How to Make an iOS App

A Brief Guide to Getting on the App Store

Emily Van Haren @ CodeChix Madison, March 2015
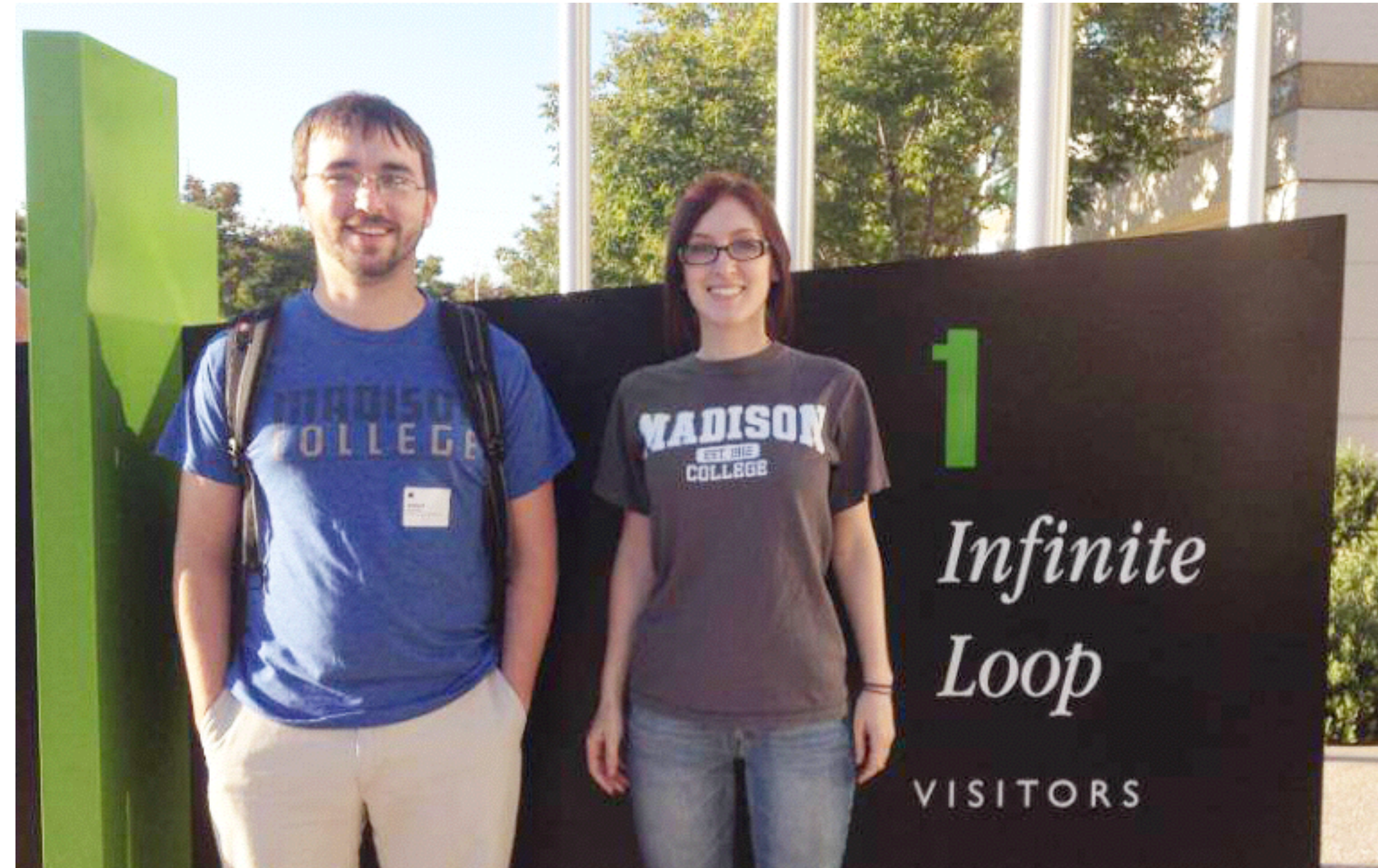
Hello,

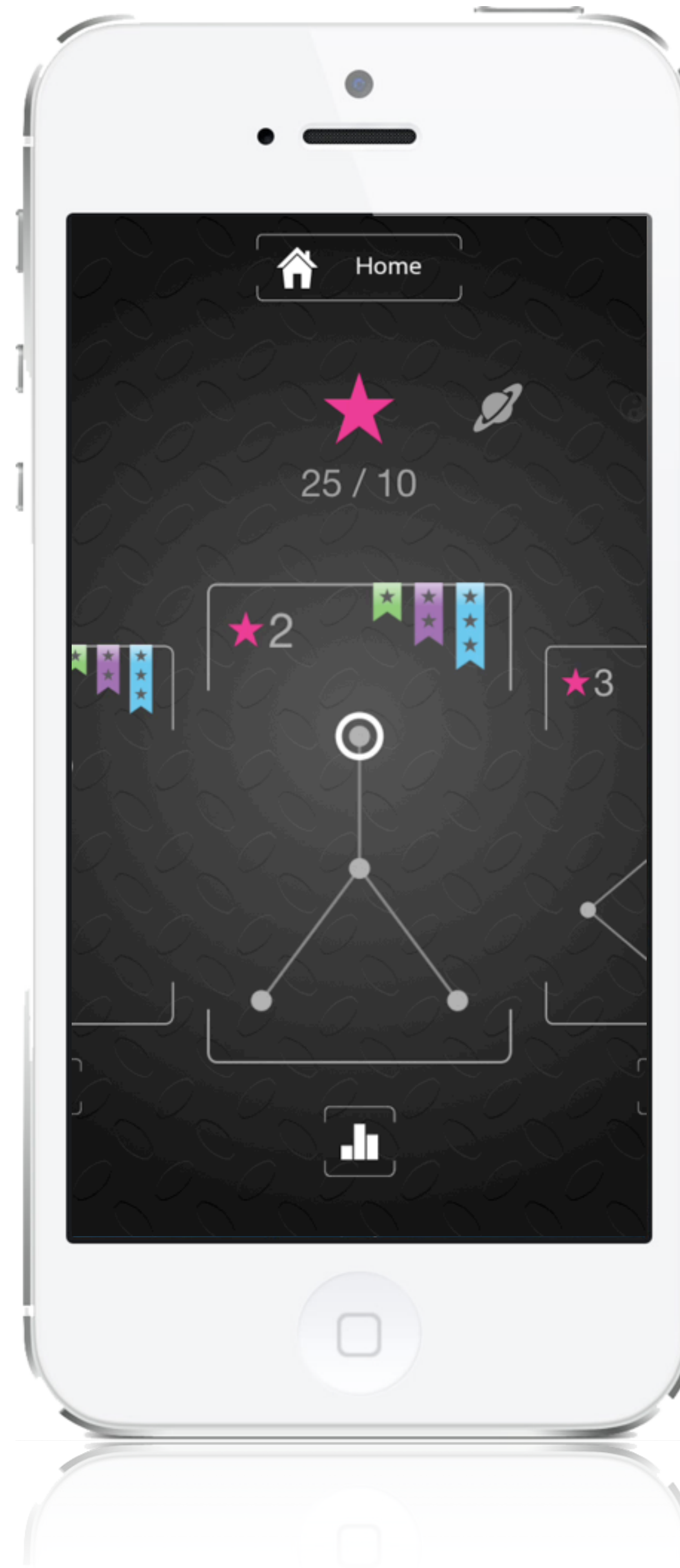## IT - Mobile App Development

Madison College, Fall 2012 - Spring 2015

Hello,

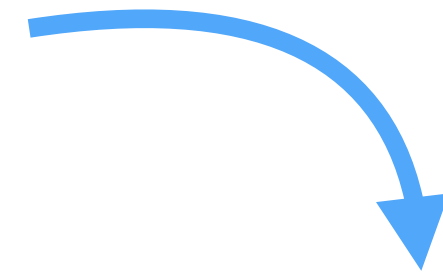Cocoa Camp 2013

Hello,

Connexio

Available on the App Store

"The first 90 percent of the code accounts for the first 90 percent of the development time.

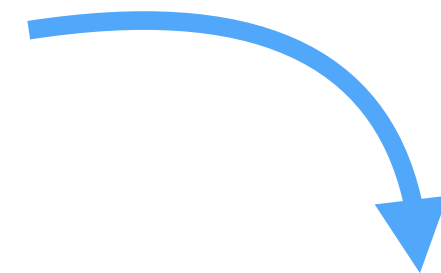The remaining 10 percent of the code accounts for the other 90 percent of the development time."

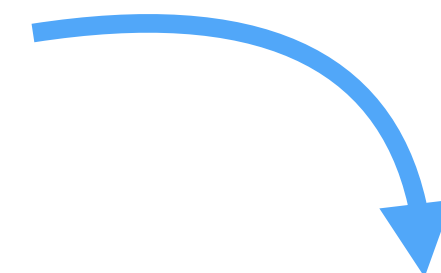- Tom Cargill, Bell Labs
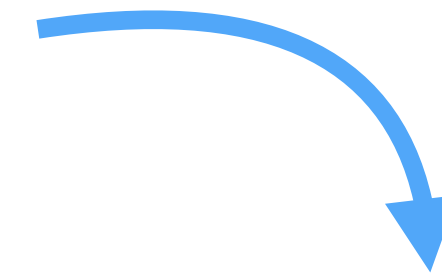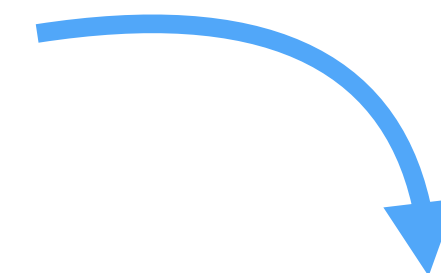
My Development Process

Idea

Plan

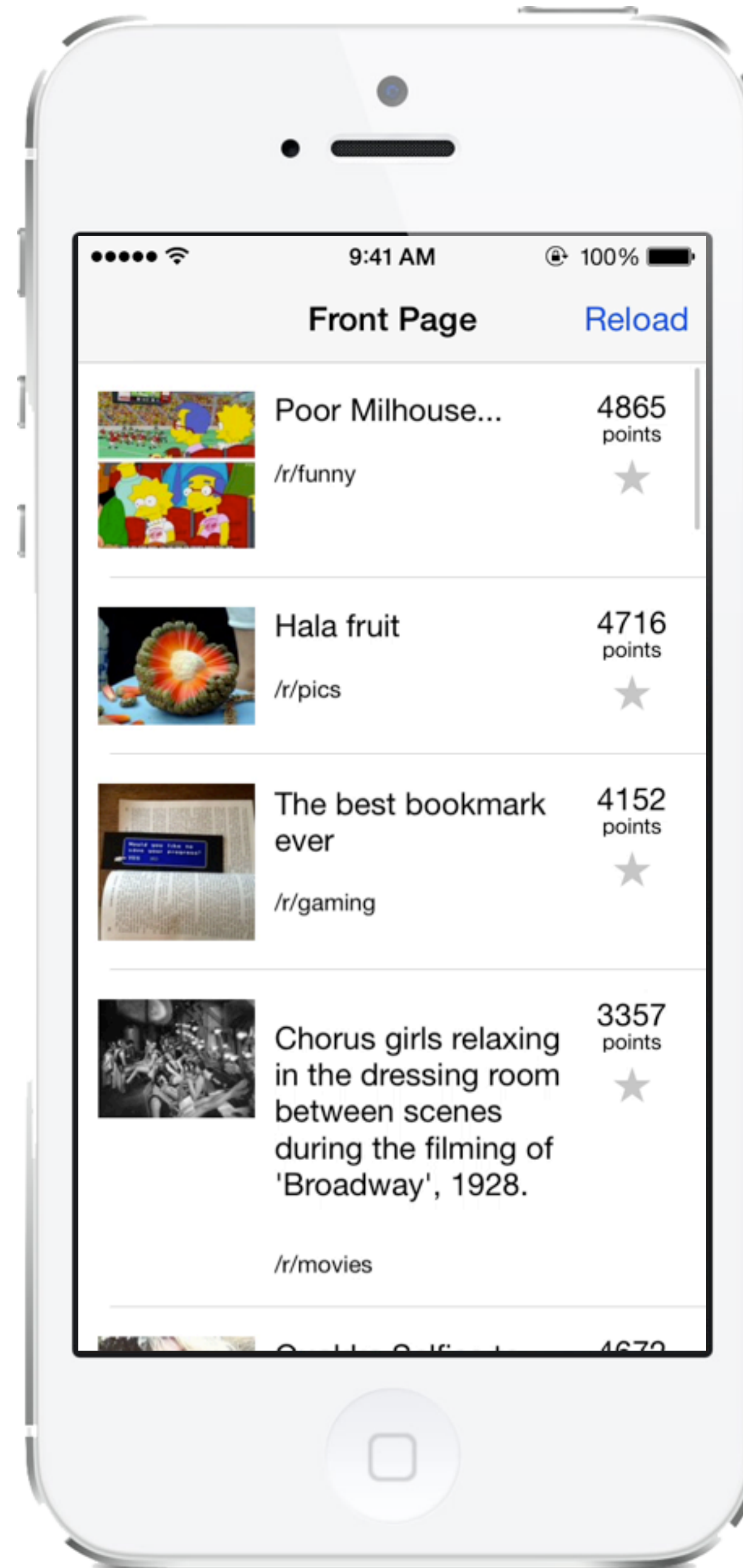Design

Code

Test

Submit

The Internet's Front Page

Tonight's App
A Reddit Feed

Idea

Idea

What are you passionate about?

Idea

What are you passionate about?

What would you use?

Idea
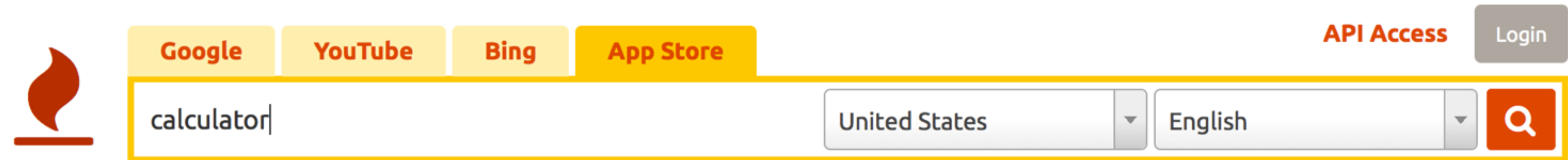
What are you passionate about?

What would you use?

Do some market research!

Idea
Market Research

http://keywordtool.io/app-store

Idea
Market Research

calculator **hd - free**	+
calculator **pro for ipad free**	+
calculator·	+
scientific calculator	+
graphing calculator **viewer**	+
graphing calculator	+
digits, the calculator **for humans**	+
financial calculator	+
free calculator	+
handy calculator	+
loan calculator	+
mortgage calculator	+
calculator **hero**	+

calculator **hero**	+
calculator **for ipad - calc pro hd free**	+
calculator **xl**	+
calculator **hd pro free**	+
calculator **hd+ free**	+
calculator **x free: metric, currency and unit converter for ipad**	+
calculator **lock free - private photos and videos manager**	+
calculator **free for ipad**	+
myscript calculator **- handwriting calculator**	+
calculator **hd for ipad**	+
calculator **hd**	+

calculator **- all in one**	+
calculator **all-in-one lite**	+
2 cycle mix & sim - oil calculator **and simulator**	+
2-in-1: calculator **and tip calculator pro**	+
2-in-one: calculator **and tip calculator**	+
abi calculator **and reference**	+
academy professor - damage calculator **and hero tracker for council, dark elves, dwarves, the tribe, tf2, and shaolin**	+
age calculator **- age+**	+
algebra calculator **- advanced 2 line calculator**	+
audio calculator **app**	+

Idea
A Reddit Feed

✓ I would use it

✓ I'm passionate about it

✓ I did some market research

Idea
Existing Apps

Idea
Existing App Reviews

Confusing, at Best ★★★☆☆

"it's awesome to look at, but sadly, absolutely worthless [at] actually navigating"

Normally great, but lately glitchy... ★★☆☆☆

"the app has been randomly crashing … it's getting more and more frequent"

Great! But needs picture swipe ★★★☆☆

"I don't have time to exit the story/picture then find another one. I would rather just swipe from one to the other."

My Development Process

Idea ✔
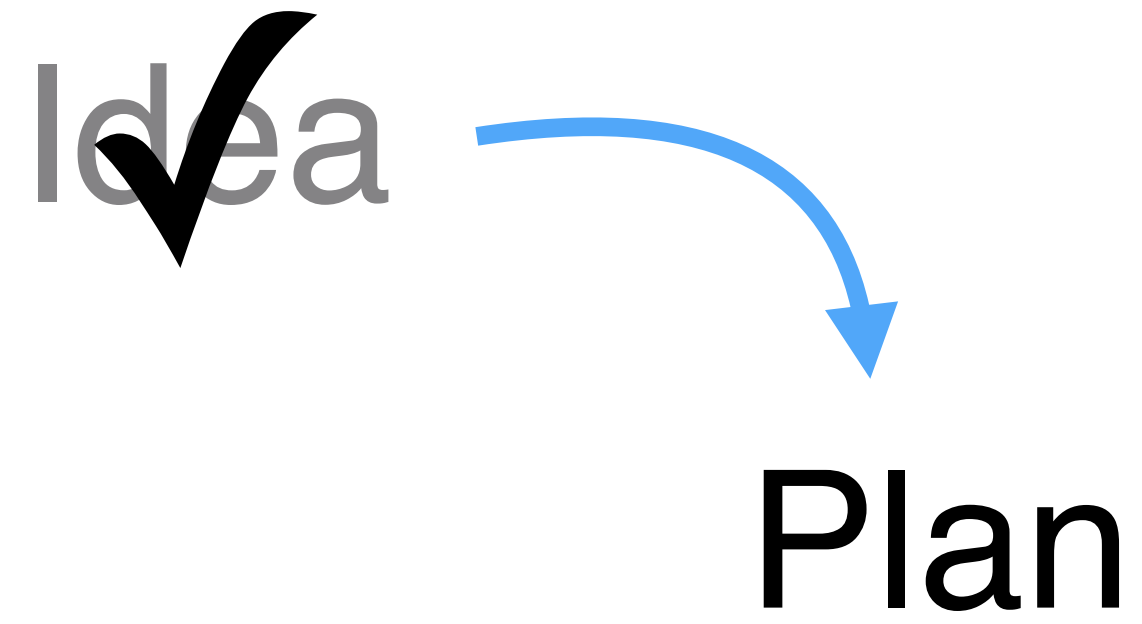
Plan

Plan

Features

What should the user

be able to do?

Plan
Features

✓ Browse posts from the Reddit front page

✓ See the posted picture, video, website, etc.

Plan
Someday…

☐ Log in

☐ Add comments

☐ Create a post

☐ See comments

☐ Vote on comments

☐ Vote on posts

Plan
Technologies

Back-End Web Server

Plan
Technologies

Back-End Web Server

━━━	★★★
━━━	★★
━━━	★★
━━━	★
━━━	★

Databases

Plan
Technologies
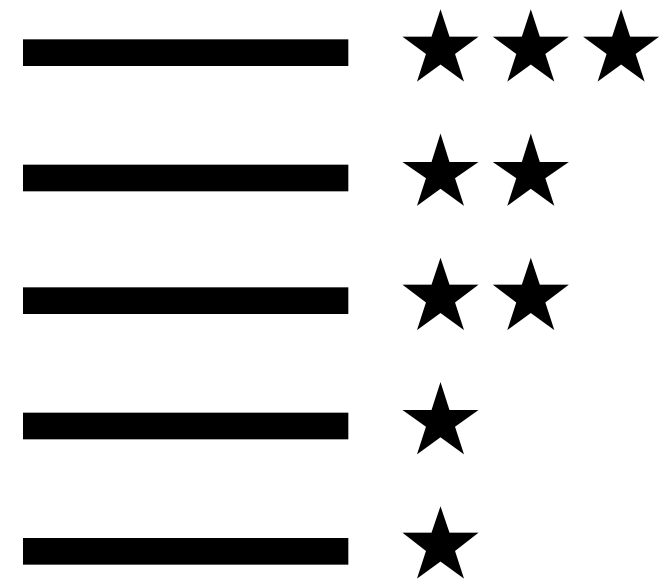
Back-End Web Server
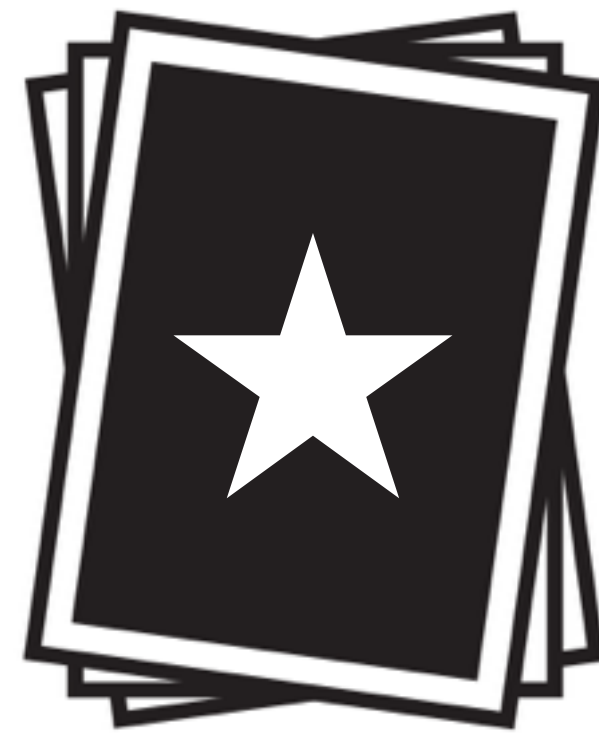
Databases

File storage

Plan
Technologies
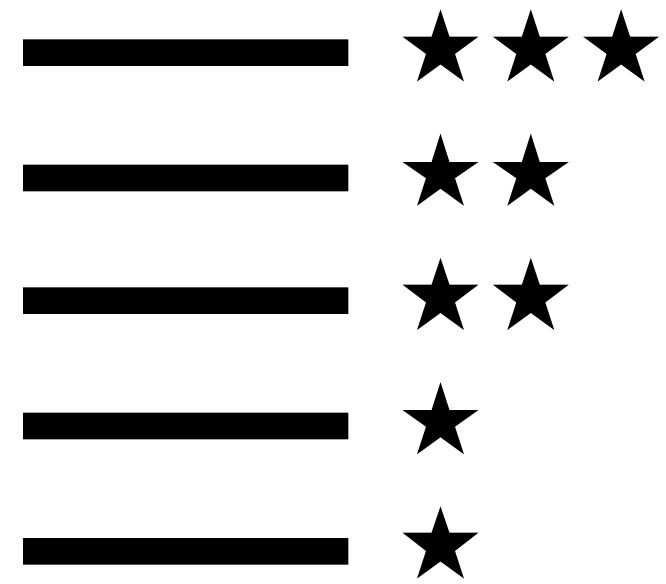
Back-End Web Server
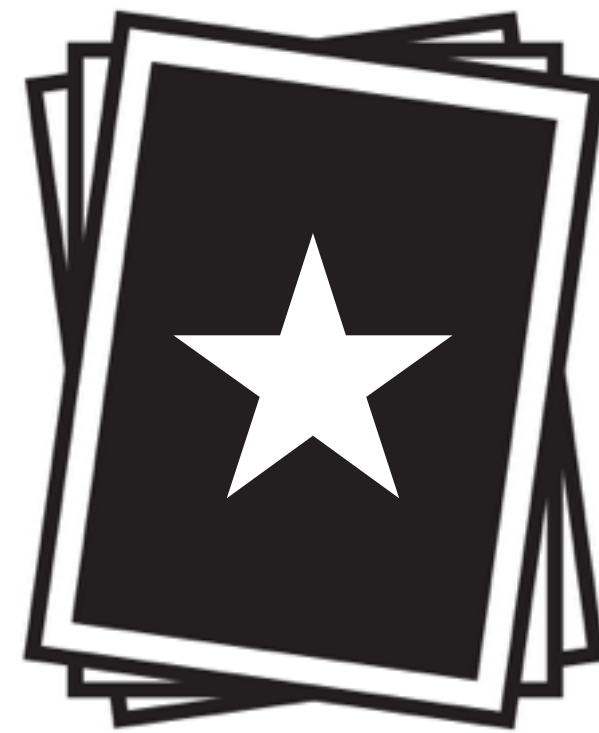
Databases   File storage   Authentication

Plan
Technologies

Back-End Web Server
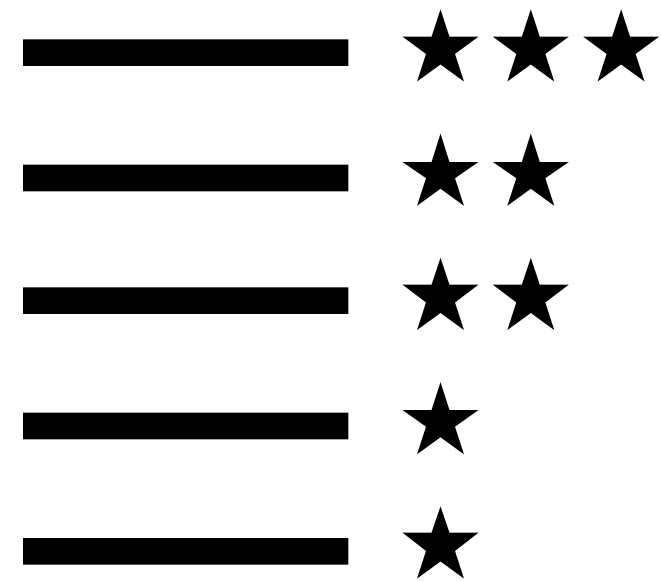
Databases
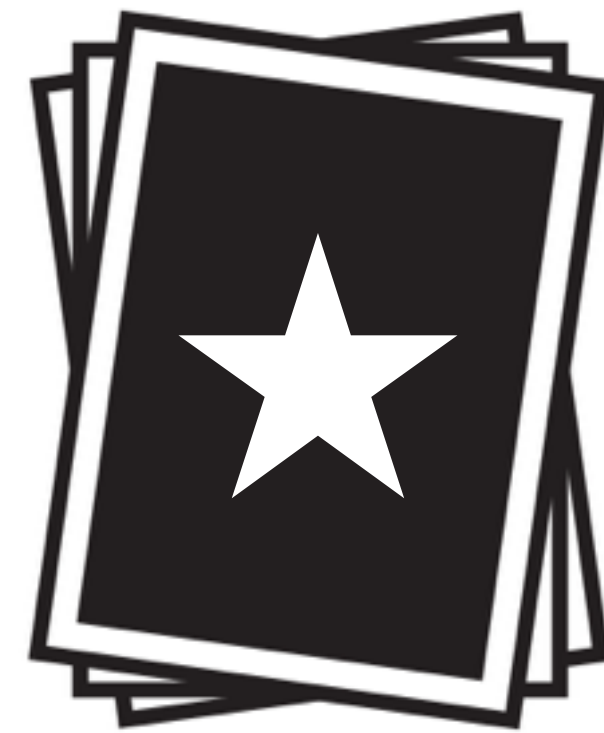
File storage

Authentication
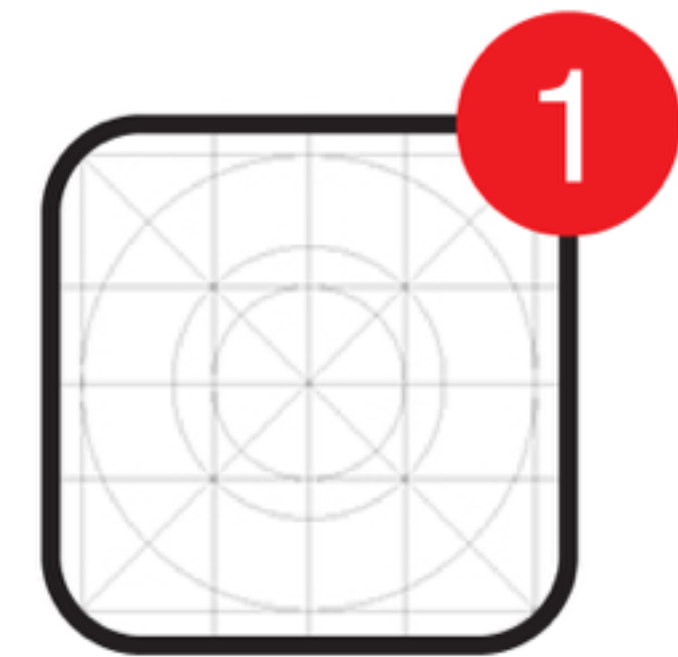
Push notifications

Plan
Technologies

Back-End Solutions

Plan
Technologies

Back-End Solutions

Roll your own

Plan
Technologies

Back-End Solutions

Roll your own

Back-end as a service

(BaaS)

Plan
Technologies

Tonight's App:

~~Back-End Web Server~~

Plan
Technologies

iOS Frameworks

Core Audio

Core Graphics

Core Bluetooth

Core Location

Core Data

SpriteKit

Plan
Technologies

Tonight's App:

Core Audio

✓ Core Graphics

Core Bluetooth

Core Location

Core Data

SpriteKit

My Development Process

Idea ✔

Plan ✔
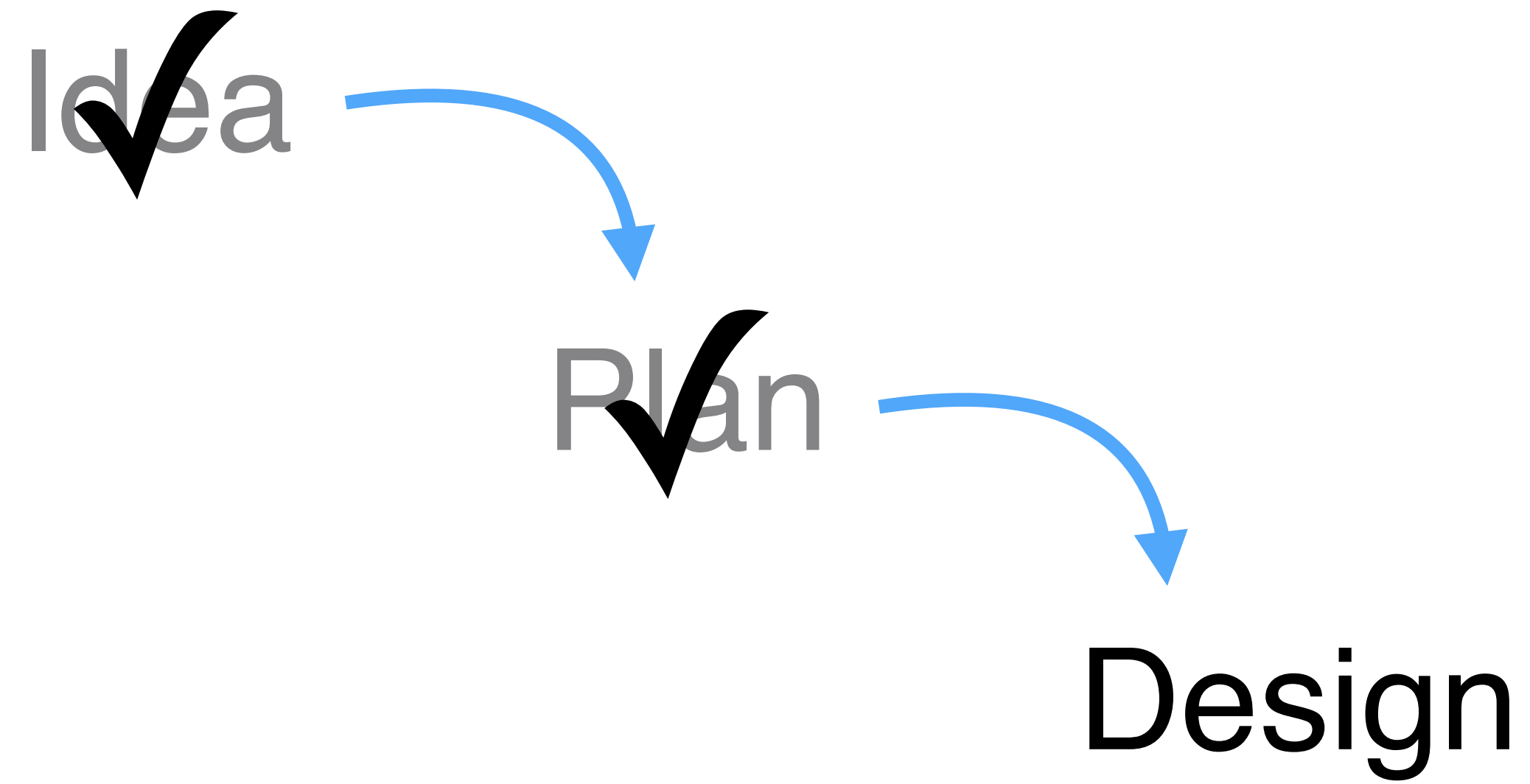
Design

Design

What should the user see?

Design
Features (Again)

✓ Browse posts from the Reddit front page

✓ See the posted picture, video, website, etc.

Design
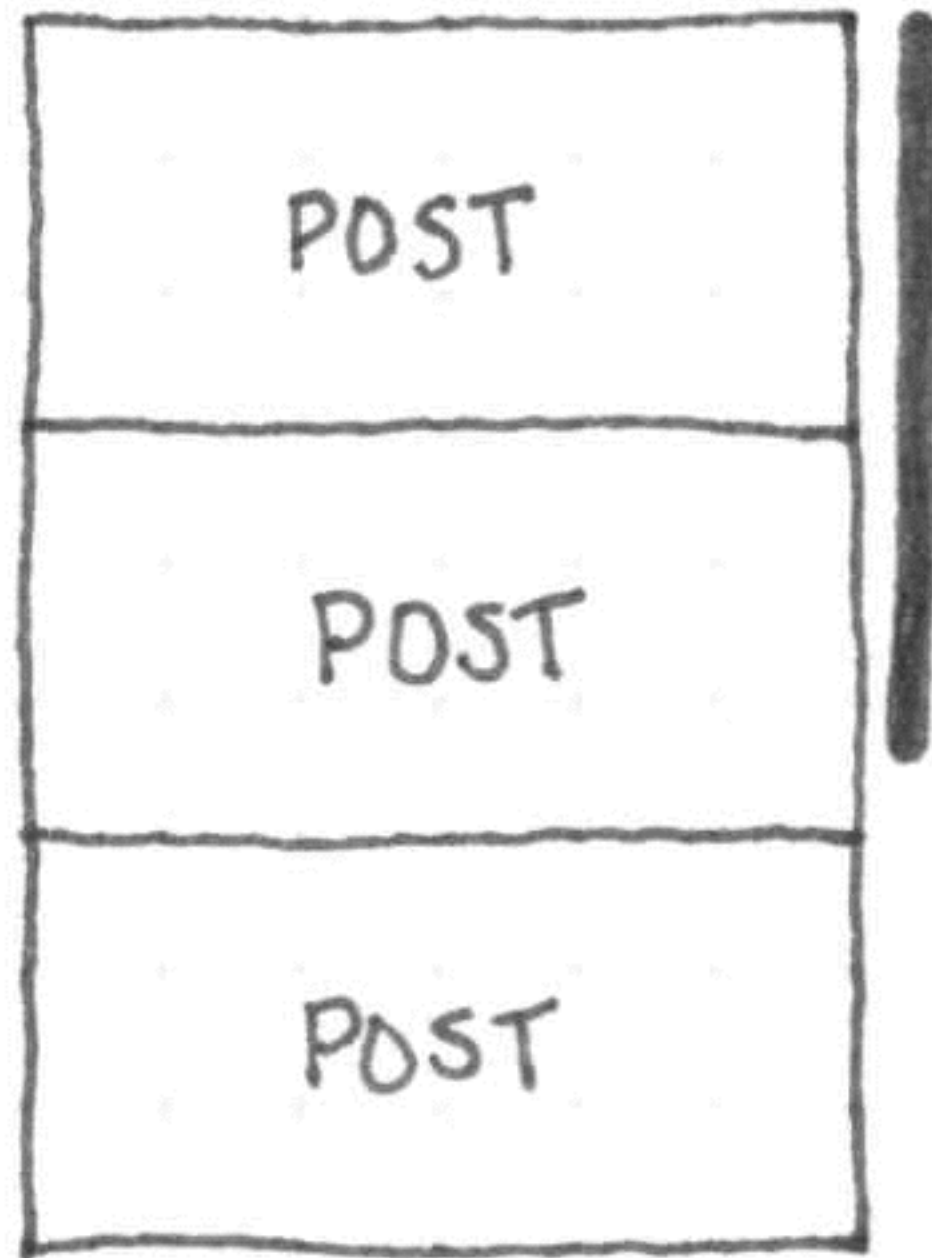
Browse posts

Design

Browse posts   See a post

Design

(optional)

Thumbnail

Title

The importance of Scooby-Doo. (imgur.com)

5390

submitted 3 hours ago by dinoignacio to /r/funny

352 comments share
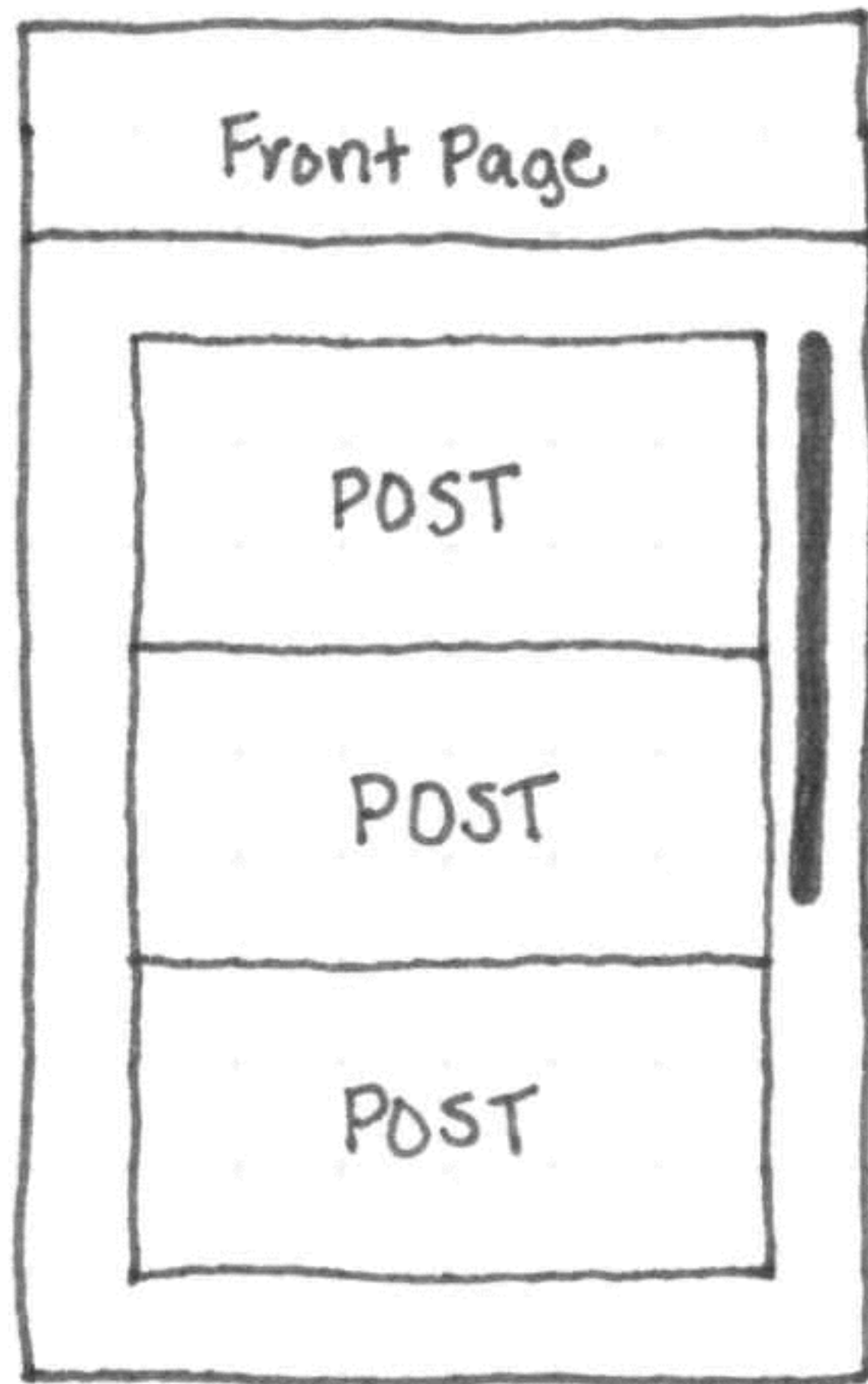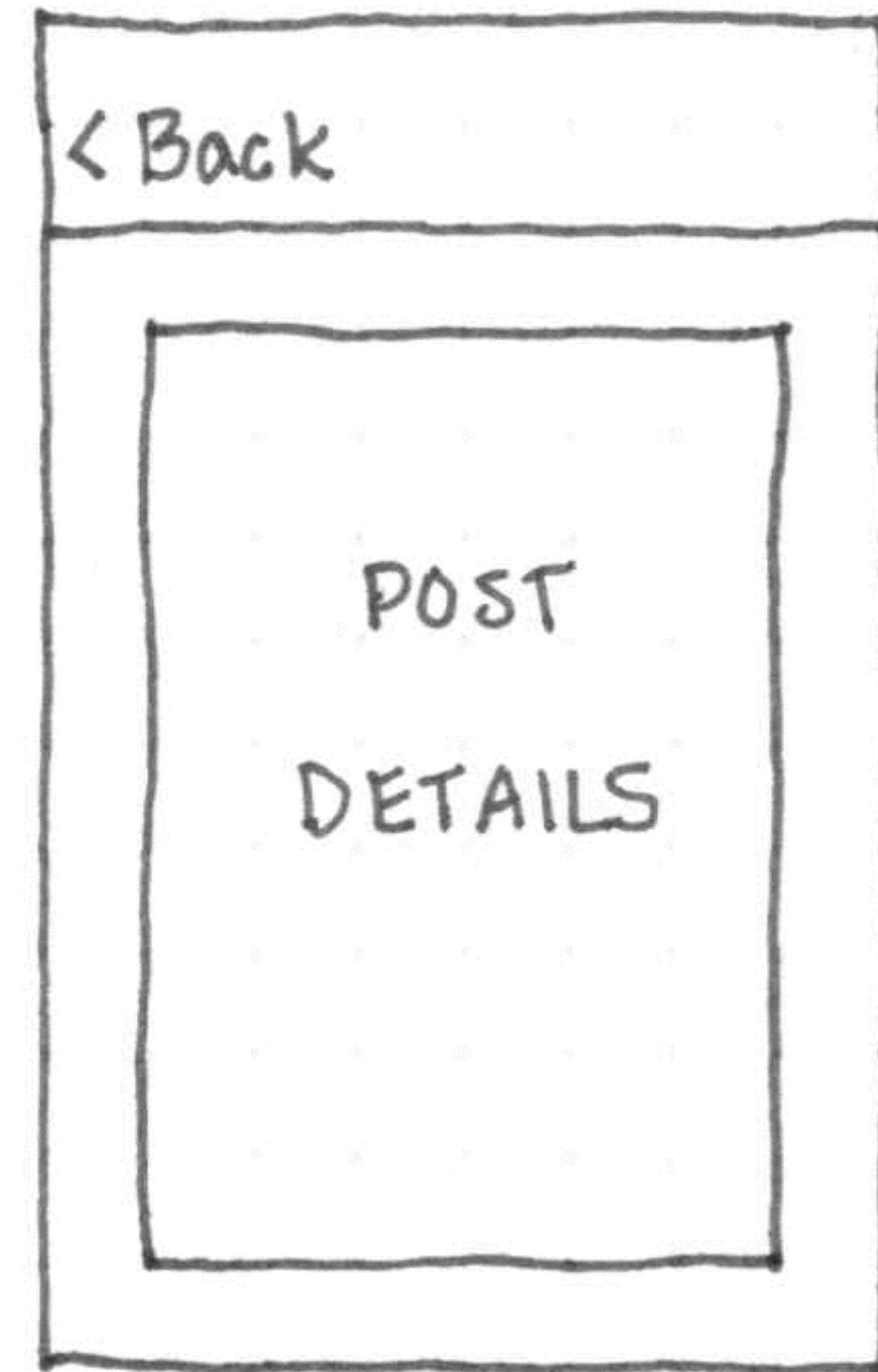
Score

Subreddit

Design
Sketch It On Paper

Graph Paper

+

Colored Pens

Design
Sketch It On Paper
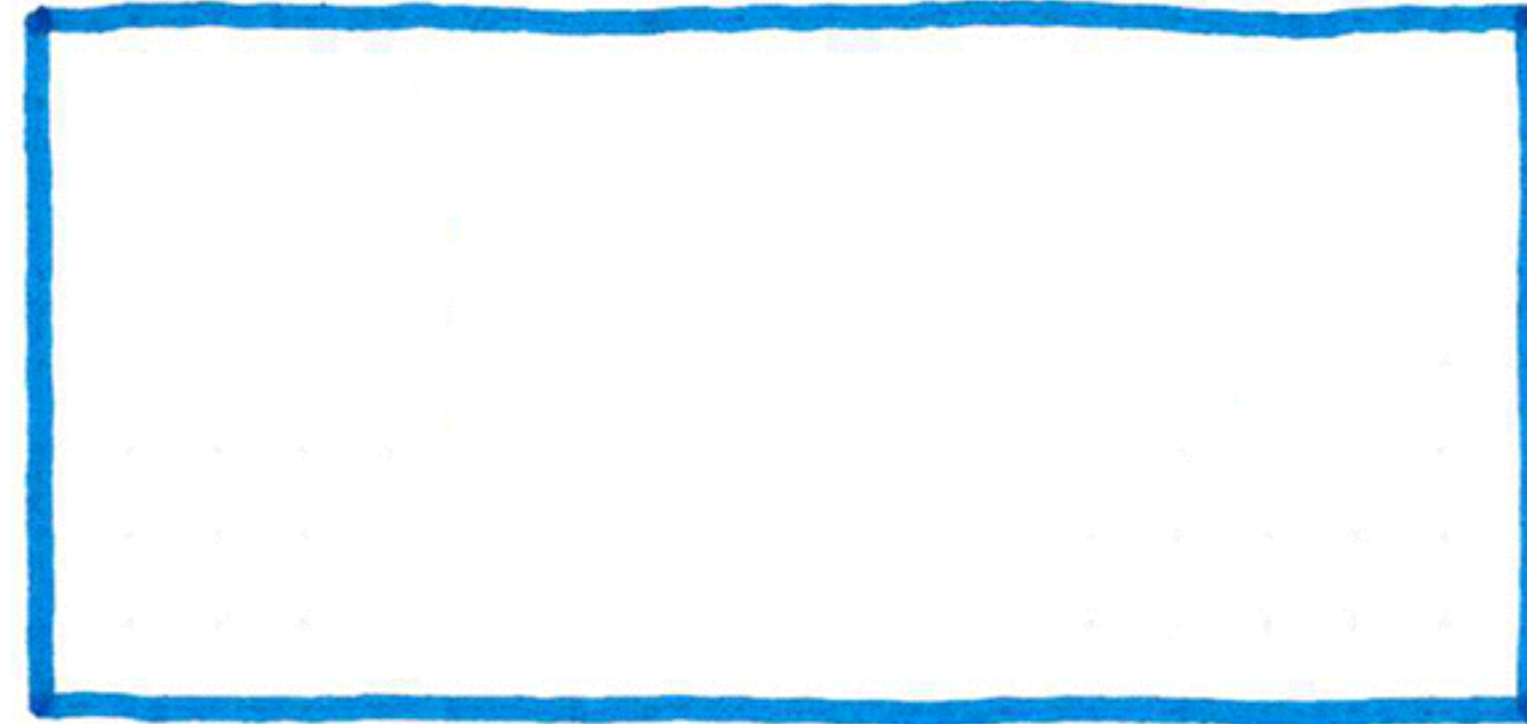
Title

Thumbnail

Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail

Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail
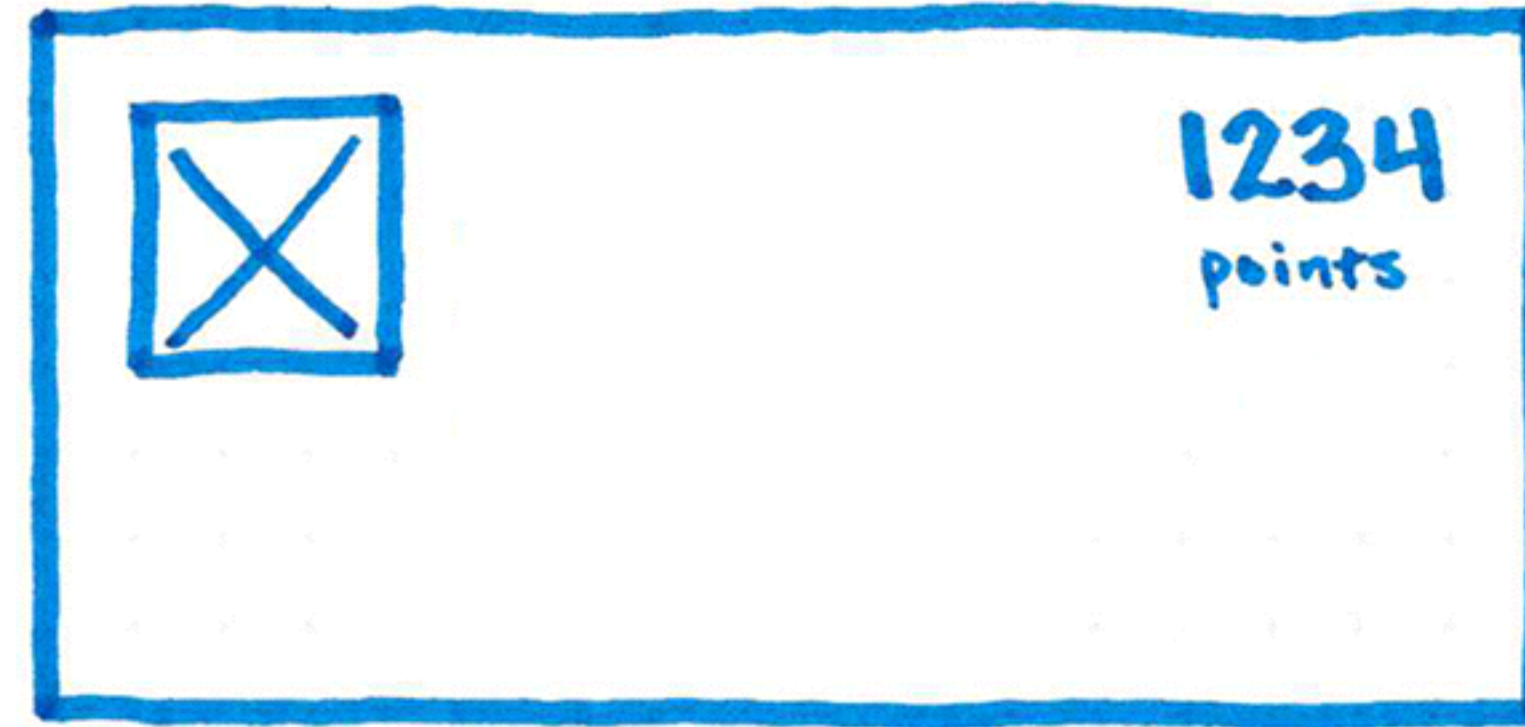
Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail
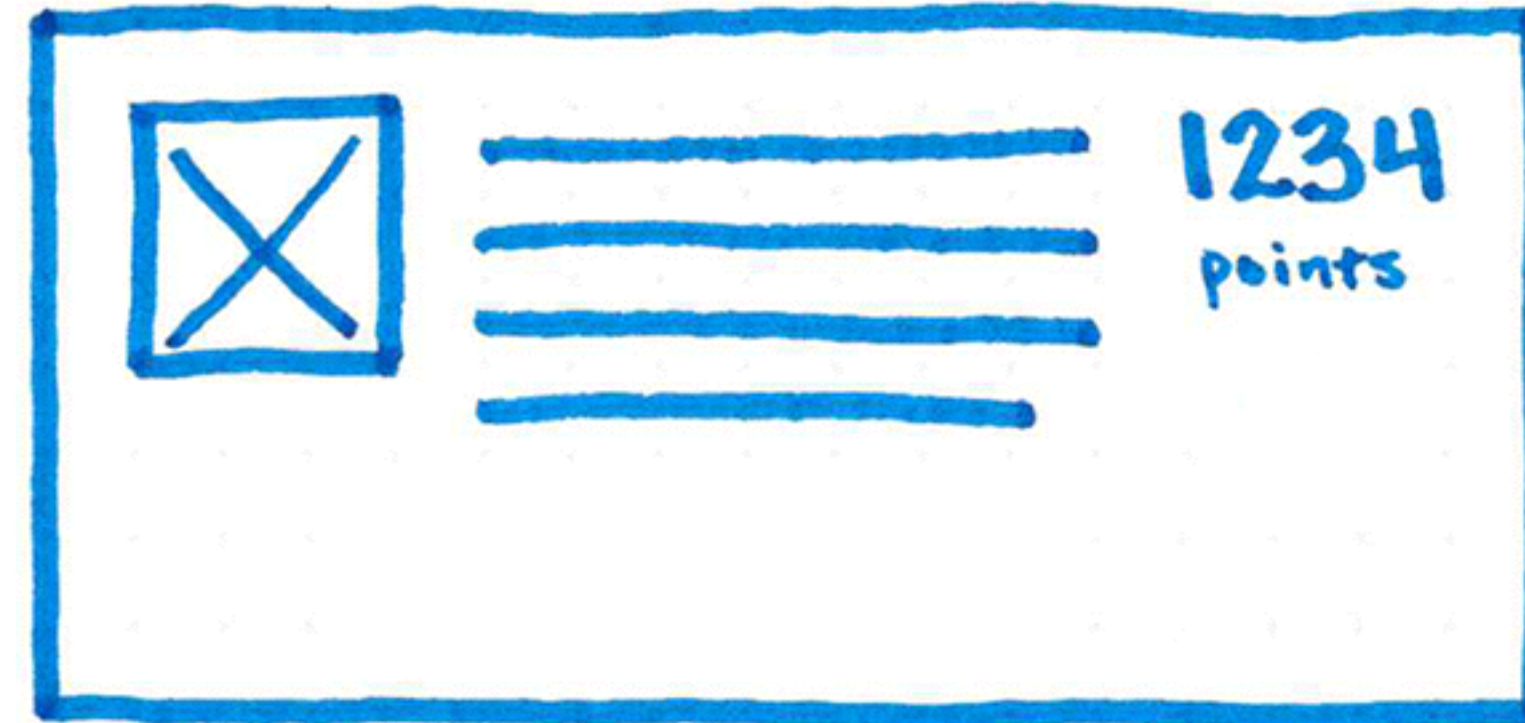
Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail
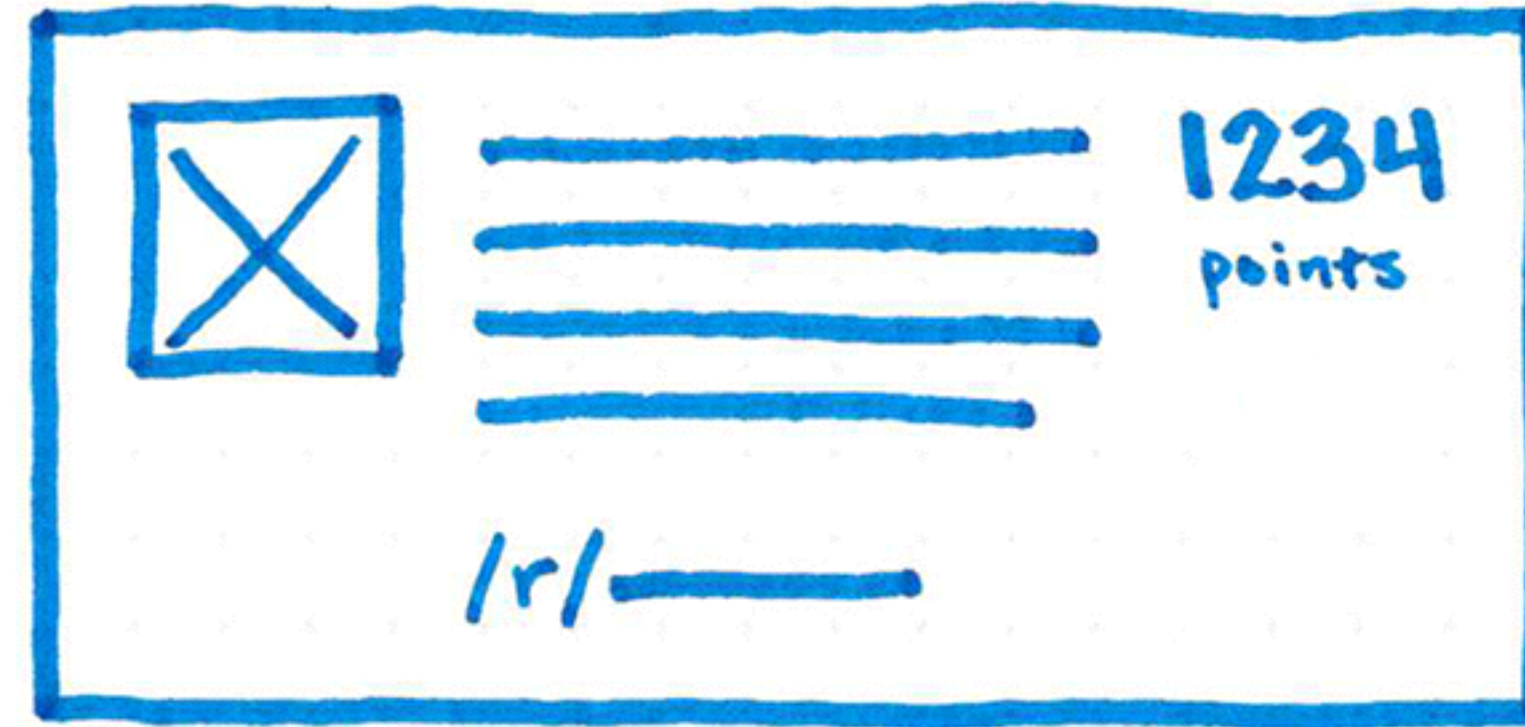
Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail
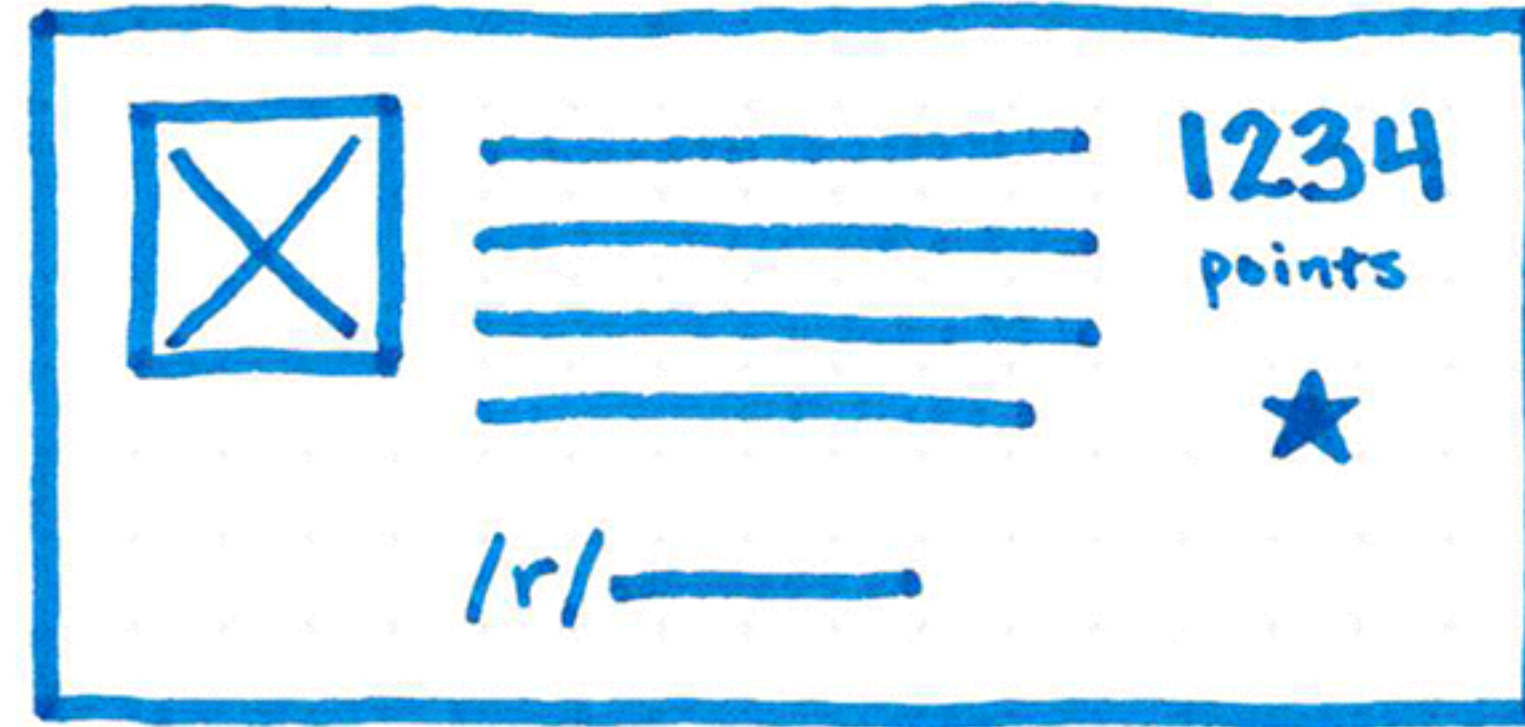
Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail

Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail
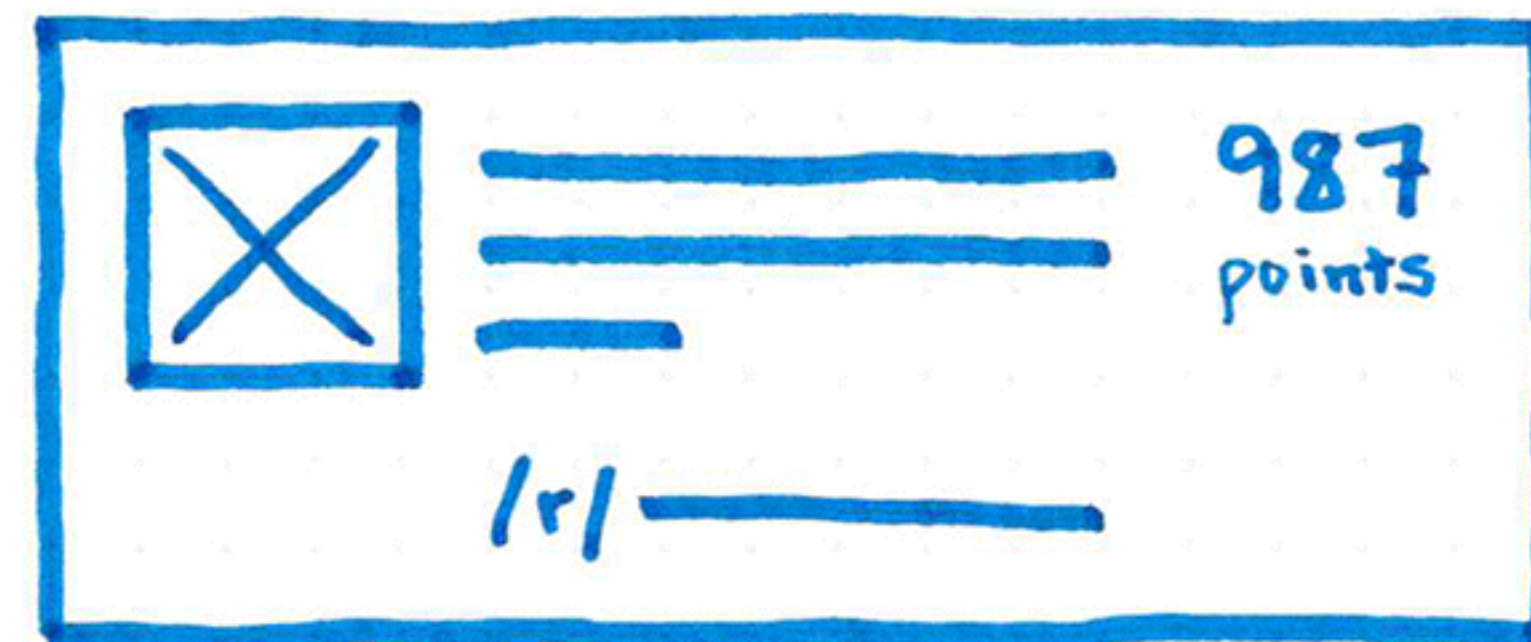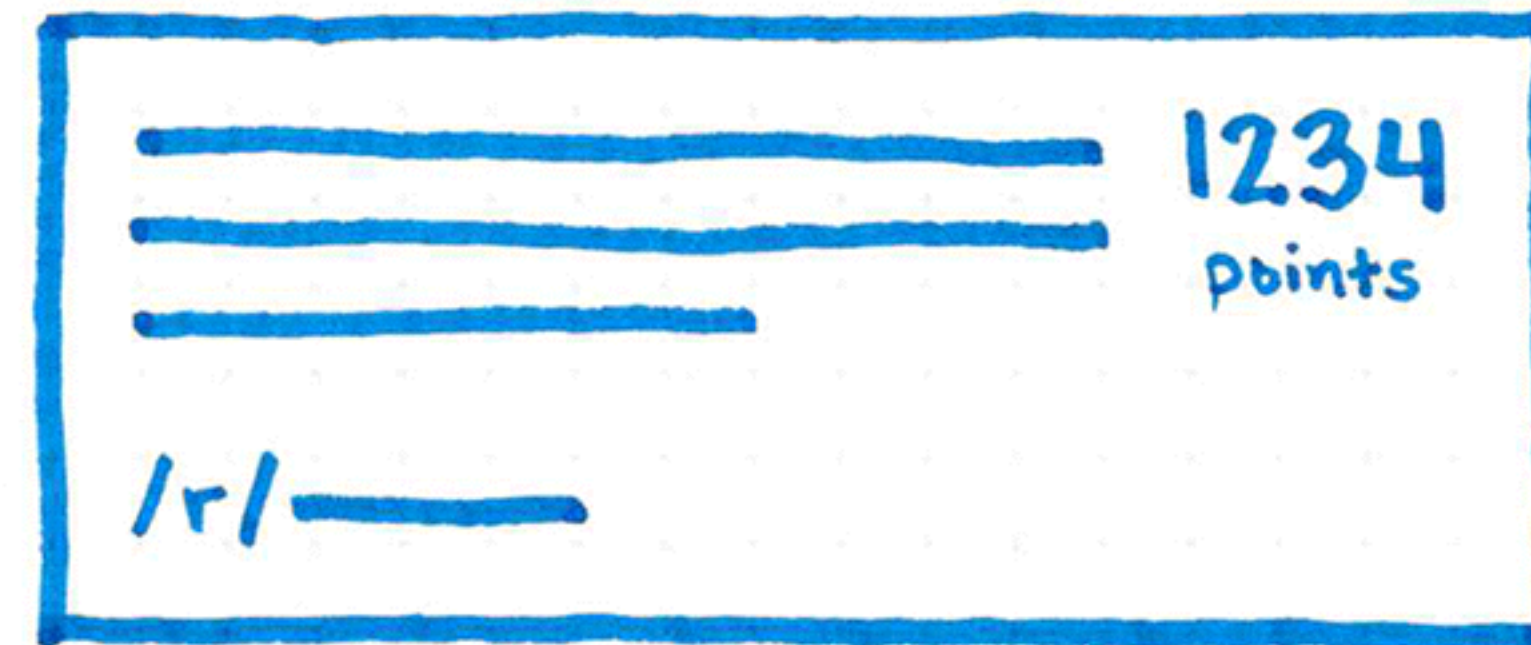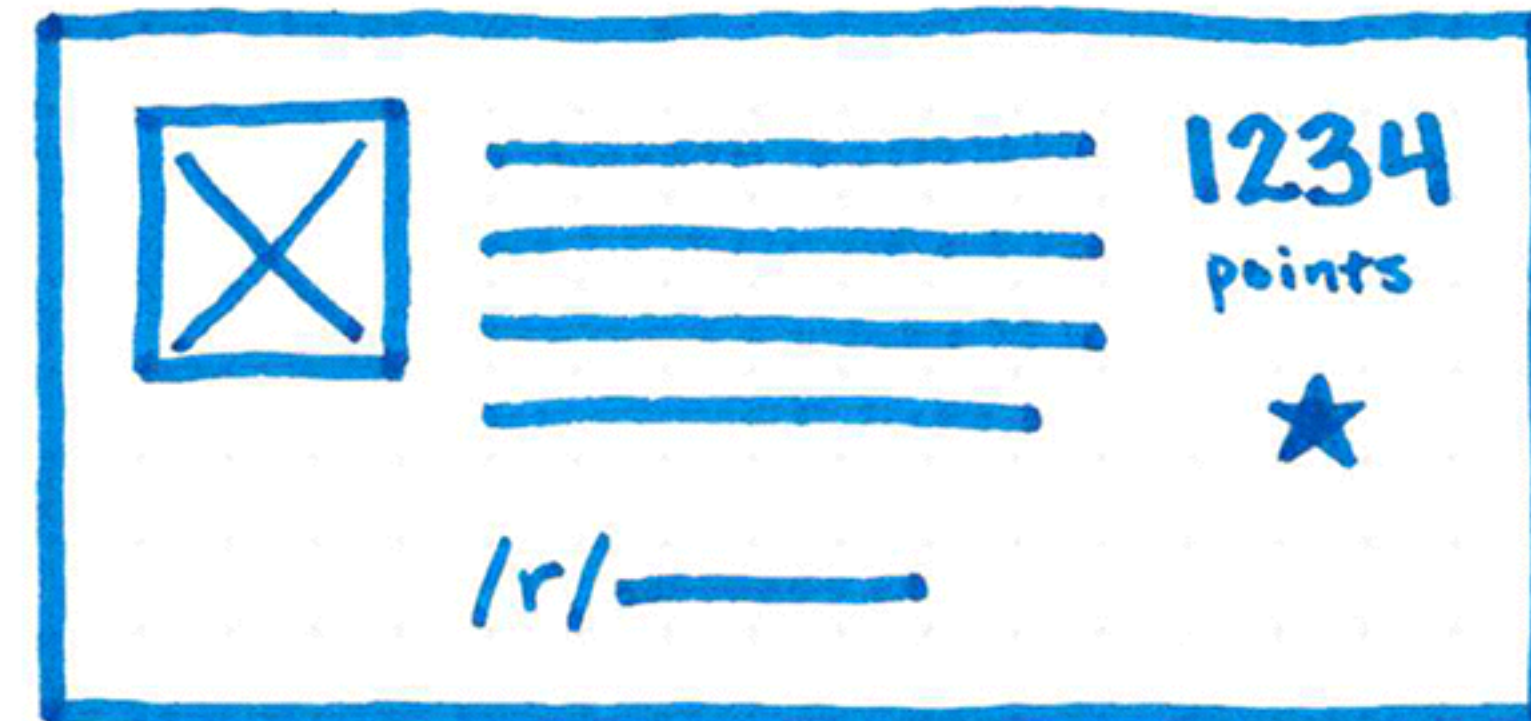
Score

Subreddit

Design
Sketch It On Paper

Title

Thumbnail

Score

Subreddit
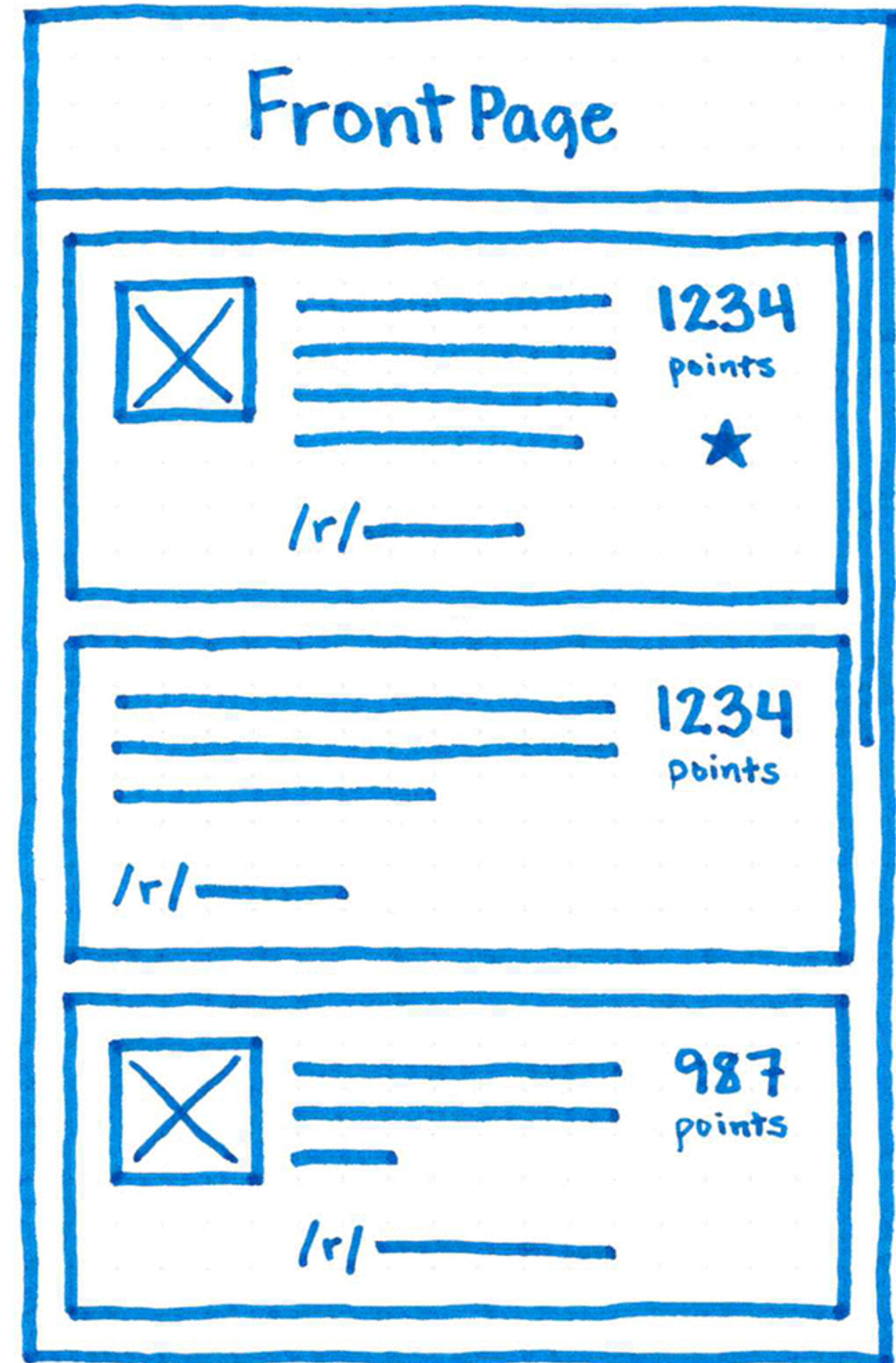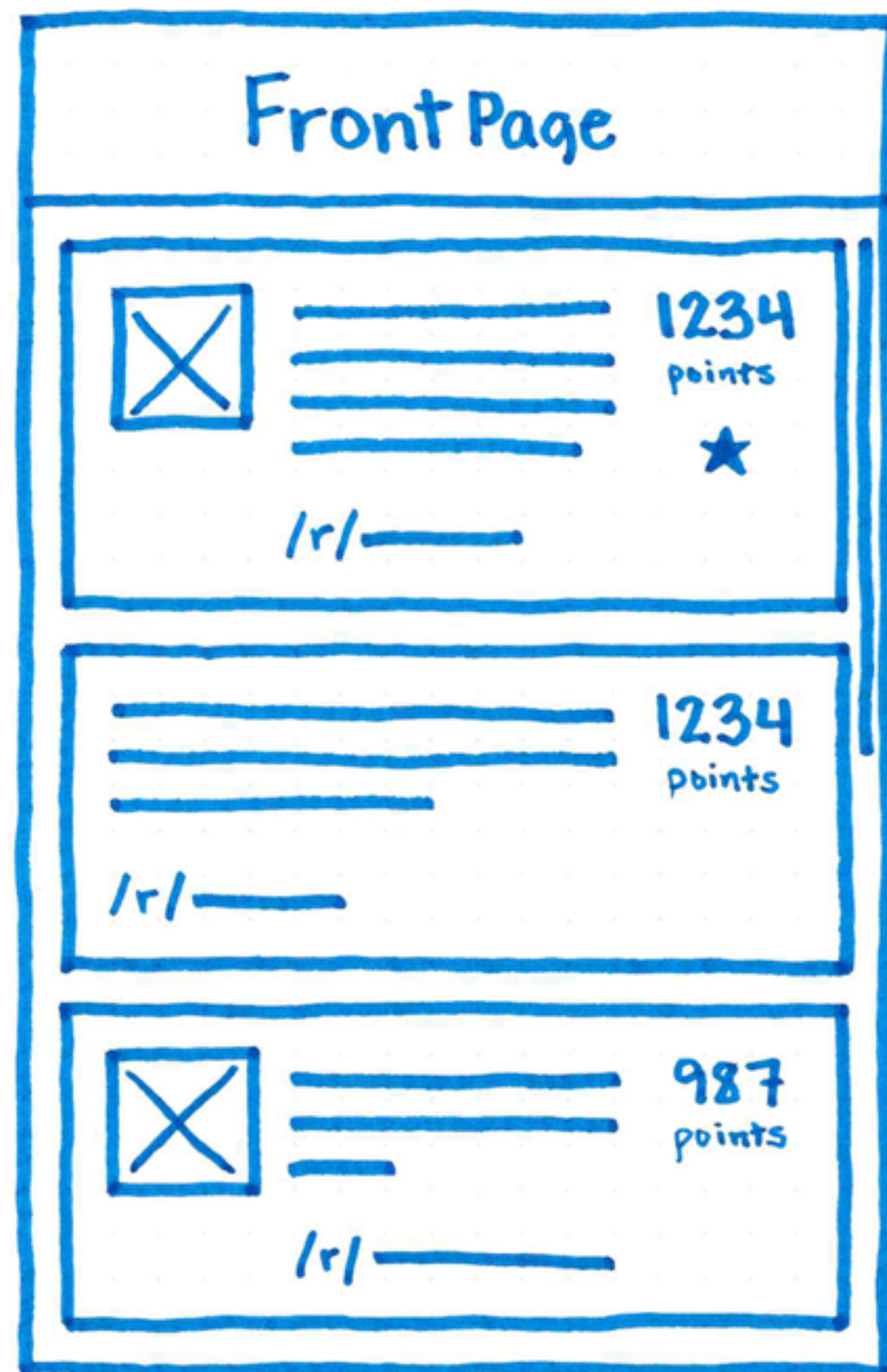
Design

Browse posts   See a post

Design
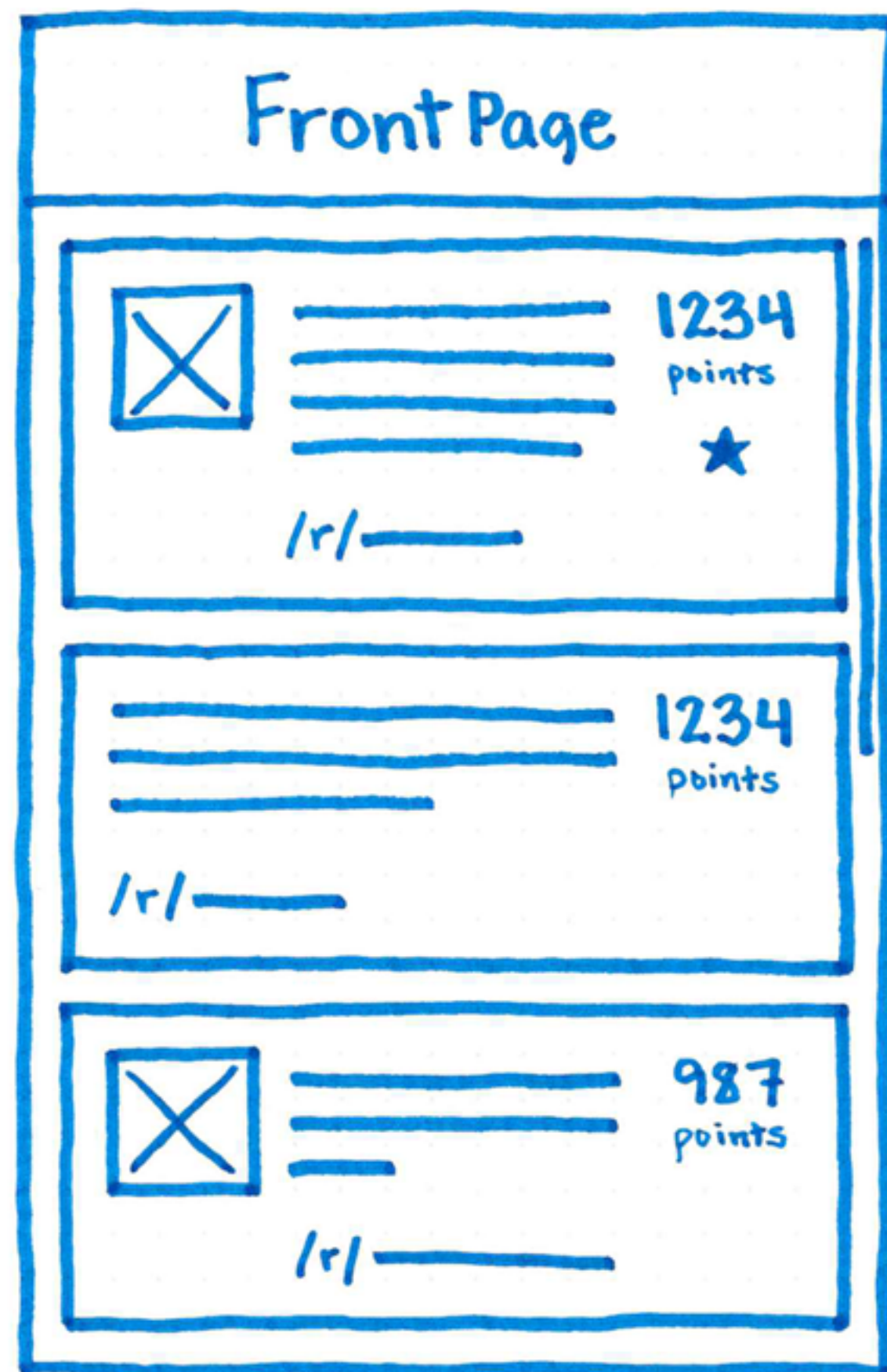
Browse posts
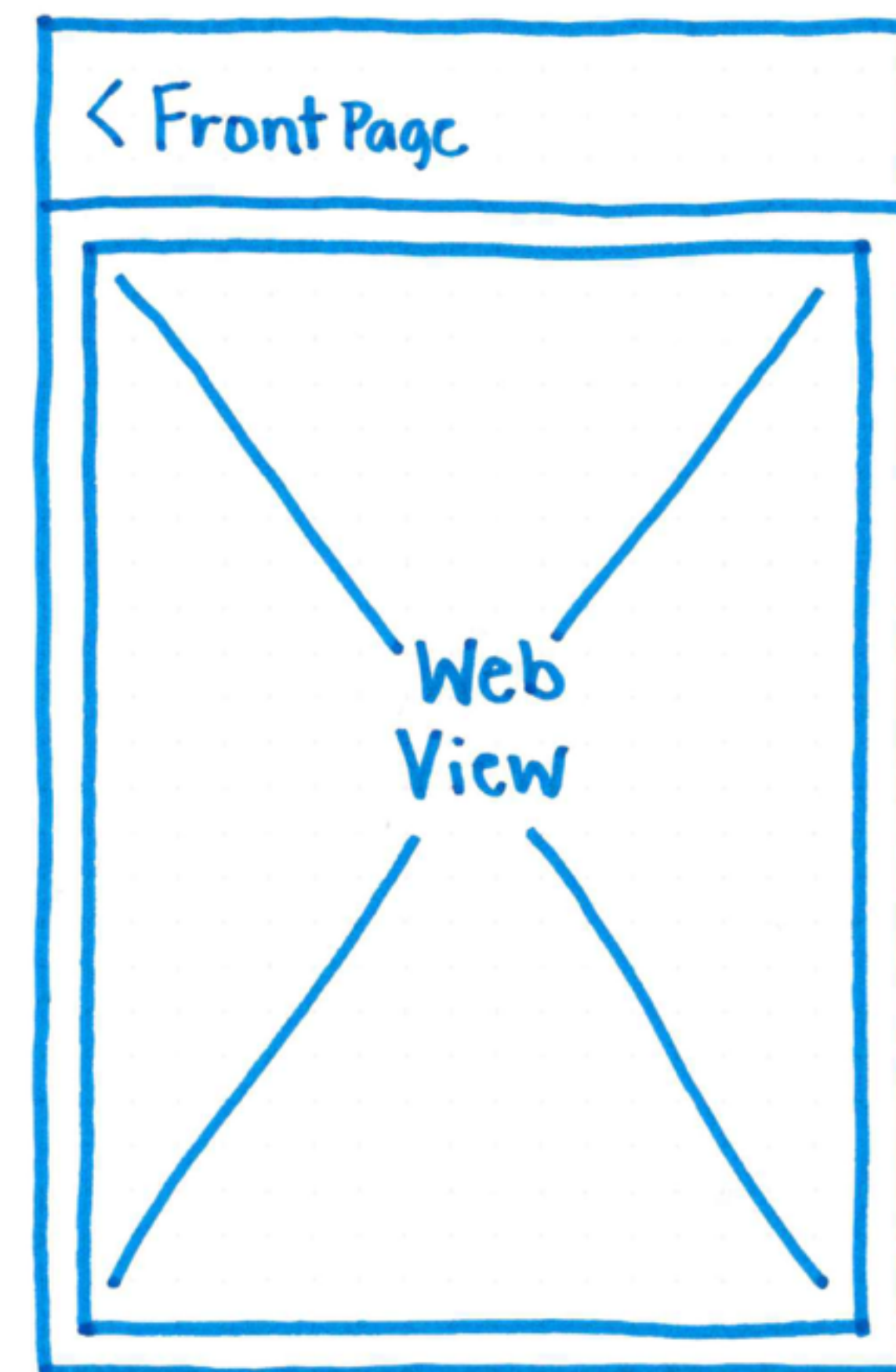
See a post

My Development Process

Idea ✔

Plan ✔

Design ✔
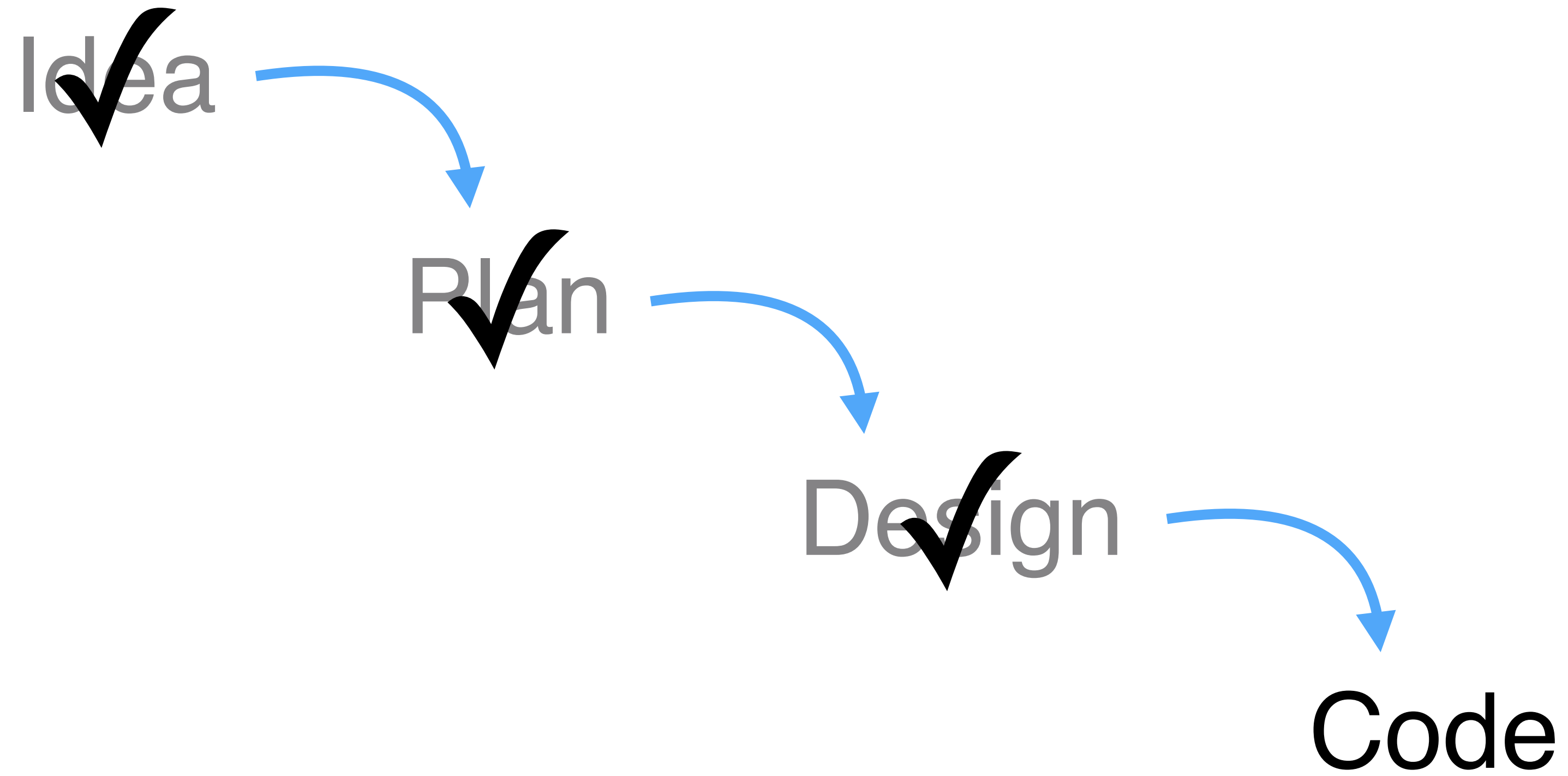
Code

Code
Languages

Objective-C	Swift
Released 1983	Released 2014

Code
Environment

Xcode

Code

New Project
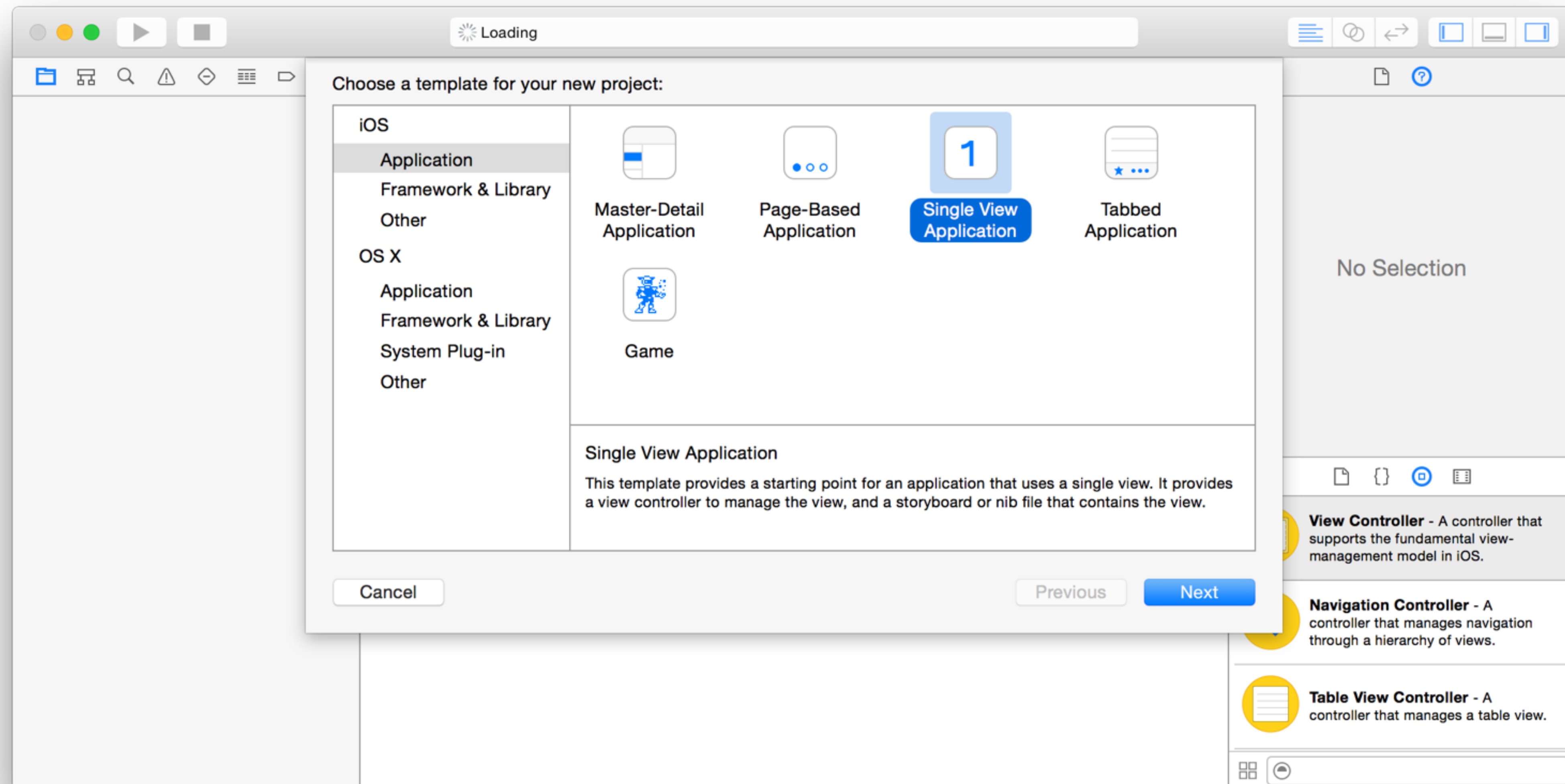
Code
Storyboards

Code
First Screen First

Navigation Controller

Table View
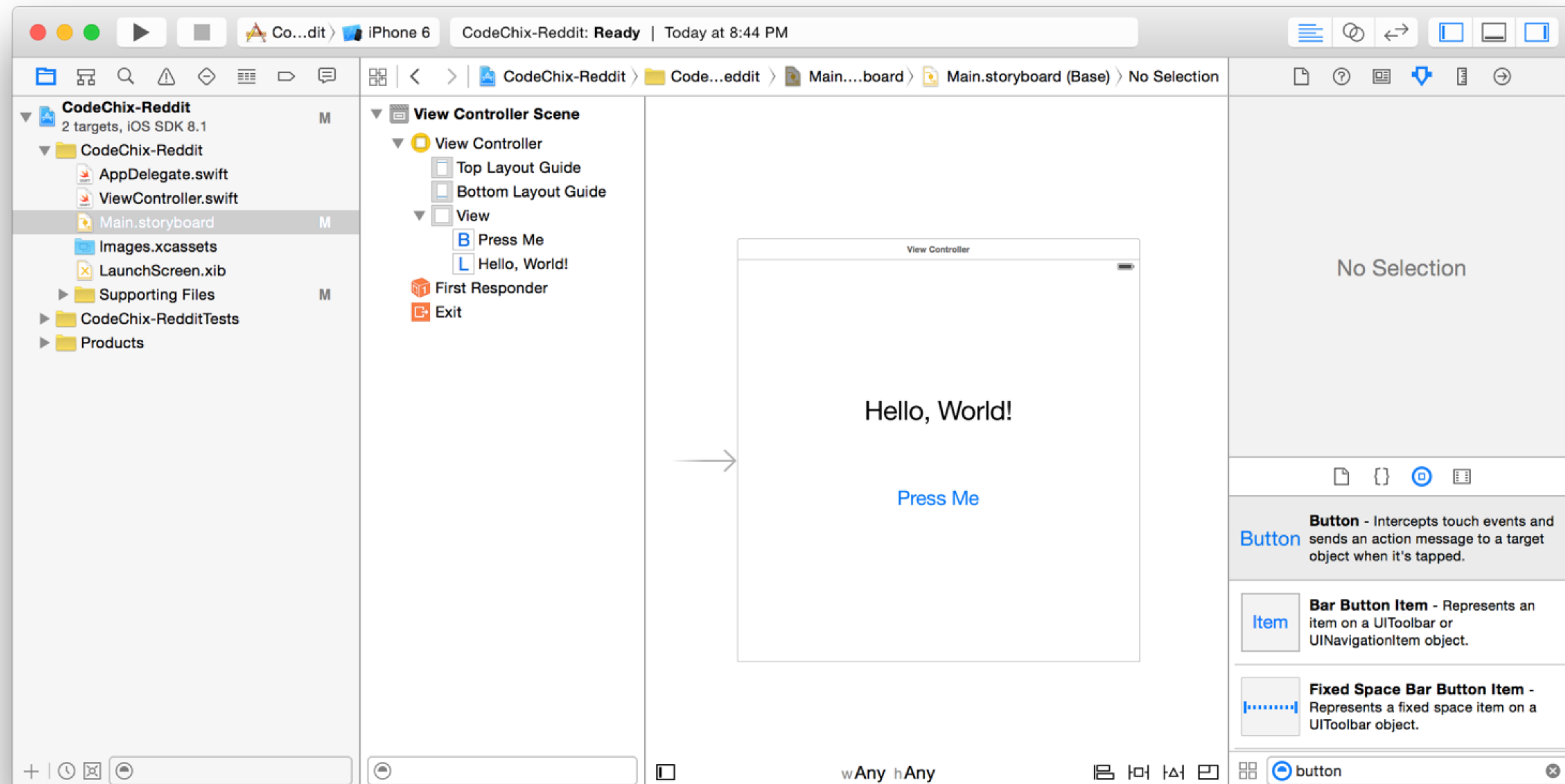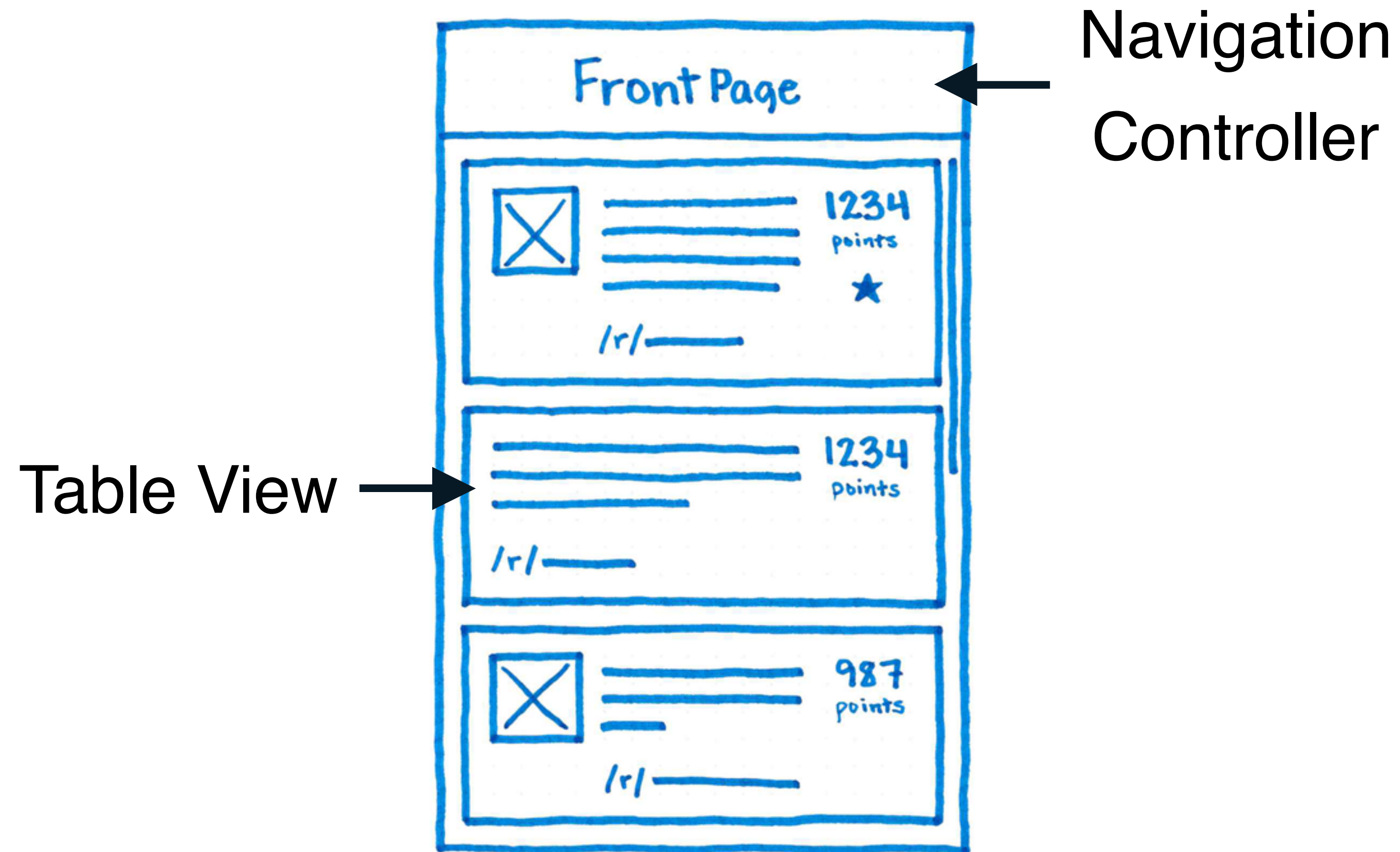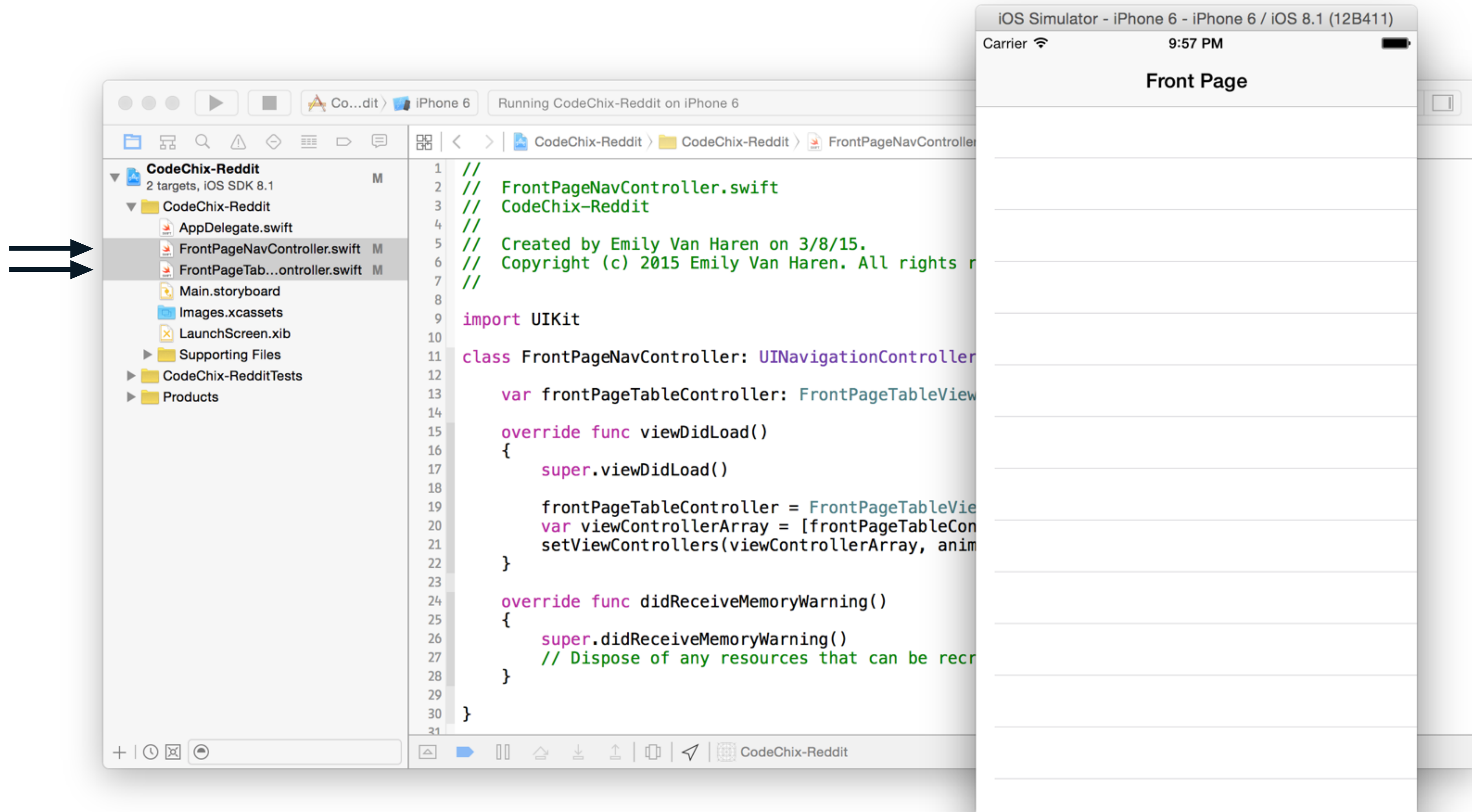
Browse posts

Code
First Screen First


```swift
//
//  FrontPageNavController.swift
//  CodeChix-Reddit
//
//  Created by Emily Van Haren on 3/8/15.
//  Copyright (c) 2015 Emily Van Haren. All rights r
//

import UIKit

class FrontPageNavController: UINavigationController

    var frontPageTableController: FrontPageTableView

    override func viewDidLoad()
    {
        super.viewDidLoad()

        frontPageTableController = FrontPageTableVie
        var viewControllerArray = [frontPageTableCon
        setViewControllers(viewControllerArray, anim
    }

    override func didReceiveMemoryWarning()
    {
        super.didReceiveMemoryWarning()
        // Dispose of any resources that can be recr
    }

}
```

```
{
    "kind": "t3",
    "data": {
        "domain": "i.imgur.com",
        "banned_by": null,
        "media_embed": {

        "subreddit": "funny",

        "selftext": "",
        "likes": null,
        "user_reports": [

        ],
        "secure_media": null,
        "link_flair_text": null,
        "id": "2xxtzv",
        "gilded": 0,
        "archived": false,
        "clicked": false,
        "report_reasons": null,
        "author": "rossgraphitas",

        "score": 4246,

        "over_18": false,

        "thumbnail": "http:\/\/b.thumbs.redditmedia.com\/_sHsYX6TNh3N1cYIbVFKsT2KeFa6KbqUWzvYP1AgLSY.jpg",

        "edited": false,
        "link_flair_css_class": null,
        "author_flair_css_class": null,
        "downs": 0,
        "secure_media_embed": {

        },
        "saved": false,
        "stickied": false,
        "is_self": false,
        "permalink": "\/r\/funny\/comments\/2xxtzv\/who_has_ever_needed_one_of_these_after_a_meeting\/",
        "name": "t3_2xxtzv",
        "created": 1425526739,
        "url": "http:\/\/i.imgur.com\/9yF0Vyo.jpg",

        "title": "Who has ever needed one of these after a meeting?",

        "distinguished": null,
        "media": null,
        "mod_reports": [

        ],
        "visited": false,
        "num_reports": null,
        "ups": 4246
    }
},
```

http://reddit.com/.json

Code
NSURLSession
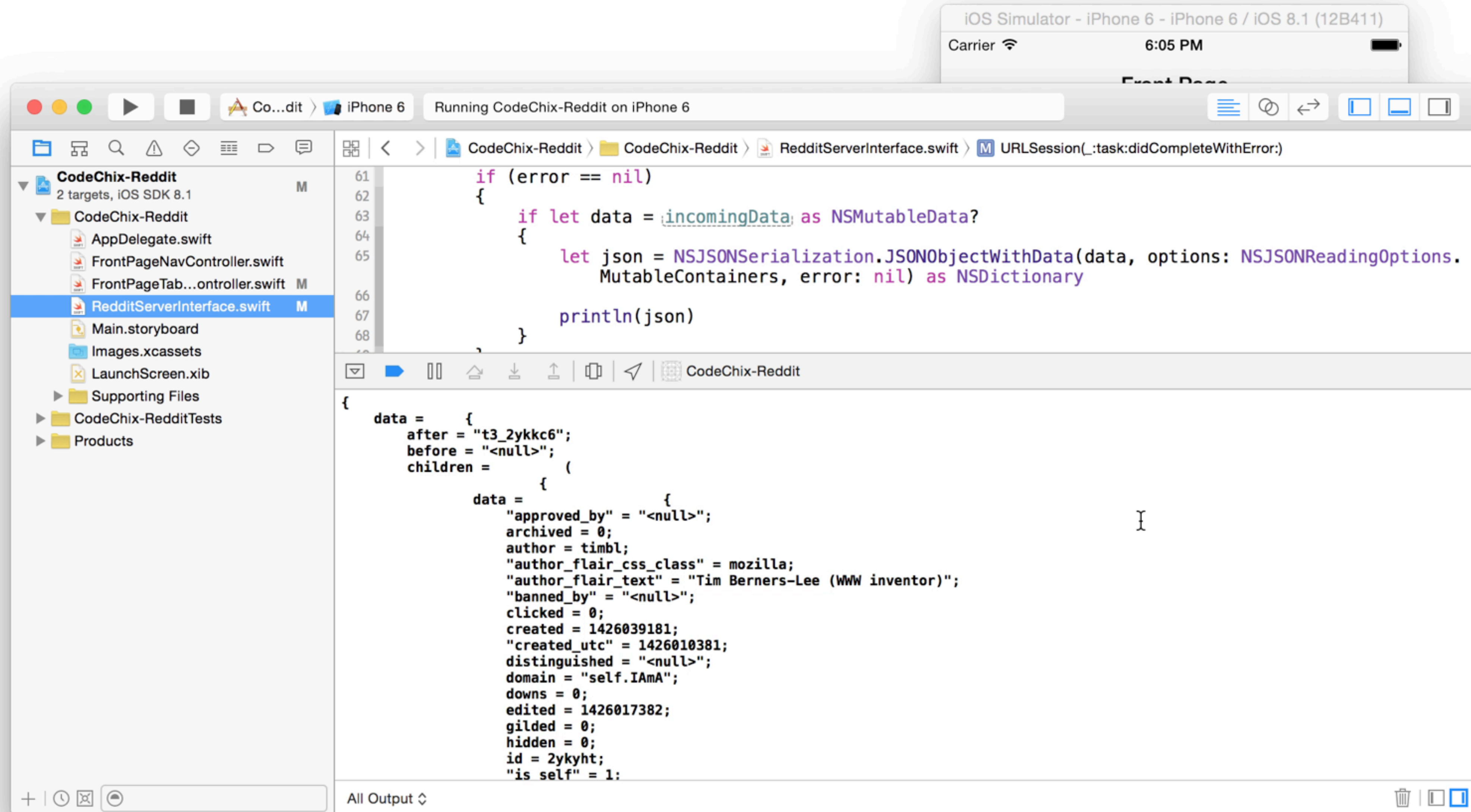
```swift
// The same URL we visited in the browser
//
let url = NSURL(string: "http://www.reddit.com/.json")

// Make it a GET request
//
var request = NSMutableURLRequest(URL: url!)
request.HTTPMethod = "GET"

// Send the request
//
dataTask = session.dataTaskWithRequest(request)
dataTask.resume()
```

Code
JSON Response
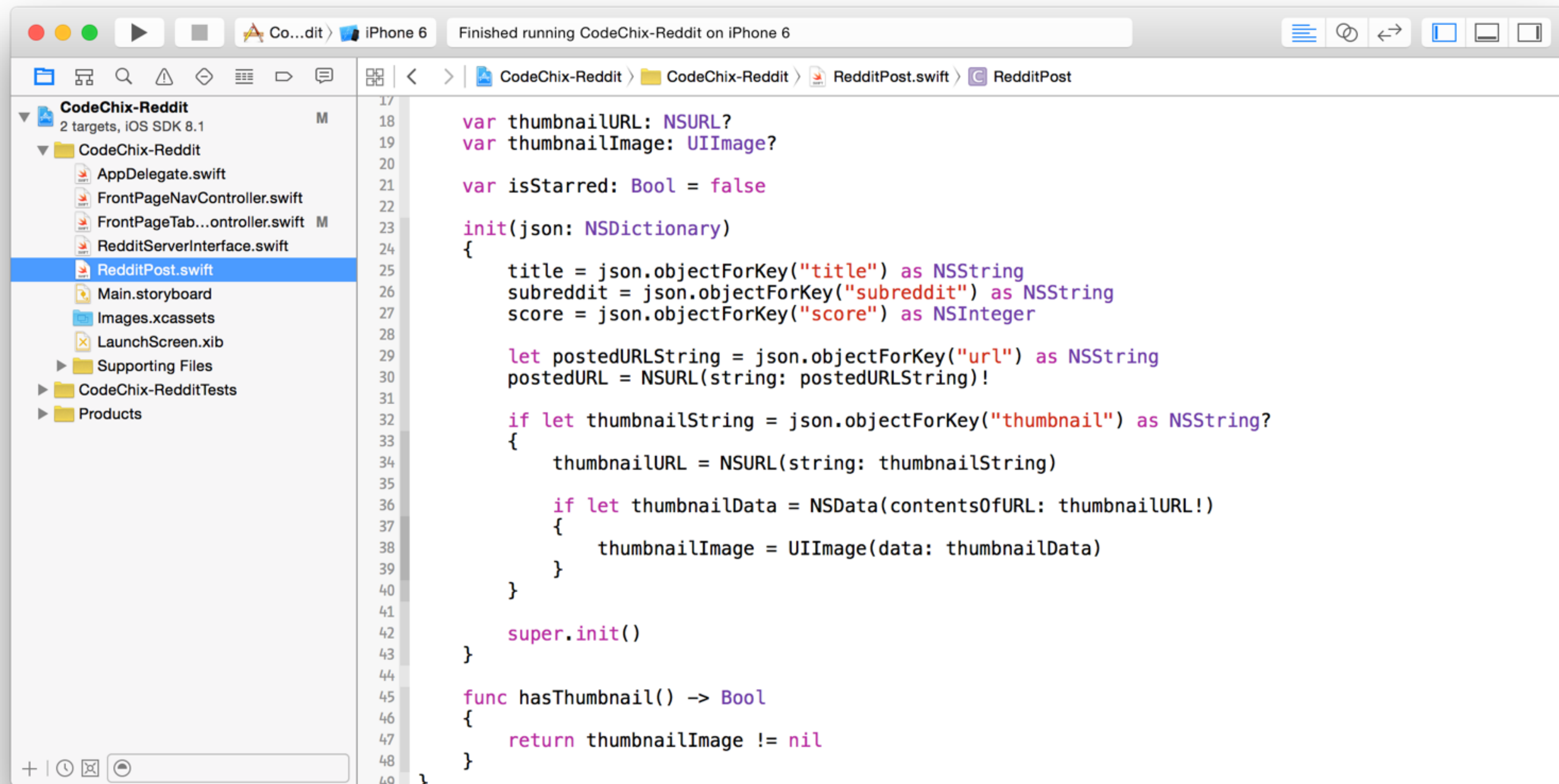
iOS Simulator - iPhone 6 - iPhone 6 / iOS 8.1 (12B411)

Carrier 🖧   6:05 PM

Running CodeChix-Reddit on iPhone 6

CodeChix-Reddit › CodeChix-Reddit › RedditServerInterface.swift › URLSession(_:task:didCompleteWithError:)

```swift
61    if (error == nil)
62    {
63        if let data = incomingData as NSMutableData?
64        {
65            let json = NSJSONSerialization.JSONObjectWithData(data, options: NSJSONReadingOptions.
                  MutableContainers, error: nil) as NSDictionary
66
67            println(json)
68        }
```

CodeChix-Reddit
  2 targets, iOS SDK 8.1   M
  CodeChix-Reddit
    AppDelegate.swift
    FrontPageNavController.swift
    FrontPageTab...ontroller.swift   M
    RedditServerInterface.swift   M
    Main.storyboard
    Images.xcassets
    LaunchScreen.xib
    Supporting Files
  CodeChix-RedditTests
  Products

CodeChix-Reddit

```
{
    data =        {
        after = "t3_2ykkc6";
        before = "<null>";
        children =        (
                {
            data =            {
                "approved_by" = "<null>";
                archived = 0;
                author = timbl;
                "author_flair_css_class" = mozilla;
                "author_flair_text" = "Tim Berners-Lee (WWW inventor)";
                "banned_by" = "<null>";
                clicked = 0;
                created = 1426039181;
                "created_utc" = 1426010381;
                distinguished = "<null>";
                domain = "self.IAmA";
                downs = 0;
                edited = 1426017382;
                gilded = 0;
                hidden = 0;
                id = 2kyyht;
                "is self" = 1;
```

All Output

Code
Reddit Post

Code
Post Cell

Code
Post Cell Subviews

Subviews ➡

```swift
// PostTableViewCell.swift
//
class PostTableViewCell: UITableViewCell
{
    var titleLabel: UILabel!
    var subredditLabel: UILabel!
    var pointsLabelLabel: UILabel!
    var pointsValueLabel: UILabel!

    var thumbnailImageView: UIImageView?

    var starButton: UIButton!
    var starView: StarView!
}
```

Code
Initialize the Subviews

```swift
// FrontPageTableViewController.swift
//
override func tableView(tableView: UITableView,
    cellForRowAtIndexPath indexPath: NSIndexPath) -> UITableViewCell
{
    let cell = tableView.dequeueReusableCellWithIdentifier("PostCell") as PostTableViewCell

    cell.initSubviews()

    cell.showSubviews()

    return cell
}
```

Code
Initialize the Subviews

```swift
// FrontPageTableViewController.swift
//
override func tableView(tableView: UITableView,
    cellForRowAtIndexPath indexPath: NSIndexPath) -> UITableViewCell
{
    let cell = tableView.dequeueReusableCellWithIdentifier("PostCell") as PostTableViewCell

    cell.initSubviews()

    cell.showSubviews()

    return cell
}
```

```swift
// PostTableViewCell.swift
//
func initSubviews()
{
    titleLabel = UILabel()
    subredditLabel = UILabel()
    pointsLabelLabel = UILabel()
    pointsValueLabel = UILabel()
    thumbnailImageView = UIImageView()
    starView = StarView()
    starButton = UIButton()
}
```

Code
Initialize the Subviews

```swift
// FrontPageTableViewController.swift
//
override func tableView(tableView: UITableView,
    cellForRowAtIndexPath indexPath: NSIndexPath) -> UITableViewCell
{
    let cell = tableView.dequeueReusableCellWithIdentifier("PostCell") as PostTableViewCell

    cell.initSubviews()

    cell.showSubviews()

    return cell
}
```

```swift
// PostTableViewCell.swift
//
func initSubviews()
{
    titleLabel = UILabel()
    subredditLabel = UILabel()
    pointsLabelLabel = UILabel()
    pointsValueLabel = UILabel()
    thumbnailImageView = UIImageView()
    starView = StarView()
    starButton = UIButton()
}
```

```swift
// PostTableViewCell.swift
//
func showSubviews()
{
    addSubview(titleLabel)
    addSubview(subredditLabel)
    addSubview(pointsLabelLabel)
    addSubview(pointsValueLabel)
    starButton.addSubview(starView)
    addSubview(starButton)

    if (post!.hasThumbnail()) {
        addSubview(thumbnailImageView!)
    }
}
```

Code
Subview Frames
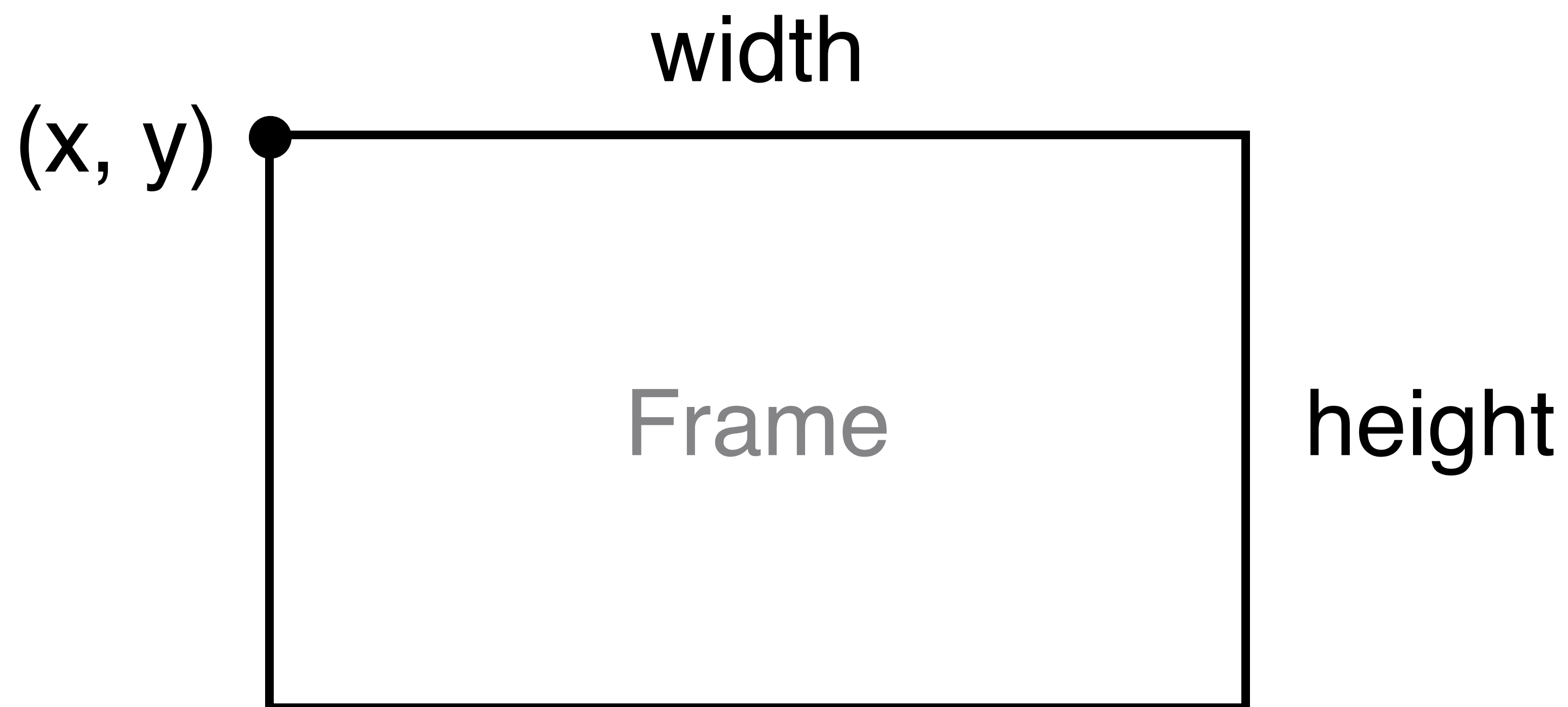
Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
override func layoutSubviews()
{
    super.layoutSubviews()

    // Set frames here
}
```

Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
override func layoutSubviews()
{
    super.layoutSubviews()

    // Set frames here

    pointsValueLabel.frame = // some frame here
}
```

Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
func frameForPointsValueLabel() -> CGRect
{
    let width = PointsWidth
    let height = PointsValueFontSize
    let x = (contentView.bounds.size.width - (width + PaddingHorizontal))
    let y = PaddingVertical

    return CGRectMake(x, y, width, height)
}
```

Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
override func layoutSubviews()
{
    super.layoutSubviews()

    // Set frames here

    pointsValueLabel.frame = frameForPointsValueLabel()
}

func frameForPointsValueLabel() -> CGRect
{
    let width = PointsWidth
    let height = PointsValueFontSize
    let x = (contentView.bounds.size.width - (width + PaddingHorizontal))
    let y = PaddingVertical

    return CGRectMake(x, y, width, height)
}
```

Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
override func layoutSubviews()
{
    super.layoutSubviews()

    // Set frames here

    pointsValueLabel.frame = frameForPointsValueLabel()
    pointsValueLabel.font = UIFont(name: FontName, size: PointsValueFontSize)
    pointsValueLabel.textAlignment = NSTextAlignment.Center
}
```
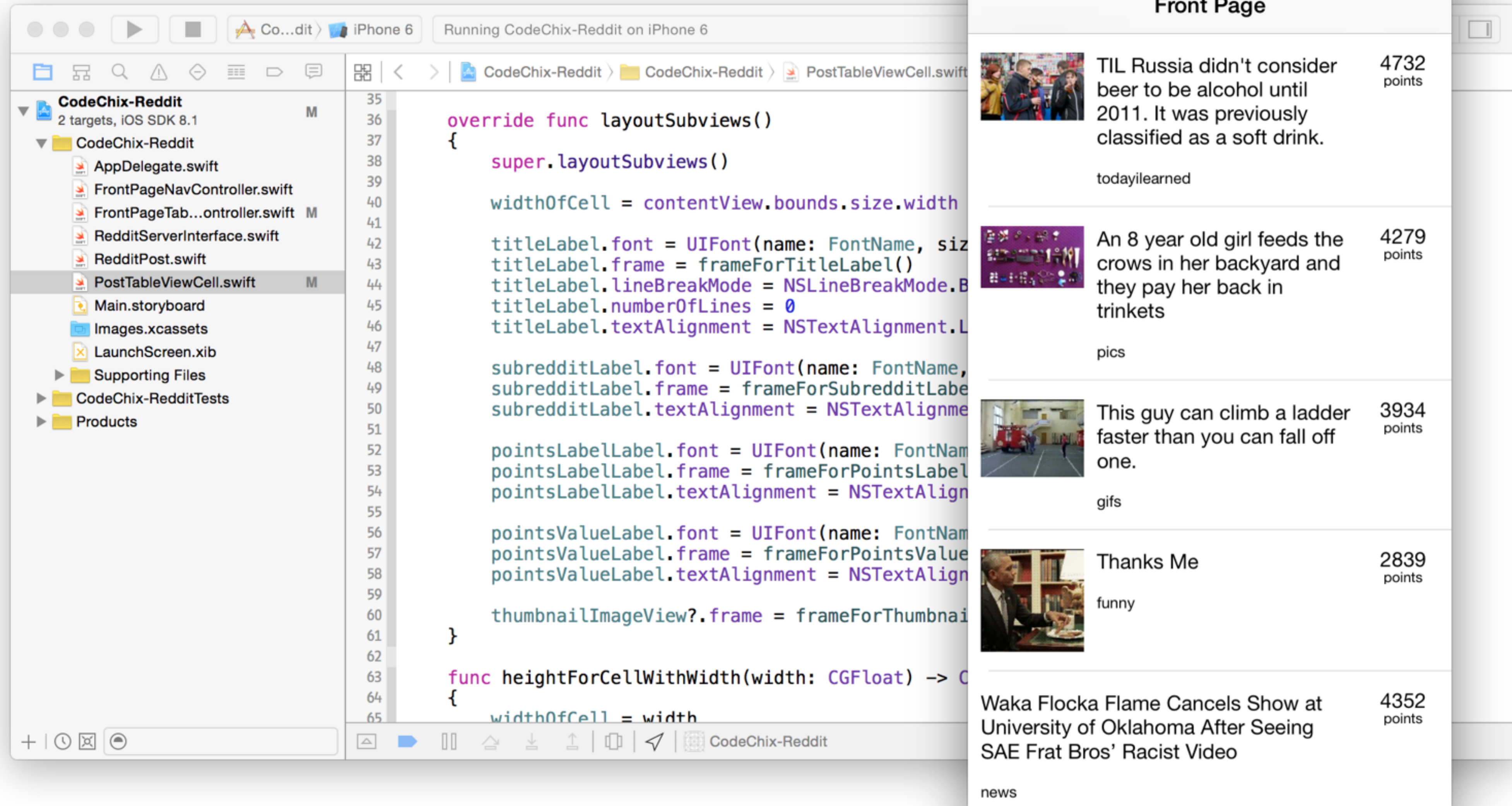
Code
Layout the Subviews

```swift
// PostTableViewCell.swift
//
func frameForPointsLabelLabel() -> CGRect { ... }

func frameForPointsValueLabel() -> CGRect { ... }

func frameForStarButton() -> CGRect { ... }

func frameForSubredditLabel() -> CGRect { ... }

func frameForThumbnailImage() -> CGRect { ... }

func frameForTitleLabel() -> CGRect { ... }
```

Code

Layout the Subviews

Code
Core Graphics

Drawn onto a context

Bezier Paths

Images

Text

Resolution Independent

Code
File Size Comparison

1.1 MB

1.4 MB

Connexio

4500 x 3000 pixels

Code
Triangle by Core Graphics

```swift
let context = UIGraphicsGetCurrentContext()

// Start at the top of the triangle
//
CGContextMoveToPoint(context, (frame.size.width / 2.0), 0.0)

// Bottom right
//
CGContextAddLineToPoint(context, frame.size.width, frame.size.height)

// Bottom left
//
CGContextAddLineToPoint(context, 0.0, frame.size.height)

CGContextFillPath(context)
```
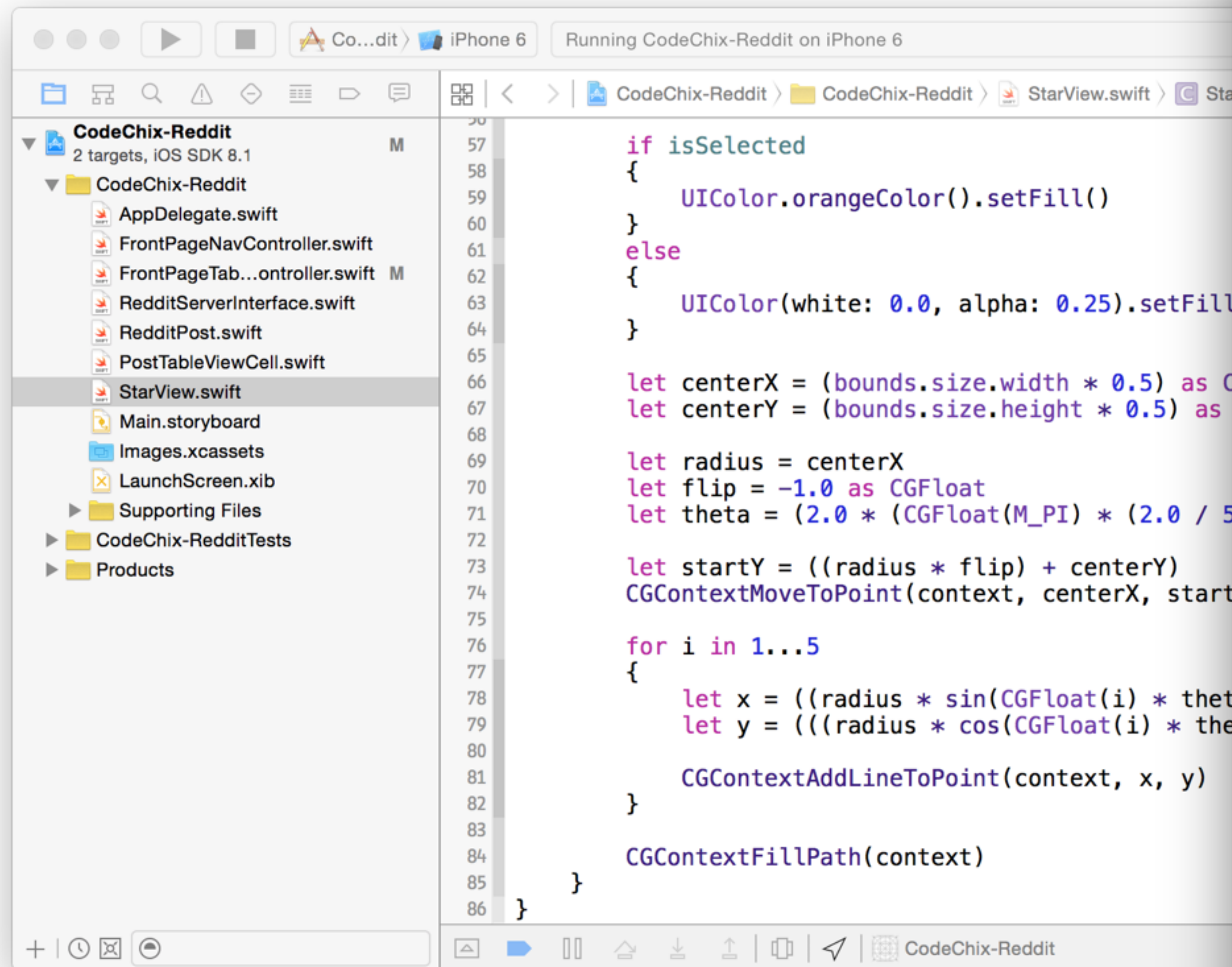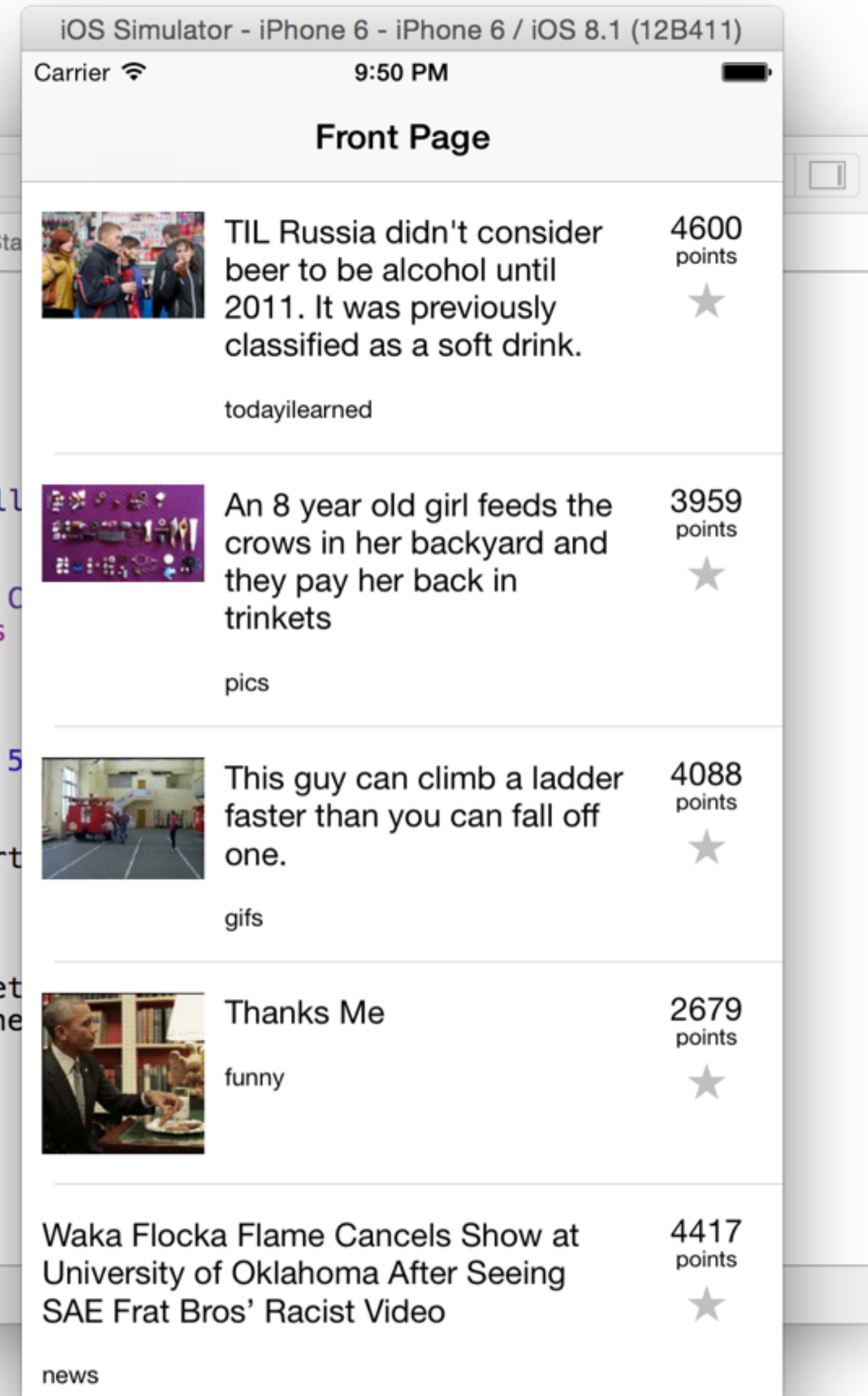
Code
Star View

Carrier 9:50 PM

Front Page

Running CodeChix-Reddit on iPhone 6

Co...dit › iPhone 6

CodeChix-Reddit › CodeChix-Reddit › StarView.swift › Sta

CodeChix-Reddit
2 targets, iOS SDK 8.1   M

▼ CodeChix-Reddit
  AppDelegate.swift
  FrontPageNavController.swift
  FrontPageTab...ontroller.swift   M
  RedditServerInterface.swift
  RedditPost.swift
  PostTableViewCell.swift
  StarView.swift
  Main.storyboard
  Images.xcassets
  LaunchScreen.xib
  ▶ Supporting Files
▶ CodeChix-RedditTests
▶ Products

```swift
if isSelected
{
    UIColor.orangeColor().setFill()
}
else
{
    UIColor(white: 0.0, alpha: 0.25).setFill
}

let centerX = (bounds.size.width * 0.5) as C
let centerY = (bounds.size.height * 0.5) as

let radius = centerX
let flip = -1.0 as CGFloat
let theta = (2.0 * (CGFloat(M_PI) * (2.0 / 5

let startY = ((radius * flip) + centerY)
CGContextMoveToPoint(context, centerX, start

for i in 1...5
{
    let x = ((radius * sin(CGFloat(i) * thet
    let y = (((radius * cos(CGFloat(i) * the

    CGContextAddLineToPoint(context, x, y)
}

CGContextFillPath(context)
}
}
```

CodeChix-Reddit

TIL Russia didn't consider beer to be alcohol until 2011. It was previously classified as a soft drink.

todayilearned

4600 points ☆

An 8 year old girl feeds the crows in her backyard and they pay her back in trinkets

pics

3959 points ☆

This guy can climb a ladder faster than you can fall off one.

gifs

4088 points ☆

Thanks Me

funny

2679 points ☆

Waka Flocka Flame Cancels Show at University of Oklahoma After Seeing SAE Frat Bros' Racist Video

news

4417 points ☆

Code

Post Details

iOS Simulator - iPhone 6 - iPhone 6 / iOS 8.1 (12B411)

Carrier 🛜   9:47 PM

Front Page

TIL Russia didn't consider beer to be alcohol until 2011. It was previously classified as a soft drink.

4600 points

todayilearned

An 8 year old girl feeds the crows in her backyard and they pay her back in trinkets

3959 points

pics

This guy can climb a ladder faster than you can fall off one.

4088 points

gifs

Thanks Me

2679 points

funny

Waka Flocka Flame Cancels Show at University of Oklahoma After Seeing SAE Frat Bros' Racist Video

4417 points

news

Co...dit › iPhone 6   Running CodeChix-Reddit on iPhone 6

CodeChix-Reddit › CodeChix-Reddit › PostDetailViewControlle

CodeChix-Reddit
2 targets, iOS SDK 8.1

CodeChix-Reddit
- AppDelegate.swift
- FrontPageNavController.swift
- FrontPageTableViewController.swift
- RedditServerInterface.swift
- RedditPost.swift
- PostTableViewCell.swift
- StarView.swift
- PostDetailViewController.swift
- Main.storyboard
- Images.xcassets
- LaunchScreen.xib
- Supporting Files
CodeChix-RedditTests
Products

```swift
import UIKit

class PostDetailViewController: UIViewController, UI
{
    var activityIndicator: UIActivityIndicatorView!
    var webView: UIWebView!

    init(post: RedditPost)
    {
        super.init()

        activityIndicator = UIActivityIndicatorView(
            UIActivityIndicatorViewStyle.Gray)

        webView = UIWebView()
        webView.delegate = self
        webView.scalesPageToFit = true

        let request = NSURLRequest(URL: post.postedU
        webView.loadRequest(request)
    }

    required init(coder aDecoder: NSCoder)
    {
        super.init(coder: aDecoder)
    }

    override init(nibName nibNameOrNil: String?, bun
    {
        super.init(nibName: nibNameOrNil, bundle: ni
```

CodeChix-Reddit

My Development Process

Idea ✔

Plan ✔

Design ✔
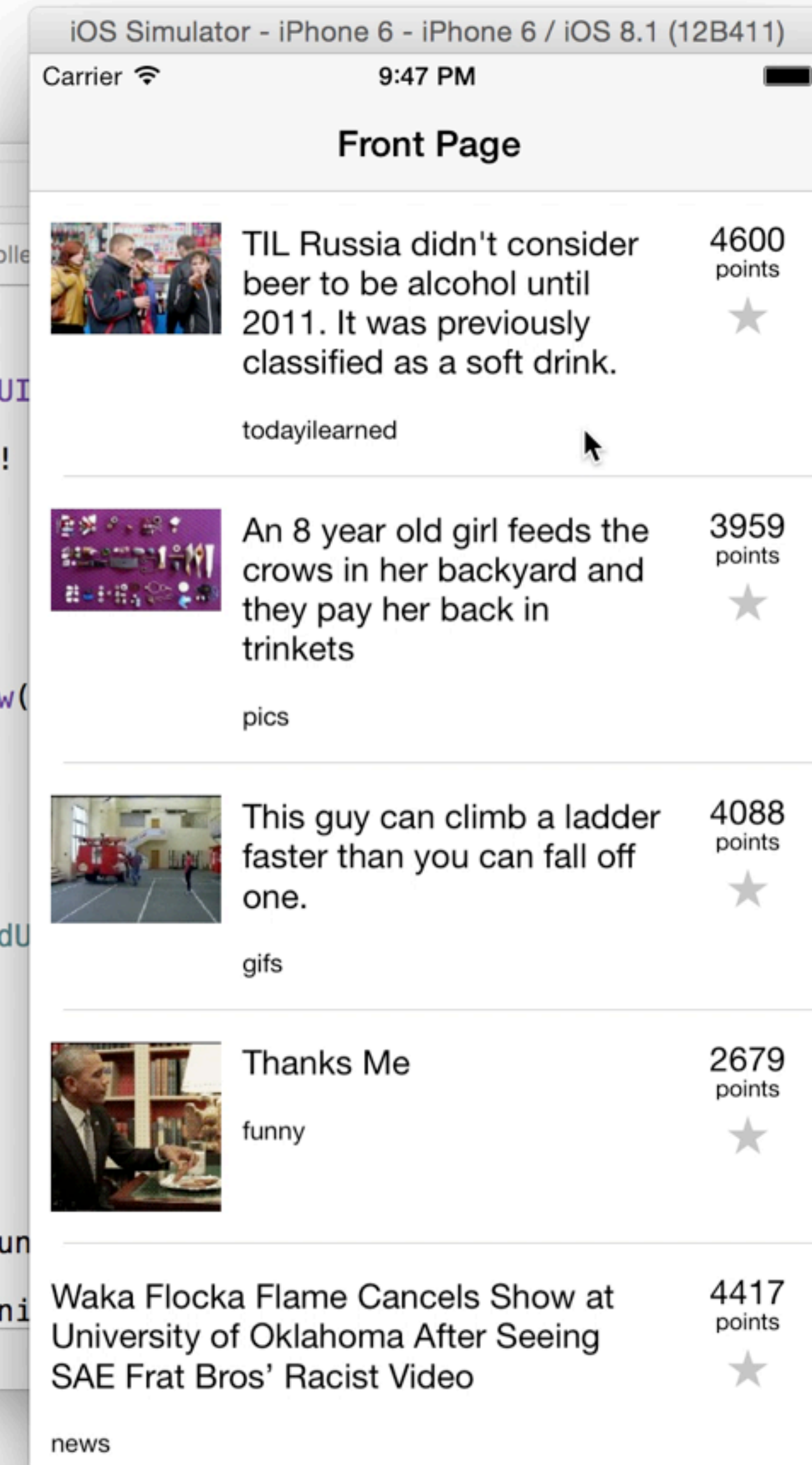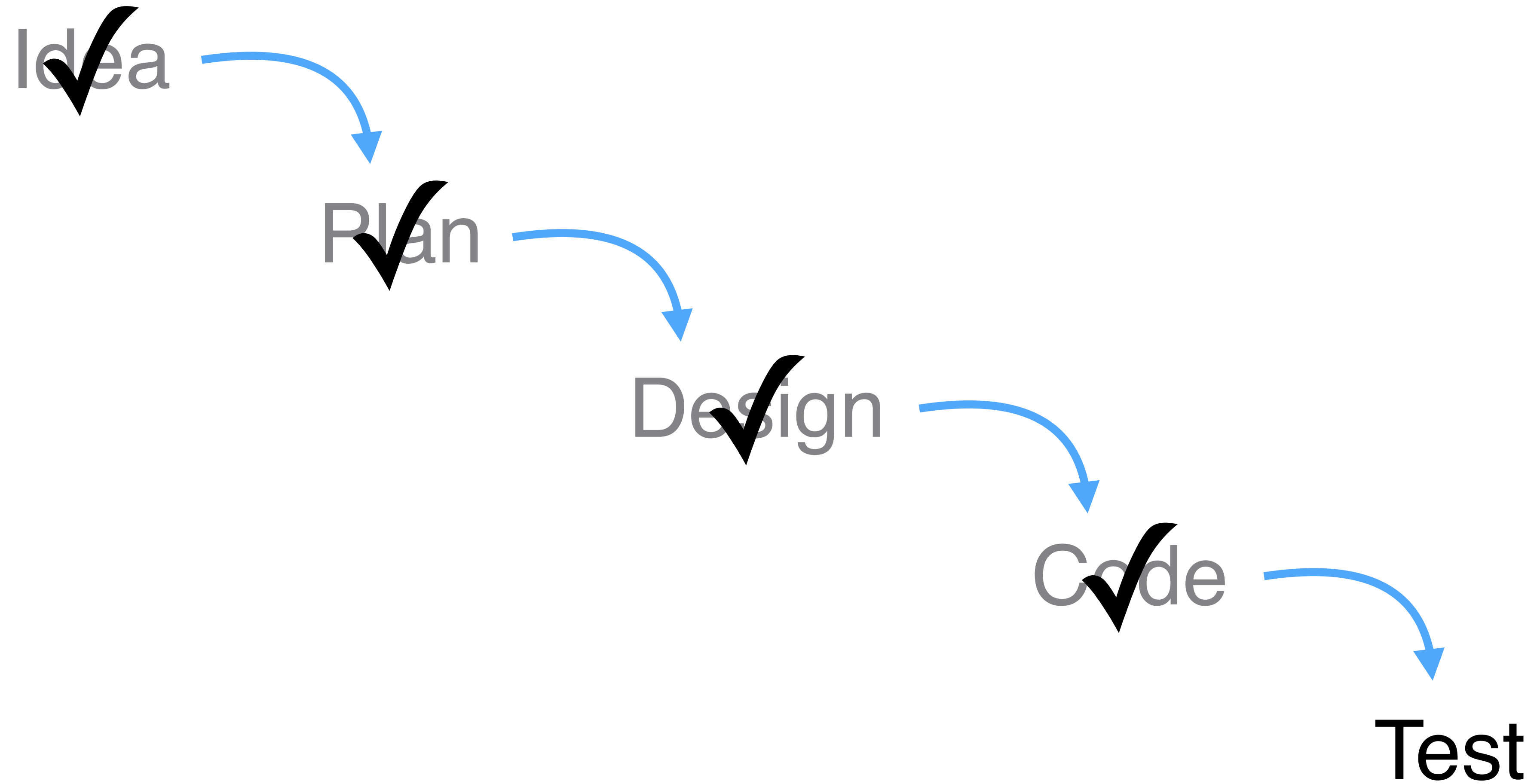
Code ✔

Test

Test

Always test on a device!

Test
Xcode Simulator

Unsupported

~~Accelerometer~~   ~~Gyroscope~~

~~Camera~~   ~~Microphone~~

~~GPS~~   ~~Location Data~~

Test

Developer License

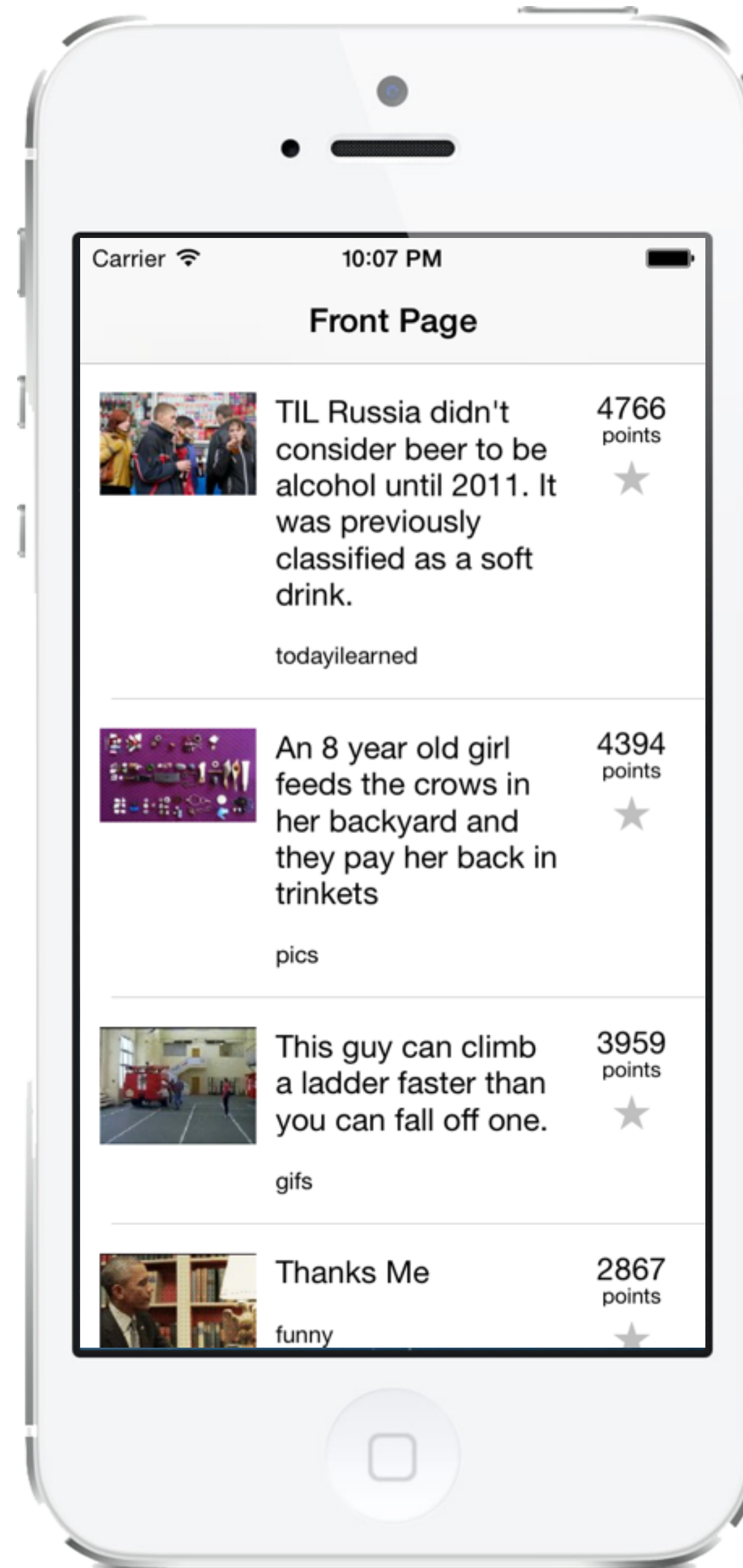iOS Developer Program

The fastest path from code to customer.

Enroll now   **$99**/year

https://developer.apple.com/programs/ios/

Test
On Your Device

Test

Make It Crash!

Test
Many Devices

Test

Instruments

Test

Test It Again!

My Development Process

Idea ✔

Plan ✔

Design ✔

Code ✔

Test ✔
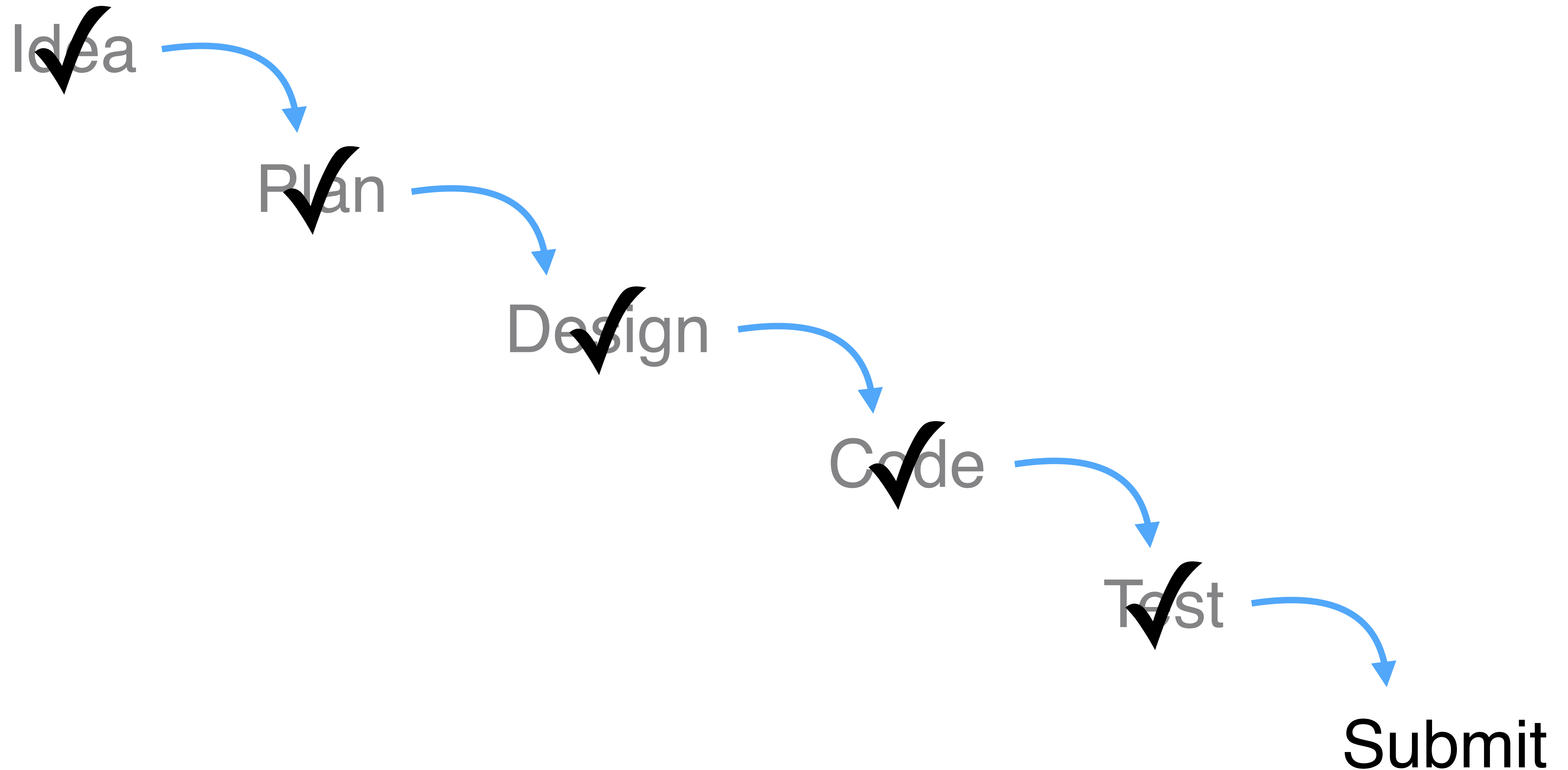
Submit

Submit
Status

Prepare for Submission

↓

Waiting for Review

↓

In Review

↓

Processing for App Store

↓

Ready for Sale

Submit

Did we follow the rules?

https://developer.apple.com/app-store/review/

Submit

Did we follow the rules?

Provisioning profiles

Submit

Did we follow the rules?

Provisioning profiles   App Store graphics

Submit

Did we follow the rules?

Provisioning profiles   App Store graphics
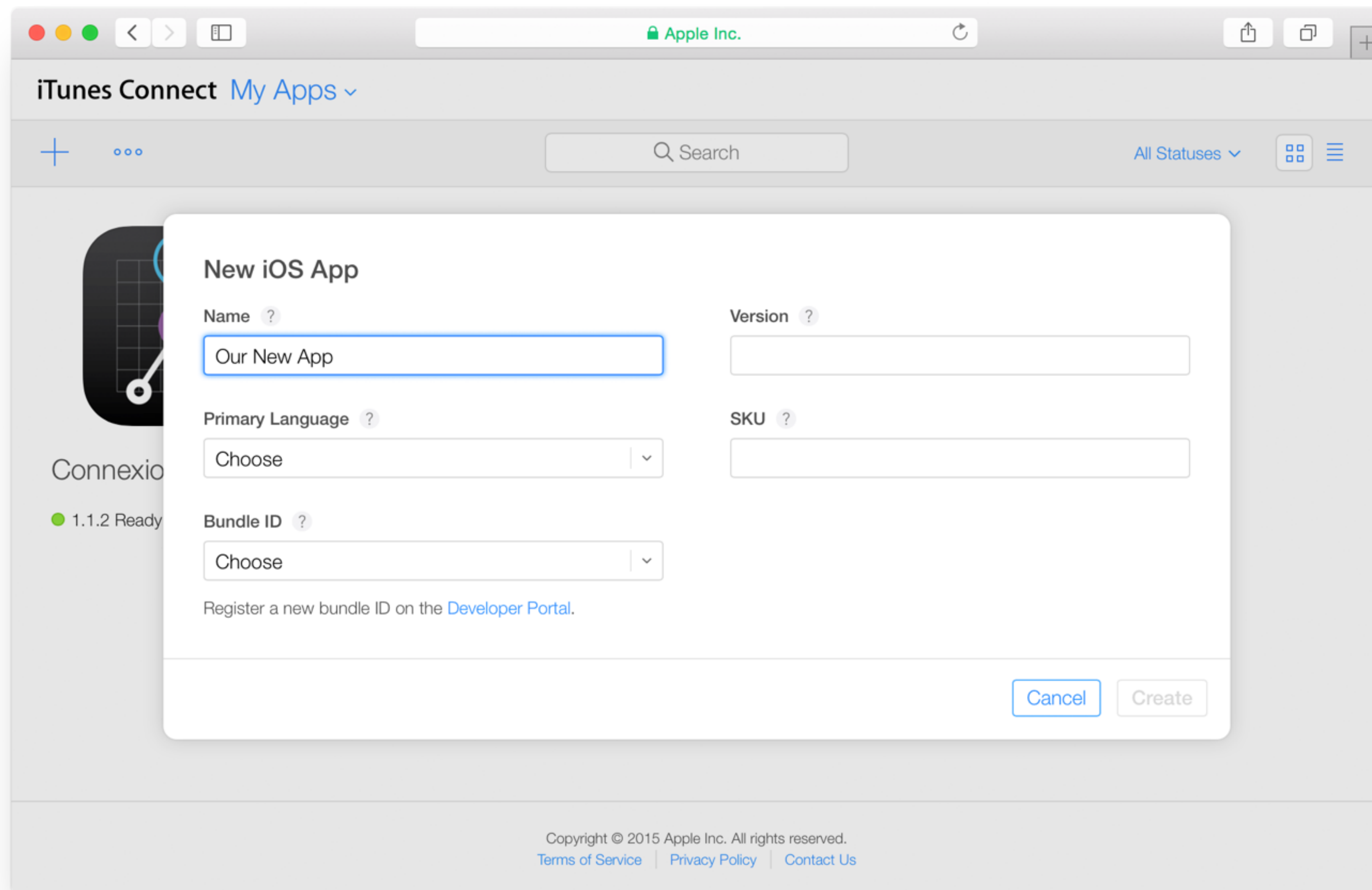
App metadata

Submit

Did we follow the rules?

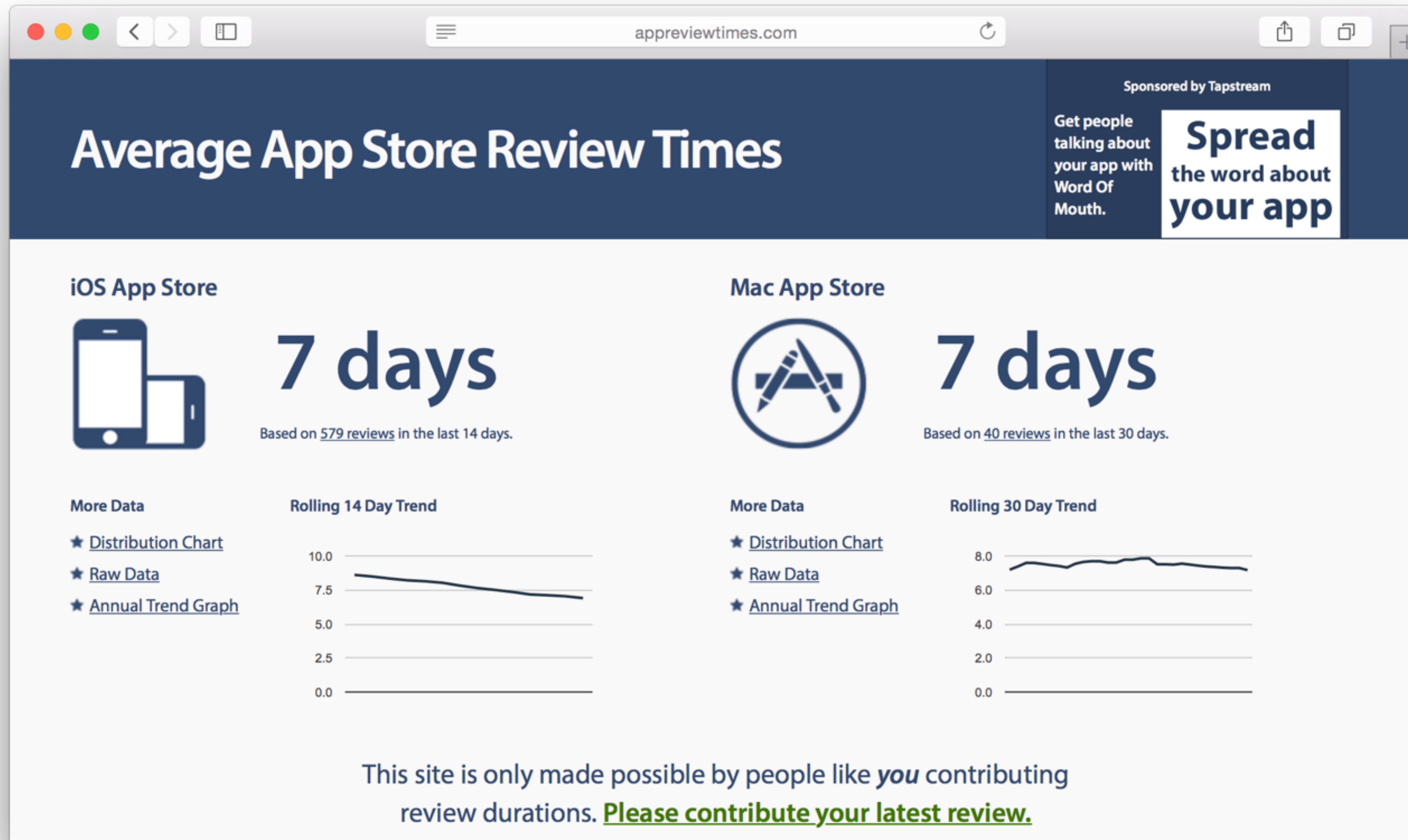Provisioning profiles   App Store graphics

App metadata   Price point

Submit

Submit

Submit

 iTunes Connect

Dear Viridian Ink Design LLC,

The following app has been approved and the app status has changed to Ready for Sale:

App Name: Connexio ⊕
App Version Number: 1.1.2
App Type: iOS App
App SKU: com.viridianink.Connexio

If your contracts are not in effect at this time, your app status will be Pending Contract. You may track the progress of your contracts in the Contracts, Tax, and Banking module in iTunes Connect.

To make changes to this app, sign in to iTunes Connect and open the Manage Your Applications module.
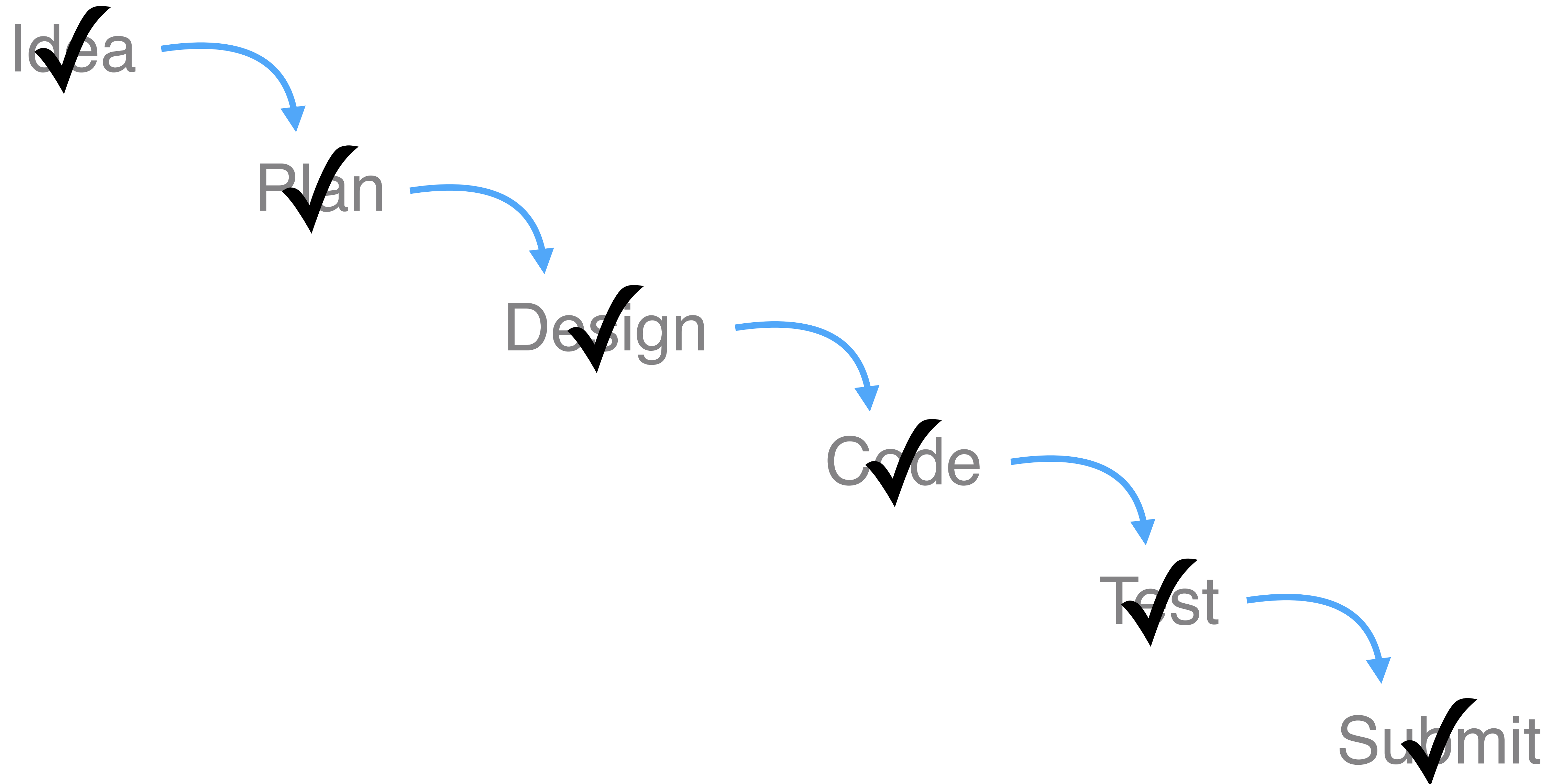
It can take up to 24 hours before your app is available on the App Store. This delay is dependent on any app availability issues.

Before you market your app, read the App Store Marketing and Advertising Guidelines for Developers. The guidelines include information on using the App Store badge, best practices to market apps on the App Store, and details on the use of Apple product images.

If you have any questions regarding your app, use the Contact Us module on iTunes Connect.

Regards,
The App Store team

My Development Process

Idea ✔

Plan ✔

Design ✔

Code ✔

Test ✔

Submit ✔

Thank You

http://viridianink.com/ios-talk