Introduction to Apple’s iOS Mobile Development

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Class summary

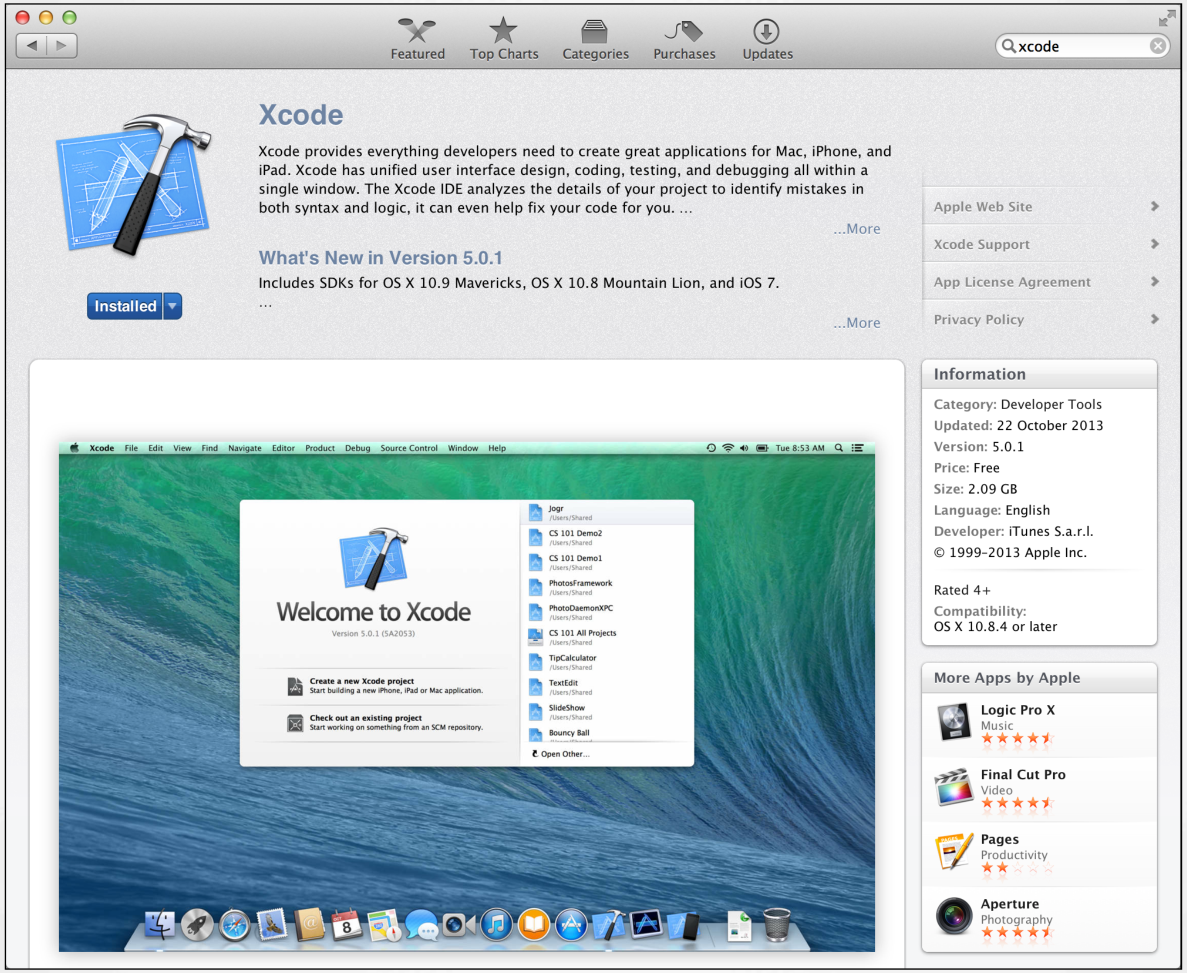
Learn how quick and easy it is to start programming on iOS for Apple® iPhone®, iPad®, and iPod®. I will create from scratch a simple iOS application with traditional UI elements like buttons, tabs, and lists. I will then deploy this app on an iPad and show it running. Finally, I will show how you can debug and test an iOS application. In the process of these demonstrations, you will learn where you need to go and what you need to do to start programming in iOS. I will also show you how you can use GLKit to draw 3d graphics and how to access REST web services from your iOS device. This presentation will mainly consist of hands-on demonstrations.

Key learning objectives

At the end of this class, you will be able to:

- Explain where to start to develop applications for iOS devices
- Create simple apps with a simple UI for iOS
- Show how to access REST web services from iOS
- See how to use GLKit and OpenGL ES

Develop applications for iOS devices



Xcode

Xcode provides everything developers need to create great applications for Mac, iPhone, and iPad. Xcode has unified user interface design, coding, testing, and debugging all within a single window. The Xcode IDE analyzes the details of your project to identify mistakes in both syntax and logic, it can even help fix your code for you. …

...More

What's New in Version 5.0.1

Includes SDKs for OS X 10.9 Mavericks, OS X 10.8 Mountain Lion, and iOS 7.
…

...More

Information

Category: Developer Tools
Updated: 22 October 2013
Version: 5.0.1
Price: Free
Size: 2.09 GB
Language: English
Developer: iTunes S.a.r.l.
© 1999–2013 Apple Inc.

Rated 4+
Compatibility:
OS X 10.8.4 or later

More Apps by Apple

Logic Pro X
Music

Final Cut Pro
Video

Pages
Productivity

Aperture
Photography

Xcode File Edit View Find Navigate Editor Product Debug Source Control Window Help
Tue 8:53 AM

Welcome to Xcode
Version 5.0.1 (5A2053)

Create a new Xcode project
Start building a new iPhone, iPad or Mac application.

Check out an existing project
Start working on something from an SCM repository.

Jogr
/Users/Shared
CS 101 Demo2
/Users/Shared
CS 101 Demo1
/Users/Shared
PhotosFramework
/Users/Shared
PhotoDaemonXPC
/Users/Shared
CS 101 All Projects
/Users/Shared
TipCalculator
/Users/Shared
TextEdit
/Users/Shared
SlideShow
/Users/Shared
Bouncy Ball

- Getting started
  http://developer.apple.com/library/ios/#referencelibrary/GettingStarted/RoadMapiOS/chapters/Introduction.html

- Objective-C
  https://developer.apple.com/library/mac/#documentation/Cocoa/Conceptual/ObjectiveC/Introduction/introObjectiveC.html

Swift – new programming language

- Objective-C
  - has been around for decades
  - bit out of date
  - reliable
- Swift
  - new (release end of October)
  - mainstream feel (Java, C++, C#, etc)
  - has issues to iron out

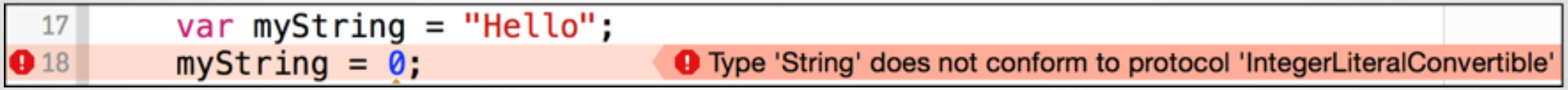
Swift – new programming language

- Objective-C

```
NSData * data = [self.fileId
  dataUsingEncoding:NSUTF8StringEncoding];
```

- Swift

```
var data =
  fileId.dataUsingEncoding(NSUTF8StringEncoding)
```



```
    var myString = "Hello";
    myString = 0;
```

Type 'String' does not conform to protocol 'IntegerLiteralConvertible'

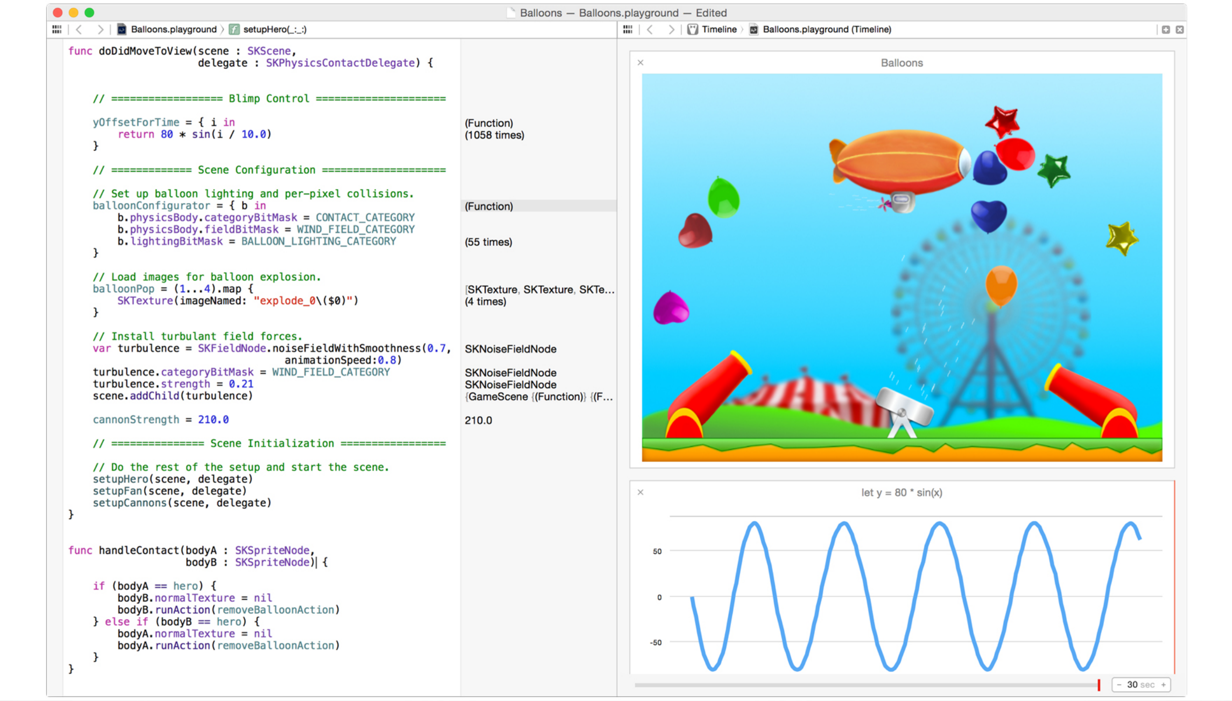
Swift – new programming language

Objective-C project = Swift project

- UI design
- underlying libraries
- mix and match: https://developer.apple.com/library/ios/documentation/swift/conceptual/buildingcocoaapps/MixandMatch.html

Playgrounds

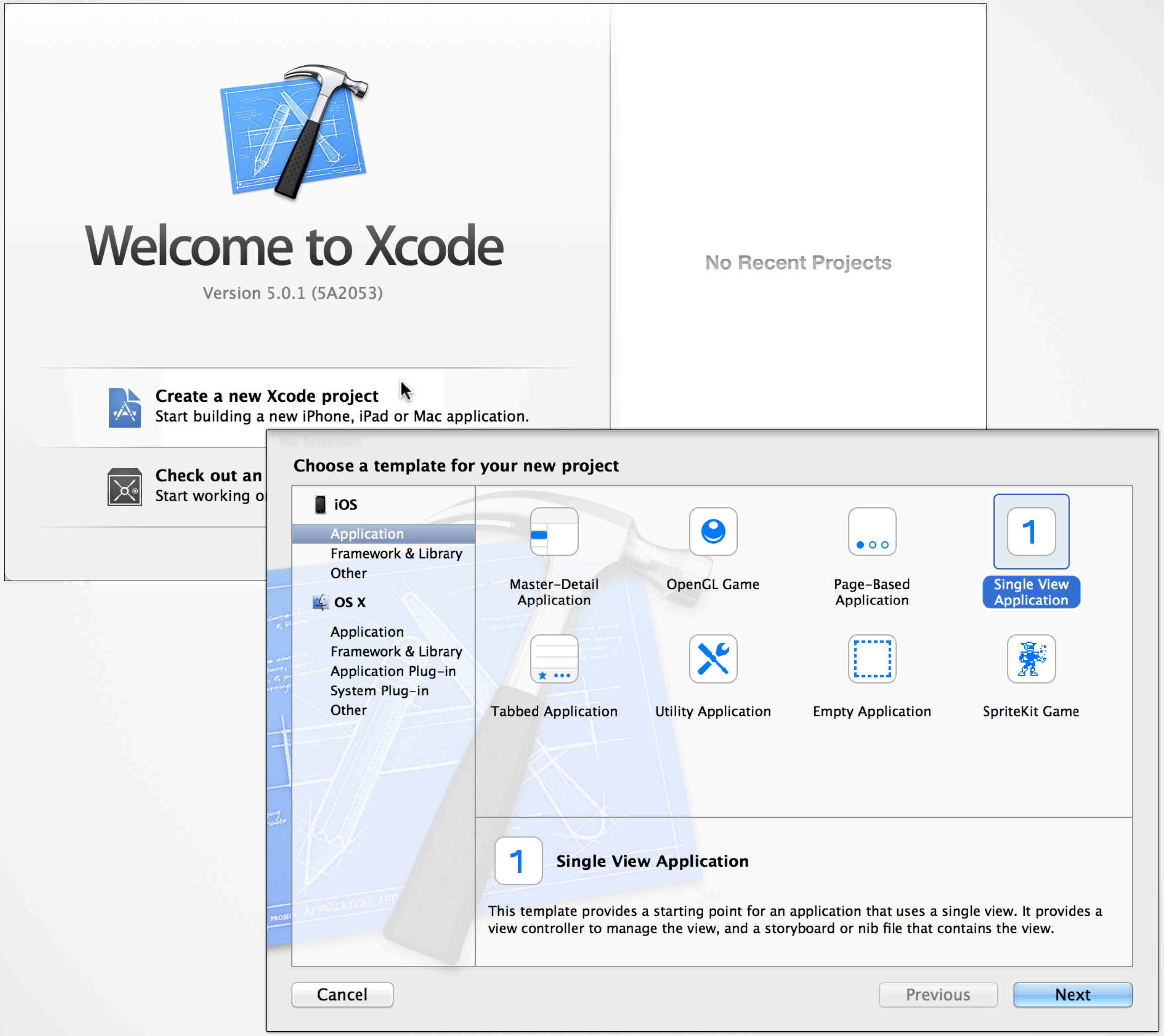
https://developer.apple.com/swift/resources/



```
func doDidMoveToView(scene : SKScene,
                     delegate : SKPhysicsContactDelegate) {


    // ================== Blimp Control =====================

    yOffsetForTime = { i in
        return 80 * sin(i / 10.0)
    }

    // ============= Scene Configuration ====================

    // Set up balloon lighting and per-pixel collisions.
    balloonConfigurator = { b in
        b.physicsBody.categoryBitMask = CONTACT_CATEGORY
        b.physicsBody.fieldBitMask = WIND_FIELD_CATEGORY
        b.lightingBitMask = BALLOON_LIGHTING_CATEGORY
    }

    // Load images for balloon explosion.
    balloonPop = (1...4).map {
        SKTexture(imageNamed: "explode_0\($0)")
    }

    // Install turbulant field forces.
    var turbulence = SKFieldNode.noiseFieldWithSmoothness(0.7,
                                animationSpeed:0.8)
    turbulence.categoryBitMask = WIND_FIELD_CATEGORY
    turbulence.strength = 0.21
    scene.addChild(turbulence)

    cannonStrength = 210.0

    // =============== Scene Initialization =================

    // Do the rest of the setup and start the scene.
    setupHero(scene, delegate)
    setupFan(scene, delegate)
    setupCannons(scene, delegate)
}


func handleContact(bodyA : SKSpriteNode,
                   bodyB : SKSpriteNode) {

    if (bodyA == hero) {
        bodyB.normalTexture = nil
        bodyB.runAction(removeBalloonAction)
    } else if (bodyB == hero) {
        bodyA.normalTexture = nil
        bodyA.runAction(removeBalloonAction)
    }
}
```

```
(Function)
(1058 times)

(Function)

(55 times)

[SKTexture, SKTexture, SKTe...
(4 times)

SKNoiseFieldNode

SKNoiseFieldNode
SKNoiseFieldNode
{GameScene {(Function)} {(F...

210.0
```

Simple apps with a simple UI for iOS



Welcome to Xcode

Version 5.0.1 (5A2053)

Create a new Xcode project
Start building a new iPhone, iPad or Mac application.

Check out an
Start working o

No Recent Projects

Choose a template for your new project

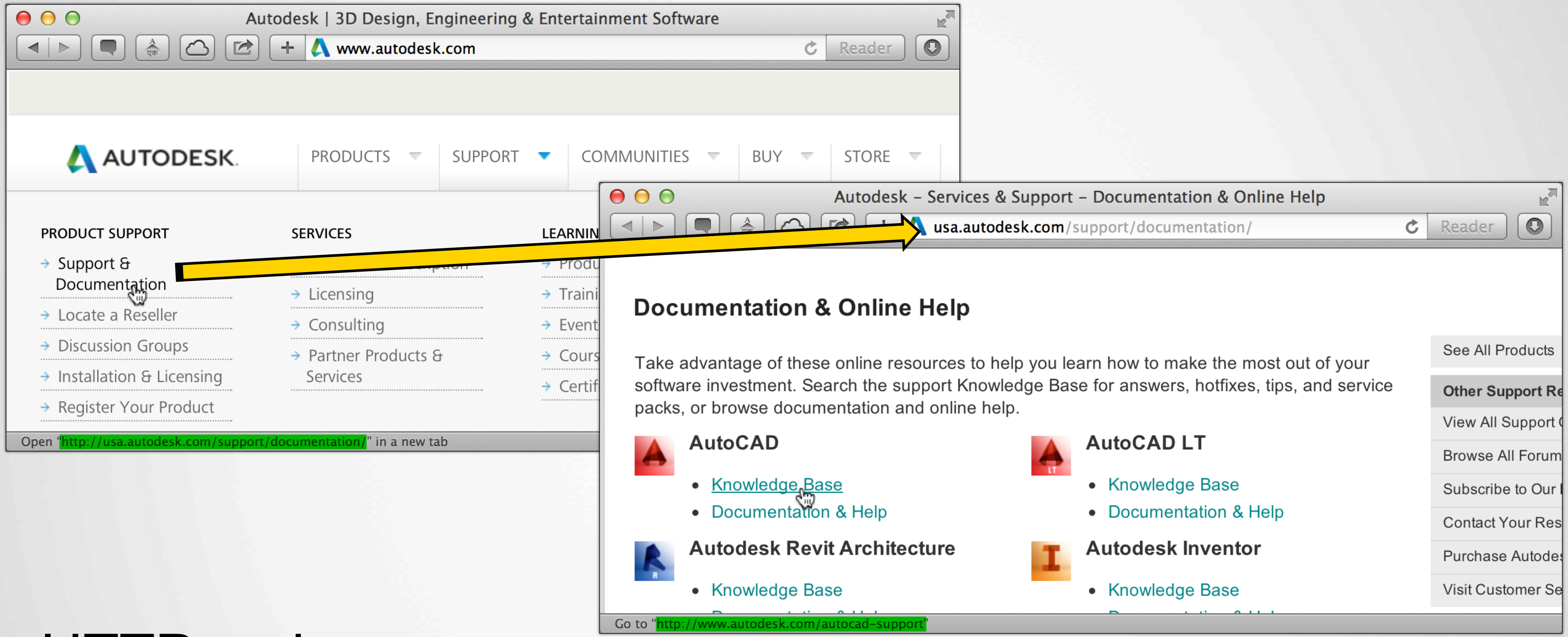
Single View Application

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.

REST web services from iOS

HTTP Requests

- World Wide Web (WWW)
  - Web of resources
  - Resources reference each other
  - Resources can be of many types
    (e.g., documents, images, services, html pages)
- URI identifies resources (Uniform Resource Identifier)
- HTTP used to access resources (HyperText Transfer Protocol)
  - 9 methods (a.k.a. verbs):
    GET, HEAD, OPTIONS, POST, PUT, DELETE, TRACE, CONNECT, PATCH



Open "http://usa.autodesk.com/support/documentation/" in a new tab

Documentation & Online Help

Take advantage of these online resources to help you learn how to make the most out of your software investment. Search the support Knowledge Base for answers, hotfixes, tips, and service packs, or browse documentation and online help.

AutoCAD

- Knowledge Base
- Documentation & Help

AutoCAD LT

- Knowledge Base
- Documentation & Help

Autodesk Revit Architecture

- Knowledge Base

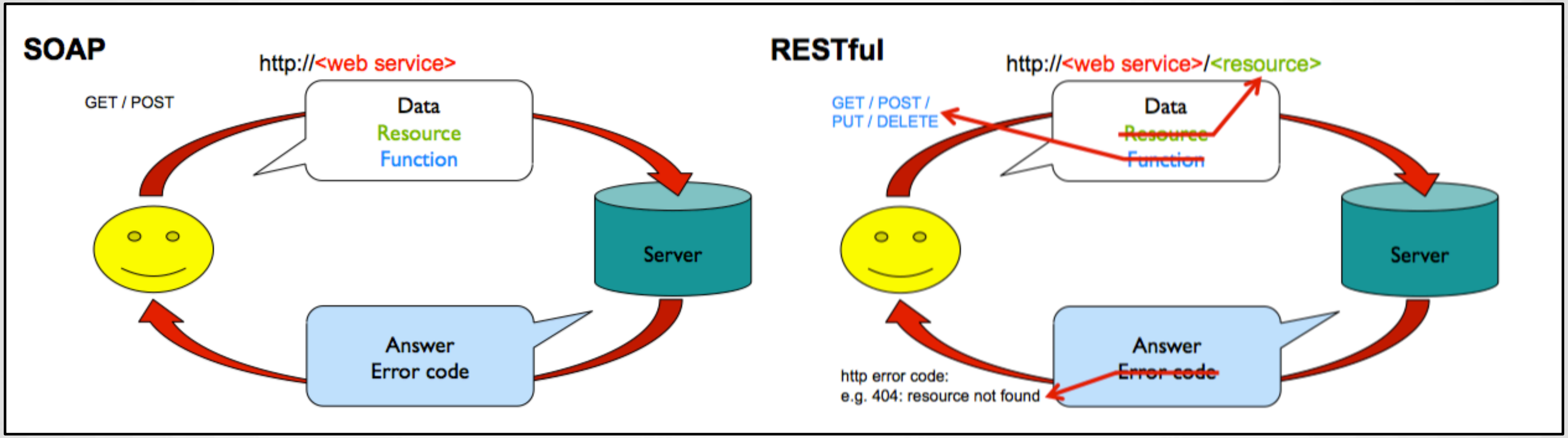
Autodesk Inventor

- Knowledge Base

Go to "http://www.autodesk.com/autocad-support"

HTTP verbs

- GET, HEAD, OPTIONS, POST, PUT, DELETE, etc.



SOAP

http://<web service>

GET / POST

Data
Resource
Function

Server

Answer
Error code

RESTful

http://<web service>/<resource>

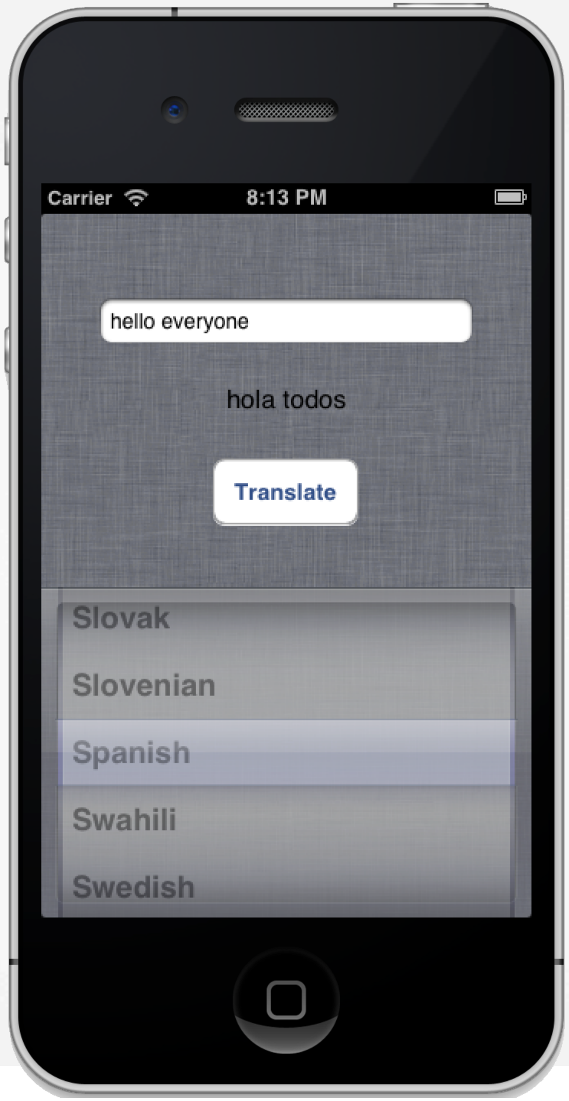
GET / POST /
PUT / DELETE

Data
~~Resource~~
~~Function~~

Server

Answer
~~Error code~~

http error code:
e.g. 404: resource not found



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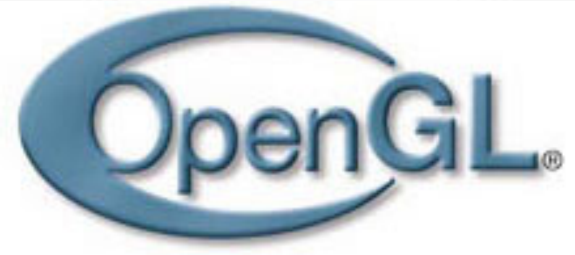
hello everyone

hola todos

GLKit and OpenGL ES

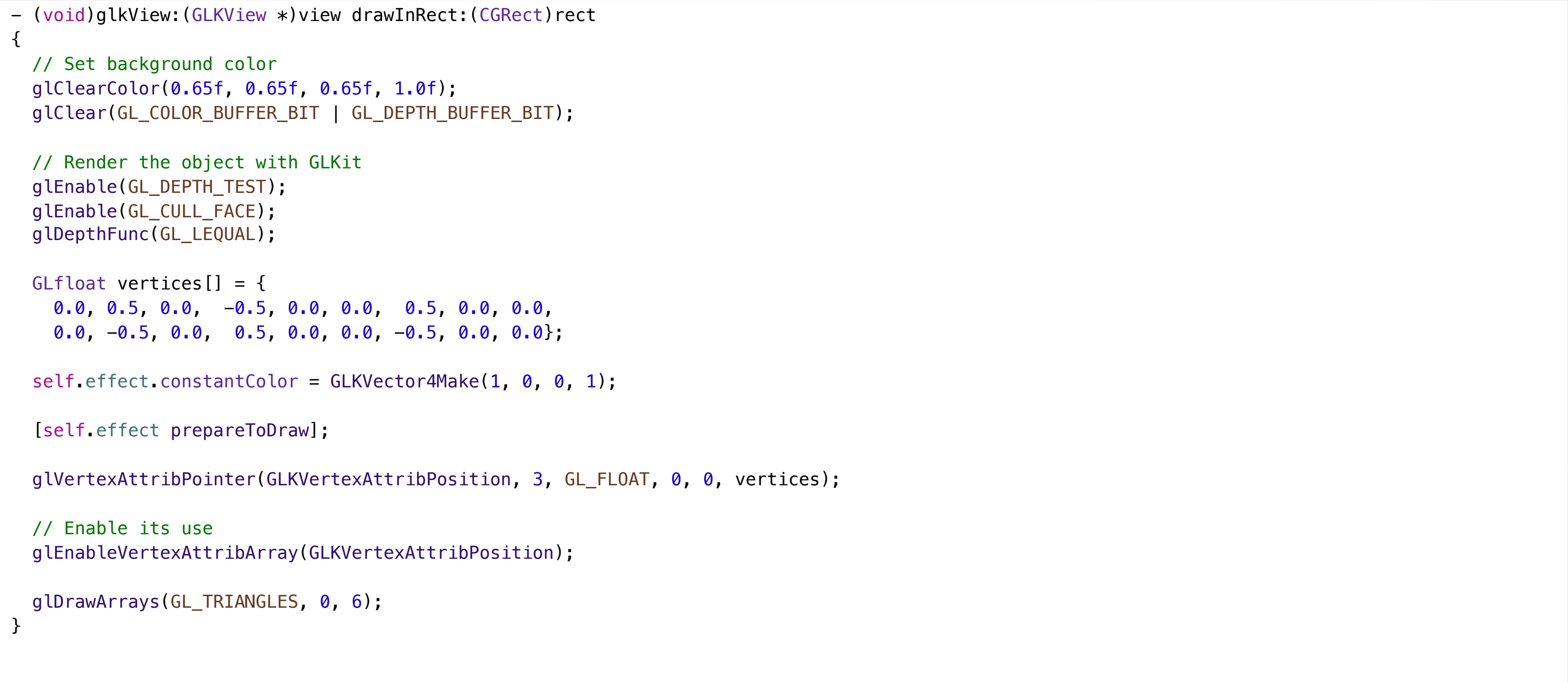
OpenGL ES

http://www.opengl.org

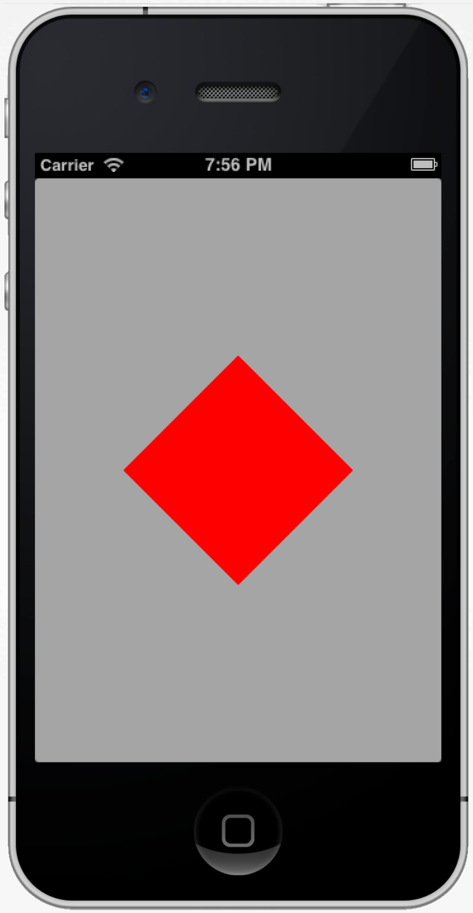


https://developer.apple.com/devcenter/ios/resources/opengl-es/

```
- (void)viewDidLoad
{
  [super viewDidLoad];

  // Initialize the system
  GLKView * view = (GLKView *)self.view;
  view.context = [[EAGLContext alloc] initWithAPI:kEAGLRenderingAPIOpenGLES2];

  // You can also set this in the storyboard
  view.delegate = self;

  [EAGLContext setCurrentContext:view.context];

  self.effect = [[GLKBaseEffect alloc] init];

  float aspect = fabsf(self.view.bounds.size.width / self.view.bounds.size.height);
  GLKMatrix4 projectionMatrix = GLKMatrix4MakePerspective(GLKMathDegreesToRadians(65.0f), aspect, 0.1f, 10.0f);
  self.effect.transform.projectionMatrix = projectionMatrix;

  self.effect.transform.modelviewMatrix = GLKMatrix4MakeLookAt(
    0, 0, 2,  // eye
    0, 0, 0,  // center
    0, 1, 0); // up vector

  // Or set "Enable setNeedsDisplay" e.g. in storyboard
  [view display];
}
```



```
- (void)glkView:(GLKView *)view drawInRect:(CGRect)rect
{
  // Set background color
  glClearColor(0.65f, 0.65f, 0.65f, 1.0f);
  glClear(GL_COLOR_BUFFER_BIT | GL_DEPTH_BUFFER_BIT);

  // Render the object with GLKit
  glEnable(GL_DEPTH_TEST);
  glEnable(GL_CULL_FACE);
  glDepthFunc(GL_LEQUAL);

  GLfloat vertices[] = {
    0.0, 0.5, 0.0,  -0.5, 0.0, 0.0,  0.5, 0.0, 0.0,
    0.0, -0.5, 0.0,  0.5, 0.0, 0.0, -0.5, 0.0, 0.0};

  self.effect.constantColor = GLKVector4Make(1, 0, 0, 1);

  [self.effect prepareToDraw];

  glVertexAttribPointer(GLKVertexAttribPosition, 3, GL_FLOAT, 0, 0, vertices);

  // Enable its use
  glEnableVertexAttribArray(GLKVertexAttribPosition);

  glDrawArrays(GL_TRIANGLES, 0, 6);
}
```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Graphics Kits

- GLKit – 3d (iOS 5)
- Sprite Kit – 2d (iOS 7)
- Scene Kit – 3d (iOS 8)
  - http://www.raywenderlich.com/83748/beginning-scene-kit-tutorial

Overview:

http://www.macworld.com/article/2051345/sprite-kit-glkit-and-scene-kit-how-apple-is-shaping-game-development.html

Samples

- http://adndevblog.typepad.com/cloud_and_mobile/2012/12/picture-on-picture-manipulation-on-ios.html
- http://adndevblog.typepad.com/cloud_and_mobile/2012/12/using-rest-translator-service-from-ios.html

Session Feedback

- Via the Survey Stations, email or mobile device
- AU 2015 passes given out each day!
- Best to do it right after the session
- Instructors see results in real-time

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