CollectionKit Workshop

Luke Zhao

Luke

- 北美工作的iOS猿
- 开源框架Hero和CollectionKit作者
- 苹果，Pinterest，Snapchat (Bitmoji)

- https://github.com/HeroTransitions/Hero
- https://github.com/SoySauceLab/CollectionKit

App Store Preview

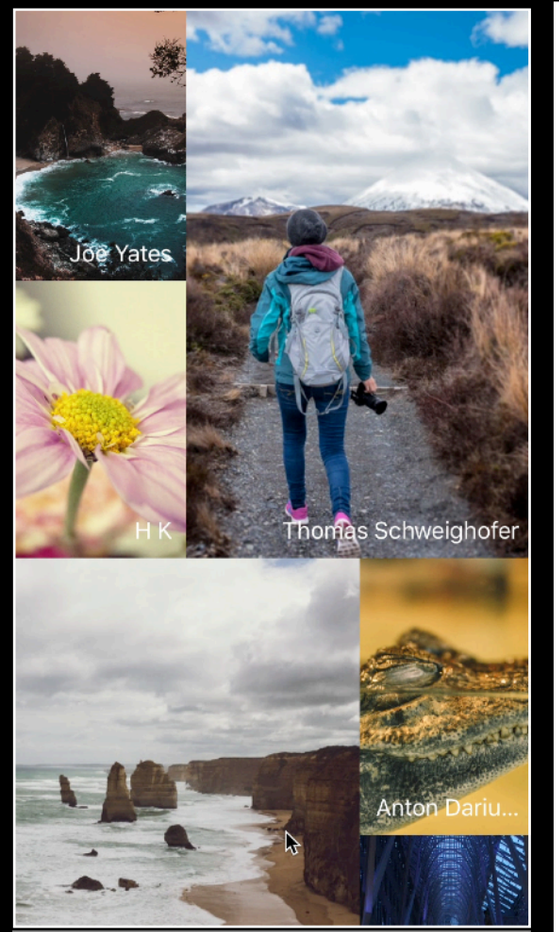
BEST OF 2017

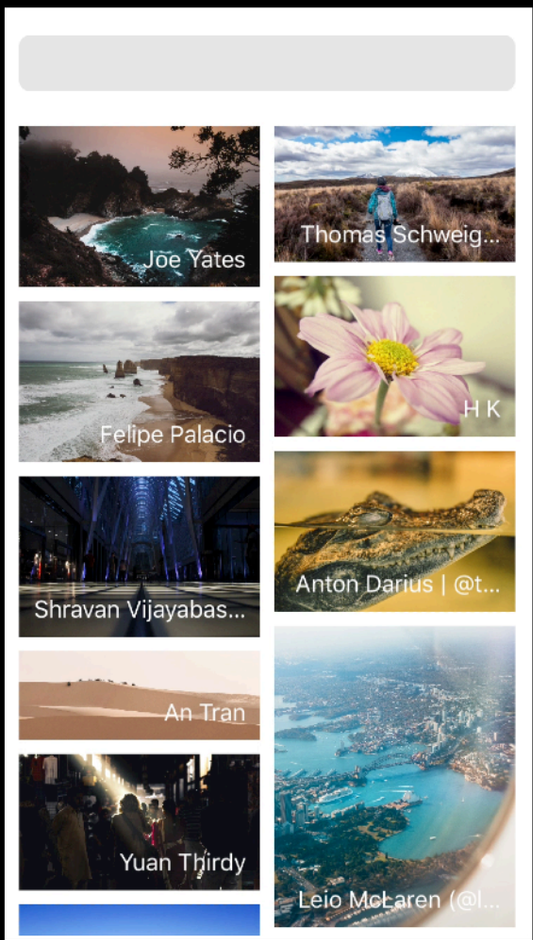
Top Apps Charts

Bitmoji Utilities	VIEW	Snapchat Photo & Video	VIEW
YouTube: Watch, Listen, Stream Photo & Video	VIEW	Messenger Social Networking	VIEW
Instagram Photo & Video	VIEW	Facebook Social Networking	VIEW
Google Maps - Transit & Food Navigation	VIEW	Netflix Entertainment	VIEW
Spotify Music Music	VIEW	Uber Travel	VIEW
Gmail - Email by Google Productivity	VIEW	Pandora Music Music	VIEW
Amazon - Shopping made easy Shopping	VIEW	WhatsApp Messenger Social Networking	VIEW
Wish - Shopping Made Fun Shopping	VIEW	Twitter News	VIEW
SoundCloud - Music & Audio Music	VIEW	Google Chrome Utilities	VIEW

日程

- CollectionKit简介
- 微博
- 图片库
- 休息（5分钟）
- 图片搜索
- 内部构造与设计思路





Requirements

- Workshop Project 下载链接：https://github.com/lkzhao/CollectionKitWorkshop

- Xcode 9.4.1

- UICollectionView的一些概念

- 无需Auto Layout，Storyboard

- 一点点几何数学（计算大小，位置）

CollectionKit

- Reimagining UICollectionView

- 代替UICollectionView。显示集合视图
- 数据驱动，更简单更高效
- 提供了布局和动画系统
- 为Swift设计，用Swift实现

```
collectionView.provider = ComposedProvider(sections: [
    FriendSectionProvider(friends: friends),
    SubscriptionSectionProvider(subscriptions: subscriptions),
    ForYouSectionProvider(stories: stories),
])
```

Joe Yates
Thomas Schweig...
Felipe Palacio
H K
Shravan Vijayabas...
Anton Darius | @t...
An Tran
Yuan Thirdy
Leio McLaren (@l...
Creaslim

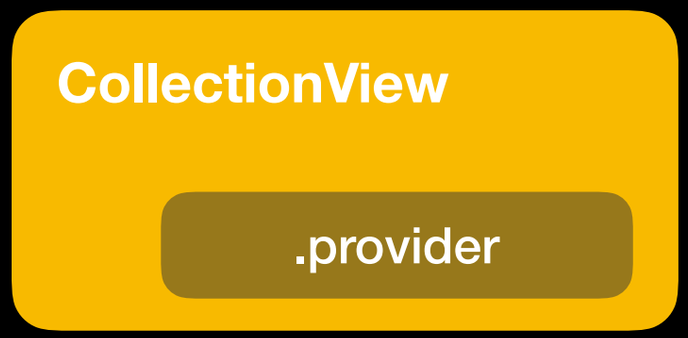
对比UICollectionView

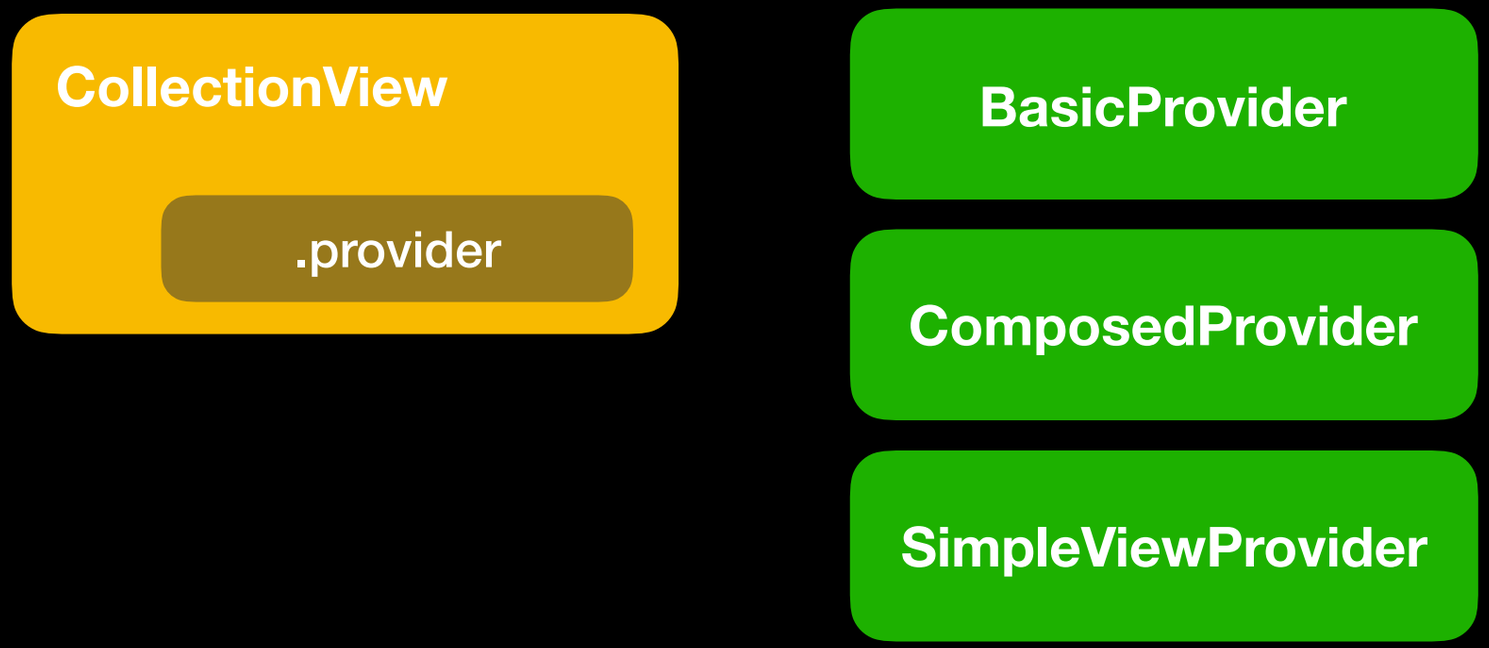
- 简单的管理各个Section的顺序和布局
- Cell无需是UICollectionViewCell的子类
- Type Safe, no more force casting
- 不再是一个黑盒子

对比IGListKit

- 数据管理层面非常相似
- 抛弃了和UICollectionView的连接，变得更加简洁
- 提供了布局和动画支持

Examples of things beyond the scope of IGListKit:
- **Advanced/custom UICollectionViewLayouts**
- **Sizing and layout (e.g. auto layout, estimated sizes)**
- **Render and display pipelines**


CollectionView
.provider


CollectionView
.provider
BasicProvider
ComposedProvider
SimpleViewProvider

CollectionView

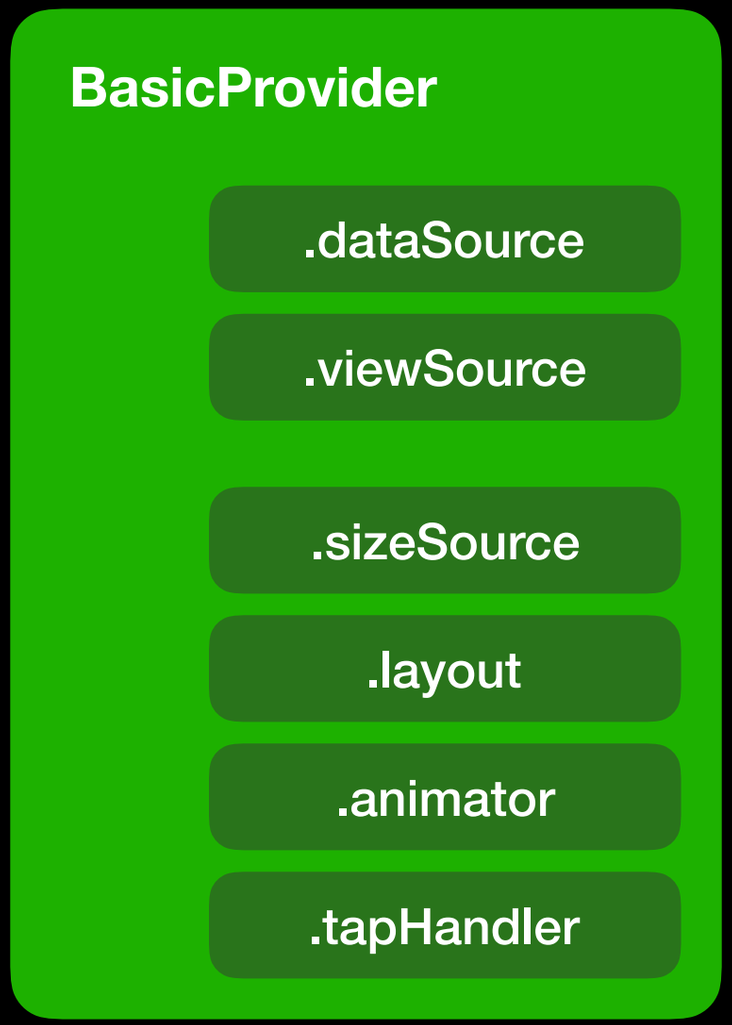
.provider

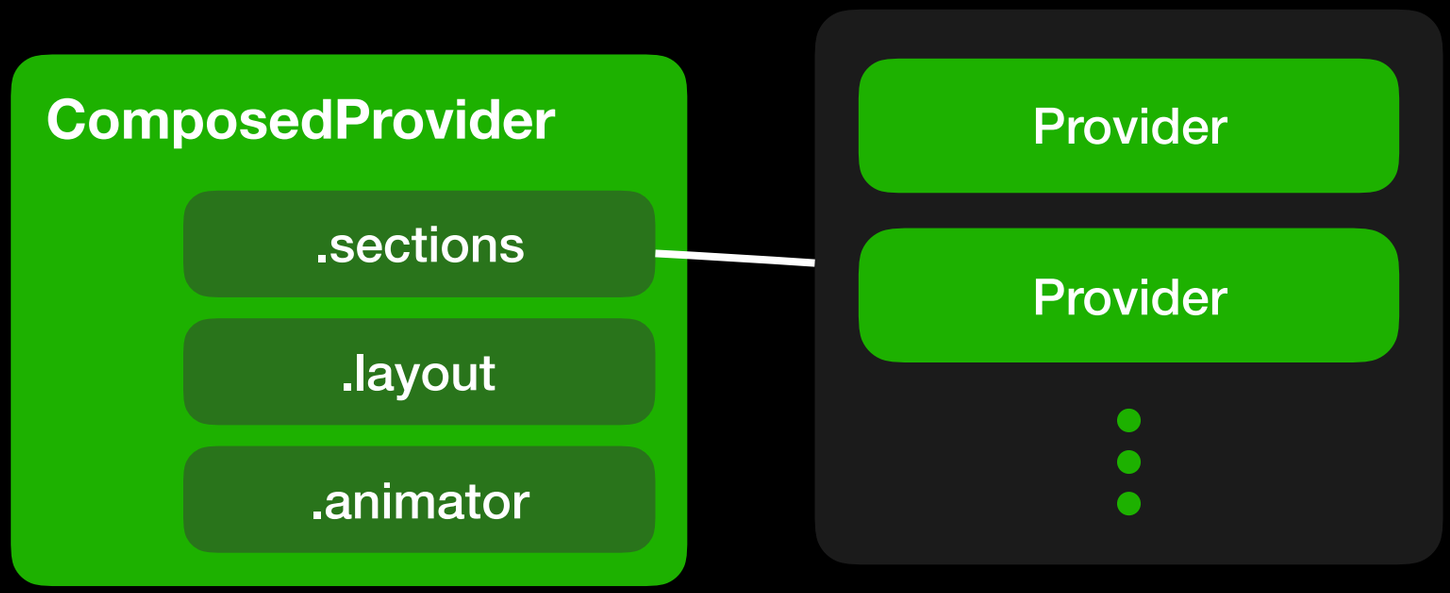
BasicProvider

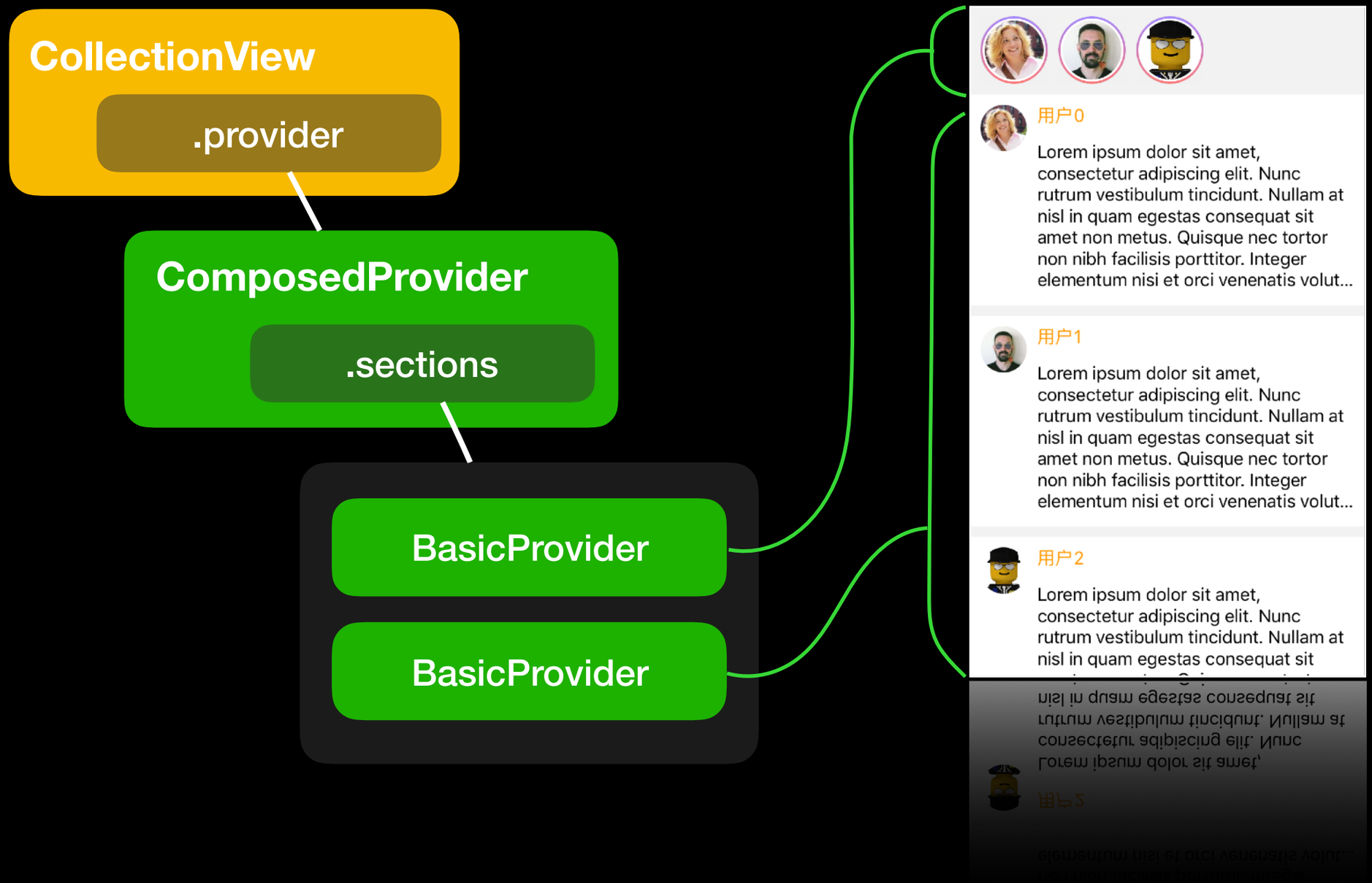
ComposedProvider

SimpleViewProvider

```
collectionView.provider = BasicProvider( … )
```


BasicProvider
.dataSource
.viewSource
.sizeSource
.layout
.animator
.tapHandler


ComposedProvider
.sections
.layout
.animator
Provider
Provider


CollectionView
.provider
ComposedProvider
.sections
BasicProvider
BasicProvider
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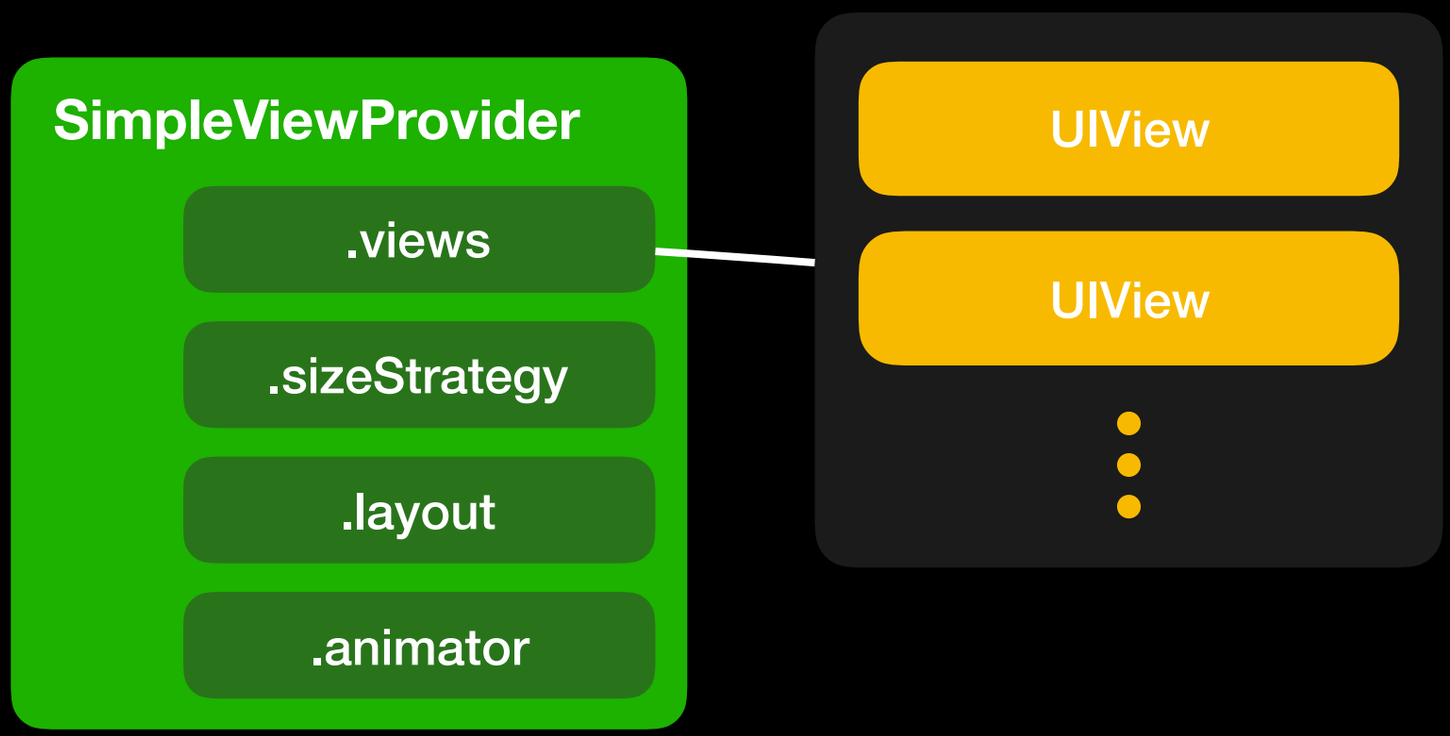
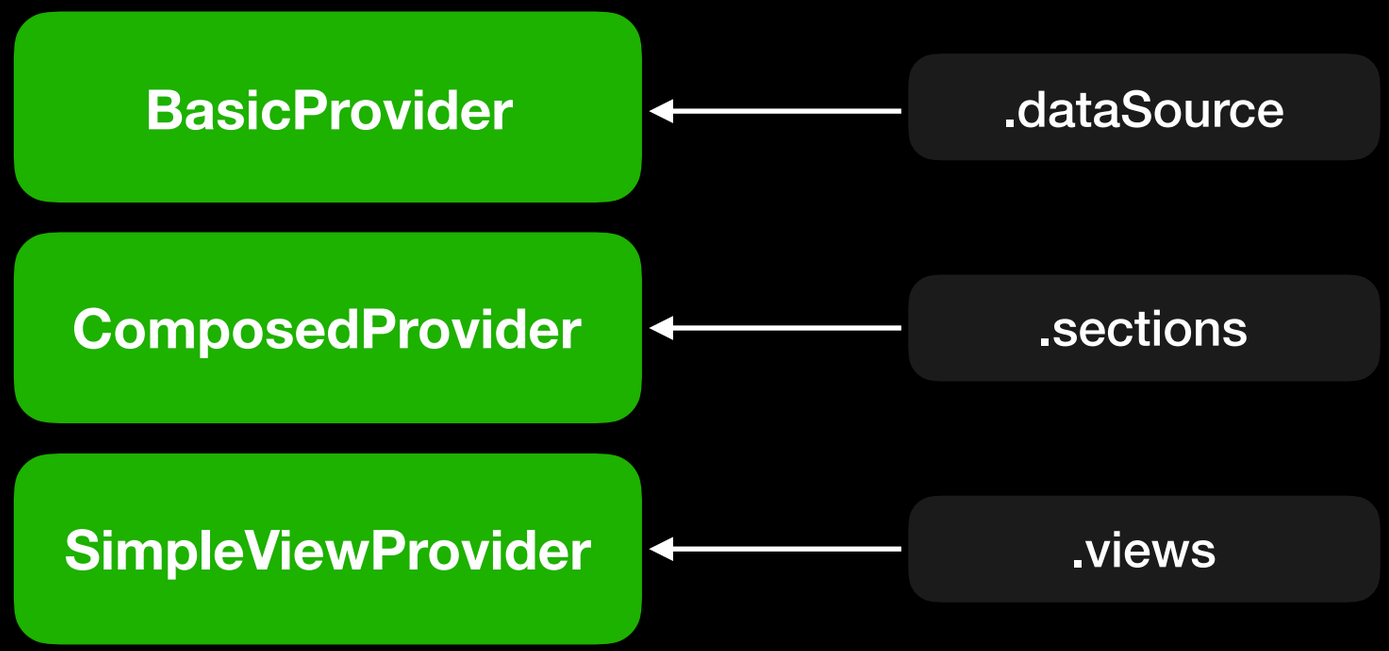

SimpleViewProvider
.views
.sizeStrategy
.layout
.animator
UIView
UIView


BasicProvider
.dataSource
ComposedProvider
.sections
SimpleViewProvider
.views

Let’s make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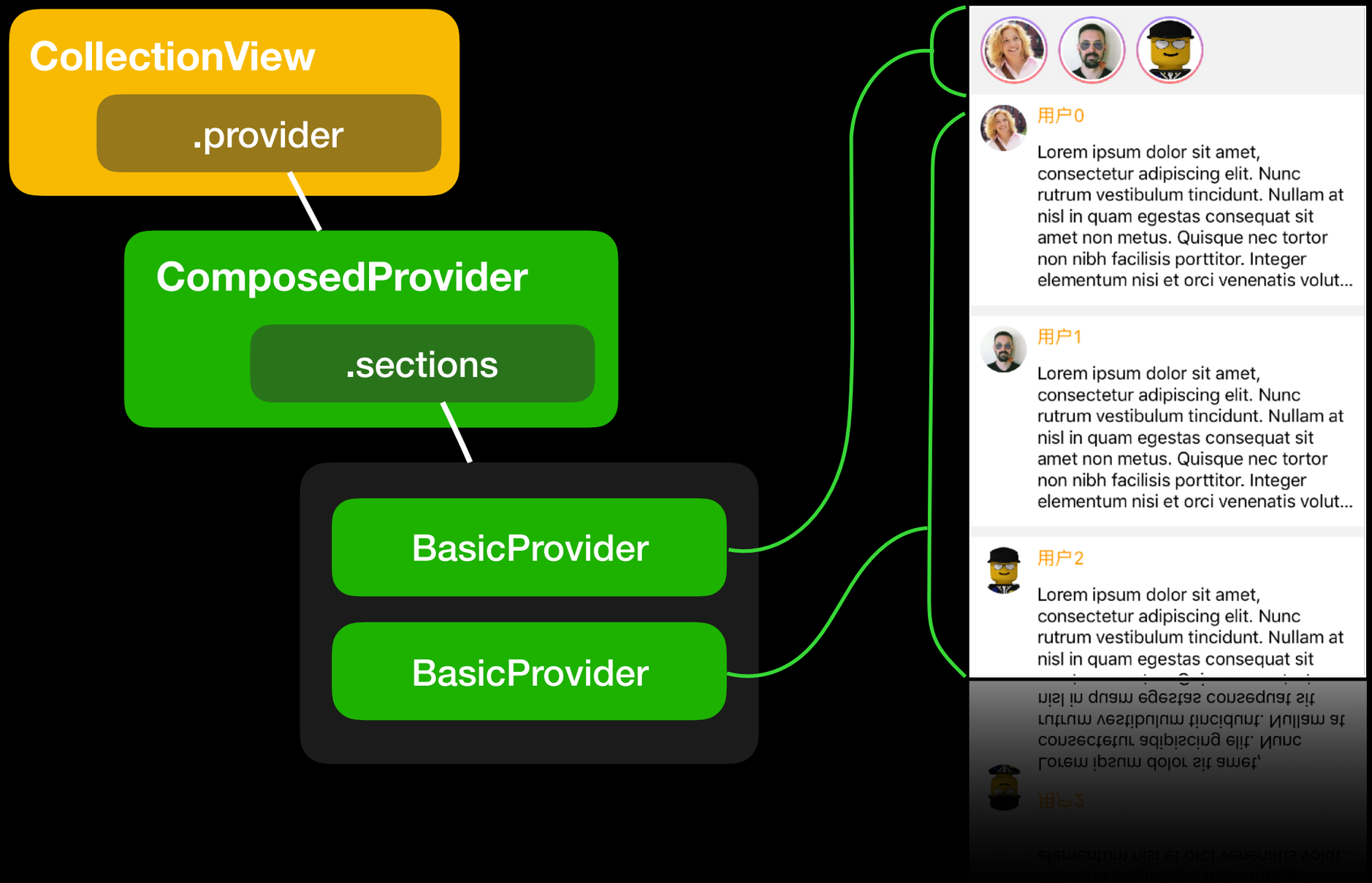
CollectionView
.provider
ComposedProvider
.sections
BasicProvider
BasicProvider
用户0
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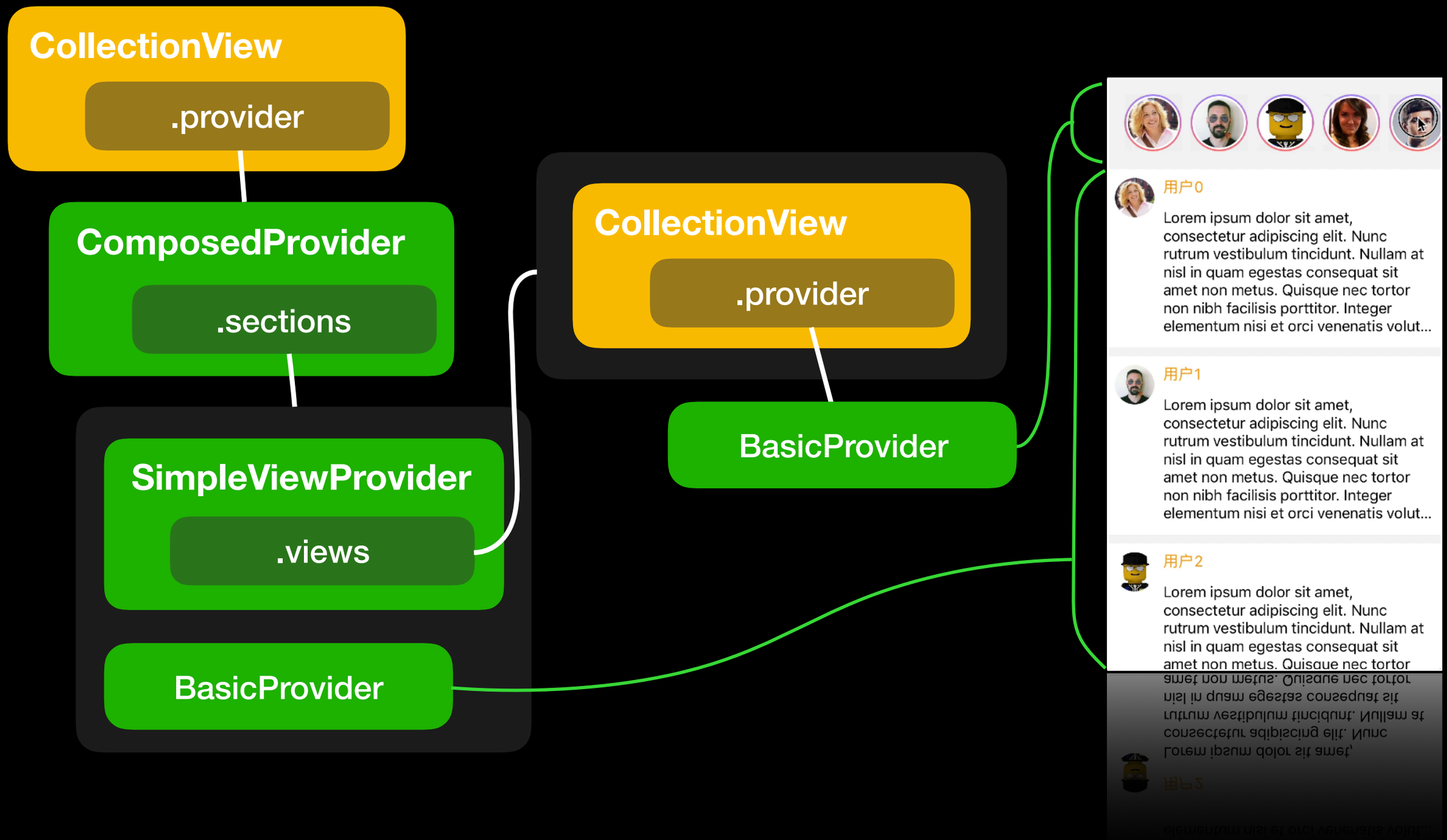
CollectionView
.provider
ComposedProvider
.sections
SimpleViewProvider
.views
BasicProvider
CollectionView
.provider
BasicProvider
用户0
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小结

- CollectionView
- BasicProvider, ComposedProvider, SimpleViewProvider
- 省去了
  - Cell Registration
  - Force Casting
  - 管理Section Indexes
- Delegate vs Declarative

Layout

FlowLayout

RowLayout

WaterfallLayout

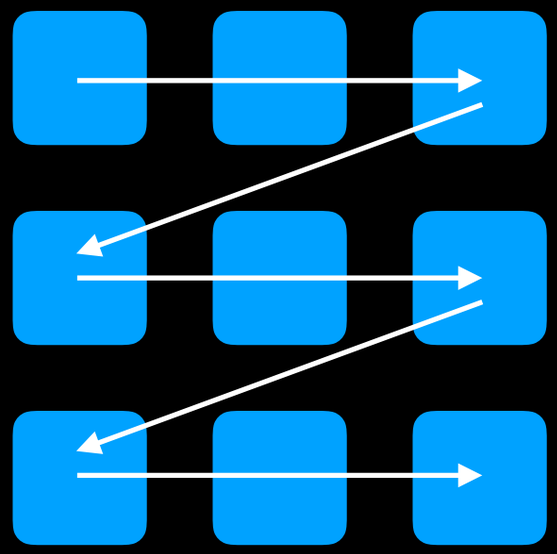
InsetLayout

TransposeLayout

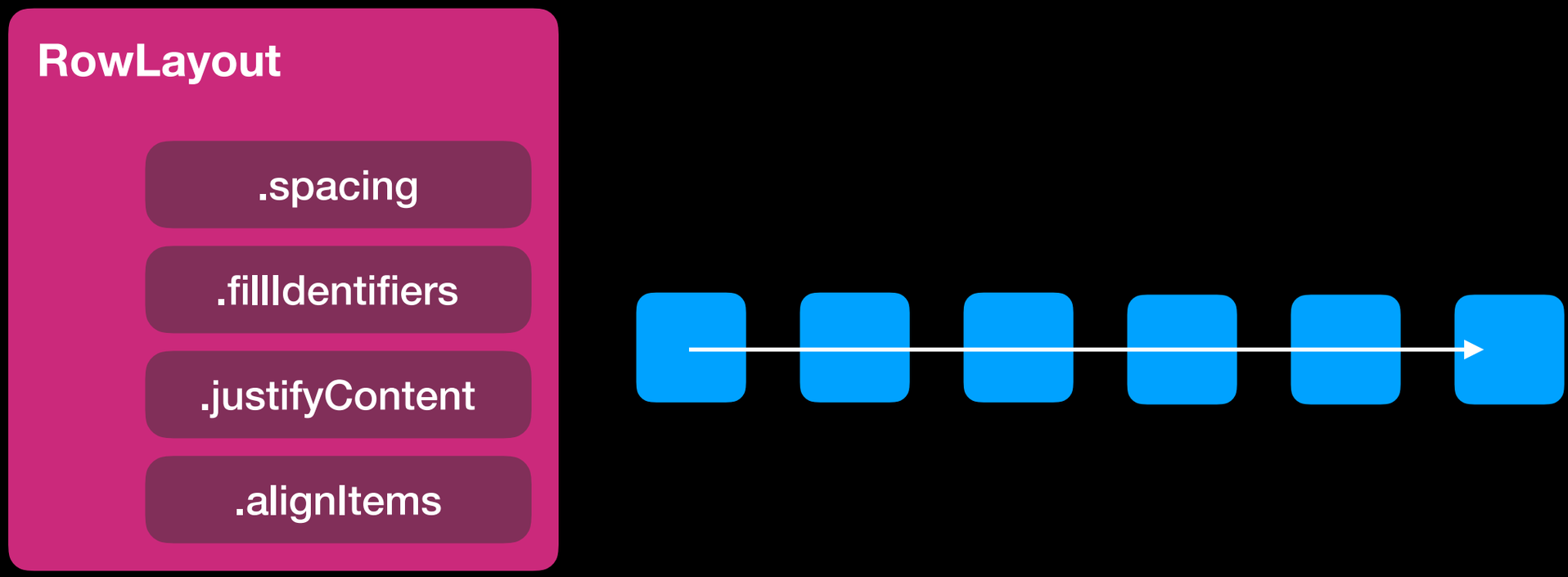
FlowLayout

FlowLayout

- .spacing
- .lineSpacing
- .interItemSpacing
- .justifyContent
- .alignItems
- .alignContent



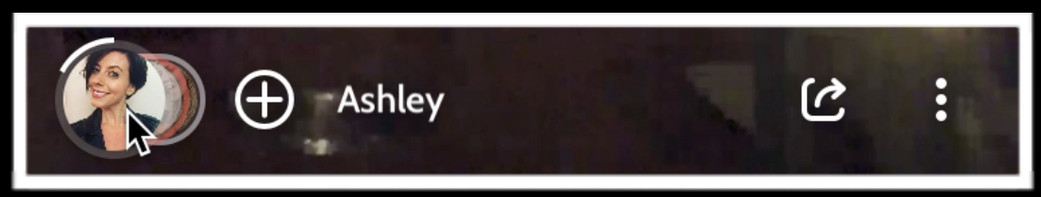
RowLayout


RowLayout
.spacing
.fillIdentifiers
.justifyContent
.alignItems

RowLayout

RowLayout

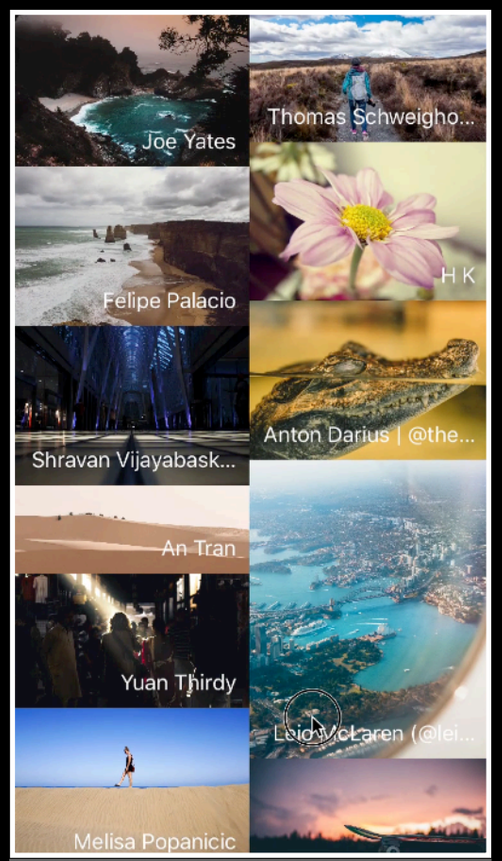
- .spacing
- .fillIdentifiers
- .justifyContent
- .alignItems



WaterfallLayout

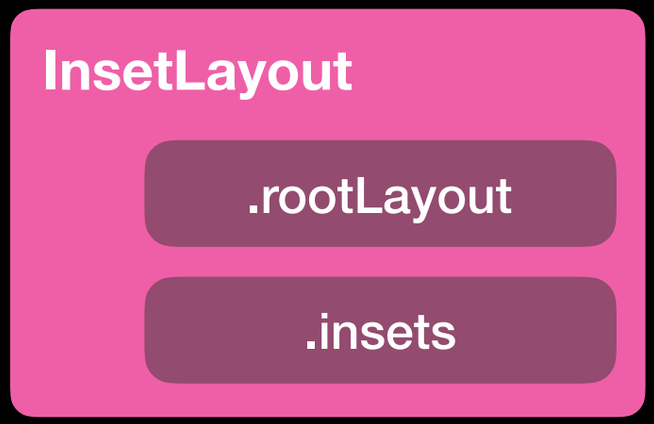
WaterfallLayout

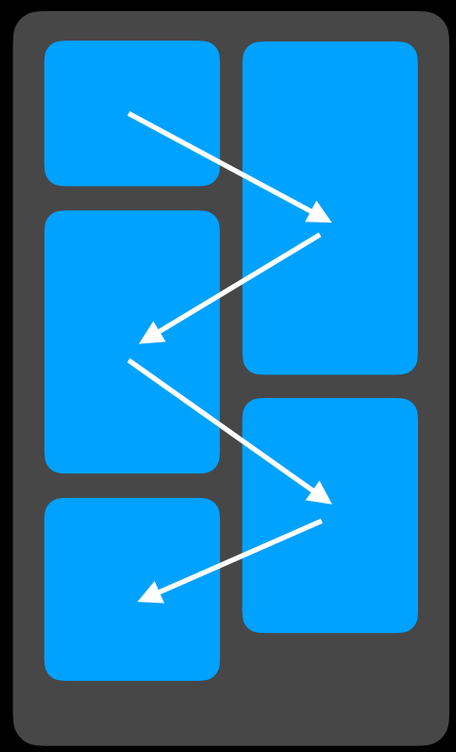
- .spacing
- .columns



WaterfallLayout(columns: 2, spacing: 10)
WaterfallLayout(columns: 2, spacing: 0)

InsetLayout



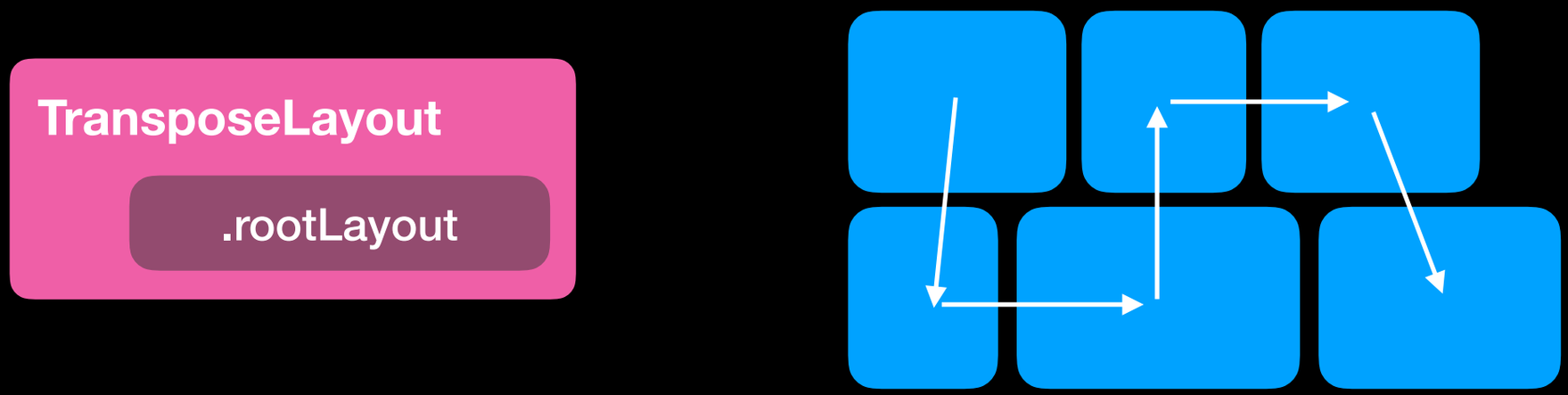


InsetLayout(WaterfallLayout(columns: 2, spacing: 10) ,
insets: UIEdgeInsets(top: 10, left: 10, bottom: 10, right: 10))

OR

WaterfallLayout(columns: 2, spacing: 10)
.inset(by: UIEdgeInsets(top: 10, left: 10, bottom: 10, right: 10))

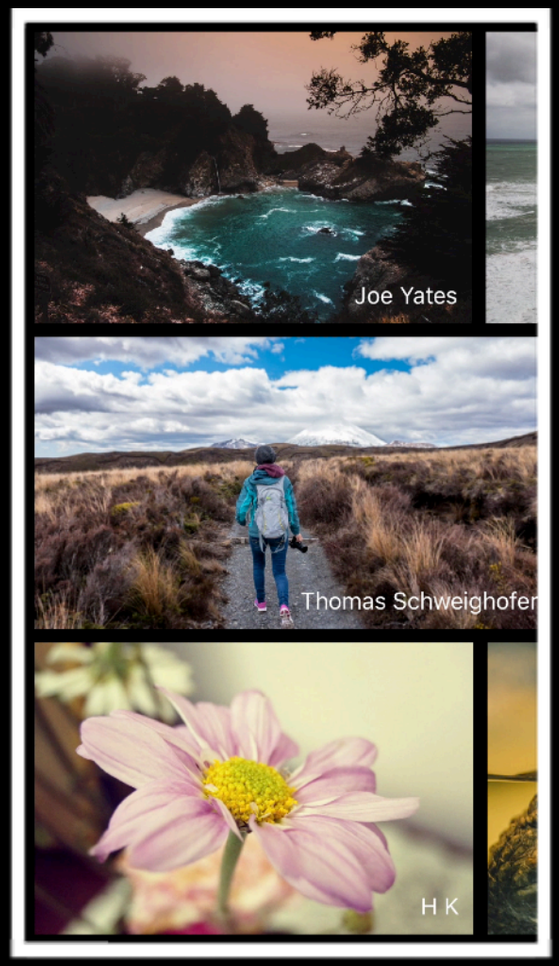
TransposeLayout



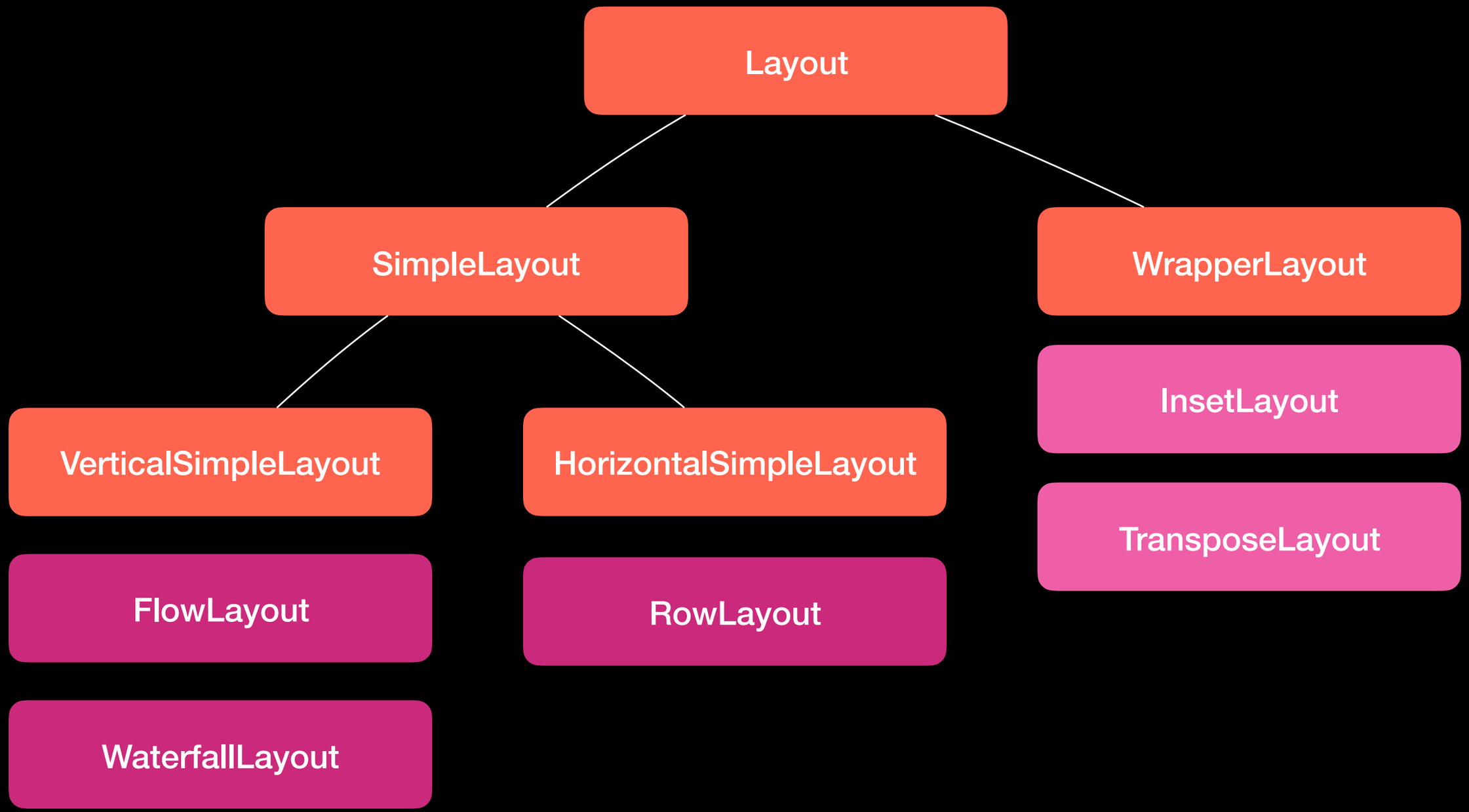
TransposeLayout(WaterfallLayout(columns: 2, spacing: 10))

OR

WaterfallLayout(columns: 2, spacing: 10).transposed()




```
InsetLayout( TransposeLayout( WaterfallLayout(columns: 3, spacing: 10) ) ,
                insets: UIEdgeInsets(top: 10, left: 10, bottom: 10, right: 10) )
```


Layout
SimpleLayout
WrapperLayout
VerticalSimpleLayout
HorizontalSimpleLayout
InsetLayout
TransposeLayout
FlowLayout
RowLayout
WaterfallLayout

Layout

```swift
// 返回整个布局完成后的大小
// 同 `collectionViewContentSize` 相似
var contentSize: CGSize

// 布局计算
// 同 `prepare()` 相似
func layout(context: LayoutContext)

// 返回相对应Cell的Frame
func frame(at: Int) -> CGRect

// 返回在visibleFrame里面可见Cell的indexes
// 同 `layoutAttributesForElements(in rect: CGRect)` 相似
func visibleIndexes(visibleFrame: CGRect) -> [Int]
```

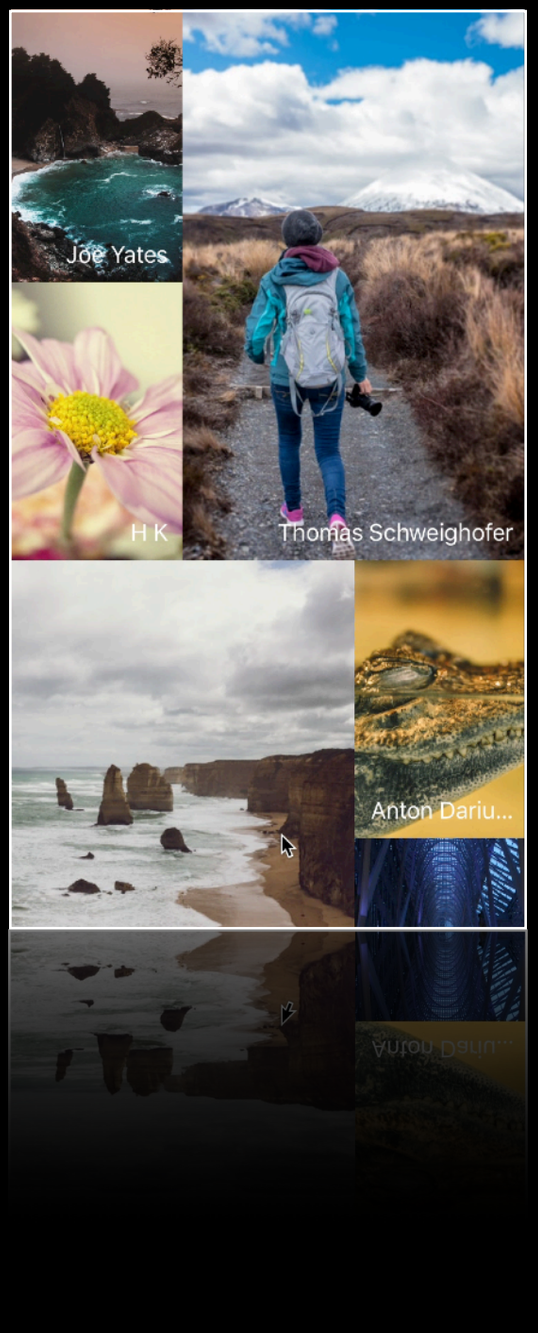
SimpleLayout

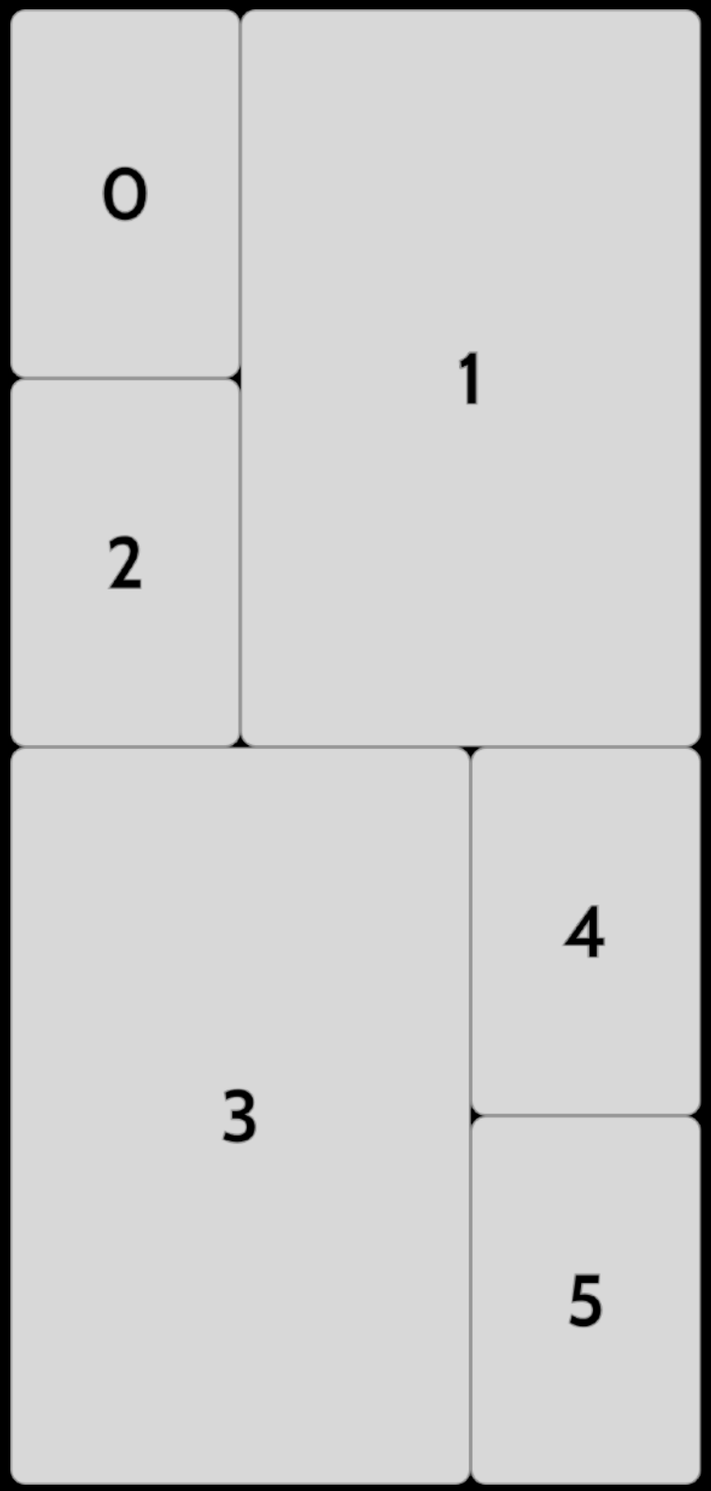
VerticalSimpleLayout

HorizontalSimpleLayout

```
// 根据LayoutContext，返回所有Cell的Frames
func simpleLayout(context: LayoutContext) -> [CGRect]
```

Let’s make




0
1
2
3
4
5

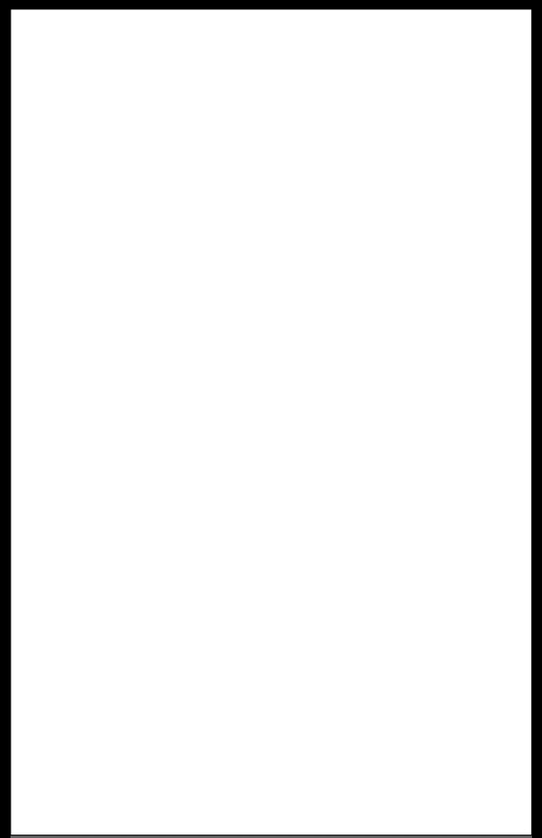
Layout 小结

- 上手快
- 每个Section都可以有不同的Layout
- 简化了布局实现
- 可以通过Helper Layout来完成一些修改

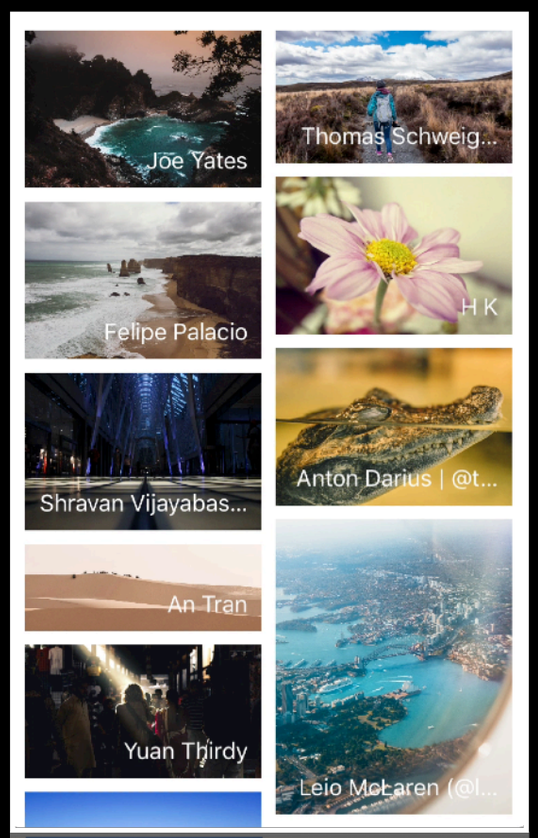
Break

5 min

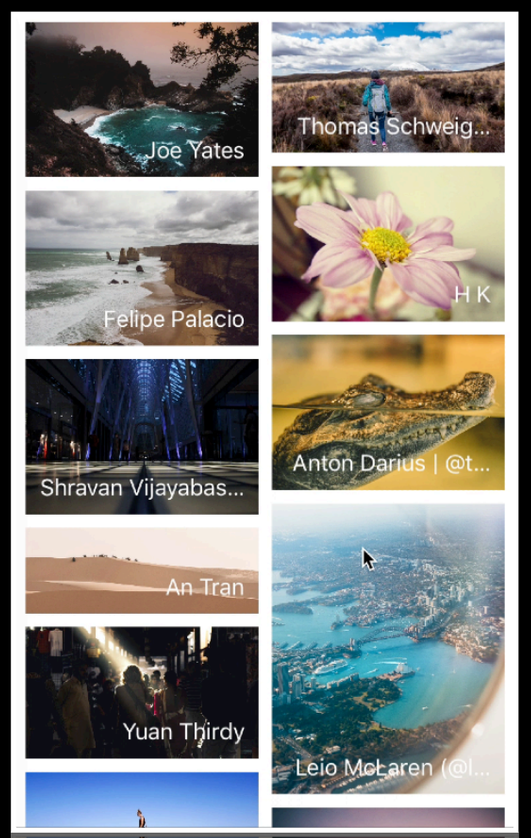
Animator



Insertion / Deletion



Move

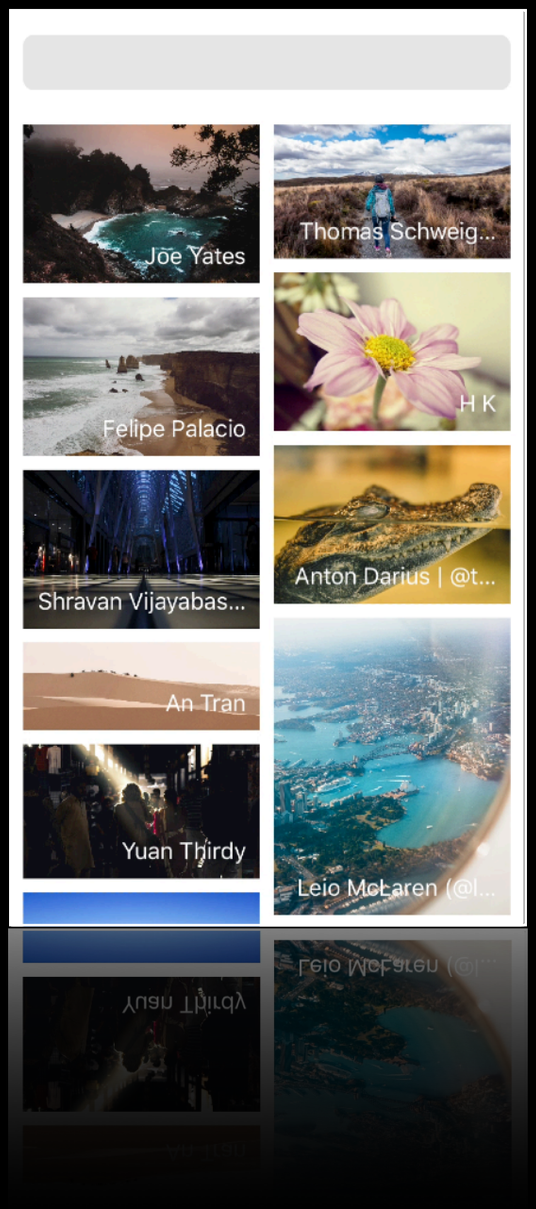


Scroll

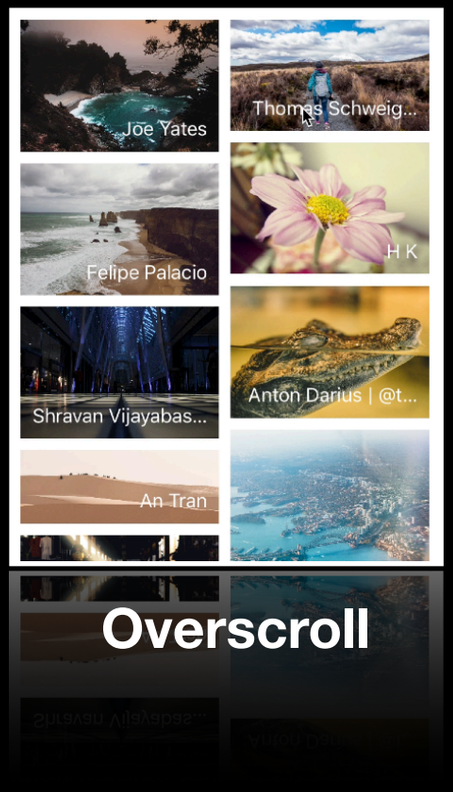
Animator

```swift
/// Called when CollectionView inserts a view into its subviews.
///
/// Perform any insertion animation when needed
///
func insert(collectionView: CollectionView, view: UIView,
            at: Int, frame: CGRect)

/// Called when CollectionView deletes a view from its subviews.
///
/// Perform any deletion animation, then
/// call `view.recycleForCollectionKitReuse()`
/// after the animation finishes
///
func delete(collectionView: CollectionView, view: UIView)

/// Called when:
///   * the view has just been inserted
///   * the view's frame changed after `reloadData`
///   * the view's screen position changed when user scrolls
///
func update(collectionView: CollectionView, view: UIView,
            at: Int, frame: CGRect)
```

Let’s make

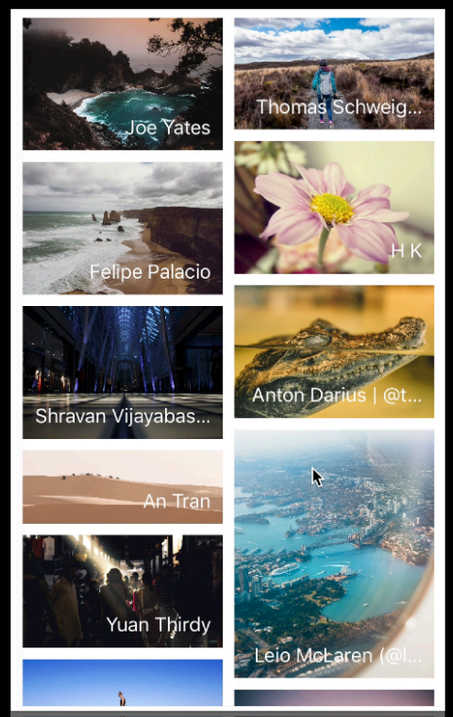

Joe Yates
Thomas Schweig...
Felipe Palacio
H K
Shravan Vijayabas...
Anton Darius | @t...
An Tran
Yuan Thirdy
Leio McLaren (@l...

Animator



Overscroll

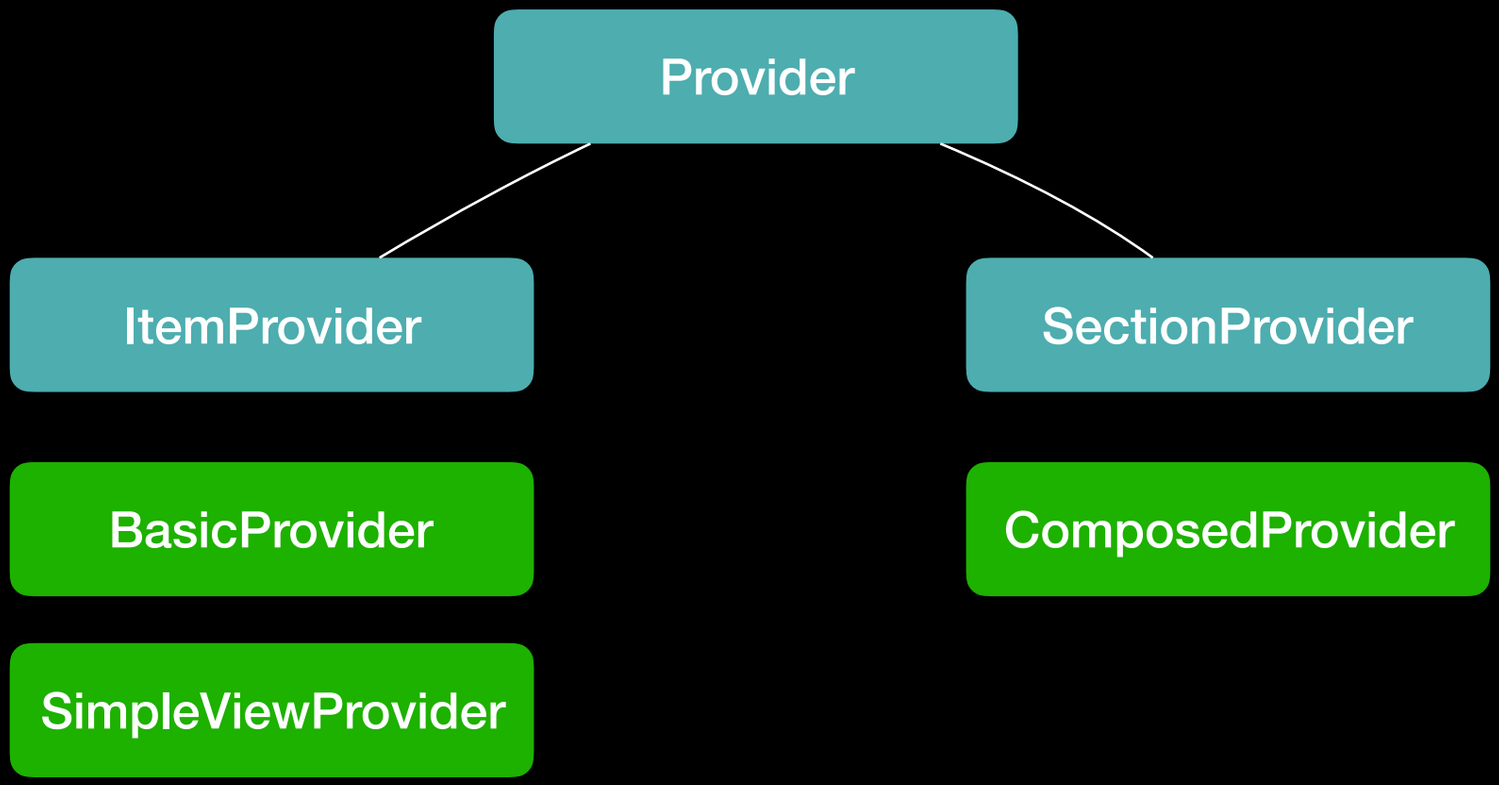
Rotate



Wobble

Shrink

Shrink


Provider
ItemProvider
SectionProvider
BasicProvider
ComposedProvider
SimpleViewProvider

Provider

```swift
protocol Provider {
  var identifier: String? { get }

  // data
  var numberOfItems: Int { get }
  func identifier(at: Int) -> String

  // layout
  func layout(collectionSize: CGSize)
  func visibleIndexes(visibleFrame: CGRect) -> [Int]
  var contentSize: CGSize { get }
  func frame(at: Int) -> CGRect

  // ……
}
```

ItemProvider

```swift
public protocol ItemProvider: Provider {
  func view(at: Int) -> UIView
  func update(view: UIView, at: Int)

  func didTap(view: UIView, at: Int)
}
```

SectionProvider

```swift
public protocol SectionProvider: Provider {
  func section(at: Int) -> Provider?
}
```

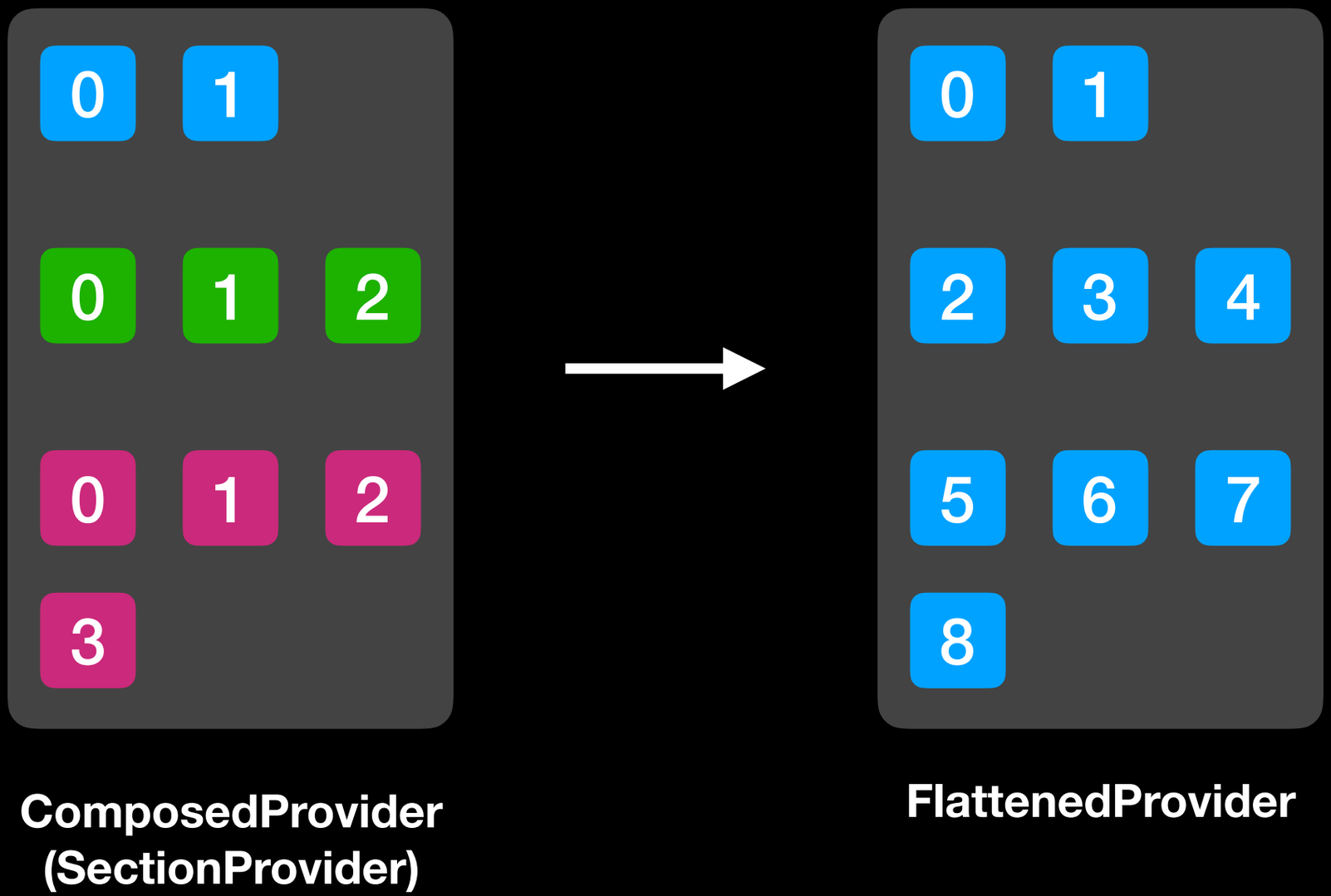
ItemProvider

```swift
protocol Provider {
  func flattenedProvider() -> ItemProvider
  // ……
}

extension ItemProvider {
  public func flattenedProvider() -> ItemProvider {
    return self
  }
}
```

SectionProvider

```swift
extension SectionProvider {
  public func flattenedProvider() -> ItemProvider {
    return FlattenedProvider(provider: self)
  }
}
```

Flattening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1
2
3
0
1
2
3
4
5
6
7
8
ComposedProvider
(SectionProvider)
FlattenedProvider

ReloadData

1. **Flatten the provider**
   - `flattenedProvider = provider.flattenedProvider()`
2. **Ask the provider to layout**
   - `flattenedProvider.layout(collectionSize:)`
3. **Retrieve a list of visible indexes**
   - `flattenedProvider.visibleIndexes(visibleFrame:)`
4. **Calculate a diff between old visible cells and new visible cells**
5. **Remove deleted cells**
6. **Insert newly added cells**

Scrolling

When contentOffset changed

1. ~~**Flatten the provider**~~
   - ~~`flattenedProvider = provider.flattenedProvider()`~~
2. ~~**Ask the provider to layout**~~
   - ~~`flattenedProvider.layout(collectionSize:)`~~
1. **Retrieve a list of visible indexes**
   - `flattenedProvider.visibleIndexes(visibleFrame:)`
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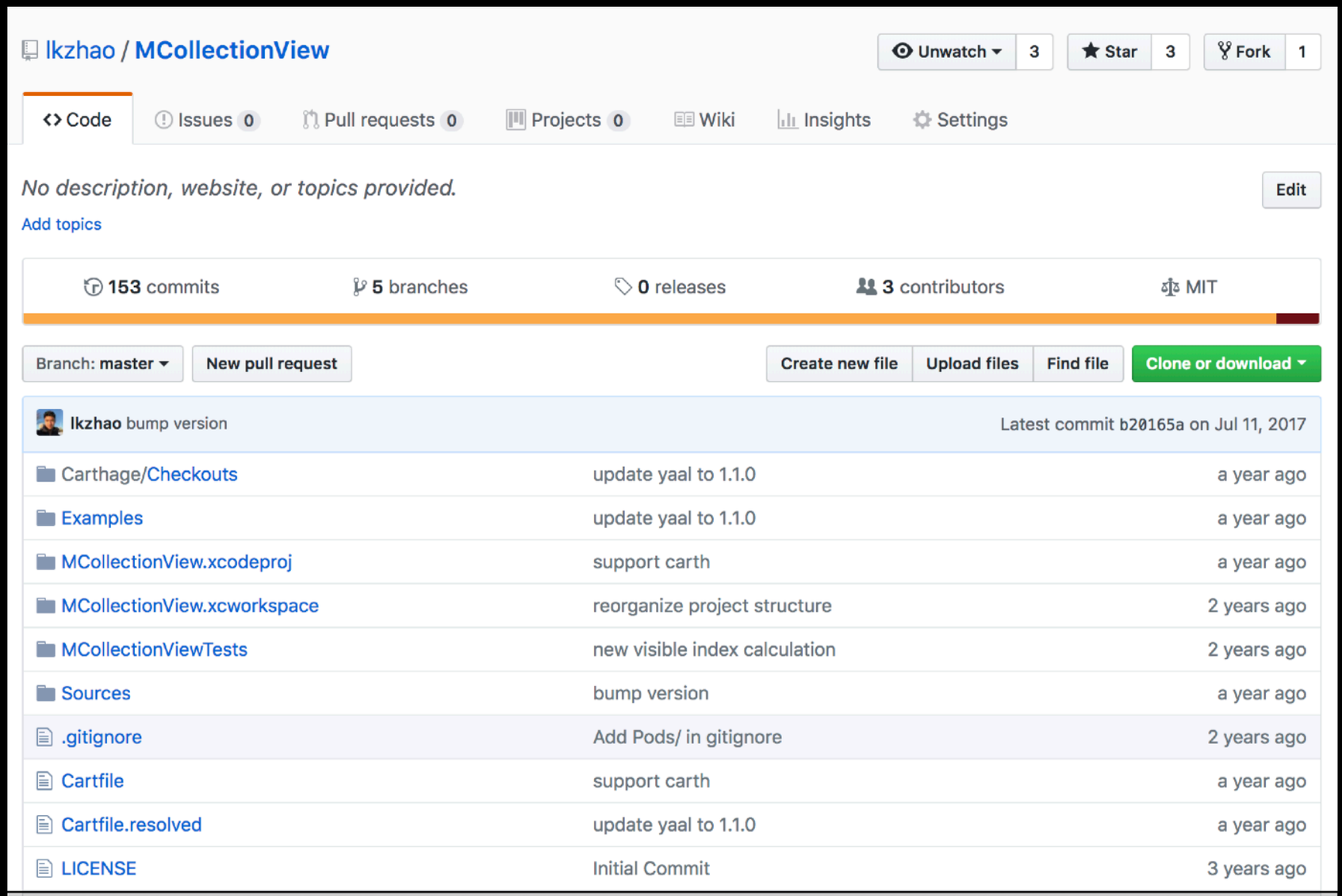
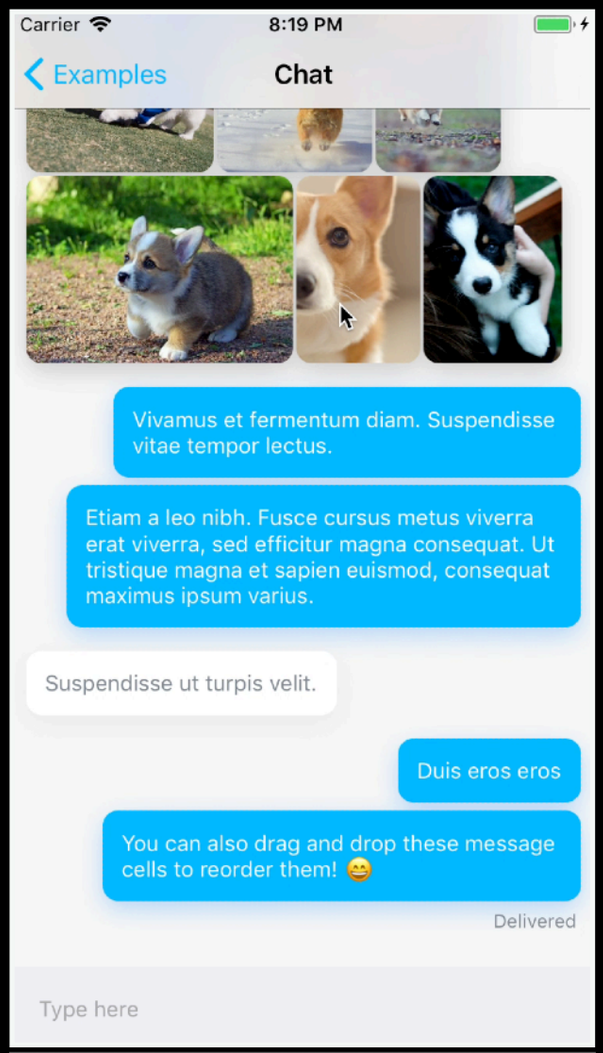
CollectionKit的前身





The End

Thanks for joining