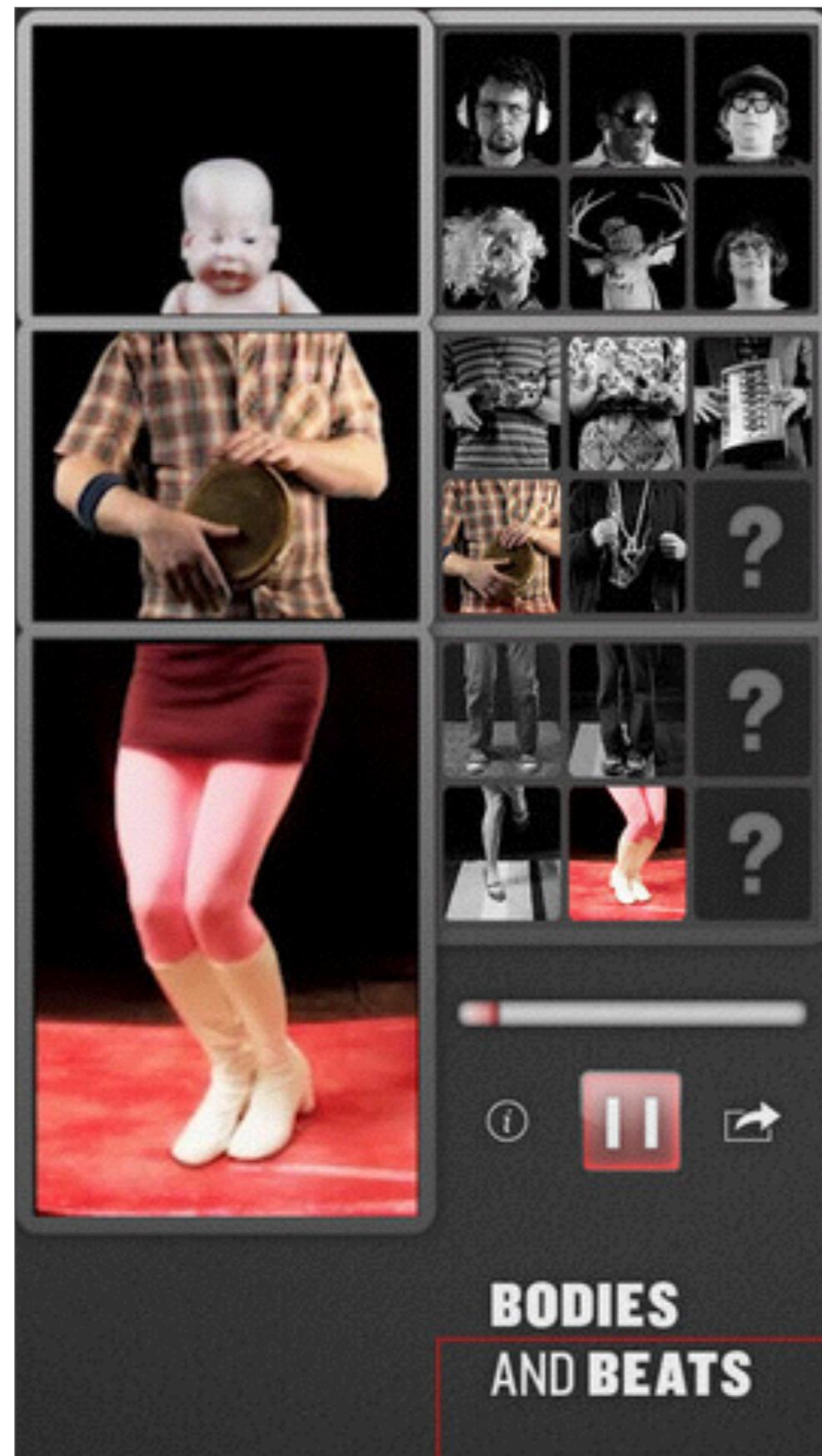
LeaseCrunch



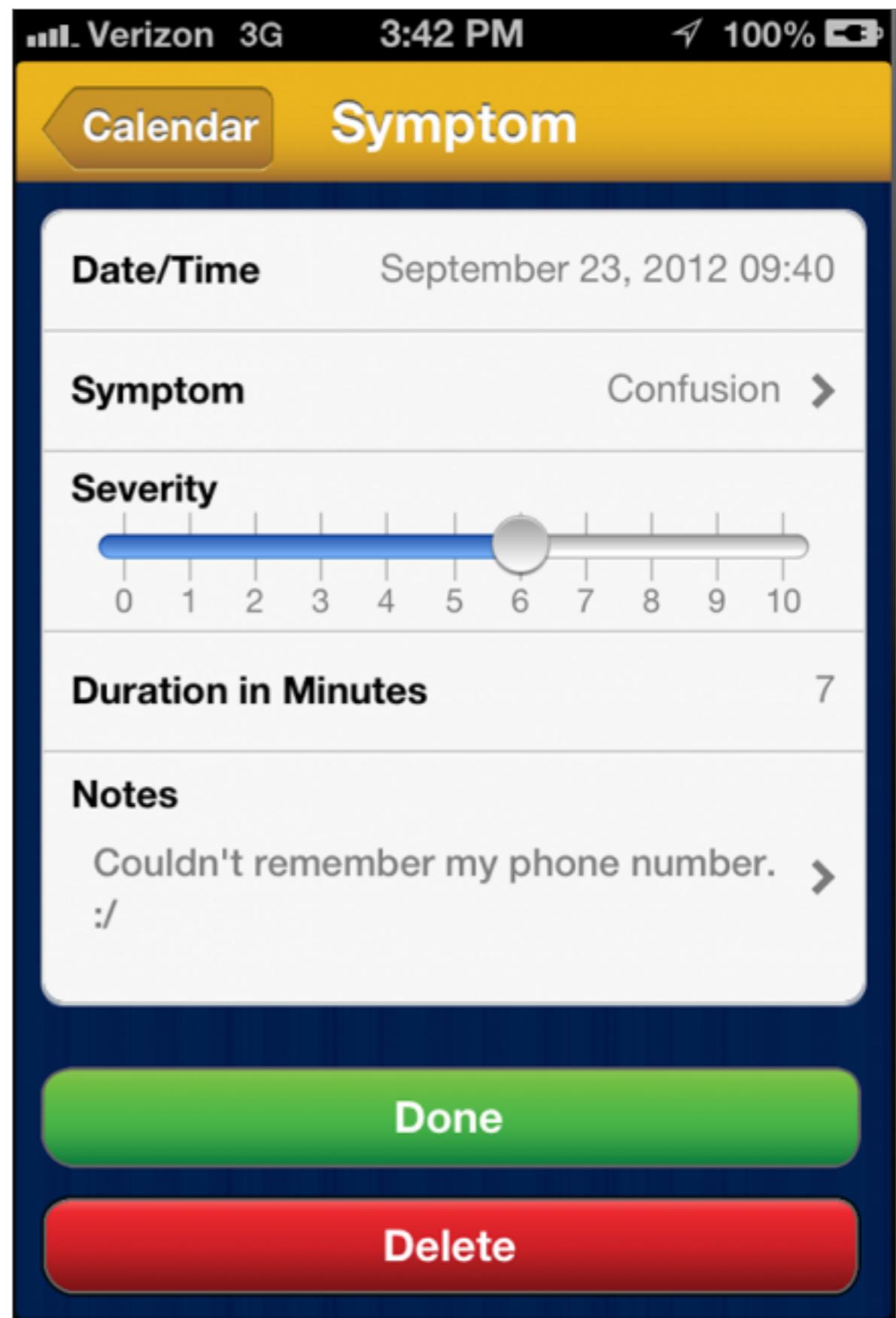
Location Tools



Bodies and Beats



Return2Play

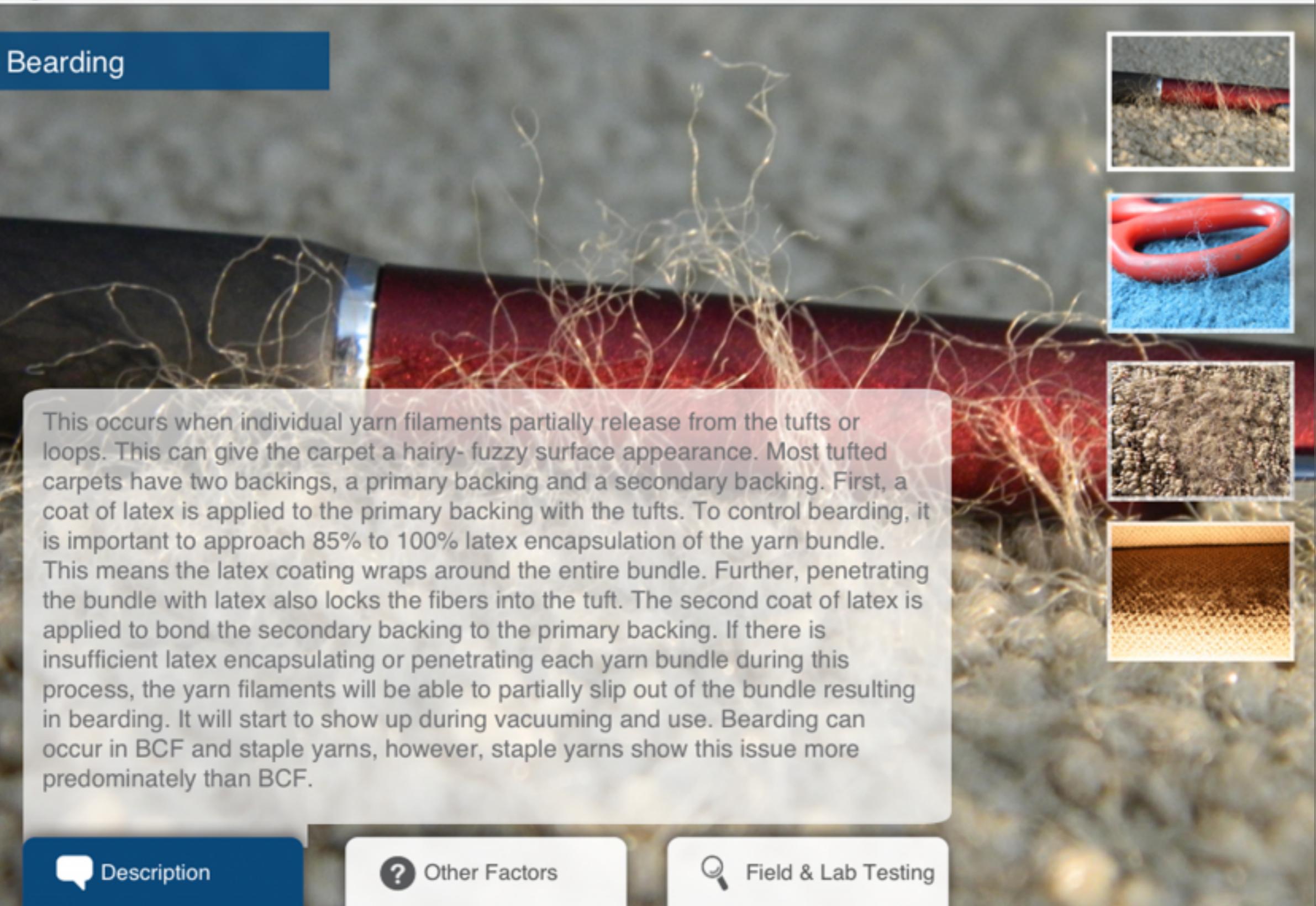


Floor Detective



Aa \$
Dictionary Inspectors Consult Lab Tests Search

Bearding



This occurs when individual yarn filaments partially release from the tufts or loops. This can give the carpet a hairy-fuzzy surface appearance. Most tufted carpets have two backings, a primary backing and a secondary backing. First, a coat of latex is applied to the primary backing with the tufts. To control bearding, it is important to approach 85% to 100% latex encapsulation of the yarn bundle. This means the latex coating wraps around the entire bundle. Further, penetrating the bundle with latex also locks the fibers into the tuft. The second coat of latex is applied to bond the secondary backing to the primary backing. If there is insufficient latex encapsulating or penetrating each yarn bundle during this process, the yarn filaments will be able to partially slip out of the bundle resulting in bearding. It will start to show up during vacuuming and use. Bearding can occur in BCF and staple yarns, however, staple yarns show this issue more predominately than BCF.






 Description

 Other Factors

 Field & Lab Testing

Happy Hour Deals

Carrier Wi-Fi 7:16 PM

DAY Today TIME Any TYPE Any AREA 5 Miles

Casey's Tavern
\$1 off beer, wine, liquor, and select appetizers

3PM - 6PM BEER WINE LIQUOR FOOD
1.4 miles Tuesday

Eightball Saloon
\$1 select bottled beer, \$1.75 well drinks, and free pool

3PM - 2AM BEER LIQUOR
4,723 feet It's On!

T.G.I. Friday's
1/2 off select appetizers, and daily discounts on beer, wine, and mixed drinks

3PM - 7PM BEER LIQUOR FOOD
2.3 miles It's On!

Gratzi
\$3 domestic beer, \$4 import beer, \$5 select glasses of wine, and 1/2 off select appetizers at the bar

3PM - 6PM BEER WINE FOOD
5,225 feet Tuesday

Los Amigos
1/2 off regular drinks

3PM - 6PM BEER LIQUOR DEAL
2.9 miles Tuesday

74 HappyHours Map View Update

Carrier Wi-Fi 7:21 PM

DAY Today TIME Any TYPE Any AREA 5 Miles

A map of Ann Arbor, Michigan, highlighting various happy hour locations with red pins. The map shows the University of Michigan Health System, University of Michigan, Palmer Field, North Central Kerrytown, and surrounding neighborhoods like Broadmoor, Plymouth, and Broadway. Streets labeled include Main St, Daniel St, Fuller St, N 4th Ave, E Huron St, Washington St, S State St, S University, Hill St, and Packard St.

74 HappyHours Map View Update

Upcoming Meetups

Upcoming Meetups

- ▶ DC Thu 10/1 - Cocoaheads
- ▶ DC Wed 10/14 - MDC User Acquisition
- ▶ DC Tue 10/20 - DCTech Demos
- ▶ DC Wed 10/21 - MDC Mixer
- ▶ DC Mon 10/26 - UXDC
- ▶ DC Thu 11/5 - Cocoaheads
- ▶ DC Tue 11/17 - DCTech Demos
- ▶ DC Wed 11/18 - MDC Mixer
- ▶ DC Thu 12/3 - Cocoaheads
- ▶ DC Wed 12/16 - MDC Mixer

Getting Started

What I Expect About You

You've used a smart device before

You've used a computer before

(both preferably from Apple, but any is fine)

You're somewhat logical & structured

You're a quick learner

What I Don't Expect

Knowledge of C or Objective-C

Previous Xcode experience

Previous programming experience

Or even

...a comp-sci major

...a genius

Quiz

Xcode

What is Xcode?

- ▶ Xcode is the software we use to develop 99.5% of an app for iOS
- ▶ It can also be used to develop software for Mac & Safari (and other things too)

Xcode Project Templates

Choose a template for your new project:

iOS

Application



Framework & Library

Other

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

Xcode Initial Project Setup

Choose options for your new project:

Product Name:

Organization Name:

Organization Identifier:

Bundle Identifier:

com.viznetwork.ProductName

Language:

 ▼

Devices:

 ▼

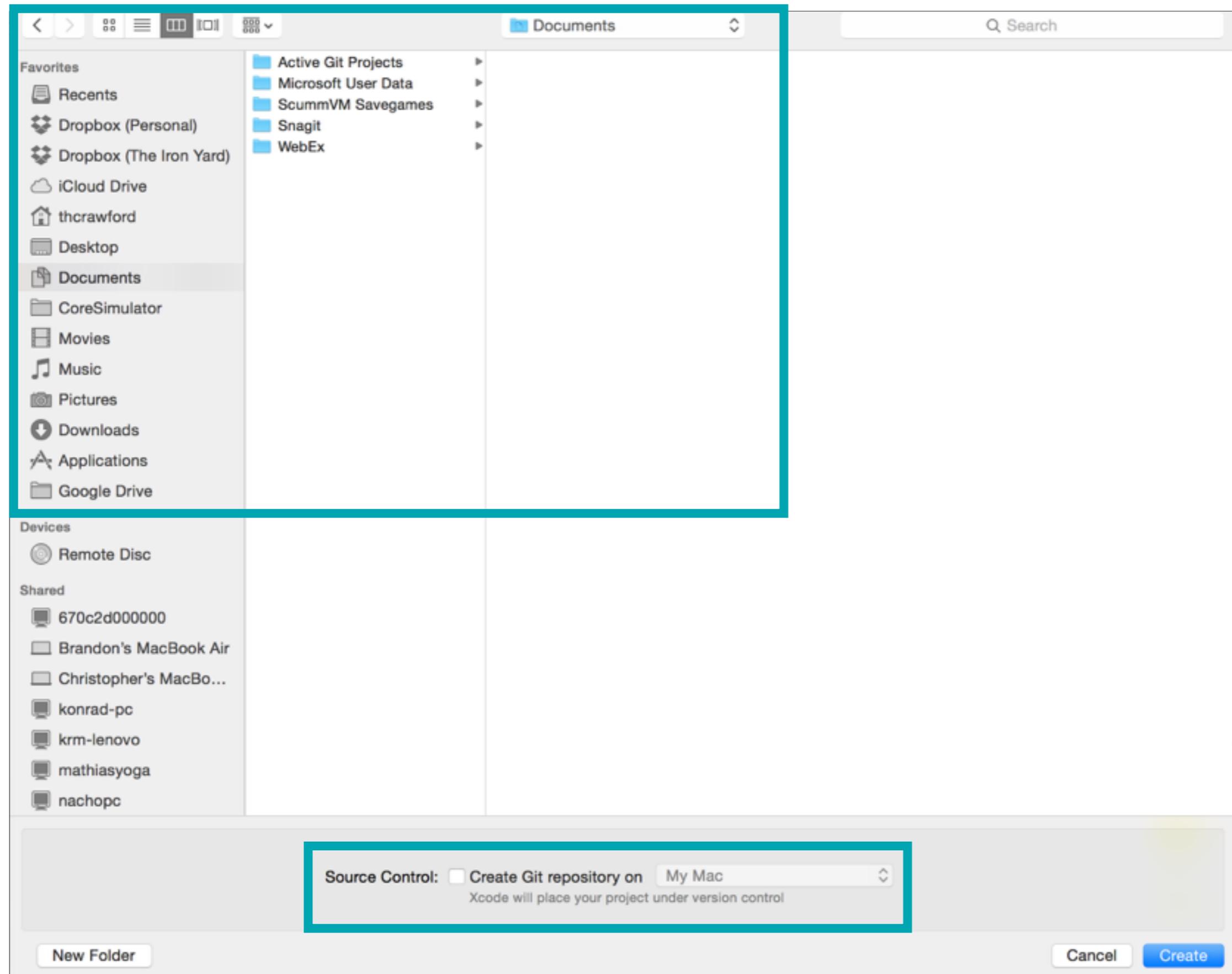
Use Core Data

Cancel

Previous

Next

Xcode Project Location



Xcode App Targets

The screenshot shows the Xcode interface with the "Sample" project selected in the left sidebar. The "General" tab is active in the main pane, displaying various configuration options for the "Sample" target.

Identity section:

- Bundle Identifier: com.viznetwork.Sample
- Version: 1.0
- Build: 1
- Team: None

Deployment Info section:

- Deployment Target: 8.3
- Devices: Universal
- Main Interface: Main
- Device Orientation:
 - Portrait
 - Upside Down
 - Landscape Left
 - Landscape Right
- Status Bar Style: Default
 - Hide status bar

App Icons and Launch Images section:

- App Icons Source: AppIcon
- Launch Images Source: Use Asset Catalog
- Launch Screen File: LaunchScreen

Embedded Binaries section:

Add embedded binaries here

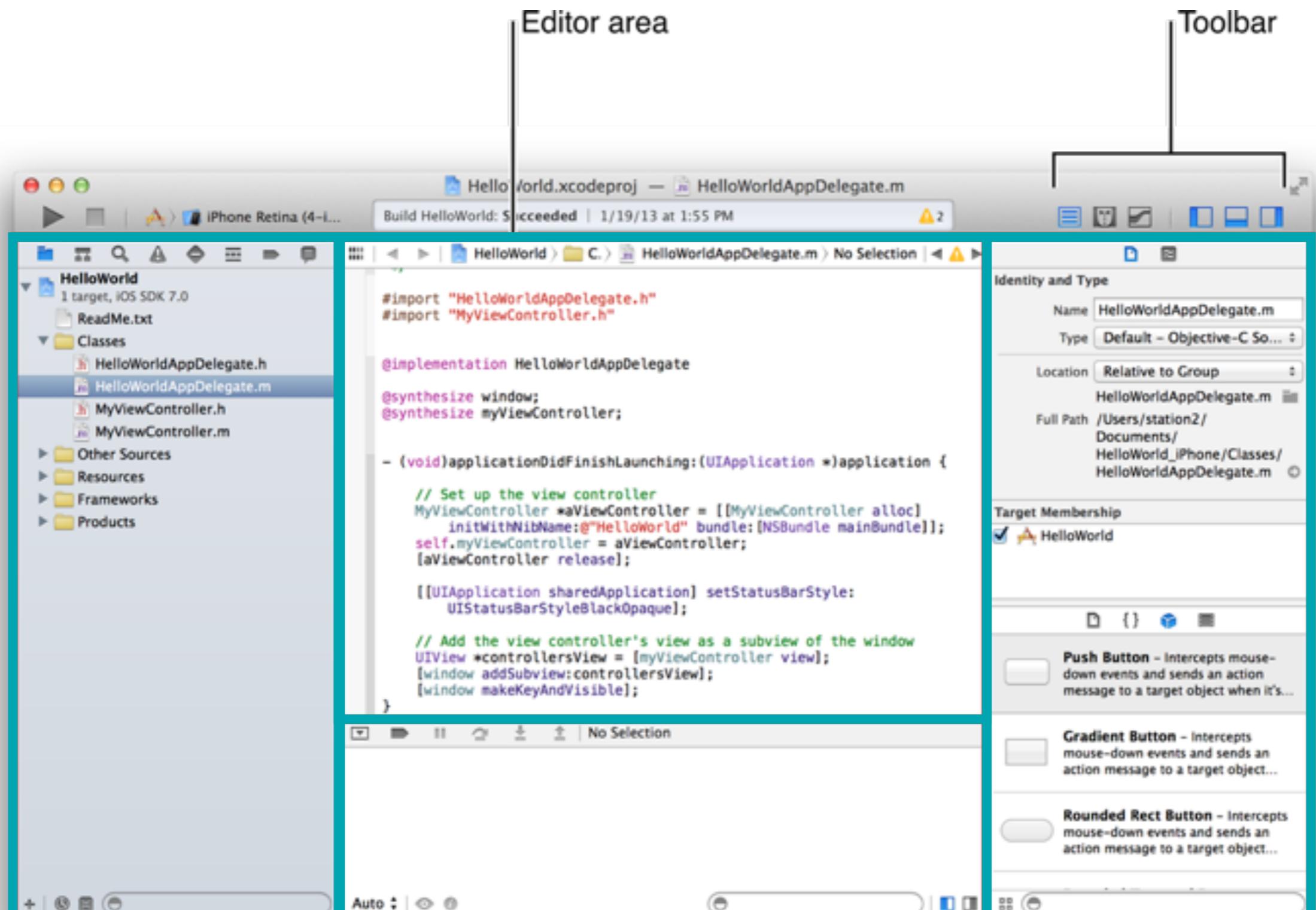
Right-hand pane (Identity and Type):

- Name: Sample
- Location: Absolute
- Containing directory: /Users/thcrawford/Dropbox (Personal)/Code Backup/ Sample and Test Apps/ Sample/Sample.xcodeproj
- Project Document
 - Project Format: Xcode 3.2-compatible
 - Organization: Thomas Crawford
 - Class Prefix:
- Text Settings
 - Indent Using: Spaces
 - Widths: Tab 4, Indent 4
 - Wrap lines: checked
- Source Control
 - Repository: --
 - Type: --
 - Current Branch: --
 - Version: --
 - Status: No changes
 - Location:

Bottom right sidebar icons (partial view):

- View Controller - A controller that supports the fundamental view-management model in iOS.
- Navigation Controller - A controller that manages navigation through a hierarchy of views.
- Table View Controller - A

Xcode Areas



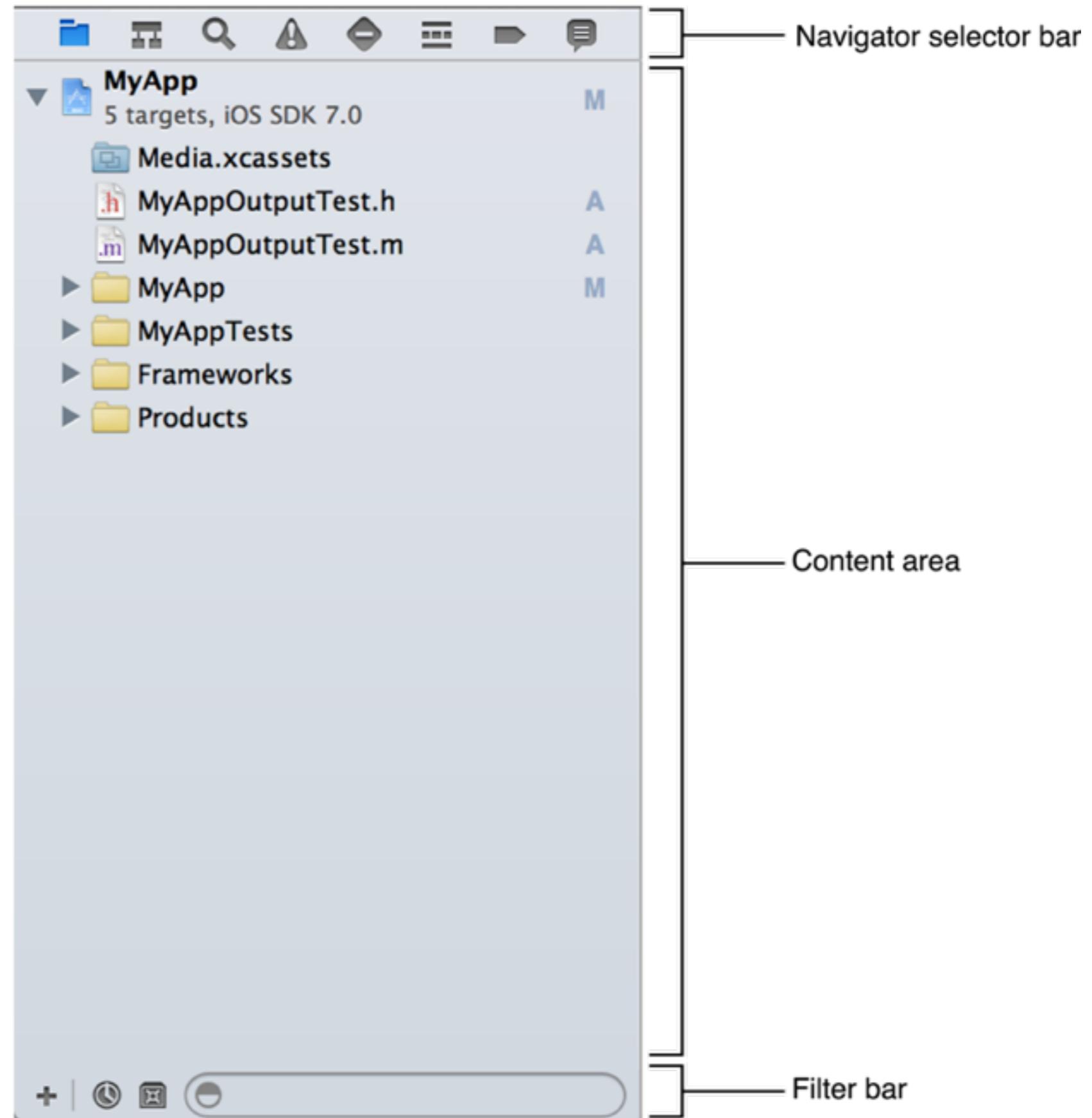
Navigator area

Debug area

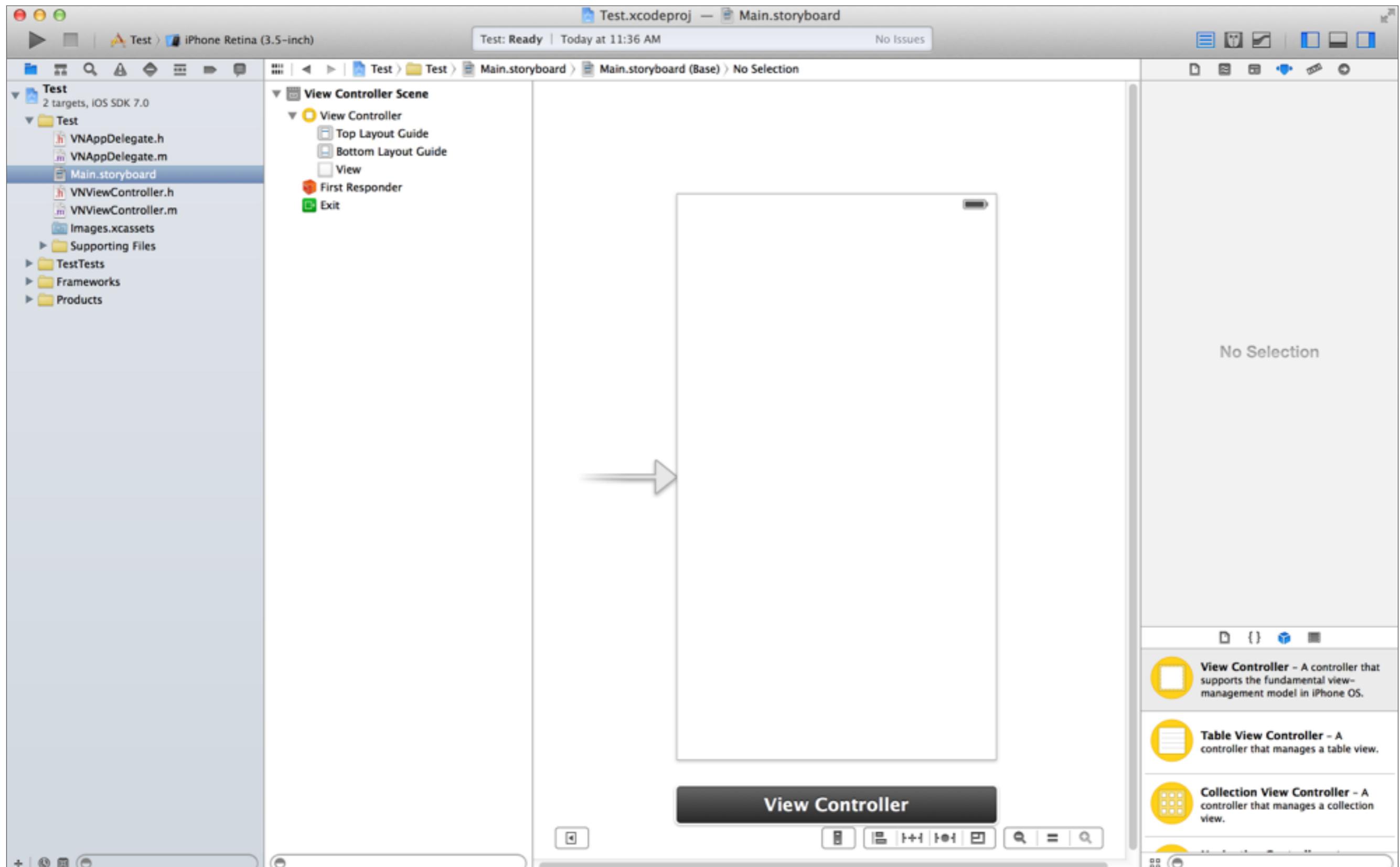
Utility area

Navigator Area

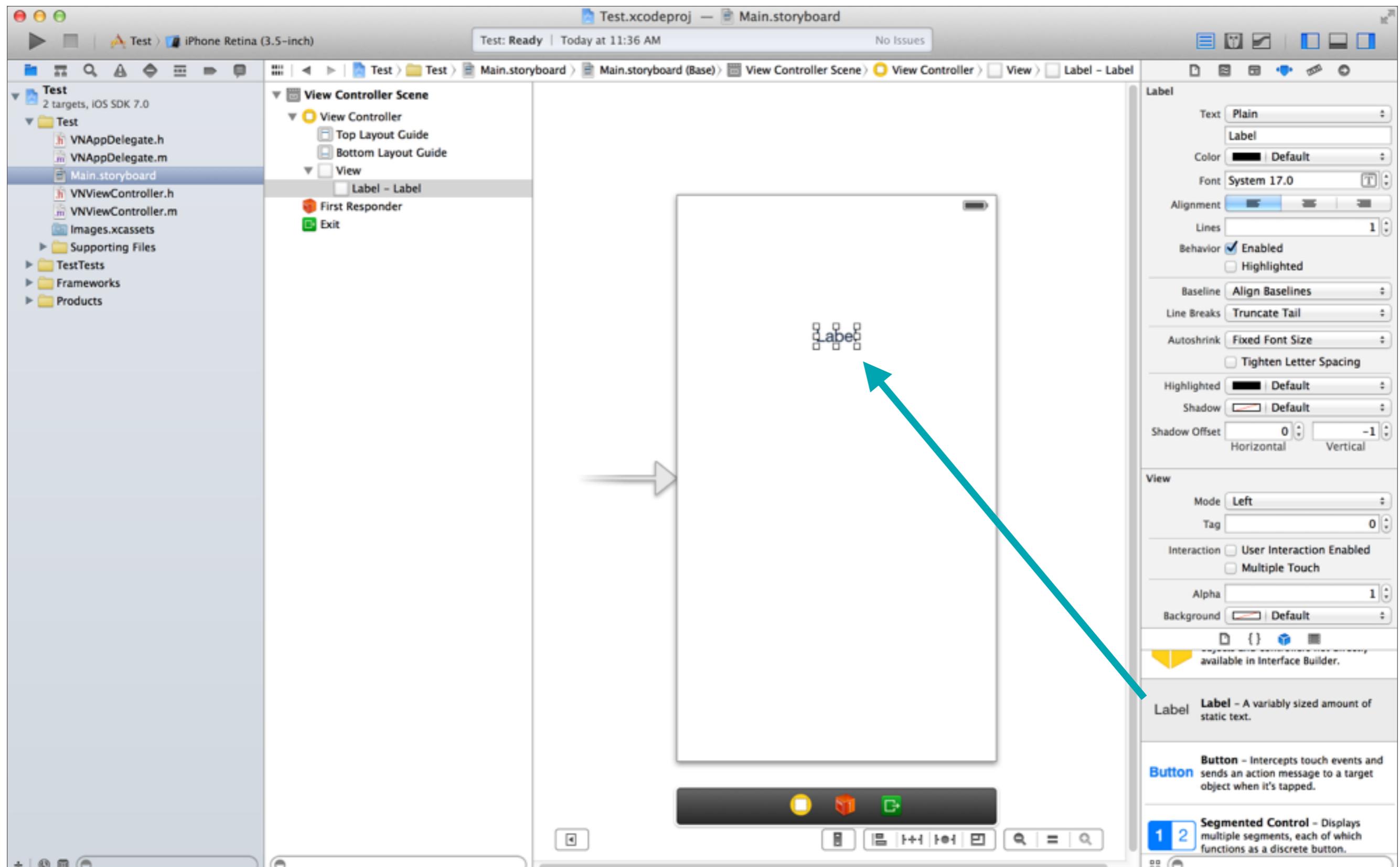
- ▶ All files
- ▶ Your order
- ▶ Your structure
- ▶ It has (almost) nothing to do with the actual file structure



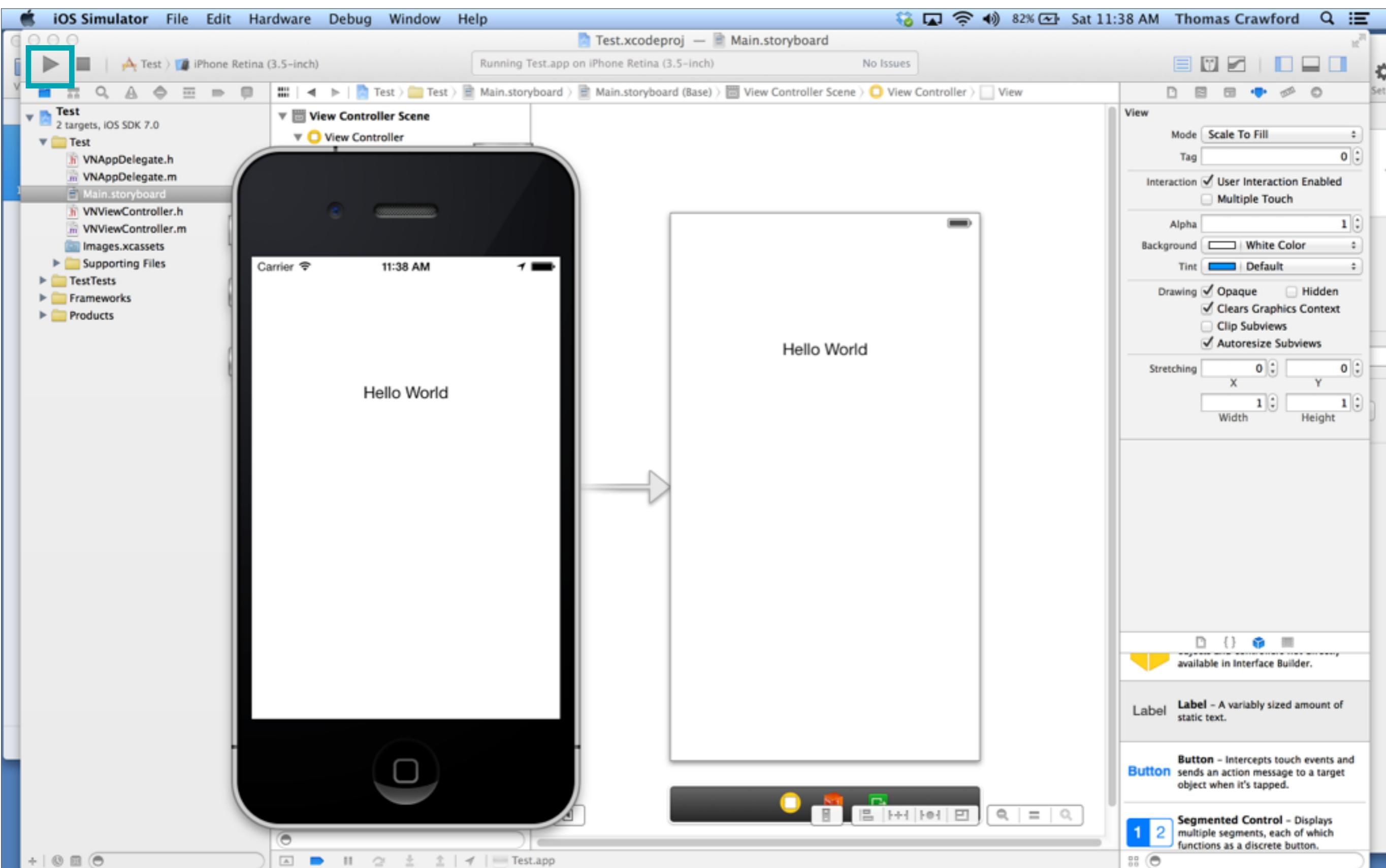
Storyboard



Storyboard Layout



The Simulator



What is the Simulator?

A way to TEST your app without loading it on a device

It's not perfect...

Can't test performance (laptop is faster)

Can't really test shake (dangerous on laptop)

Can't really test location (not well, anyway)

Can't test push notifications or in app purchase

or...or....or...

It's a simulator not an emulator

But can test sizes and (some) rotation

Helloworld

HelloWorld Instructions

1. Open XCode
2. Create a new Single View app called HelloWorld
3. Add a label and change it to Hello World!
4. Run the app

Bonus: Change the view background color

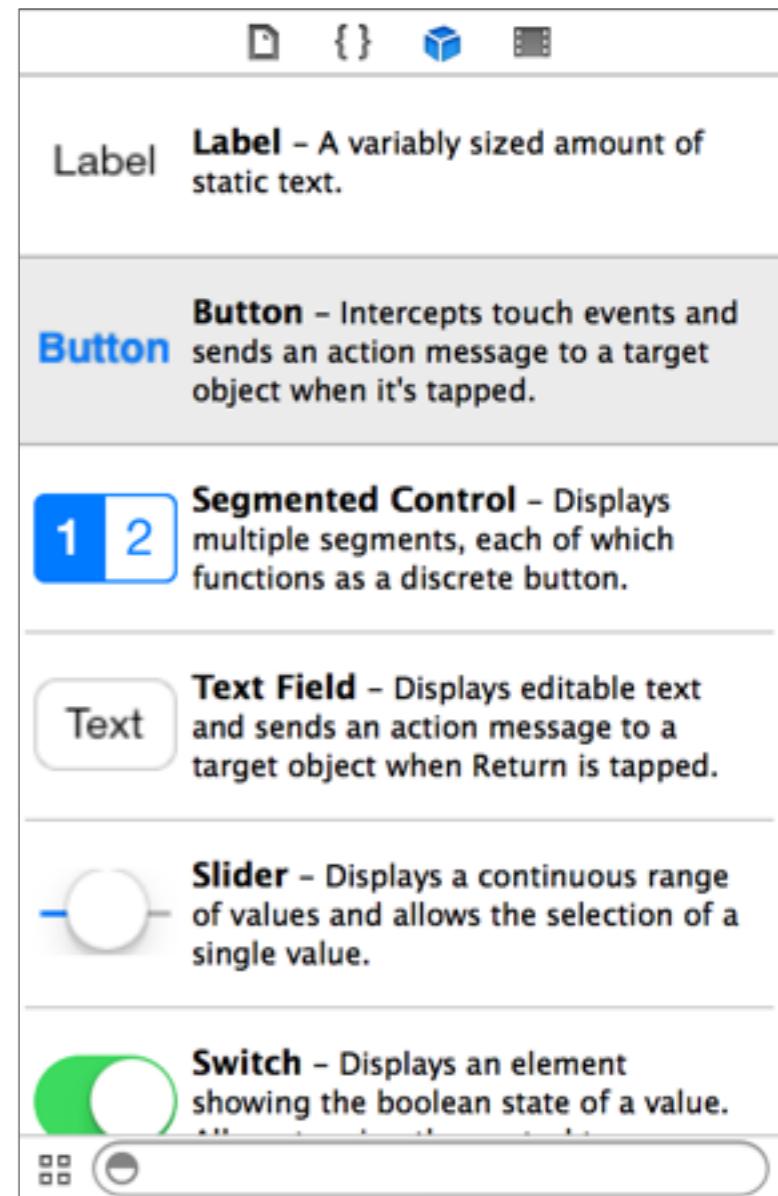
Congrats!!!

(without writing one line of code!)

Interface Builder (IB)

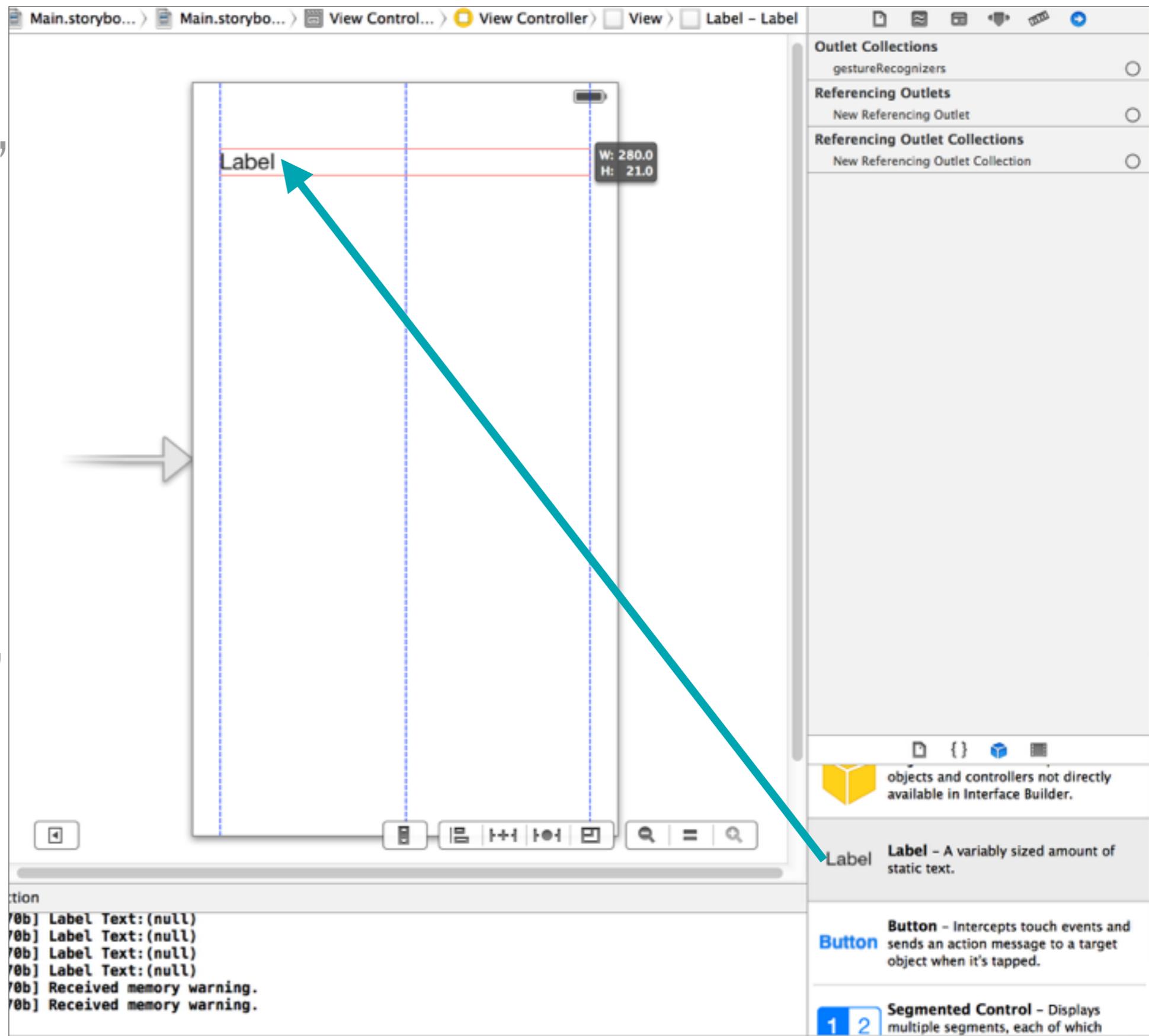
IB Object Library

Where you find all of the controls, gestures, and even view controllers that can be added to Interface Builder



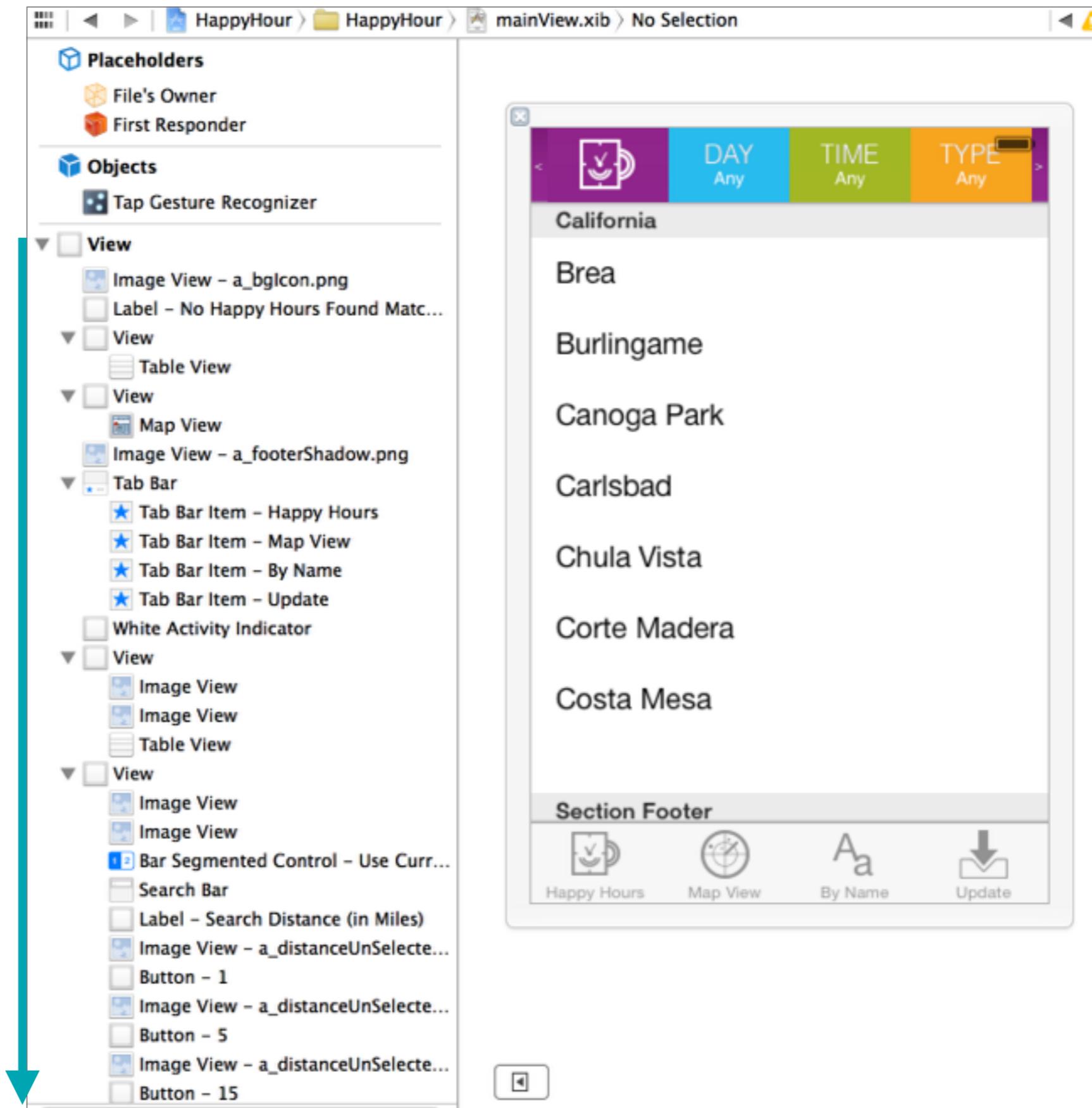
IB Object Alignment

When you drag & drop, IB provides guides set to Apple standards. You should follow them, but you won't. More design later...



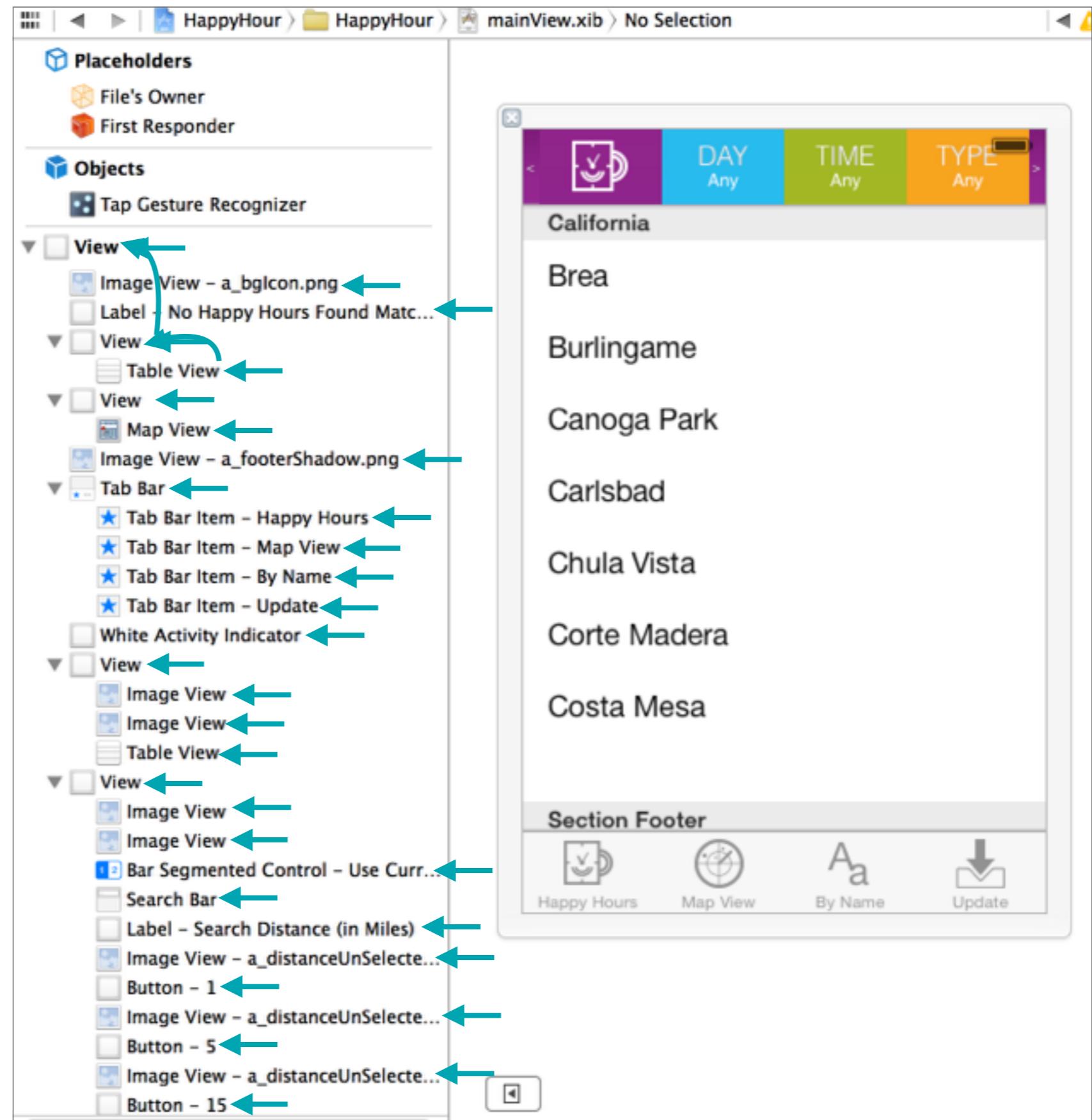
IB Order Matters

Objects further down the list appear on top of the items higher in the list
If they overlap on screen, the one on top gets first chance at the responder



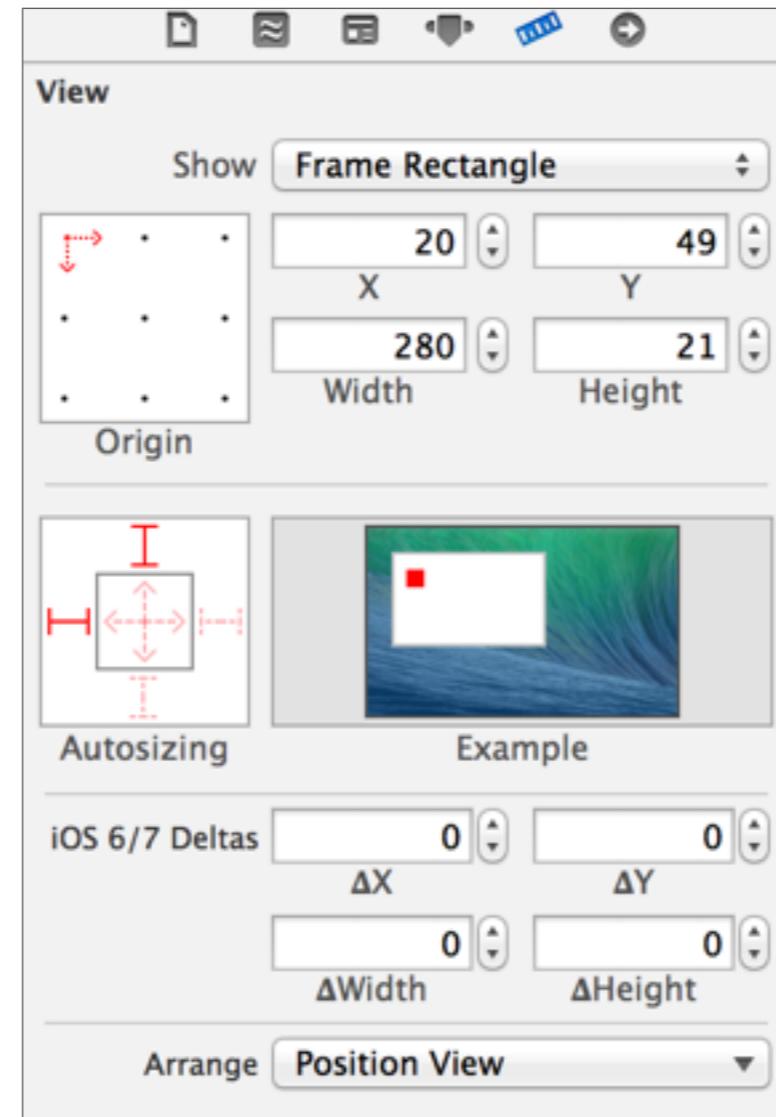
IB Hierarchy

- Everything's a view
- Views can be nested
- Each subview has only one parent view

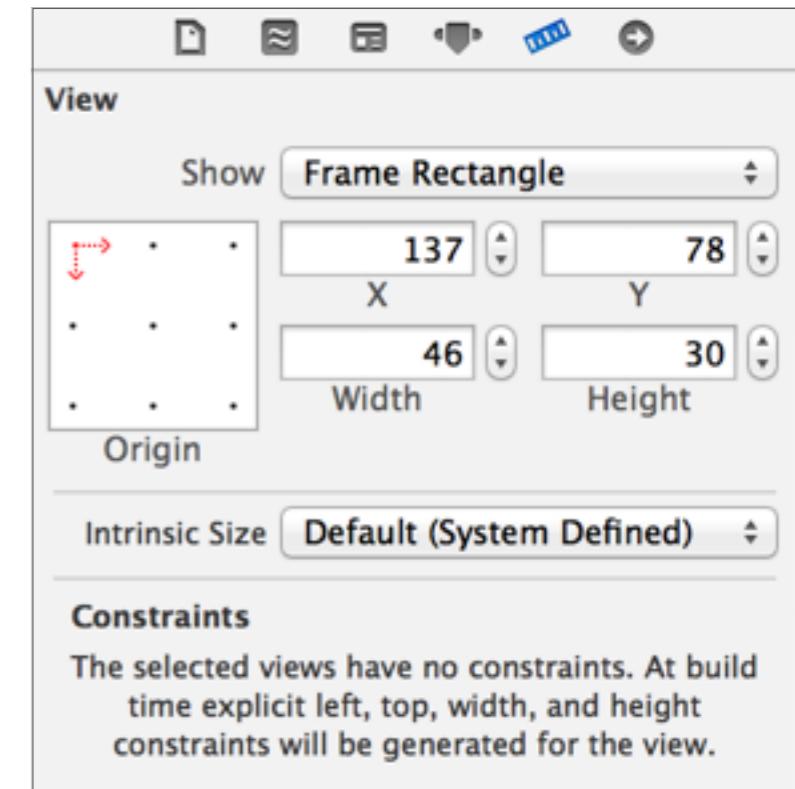


IB Hierarchy

Views are placed (x, y) and sized (width, height) in relationship to their parent, not the whole



Springs & Struts

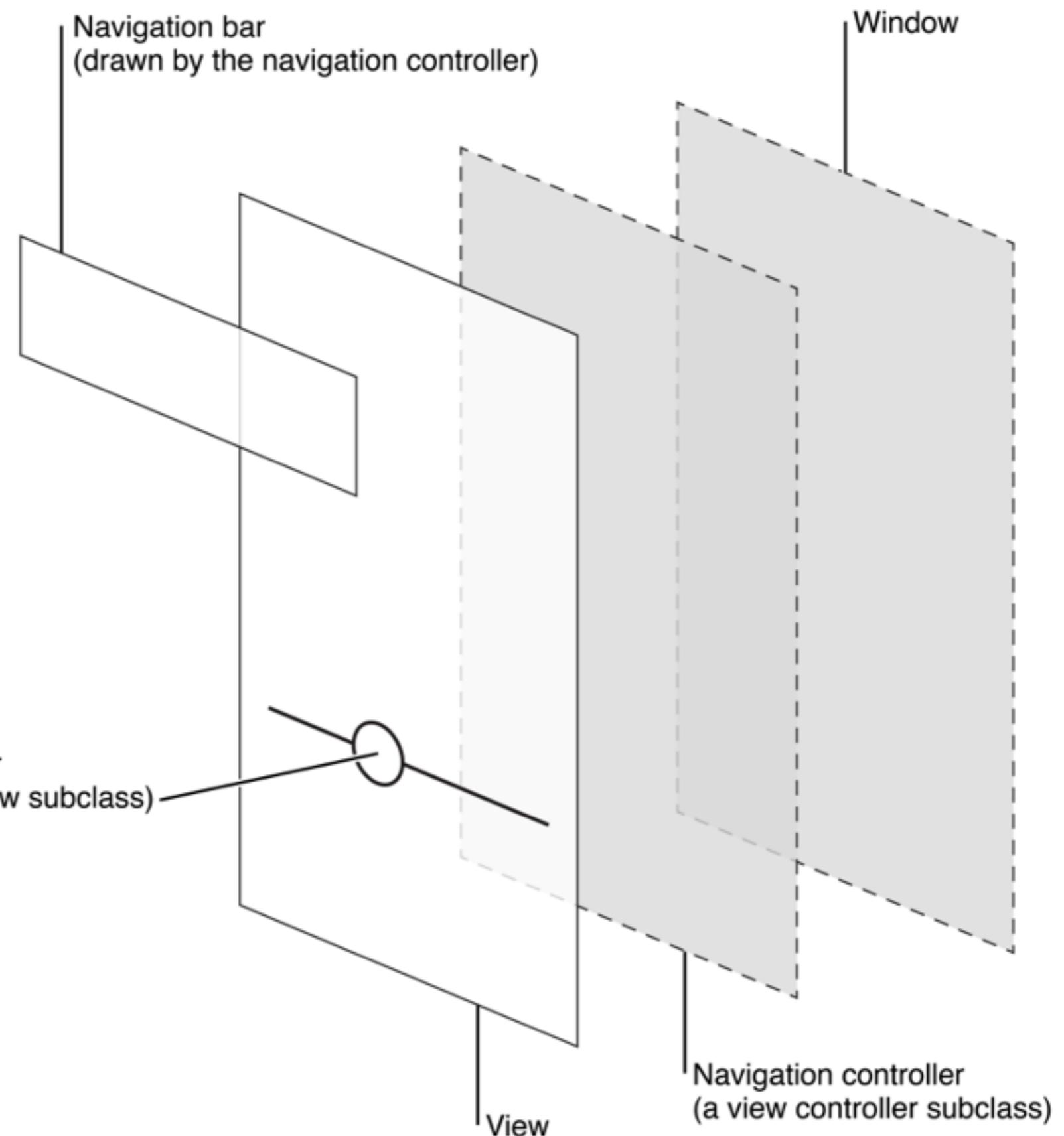


AutoLayout

UIWindow

UIWindow
(there's only
one and it
covers the
entire space) is
the parent of
the top-level
UIView

(BTW, UIWindow
resides in UIScreen)



Basic Controls

What is an Object Anyway?

Basically, everything's an object...buttons, views, controllers, everything

Objects have two basic features:

Properties - information about themselves

(how they look, current state, etc)

Methods - what they can do



UILabel

Properties

Text or attributed text

Not editable by user

Color, Font, Alignment

Number of lines

Handle text that's too long

Hidden, Alpha, Background color

Tag

Origin, Size

To change any of those, it needs a name (or occasionally a tag) done through:

```
@property (nonatomic, weak) IBOutlet UILabel *myLabel;
```

Label

Label - A variably sized amount of static text.

UIButton

Properties

Type

Title or attributed title

State - Default, Highlighted, Selected, Disabled

Color, Font, Alignment

Image, Background image

Handle text that's too long

Hidden, Alpha, Background color

Tag

Origin, Size

Name (only necessary if you want to change above in code):

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

Button

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

UIButton

Event:

Touch Up Inside

```
- (IBAction)myButtonPressed:(id)sender {  
    // Do Something Here  
}
```

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

Sent Events

- Did End On Exit
- Editing Changed
- Editing Did Begin
- Editing Did End
- Touch Cancel
- Touch Down
- Touch Down Repeat
- Touch Drag Enter
- Touch Drag Exit
- Touch Drag Inside
- Touch Drag Outside
- Touch Up Inside**
- Touch Up Outside
- Value Changed

Helloworld +Button

HelloWorld+Button Instructions

Code Along...

1. Open the HelloWorld app
2. Add a button
3. Button changes the label to “Goodbye!”

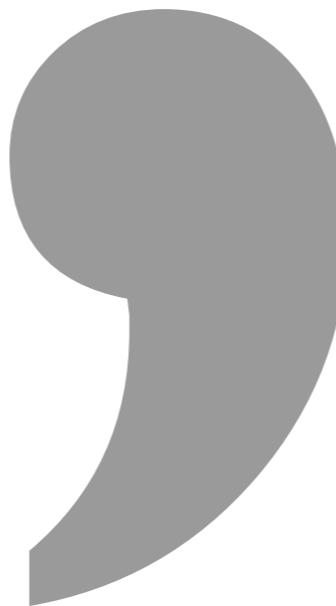
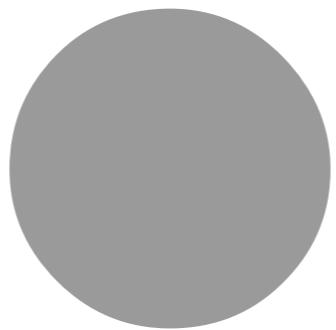
```
@property (nonatomic, strong) IBOutlet UILabel *myLabel;  
...  
- (IBAction)myButtonPressed:(id)sender {  
    _myLabel.text = @"Goodbye!";  
}
```

Yay!!!

(you just wrote your first 4 lines of code!)

Code Basics

Every Line of Code Ends with...



(a semi-colon)

Declaring Properties

Syntax

```
@property (nonatomic, weak) IBOutlet UILabel *nameLabel;
```

Not everything needs a property

Declarer property Manager class Descartation Object Name

Creates (getter, Setter, Interface Builder only) by name
(in Modern Objective C)

Naming Conventions

Apple says to use Camel Case

```
int thisIsCamelCase = 1;
```

Other Cases

```
int ThisIsWordCase = 1;  
int ThisIsSentenceCase = 1;  
int THISISUPPERCASE = 1;  
int thisIslowercase = 1;  
int some_languages_suggest_underscores = 1;
```

Tip: use object type in name

```
@property (strong, nonatomic) NSString *nameString;  
@property (strong, nonatomic) NSArray *nameArray;  
@property (strong, nonatomic) UILabel *nameLabel;
```

Declaring Methods

Syntax

- `(void)doSomethingCool;`



Object to Return
Method Name

Declaring Methods

Syntax

- `(void)doSomethingCool;`
- `(float)squareWithNumber:(float)number;`

Object to Return Method Name Parameter Name
(Internal to Method)

Declaring Methods

Syntax

- `(void)doSomethingCool;`
- `(float)squareWithNumber:(float)number;`
- `(IBAction)myButtonPressed:(id)sender;`



Available to Method Connectors and Untyped Object Parameter

Interface Builder

Naming Conventions

Apple says to use Camel Case

Use verbs for method names and be clear

- `(Activity *)fetchActivityForDate:(NSDate *)activityDate;`

Two Words About AutoComplete...

USE IT!!!

- ▶ Tab through to accept the text
- ▶ Pay attention to the parameter types it's asking for and give it what it wants!
- ▶ If it's not trying to AutoComplete, something's probably wrong with your code, so go back and fix it first!
- ▶ Be careful to choose the right AutoComplete

Controls

UITextField

UITextField

What events might you want to know?



Text Field – Displays editable text and sends an action message to a target object when Return is tapped.

Events

Editing Did Begin

Text Did Change

Editing Did End

...but also...

Should Change Characters

Should Return

UITextField Instance Methods

```
- (void)textFieldDidBeginEditing:(UITextField *)textField;
- (void)textFieldDidEndEditing:(UITextField *)textField;
- (BOOL)textFieldShouldReturn:(UITextField *)textField {
    [textField resignFirstResponder];
    return YES;
}
- (BOOL)textField:(UITextField *)textField
shouldChangeCharactersInRange:(NSRange)range
replacementString:(NSString *)string {
    NSCharacterSet *numbersCharSet = [[NSCharacterSet
        characterSetWithCharactersInString:@"1234567890"]
        invertedSet];
    NSString *filteredString = [[string
        componentsSeparatedByCharactersInSet:
        numbersCharSet] componentsJoinedByString:@""];
    return [string isEqualToString:filteredString];
}
```

Where's Did Change??

- (IBAction)textFieldDidChange:(UITextField *)textField;

Delegates

Usually, an object houses its own code
Sometimes, it's easier for an object to “delegate”
its code to another object (often a parent)

```
@interface MainViewController :  
    UIViewController <UITextFieldDelegate>  
_myTextField.delegate = self; // OR by wiring it up in IB
```

So, by declaring **and** setting a delegate, it says:
Look for my code over here
AutoComplete method names (yay)!
Warn if any required methods are missing

Helloworld
+Text

HelloWorld+TextField Instructions

1. Add a text field and a new button
2. The button changes the label to the value of the text field, but only accepts vowels
3. The Done button dismisses the keyboard

```
- (BOOL)textFieldShouldReturn:(UITextField *)textField {
    [textField resignFirstResponder];
    return YES;
}
- (BOOL)textField:(UITextField *)textField
    shouldChangeCharactersInRange:(NSRange)range
    replacementString:(NSString *)string {
    NSCharacterSet *numbersCharSet = [[NSCharacterSet
        characterSetWithCharactersInString:@"1234567890"]
        invertedSet];
    NSString *filteredString = [[string
        componentsSeparatedByCharactersInSet:
        numbersCharSet] componentsJoinedByString:@""];
    return [string isEqualToString:filteredString];
}
```

Git

Why Version Control?

- ▶ Create a history of your changes
- ▶ Rollback to a point that works
- ▶ Work on new features without damaging main project
- ▶ Have a backup, if using a remote server
- ▶ Collaborate with others by sharing same code
- ▶ For potential employers to evaluate

But we'll worry about that stuff later. For now...

- ▶ **It's where you turn in homework**

Common Git Terms

Repository - where files & history are stored

Local/Remote - location of a repo

Fork - creating your separate copy of a repo

Clone - creating a local copy of a repo

Commit - saving and documenting changes

Push - moves all changes to the remote repo

+++

Common Git Steps for iOS

For Your Homework:

- ▶ Navigate to the course organization
 - ▶ Find today's homework & fork to your account
 - ▶ Clone the project to your computer
 - ▶ Create a new Xcode project in that folder with Git selected
- {Make Changes} 
- Commit
- ▶ Push to GitHub remote

Homework