

Welcome to CS193P

iPhone Application Development

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Introductions

- Lecturers
 - Alan Cannistraro <accannis@stanford.edu>
 - Josh Shaffer <joshh@stanford.edu>
- Student TAs
 - Paul Salzman <paulsalz@stanford.edu>
 - David Jacobs <dejacobs@stanford.edu>
- Grand-Master Chief
 - Paul Marcos <pmarcos@apple.com>

Quick Survey

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- Have worked with Object Oriented Programming??

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- Have developed apps for Mac OS X?

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- Have submitted apps to the App Store?

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- Lectures:
 - Education 128
 - Tuesday & Thursday 4:15 - 5:30 PM

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 - Guest speakers & hot topics
- Office Hours
 - Paul & David will hold office hours
 - See website for details

Requirements

- **Prerequisite:** CS 106B/X
- **Recommended Book:** None! We'll use Apple documentation
- **Required Hardware & Software:**
 - Intel-based Macintosh, running Mac OS X 10.5 Leopard
 - iPhone SDK (*not currently available* on cluster computers)
- **iPhone or iPod touch is not required**
 - Assignments may be completed using the iPhone Simulator
 - Loaner iPod touches will be available

Enrollment

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- **Auditors welcome!**

iPhone Developer University Program

- Stanford is part of the iPhone Developer University Program
 - Do not sign up for this!
- **Free on-device development for students (save \$99!)**
 - Valid through the end of the quarter
 - Invites will be issued to your @stanford.edu email address
 - Read through a Student Agreement to get started

Available on iTunes U



CS193P on iTunes U

For enrolled students at Stanford

- Your voice may be recorded
- Not a substitute for attending lectures
- There will be a delay of a few days before lectures and materials are available

CS193P on iTunes U

For viewers on iTunes U:

- Welcome to Stanford!
- Feedback and suggestions are welcome
- **We can't answer individual questions via email**
- Download materials now, if you want them later!

Communication and Materials

- Email
 - cs193p@cs.stanford.edu
 - Questions from enrolled students only, please!
- Course web site
 - <http://cs193p.stanford.edu>
- Other web sites
 - Apple Dev Center: <http://developer.apple.com>
 - Developer Forums: <http://devforums.apple.com>
 - External resources:
 - <http://cs193p.com>
 - <http://groups.google.com/group/iphone-appdev-auditors/>

Communication and Materials

- Auditors
 - cs193p-auditors@lists.stanford.edu
 - Self-add email list
 - Low volume, but allows us to communicate with all folks following along
 - To sign up, go to:
 - <http://lists.stanford.edu>
 - <https://mailman.stanford.edu/mailman/listinfo/cs193p-auditors>

Why Are We Here?



To build iPhone & iPod touch applications
using Cocoa Touch

Why Are We Here?

- CS193P is not just about the iPhone, Cocoa Touch or ObjC
- It's about Software Engineering, as well as object oriented architecture and design
- Exposure to problems and solutions that you might not see in other classes

Cocoa Touch & iPhone SDK

Cocoa Touch & iPhone SDK

- Based on Cocoa
 - Mature, polished, highly consistent APIs
- Provides a very 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

Things We'll Cover

Tools

Frameworks

**Language
(& Runtime)**

Tools



Xcode



Interface Builder

Frameworks

Language (& Runtime)

Tools



Xcode



Interface Builder

Frameworks



Foundation



UIKit

Language (& Runtime)

Tools



Xcode



Interface Builder

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Foundation



UIKit

Language (& Runtime)

```
[textView setValue: @"Hello"];
```

Objective-C

Why Objective-C?

- Exposure to other languages is always good
- ObjC is a language focused on simplicity and the elegance of OO design
 - Based on ANSI C
 - Brings many object oriented principles, but with a minimal amount of syntax
- A data point to compare with designs of C, C++ and Java

Assignments, Grading & Late Policy

- 7 weekly assignments
- Final project of your choice
 - End of quarter demos at Apple...
- Grading: Nice & simple: ✓, ✓+ and ✓-
- Late Policy: 3 late days, use them wisely!


Applications You Will Build

| | |
|--|---------------------------------------|
| | HelloStanford & Obj-C Tool |
| | HelloPoly - 2 weeks |
| | Paparazzi - 4 weeks |
| | Final Project (your choice) - 3 weeks |

First Assignment

- First assignment handed out today, in two parts
- Intended to get you situated with tools and start off with Obj-C
- Includes a comprehensive walkthrough
- We suggest trying to do the first half before Thursday to help work out any tools or installation issues
- Due on Jan 13 (next Wednesday)

Paparazzi

- Build a fully functional application from scratch over 4 weeks
- Access photos on  flickr®
- Each assignment builds on the previous one
 - Don't fall behind!
- Covers a wide variety of topics in the UIKit framework...

What We'll Cover

- Application design patterns
- View controllers
- Presenting data
 - Table views
- Loading & saving data
 - Property lists, Core Data, web services
- Text input
- Threading and Performance
- Address Book and other system integration
- iPhone SDK 3.0 stuff!
 - MapKit, Video & Photo APIs, & more

Final Projects

- 3 weeks to work on them
- By yourself or with a partner
- It's never too early to think of something and propose it to us
- Categories to consider:
 - Student life apps
 - Educational tools
 - Games
 - Social / location-aware software
- Find a project that you or your friends would actually like to use!
- Post it on the app store?
- <http://www.stanfordiphoneclassapps.com>

Questions?

iPhone OS Overview

iPhone



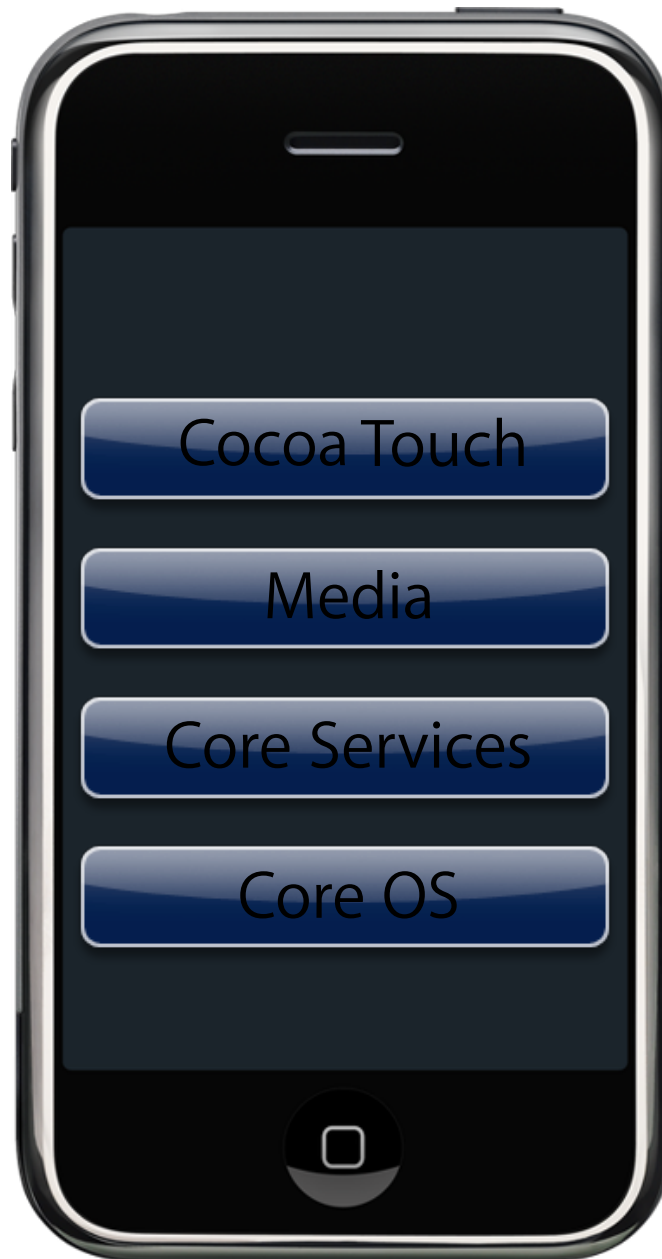
Mac OS X



Mac OS X

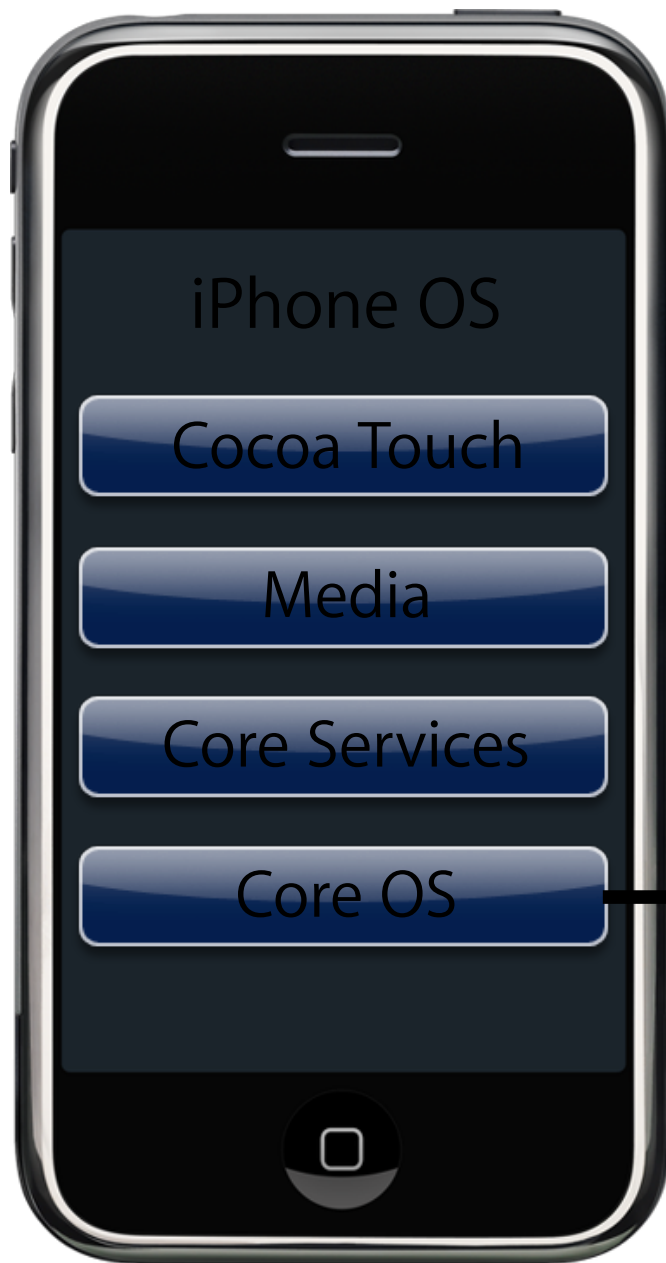












Core OS

OS X Kernel

Mach 3.0

BSD

Sockets

Security

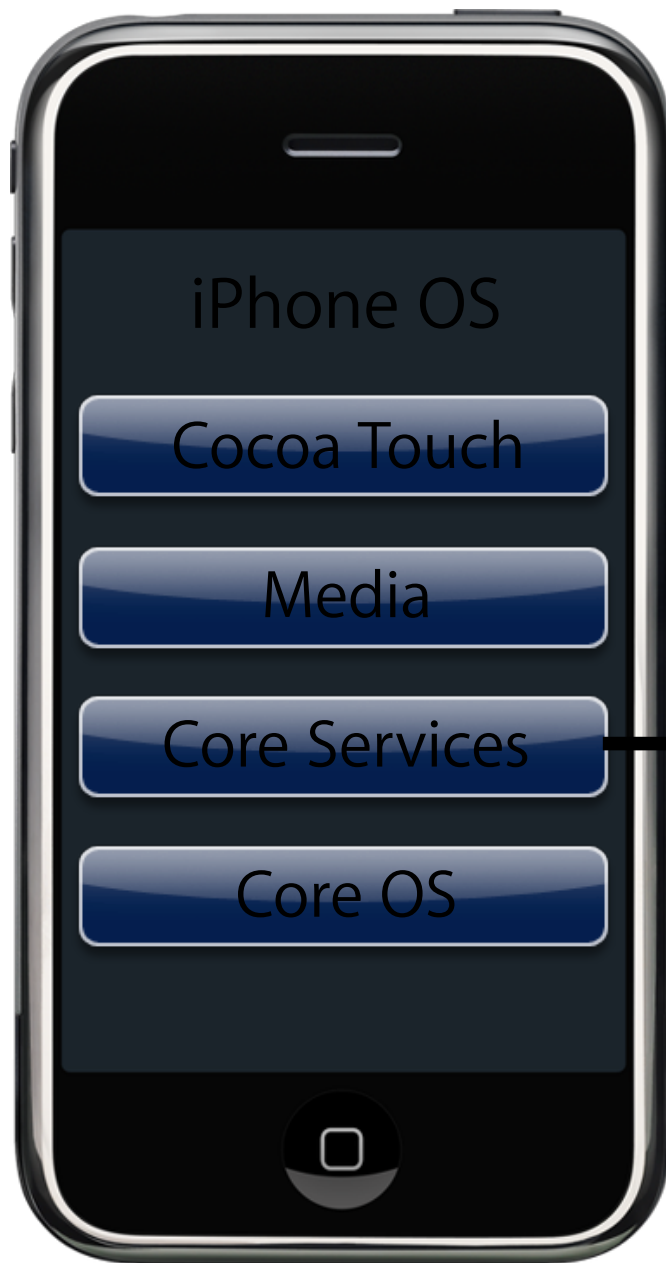
Power Mgmt

Keychain

Certificates

File System

Bonjour



Core Services

Collections

Address Book

Networking

File Access

SQLite

Core Location

Net Services

Threading

Preferences

URL utilities



Media

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



Cocoa Touch

Multi-Touch Events

Alerts

Multi-Touch Controls

Web View

Accelerometer

People Picker

View Hierarchy

Image Picker

Localization

Camera



Tools



Xcode



Interface Builder

Frameworks



Foundation



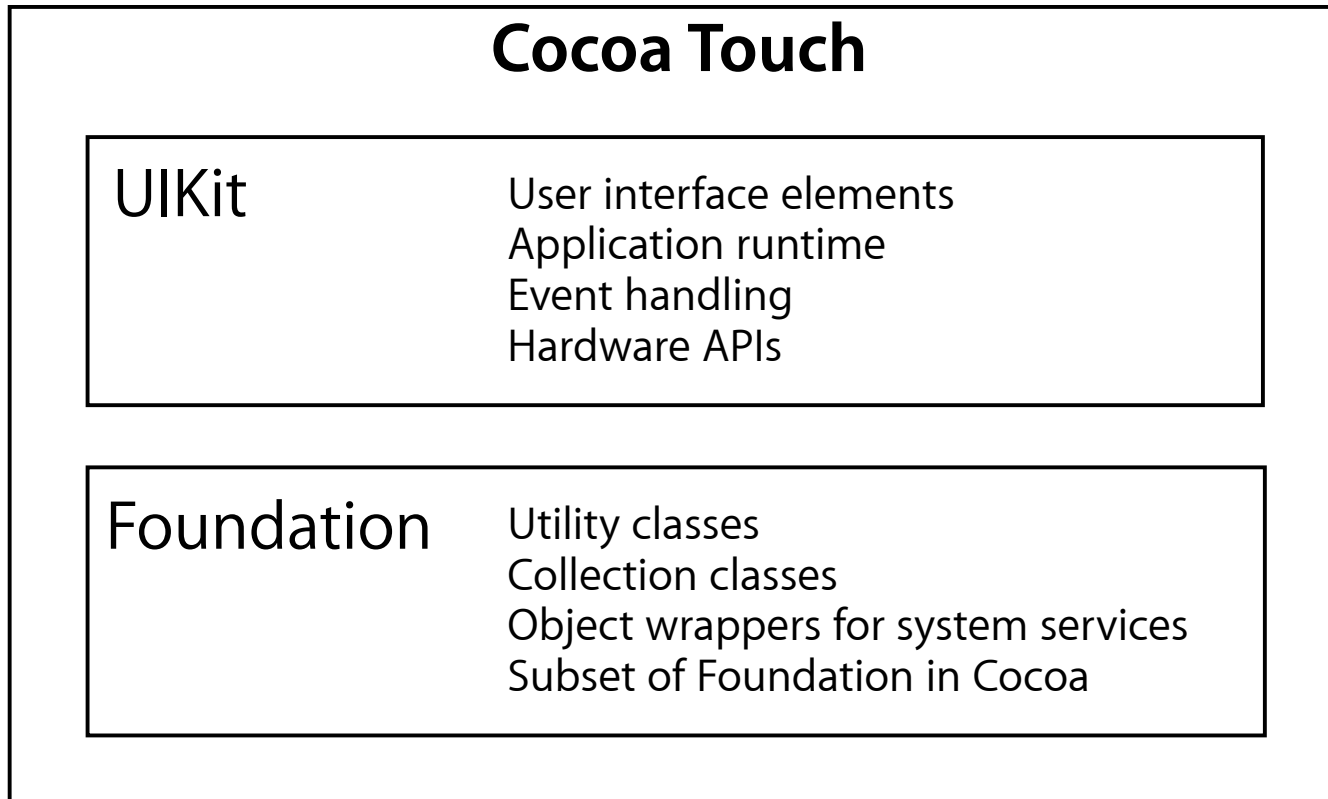
UIKit

Language (& Runtime)

```
[textView setValue: @"Hello"];
```

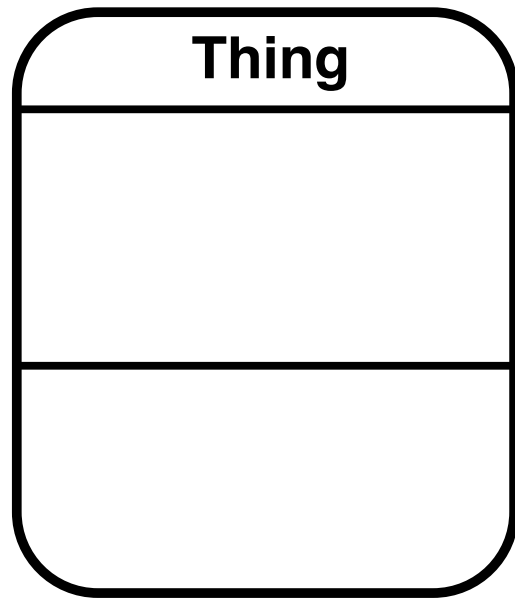
Objective-C

Cocoa Touch Architecture



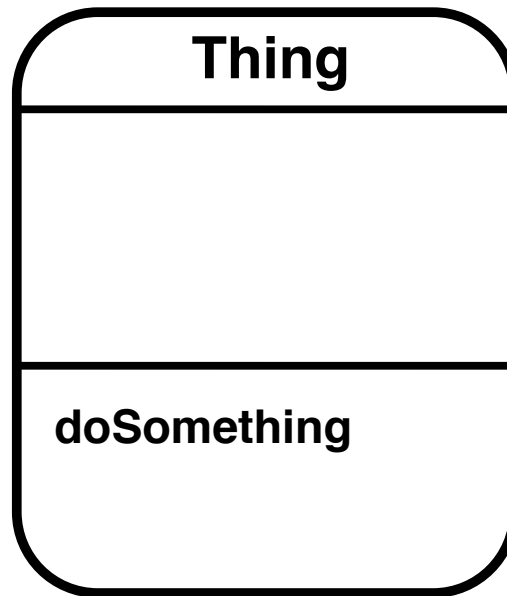
Objects

Object

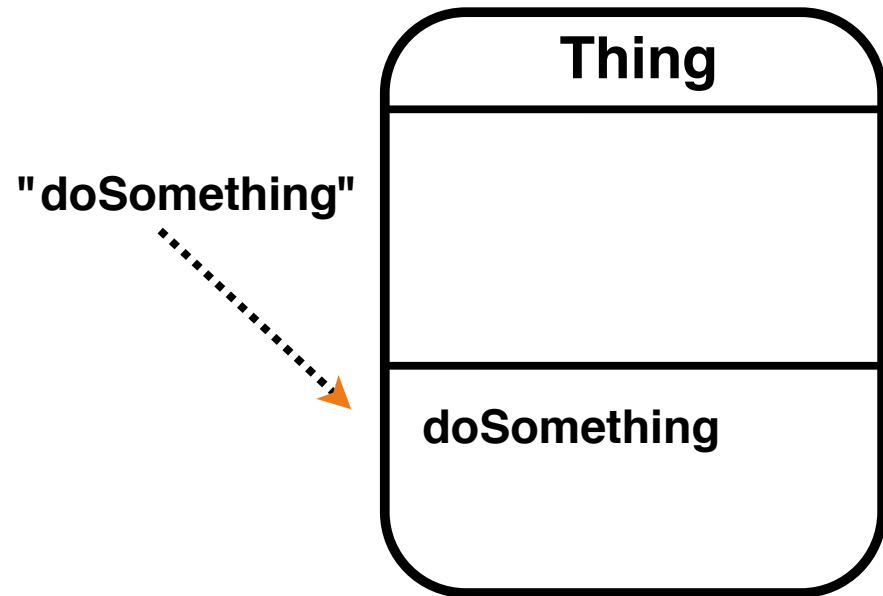


Behavior

behavior



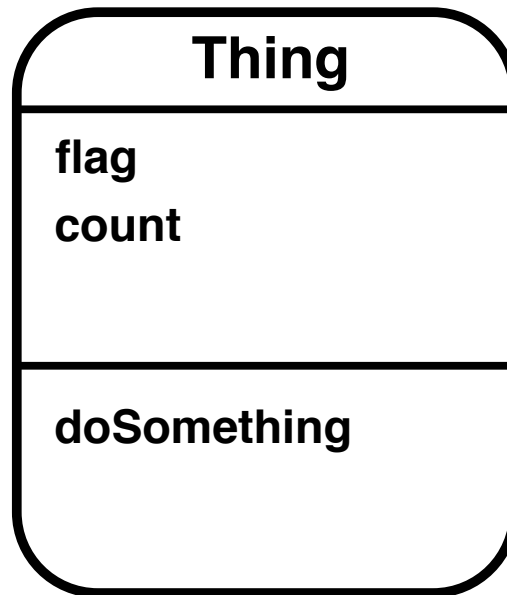
Message



State

state

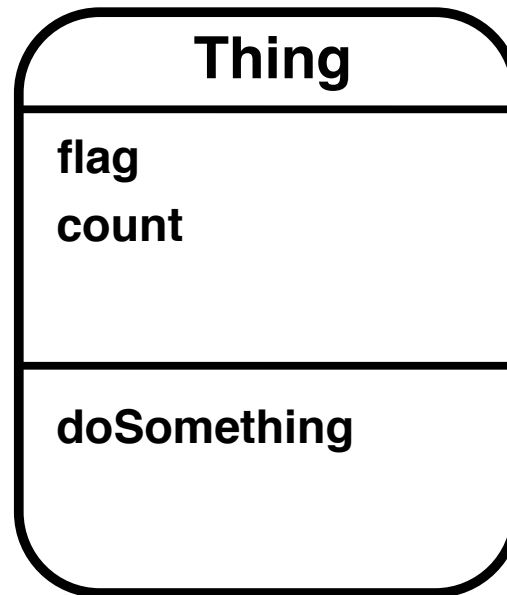
behavior



Other Objects As State

state

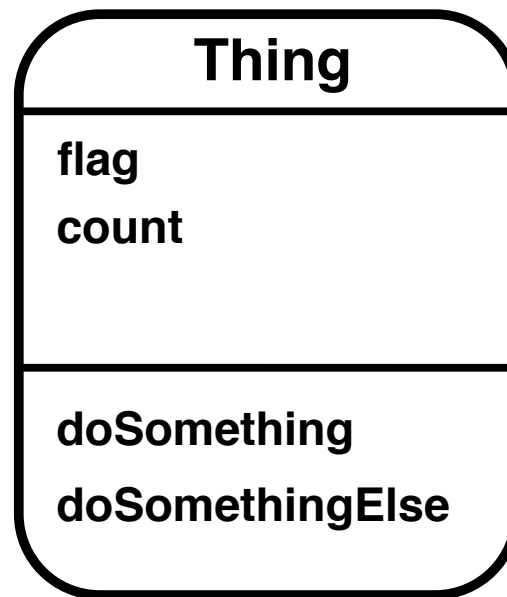
behavior



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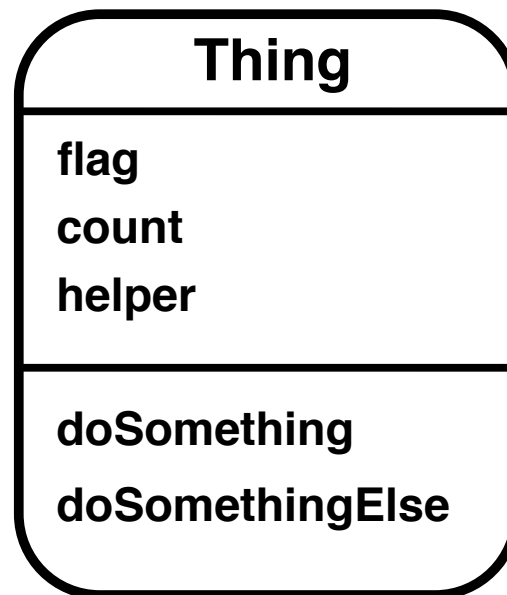
behavior



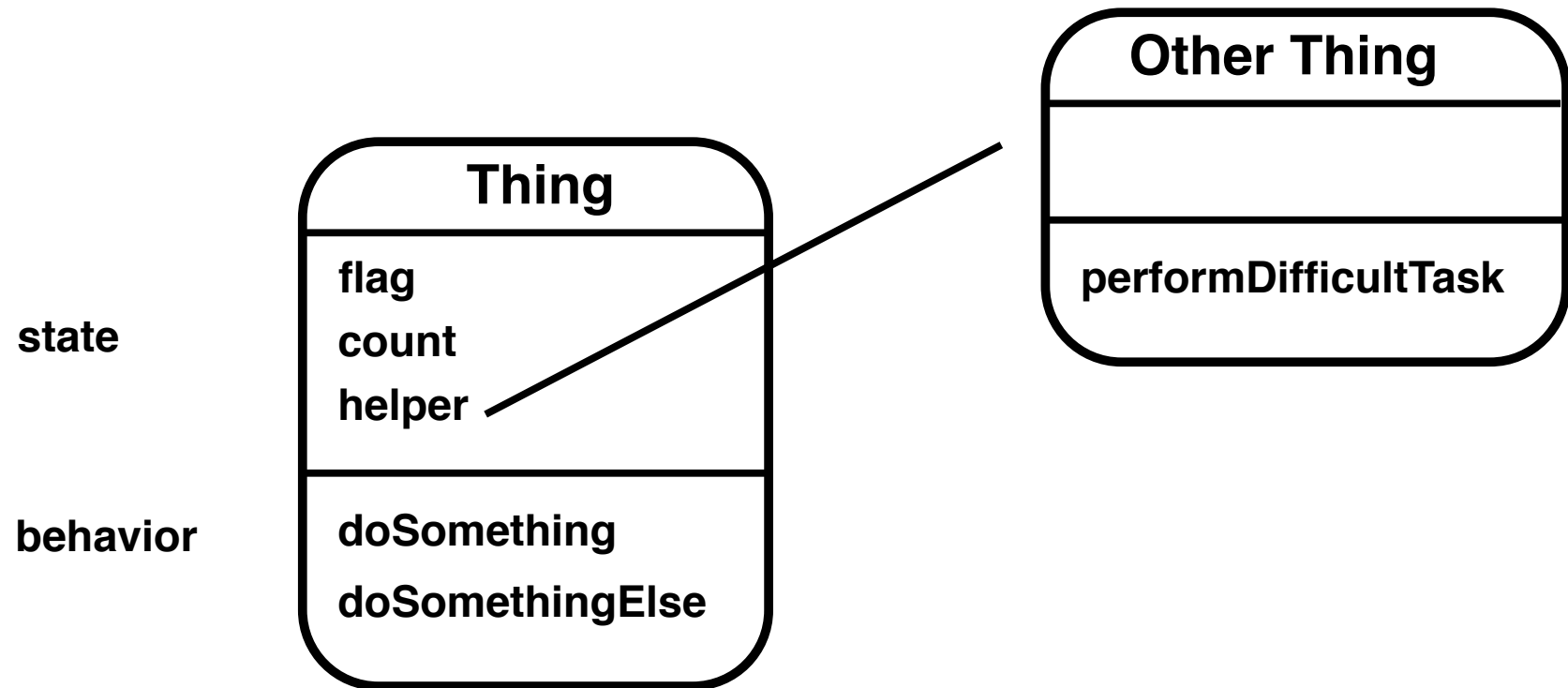
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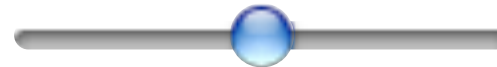
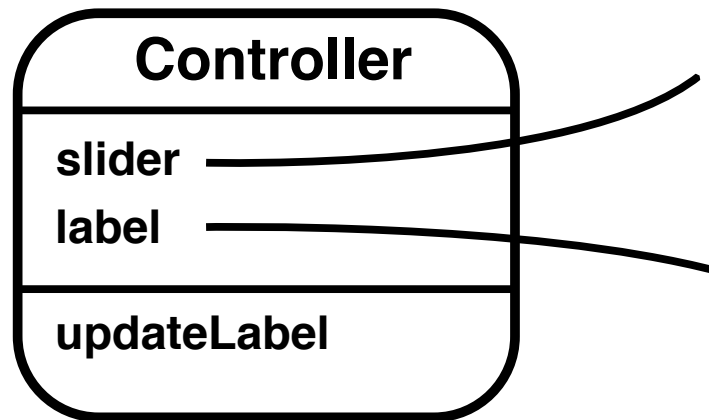


Outlets

Need to decide what the demo would be and update slide to appropriate material.

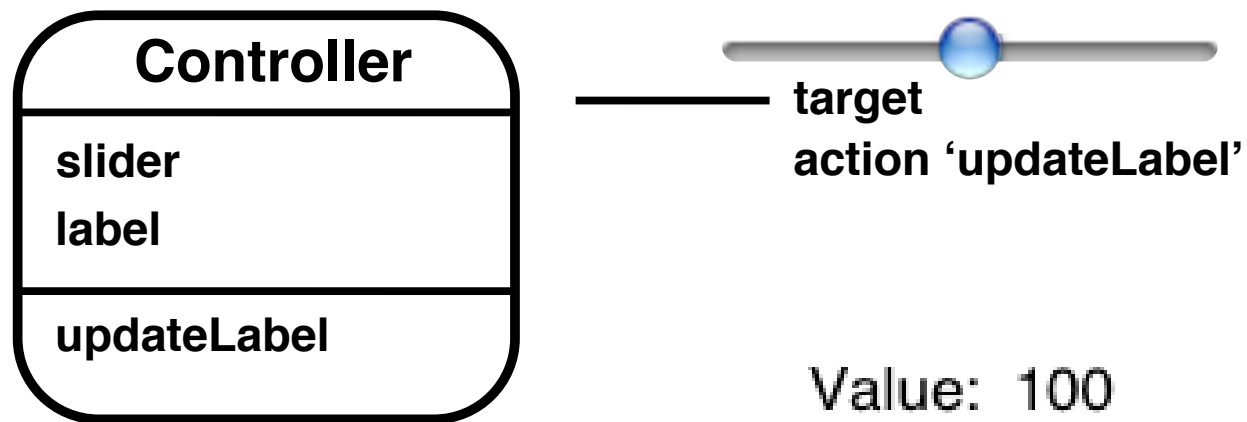
- text field / slider?

- color tabs?



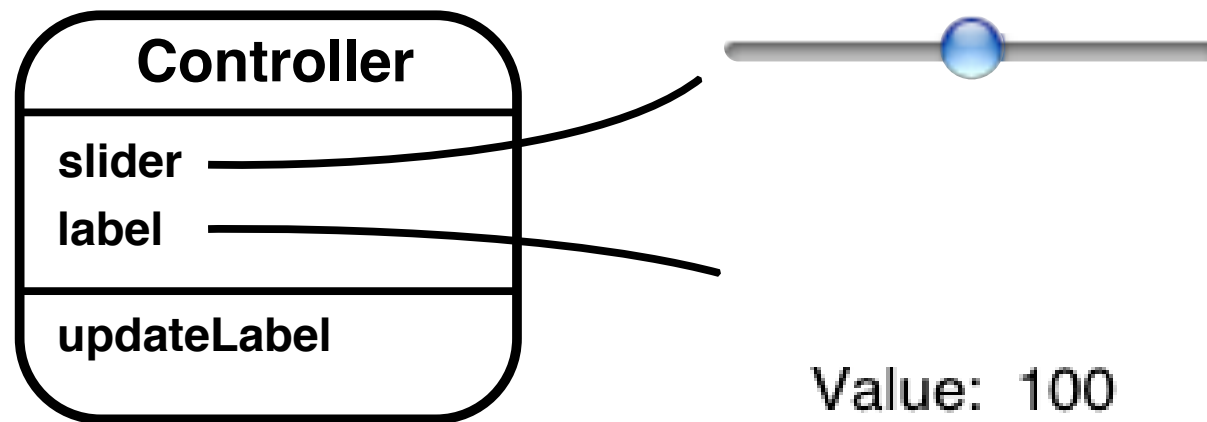
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Target / Action

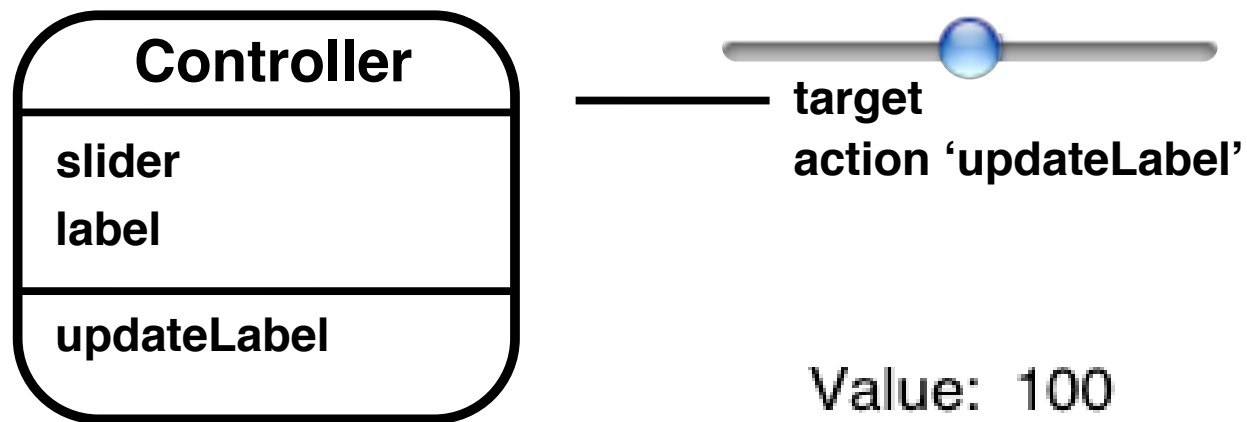


Demo

Outlets



Target / Action



Questions?