iPhone Development 101

insight & courage

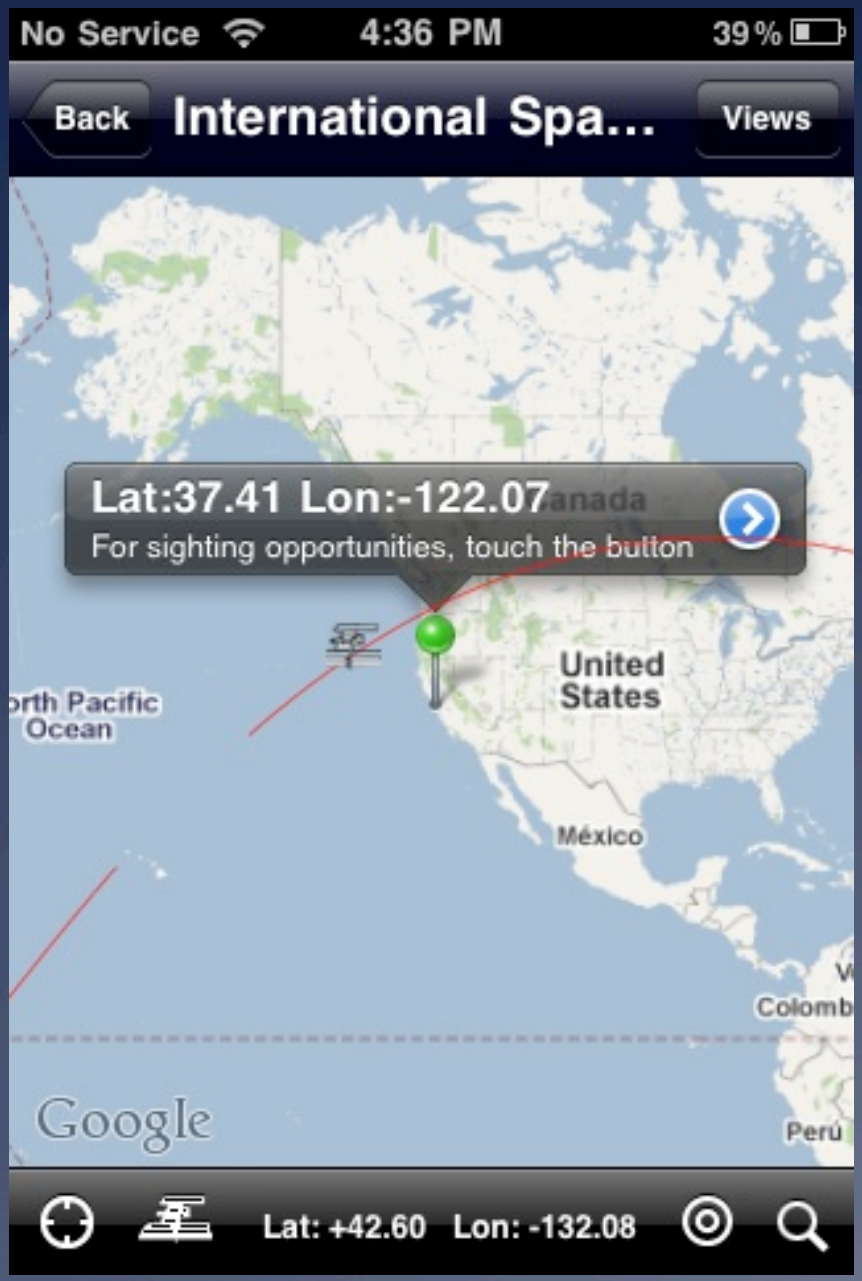
Insight & Courage

* Get Started Quickly
* Xcode Demo
* Objective C
* Xcode Demo
* Model, View, Controller
* iPhone Developer Licenses for NASA apps

Screenshot of TV Commercial

Missions Home Screen

The missions home screen shows all current NASA missions in a table view to skim. Any item in the list of missions can be selected, which opens a detailed view. (nasa.gov)



Mission Orbit Tracking

The mission orbit tracking screen (available for some missions that are in orbit around the Earth, like the International Space Station), shows the current orbit position of a selected spacecraft. (nasa.gov)

Images Home Screen

The images home screen gives you three image gallery options - NASA Image of the Day, Astronomy Picture of the Day and the NASAimages.org collection. (nasa.gov)

iSWA: iNTEGRATED SPACE WEATHER ANALYSIS SYSTEM

Get Started Quickly

* Mac Intel OSX 10.5 or newer
* Apple Developer Connection Account
* Download iPhone 3.1 SDK
* Free, no licenses needed
* Can only test Apps on iPhone Simulator

developer.apple.com/iphone

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iPhone and iPod touch applications.

for iPhone OS 3.1

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- iPhone Development Guide
- iPhone Human Interface Guidelines
- Your First iPhone Application
- Learning Objective-C: A Primer

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Developing for iPhone OS 3.1

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Technical Documentation

Getting Started Documents
Developers new to iPhone OS can read about the tools, frameworks, development best-practices, and design methods for creating innovative world-class iPhone applications.

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Explore a collection of in-depth technical documentation, sample code, guides, and articles for iPhone development categorized by topic and frameworks.

Featured Content

- iPhone Application Programming Guide
- iPhone Development Guide
- iPhone Human Interface Guidelines
- Your First iPhone Application
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Find details on everything from how to prepare for

Download iPhone SDK

your application.

Sample Code
Use these samples to inspire development of your own great applications.

Apple Developer Forums
Discuss iPhone development with other developers and Apple engineers.

- Media Player Framework Reference
- Core Data Tutorial for iPhone OS

Marketing Resources

Downloads

Read me before downloading Hide details

- If you have updated your device to iPhone OS 3.1.3 with iTunes, you must install iPhone SDK 3.1.3 in order to continue with your development.

iPhone SDK 3.1.3
iPhone SDK 3.1.3 includes the Xcode IDE, iPhone simulator, and a suite of additional tools for developing applications for iPhone and iPod touch.

Posted: February 2, 2010
Leopard Build: 9M2809a
Snow Leopard Build: 10M2003a

Leopard Downloads
- iPhone SDK 3.1.3 with Xcode 3.1.4
- iPhone SDK 3.1.3 with Xcode 3.1.4 Readme

Snow Leopard Downloads
- iPhone SDK 3.1.3 with Xcode 3.2.1
- iPhone SDK 3.1.3 with Xcode 3.2.1 Readme

Other Downloads
- iPhone SDK Agreement
- iPhone Configuration Utility

News & Announcements

Exciting News about the New Mac Developer Program
Mar 19, 2010

You Can Now Schedule Price Changes for Your App
Mar 17, 2010

Getting Help with iTunes Connect
Feb 22, 2010

New Countries Added to the App Store
Feb 18, 2010

Updated iTunes Connect Developer Guide Now Posted
Feb 16, 2010

App Store Tip: Delivering Video to Your iPhone App
Feb 10, 2010

iPhone SDK

* Xcode
* Interface Builder
* iPhone Simulator
* Performance Testing Tools

Objective C 2.0

* Extension of C
* Similar feel to java: rarely copy objects
* Similar feel to C++: memory management
* Single Inheritance
* Garbage Collection not available for iPhone OS

Extension of C

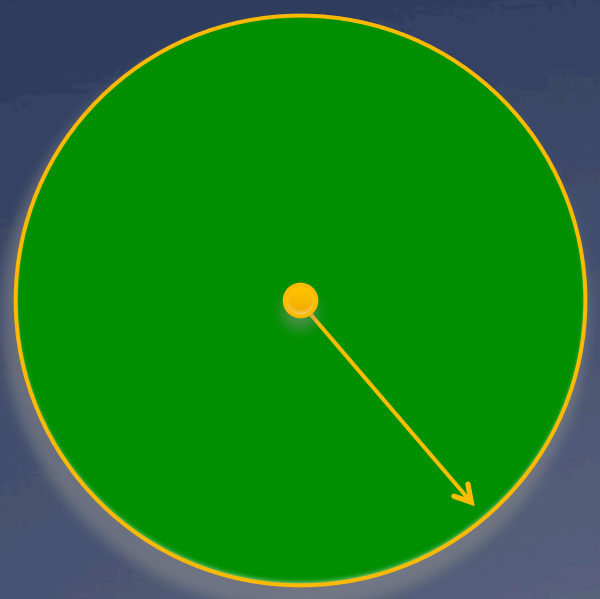
```
#import <UIKit/UIKit.h>

int main(int argc, char *argv[]) {
    int a = 5;
    int b = 6;
    int total = a + b;

    NSLog(@"hello total = %i", total);

    return retVal;
}
```

Objective C Objects



* Circle
  * Radius
  * Area

```
#import <UIKit/UIKit.h>
#import "Circle.h"                                  // line 1

int main(int argc, char *argv[]) {

    Circle* myCircle = [Circle alloc];              // line 2
    [myCircle init];                                        // line 3

    [myCircle setRadius:4.0];                       // line 4

    float area = [myCircle getArea];                // line 5

    NSLog(@"area = %f", area);                      // line 6

    [myCircle release];                             // line 7

    return 0;
}
```

Instantiation

Objective C:

```
Circle* myCircle = [Circle alloc];
[myCircle init];
```

Typically Nested together:

```
Circle*  myCircle = [[Circle alloc] init];
```

Java:

```
Circle myCircle = new Circle();
```

C++:

```
Circle myCircle;
Circle* myCircle = new Circle();
```

Single Argument

Objective C:

```
[myCircle setRadius: 5.0];
```

Java:

```
myCircle.setRadius(5.0);
```

C++:

```
myCircle.setRadius(5.0);
myCircle->setRadius(5.0);
```

Returning Value

Objective C:

```
float area = [myCircle getArea];
```

Java:

```
float area = myCircle.getArea();
```

C++:

```
float area = myCircle.getArea();
float area = myCircle->getArea();
```

Multiple Arguments

Objective C:
[myCircle setCenterWithX: 2.0 Y: 4.0];

full function name:
setCenterWithX: Y:

Java:
myCircle.setCenterPoint(2.0, 4.0);

C++:
myCircle.setCenterPoint(2.0, 4.0);
myCircle->setCenterPoint(2.0, 4.0);

Release Object

Objective C:
[myCircle release];

Java:
There is no equivalent.

C++:
delete myCircle; // **not the same**

```
#import <UIKit/UIKit.h>
#import "Circle.h"

int main(int argc, char *argv[]) {

    Circle* myCircle = [[Circle alloc] init];

    [myCircle setRadius:4.0];

    float area = [myCircle getArea];

    NSLog(@"area = %f", area);

    [myCircle release];

    return 0;
}
```

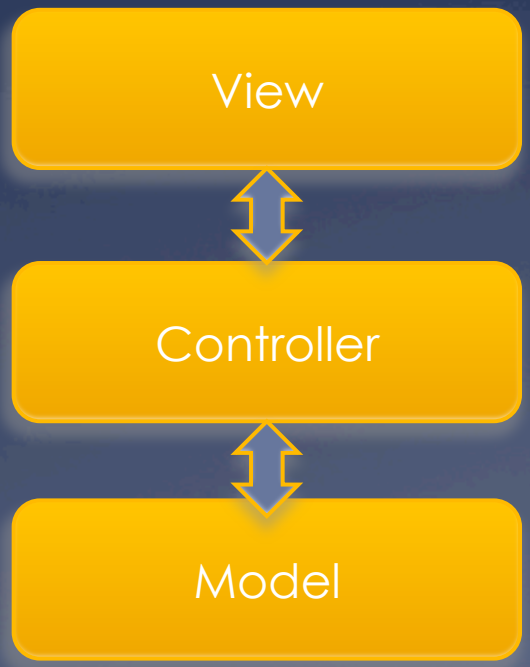
Memory Management

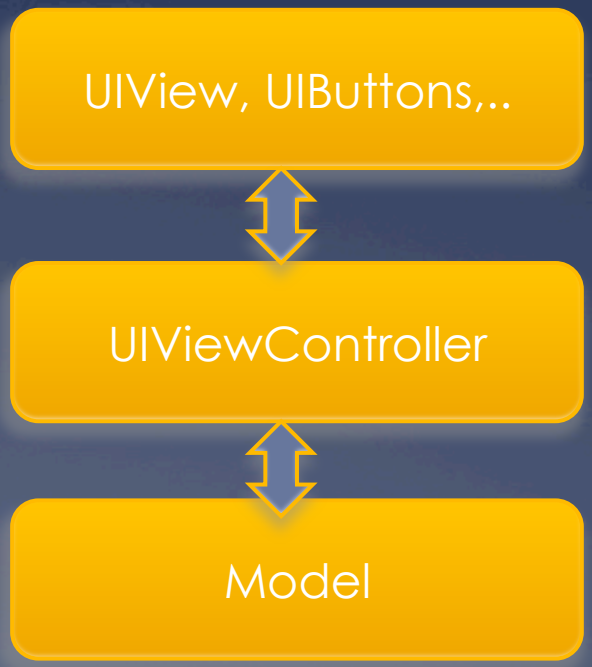
* Reference Counting
* Each Instantiated Object has a Reference Count
* Destroyed when References Count is 0

Objective C 2.0 features

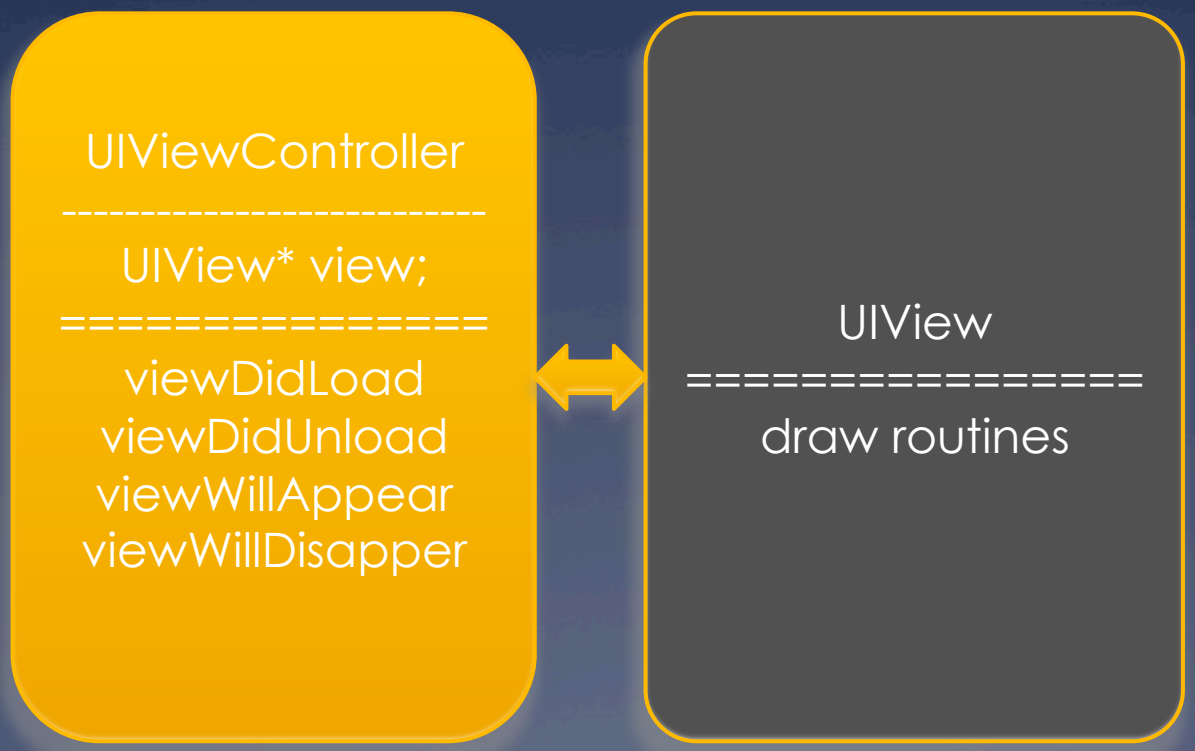
* Synthesizers
  * automatically creates getters and setters
* Categories and Delegates
  * similar to java interfaces
* self (equivalent to java's "this")
* Properties with Dot Syntax
  * circle.radius = 5.0;
  * [circle setRadius: 5.0];
  * self.view.backgroundColor = [UIColor redColor];

Model, View, Controller



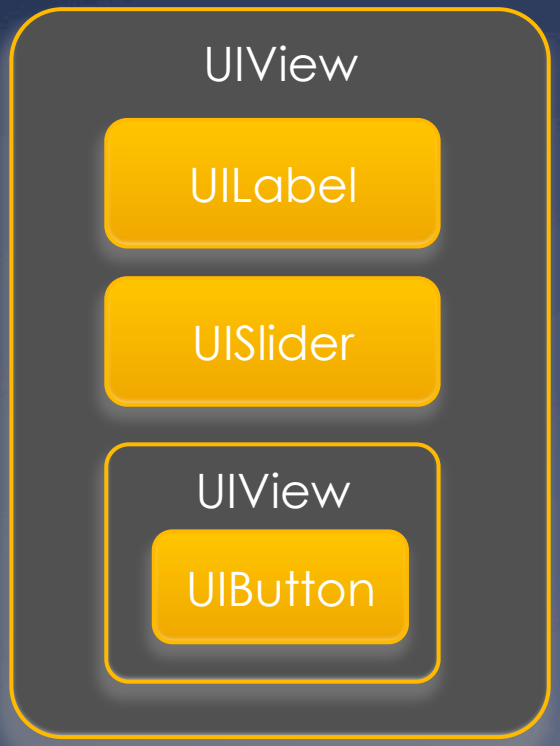


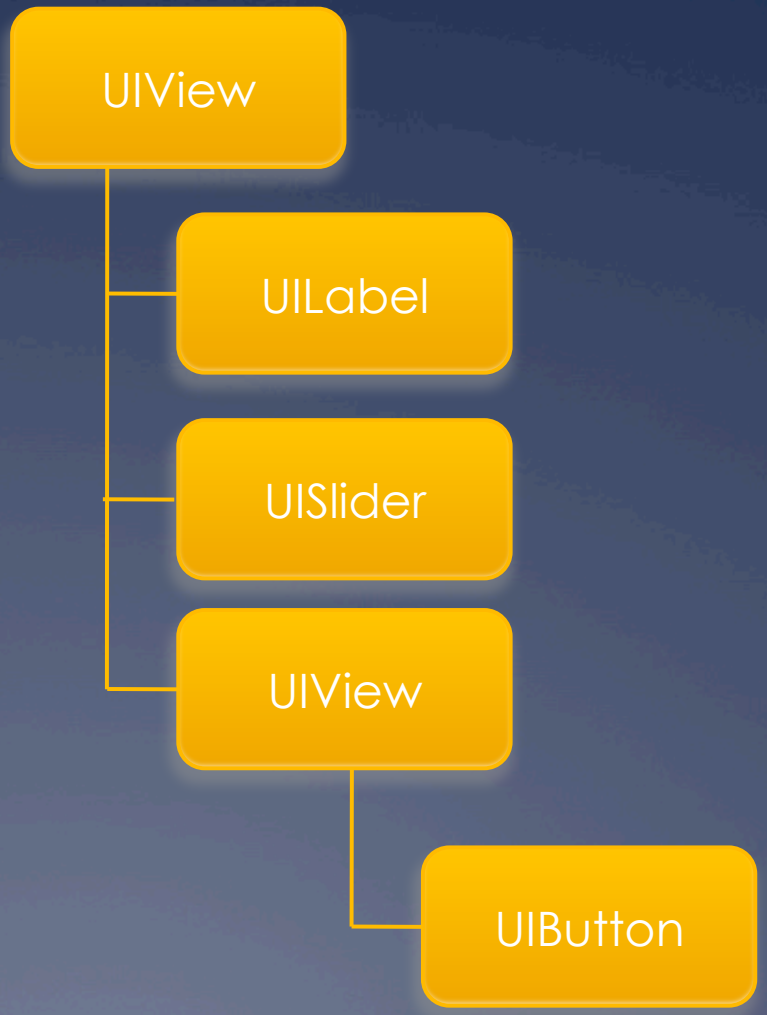
UIViewController



self.view.backgroundColor = [UIColor redColor];

UIView Hierarchy





Subclasses of UIView

* UISegmentedControl
* UILabel
* UIButton
* UISwitch
* UISlider
* UIPageControl

iPhone Limitations

- No Background Apps
  - shutdown app → save the state of the app
- Memory Limitations
  - ~50mb available for your app
  - No Swap file
  - App will crash if you run out of memory
- Application Sandbox
  - each app has own files

Try It Out!	Create NASA App	Outsiders
Test Application on Simulator	Test on Simulator and Local Device iTunes App In-House App	Test on Simulator and Local Device iTunes App
Mac Intel OS X 10.5 or newer ADC Account Download iPhone 3.1 SDK	Basic Requirements Request License from NASA	Basic Requirements Apple Developer's License
FREE	NASA has Licenses	$99/year

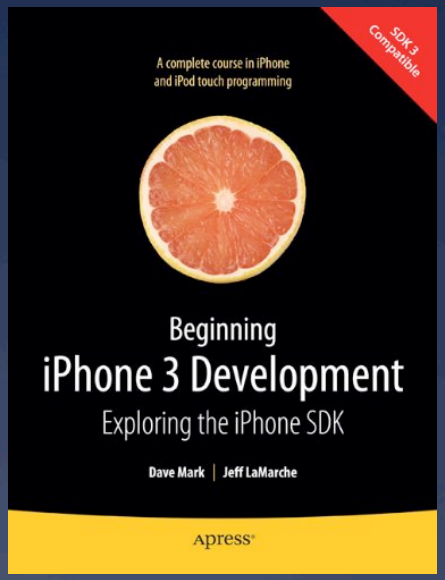
Create NASA App

* http://etads.nasa.gov/DCS/iPhone.shtml
* "iPhone Application Development Standards for Registration, Licensing, and Distribution"

Create NASA App

* ETADS (Emerging Technology and Desktop Standards) does all the hard work for you.
* Request license from ETADS via email
* Developer creates/tests app
* Developer Submits App to ETADS
* Can develop both Internal "In-House" Apps and External "iTunes" Apps

References



* Dave Mark's
  * Beginning iPhone 3 Development Book
* http://cocoadevcentral.com
* http://developer.apple.com/iphone/
  * sample code
  * detailed documentation
  * video tutorials
* Stanford Course on iTunes