lecture 0

course overview

cs198-001 : fall 2017

today's lecture

- prerequisites
- what's covered in this decal
- course logistics
- Xcode (intro) and Swift

what you need for this decal

- macbook
- **Xcode** 9 beta 6: developer.apple.com/download/
- object oriented programming experience (cs61a + cs61b or equivalent)
- willing to put in a substantial amount of time into the course
  - heavy workload for a decal
  - roughly 4-6 hours outside of class

what you will learn

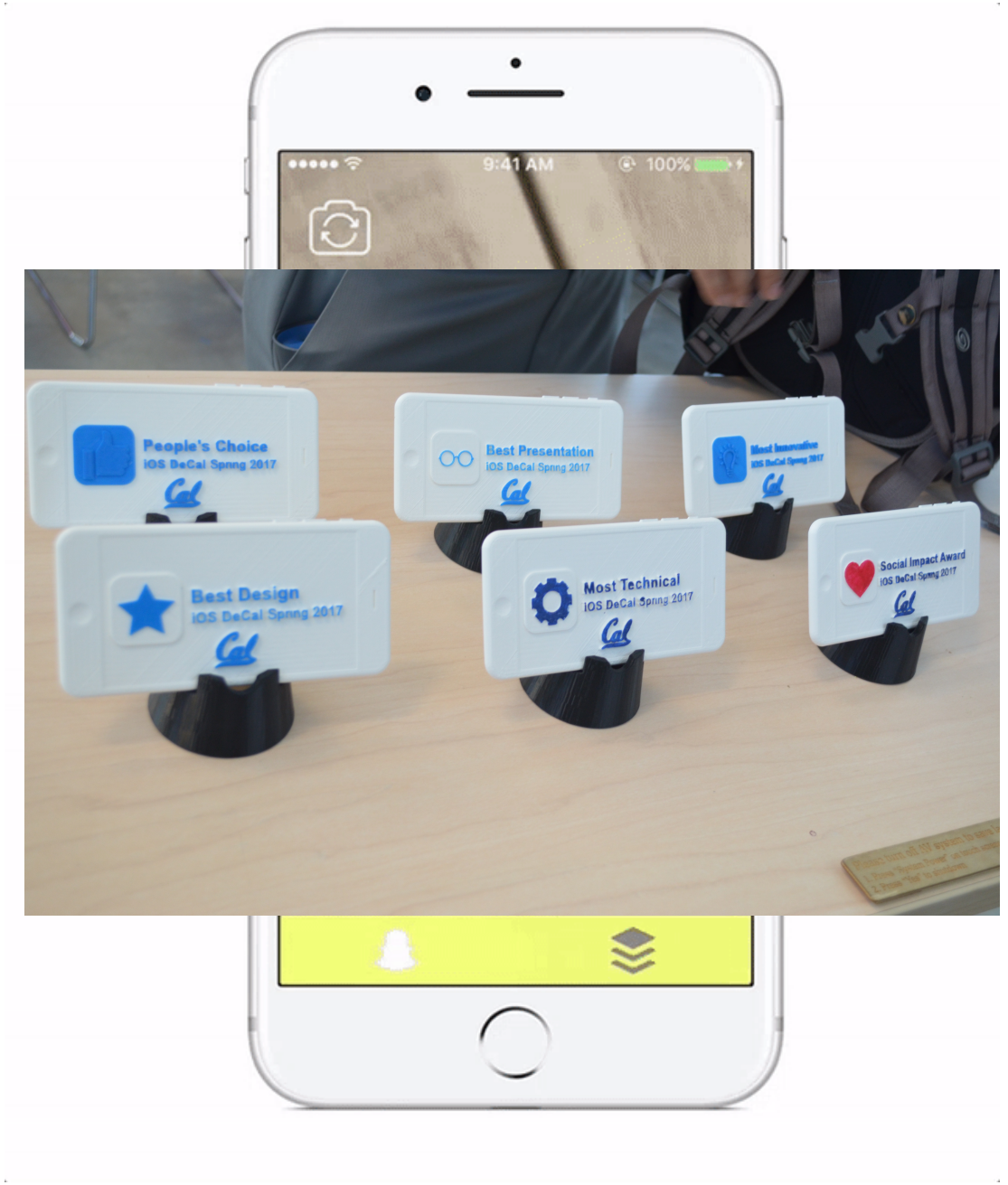
Swift
(language)

Xcode 9
(IDE)

design &
development

course overview

- weeks 1-5
  - create simple apps from scratch
  - design patterns + best practices
  - begin planning custom app
- week 6 – 10
  - advanced topics
  - begin work on custom app
- week 10 to end
  - finish custom apps
  - final app presentations



class format

lectures

- Mondays
- 6:30 to ~7:30pm
- HP Auditorium
- attendance required

labs

- Wednesdays
- 7:00-8:30pm
- various rooms (sign up on piazza tomorrow 8pm)
- attendance required

grading breakdown

- 30% projects
- 35% labs - pass / fail policy
- 35% final project

assignment submission

labs

- must get checked off during lab
- if you do not finish within the lab period, you can get checked off the following week at the beginning of lab

other assignments (homework/projects)

- submit on Gradescope
- graded via autograder

enrollment

if you've been accepted, you'll be enrolled automatically (thursday afternoon)

waitlisted students will receive access codes to enroll on CalCentral tomorrow morning via email

attendance policy

check-in every lecture/lab via google form

- you must check in with another person in the class (one form per pair)

excused absences – private post on piazza

unexcused absences

- students with 4+ unexcused Absences will receive an NP for the course

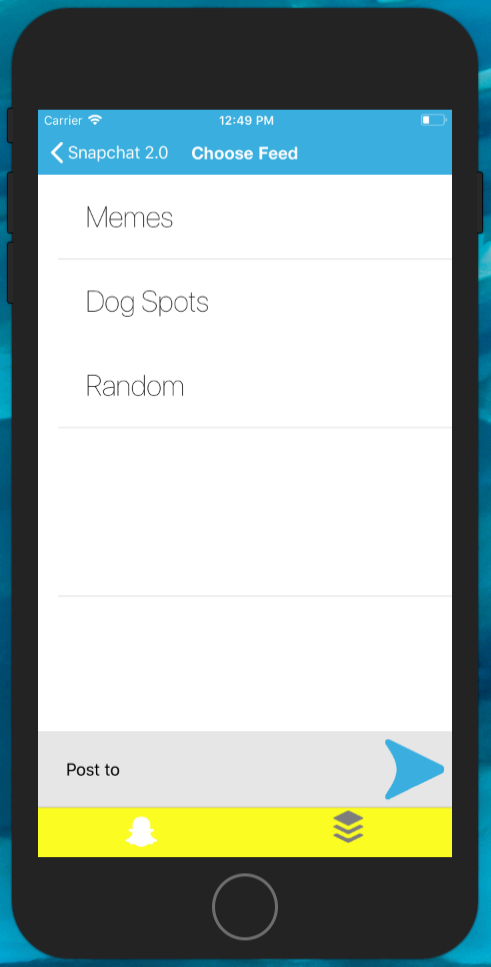
attendance policy - example

let’s try it now!

introduce yourself to another student or TA, and fill out the google form found on our course website (**http://iosdecal.com/**)

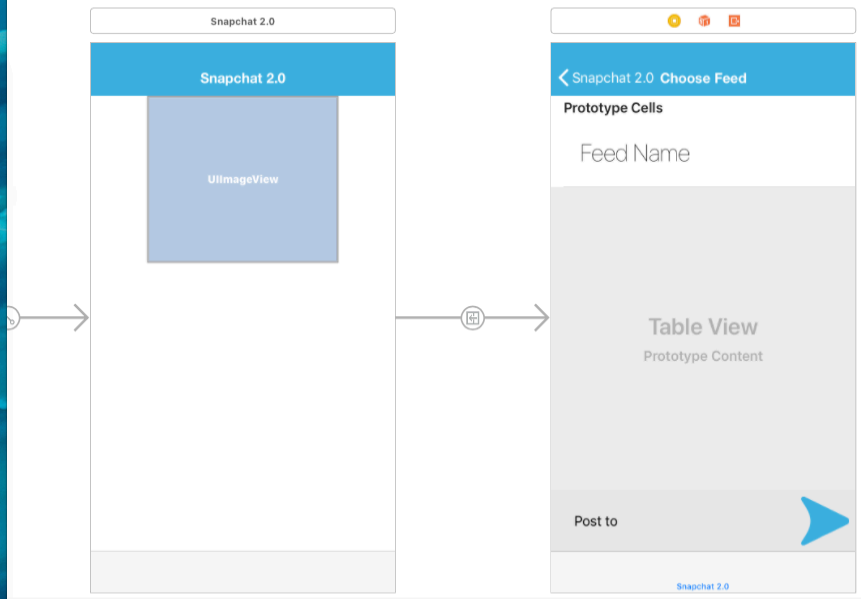
iOS development

Xcode



iPhone 7 Plus | Running snapChatProject on iPhone 7 Plus | 1

SnapchatClone › Main.storyboard (Base) › No Selection



View as: iPhone 7 (wC hR) — 41% +

ChooseThread...Controller.swift › No Selection

```
1  //
2  //  ChooseThreadViewController.swift
3  //  SnapChatClone
4  //
5  //  Created by Paige Plander on 3/8/17.
6  //  Copyright © 2017 org.iosdecal. All rights reserved.
7  //
8
9  import UIKit
10
11 class ChooseThreadViewController: UIViewController,
       UITableViewDelegate, UITableViewDataSource {
12
13     /// Table view displaying the names of each thread
14     @IBOutlet weak var threadTableView: UITableView!
15
16     /// The image picked by the user from the image picker
17     var chosenImage: UIImage?
18
19     /// Displays the name of the thread that the user has
           selected
20     @IBOutlet weak var chosenThreadLabel: UILabel!
21
22     override func viewDidLoad() {
23         super.viewDidLoad()
24         threadTableView.delegate = self
```

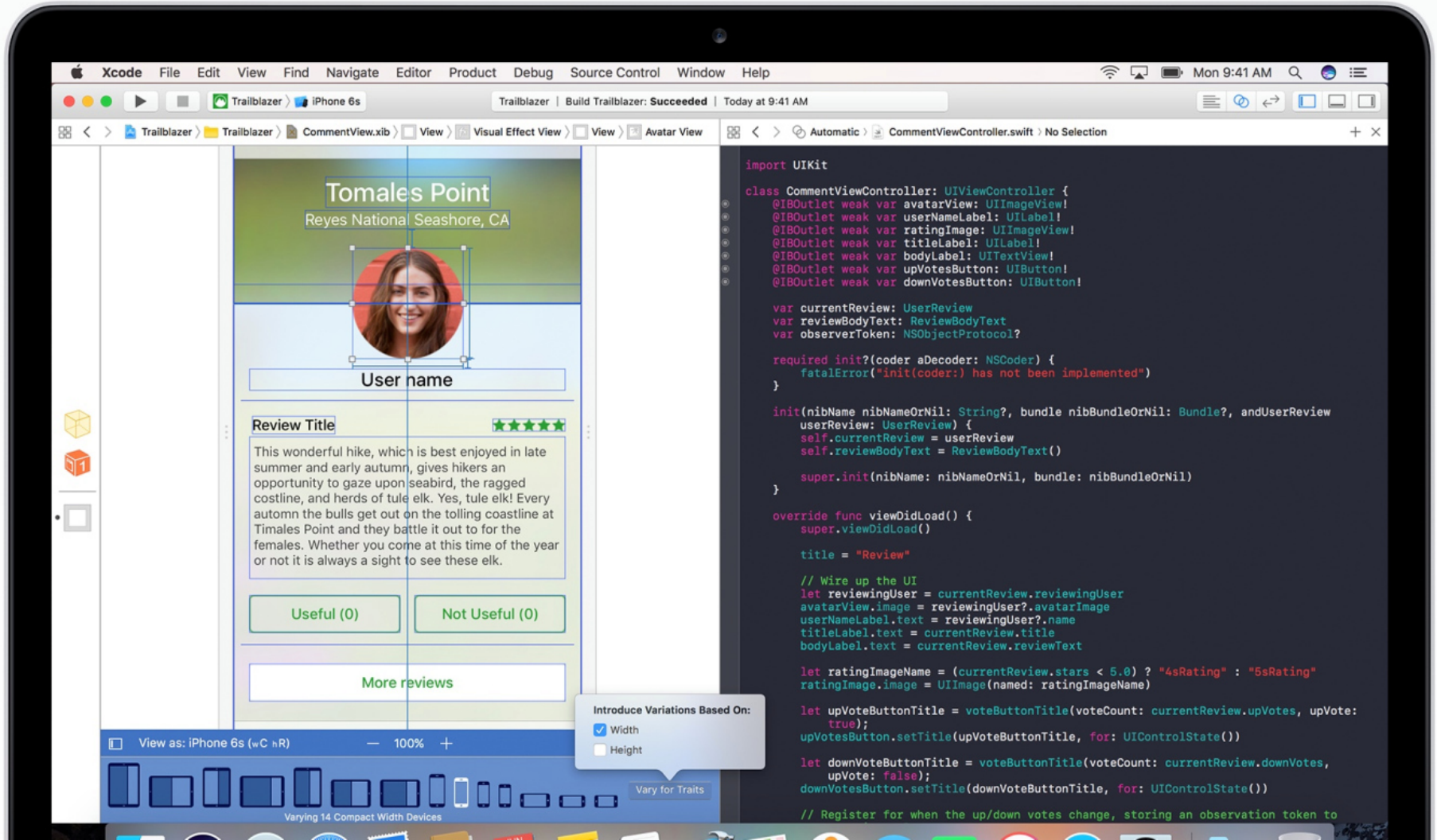
snapChatProject

```
AF61386F-0E29-47EE-8B48-EF56665B3DB7/data/Containers/Shared/
SystemGroup/systemgroup.com.apple.configurationprofiles
2017-09-04 12:49:37.921996-0700
snapChatProject[49022:3365634] [MC] Reading from private
effective user settings.
```

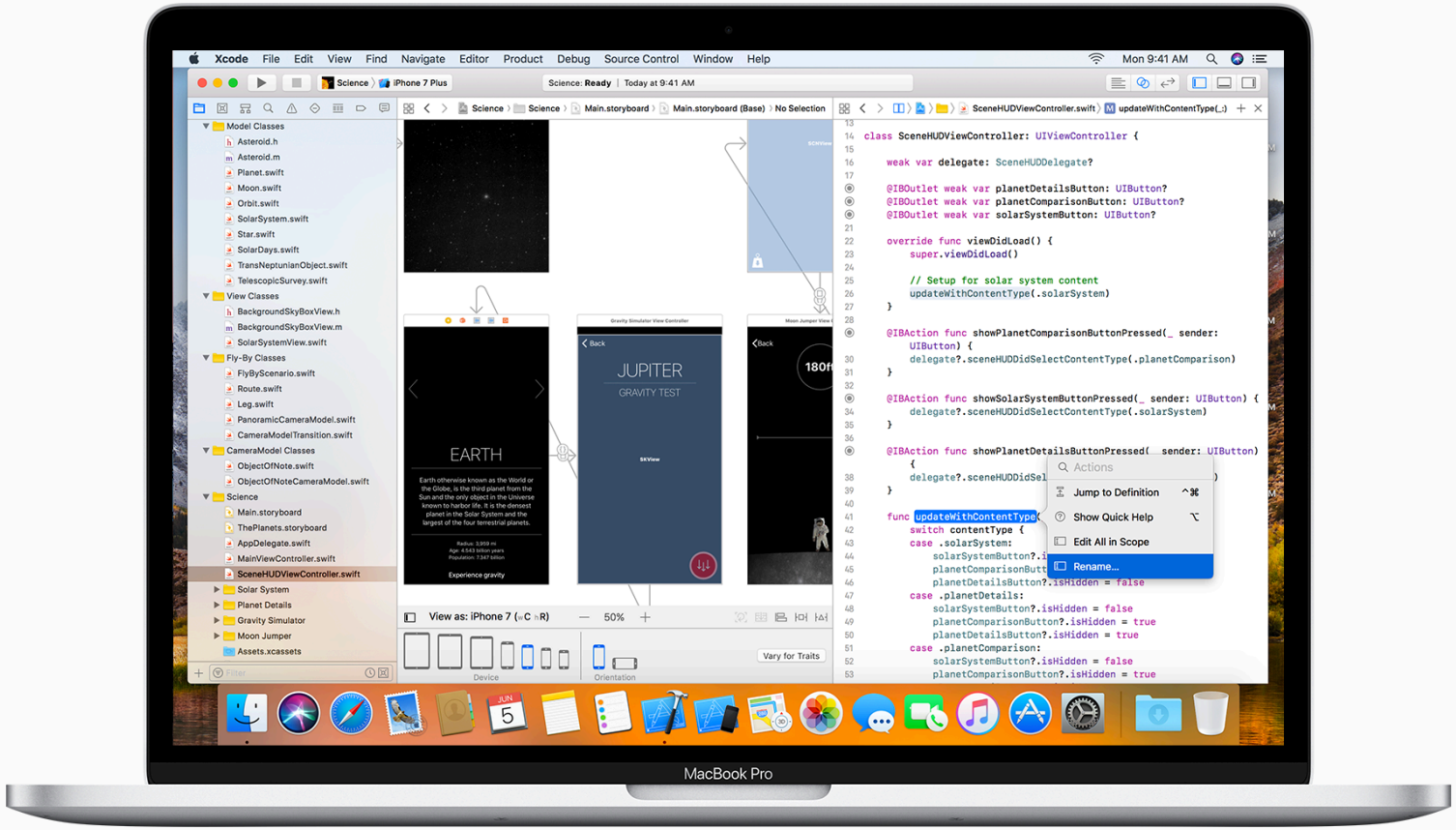
Auto | Filter

All Output | Filter

Xcode 8 – currently in App Store



what we'll be using - Xcode 9



announced June 5, 2017

debugging, refactoring, and GPU improvements

current version: Xcode 9 beta 6

uses the new Swift 4

swift overview

assignments with var and let

```
var x = "Hello"
x = "world"

let implicitInt = 70
let explicitInt: Int = 70

// error
let implicitInt = 50
```

functions

```
// defining functions
func update(withNewData data: [String]) -> Bool {
    if data[0] == "Error" {
        return false
    }
    // ...
     return true
}

// calling Functions
update(withNewData: ["iOS", "DeCal"])
```

functions

```
// defining functions
func update(withNewData data: [String]) -> Bool {
    if data[0] == "Error" {
        return false
    }
    // ...
     return true
}

// calling Functions
update(withNewData: ["iOS", "DeCal"])
```

Internal Parameter (used in function) - `data`

External Parameter (used when calling function) - `withNewData`

classes and functions

```
class Dog {
    private let name: String?
    private let age: Int

    init(age: Int, name: String?) {
        self.age = age
        self.name = name
    }

    func getGreeting() -> String {
        return name + " says
                hello!"
    }
}
```

classes and functions

optional type

```
class Dog {
    private let name: String?
    private let age: Int

    init(age: Int, name: String?) {
        self.age = age
        self.name = name
    }

    func getGreeting() -> String {
        return name + " says
                hello!"
    }
}
```

optionals

A type that is logically allowed to have “no value”

Properties of optional type are automatically initialized with a value of `nil`

“Unwrap” optionals with a “!” (Careful! If `nil` -> error)

```
var response: String? = "Hello"
print(response)
```

Console Output

optionals

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```
var response: String? = "Hello"
print(response)
```

Console Output

```
Optional(“Hello”)
```

optionals

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```
var response: String? = "Hello"
print(response!)
```

Console Output

optionals

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```
var response: String? = "Hello"
print(response)
```

Console Output

```
“Hello”
```

optionals

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```
var response: String?
print(response)
```

Console Output

optionals

A type that is logically allowed to have “no value”

Properties of optional type are automatically initialized with a value of `nil`

“Unwrap” optionals with a “!” (Careful! If `nil` -> error)

```
var response: String?
print(response)
```

Console Output

```
nil
```

optionals

A type that is logically allowed to have “no value”

Properties of optional type are automatically initialized with a value of `nil`

“Unwrap” optionals with a “!” (Careful! If `nil` -> error)

```
var response: String?
print(response!)
```

Console Output

optionals

A type that is logically allowed to have “no value”

Properties of optional type are automatically initialized with a value of `nil`

“Unwrap” optionals with a “!” (Careful! If `nil` -> error)

```
var response: String?
print(response!)
```

Console Output

```
fatal error: unexpectedly found nil while unwrapping an Optional value
```

optionals

what if you don’t know whether an optional is nil or not?

optional binding
safe way to unwrap: ”if let”

```
var someOptional: String? = “hello”

if let myOptional = someOptional {
    print(myOptional)
}
```

Console Output

```
hello
```

optional chaining

```
var optionalDog: Dog? = getDog(named:
"Molly")

print(optionalDog.bestFriend.name)
```

Console Output

```
error: value of optional type 'Dog?'
not unwrapped; did you mean to use
'!' or '?'?
```

closures

```
{ (parameters) -> return type in
    statements
}
```

closures

```
/// normal function
func isGood(string: String) -> Bool {
    return string == "dog"
}
```

closures

```
/// normal function
func isGood(string: String) -> Bool {
    return string == "dog"
}

/// as a closure
let isGoodClosure = { string in
    return string == "dog" }
```

closures

```
/// as a closure
let isGoodClosure = { string in
    return string == "dog" }
```

closures

```
/// as a closure
let isGoodClosure = { string in
    return string == "dog" }

/// short hand arg name
let isGoodClosure = {
     return $0 == "dog" }
```

closures

```
/// as a closure
let isGoodClosure = { string in
    return string == "dog" }

/// short hand arg name
let isGoodClosure = {
     return $0 == "dog" }

/// even better
let isGoodClosure = { $0 == "dog" }
```

closures

```
/// as a closure
let isGoodClosure = { string in
    return string == "dog" }

/// short hand arg name
let isGoodClosure = {
     return $0 == "dog" }

/// even better
let isGoodClosure = { $0 == "dog" }
```

closures as completion handlers

```
func responseData(completionHandler:
    @escaping (Response) -> Void) {
    // ...
}
```

closures as completion handlers

```
Alamofire.request(url).responseData({
   response in
   if let data = response.result.value {
         // do something with data
        print(data)
    }
})
```

closures as completion handlers

```
Alamofire.request(url).responseData {
   response in
   if let data = response.result.value {
         // do something with data
        print(data)
    }
}
```

(tip! parentheses not required)

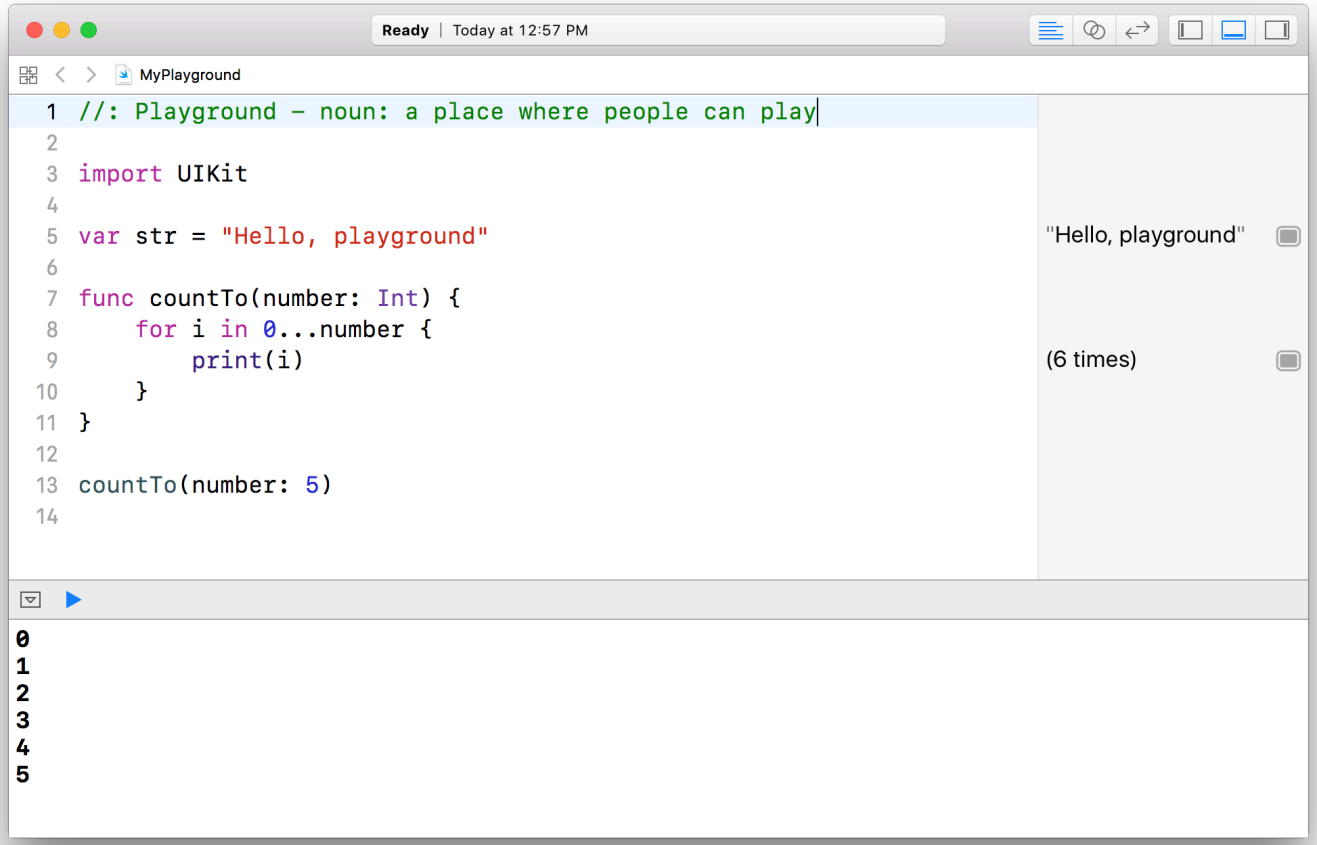
protocols

```
protocol DogOwner {
    var dog: Dog { get set }
}

protocol NicePerson {
    func pet(dog: Dog) -> Bool
}

class Sandy: DogOwner, NicePerson {
    var dog: Dog = Dog()
    func pet(dog: Dog) -> Bool {
        return dog.pet()
    }
}
```

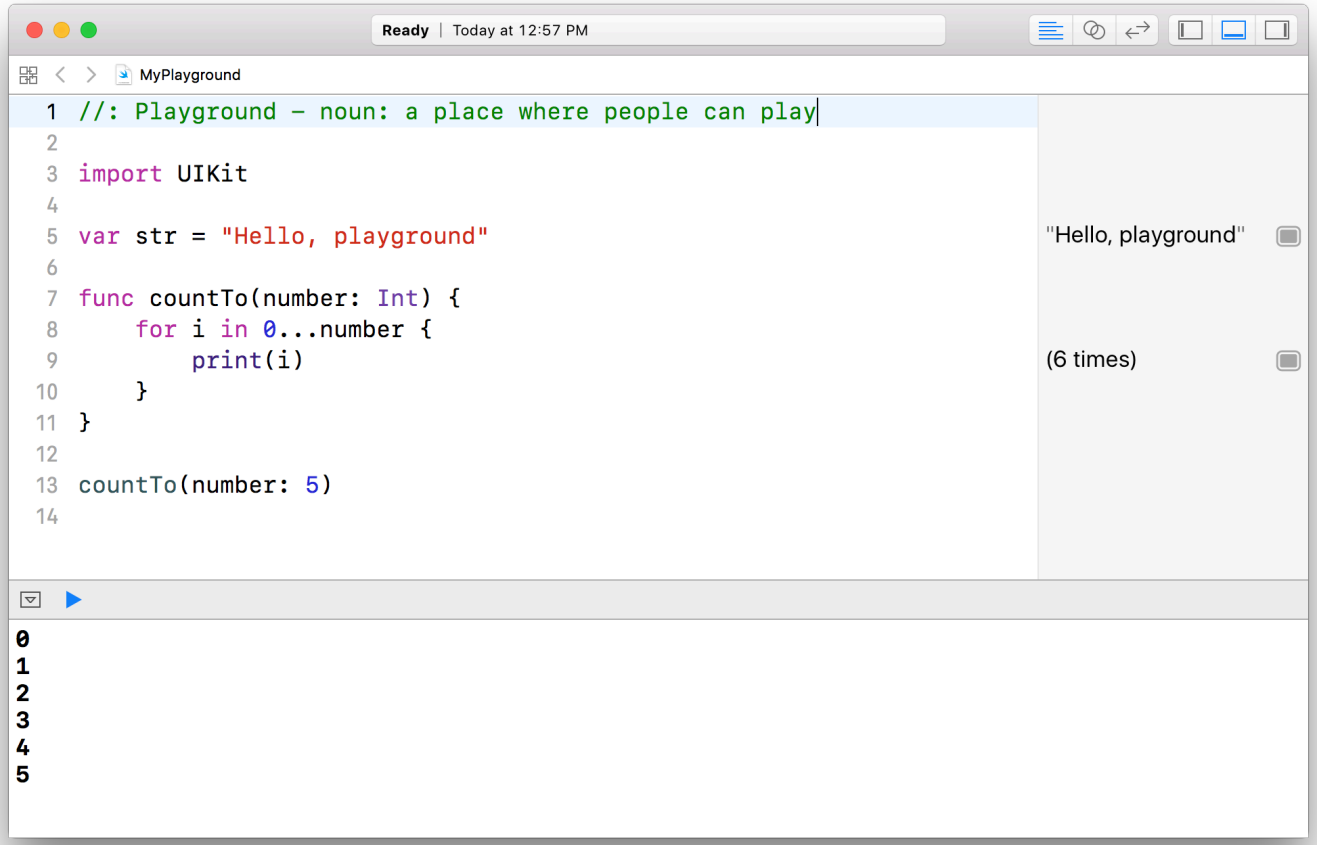
playgrounds



lightweight interface for small programs

environment for homework 1

homework 1: swift playground



due **Monday** before lecture (6:30pm)

submit on Gradescope

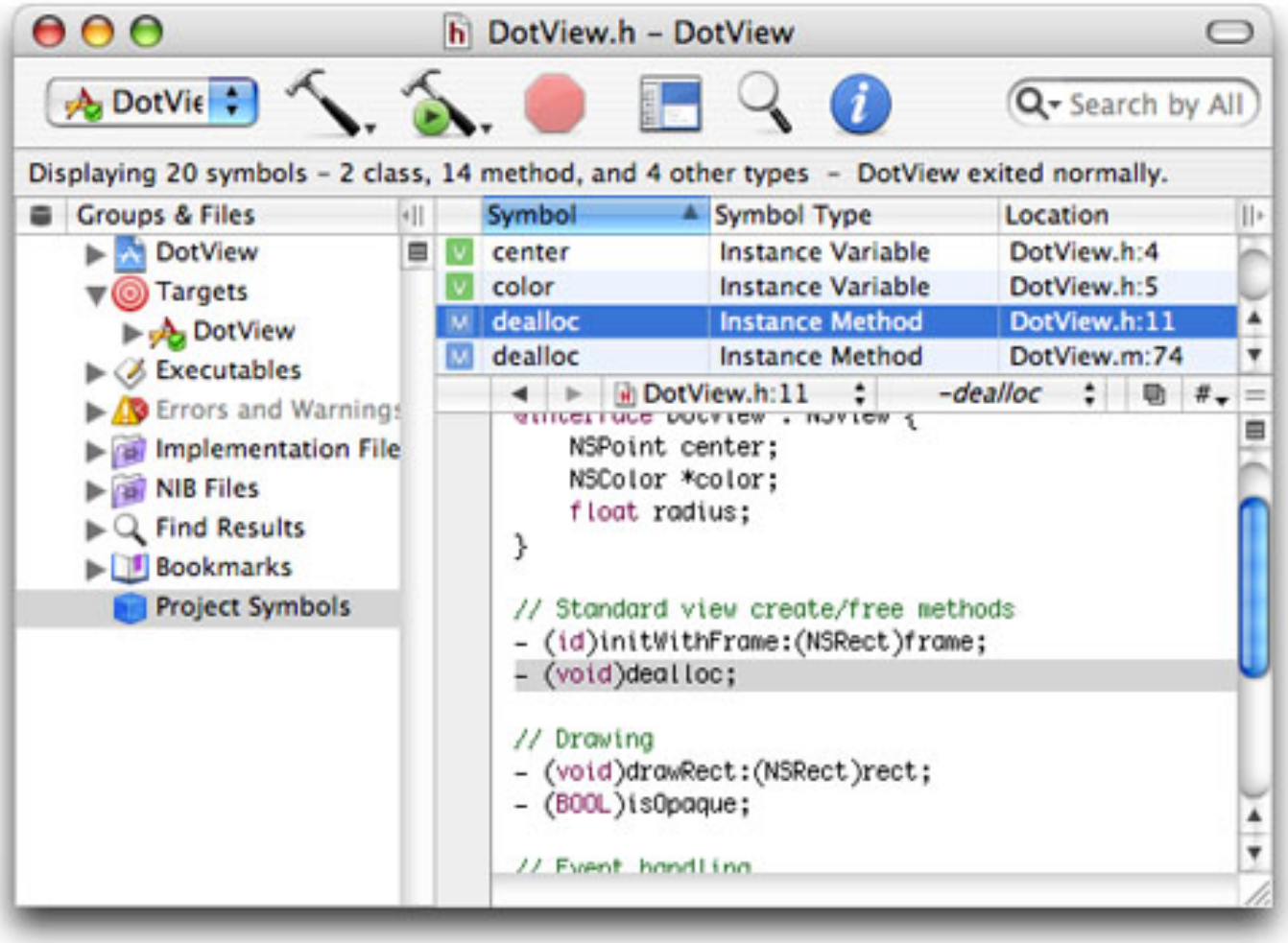
homework 1: swift playground

due monday before lecture
posted tonight

extra slides

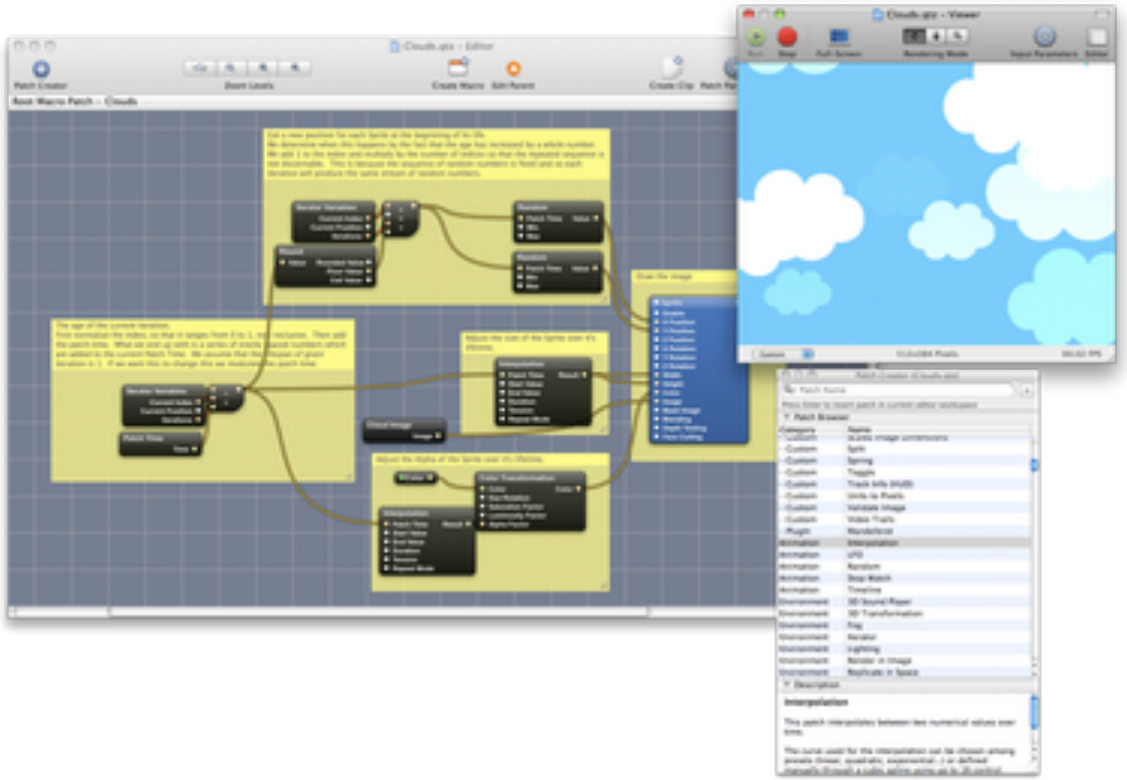
Project Builder

- IDE for the NeXTSTEP OS (source of macOS, iOS, tvOS, etc.)
- rewritten for OS X, and rebranded as **Xcode**



Xcode versions

- 2003: Xcode 1.0
- 2005: Xcode 2.x
  - included a visual programming language (Quartz Composer)
  - breakpoints and watchpoints
- 2007: Xcode 3.x
  - 2008: iOS SDK released to third party developers



the Quartz Composer