Welcome to CSE 436S
Software Engineering Workshop

"iPhone Class"

Course Information

- **Instructor**
  - Todd Sproull
  - todd@wustl.edu
  - Jolley 538
  - Office Hours by Appointment
- **Classrooms**
  - McMillan G052
  - Whitaker 316 (Mac Lab)
- **Time**
  - Mondays and Wednesdays 10 – 11:30 AM
- **Course Website**
  - http://research.engineering.wustl.edu/~todd/cse436/
- **Head TA**
  - Andrew Buckley (abuckley@wustl.edu)

Requirements

- **CSE 332S**
  - Object Oriented Software Development Laboratory
- **Access to an Intel-based Macintosh**
  - Running Mac OS X 10.8 – 10.10
  - iPhone SDK Xcode 6 and iOS 8
- **Textbook**
  - None, we will use lecture slides and the developer.apple.com website
- **Owning an iPhone or iPod Touch not required**
  - We will use the simulator throughout the semester
  - Final projects may target an iPhone or iPod Touch
    - CS department purchased a few iPod Touch devices for the class

Stanford CS193p

- **This course is based on cs193p taught at Stanford by Evan Doll and Alan Cannistraro**
  - Lectures and slides available on iTunes
- **Many of the lectures and programming assignments come from this class**
  - Initial assignments are identical
  - Later assignments somewhat different
- **Consider taking the iTunes course if that suits your personality**

iPhone Developer University Program

- **WashU is enrolled in the program**
  - Free development on devices for students
  - Valid for the entire semester
- **Each student will need to enroll online at developer.apple.com**
  - More details to come later
- **This license does not allow you to sell your application on the App Store**

Copyrights, Patents, Fair Use…

- **Everything discussed in this class and on the website is completely OPEN and FREE**
  - Do whatever you want with it
- **The goal of this class is to share as much information as possible**
  - Open discussion of topics and ideas
- **If you have a great idea and do not want others to implement it and sell it DO NOT discuss it here**
  - If you choose to discuss it, we can probably improve it
- **You are free to become an Apple Developer ($99/yr) and sell anything you create in this class**
  - Or implement another student's great idea and sell it

What is this class all about?

- **Software Engineering**
  - Creating useful software to solve interesting problems
  - Utilize amazing hardware with lots of cool features
- **Building applications on the Apple iPhone and iPod Touch with Cocoa Touch**

Cocoa Touch and iPhone SDK

- **Based on Cocoa**
  - API used to develop software on Mac
- **Provides rich starting point for exploring app design**
- **Shows real-world implementations of OO design patterns**
- **Designs learned on iPhone translate directly to Mac OS X**

Why Objective-C

- **Exposure to other languages is good**
  - Probably new to most students to this class
- **ObjC is a language focused on simplicity and elegance of objected oriented design**
  - Based on ANSI C
  - Brings many object oriented principles, but with a minimal amount of syntax
- **Useful data point to compare with designs of C, C ++, Java other languages**

Grading

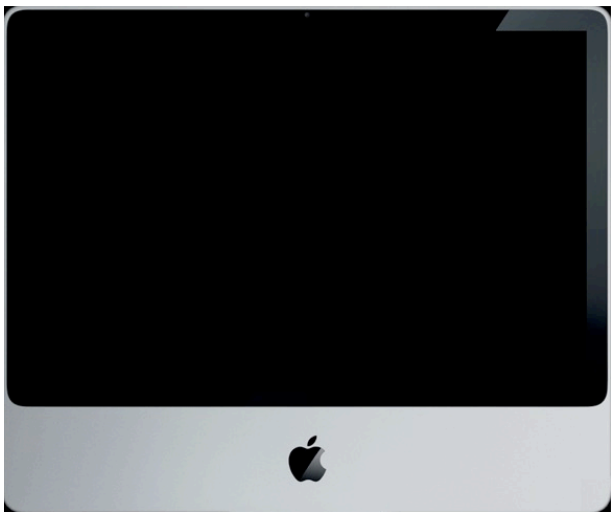
- **4 or 5 lab assignments during the semester**
  - 55% of your final grade
- **Mid-term**
  - Covers ObjC programming and some software engineering concepts
  - 20% of your final grade
- **Final Project**
  - Work on something that can make a difference
    - Start thinking about your project today!
  - 25% of your final grade

Questions?

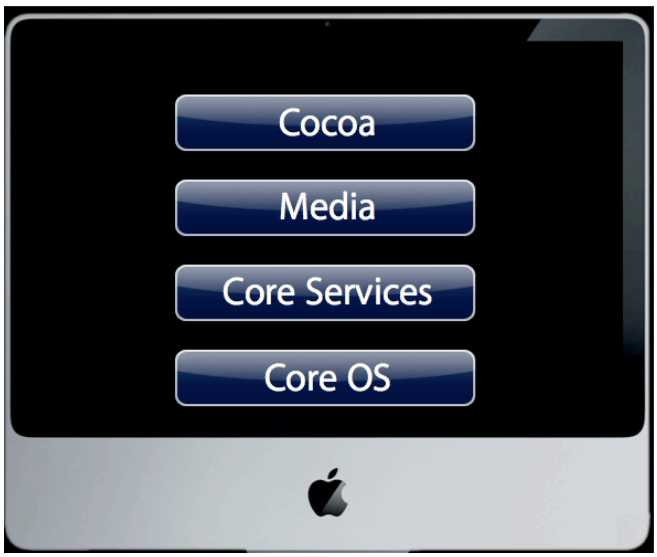
iPhone OS Overview

iPhone

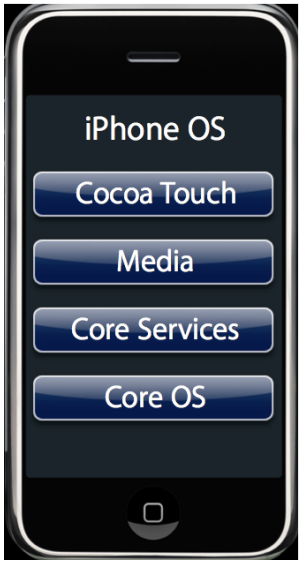
Mac OS X

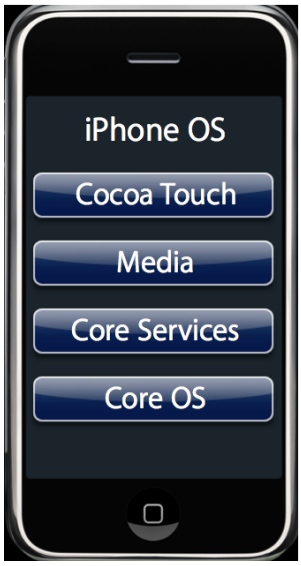


Mac OS X

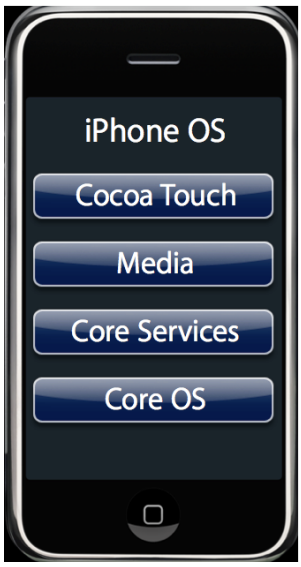


iPhone / iPad

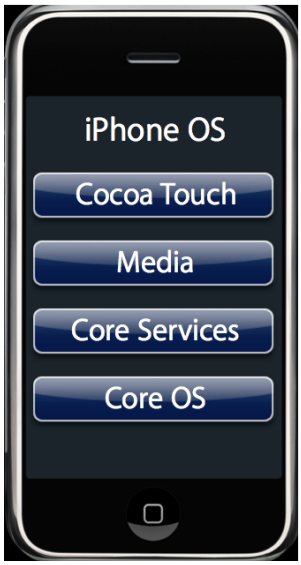




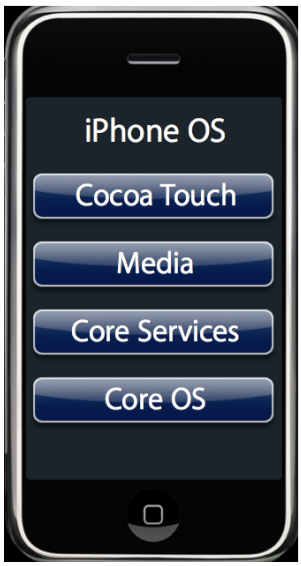
- **Core OS**
  - OS X Kernel
  - BSD
  - Sockets
  - Security
  - Power Mgmt
  - Keychain
  - File System



- **Core Services**
  - Collections
  - Networking
  - SQLite
  - Net Services
  - Threading
  - Preferences



- **Media**
  - Core Audio
  - Audio Mixing
  - Audio Recording
  - Video Playback
  - JPG, PNG, TIFF
  - PDF
  - Quartz (2D)
  - Core Animation
  - OpenGL ES

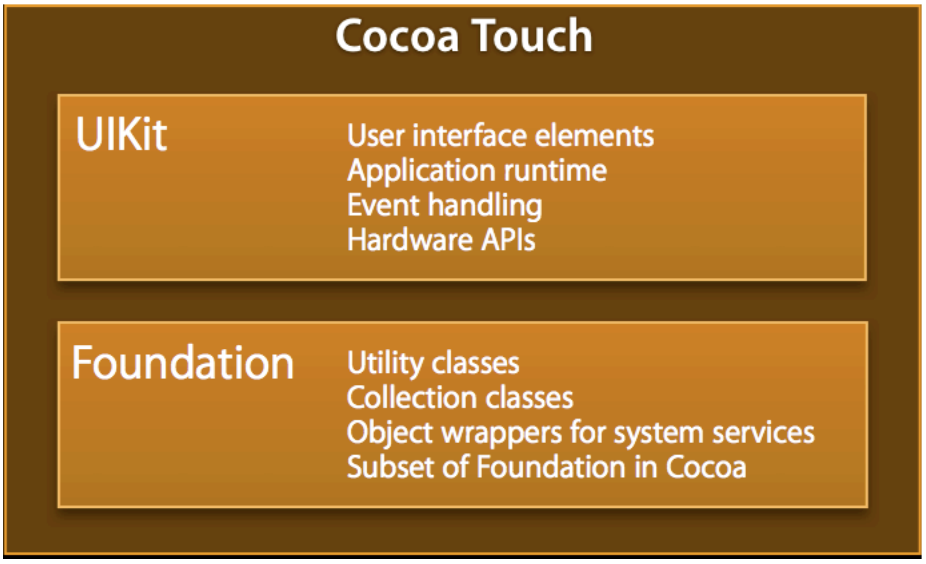


- **Cocoa Touch**
  - Multi-Touch Events
  - Multi-Touch Controls
  - Accelerometer
  - Localization
  - Alerts
  - Web Views

Development

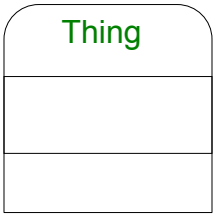
- **Tools**
  - Xcode
    - Storyboard (formerly Interface Builder)
- **Frameworks**
  - Foundations
  - UIKit
- **Languages and Runtimes**
  - Objective C

Cocoa Touch Architecture

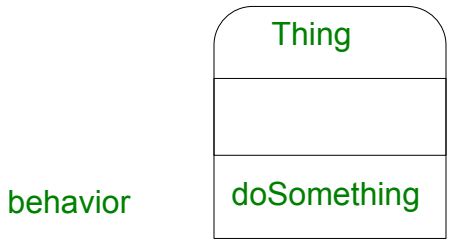


Object Oriented Programming

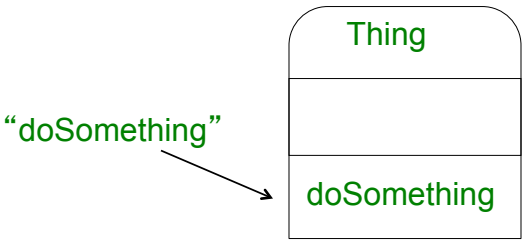
Object



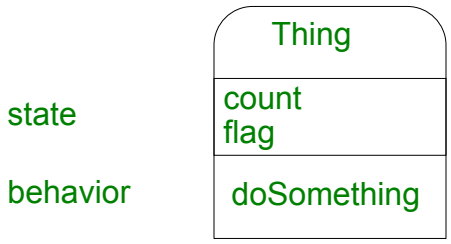
Behavior



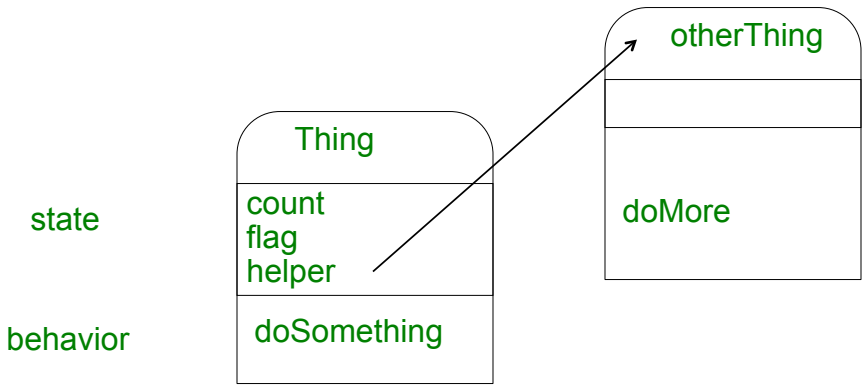
Message



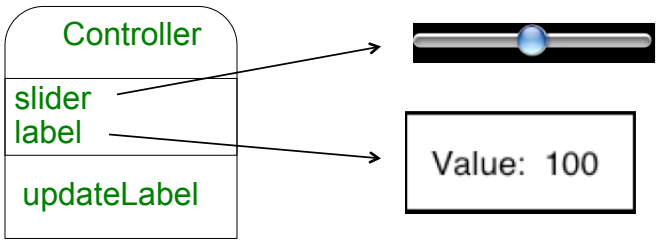
State



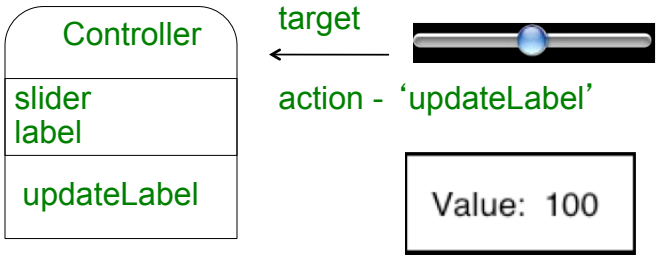
Other Objects as State



Outlets



Target/Action



Demo

Recap

- Keep logic separate from interface elements
- Outlets connect controllers to views
- Use target/action to customizer behavior