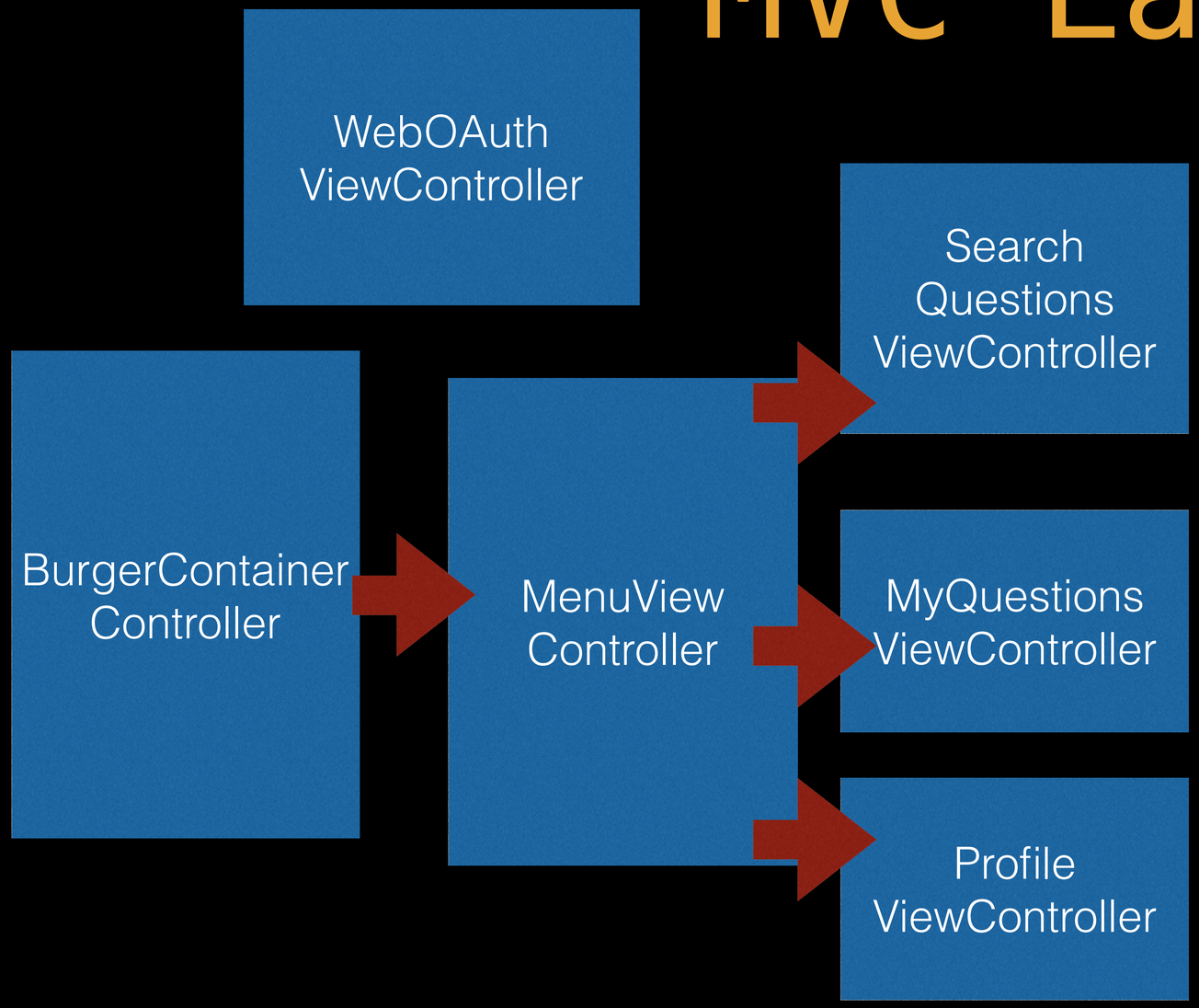
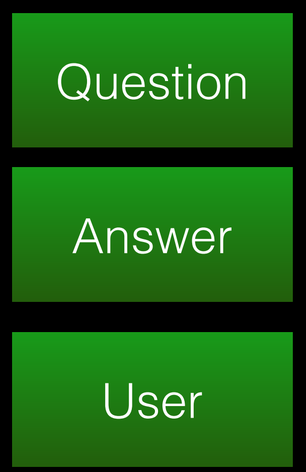
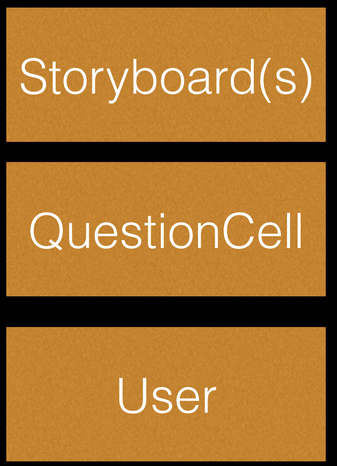
iOS Dev Accelerator Week 7 Day 1

- Custom Container View Controller
- OAuth with WebViews
- Lazy Loading in Objective-C
- Technical Interviews

MVC Layout


WebOAuth ViewController
BurgerContainer Controller
MenuView Controller
Search Questions ViewController
MyQuestions ViewController
Profile ViewController
Controllers


Question
Answer
User
Models

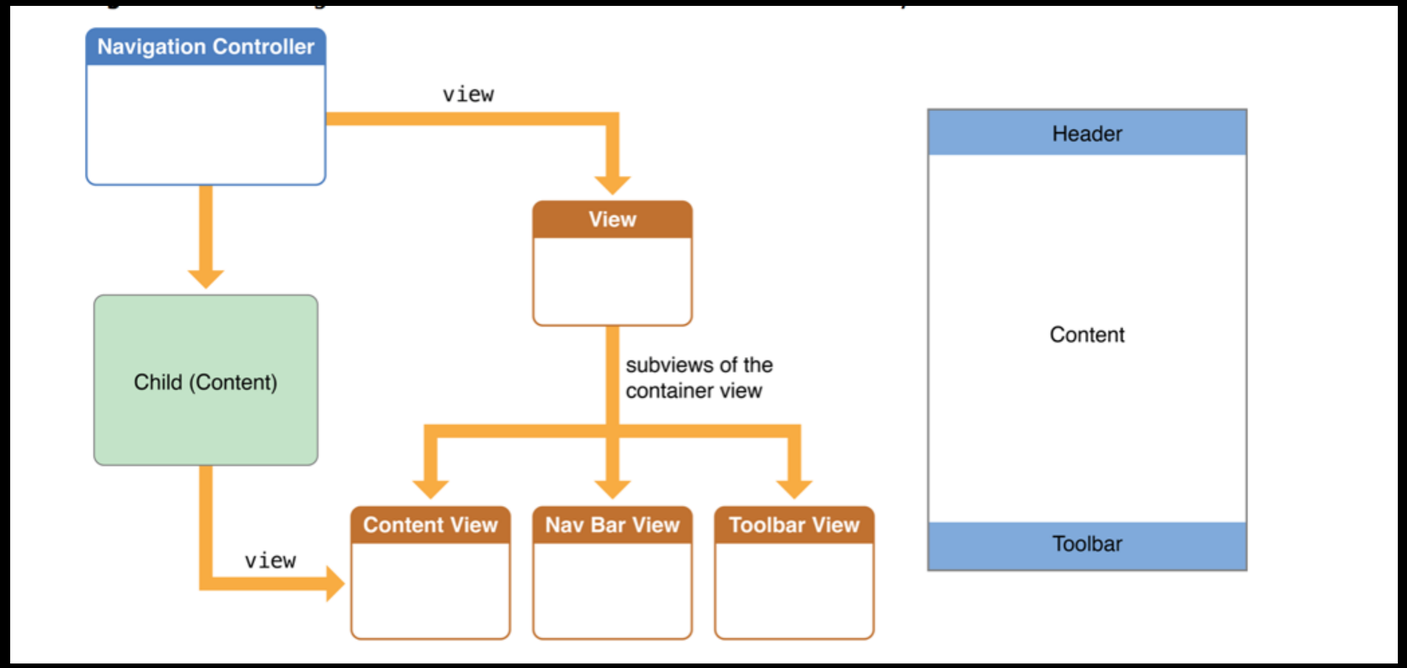

Storyboard(s)
QuestionCell
User
Views

Container View Controllers

- All of the view controllers you have created so far are considered ‘Content View Controllers’
- Container View Controllers are similar to Content View Controllers, except they manage parent-child relationships between the Container VC, the parent, and its Content VC(s), the children.
- The Container VC is in charge of displaying its children VC’s views.

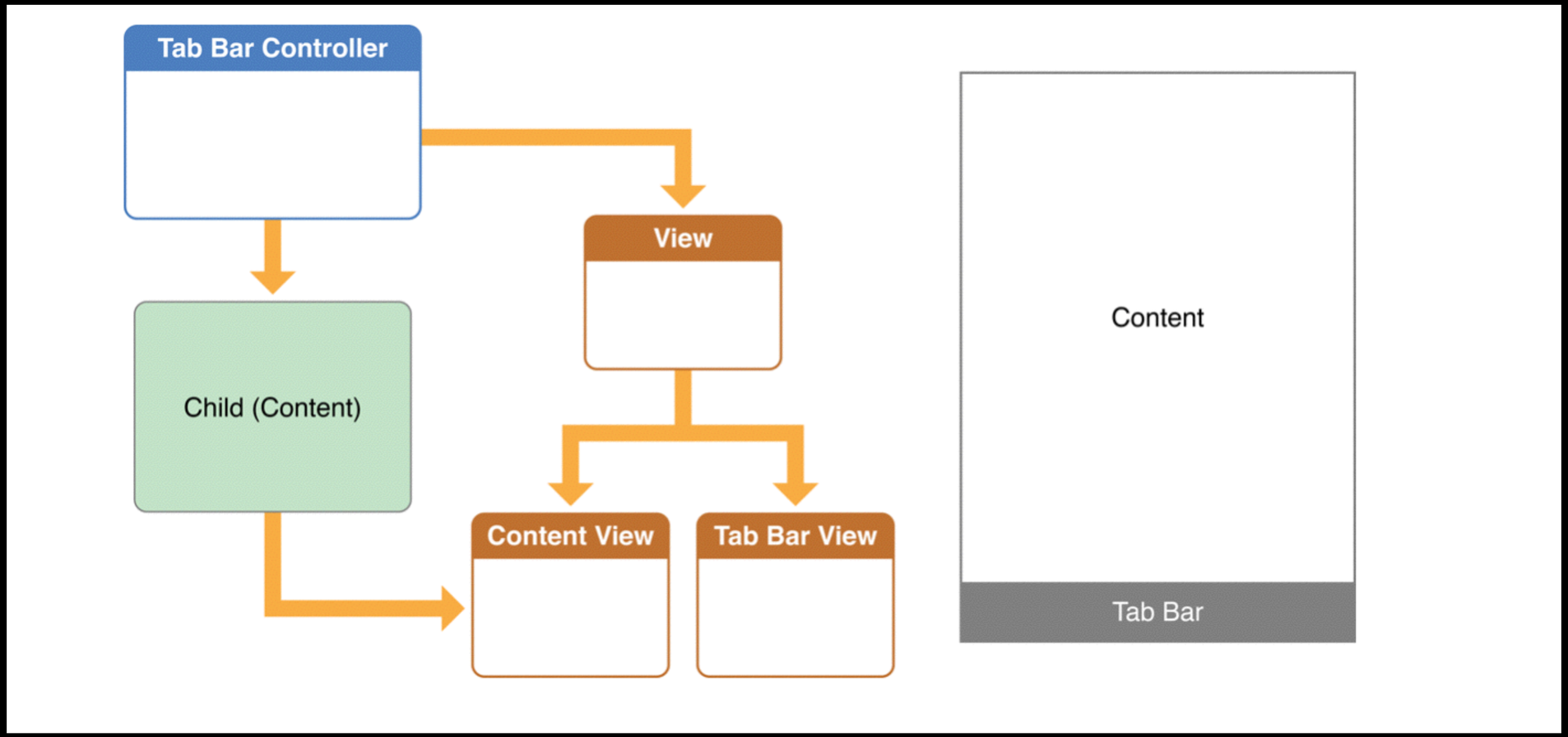
Container View Controllers

- An example of a Container View Controller you have used is the Navigation Controller:



Container View Controllers

- Same Idea with a Tab Bar Controller:



Container View Controllers

- “The goal of implementing a container is to be able to add another view controller’s view as a subview in your container’s view hierarchy”
- When a new VC is added on screen, you can ensure the right events (viewDidLoad, willAppear,etc) are given to all VC’s by associating the new VC as a child of the container VC.

Getting your child on screen

```
func setupChildVC() {
    //create a new VC
    var childVC = UIViewController()
    //tell this VC that we are adding a child VC
    self.addChildViewController(childVC)
    //set the child VC's view's frame, in this case it will
        completely cover the container VC
    childVC.view.frame = self.view.frame
    //add the child view to the parent view
    self.view.addSubview(childVC.view)
    //notify the child vc he is now on screen
    childVC.didMoveToParentViewController(self)
}
```

Taking the child off screen

```
childVC.willMoveToParentViewController(nil)
childVC.view.removeFromSuperview()
childVC.removeFromParentViewController()
```

Transitioning your Child VCs

There is also an optional method you can use for cool transitions

```
//being process of removing old one and adding new one
childVC.willMoveToParentViewController(nil)
self.addChildViewController(nextChildVC)

//set the new child's frame to be off screen to the left, and create an end frame
    that is off the screen to the right
nextChildVC.view.frame = CGRectMake(-700, 0, self.view.frame.width, self.view.
    frame.height)
var endFrame = CGRectMake(700, 0, childVC.view.frame.width, childVC.view.frame.
    height)

//call the transition method on our container view controller
self.transitionFromViewController(childVC, toViewController: nextChildVC,
    duration: 0.5, options: UIViewAnimationOptions.TransitionCrossDissolve,
    animations: { () -> Void in
    //give our new child a frame equal to our containers view, putting him fully
        on screen. set our old child's view to the end frame so it slides off to
        the right
    nextChildVC.view.frame = self.view.frame
    childVC.view.frame = endFrame

}) { (success) -> Void in

    //finish the operation
    childVC.removeFromParentViewController()
    nextChildVC.didMoveToParentViewController(self)

}
```

Demo

OAuth with Webviews

OAuth with Webviews

- When we first learned Oauth, we learned the workflow that actually takes the user completely out of our app and into the web browser.
- Once the the user gives permission for our app, the service provider redirects the user back to our app via the redirect URL.
- This works great, but some web API's don't support mobile app style redirect URL's (appname:\\url), which means they they aren't able to redirect the user back to the mobile app.

OAuth with Webviews

- We can get around this by never leaving our app in the first place
- Instead of relying on Safari to show the user the web page that is generated by the service provider to grant permission for our app, we can use a web view.

WebView+Oauth workflow

1. Instantiate a WKWebView and become its delegate
2. Create your initial OAuth URL, which for most web API's will include your clientID and redirect URL
3. implement webView:decidePolicyForNavigationAction:decisionHandler:

webView:decidePolicyForNavigationAction:decisionHandler

- This method is part of the WKNavigationDelegate, and is called anytime the web view is about to load a URL
- We will use this method to listen for each request the web view loads, until the request is loaded that contains the oauth token.
- This method is essentially taking the place of the openURL: method in the app delegate we did for the first oauth workflow.

Special considerations for stack apps

- Make sure the redirect URI you pass in with your initial oauth url is “https://stackexchange.com/oauth/login_success”
- Enable Desktop OAuth Redirect Uri, which allows non web apps like ours to participate in the OAuth process.
- No need to have the client secret or key in your app at all, yay!
- And there is no 2nd post call we have to make after our initial request. Instead of giving us an intermediate ‘request code’, they gave us the full oauth token after the first request.

Demo

Lazy Loading in Objective-C

Lazy Loading

- During our swift month we learned lazy loading by lazily downloading images only when they were actually needed, instead of downloading them all at once with our initial API request
- You can also apply this same principle to your properties. Leave them uninstantiated until they are actually needed
- We know a property is needed when its getter is called
- This is much more common practice in objective-C simply because we can’t give our properties values inline with their declaration
- You can also do this in swift by simply marking your properties as lazy

Lazy Loading workflow

- Override the getter of any property you want to make lazy and you basically just do 2 things:
    1. first check if the underlying i-var is nil. If it is, that means the property is not instantiated, and you need to instantiate the i-var
    2. return the i-var

Lazy Loading workflow

```
-(UINavigationController *)searchVC {
  if (!_searchVC) {
  _searchVC = [self.storyboard
  instantiateViewControllerWithIdentifier:@"SEARCH_VC"];
  }
  return _searchVC;
}
```

It is not uncommon to see ALL properties done this way

Demo

Technical Interviews

A poorly lit technical interview

Types of interview questions

- Most interviews in the tech industry tend to stray away from traditional interview questions (Tell me about your strengths, where do you see yourself in 5 years, why do you want to work here, etc)
- Instead, they focus on two types of interview questions:
  - Behavioral: Questions about your past work and personal experiences and how you handled challenging situations.
  - Technical: Questions about your specific stack, general comp-sci questions, or abstract problem solving questions.

Important Advice

- The most important thing to remember: **These questions are designed so that you wont see the solution immediately.** This is the scary part. You will probably want to panic and think you will never ever figure out the solution.
- You have to fight through that feeling and approach the problem just like any other problem you have faced while programming.
- Often times you just need a place to start, and once you really begin to focus on the problem and get over the nerves, the solution will begin to show itself.

Avoid Silences

- If you are stumped or shocked by the question at first, counter the question with questions of your own. Ask for more details or clarification. Ask if there are any edge cases that you need to account for. A lot of the time their answers will greatly benefit you.
- The person interviewing you is usually from the dev team you will be working on if you get the job. They want to see how you think. So talk through the problem as you work through it. Don’t just silently write or type things.

Be Resourceful

- During a technical interview, you will always have either a computer, a pad of paper, and/or a whiteboard at your disposal. So use them!
- Most interviewers will make it clear if you are allowed to consult google or the documentation before the interview begins. If they don't and you need those resource, ask if its okay.
- Once you start writing code on your computer, or writing pseudo code on the paper or whiteboard, it will help put you in problem solving mode. You will start thinking, okay what properties do I need? what methods? what kind of objects should I use? These are the things the interviews want to see.

Pseudo Code

- Pseudo code allows you to write out and describe your algorithm without having to worry about the exact syntax of a language.
- Once you have written out your algorithm in pseudo code, it should be very easy to translate into working code. A trick is to pretend that someone else is going to use your pseudo code as instructions to write the code.
- Structurally, it should be very similar to how you would write the real code. Specifically, indent things when they would normally be indented (like in conditionals and for loops.)
- Writing pseudo code will help transition your mind into problem solving/coding mode.

Pseudo Code Examples

Pseudocode Editor

Edit Tools

```
If within boundaries of search
      Calculate midpoint
      Get value at midpoint as integer
      If value at midpoint is what we are looking for
            Return midpoint
      Else if value at midpoint is too big
            Look to the left
      Else if value at midpoint is too small
            Look to the right
      ENDIF
ENDIF
Return -1 when number wasn't found
```

Algorithm

```
for i = 1:n,
     swapped = false
     for j = n:i+1,
          if a[j] < a[j-1],
               swap a[j,j-1]
               swapped = true
     → invariant: a[1..i] in final
     break if not swapped
end
```

PSEUDOCODE

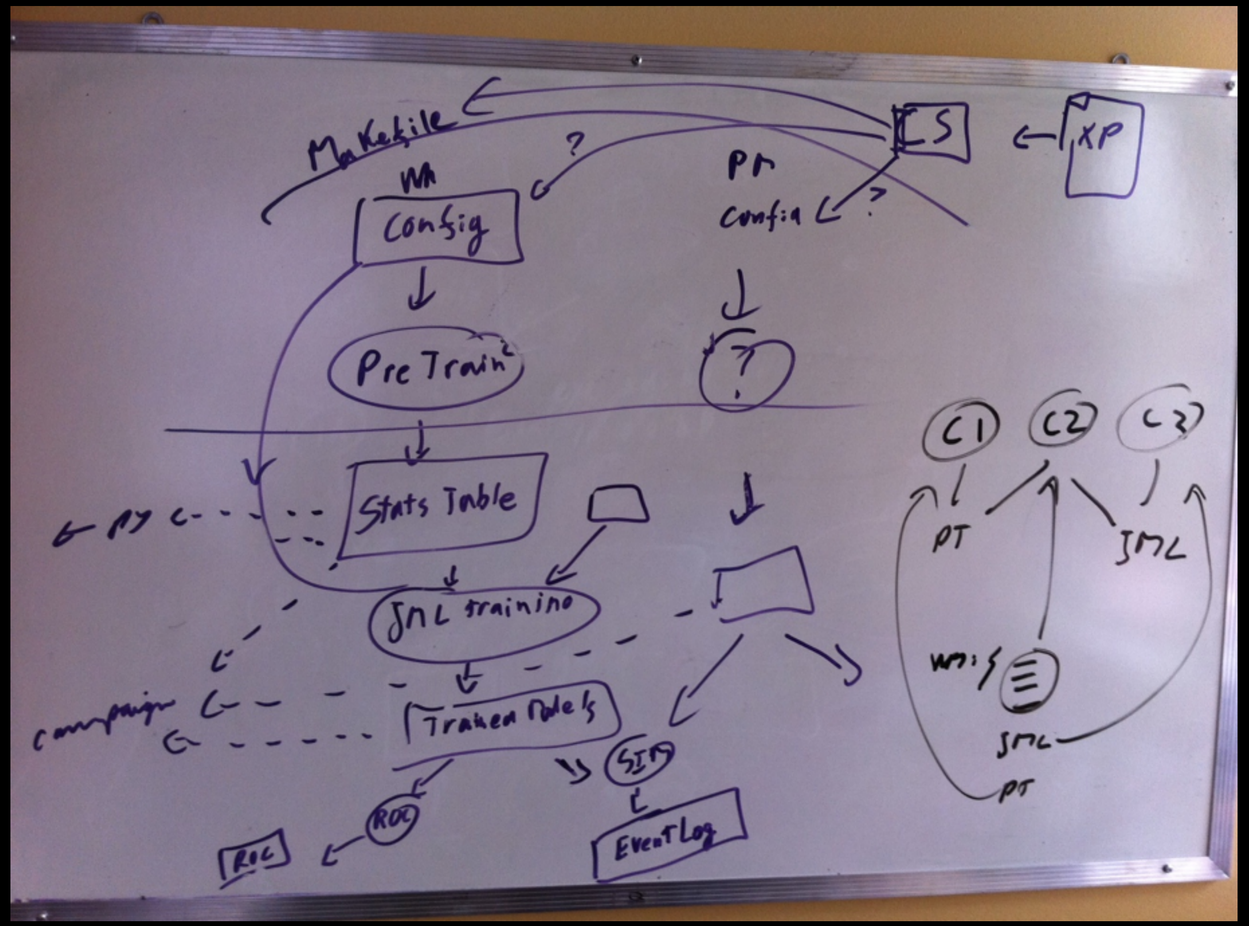
```
set total to zero

get list of numbers

loop through each number in the list
   add each number to total
end loop

if number more than zero
   print "it's positive" message
else
   print "it's zero or less" message
end if
```

PsueN0 code



- Symbols can be repeated
  - Not V, L, D (just I, X, C, M)
  - No more than 3 occurrences
- Symbol followed by ≤ sums
- Otherwise, subtracts
  - Not V, L, D (only I, X, C, M)
  - Only two symbols

Phone Screening

- You will usually go through a technical phone interview before being invited for an in person interview.
- This will either be completely over the phone, or another dev will watch your screen through a screen sharing app while you work through a few problems.
- Sometimes they will have you logon to a proprietary online coding website, and you will be forced to code in a web language you don't know. If its a language you have never seen or used before, ask plenty of questions about syntax and structure. They may be doing this on purpose to throw you off your game.

Types of technical questions

- Stack Specific iOS questions (yay!)
- Abstract object oriented questions (yay!)
- Data structures and algorithms (oh crap)

Stack Specific questions

- Meant to test your knowledge and experience with the language and frameworks used in the job you are applying for.
- This is the most common type of questions our students have received.
- Can be either an abstract pattern question (MVC, Delegation,etc), or they will have you build a feature in Xcode.

iOS Examples

- What is a delegation pattern used for?
- Explain MVC
- What is a protocol used for?
- Explain categories/extensions
- How would you implement Core Data in an app?
- How do you get multiple view controllers on one screen?
- Implement a collection view.
- How do block/closures work and what are they good for?
- How would you go about accessing web services/API’s asynchronously?
- ARC

Abstract problem solving

- These questions are meant to test your overall problem solving skills and your ability to think on the fly.
- They are purposely weird to see how you squirm under uncomfortable circumstances.
- Ignore the strangeness and focus on how you would solve this problem as if it were your actual job.

Abstract Examples

- Build me an elevator
- How many windows are there in seattle?
- You're shrunken to the size of a quarter and you are inside a blender that is about to turn on. What do you do?

Data structure and algorithm questions

- Meant to test your fundamental computer science knowledge and your ability to find solutions under pressure.
- 99% of the time the solution will not come to you immediately.
- It isn’t a disaster if you don't find the correct solution, as long as you don’t give up and you are trying things that make sense.
- Always be thinking of big O when doing these types of questions. How efficient is my solution? Can I improve the efficiency in some way?

Data structure and algorithm examples

- Write out 0 through 10 in binary, base 3, and base -3.
- Create a function to find the angle between the hands of a clock
- Write a function that takes two ordered arrays and combines into one ordered array.
- How do you remove duplicates from an array?
- Implement an array from scratch using TDD
- What data structure would you use to add two polynomials together?
- how would you add two polynomials?