



Introduction to iPhone Development

Justin Toyama - Developer, Smilefish

Week 1

Agenda, Course Outline, Getting Started, Books



Agenda

- Self-introduction
- Motivation for this class
- List the topics covered in the iPhone Introduction class
- List the topics covered in the Advanced iPhone Class
- Review a sample application that shows what you will learn in this class. The application focuses on user interface elements.
- End-to-end process to develop and deploy iPhone apps
- Do some live programming to sync up and get started
- Books and other materials

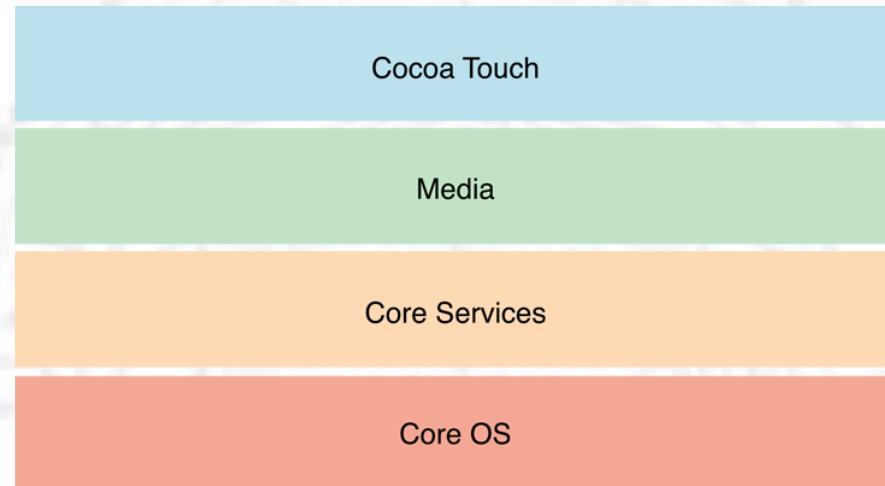
Justin Toyama

- BS Political Science, Univ. of San Diego
- Taught in Japan with NCR
- 2 years iPhone development
- 14 months at Smilefish
 - 4 Projects
 - Project Manager and Lead iOS Developer
 - We're always looking
- Love life since I became an iOS Programmer
- E-mail for this class: iphone@smilefish.com



- Who is in the class?
 - West Coast to East Coast and International
 - High Schoolers to developers with 20+ years experience
 - Contractors, startups, large corporations
 - Developers, QA, Marketing, Management
- Why?
 - Curiosity
 - Stay up to date with technology
 - New Opportunities at work
 - Business side desires hands on experience
 - *Maybe you fall into one of these categories:*
 - *I can write an application, but I can't get it released.*
 - *I can release it, but I can not sell it.*
 - *I can sell it, but I can not write it.*

- Layered iPhone Architecture
 - Objective-C, Foundation Framework, Cocoa Touch, and UIKit



- iPhone (OS) is made of first 3 layers,
- Use BSD Unix C to address this layer.
- The “c-layer” includes (I/O, network sockets, SQLite).
- Media layer includes C-addressable APIs like OpenGL, Quartz, CoreAudio.
- Cocoa Layer simplifies programming: i.e. NSString (Obj-C) and String (Swift) class for C Strings, collections (i.e. Arrays and Dictionaries), simpler I/O, file handling, date/time, ... (Foundation Framework)
- Cocoa Touch contains all the handling for user touch events (UIKit)

- iPhone Frameworks

- iPhone frameworks are collections of classes. Each is devoted to a “set of functionalities”.
- Cocoa Touch contains 2 primary class libraries that are used in most iPhone applications:
 - Foundation Framework (encapsulates collections, strings, file I/O etc)
 - UIKit (includes all the view-handling classes etc.) **We import this in Swift to gain access to the iOS SDK including Obj-C APIs**
- The SDK provides a whole list of frameworks for various purposes:
 - AddressBook (access the phone's address book)
 - AudioToolbox and Audio Unit (audio stream and recorded sound)
 - CFNetWork (WiFi handling)
 - Core Graphics
 - Media Player (Video playback)
 - OpenGLES (Embedded Open GL for 2-D and 3-D redering.)
 - QuarzCore (Core animation)

- **Mobile devices have “limiting factors”**
 - Example iPhone3: Memory (~128MB), Speed (~600MHz), later models are a lot faster but still not like desktop.
 - Screen (480x320), iPhone4 essentially doubled that for sharpness but kept the 480*320 coordinate system, Later models have higher resolution, but the screen size is essentially the same.
 - iPad (1024x768) Later models have higher resolution, but the screen size is essentially the same.
 - Security=Sandbox
 - Applications can only read from their bundle and place documents in their own documents directory.
 - Limited sharing is possible if documents are added specifically to a shared documents directory (later more)
 - Short-Lived Applications
 - One app at a time, start quickly and shut down almost instantly when someone calls.
 - In 4.x there is rudimentary background processing but no true multitasking. An application can ask for “some” processing time in the background, but might/will get shut down if “phone is busy”.
 - Objective-C 2.0 without garbage collection (manual memory management)

Motivation: Is Ernie an Attorney?



Started the port to iPhone June 1st 2009. Goal: in store by 1/1/2010

iTunes

LIBRARY Music Movies TV Shows Podcasts iTunes U Applications Radio

STORE iTunes Store Purchased

SHARED Home Sharing

GENIUS Genius

PLAYLISTS iTunes DJ 90's Music Classical Music Music Videos My Top Rated Recently Added Recently Played Top 25 Most Played Voice Memos

App Store Games SmileFISH.com

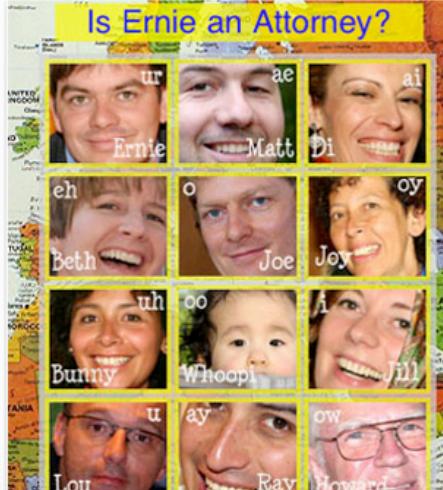
Is ERnie an attORney?

Description

Is ERnie an attORney? is a simple game that was designed by professional pronunciation trainers and produces amazing results in allowing non-native speaker to quickly and efficiently improve their pronunciation of the English language. American English vowel sounds are difficult for second language learners because English has no clear sound-spelling relationship.

[SmileFISH.com Web Site](#) > [Is ERnie an attORney? Support](#) >

Screenshots




About

Is Ernie An Attorney?
Version 1.03 (12/28/2009)
© 2009, SpeechGame.com,
all rights reserved
support@speechgame.com

American English vowel sounds are difficult for second language learners because English has no clear sound-spelling relationship. Five vowel letters and their different combinations create 15 vowel sounds. Most vowel sounds are spelled many different ways. For example, the I sound, as in pink, may be spelled "ee" as in been, "I" as in pig, or "igh" as in night.



! ENGLISH Talk Shop

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Strong communications skills are imperative for gaining confidence and moving ahead in your chosen field. Practice speaking at a sophisticated level — fluency and natural intonation in realistic sentences. We offer **Professional**, **Personal**, **Healthcare**, and **Academic** versions of our accent reduction packages.

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English Talk Shop has comprehensive software and training materials that help people reduce their accents and improve confidence and intelligibility in mission critical jobs.

Ready to Start Speaking Clearly?

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[Get Started!](#)



[Download](#)

+ This app is designed for both iPhone and iPad

Category: Education
Released: Mar 27, 2012
Version: 1.0
Size: 30.1 MB
Language: English
Seller: English Talk Shop LLC
© 2012 English Talk Shop LLC

Rated 4+

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iOS 5.0 or later.

US Citizenship Test Pro

Description

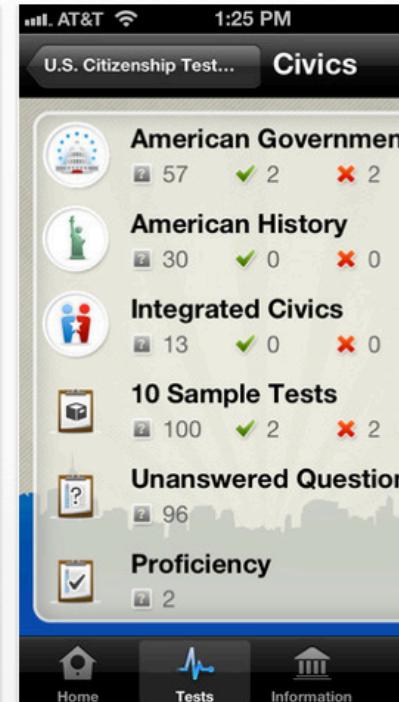
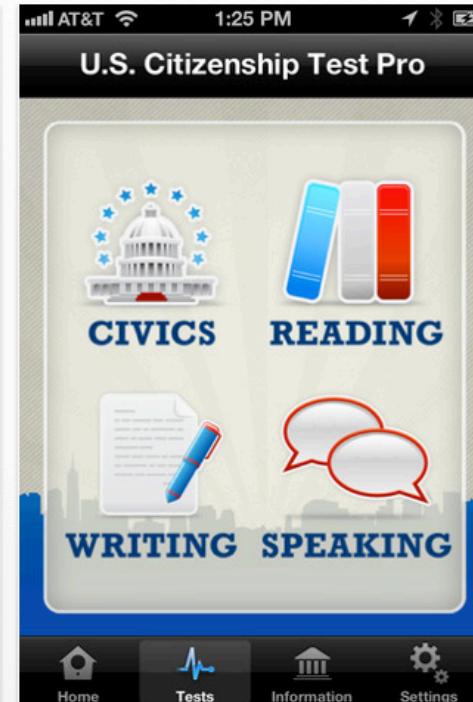
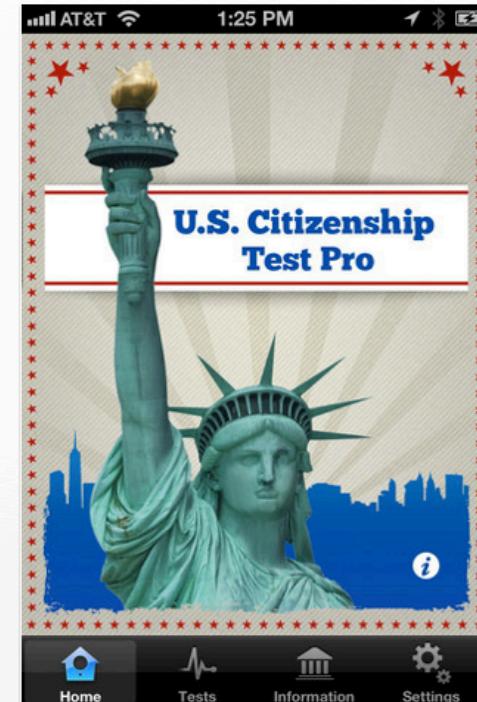
U.S. Citizenship Test Pro covers all the content needed to pass the U.S. Citizenship Test including Civics, Reading, Writing, and Speaking tests based on the official 2011/2012 USCIS material and guidelines. ...

[...More](#)

[English Talk Shop Web Site](#) > [US Citizenship Test Pro Support](#) >

Screenshots

[iPhone](#) [iPad](#)



Juanito y los Frijoles Mágicos

By Ayars Animation Inc.

Open iTunes to buy and download apps.



[View In iTunes](#)

 This app is designed for both iPhone and iPad

\$3.99

Category: **Books**

Updated: Nov 14, 2011

Version: 1.0.2

Size: 125 MB

Seller: Ayars Animation Inc

© 2010 Ayars Animation Inc.

[Rated 4+](#)

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iOS 3.1 or later

Description

La aplicación ganadora de premios del cuento "Jack and the Beanstalk" ahora está disponible en español como "Juanito y los Frijoles Mágicos."

[Ayars Animation Inc. Web Site](#) ▶ [Juanito y los Frijoles Mágicos Support](#) ▶

[...More](#)

Screenshots

[iPhone](#) | [iPad](#)



Después de que Juanito regresó, la gallina puso muchos huevos de oro, lo que le permitió a Juanito comprar de nuevo a Cremita. Y aunque la vida en su granja ya era feliz y tranquila, muchas personas todavía le tenían miedo al gigante porque seguía saqueando la aldea. Así que a Juanito se le ocurrió un atrevido plan para parar al gigante ¡de una vez por todas!

App Store > Books > Aridan Books



[Download](#)

 This app is designed for both iPhone and iPad

Category: Books

Released: May 11, 2012

Version: 1.0.0

Size: 62.4 MB

Language: English

Seller: Aridan Books, Inc.

© 2012 Aridan Books

Rated 4+

Requirements: Compatible with iPhone, iPod touch, and iPad. Requires iOS 3.1 or later

The Tree I See - Interactive Storybook

Description

Storyline : Watch as a young boy bears witness to a tree who constantly gives and shares unconditionally with friends of the wilderness. Your child will learn how friendships are formed by sharing with others. Observe how our young tree overcomes a dark moment in his life and transforms into a brilliant, vibrant, multicolored tree - full of life and happiness. Our story is for toddlers and children of all ages...

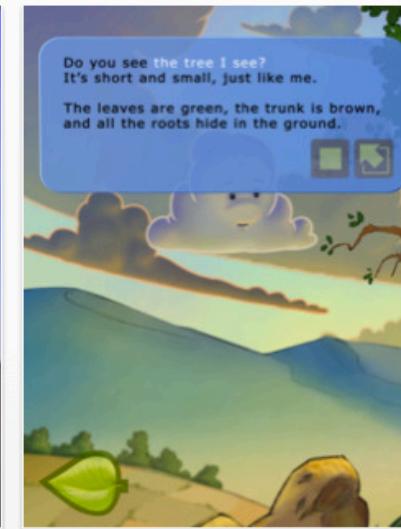
[...More](#)

[Aridan Books Web Site](#) > [The Tree I See - Interactive Storybook Support](#) >

Screenshots

[iPhone](#)

[iPad](#)



Stadiyum! By Apptico Technology Group

Open iTunes to buy and download apps.

[View More By This Developer](#)

[View In iTunes](#)

Free

Category: **Sports**
Updated: Jun 02, 2011
Version: 1.5.1
Size: 2.8 MB
Language: English
Seller: Apptico Technology Group, LLC
© 2011 - Apptico Technology Group
Rated 12+ for the following:
Infrequent/Mild Alcohol, Tobacco, or Drug Use or References

Requirements: Compatible with iPhone, iPod touch, and iPad.
Requires iOS 3.2 or later

Customer Ratings

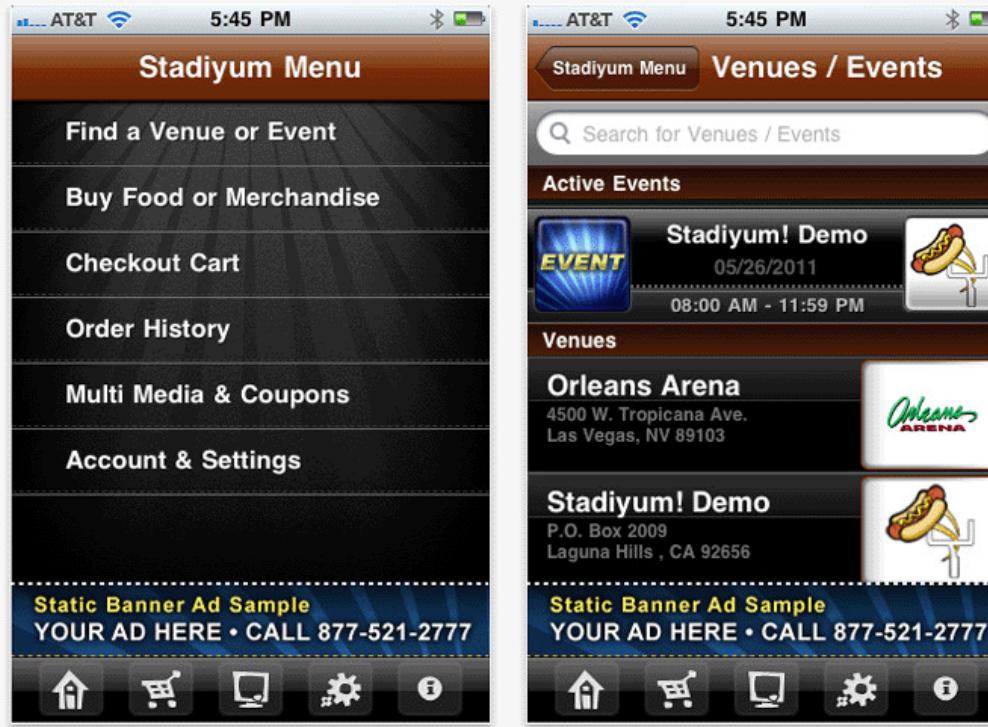
We have not received enough ratings to display an average for the current version of this

Description

Stadiyum! allows fans to order food, beverages and merchandise from their mobile devices and have the items delivered directly to their seat. No more waiting in long lines or missing any part of the action because Stadiyum! offers video replays, news updates and scores within the same app.

[Apptico Technology Group Web Site](#) ▶ [Stadiyum! Support](#) ▶

iPhone Screenshots



Rush49

By Trilion Inc.

Open iTunes to buy and download apps.



[View In iTunes](#)

Free

Category: Lifestyle

Released: Nov 10, 2011

Version: 1.0

Size: 9.5 MB

Language: English

Seller: trilion inc.

© 2011 Trilion Inc.

Rated 12+ for the following:

Inrequent/Mild Alcohol,
Tobacco, or Drug Use or
References

Requirements: Compatible with
iPhone, iPod touch, and
iPad.Requires iOS 4.2 or later.

Customer Ratings

We have not received enough
ratings to display an average for
the current version of this
application.

[View More By This Developer](#)

Description

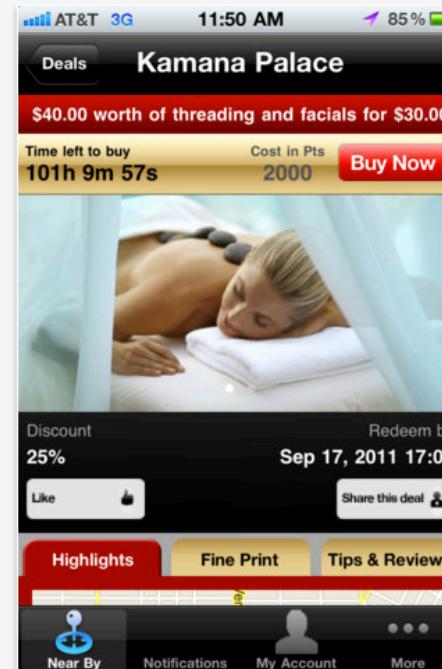
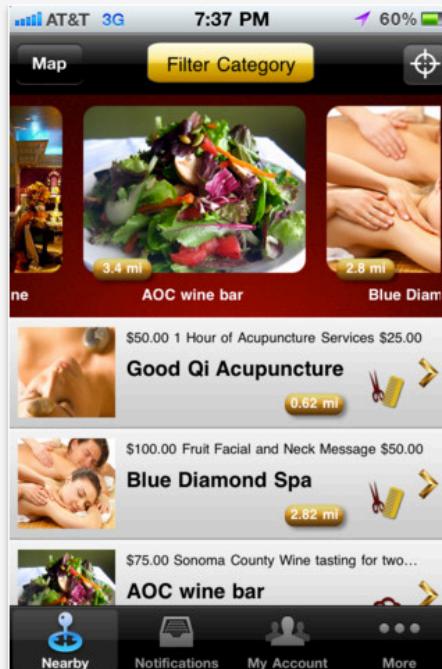
Rush49 - The Elixir for Your Urban Life

Want to discover exclusive deals and rewards at great local businesses? Now, with Rush49 you can do the very best

[Trilion Inc. Web Site](#) ▶ [Rush49 Support](#) ▶ [Application License Agreement](#) ▶

[...More](#)

iPhone Screenshots



UCI Mobile Certificate

18 months of preparation and we want your input!

- Generally 2 types of Applications
 - Stand alone (games, books, utilities)
 - Networked (REST based service, JSON, ...)
- Different business models:
 - Sell applications
 - Free apps with paid advertising
 - In-app purchase
 - Other: marketing, more targeted advertising, etc.
 - Apps to sell products like “food in stadium” or “coupons” etc.



The screenshot shows the UC Irvine Extension website. The top navigation bar includes links for Courses, Certificates, Corporate Training, International, Community Programs, Pressroom, and Student Services. The main content area displays the "Mobile Application Development" certificate program. It features a sidebar with various IT-related certificates like Business Intelligence & Data Warehousing, Database Management, Enterprise Development Using Java Technologies, etc. The main content includes an "Overview" section describing the growth of mobile computing, a large image of the UCI seal labeled "Certificate", and two call-to-action boxes: "Stay Informed About Mobile Application Development" and "View this quarter's courses in Mobile Application Development". A separate box for a "Mobile Development for Apple iPhone and iTouch Information Session" is also shown.

- The bigger Picture:
 - Introduction to mobile computing (market, enterprise, gaming, tech overview)
 - Specialization in iPhone, Android, or Phone8
 - Electives include Agile, Social Network Integration, Cloud Computing, ...
 - <http://unex.uci.edu/certificates/it/mobile/courses.aspx>

Mobile Development for Apple iPhone and iTouch

- Online Class
 - End-to-end process to develop Apple iPhone applications
 - Sign-up for Apple iPhone development program
 - Cocoa environment, XCode, Interface Builder
 - Swift programming language
 - Learning Process, Resources, Simulator, Devices
 - Deployment, application qualification and upload to Apple Store
 - Event handling, Views, User Interface Controls,
 - Navigation (Tab Bar, Navigation Bar, TableView)
 - Sound, WebBrowser, Alerts, Error handling
 - Generate UI programmatically vs interface builder.
 - Camera, ImagePicker, MoviePlayer

Advanced Apple iPhone and iPod Touch Development

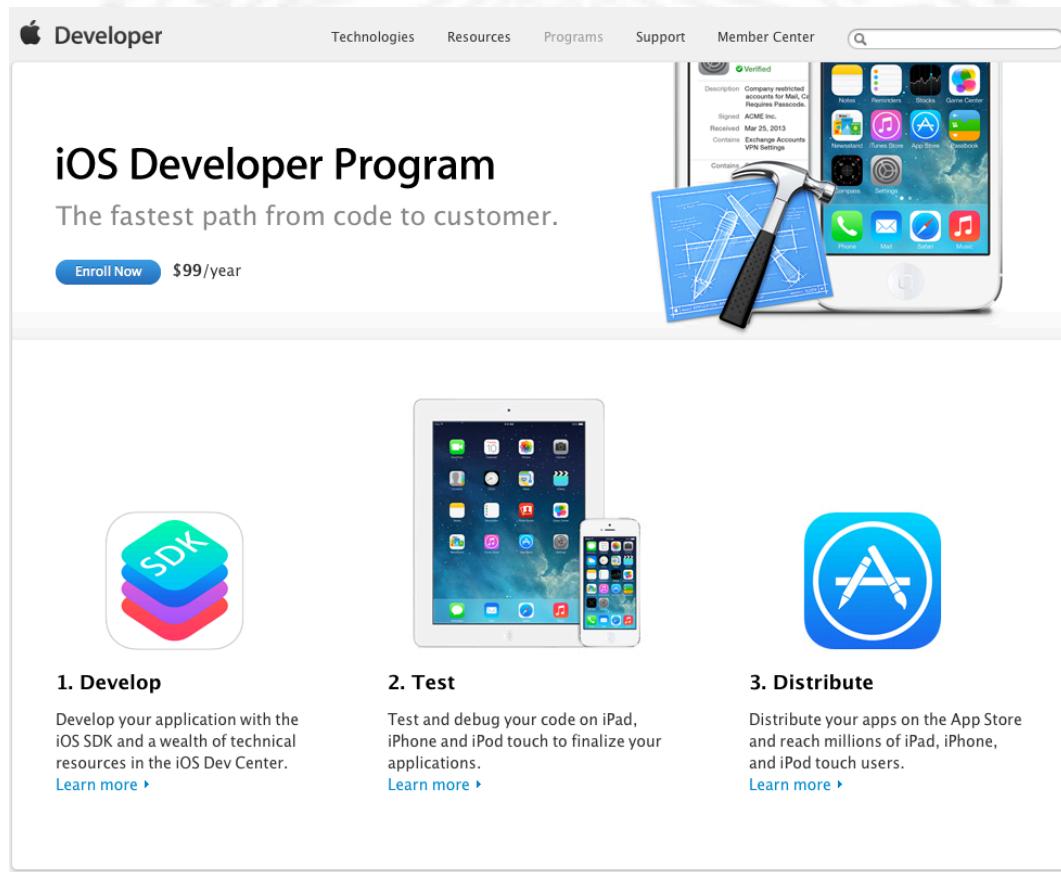
- Online
 - Advanced Data handling, structures, XML
 - Configuration / Application Settings
 - Advanced Web Access, Web Service Calls
 - REST, JSON, XML WebServices
 - Data Persistence SQLite and Core Data
 - Advanced Navigation
 - Animation
 - Accelerometer, GEO positioning
 - Universal Applications.
 - Facebook integration
 - Push Notification.



- Tab Bar
- Navigation Bar
- Sound
- Images
- Event Handling
- About Page
- Calendar controls
- Internet Access
- “Programmed UI vs. Interface Builder”

Getting Started

- Need a Mac – or MacInCloud.com
- Need the iPhone SDK and development environment
- Sign up for development program:
 - <http://developer.apple.com/iphone/program/>



The screenshot shows the Apple Developer website's iOS Developer Program page. At the top, there's a navigation bar with links for Technologies, Resources, Programs, Support, and Member Center. Below the navigation is a large banner for the "iOS Developer Program" with the tagline "The fastest path from code to customer." It features a "Enroll Now" button and a price of "\$99/year". To the right of the banner is an image of an iPhone displaying its home screen with various app icons, and a blueprints icon with a wrench resting on it. The main content area is divided into three sections: 1. Develop (with an icon of stacked books labeled "SDK"), 2. Test (with an icon of an iPad and iPhone), and 3. Distribute (with an icon of the App Store logo). Each section contains a brief description and a "Learn more" link.

iOS Developer Program
The fastest path from code to customer.

[Enroll Now](#) \$99/year

1. Develop
Develop your application with the iOS SDK and a wealth of technical resources in the iOS Dev Center.
[Learn more ▾](#)

2. Test
Test and debug your code on iPad, iPhone and iPod touch to finalize your applications.
[Learn more ▾](#)

3. Distribute
Distribute your apps on the App Store and reach millions of iPad, iPhone, and iPod touch users.
[Learn more ▾](#)

- Signing up:
 - Decide if you want to sign up personally or corporate.
 - Keep in mind that you sign a legal contract
 - You receive a developer account and an ID (Certificate) that needs to be added to your key chain.
 - You need to register your test devices (up to 100).
 - For each application you need to create an ID and a certificate. This will be combined into a Provisioning Profile.
 - Meanwhile you can install the iPhone SDK

- What you get:

Development Tools in the iPhone SDK



Xcode

Complete development environment provides project management, a powerful source editor, and a graphical debugger.



iPhone Simulator

Run, test, and debug your application locally on your Mac using a simulated iPhone.



Instruments

Collect, display, and compare performance data graphically in real-time to optimize your application.



Interface Builder

Interface Builder makes designing a user interface as easy as drag and drop.

Development Resources



Apple Developer Forums Beta

Post iPhone SDK development topics and questions for an open discussion with other iPhone developers and Apple engineers.



Getting Started Videos & Documents

Get started with videos and documentation covering a range of topics, from tools and frameworks to development best-practices and design methods.



iPhone Reference Library

A rich collection of documentation, guides, and articles categorized so you can quickly find the information you're looking for.



Coding Resources

Inspire your own development with a library of sample code and Coding How-To's. Use these examples to add new functionality or to enhance your application's current design.

- What's new in Xcode 7
 - https://developer.apple.com/library/ios/documentation/DeveloperTools/Conceptual/WhatsNewXcode/Articles/xcode_7_0.html#/apple_ref/doc/uid/TP40015242-SW1
 - A word on Memory Management
 - Automatic Reference Counting
 - <http://stackoverflow.com/questions/6385212/how-does-the-new-automatic-reference-counting-mechanism-work>
 - Please read Ch. 3 of Big Nerd Ranch book to become familiar with Memory Management concepts for Obj-C

Get Xcode from the Mac Appstore. (this icon in your desktop's dock)



The screenshot shows the 'Welcome to Xcode' screen. At the top right, there's a sidebar listing recent projects: 'eddiapp' (~/Users/Shared/Developer/EDDI/eddi-ios), 'Pilgrim' (~/...Projects/In-house/ETSC/MacSource/Citizen), 'AVCam' (~/Downloads), 'ImageApp' (~/Downloads), 'scratchpad' (~/Users/Shared/Developer/my library), 'S3Uploader' (~/s/aws-ios-sdk-1.6.1/samples/S3_Uploader), 'SFMonteCarlo' (~/...Smilefish Projects/Contract Work/SFMC/iOS), 'PhotosByLocation' (~/Downloads), 'EHS' (~/...Smilefish Projects/Contract Work/EHS/code), and 'Claremont'. Below the sidebar is a 'Recent Document' section with icons for 'eddiapp', 'Pilgrim', 'AVCam', 'ImageApp', 'scratchpad', 'S3Uploader', 'SFMonteCarlo', 'PhotosByLocation', 'EHS', and 'Claremont'. The main content area features a large 'Welcome to Xcode' title, a subtitle 'Version 5.0.1 (5A2053)', and two buttons: 'Create a new Xcode project' (with a gear icon) and 'Check out an existing project' (with a folder icon). At the bottom left is a checkbox for 'Show this window when Xcode launches', and at the bottom right is a 'Open Other...' button.



iPhone OS Reference Library

<http://developer.apple.com/iphone/library/navigation/index.html>



iPhone OS Reference Library

- <http://developer.apple.com/iphone/library/navigation/index.html>
- “Recommended Reading” (All available in PDF. Print and Read !!)
 - iOS Application Programming Guide
 - https://developer.apple.com/library/ios/documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/Introduction/Introduction.html#/apple_ref/doc/uid/TP40007072-CH1-SW1
 - iPhone Development Guide - About the Tools Workflow for iOS
 - https://developer.apple.com/library/ios/referencelibrary/GettingStarted/RoadMapiOS/AppDevelopmentProcess.html#/apple_ref/doc/uid/TP40011343-CH4-SW1
 - iPhone Human Interface Guidelines (for iOS 7)
 - <https://developer.apple.com/library/ios/documentation/UserExperience/Conceptual/MobileHIG/index.html>
 - Xcode integrated documentation:
 - Option key + double click on symbol
 - Also <http://stackoverflow.com/questions/146297/hidden-features-of-xcode>

Distribute your Application



App Store

Reach millions of iPhone and iPod touch customers on the App Store.

The App Store is accessible through Wi-Fi and cellular networks so iPhone and iPod touch customers can discover and download new applications wherever they go. Users can search applications by genre, featured, and top ten. Once downloaded, customers will be notified whenever an update is available – directly on their iPhone or iPod touch.

- ✓ You pick the price
- ✓ You get 70% of sales revenue
- ✓ Receive revenue checks monthly
- ✓ No charge for free apps
- ✓ No credit card fees
- ✓ No hosting fees
- ✓ No marketing fees



1, 2, 3 ...



A long way to go!!!

Textbooks

- **Required Reading:**

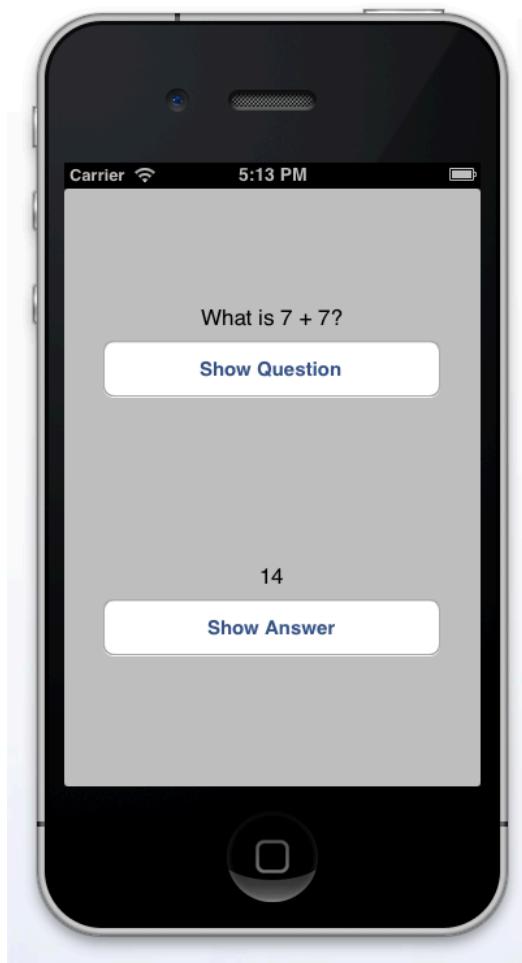
- Both of the following are available for free on iBooks and online for those who do not have access to iBooks (note: iBooks is available on iPhone, iPad and your Mac computer (requires OS X Mavericks or Yosemite))
 - [The Swift Programming Language](#) by Apple, Inc.
 - [Using Swift with Cocoa and Objective-C](#) by Apple, Inc.
- [iOS Programming: The Big Nerd Ranch Guide](#) (4th Edition) by Christian Keur, Aaron Hillegass and Joe Conway – 2014
 - Paperback \$33.00 – available at Amazon.com
 - Kindle \$22.99
 - iBooks \$39.99

- **Recommended reading:**

- [Objective-C Programming: The Big Nerd Ranch Guide](#) by Aaron Hillegass
- (you'll likely be asked to maintain applications that were written in Obj-C)
- **Supplemental Material will also be introduced in the class lecture notes and as part of your homework**



Sample

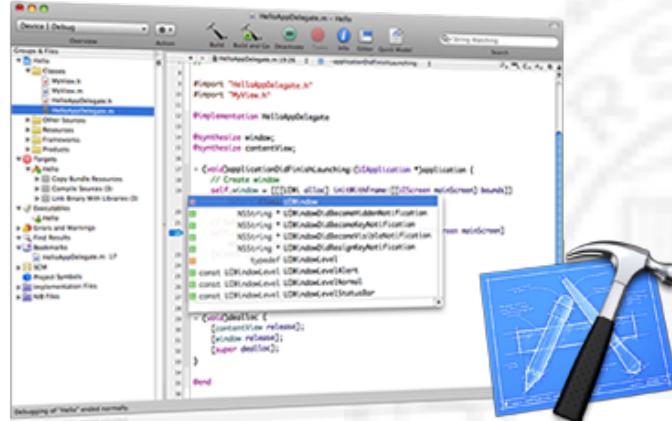


Let's generate a small sample:

- Quiz application from Ch. 1
- DEMO

Recap Sample

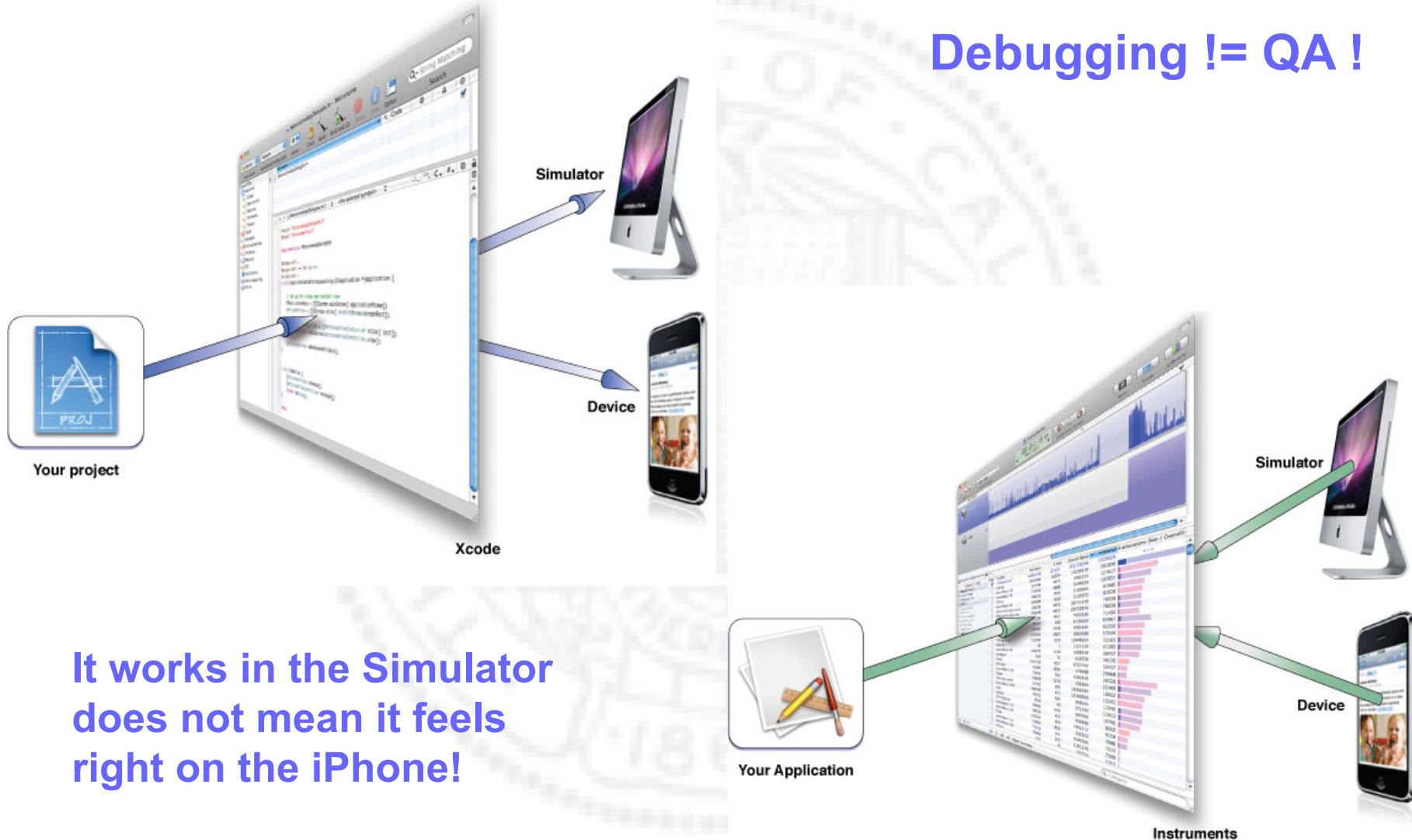
Xcode



Interface Builder



Testing



iPhone Deployment

Developer

Member Center

Home People Programs & Add-ons Your Account

Organization: SmileFish Hi, Justin-Nicholas Toyama | Sign out

Developer Program Resources

Technical Resources and Tools

Dev Centers
Quickly access a range of technical resources.
[iOS](#) | [Mac](#) | [Safari](#)

Certificates, Identifiers & Profiles
Manage your certificates, App IDs, devices, and provisioning profiles.

App Store Distribution

App Store Resource Center
Learn about how to prepare for App Store Submission.

iTunes Connect
Submit and manage your apps on the App Store.

Community and Support

Apple Developer Forums
Discuss technical topics with other developers and Apple engineers.

Developer Support
Request technical or developer program support.
[Technical](#) | [Program](#)

Developer Program Overview
[Read about accessing the resources and benefits of your iOS Developer Program](#)

News and Announcements
Get app submission tips, learn about new features in iTunes Connect and receive guidance on developing and marketing your apps.
[Learn more ▾](#)

- Login to
 - <https://developer.apple.com/membercenter/index.action>

 **Developer Connection**

App Store Resource Center

Prepare for App Submission 

App Store Approval Process 

Managing Apps on the App Store 

Marketing Resources 

Related Resources

[App Store Submission Tips](#) 

[News and Announcements](#) 

[iTunes Connect Developer Guide](#) 

[iTunes Connect FAQ](#) 

[Apple Developer Forums](#) 

Adding In App Purchase to your free apps 

You can now use In App Purchase within your free apps to sell content, subscriptions, and digital services.

[Learn more](#) 

Dev Centers  ADC on iTunes Support  Search ADC

Prepare for App Submission

PRO

Get Started with iTunes Connect | Gather app info | Create an account for In App Purchase

Get started with iTunes Connect

iTunes Connect is a suite of web-based tools that allows you to submit and manage your applications for distribution on the App Store. In iTunes Connect you will be able to check the status of your contracts, set up your tax and banking information, obtain sales and finance reports, request promotional codes, manage users, applications, metadata, and your in app purchase catalog.

Set up user accounts

When creating and editing an iTunes Connect user account, you are able to define user roles and notifications. Defining notifications determine the type of emails your users will receive regarding your iTunes Connect account. There are four distinct user roles Admin, Legal, Finance, and Technical.

[Log in to iTunes Connect](#) 

Complete contracts, tax, & banking information

Once you have set up your accounts, proceed to the Contracts, Tax & Banking module. In this module you will complete the paid application agreements and provide financial information relating to payment and tax withholdings from the sale of your apps.

[Log in to iTunes Connect](#) 

- <https://developer.apple.com/appstore/resources/submission/index.html>
- <http://developer.apple.com/iphone/news/appstoretips/>

Home work

- Attend or listen to Weekly live session – recorded!
- **Homework:** Please see the Homework Guide that I will post on the class homepage and submit homework via email to:
iphone@smilefish.com
- I will not collect homework this first week.

