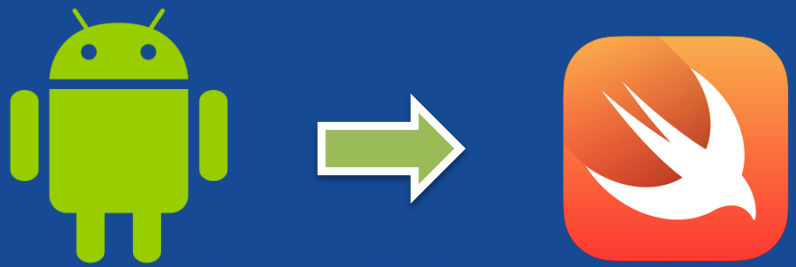
GMTC 全球移动技术大会
GLOBAL MOBILE TECH CONFERENCE

From Java/Android to Swift iOS



张西涛
架构师@千米网
微信号offbye
www.offbye.com

聚焦前沿技术　传递实践经验

主办方 Geekbang. 极客邦科技　InfoQ

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促进软件开发领域知识与创新的传播

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[上海站] 2016年10月20-22日

咨询热线：010-64738142

Agenda

- From Java/Android to Swift iOS
  - What/Why?
    - Profit
      Performance
      Possibility
    - Why learn Swift?
  -
  - How to?
    - Compare With Android
      - Gram mar
      - UI Design
      - Frameworks
      - IDE

Why From Java/Android to Swift

- Swift学习成本低
- 项目开发效率高
- Why not React Native?
- Why not HTML5 Hybrid App?
- Swift是Apple主推的语言

Why learn Swift ?

Swift is Safe Fast and Expres

- ✓ Swift是现代化的开源通用编程语言
- ✓ Swift语法类似Scala，Javascript ES6， Java，OC，C++， Python，上手容易
- ✓ Swift支持面向协议，面向对象和函数式编程
- ✓ 学习函数式编程的理想语言
- ✓ 支持macOS，iOS，Linux，Server Side, Android NDK
- ✓ IBM Swift Sandbox，Kitura Web Framework

TIOBE Index for May 2016

GMTC 全球移动技术大会 GLOBAL MOBILE TECH CONFERENCE

1	1995	Java
2	1972	C
3	1983	C++
4	2001	C#
5	1991	Python
6	1995	PHP
7	1995	JavaScript
8	1987	Perl
9	1995	Ruby
10	2001	VB.NET
11	1995	Delphi
12	1950s	Assembly
13	1998	Visual Basic
14	1983	Objective-C
15	2014	Swift
16	1993	R
17	2003	Groovy
18	1984	MATLAB
19	1978	PL/SQL
20	2001	D

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RedMonk Rankings Jan 2016

1	1995	JavaScript
2	1995	Java
3	1995	PHP
4	1991	Python
5	2001	C#
5	1983	C++
5	1995	Ruby
8	1996	CSS
9	1972	C
10	1983	Objective-C
11	1971	Shell
12	1987	Perl
13	1993	R
14	2004	Scala
15	2009	Go
15	1993	Haskell
17	2014	Swift
18	1984	MATLAB
19	2007	Clojure
20	2003	Groovy

Swift发展进程

https://swift.org/

https://github.com/apple/swift-evolution

- SE-0002: Removing currying `func` declaration syntax
- SE-0003: Removing `var` from Function Parameters
- SE-0004: Remove the `++` and `--` operators
- SE-0005: Better Translation of Objective-C APIs Into Swift
- SE-0006: Apply API Guidelines to the Standard Library
- SE-0007: Remove C-style for-loops with conditions and incrementers
- SE-0008: Add a Lazy flatMap for Sequences of Optionals

Swift 3.0 Roadmap

- Swift API Design Guidelines
- The Grand Renaming
- Mapping Objective-C APIs into Swift
- ~~ABI stability deferred~~

```
// Drawing with Core Graphics in Swift 3

// Get a transform that will rotate around a given offset
func rotationAround(offset: CGPoint, angle: CGFloat,
        transform: CGAffineTransform = .identity) -> CGAffineTransform {
    return transform.translateBy(x: offset.x, y: offset.y)
                    .rotate(angle)
                    .translateBy(x: -offset.x, y: -offset.y)
}

// Trace a path in red
func trace(in context: CGContext, path: CGPath) {
    let red = CGColor(red: 1, green: 0, blue: 0, alpha: 1)
    context.saveGState()
    context.addPath(path)
    context.setStrokeColor(red)
    context.strokePath()
    context.restoreGState()
}
```

Java vs. Swift语法比较

- 基础语法
- 函数和闭包
- struct和class
- Enum枚举
- Interface vs. Protocol
- MultiThread

Java vs. Swift

Java vs. Swift

Task	Java	Swift
Imports	import package.ClassName	import framework
Inheritance	class Child extends Parent	class Child: Parent
Interfaces	interface A	protocol A
Multiple inheritance	class A extends P implements I	class A : P,I
Variables	int myVariable	var myVariable: Int
Constructors	A()	init()
Creating Objects	A obj = new A)();	var obj : A=A()
Method declaration	Void doWork(String arg)	func doWork (arg: String)->Void
Method invocation	obj.doWork(arg)	obj.doWork(arg)

基础语法

Java

- static final 常量
- Java语言没有，Guava库提供
- Java支持自增++，自减—
- 逻辑控制和C基本一致
- Java有main方法
- Java需要;做行结束符

Swift

- var 变量，let常量
- 可选型Optional，通过if let解包
- Swift不建议使用，3.0版本将不支持自增
- 逻辑控制语句更现代
- Swift没有main方法
- Swift不需要行结束符

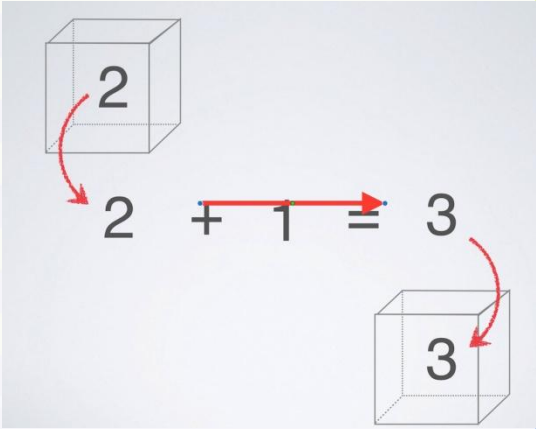
函数和闭包

- 函数的定义和Java很不一样
- Swift中函数是一等公民，可以作为返回值和参数
- Swift函数可以通过元组支持多个返回值
- Swift函数可以嵌套，Java不支持
- Swift函数可以接收不定参数，跟Java基本类似
- Swift函数参数可以带默认值，和Python类似
- Swift支持闭包，Java8才支持lambda闭包
- Swift闭包的语法糖

Swift函数式编程初探

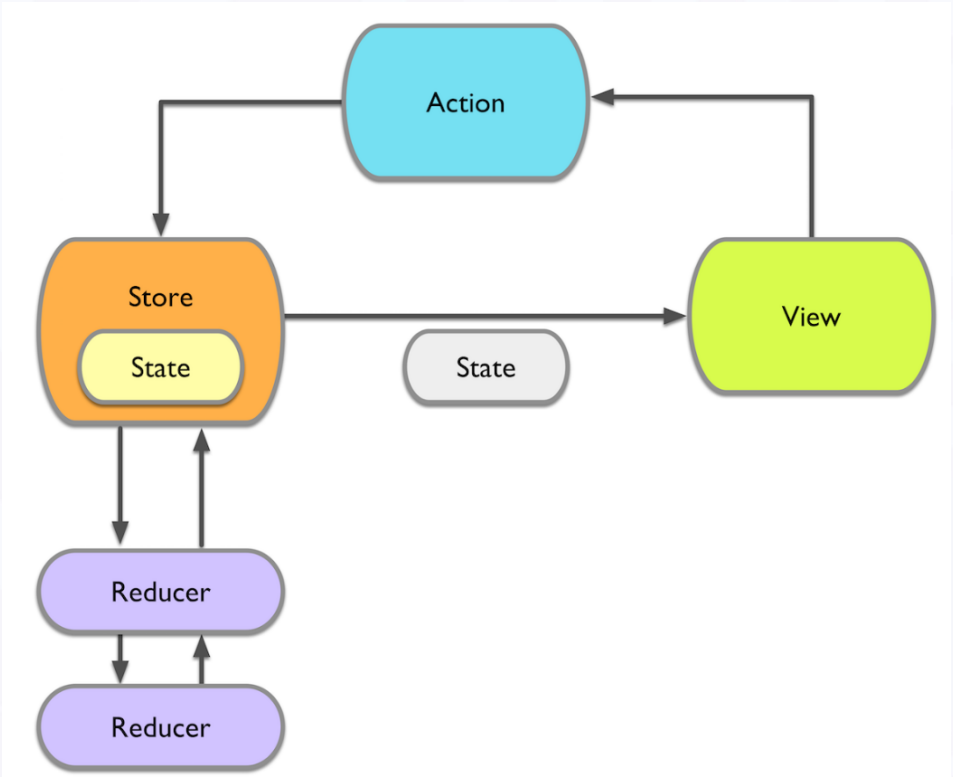
- 高阶函数(higher order function)
- 柯里化(curry)
- Monad, Functor, Applicative ...

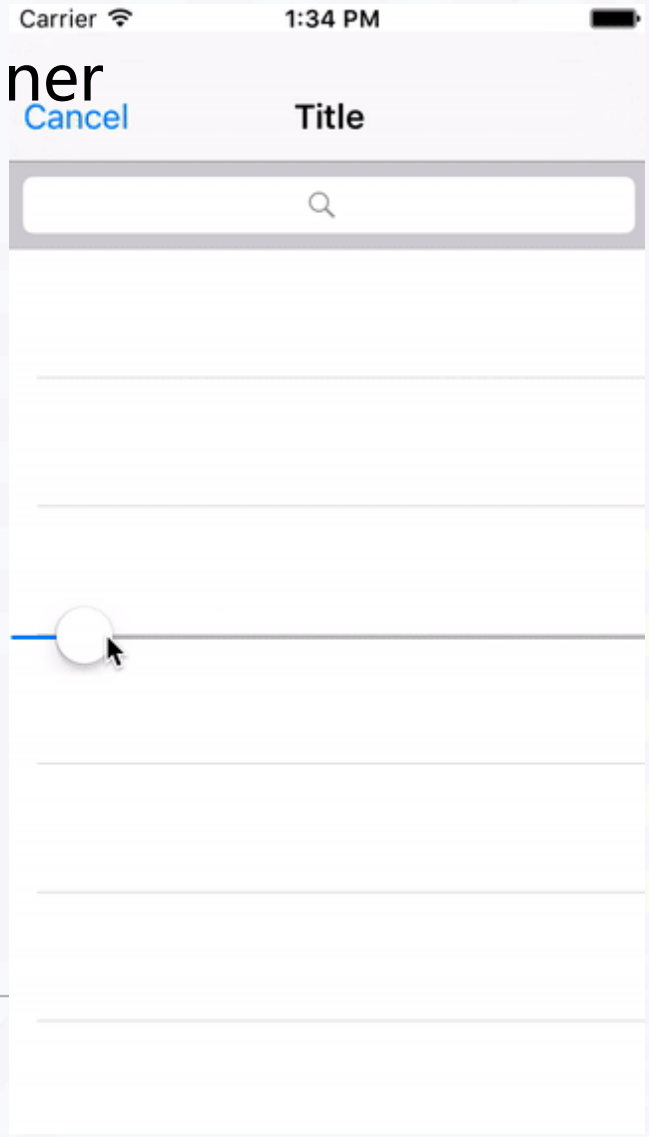
- map, reduce, flatMap, filter ...
- ReactiveX, Redux
- RxSwift, ReSwift



Redux -> ReSwift

Redux is a predictable state container for JavaScript apps.





struct vs. class

- struct is value type
- 推荐使用struct 而不是class
- Swift语言实现包括几百个struct，只有几个class
- 构造方法是init()，析构方法是deinit()，类方法调用跟Java基本一样
- self相当于Java中的this，传入生命周期不一致的闭包需要声明为weak

Enum枚举

- Android开发不建议使用Enum，影响性能
- Swift的Enum和Java类似，本质是一个类，里面可以包含函数。
- Swift Enum语法更简单
- Swift Enum支持扩展extension

Interface vs. Protocol

Java Interface

- 可以继承
- Interface不能带有具体实现的方法，Java8以后才可以
- implements

Swift Protocol

- 可以继承
- protocol可以带有具体实现的方法
- extension更强大
- 访问修饰符对extension的影响

MultiThread

Android

- Thread & Runnable
- Java Concurrency包
- Android多线程扩展
  - AsyncTask，HandleThread

Swift iOS

- NSThread
- GCD
- NSOperation NSOperationQueue

```
let queue = DispatchQueue(label: "com.example.imagetransform")

queue.async {
    let smallImage = image.resize(to: rect)

    DispatchQueue.main.async {
      imageView.image = smallImage
    }
```

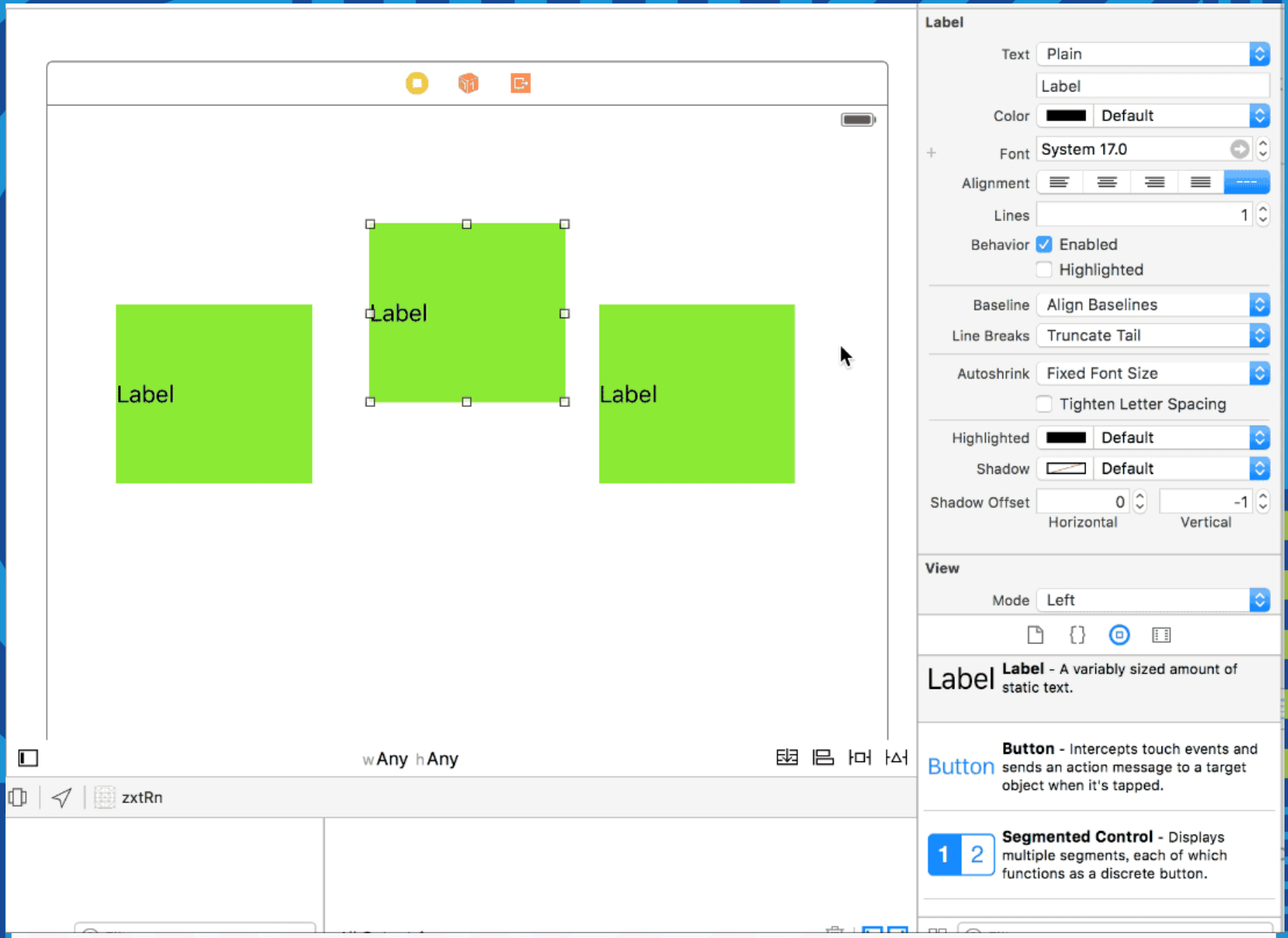
Android，iOS UI开发比较

Android

- Xml layout布局
- 直接写xml代码，可视化辅助开发
- Android可以用Java添加和实现view
- Intent页面跳转
- 自定义view
- 碎片化严重，多分辨率适配困难

Swift iOS

- Xib & StoryBoard
- frame编程, Constrains约束和Masonry框架编程
- 推荐Auto Layout和Size Classes可视化开发
- Segue连线跳转
- iOS8 IBDesignable & IBInspectable
- 机型较少，适配相对简单


Label
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Plain
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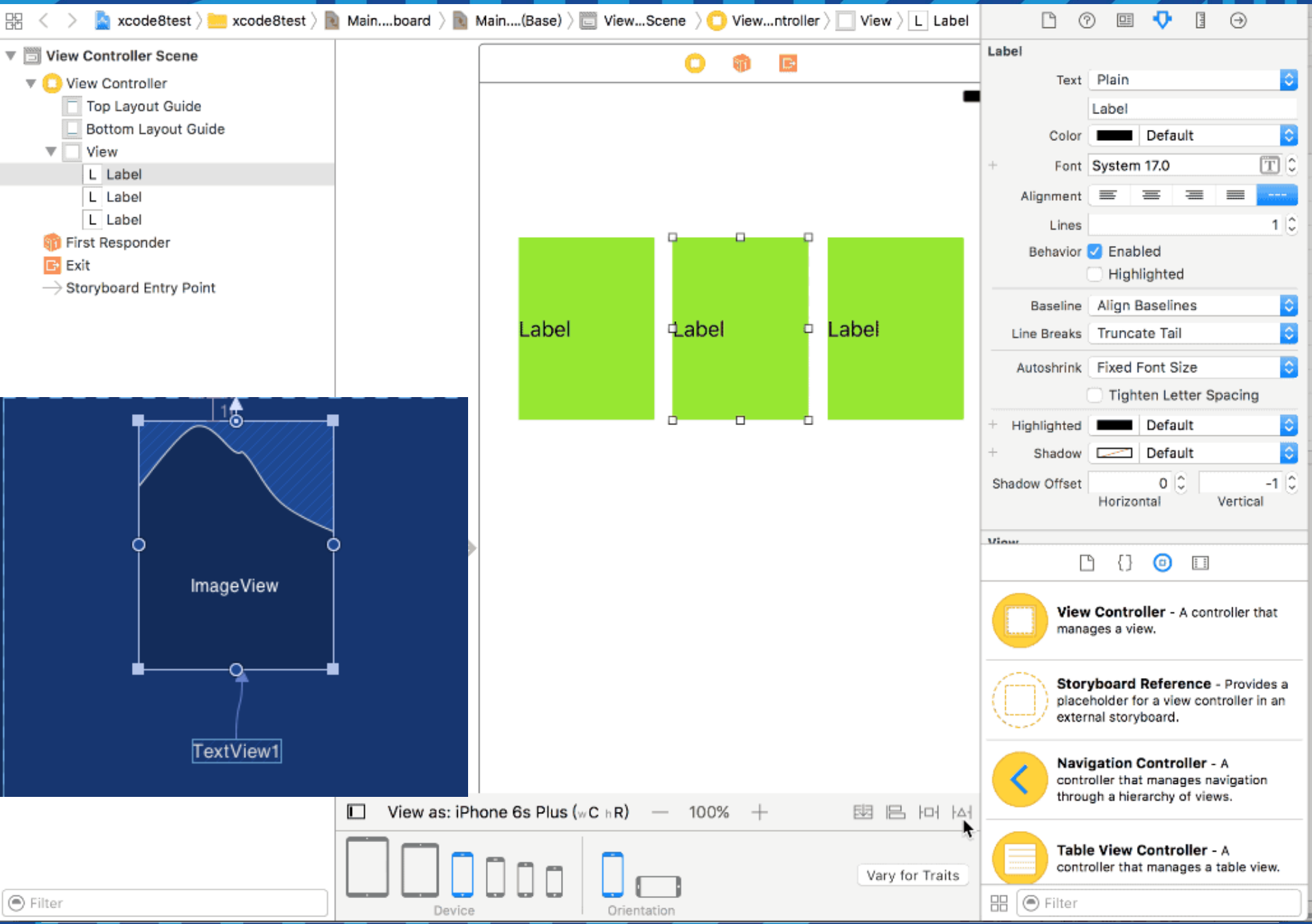
Color
Default
Font
System 17.0
Alignment
Lines
1
Behavior
Enabled
Highlighted
Baseline
Align Baselines
Line Breaks
Truncate Tail
Autoshrink
Fixed Font Size
Tighten Letter Spacing
Highlighted
Default
Shadow
Default
Shadow Offset
0
-1
Horizontal
Vertical
View
Mode
Left
Label
Label - A variably sized amount of static text.
Button
Button - Intercepts touch events and sends an action message to a target object when it's tapped.
1
2
Segmented Control - Displays multiple segments, each of which functions as a discrete button.


xcode8test
xcode8test
Main....board
Main....(Base)
View...Scene
View...ntroller
View
Label
View Controller Scene
View Controller
Top Layout Guide
Bottom Layout Guide
View
Label
Label
Label
First Responder
Exit
Storyboard Entry Point
Label
Label
Label
Label
Text
Plain
Label
Color
Default
Font
System 17.0
Alignment
Lines
1
Behavior
Enabled
Highlighted
Baseline
Align Baselines
Line Breaks
Truncate Tail
Autoshrink
Fixed Font Size
Tighten Letter Spacing
Highlighted
Default
Shadow
Default
Shadow Offset
0
-1
Horizontal
Vertical
ImageView
TextView1
View Controller - A controller that manages a view.
Storyboard Reference - Provides a placeholder for a view controller in an external storyboard.
Navigation Controller - A controller that manages navigation through a hierarchy of views.
Table View Controller - A controller that manages a table view.
View as: iPhone 6s Plus (wC hR)
100%
Vary for Traits
Device
Orientation
Filter
Filter

Storyboard的弊端

- 难以维护？ 在文本模式下修改困难
- 多人协作？ 同时修改导致冲突
- Storyboard占用太多内存，导致Xcode卡顿和崩溃
- Xcode打开Storyboard文件即会产生修改
- 对于初学者，错误定位困难

- Storyboard的未来是光明的

Storyboard UI 开发实践

- 按照业务模块分成多个Storyboard，每人负责的模块避免交叉
- 每个storyboard不要超过10个页面
- Refactor Storyboard重构
- Container，Xib，自定义View复用UI模块
- 复杂的输入表单，建议用SwiftyForm框架

Android vs Swift iOS框架比较

- Swift开源框架已经很多了
- Swift也可以使用OC开源框架，但不推荐

- 网络请求框架
- JSON解析框架
- ReactiveX框架
- 图片缓存框架

网络请求和图片缓存框架

Android

- Volley
- OkHTTP
- Retrofit

Swift iOS

- AFNetworking
- Alamofire
- Moya

图片缓存

- ImageLoader
- Glide
- Fresco

图片缓存

- SDWebImage
- HanekeSwift

JSON解析框架

Android

- Gson
- Jackson
- FastJson

- 系统自带org.json

Swift iOS

- ObjectMapper
- Argo+Curry
- SwiftyJson

- NSJSONSerialization

ReactiveX函数响应式编程

Android

- RxJava
- RxAndroid

- OkHTTP + Retrofit + RxAndroid

Swift iOS

- ReactiveCocoa
- RxSwift

- Alamofire + Moya + RxSwift

开发工具比较

- Android： Android Studio，Eclipse ADT
- iOS： Xcode， JetBrains Appcode

- Xcode上手较难，挑战开发习惯
- Xcode速度快，但不够稳定，经常Crash
- Android Emulator vs. iOS Simulator

包管理器&构建工具

Android

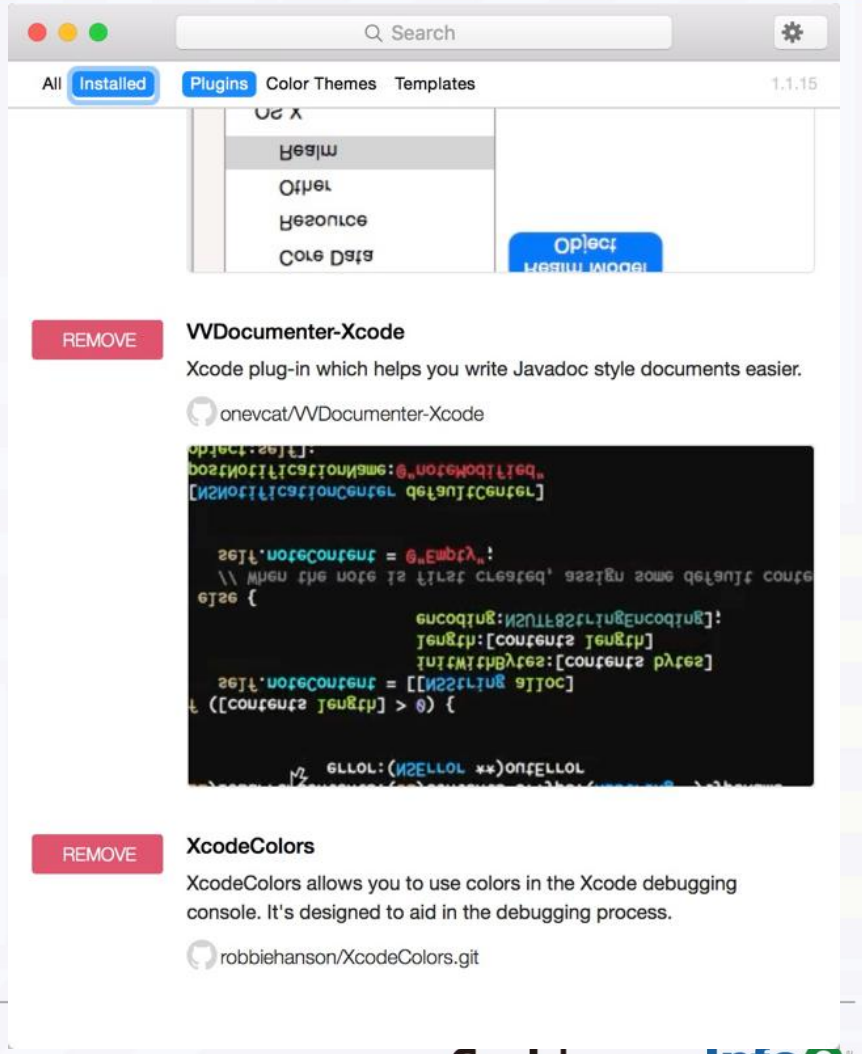
- Ant
- Maven
- Gradle ✓

Swift iOS

- CocoaPods
- Carthage ✓
- Swift Package Manager

Xcode包管理器Alcatraz

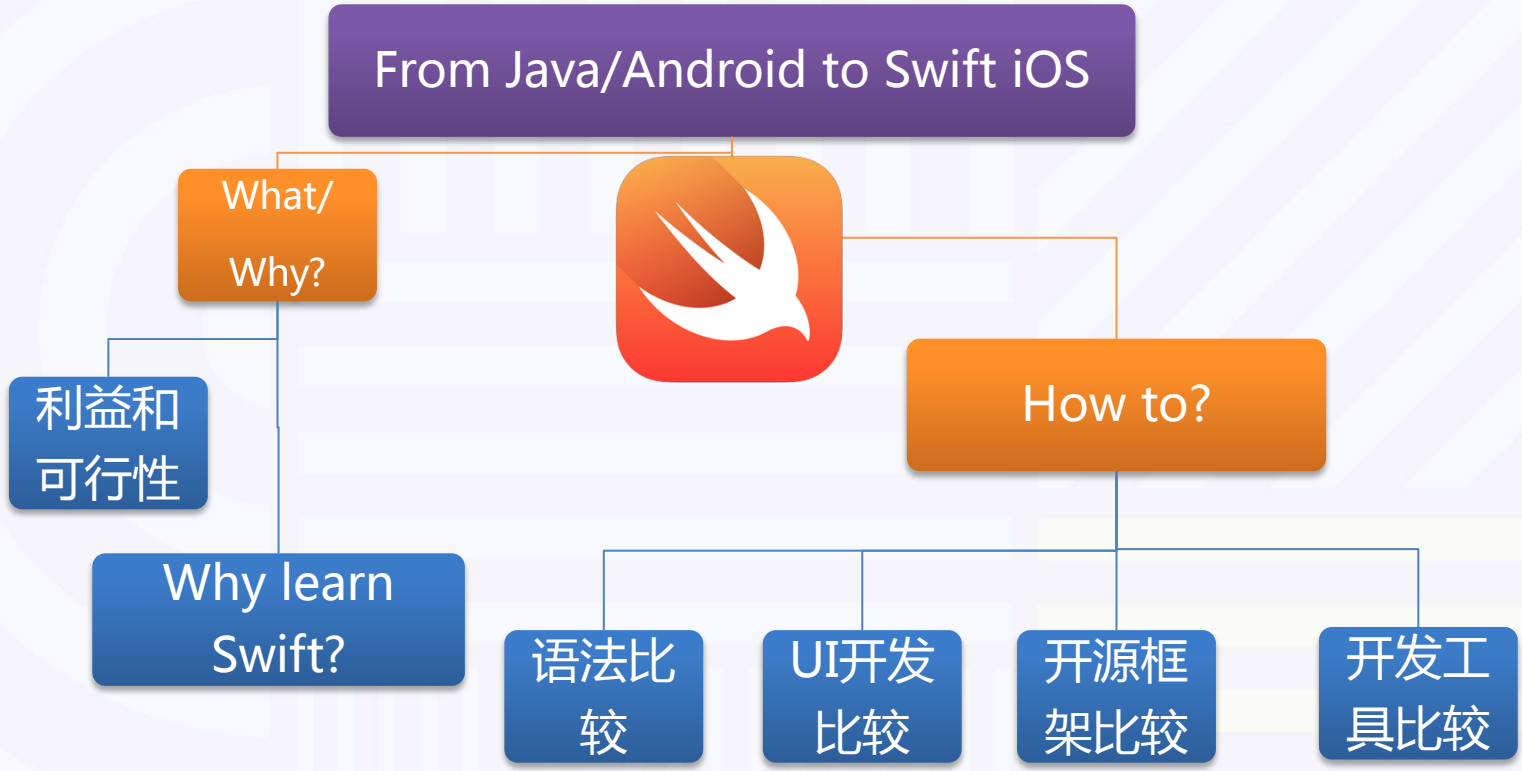
提供Xcode插件，
模板和配色方案



$ jazzy♫

Soulful docs for Swift & Objective-C

总结



Swift语法现代，上手容易，你值得拥有

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THANKS

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