

iOS: Objective-C Primer, Continued

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Announcements

iOS:
Objective-C
Primer,
Continued

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Objective-C
Review

Interface
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Delegates

UIViews

- ▶ Lectures: <http://cs76.net/Lectures>
- ▶ Sections: <http://cs76.net/Sections>

Today

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- ▶ Objective-C Review
- ▶ Interface Builder
- ▶ Outlets and Actions
- ▶ Application Lifecycle
- ▶ Delegates
- ▶ UIViews

Classes

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UIViews

- ▶ `@interface: .h files`
 - ▶ **declare class members and methods**
 - ▶ `@class <class>` to use other classes
- ▶ `@implementation: .m files`
 - ▶ **define class methods**
 - ▶ `#import "<class>.h"` to use other classes

Classes

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UIViews

- ▶ -: instance methods, sent to objects (e.g. `init`)
- ▶ +: class methods, sent to class, not object (e.g. `alloc`)

Properties

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- ▶ `@interface: @property (<attributes> <type> <name>;`
 - ▶ declare new property, specify how values are assigned
- ▶ `@implementation: @synthesize <name>;`
 - ▶ generate getters/setters for property

Message Passing

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UIViews

- ▶ `- (id) init`
- ▶ `- (id) initWithName:(NSString *) name`
- ▶ `- (id) initWithName:(NSString *) name
age:(int) age`
- ▶ `[object initWithName:@"name"];`

GDB

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UIViews

- ▶ **n**: proceed to next line, evaluating methods
- ▶ **s**: step into method calls
- ▶ **c**: continue until next breakpoint
- ▶ **po**: print object

Objective-C and GDB

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▶ example time!

Interface Builder

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- ▶ no more XML for Views!
- ▶ used to edit XIB (pronounced “nib”) files

Interface Builder

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UIViews

- ▶ File Inspector: nib options
- ▶ Quick Help: view documentation for the selected `UIView`
- ▶ Identity Inspector: modify object properties
- ▶ Attributes Inspector: customize the selected `UIView`
- ▶ Size Inspector: change placement/size of `UIView`
- ▶ Connections Inspector: manage outlets/actions

Interface Builder

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- ▶ drag objects from Object Library to add to `UIView`
- ▶ select object with single click

Interface Builder

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UIViews

- ▶ File's Owner: object that loads nib
 - ▶ nibs are loaded at runtime
- ▶ First Responder: `UIView` currently in focus and responding to input
- ▶ App Delegate: more later!
- ▶ Window: container for `UIViews`

Interface Builder

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- ▶ IBOutlet tells XCode the object represents something in IB
 - ▶ NOT the type of the object (must be a UIButton, etc.)
 - ▶ #define IBOutlet as far as compiler is concerned

Outlets

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- ▶ **define** `UIView` properties in `@interface`
- ▶ **synthesize** `UIView` properties in `@implementation`
- ▶ **connect** Objects in Interface Builder to properties

Connecting Outlets

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- ▶ select placeholder where property is defined (File's Owner or App Delegate)
- ▶ Ctrl-Click and drag to `UIView`
- ▶ select name of outlet
- ▶ ???
- ▶ profit

Actions

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- ▶ `IBAction` tells XCode the method is used by something in IB
 - ▶ IS the type of the method
 - ▶ `#define IBAction void` as far as the compiler is concerned

Connecting Actions

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- ▶ select `UIView` to fire callback for, open Connections Inspector
- ▶ Ctrl-Click callback, drag to placeholder where method is defined (File's Owner or App Delegate)
- ▶ select name of method
- ▶ ???
- ▶ profit

Outlets and Actions

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Application Lifecycle

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- ▶ no longer just a lifecycle for individual `Activities`
- ▶ `applicationDidFinishLaunchingWithOptions:` app launched, nib file loaded, still inactive
- ▶ `applicationDidBecomeActive:` app has moved from inactive to active state
- ▶ `applicationWillEnterForeground:` app brought back to foreground from background

Application Lifecycle

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- ▶ `applicationWillResignActive:` app is about to become inactive (backgrounded, phone call, etc)
- ▶ `applicationDidEnterBackground:` app has been sent to background
- ▶ `applicationWillTerminate:` app is closed and removed from memory

Delegates

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- ▶ design pattern: define separate class to handle actions
 - ▶ greater modularity
 - ▶ DRY
 - ▶ composition over inheritance

App Delegate

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- ▶ notified when state of the application changes
 - ▶ implement callbacks to respond to state changes
 - ▶ importantly,
`applicationDidFinishLaunchingWithOptions`

Protocol

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- ▶ equivalent to interfaces in Java or virtual classes in C++
- ▶ specify a set of methods that need to be (or should be) by a class

```
@protocol ProtocolName <NSObject>  
    - (void) methodNamesGoHere;  
@end
```

UITextFieldDelegate

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- ▶ return YES to allow, NO to disallow
- ▶ textFieldShouldReturn: “done” button pressed
- ▶ textFieldShouldBeginEditing: user about to edit text
- ▶ textFieldShouldEndEditing: text field about to lose focus

Using Delegates

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UISlider

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- ▶ `value`: property for current value of slider (`float`)
- ▶ `maximumValue`: upper slider bound
- ▶ `minimumValue`: lower slider bound

UISwitch

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- ▶ `on:` property for state of switch (BOOL)

UISegmentedControl

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- ▶ `selectedSegmentIndex`: **property for index of selected segment**
- ▶ `numberOfSegments`: **number of options in the control**
- ▶ `titleForSegmentAtIndex`: **get title for given segment**
- ▶ `setTitle:forSegmentAtIndex`: **set title for given segment**

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