iOS DeCal : Lecture 11

SWE in iOS

April 25, 2017

Announcements - 3/25

Final Projects due **next Tuesday** at 11:59

Projects due Tuesday of dead week

Presentations on Friday (in Jacobs 310 at 11am)

Lab 7 (Objective C) due tonight (11:59)

Make sure to submit Lab 7 to Gradescope (even if you got checked off)

Jacobs Design Showcase

Thursday, May 4th from 9:30-11:30

Interest form due on Thursday!

Announcements - 3/25

Lab Attendance Not Required this Thursday

Come by to either lab for project help!

TA Applications and Feedback Form will be going out soon

We'll announce it again at the Final Presentation

Please fill out the Feedback form - we know we can improve!

Overview : Today's Lecture

Experience with iOS in Industry:

Akilesh - Apple

Paige - Tumblr

Maya - Facebook/Pinterest

Sameer - Concur

Interview Question Practice!

SWE at **Apple**

Apple

Location - Cupertino

Length - 12 Weeks

How to apply - Go to networking sessions or get referrals!

Interview Process

Interviews based on specific teams.

Not your typical coding interview:

- Team Specific Questions

- They love autolayout questions

- Be ready to build an app from scratch

What I did!

Xcode Interface Builder Team

- Made auto-layout smarter

- Super smart and helpful team

- Intense Code-Review Process

- EVERYTHING IN OBJECTIVE-C

😱 😱 😱 😱 😱 😱 😱 😱

Life @ Apple

iOS SWE at a **startup**

iOS at a Startup : Overview

Location - Probably somewhere in South Bay

Length - who knows!

How to apply - Ask around! (Or check out the pinned posts on the CS-198 Piazza page :))

iOS internship at a Startup

Takeaways and tips from my experience

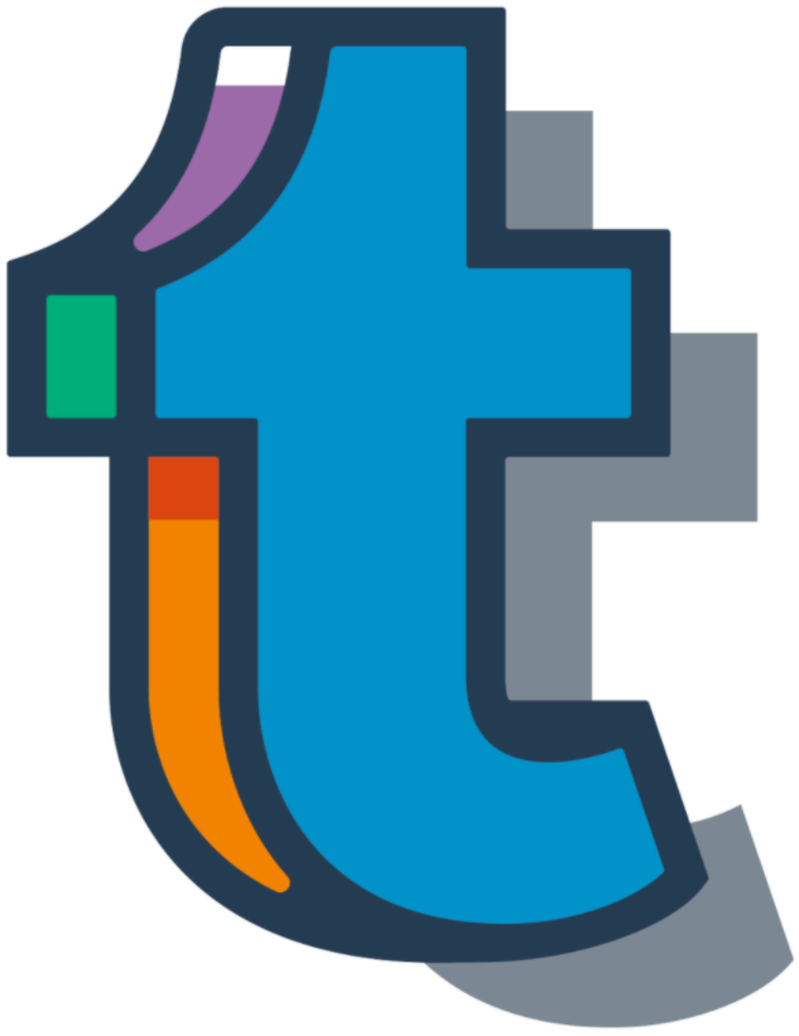
Get your foot in the door if you don’t have previous iOS experience

Get accustomed to working with a large scale project

Don’t be afraid to ask for help!

SWE at **Tumblr**

iOS at Tumblr : Overview

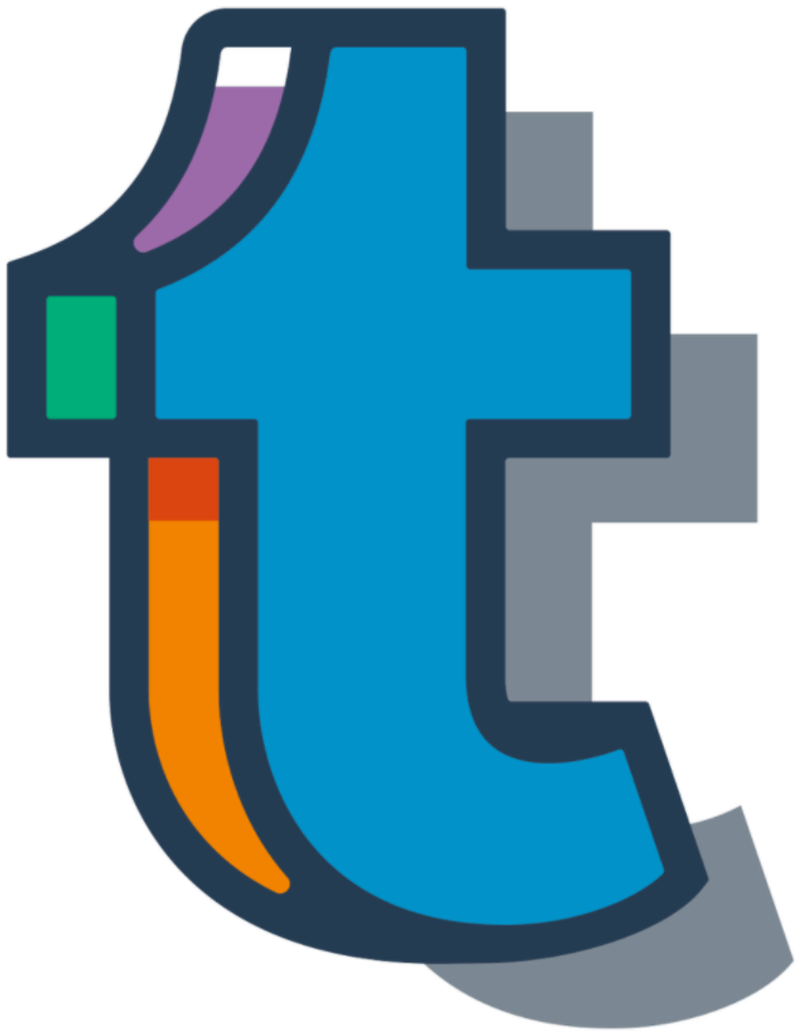


Location - NYC (1 block away from Madison Square Park!)

Length - 12 weeks

How to apply - Fill out application at tumblr.com/internships. Wait for an email back from a recruiter.

iOS at Tumblr : Overview



Apply for a specific role (not a general SDE position)

Interview Process

- Interview with recruiter
- Coding interview with manager
- Take home Programming Project
- 4 interviews with respective team (I did them remotely)

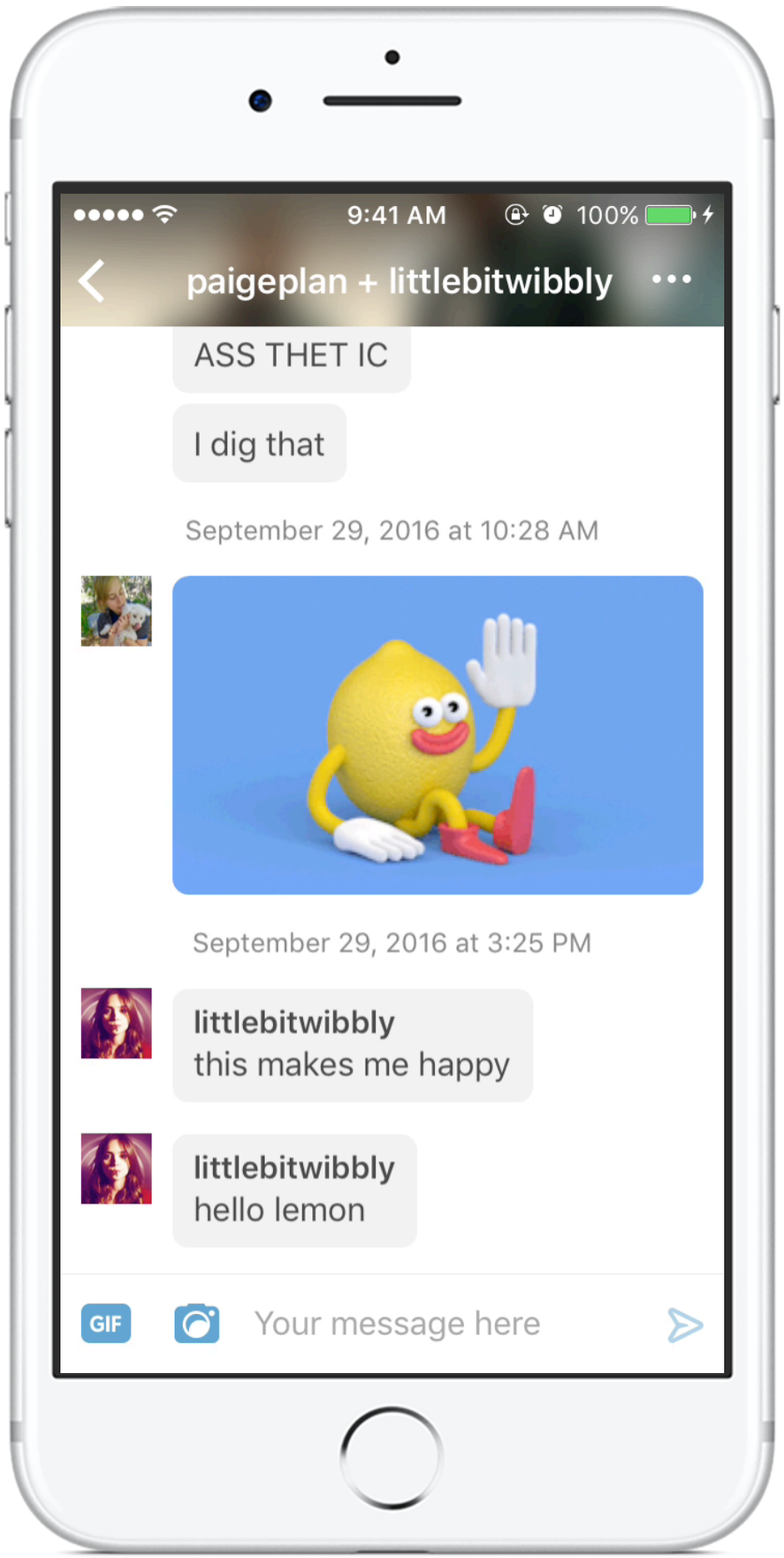
Tumblr iOS Team

Teams are super tiny!

iOS Core Team - all iOS

Product Teams - one iOS dev per team

Each intern matched with a mentor working in the same team



First Two Weeks

Once you first start, you're assigned to some small tasks throughout the app (bug fixes, small UI changes, etc)

This helps you get a sense of what the code base is like

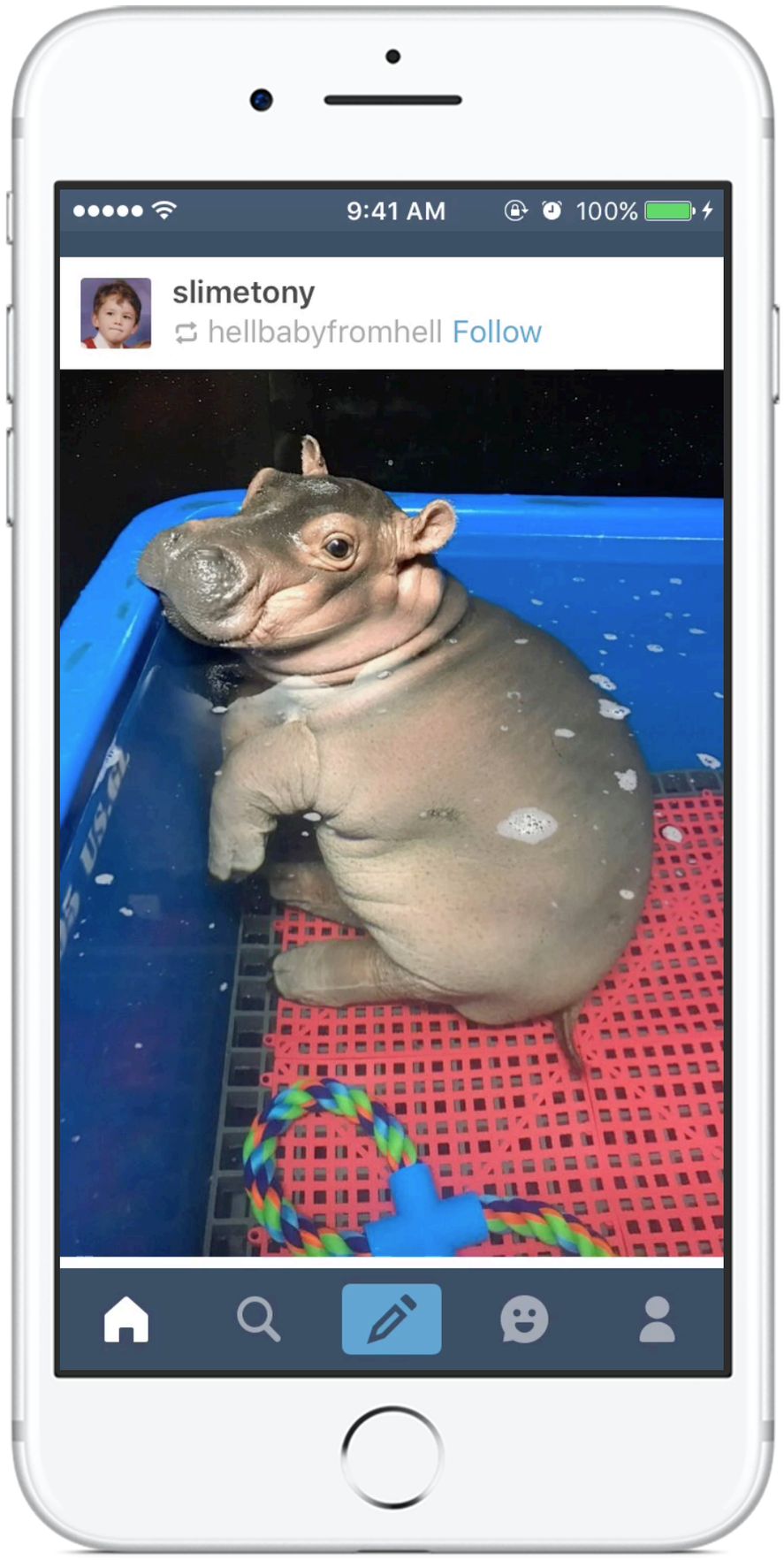
Get to have fun with some *~legacy code~*

Intern Projects

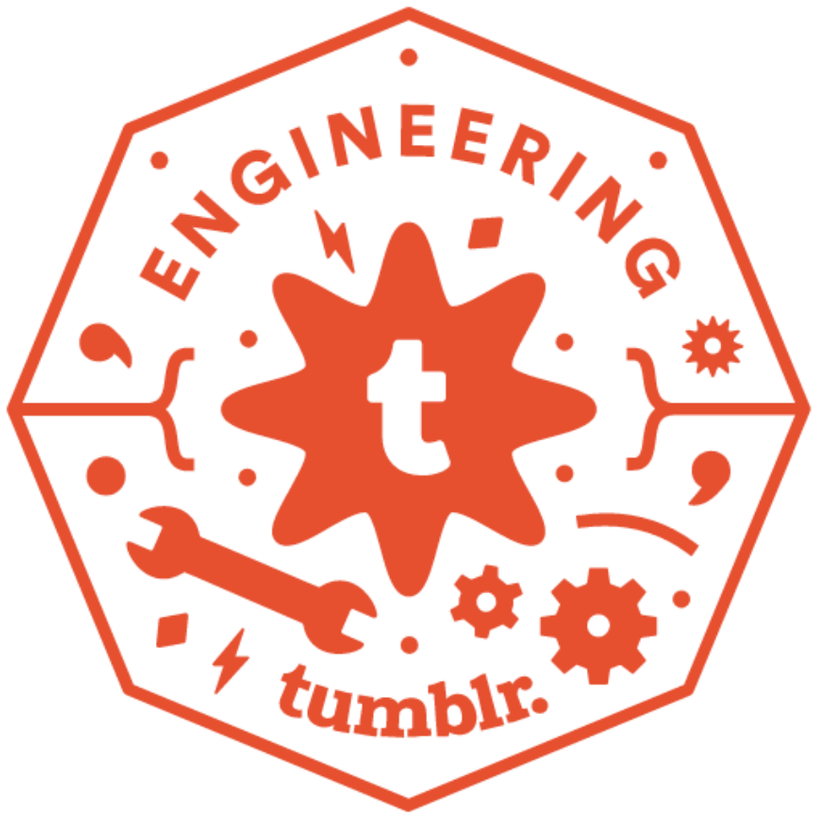
About two weeks into internship, you get to pick a intern project

List of new features - pick your top three

After one gets approved, develop an architecture plan, hold an architecture meeting, then work on that for rest of summer



iOS at Tumblr : Takeaways / Tips



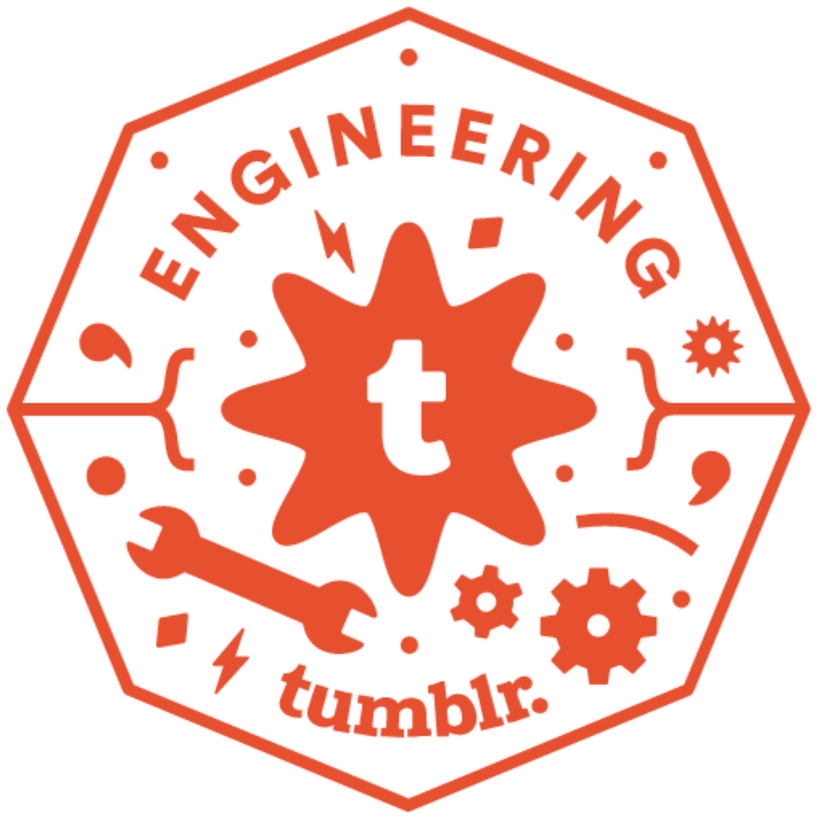
Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

iOS at Tumblr : Takeaways / Tips



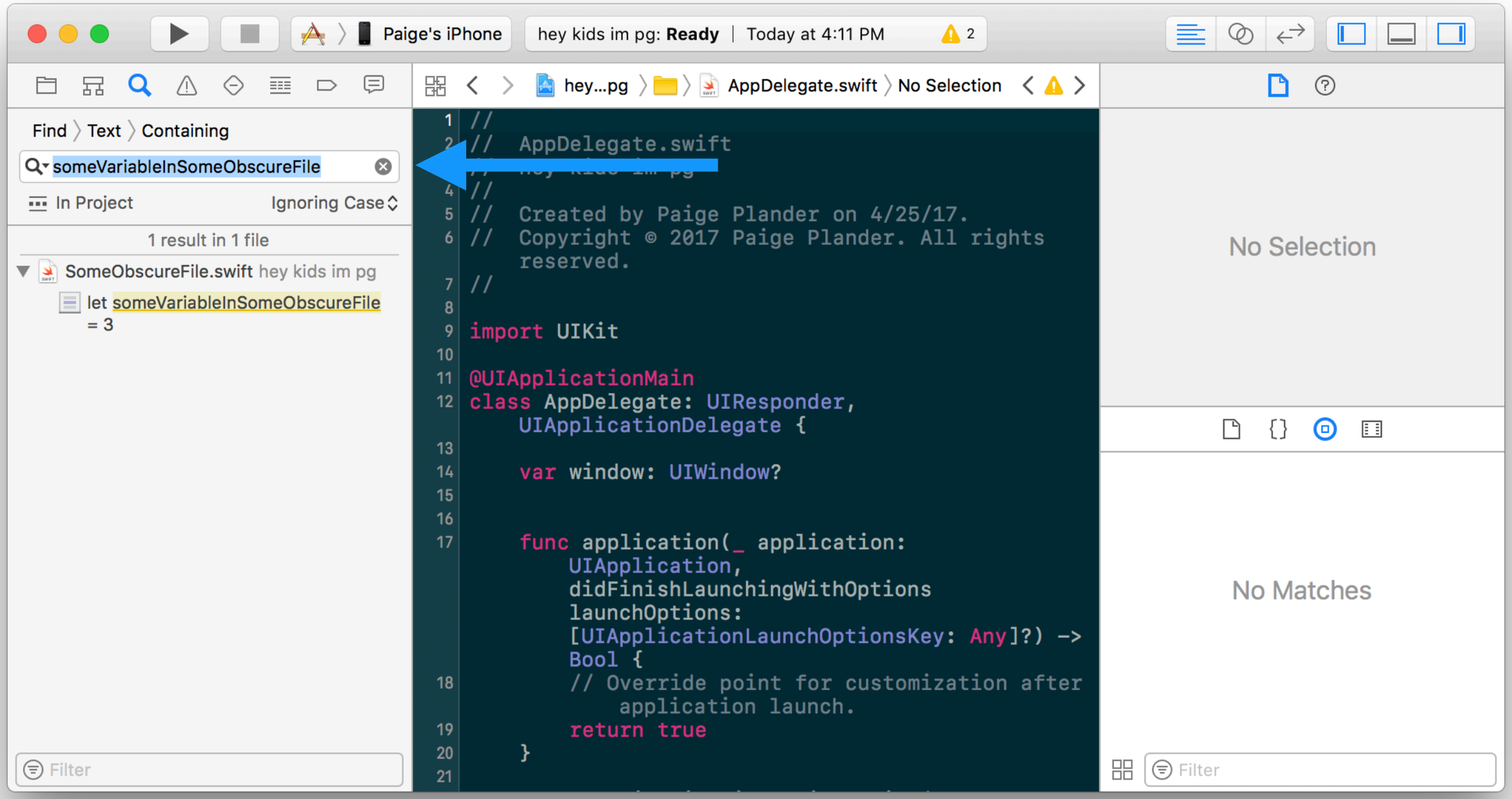
Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

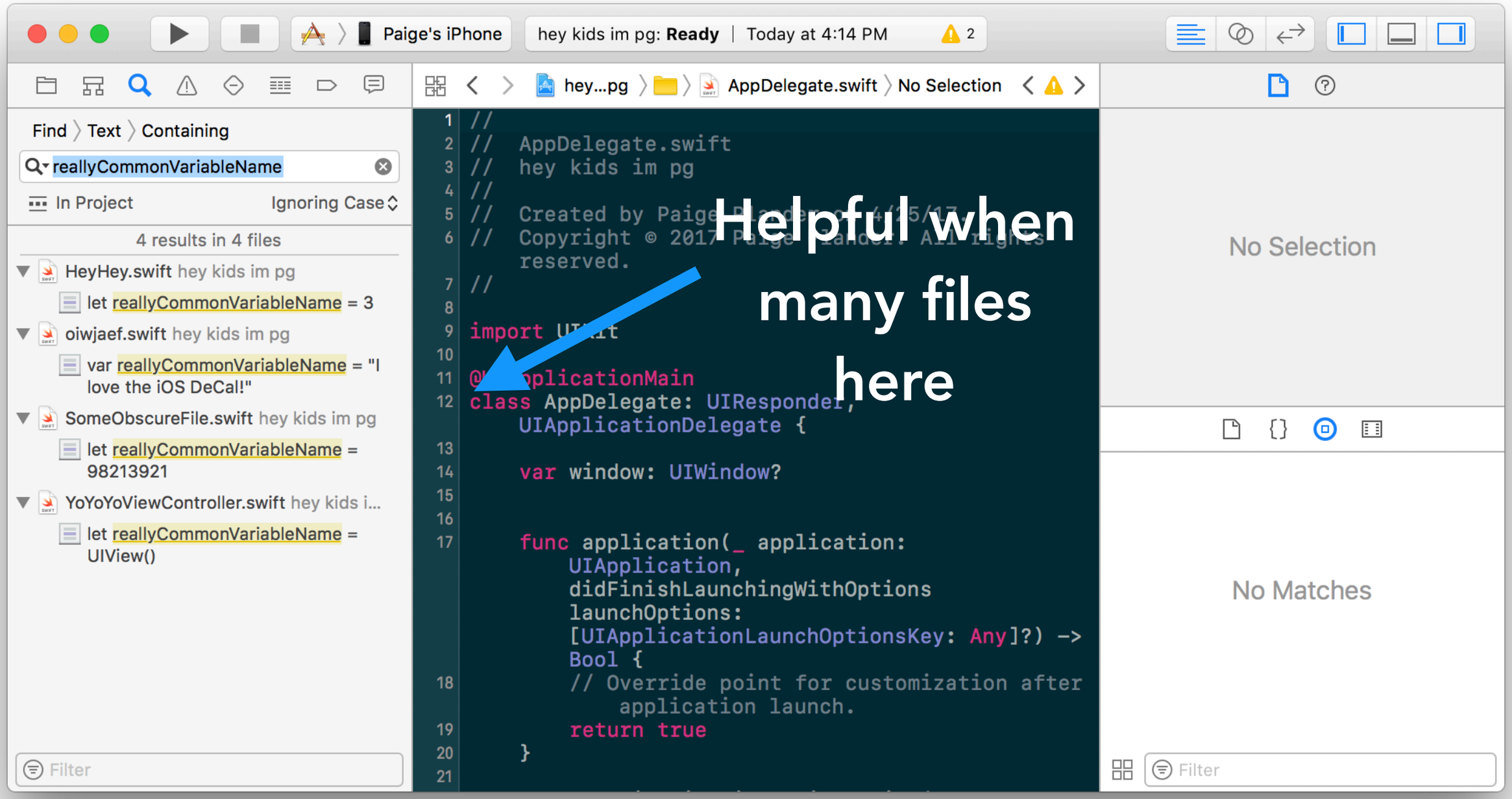
Ask for help (again)!

A slight detour



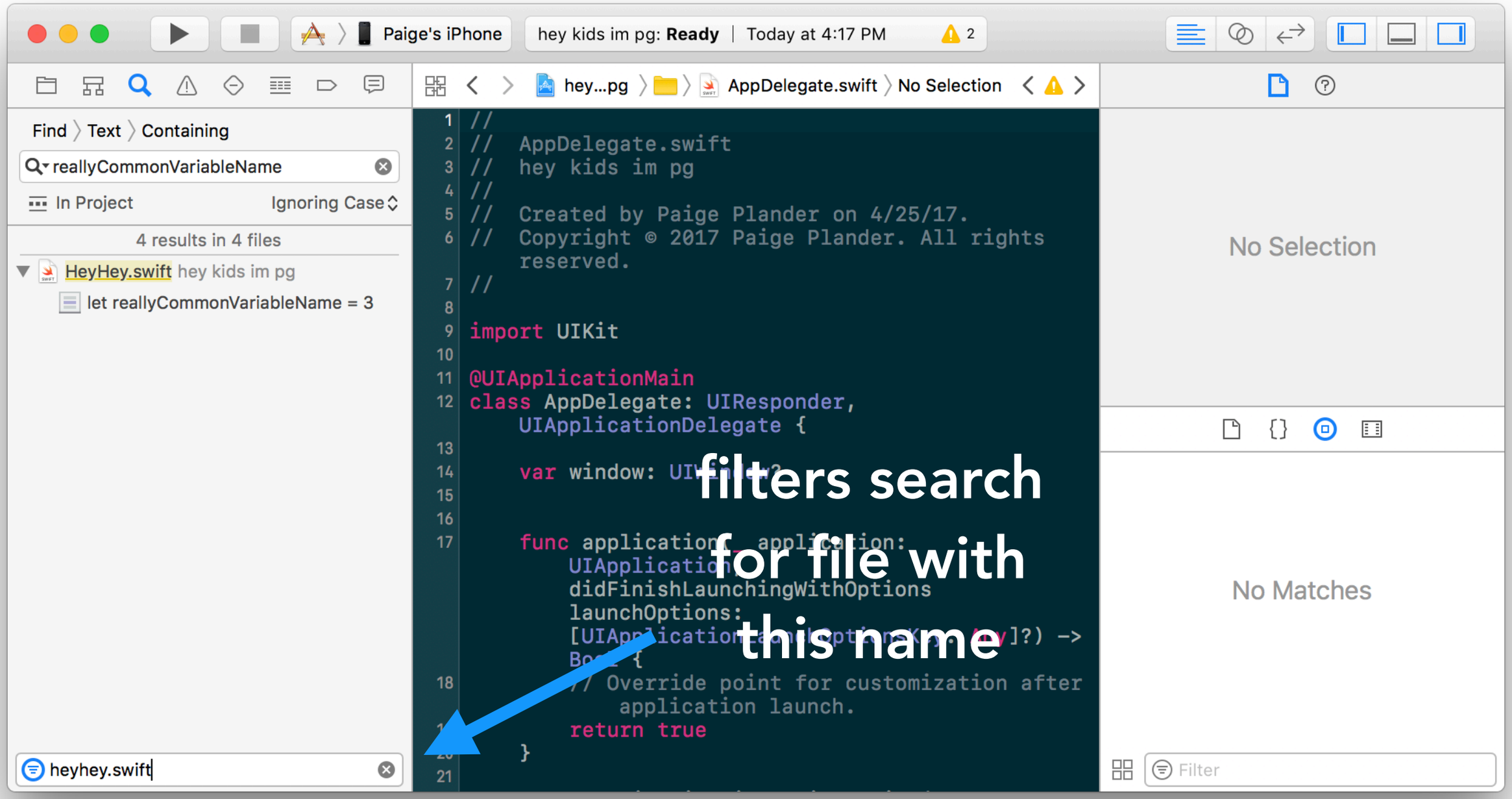
Searching for a specific variable / method / comment

A slight detour



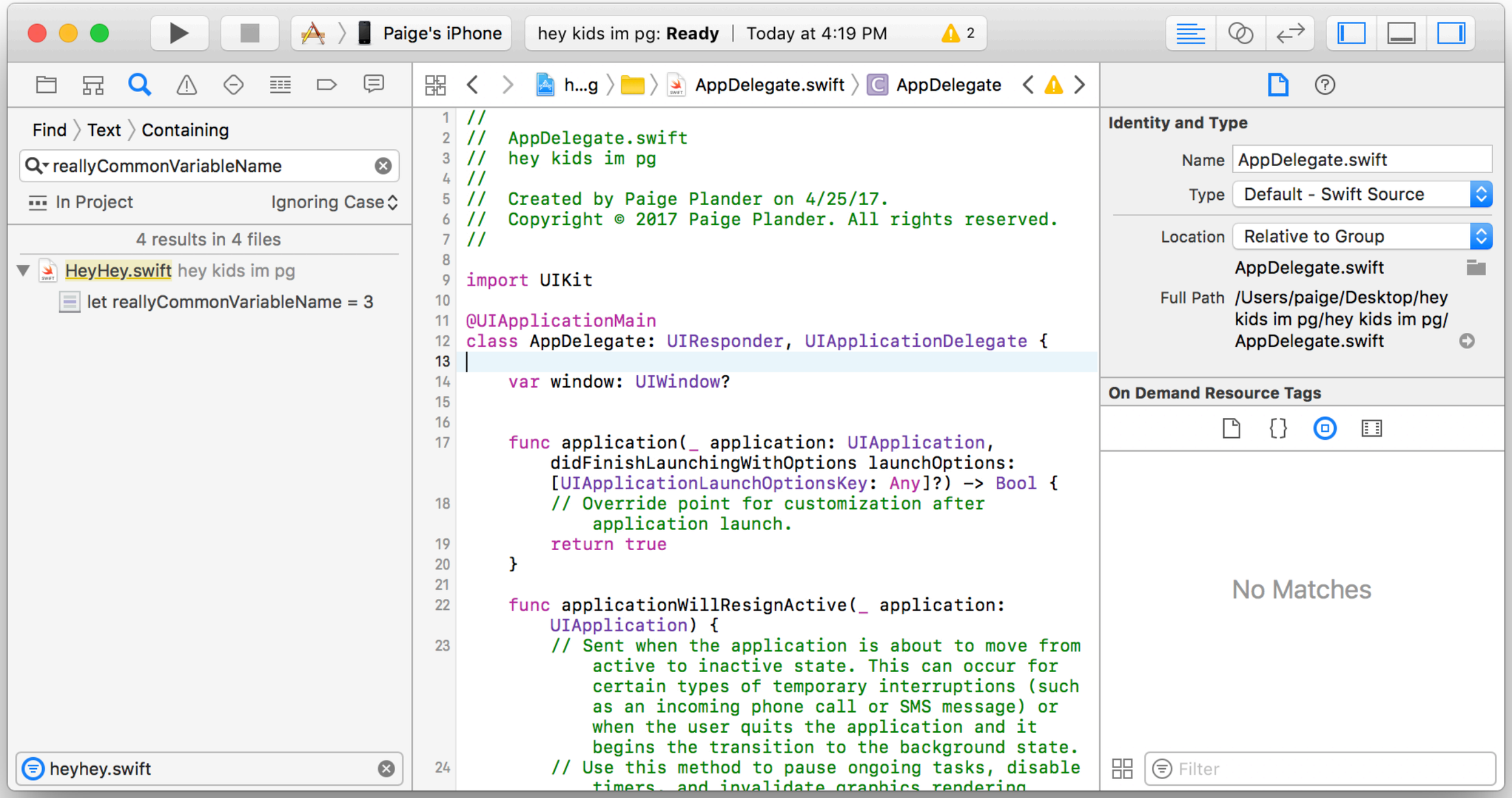
Search with filename filtering (saves a lot of time!)

A slight detour



Search with filename filtering (saves a lot of time!)

A slight detour



Quick Search - Command + Shift + O

A slight detour

Paige's iPhone | hey kids im pg: **Ready** | Today at 4:19 PM | 2

h...g 〉 AppDelegate.swift 〉 AppDelegate

Open Quickly

Find 〉 Text 〉 Containing

reallyCommonVariableNa

In Project

4 results in 4 files

HeyHey.swift hey kids im pg

let reallyCommonVariableName = 3

heyhey.swift

```
6  //  Copyright © 2017 Paige Plander. All rights reserved.
7  //
8
9  import UIKit
10
11 @UIApplicationMain
12 class AppDelegate: UIResponder, UIApplicationDelegate {
13
14     var window: UIWindow?
15
16
17     func application(_ application: UIApplication,
           didFinishLaunchingWithOptions launchOptions:
           [UIApplicationLaunchOptionsKey: Any]?) -> Bool {
18         // Override point for customization after
               application launch.
19         return true
20     }
21
22     func applicationWillResignActive(_ application:
           UIApplication) {
23         // Sent when the application is about to move from
               active to inactive state. This can occur for
               certain types of temporary interruptions (such
               as an incoming phone call or SMS message) or
               when the user quits the application and it
               begins the transition to the background state.
24         // Use this method to pause ongoing tasks, disable
               timers, and invalidate graphics rendering
```

oDelegate.swift

efault - Swift Source

Location: Relative to Group

AppDelegate.swift

Full Path: /Users/paige/Desktop/hey kids im pg/hey kids im pg/AppDelegate.swift

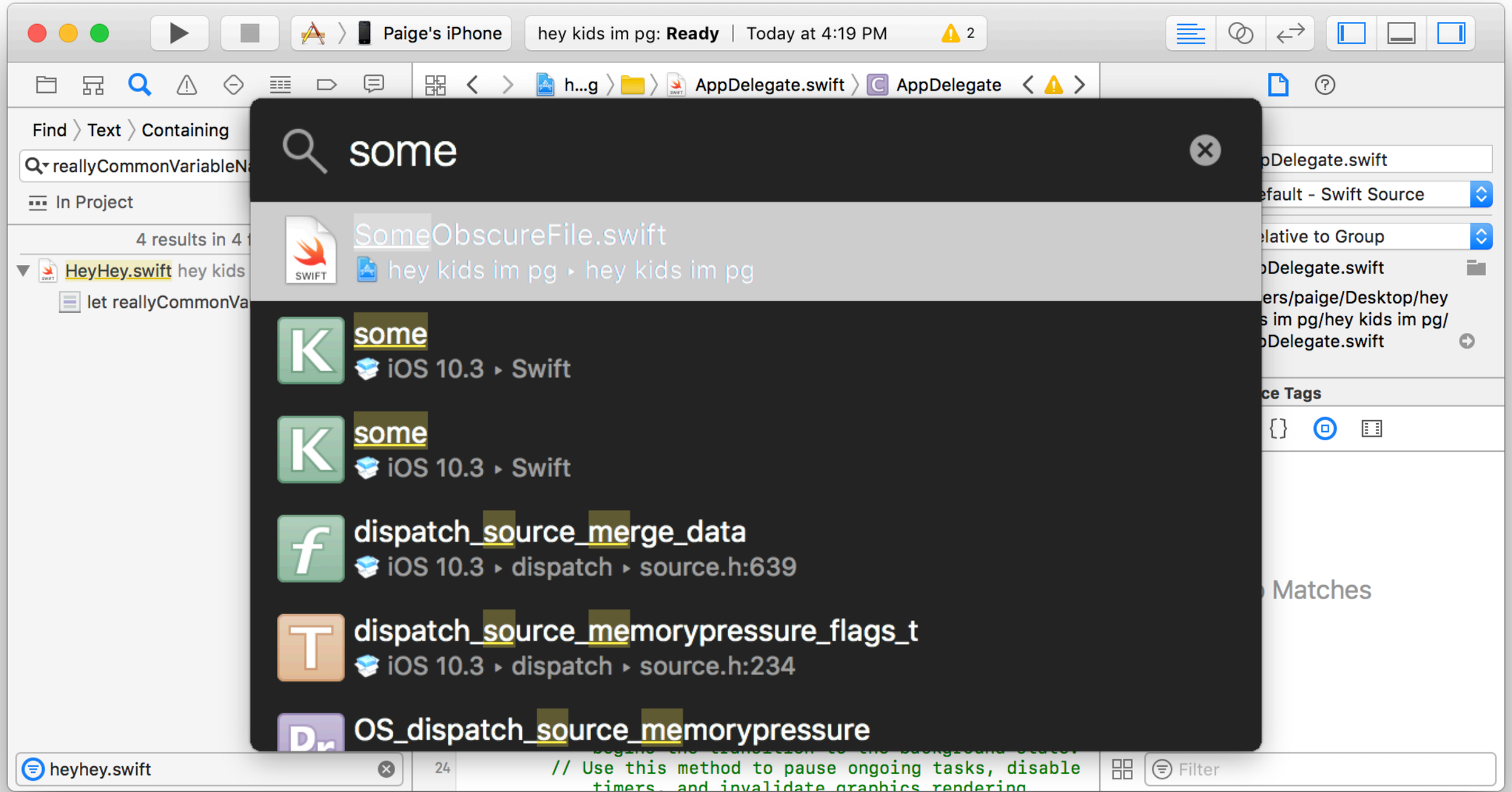
On Demand Resource Tags

No Matches

Filter

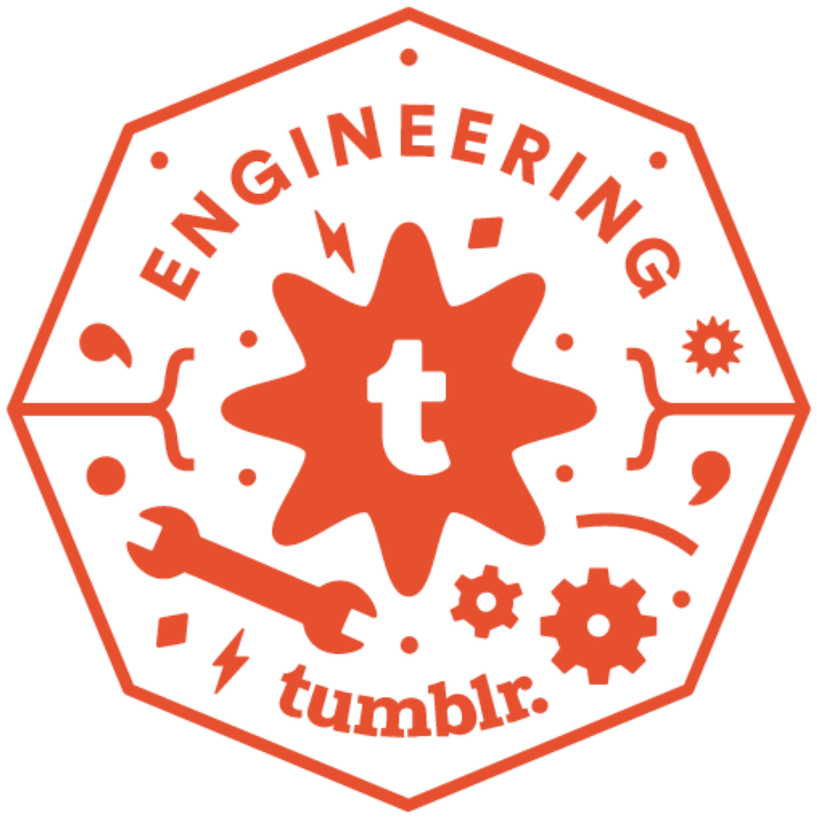
Quick Search - Command + Shift + O

A slight detour



Quick Search - Command + Shift + O

iOS at Tumblr : Takeaways / Tips



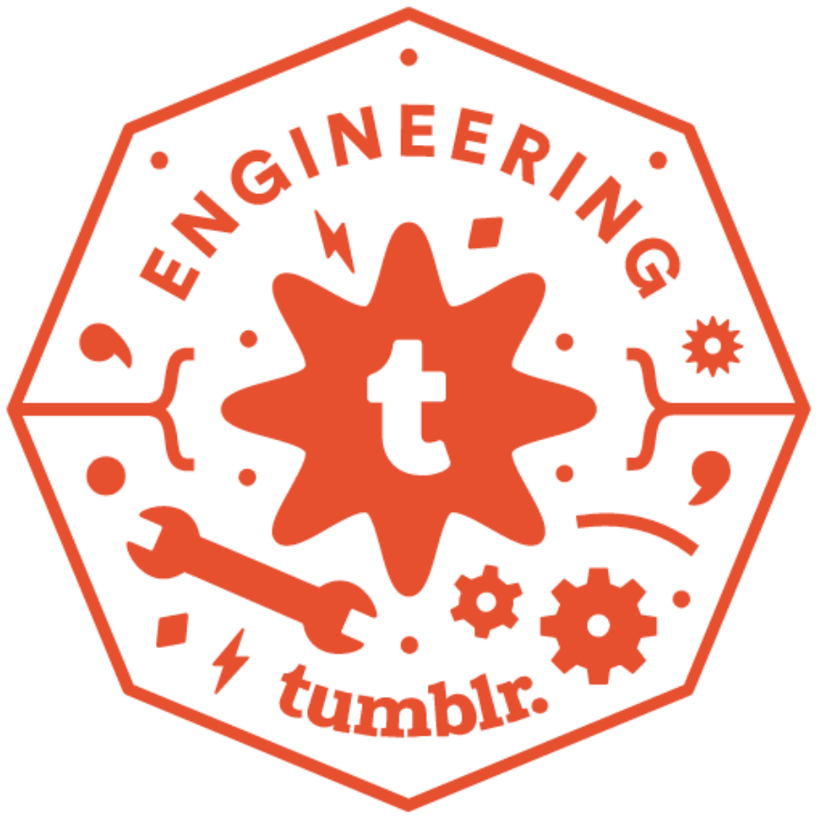
Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

iOS at Tumblr : Takeaways / Tips



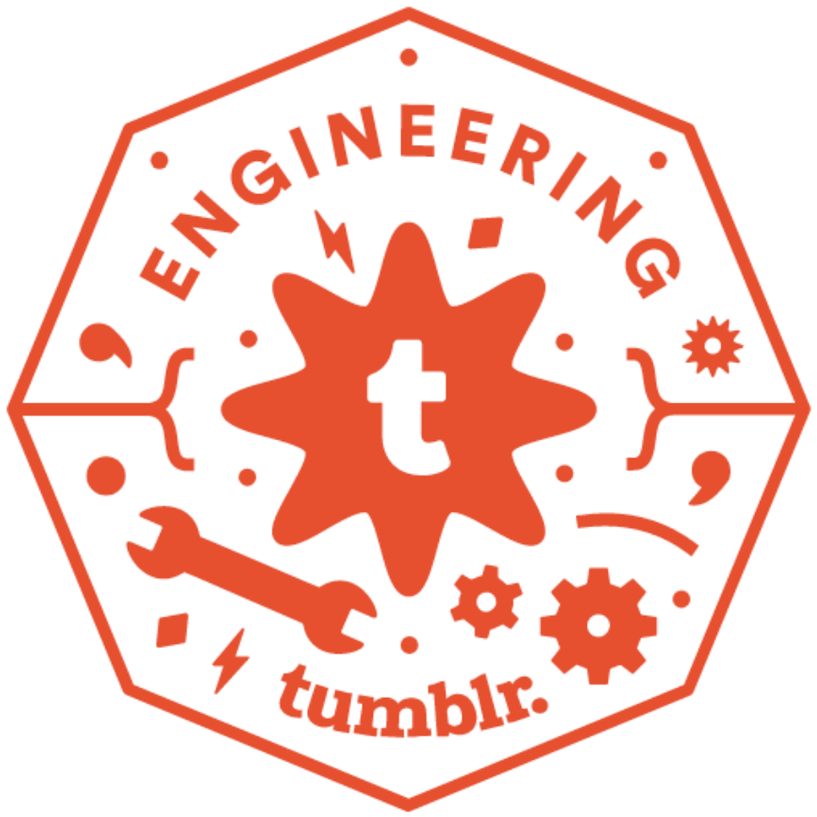
Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

iOS at Tumblr : Takeaways / Tips



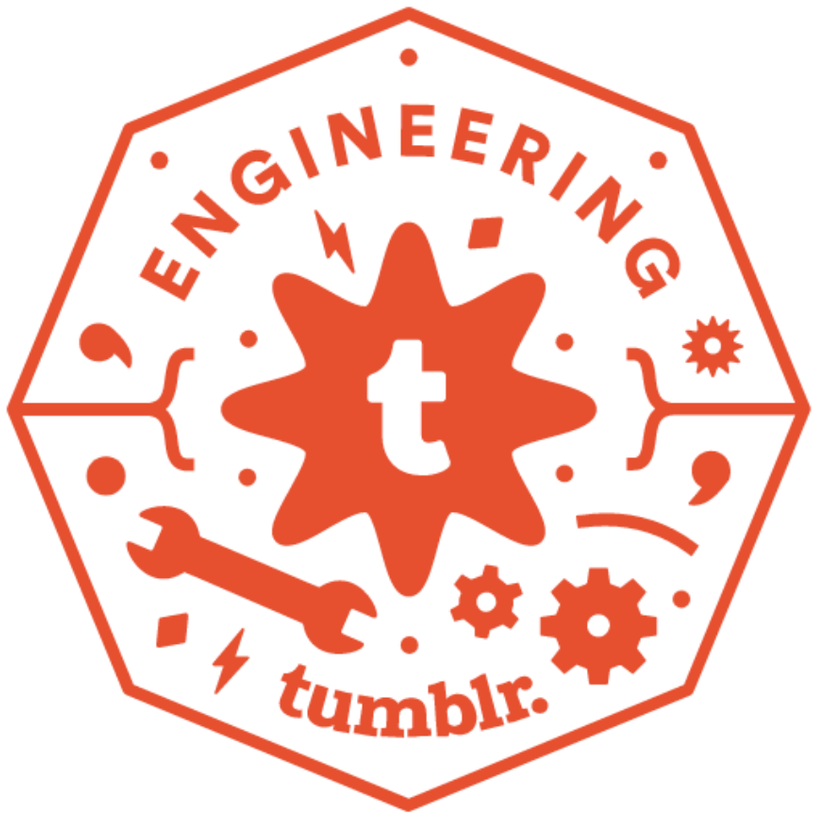
Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

iOS at Tumblr : Takeaways / Tips



Know how to use Xcode debugging tools before hand

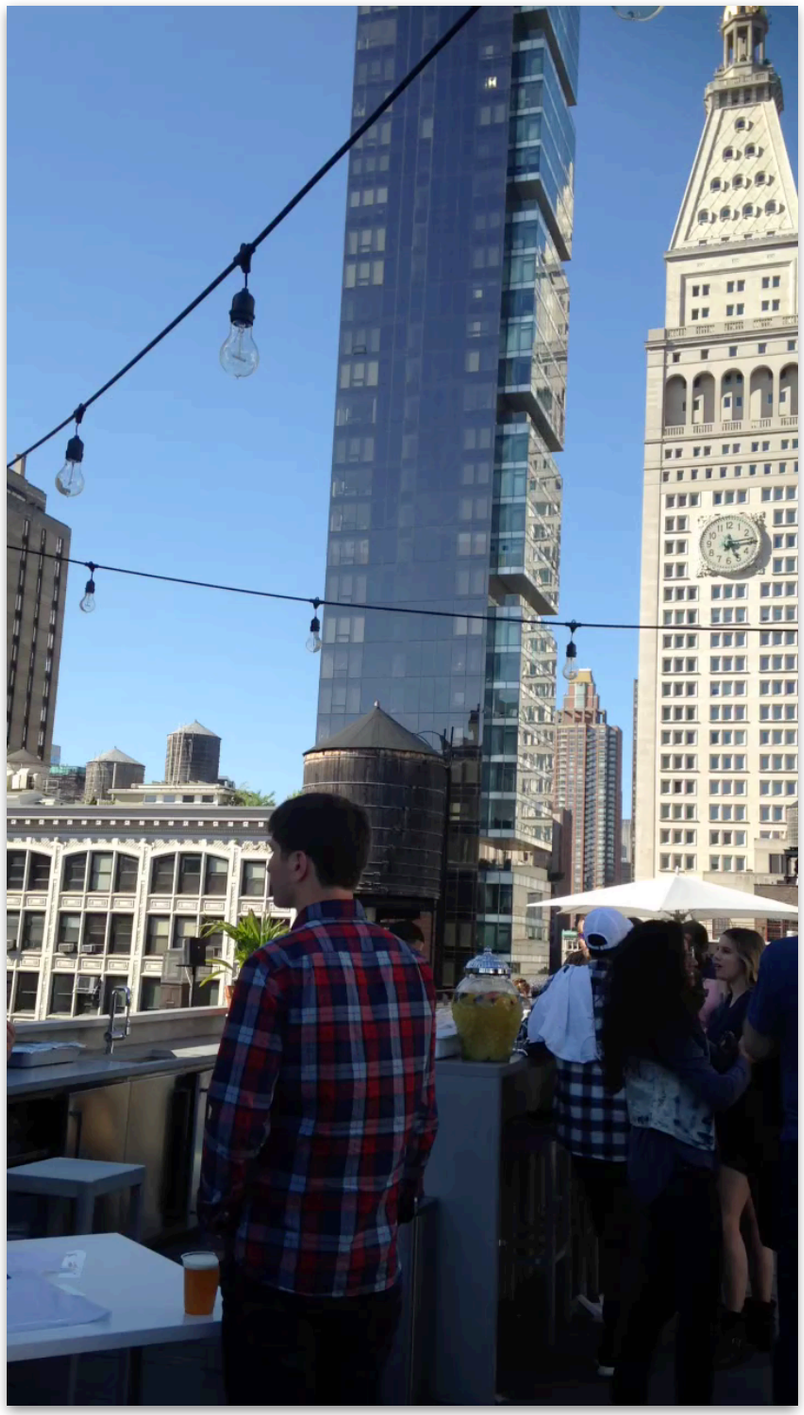
Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

hit up the Tumblr roof a ton!!!

iOS at Tumblr : Takeaways / Tips



Know how to use Xcode debugging tools before hand

Search tools (file search, variable search) breakpoints, console, etc.

Get familiar with Objective C (older companies)

Ask for help (again)!

hit up the Tumblr roof a ton!!!

SWE at **Facebook**

iOS at Facebook : Overview

Location - Menlo Park

Length - 12 weeks

How to apply - https://www.facebook.com/careers/university/

What I did

- Main project - swipe through **all** the photos in a message thread
  - lots of code refactoring
- Few small tasks
- Project depends on your mentor

Messenger iOS Team

- around 30 people on iOS (in 2015)
- 2 week release cycle
- Objective-C
- Huge codebase - spent a lot of time reading code

Takeaways/Tips

- Ask questions
- Talk to other employees
- Don't try to figure out everything on your own!
- Be aware of the release schedule

iOS at Pinterest

- More emphasis on consistent design
- Made a design doc!
- AsyncDisplayKit aka Texture
- also Objective-C
- smaller teams

SWE at **Concur**

iOS at Concur: Overview

Location - Downtown San Francisco (most interns were in Seattle, though)

Length - 10 Weeks

How to Apply - Can apply directly online or at career fairs/ hackathons

iOS at Concur: Applying

- Phone interview
  - Mostly behavioral (what interests you and why?)
- Technical video conference w/ engineers
  - Mix of iOS-specific and general software questions
  - Be able to think about challenges/ pitfalls
  - Autolayout vs. Programmatic - Pros and Cons?
  - Know your Swift - style, data structures
  - Not typical coding questions

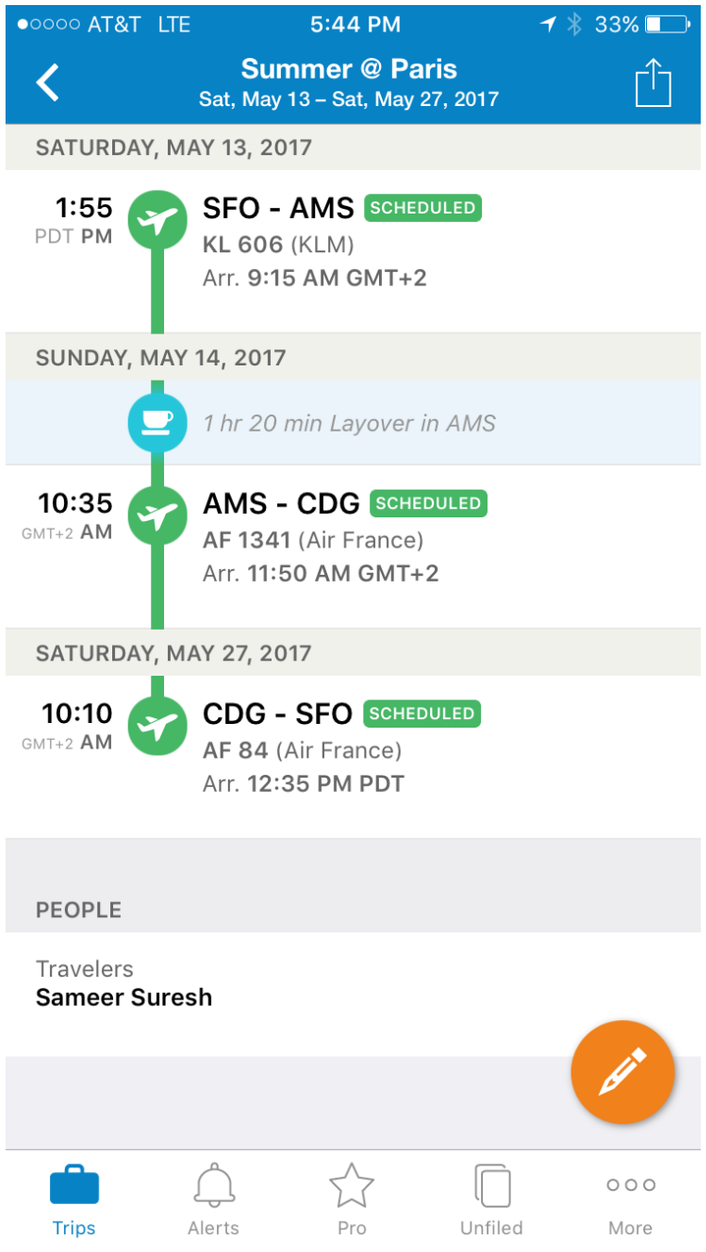
iOS at Concur: Workflow

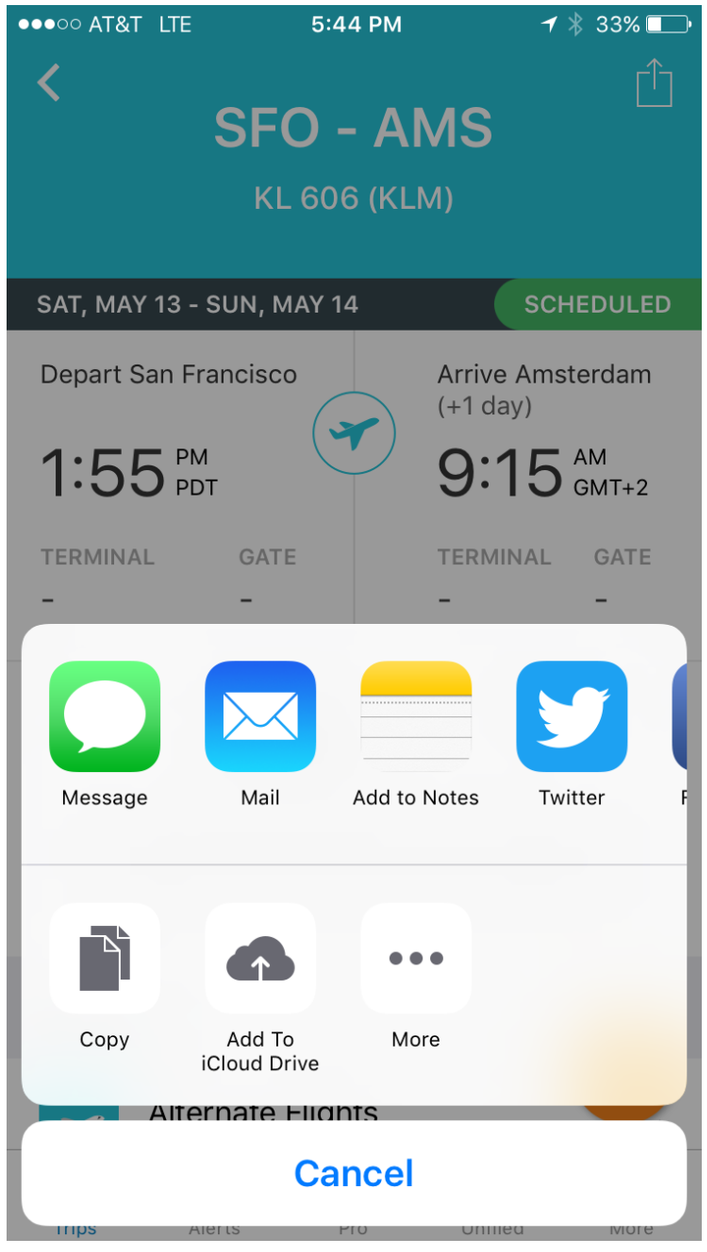
- Work in small teams, 7-8 people each
  - Teams not divided by platform/focus
- Agile methodology - everything done in 2 week sprints
- Set goals every two weeks, write your own tickets (Jira), move them through the pipeline
- Interns can take on large projects (still distributed in sprints) or work on smaller tickets just like full-time engineers

iOS at Concur: Workflow

- Agile --> frequent meetings
  - Demo work done from each sprint
  - Look back on what was done, what needs to still be done
  - Small teams working on the same things
- Code reviews: your code is never right the first time around
- Dev process: new branches for every ticket

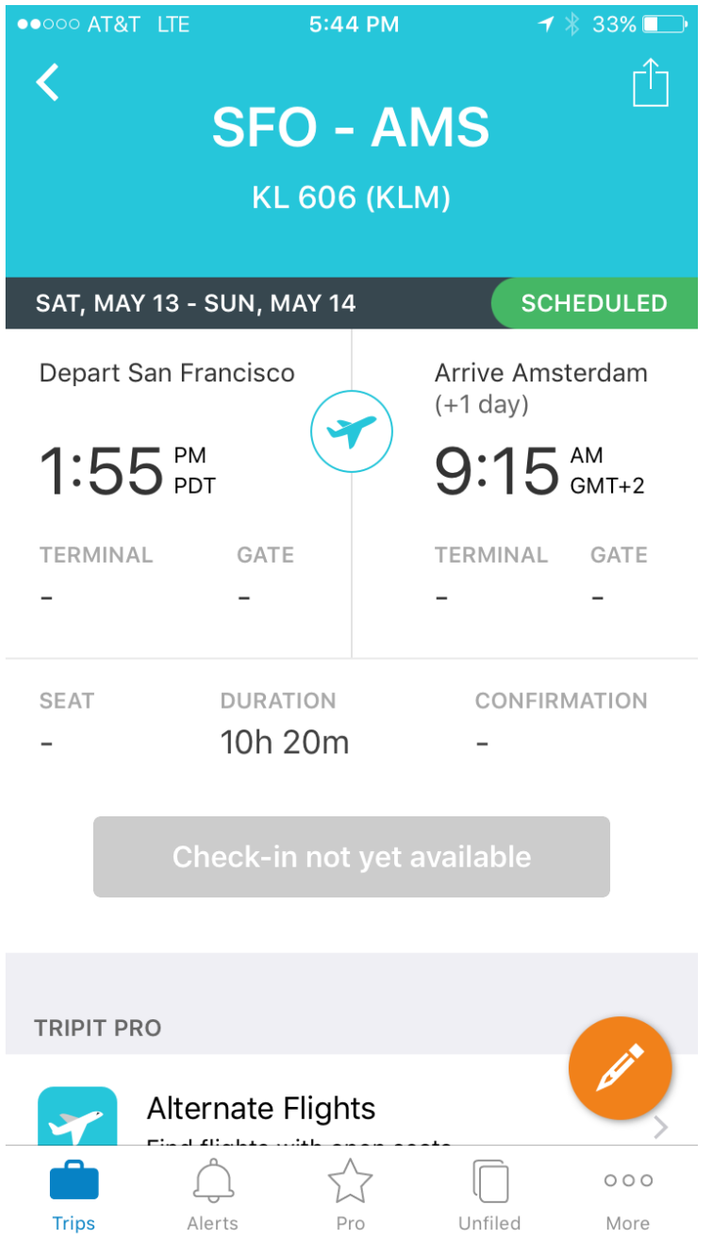
iOS at Concur: What I Did

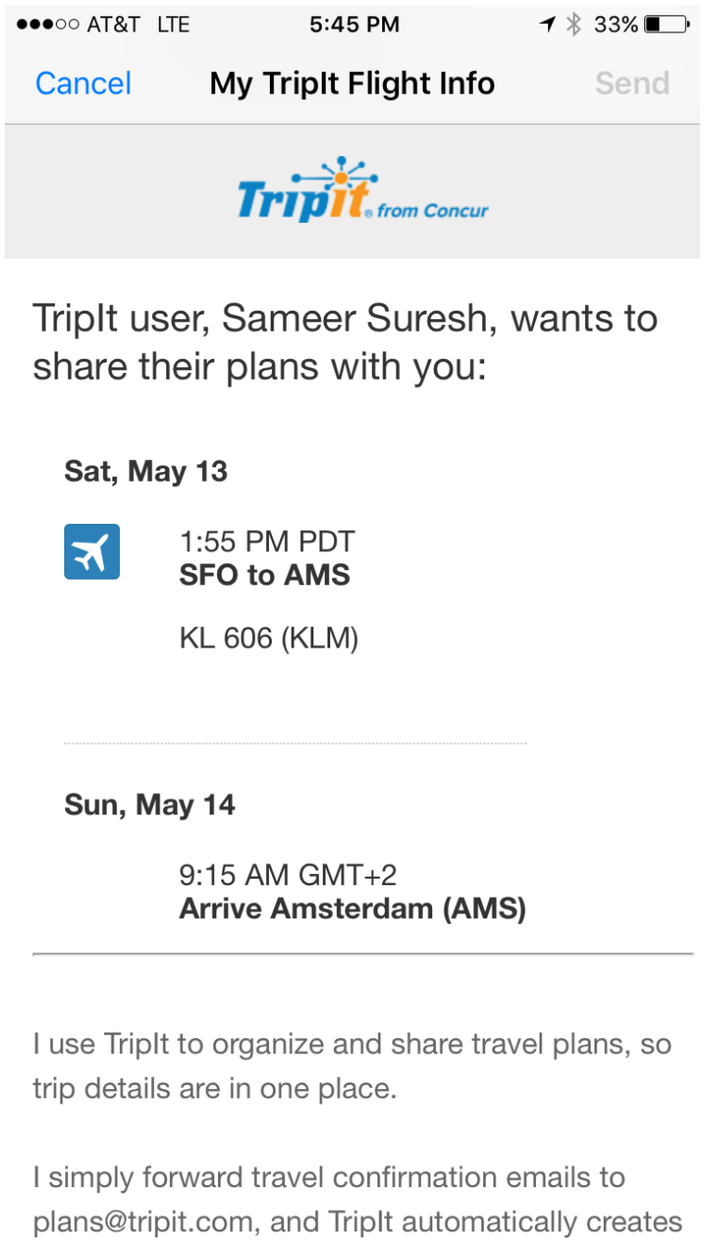




- Sharing trip plans via any social media outlet
- UIActivityViewController
- More flexibility - share many plans at a time
- Auto-detect screenshots

iOS at Concur: What I Did





- Primarily front-end, but some work on Tripit API
- Closely connected with UI/UX, PM Interns
- Navigating a huge codebase, half Obj-C and half Swift

iOS at Concur: iOS 10!!

- After release of iOS 10, worked on iMessage extension to share plans without opening app

Life at Concur

Check-In

Interview Questions!

MVC Review

Question: What are the three roles of MVC (just name them) and what are the responsibilities of each role?

MVC Review

Question: What are the three roles of MVC (just name them) and what are the responsibilities of each role?

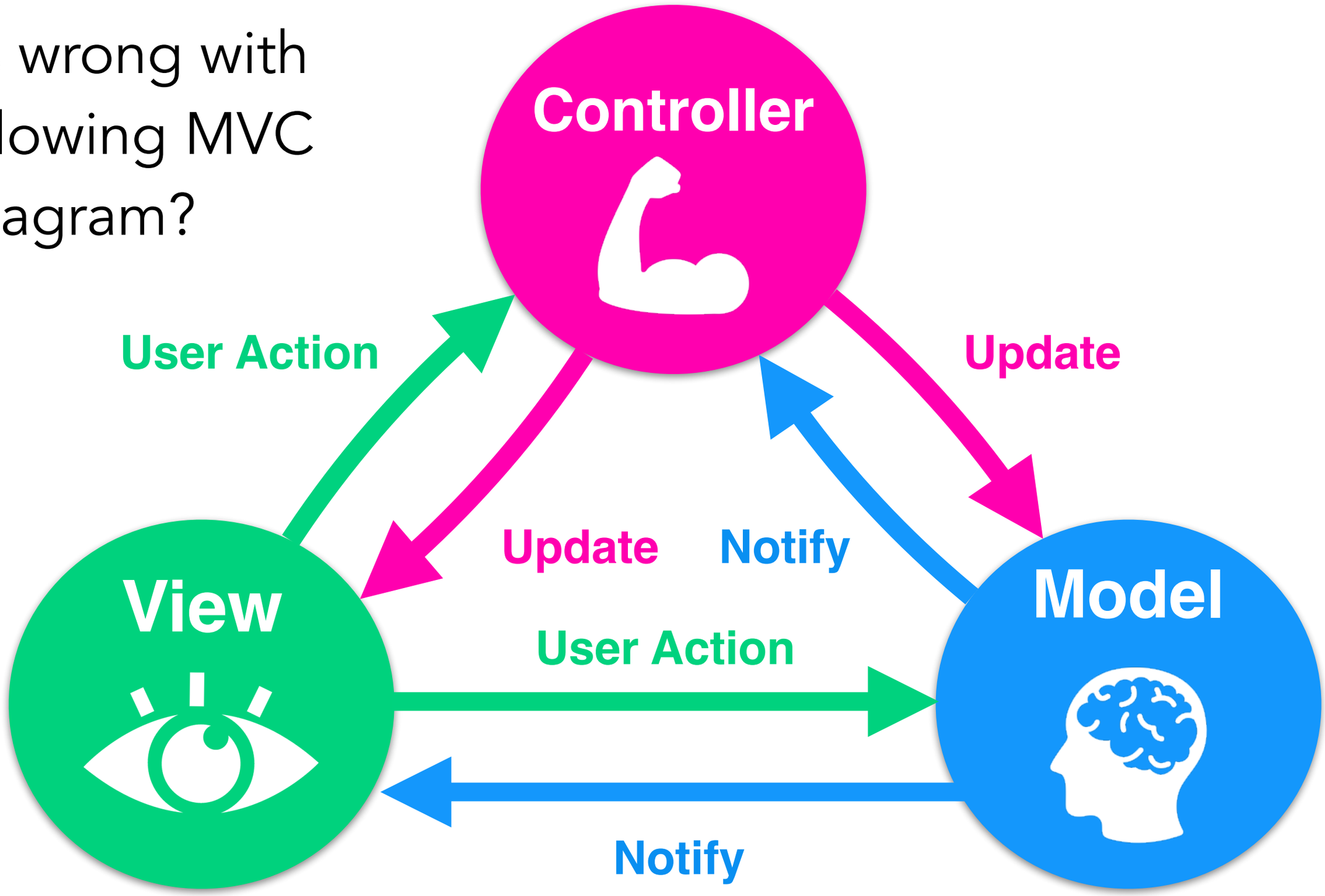
Model - encapsulates data and defines logic / computations

View - what the users see and interact with

Controller - intermediary between models and views

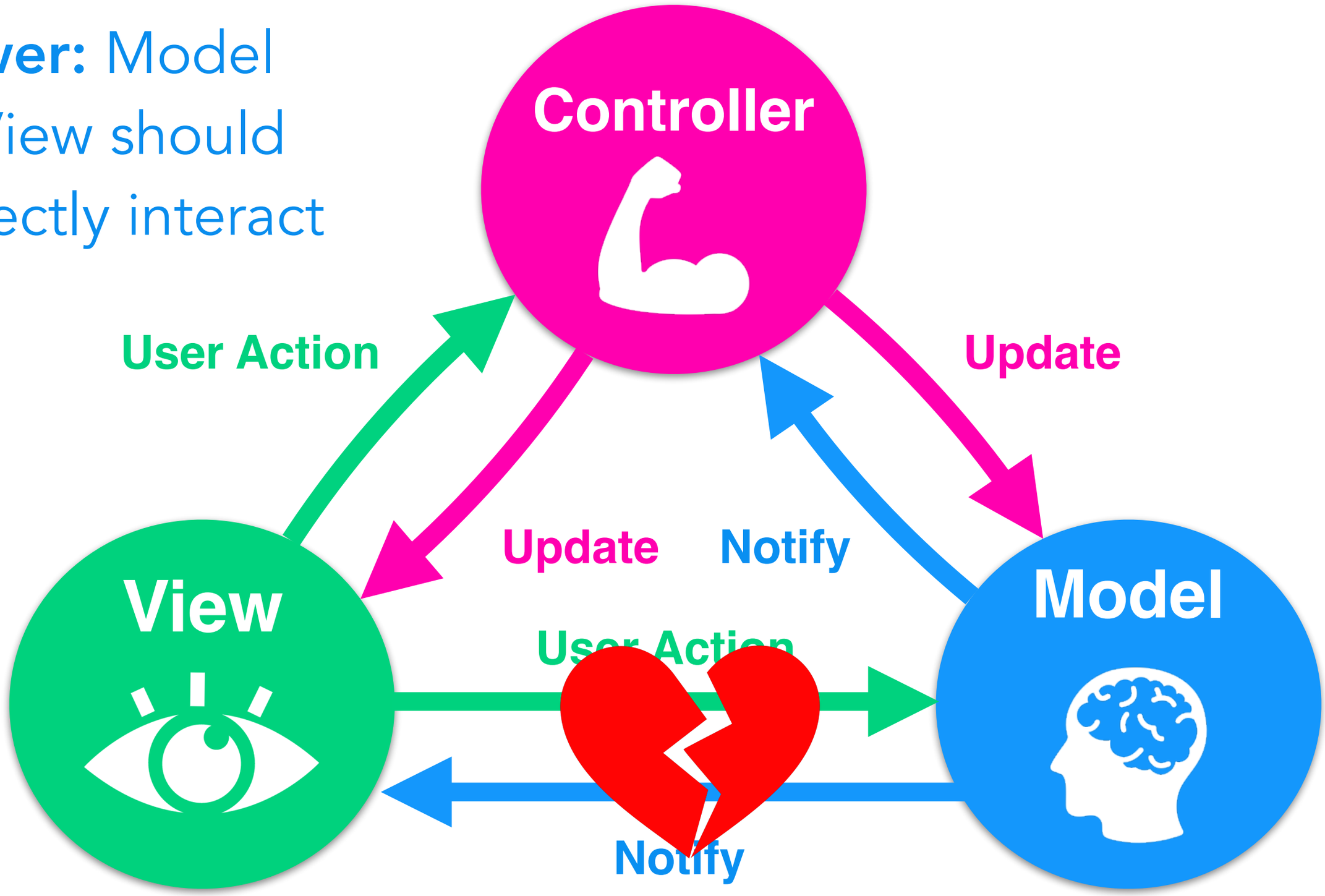
MVC Review : What's Wrong

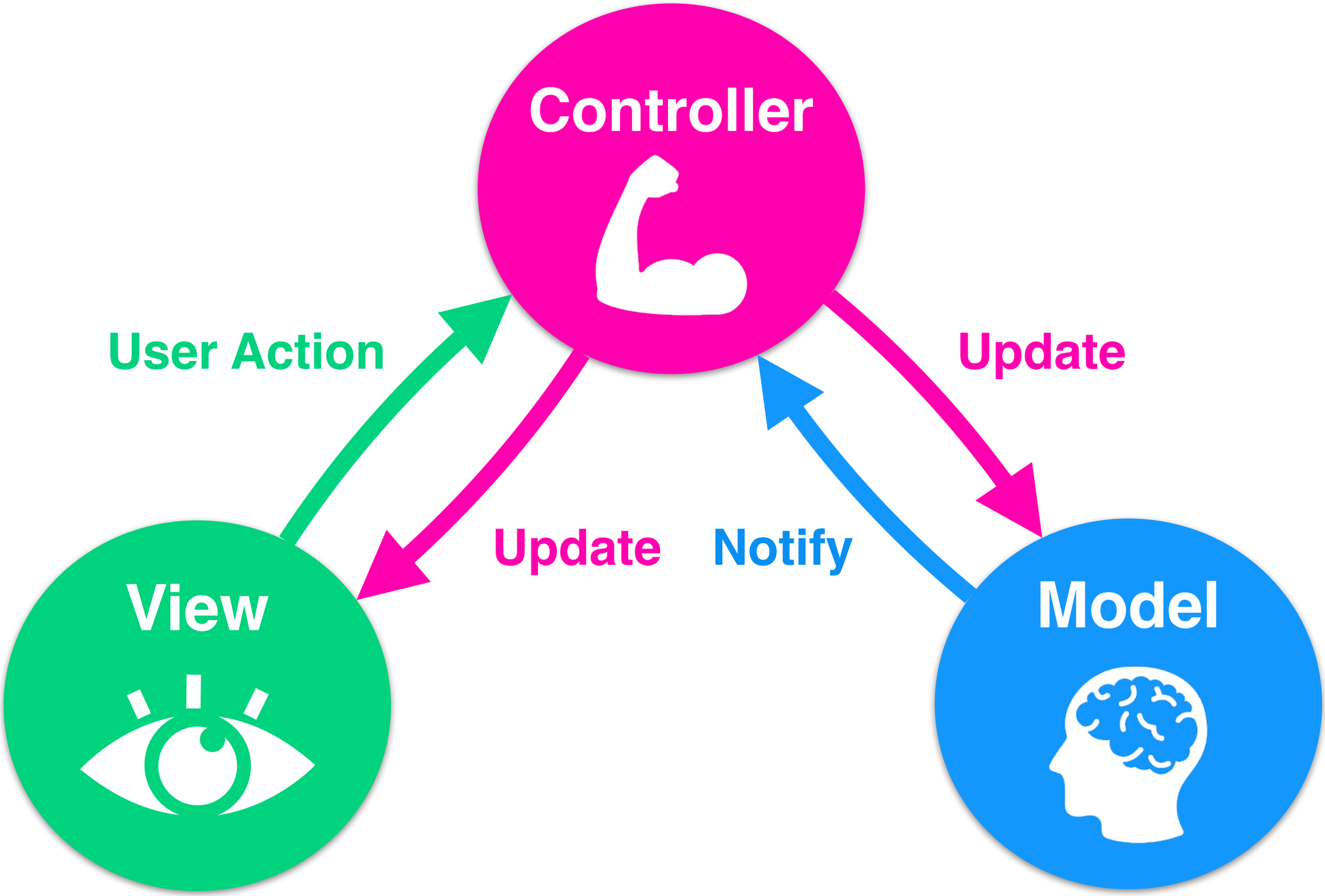
What's wrong with the following MVC Diagram?



MVC Review : What's Wrong

Answer: Model and View should not directly interact





Model View Controller

View Lifecycle Review

Question: What's the difference between the methods `viewDidLoad` and `viewWillAppear`?

View Lifecycle Review

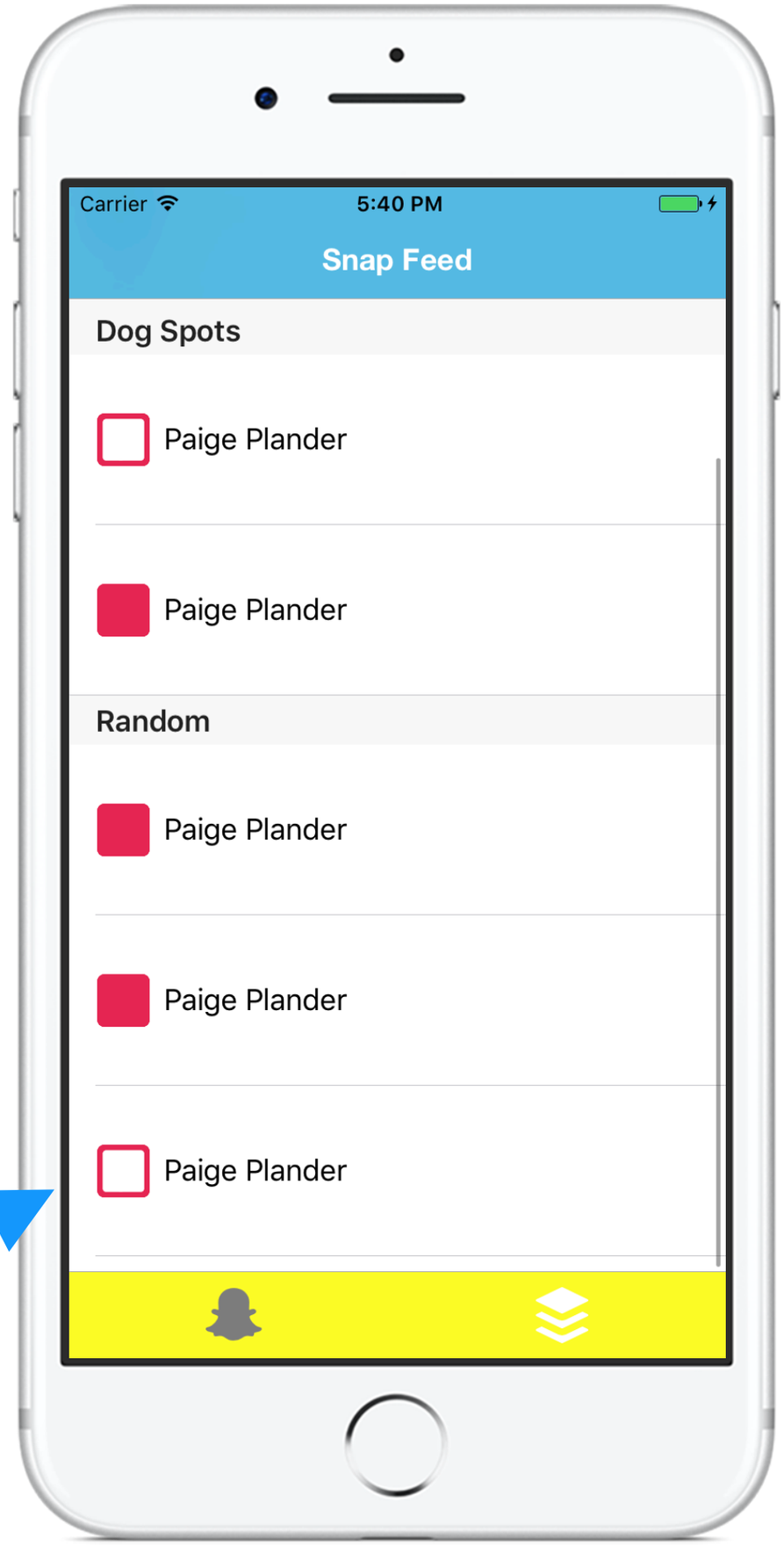
Question: What's the difference between the methods `viewDidLoad` and `viewWillAppear`?

`viewDidLoad` – called once when the view controller is created

`viewWillAppear` – called every time the view appears on the screen

Question: Some of my cells show up as read, even though they shouldn't be - what's the problem in my code?

Wasn't Read! But still clickable



Snapchat Clone Table View Bug

Question: Some of my cells show up as read, even though they shouldn't be - what's the problem in my code?

```
func tableView(_ tableView: UITableView, cellForRowAt
    indexPath: IndexPath) -> UITableViewCell {
    let cell =
        tableView.dequeueReusableCell(withIdentifier:
        "postCell", for: indexPath) as! PostsTableViewCell
    if let post = getPostFromIndexPath(indexPath:
        indexPath) {
        if post.read {
            cell.readImageView.image = UIImage(named:
                "read")
        }
    }
    return cell
}
```

Snapchat Clone Table View Bug

Since Table view Cells are **recycled** , you need to check if the cell has is not read, and set image to “unread”

```
func tableView(_ tableView: UITableView, cellForRowAt
    indexPath: IndexPath) -> UITableViewCell {
    let cell =
        tableView.dequeueReusableCell(withIdentifier:
        "postCell", for: indexPath) as! PostsTableViewCell
    if let post = getPostFromIndexPath(indexPath:
        indexPath) {
        if post.read {
            cell.readImageView.image = UIImage(named:
                "read")
        }
    }
    return cell
}
```

Snapchat Clone Table View Bug

```
func tableView(_ tableView: UITableView, cellForRowAt indexPath:
    IndexPath) -> UITableViewCell {
    let cell = tableView.dequeueReusableCell(withIdentifier:
        "postCell", for: indexPath) as! PostsTableViewCell
    if let post = getPostFromIndexPath(indexPath: indexPath) {
        if post.read {
            cell.readImageView.image = UIImage(named: "read")
        }
        else {
            cell.readImageView.image = UIImage(named: "unread")
        }
        cell.usernameLabel.text = post.username
    }
    return cell
}
```

Solution Code

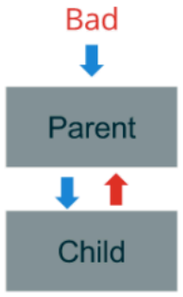
Strong vs Weak?

Strong vs Weak?

Strong - Two objects both increase each other's reference counts and are in memory forever.
Weak - Only one object increases reference count, so when one gets deallocated so does the other.

Retain Cycles

```
@class Child;
@interface Parent : NSObject {
    Child *child; //instance variables implicitly __strong
}
@end
@interface Child : NSObject {
    Parent *parent; //also implicitly __strong
}
@end
```



What are the 2 required methods for Tableviews?

What are the 2 required methods for Tableviews?

```
func cellForRow(at indexPath:
IndexPath) ->
UITableViewCell?
```

```
func numberOfRows(inSection
section: Int) -> Int
```

Var vs Let?

Question: What's the difference between something declared with "`var`" and something declared with "`let`"

Var vs Let?

Question: What's the difference between something declared with "`var`" and something declared with "`let`"

Let - Immutable (Constants)

Var - Mutable

! vs ?

! vs ?

? - Can take on a value of nil

! - Cannot take on value of nil

Classes vs Structs?

Question: What's the main difference between a Class and a Struct?

Classes vs Structs?

Question: What's the main difference between a Class and a Struct?

Classes - Pass by reference

Structs - Pass by value

Classes vs Structs?

What is/are Swift's Generic Type(s)?

What is/are Swift's Generic Type(s)?

```
Any?
NSObject
```

When do you have to use self?

When do you have to use self?

Closures

```
dispatch_async(dispatch_get_main_queue(), {
    // we cannot assign to properties of self
    self.view = nil

    // but can access properties
    someFunc(view)
})
```

How do you safely unwrap an optional?

How do you safely unwrap an optional?

```
if let protectedString = str
{
    print("Hi World")
}
```

What is the purpose of “with” in this method definition?

```
func foo(with bar: int) {

}
```

What is the purpose of “with” in this method definition?

```
func foo(with bar: int) {

}
```

“With” is the descriptor for each parameter.

Custom App

Due **Tuesday** at 11:59pm

Final App Presentations

Friday of dead week at 11:00 am in 310 Jacobs

Attendance mandatory (cannot use unexcused absence)