Stanford CS193p

Developing Applications for iOS
Winter 2015

Today

- What is this class all about?
  Why am I here?
- Prerequisites
  You must be a strong object-oriented programmer.
- iOS Overview
  What's in iOS?
- Show me!
  A demo with a thousand words is worth tens of thousands of words.

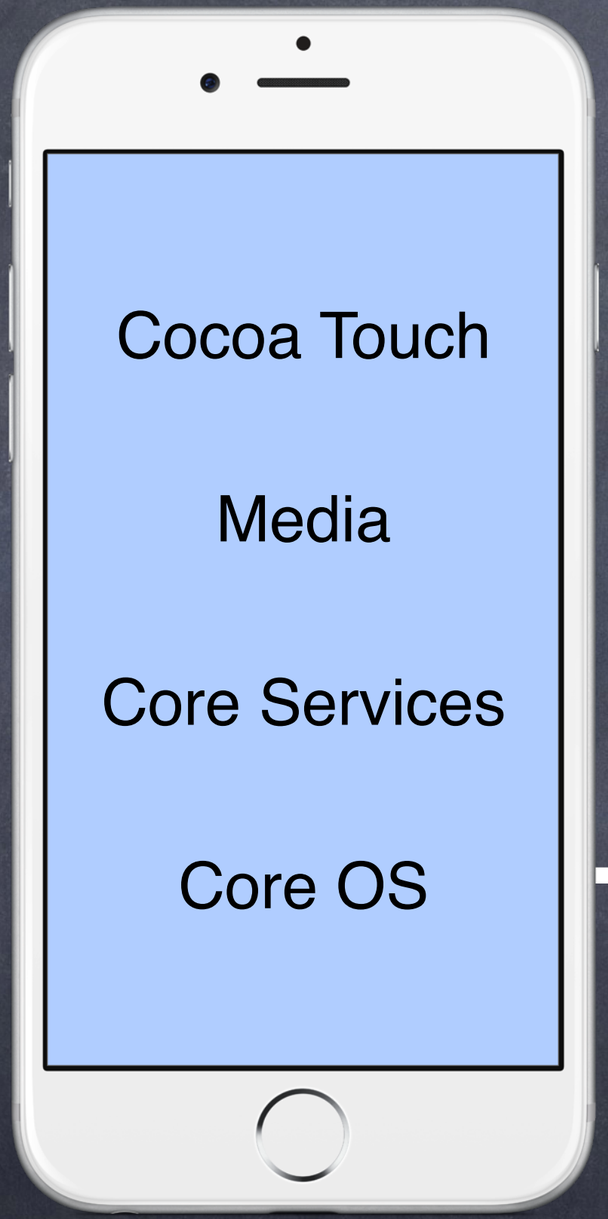
What will I learn in this course?

- How to build cool apps
  - Easy to build even very complex applications.
  - Result lives in your pocket or backpack!
  - Very easy to distribute your application through the AppStore.
  - Vibrant development community.
- Real-life Object-Oriented Programming
  - The heart of Cocoa Touch is 100% object-oriented.
  - Application of MVC design model.
  - Many computer science concepts applied in a commercial development platform:
    - Databases, Graphics, Multimedia, Multithreading, Animation, Networking, and much, much more!
  - Numerous students have gone on to sell products on the AppStore.

Prerequisites

- Prior Coursework
  - Object-Oriented Programming experience mandatory.
  - CS106A&B (or X) required & CS107 or CS108 or CS110 also (at a minimum) required.
  - (or equivalent for non-Stanford undergrads)
- You should know well the meaning of these terms ...
  - Class (description/template for an object)
  - Instance (manifestation of a class)
  - Message (sent to object to make it act)
  - Method (code invoked by a Message)
  - Instance Variable (object-specific storage)
  - Superclass/Subclass (Inheritance)
  - If you are not very comfortable with all of these, this is probably not the class for you!
- Programming Experience
  - This is an upper-level CS course.
  - If you have never written a program where you had to design and implement more than a handful of classes, this will be a big step up in difficulty for you.

What's in iOS?



Core OS

OSX Kernel	Power Management
Mach 3.0	Keychain Access
BSD	Certificates
Sockets	File System
Security	Bonjour

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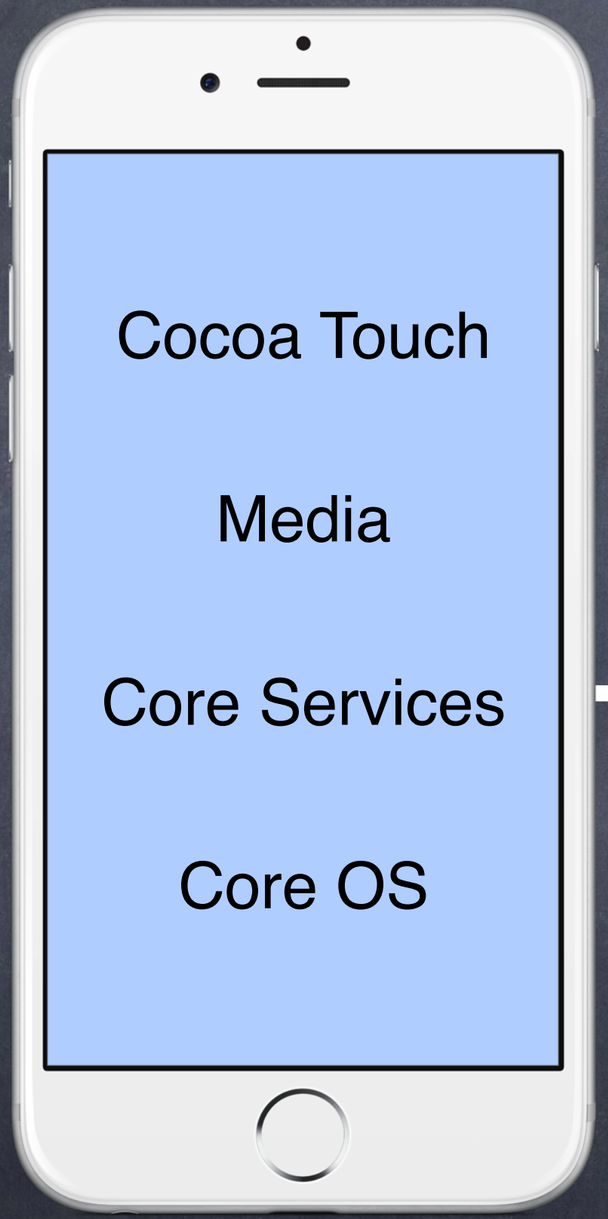

Core Services

Collections	Core Location
Address Book	Net Services
Networking	Threading
File Access	Preferences
SQLite	URL Utilities

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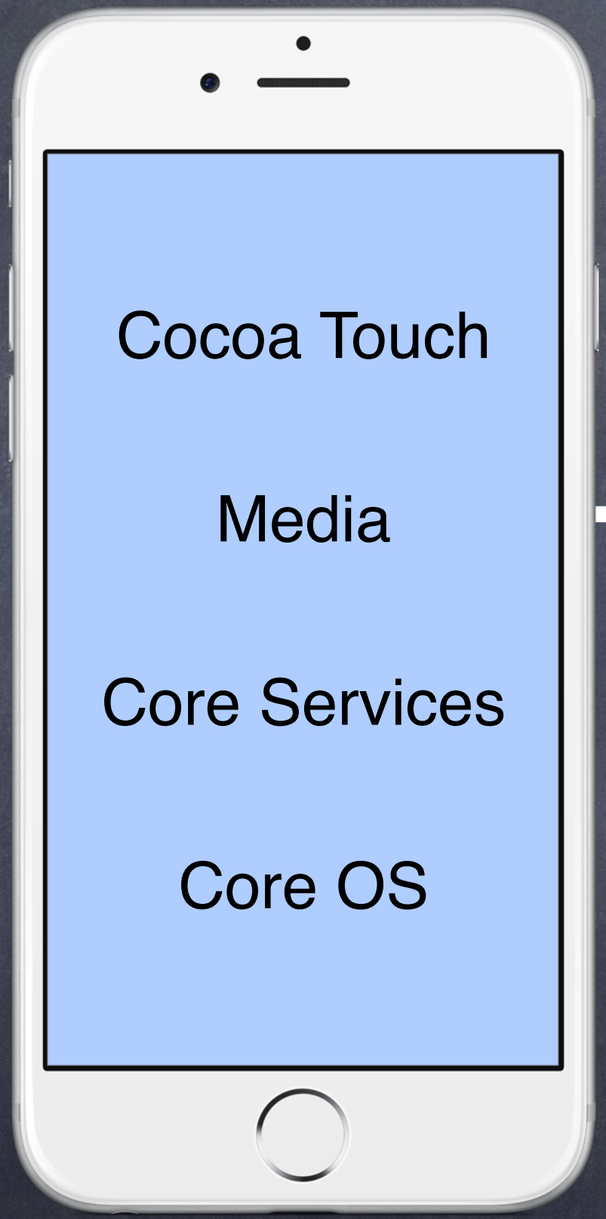


Media

Core Audio	JPEG, PNG, TIFF
OpenAL	PDF
Audio Mixing	Quartz (2D)
Audio Recording	Core Animation
Video Playback	OpenGL ES

What's in iOS?

Cocoa Touch

- Multi-Touch
- Core Motion
- View Hierarchy
- Localization
- Controls
- Alerts
- Web View
- Map Kit
- Image Picker
- Camera

Platform Components

- Tools

Xcode 6

Instruments

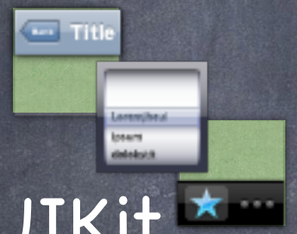
- Language(s)

```
let value = formatter.numberFromString(display.text!)?.doubleValue
```

- Frameworks

Foundation

Core Data



UIKit

Core Motion

Map Kit

- Design Strategy

MVC

Demo

- Calculator
  - All this stuff can be very abstract until you see it in action.
  - We'll start getting comfortable with Swift and Xcode 6 by building something right away.
  - Two part demo starting today, finishing on Wednesday.
- Today's topics in the demo ...
  - Creating a Project in Xcode 6
  - Building a UI (and making it squishable/stretchable using Autolayout)
  - The iOS Simulator
  - println (and conversion to a String using \() notation)
  - Defining a class in Swift, including how to specify instance variables and methods
  - Connecting properties (instance variables) from our Swift code to the UI (outlets)
  - Connecting UI elements to invoke methods in our Swift code (actions)
  - Accessing iOS documentation from our code
  - Optionals (?, unwrapping implicitly by declaring with !, and unwrapping explicitly with ! and if let)