

移动平台开发技术

iOS开发中的UI基础

章国锋 2025春夏学期

课程开始前...

Before everything...



HTML App

2007



UIKit

2008



Swift

2014



SwiftUI

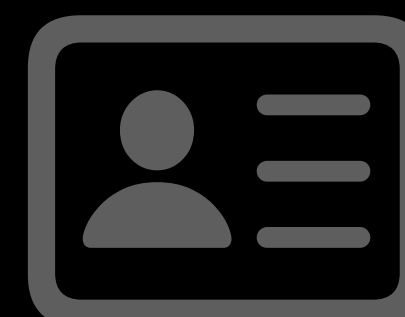
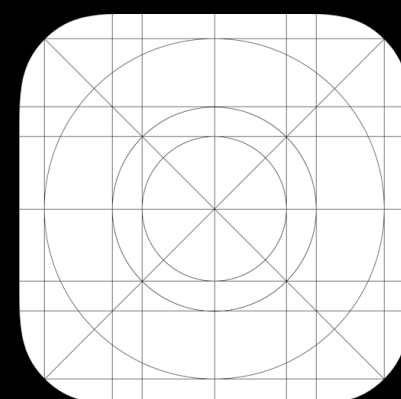
2019

iOS开发流程——从代码到上架

How to develop an iOS app



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从头开始创建一个App原型

你需要知道的SwiftUI细节

现代UI/UX设计趋势与实现方法

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你需要知道的SwiftUI细节

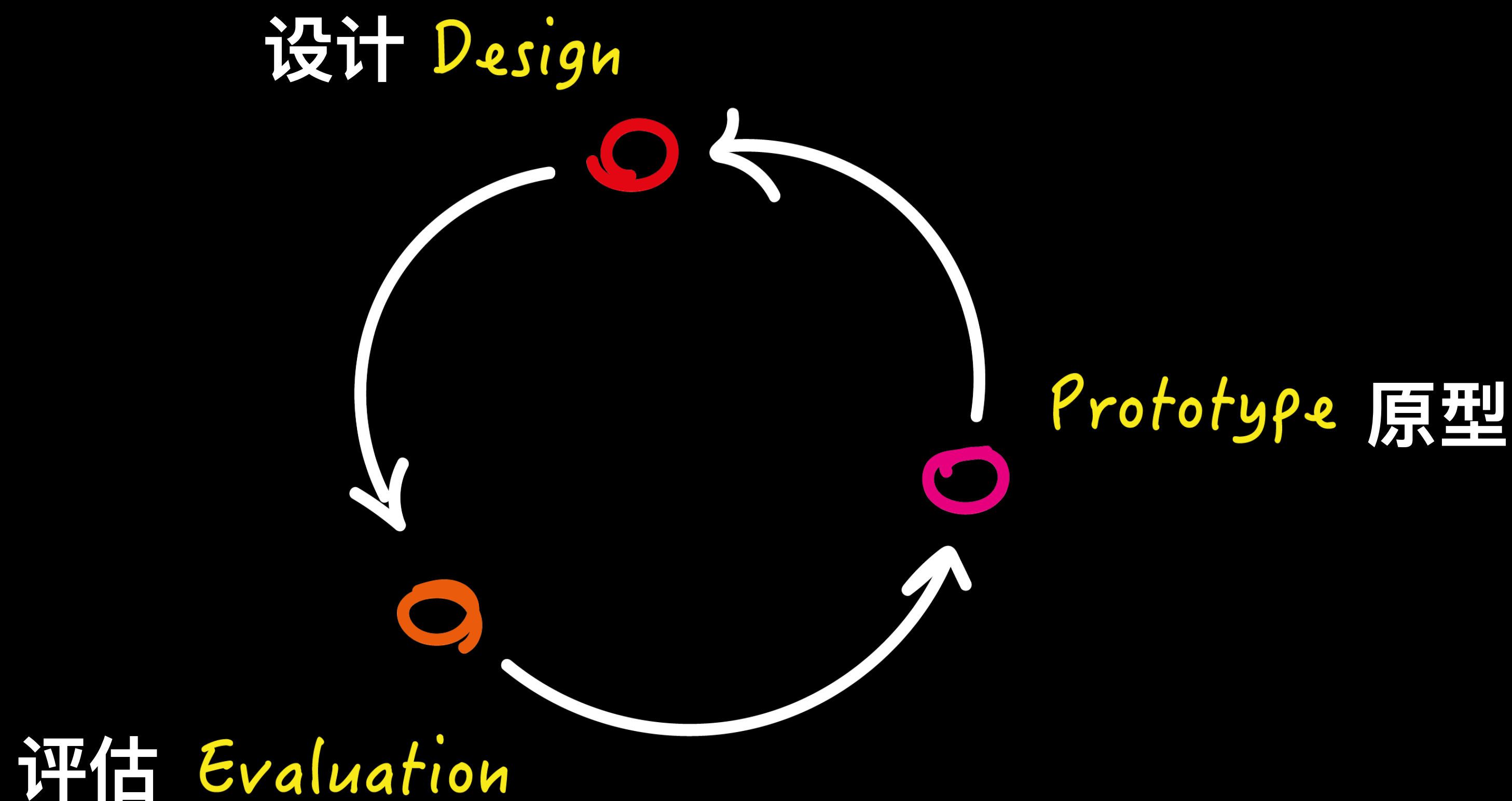
现代UI/UX设计趋势与实现方法

从头开始创建一个App原型

Creating App Prototypes from Low to High-Fidelity



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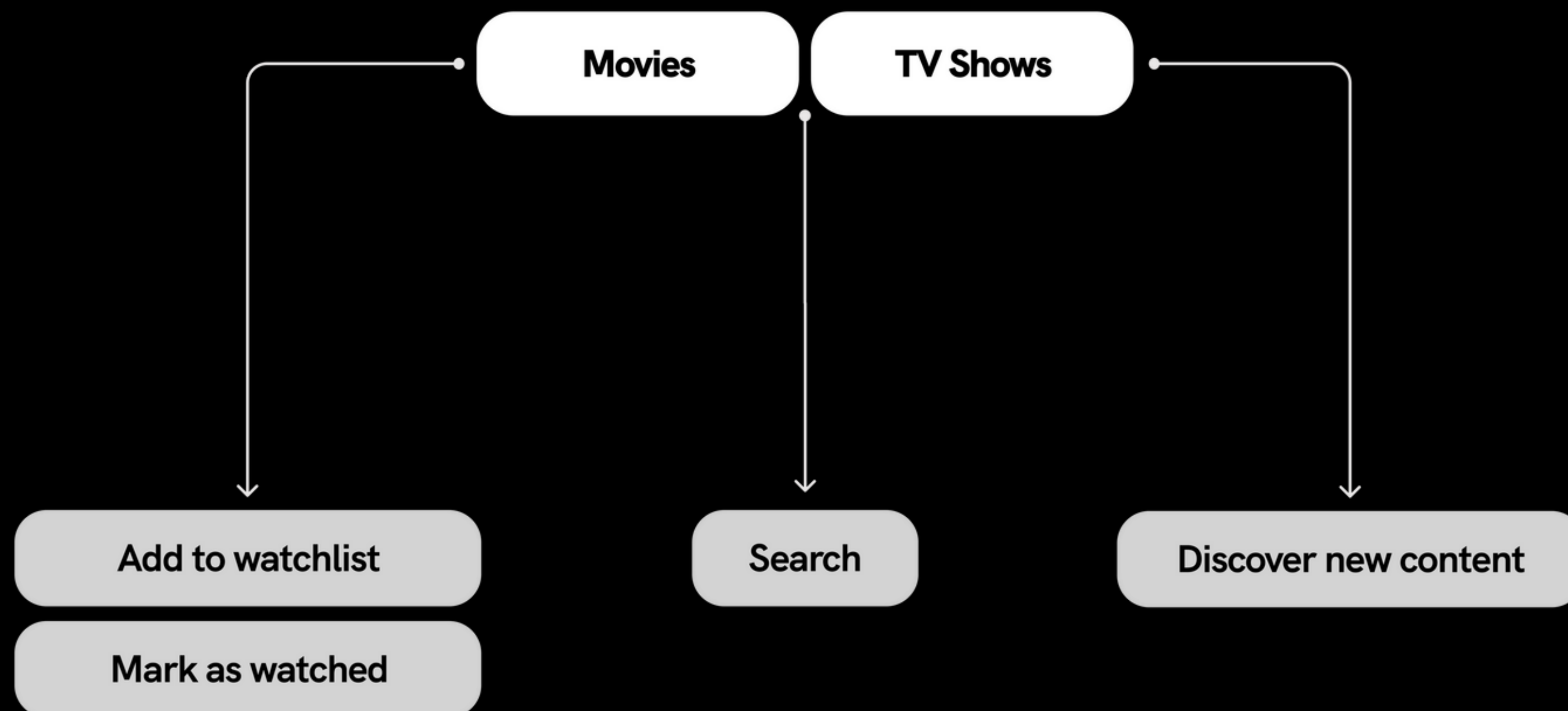
“让用户可以创建电影和电视节目的观看列表，
并根据他们添加的内容接收推荐”

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TV Time



Must



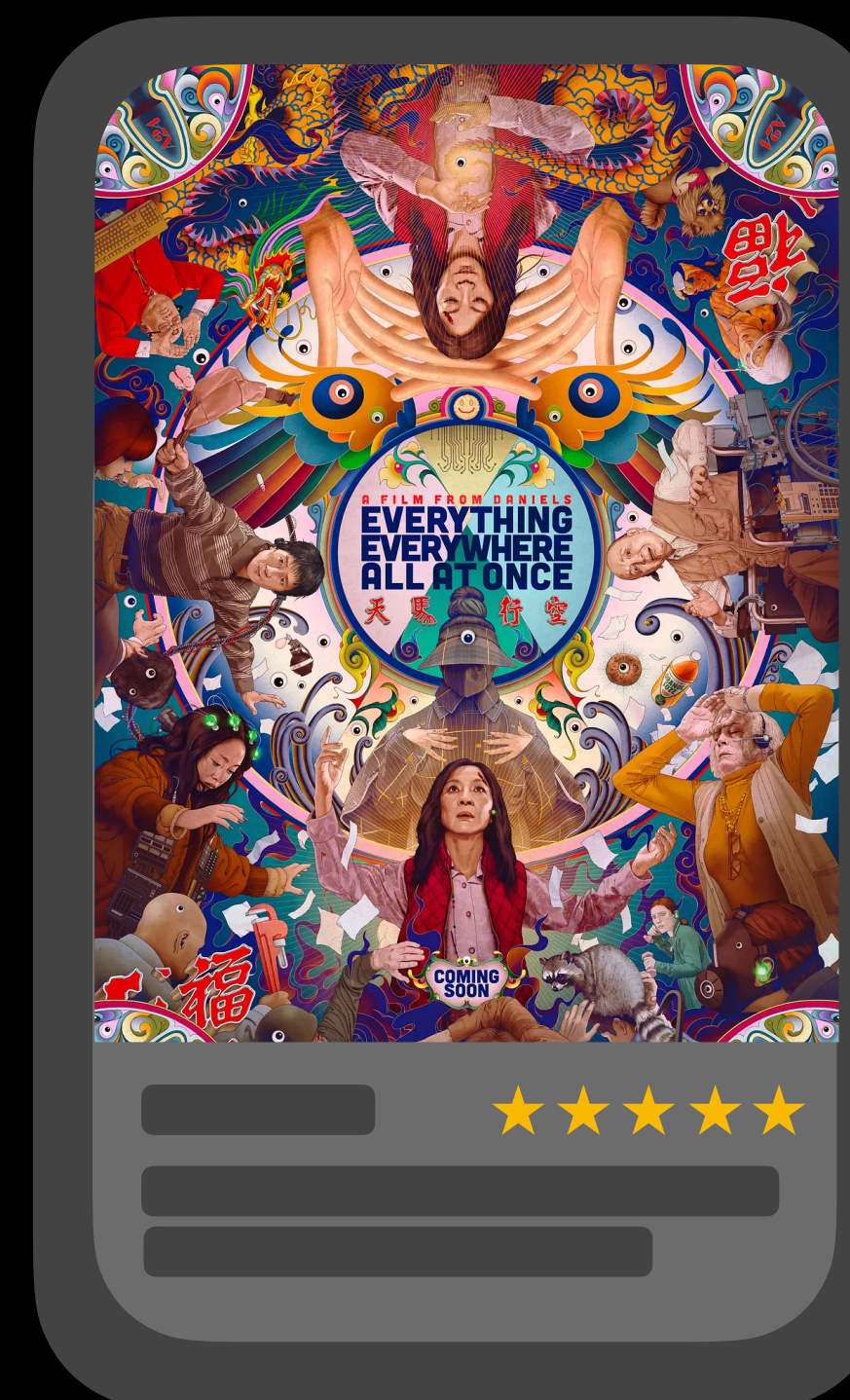
Letter Boxed

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快速直观地

“让用户可以创建电影和电视节目的观看列表，
并根据他们添加的内容接收**推荐**”

查看

详细信息

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明确需求：“让用户可以创建电影和电视节目的观看列表，
并根据他们添加的内容接收推荐”

确定核心功能： 将电影和电视节目添加到观看列表

将观看列表中某个媒体标记为已观看

发现新内容的建议

搜索

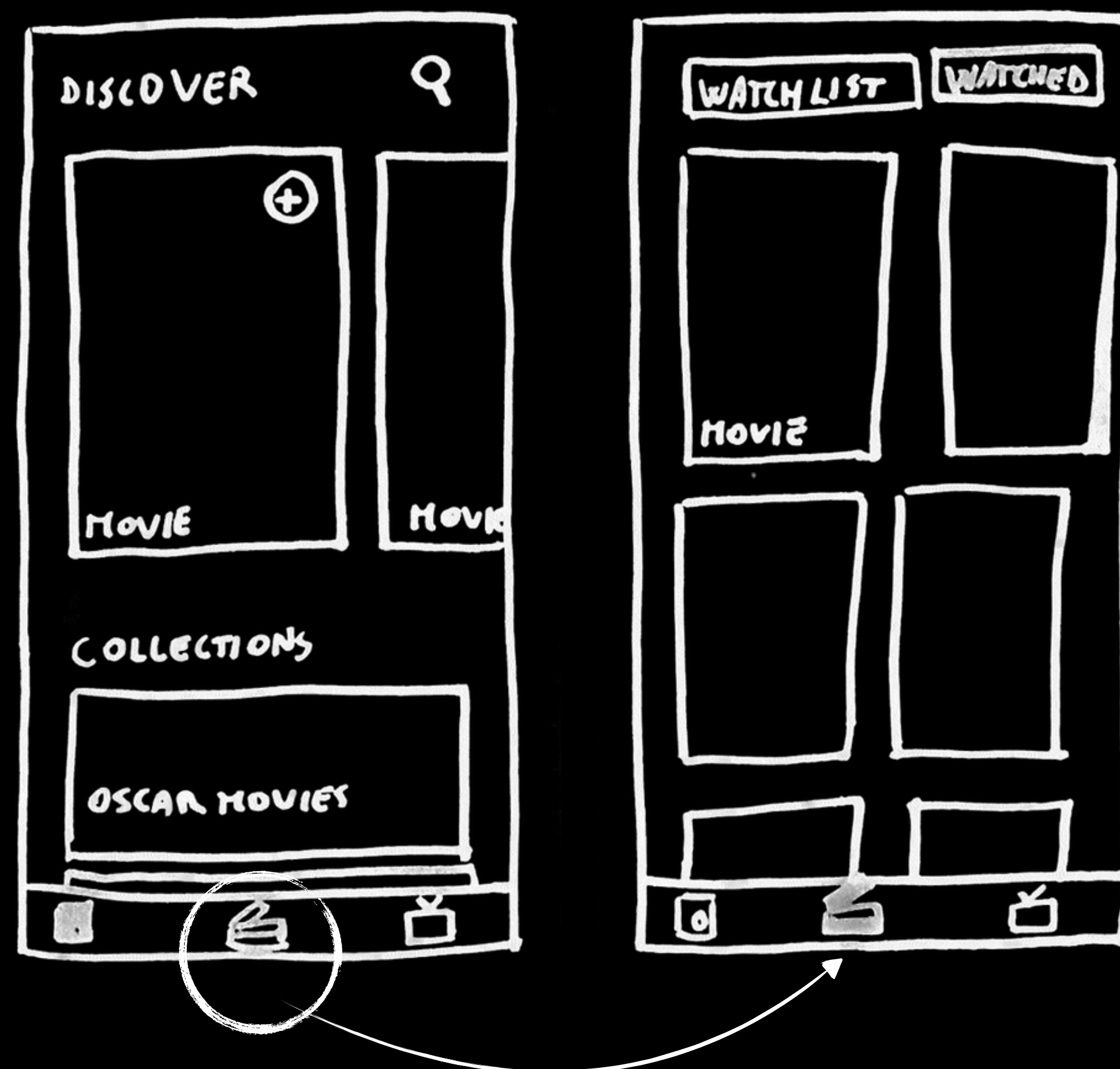
竞品分析： 许多App有完善的社区功能，不是我们的核心功能

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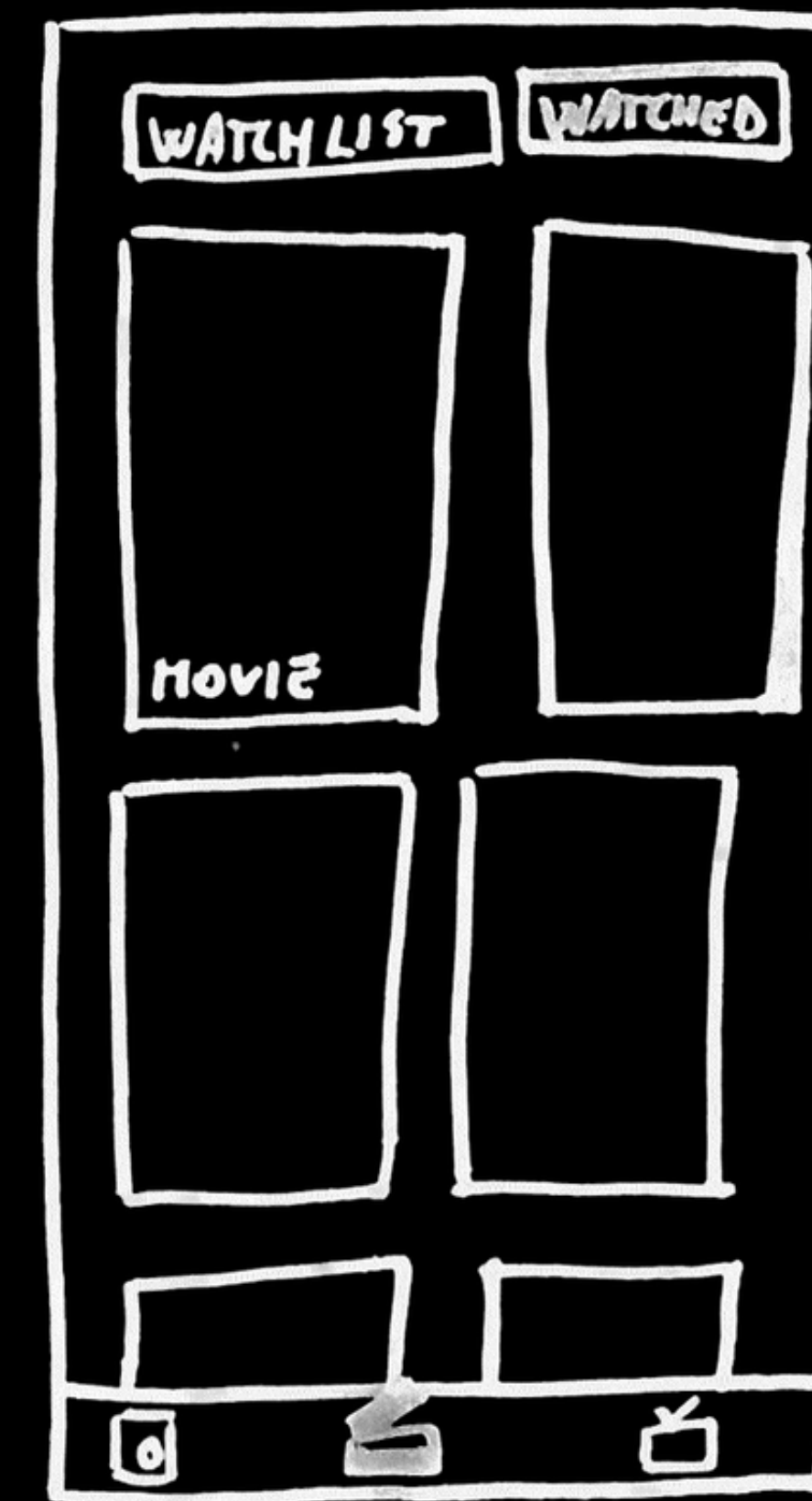
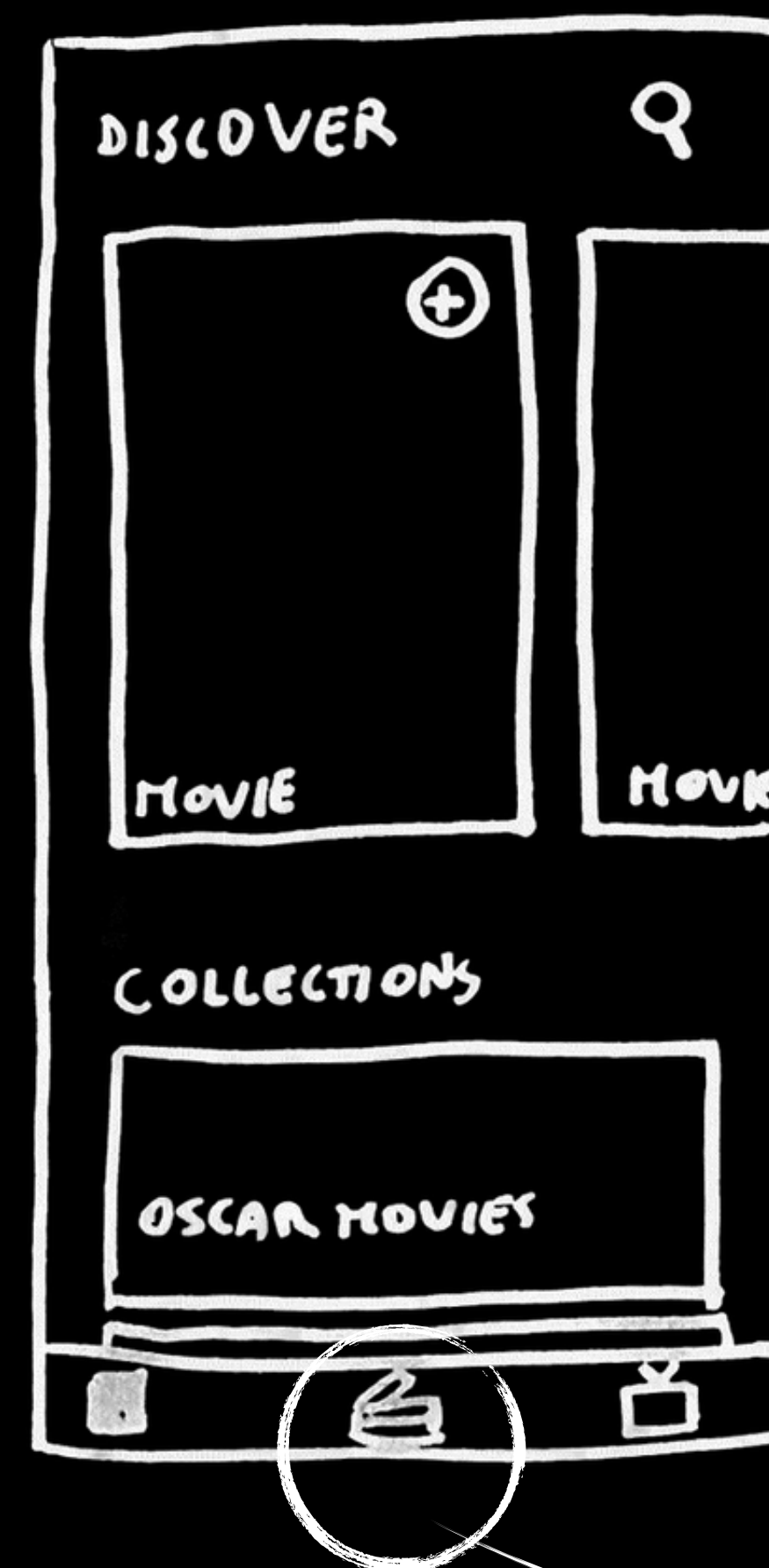
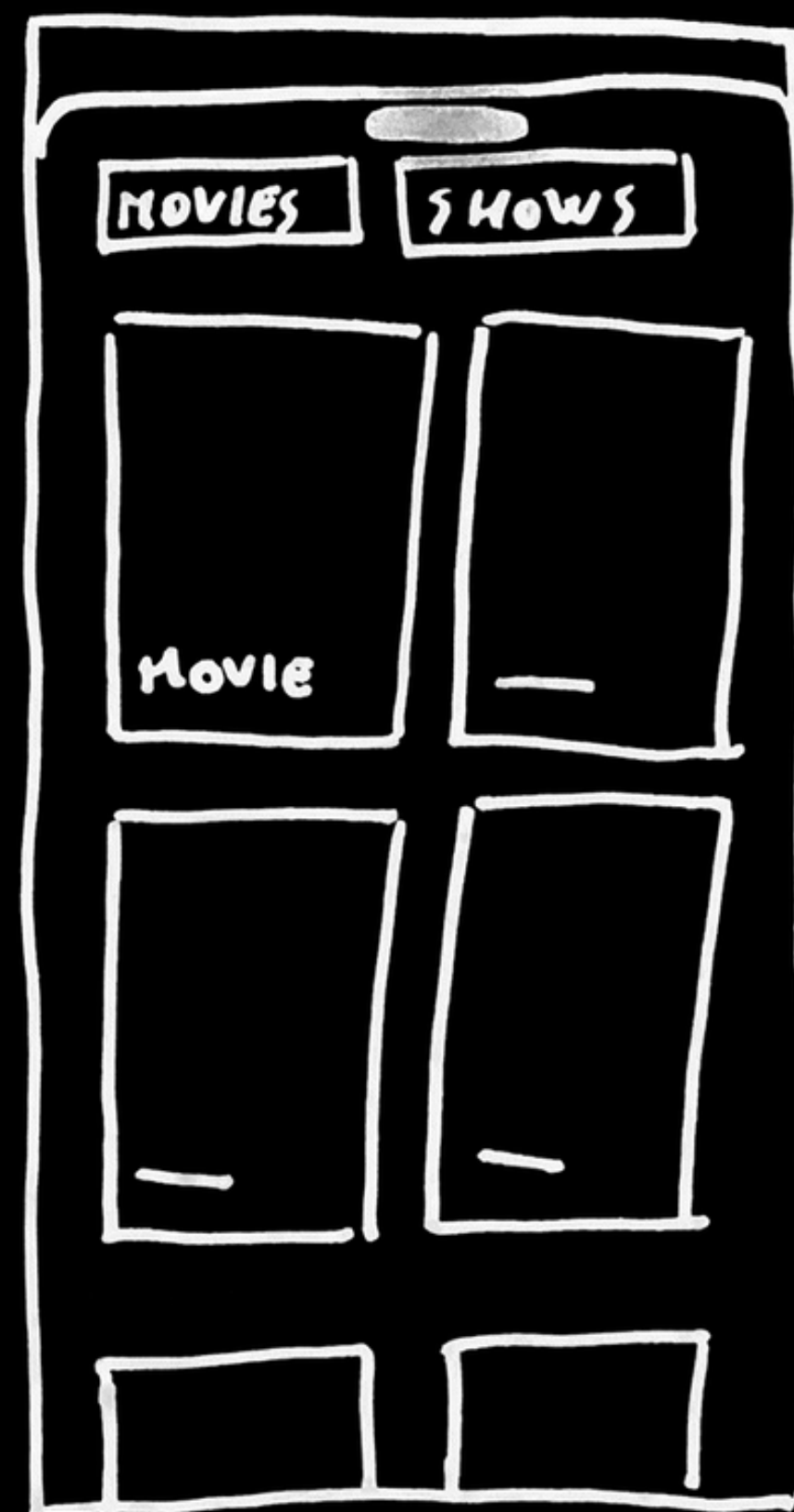
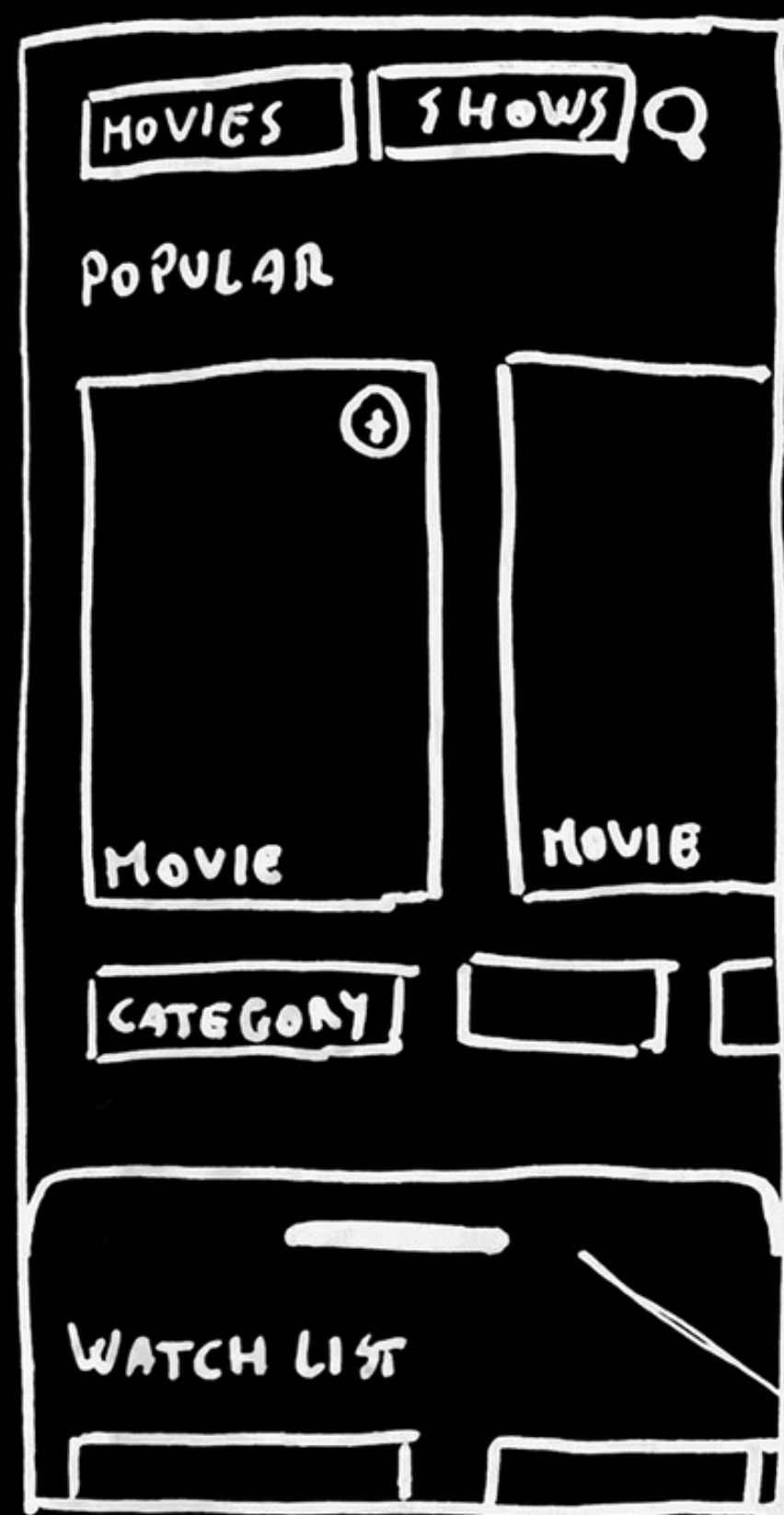


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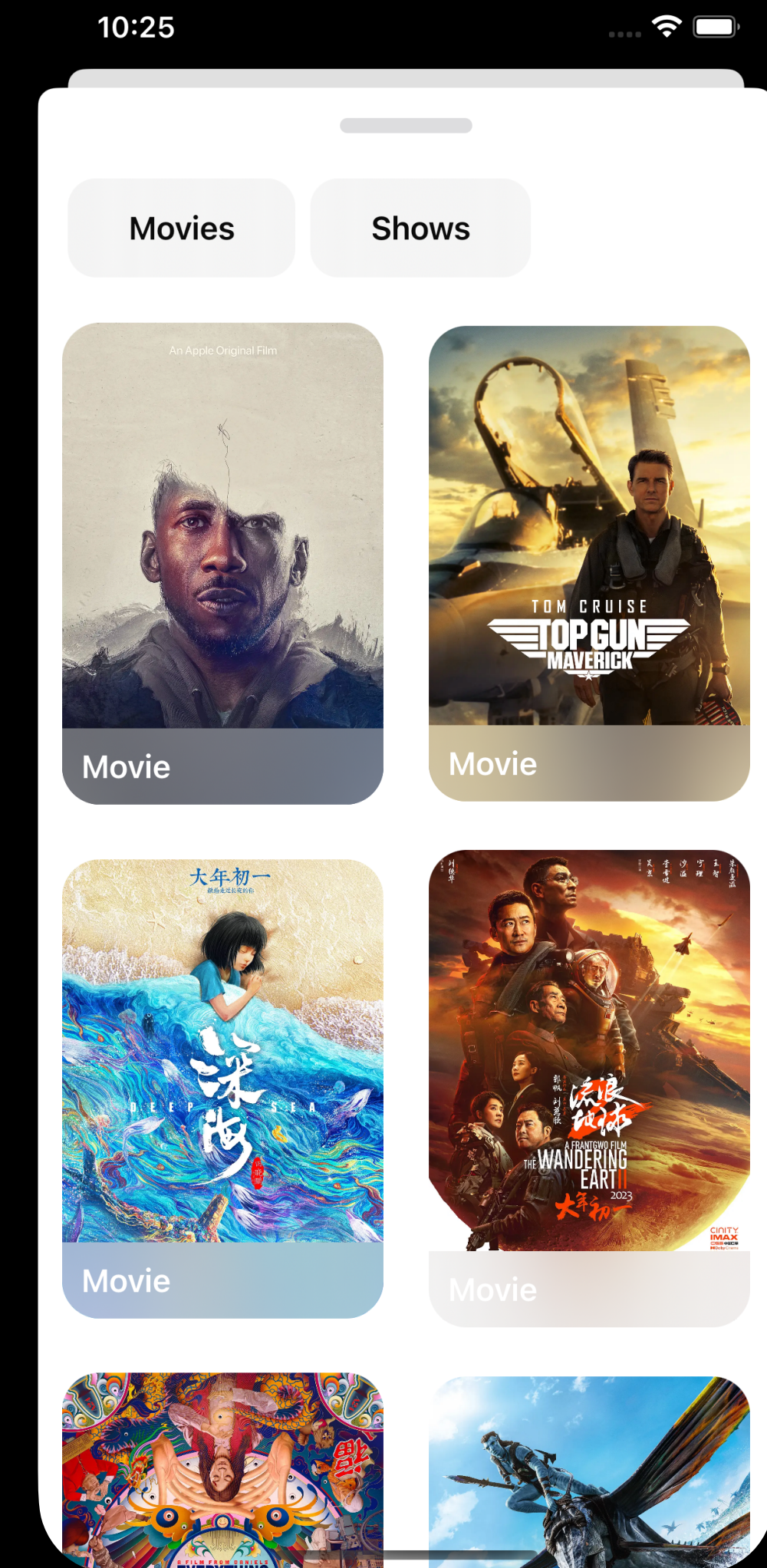
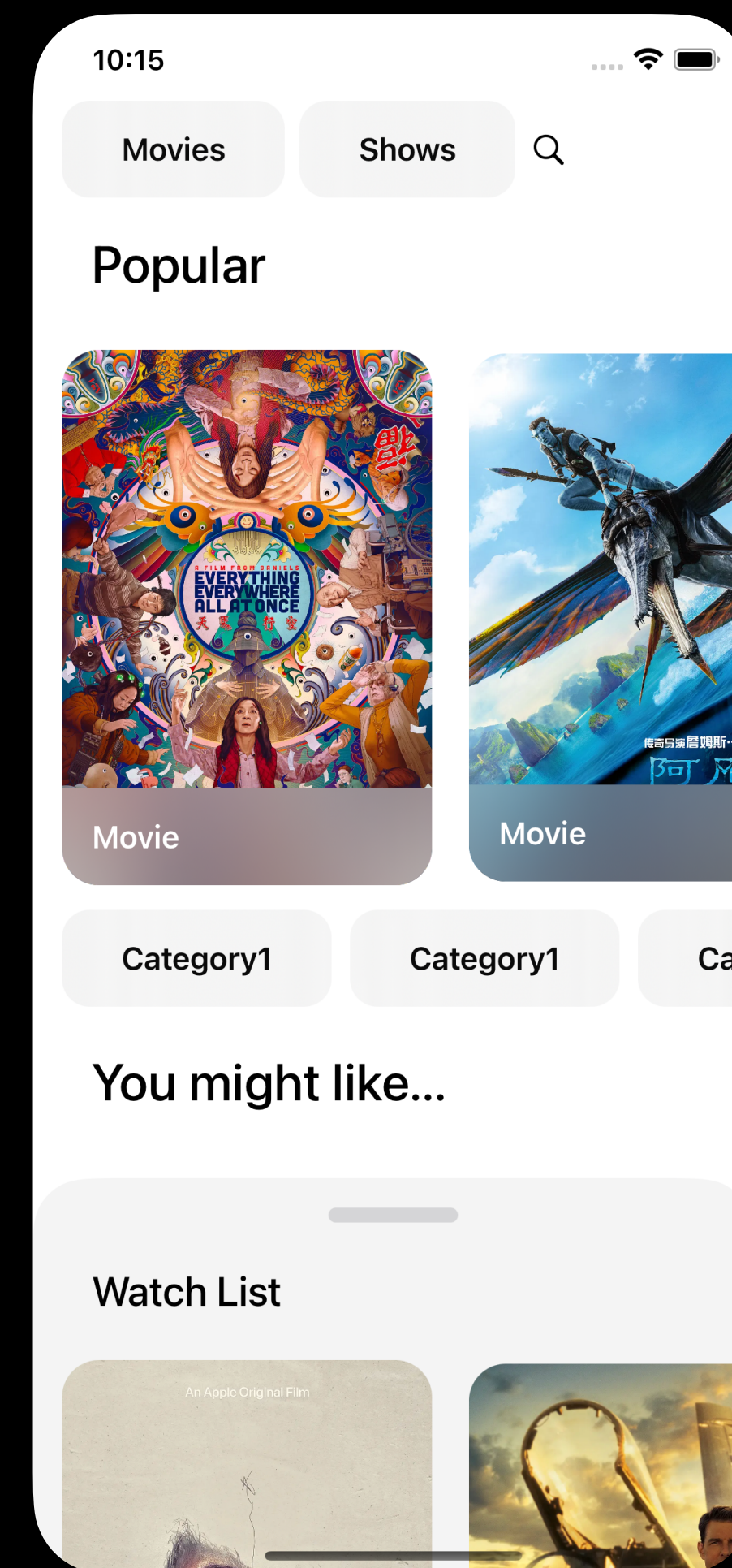
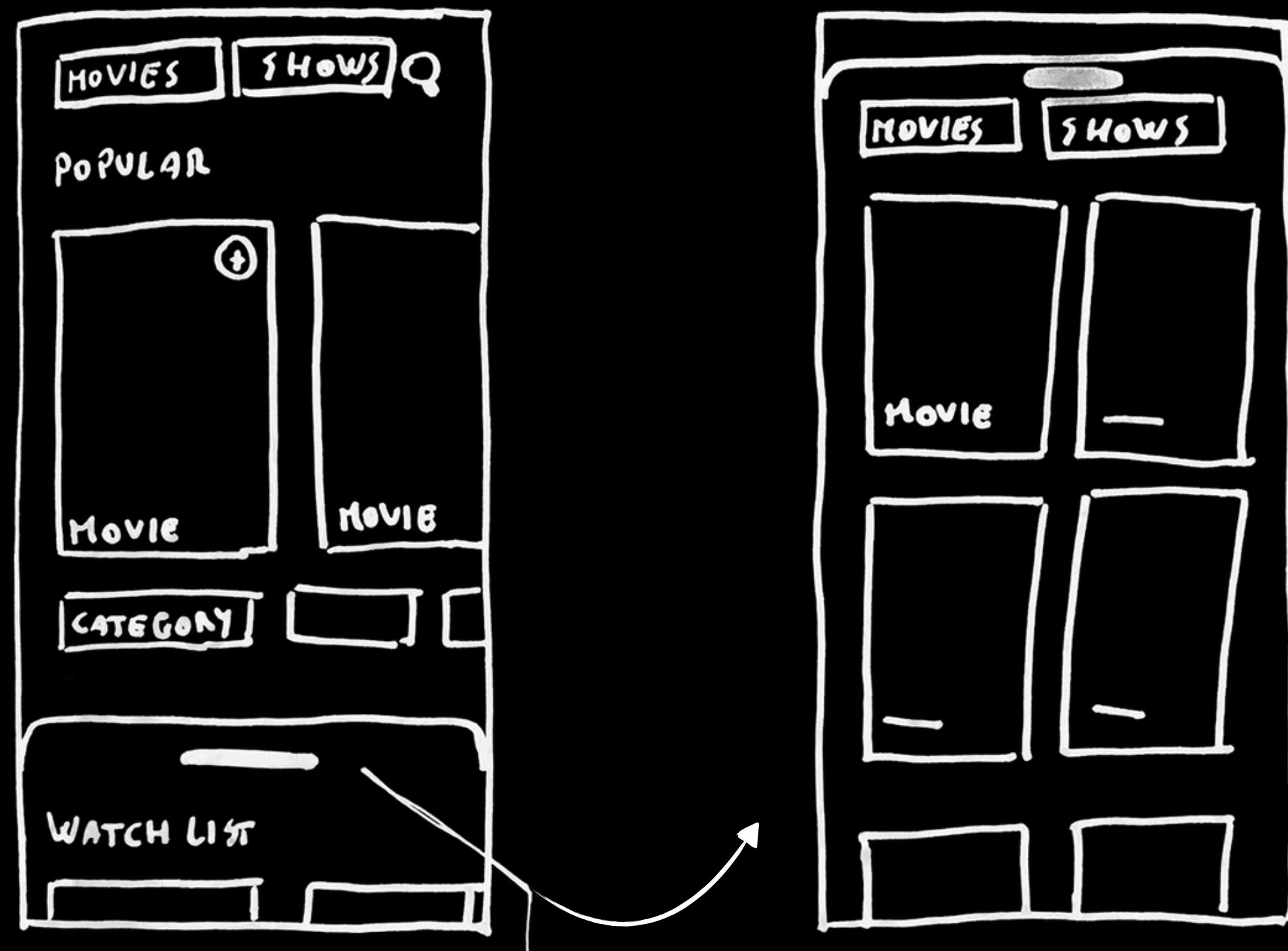


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Creating App Prototypes from Low to High-Fidelity

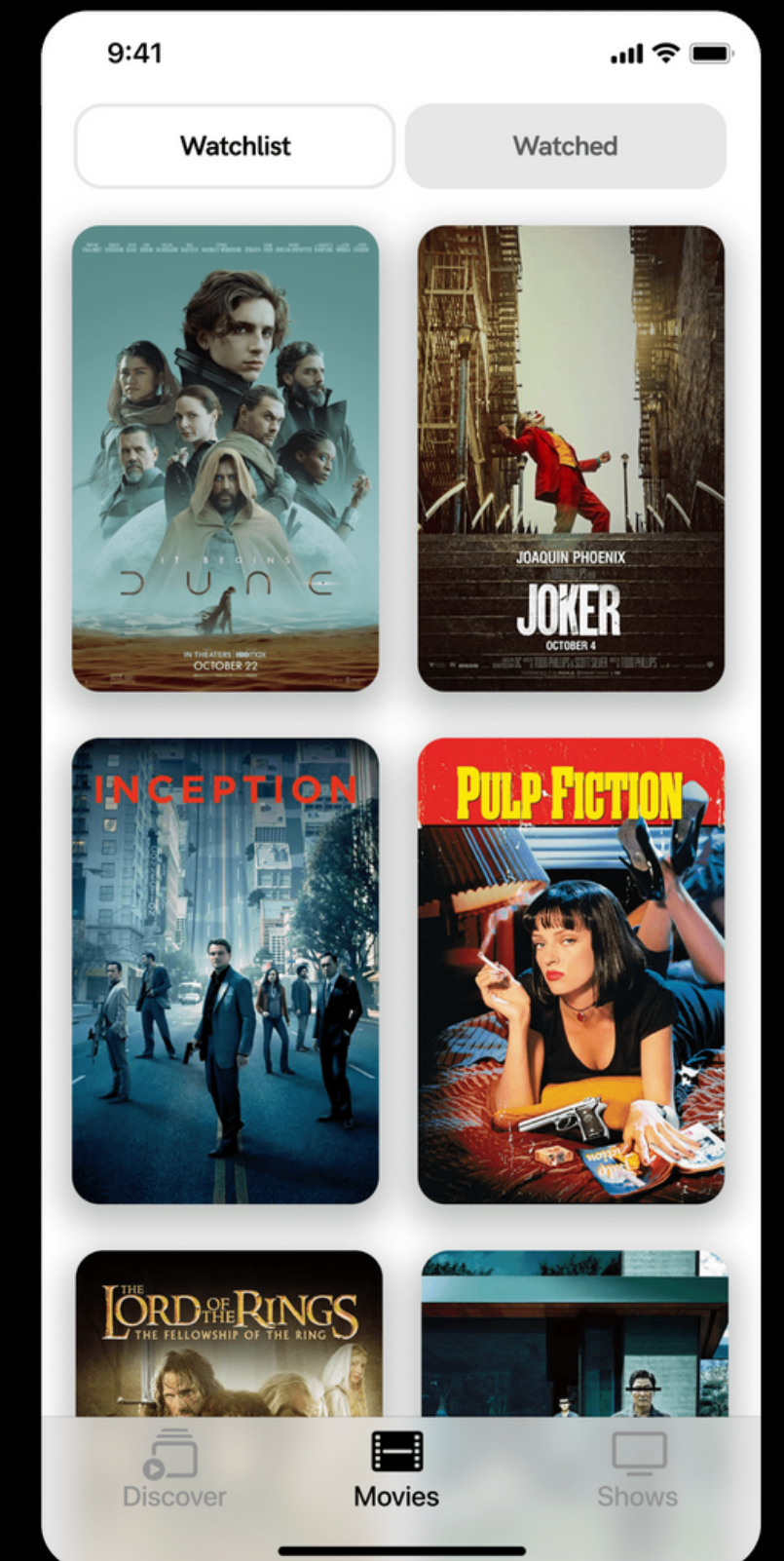
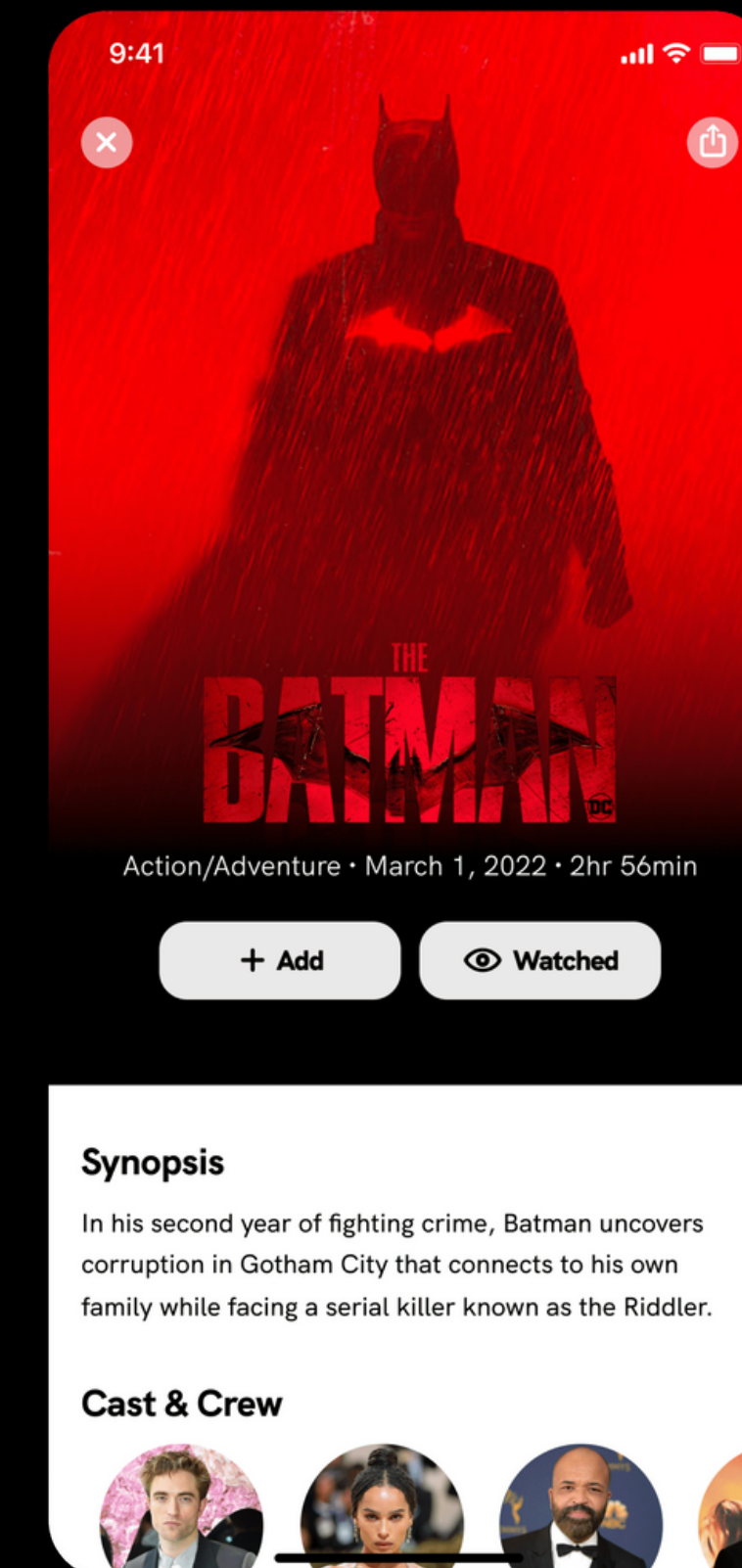
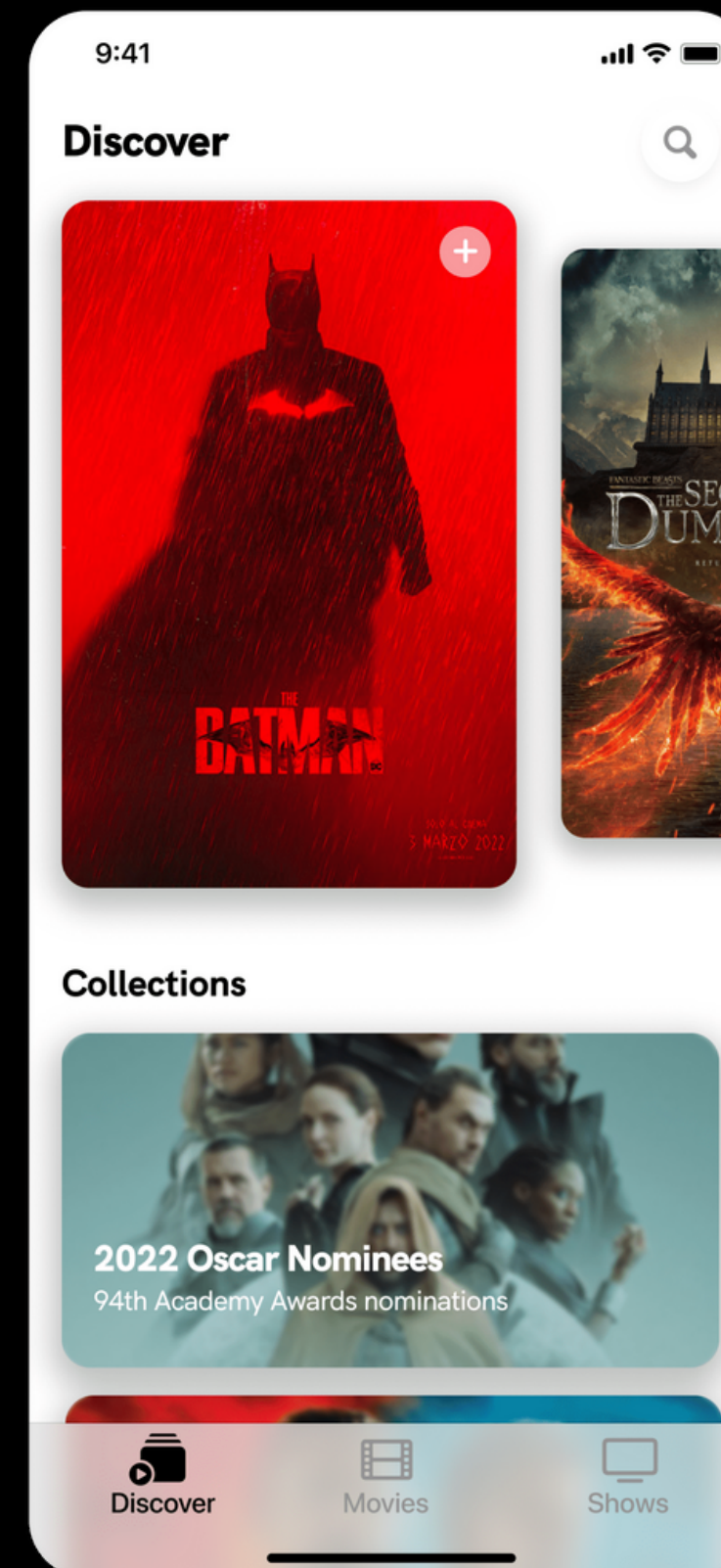
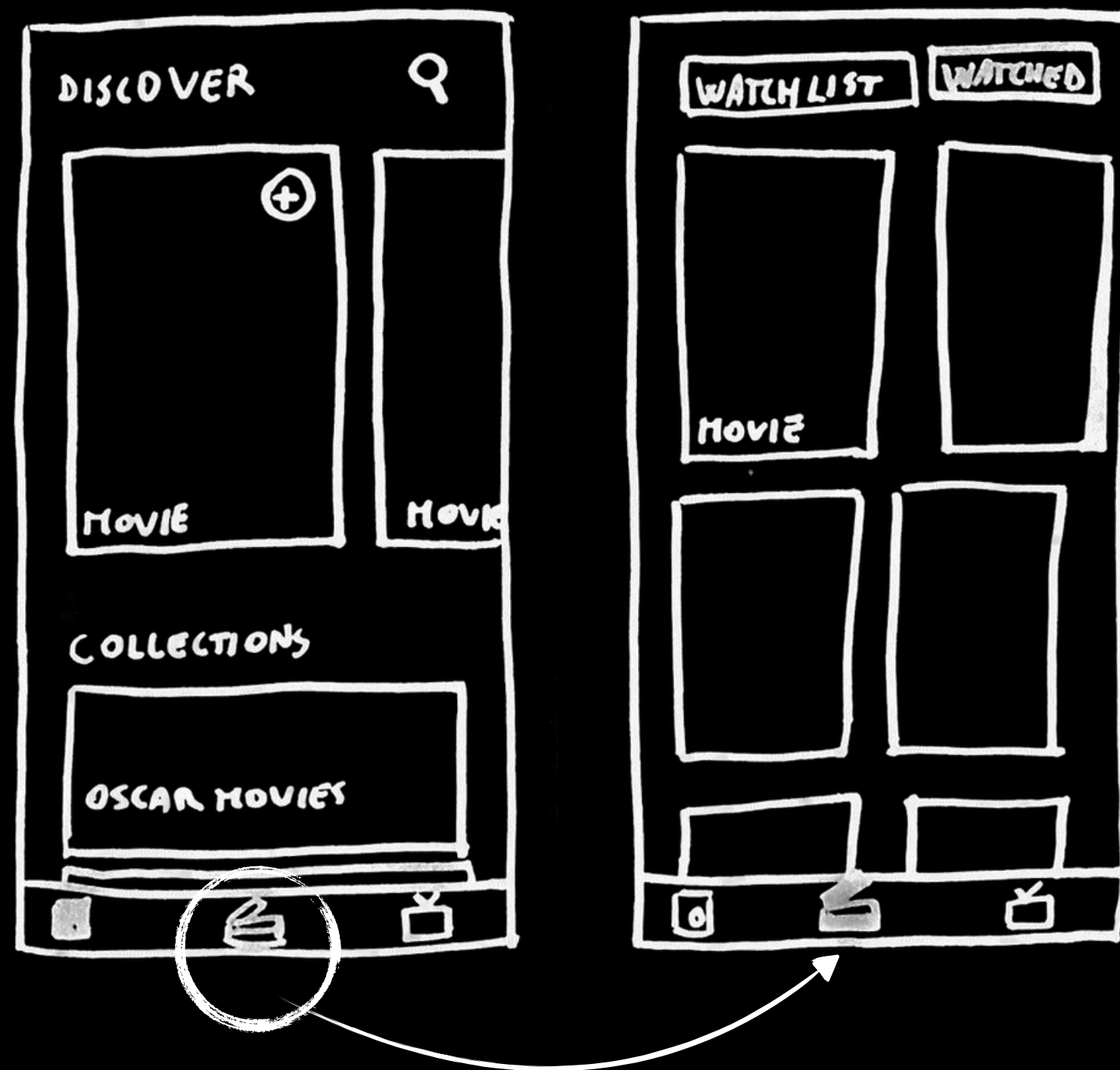


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Creating App Prototypes from Low to High-Fidelity

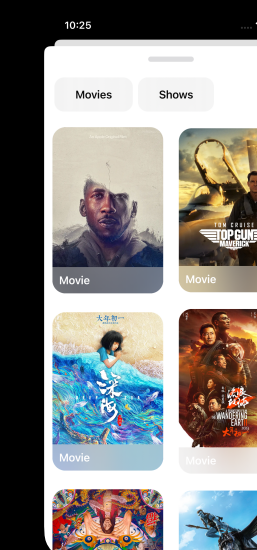
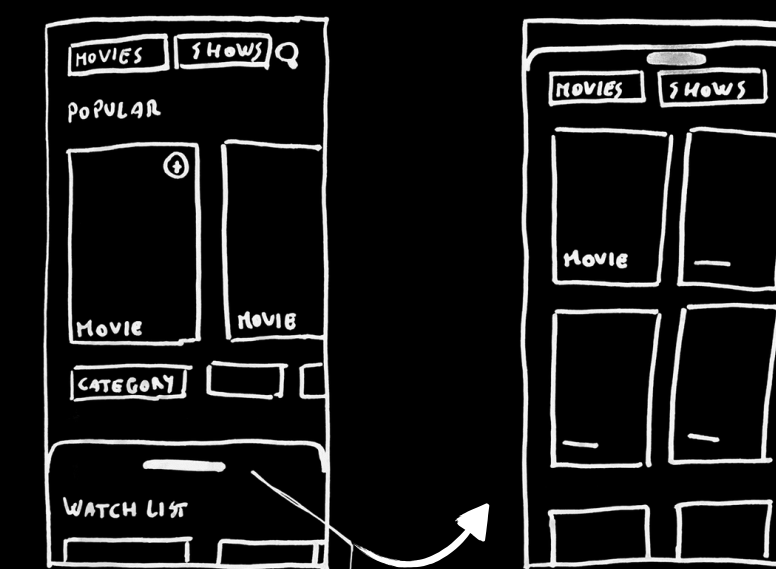
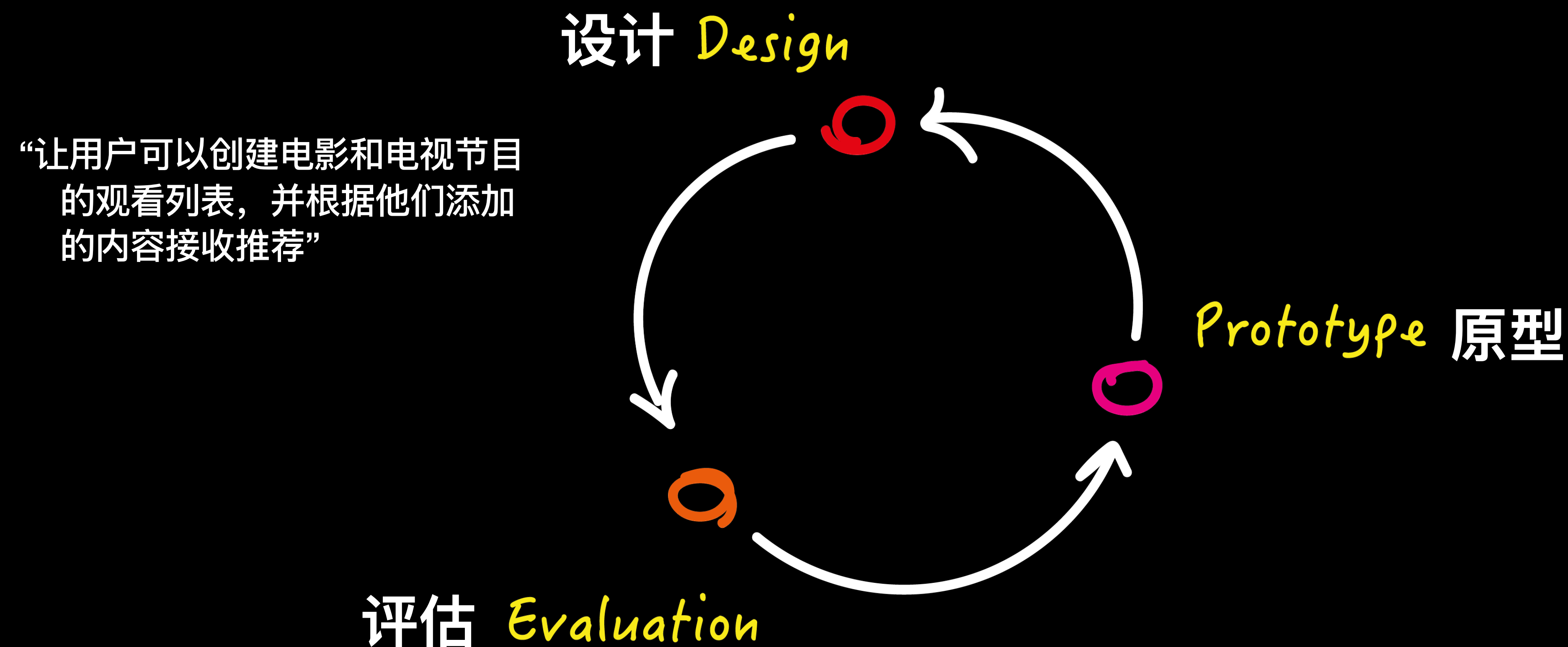


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你需要知道的SwiftUI细节

现代UI/UX设计趋势与实现方法

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你需要知道的SwiftUI细节

现代UI/UX设计趋势与实现方法

你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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```
10 struct SimpleView: View {  
11     var body: some View {  
12         Text("TEXT")  
13     }  
14 }
```

TEXT

你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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```
struct StacksView: View {
    var body: some View {
        VStack{
            Text("这是VStack")
            VStack{
                Text("组件1").border(Color.black)
                Text("组件2").border(Color.black)
                Text("组件3").border(Color.black)
            }
            .frame(width: 200, height: 100)
            .border(Color.black)
            .background(.yellow)
            // .frame加在不同位置效果不同
            // .frame(width: 150, height: 100)
            Text("这是HStack")
            HStack{
                Text("组件1").border(Color.black)
                Text("组件2").border(Color.black)
                Text("组件3").border(Color.black)
            }
            .frame(width: 200, height: 100)
            .border(Color.black)
            .background(.blue)

            Text("这是ZStack")
            ZStack{
                Text("组件1").border(Color.black)
                Text("组件2").border(Color.black)
                Text("组件3").border(Color.black)
            }
            .frame(width: 200, height: 100)
            .border(Color.black)
            .background(.green)
        }
    }
}
```



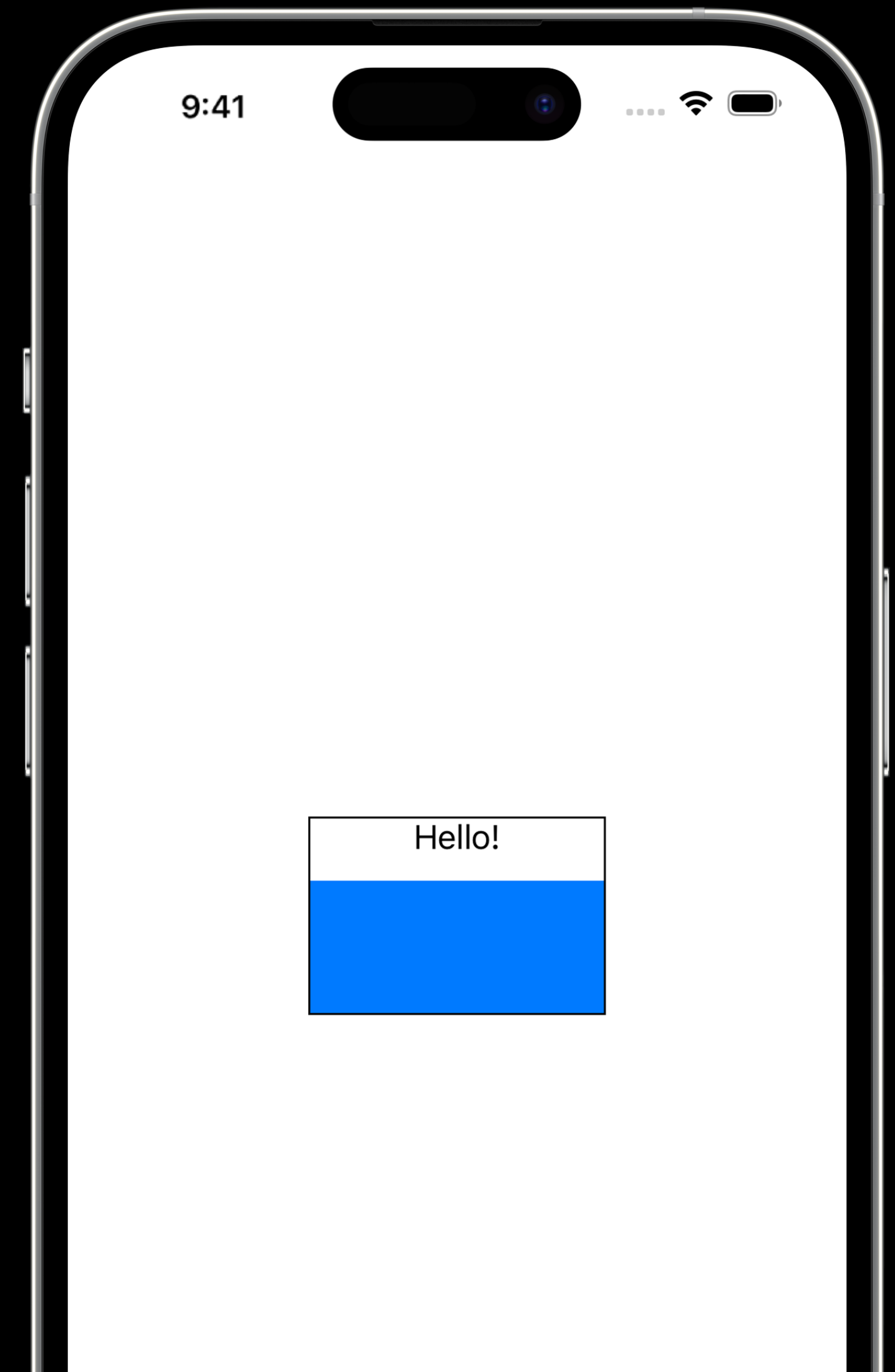
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The details you must understand about SwiftUI



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```
struct ParentView: View {  
    var body: some View {  
        VStack {  
            Text("Hello!")  
            MyRectangle  
        }  
        .frame(width: 150, height: 100)  
        .border(Color.black)  
    }  
  
    var MyRectangle: some View {  
        Rectangle()  
        .fill(Color.blue)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI



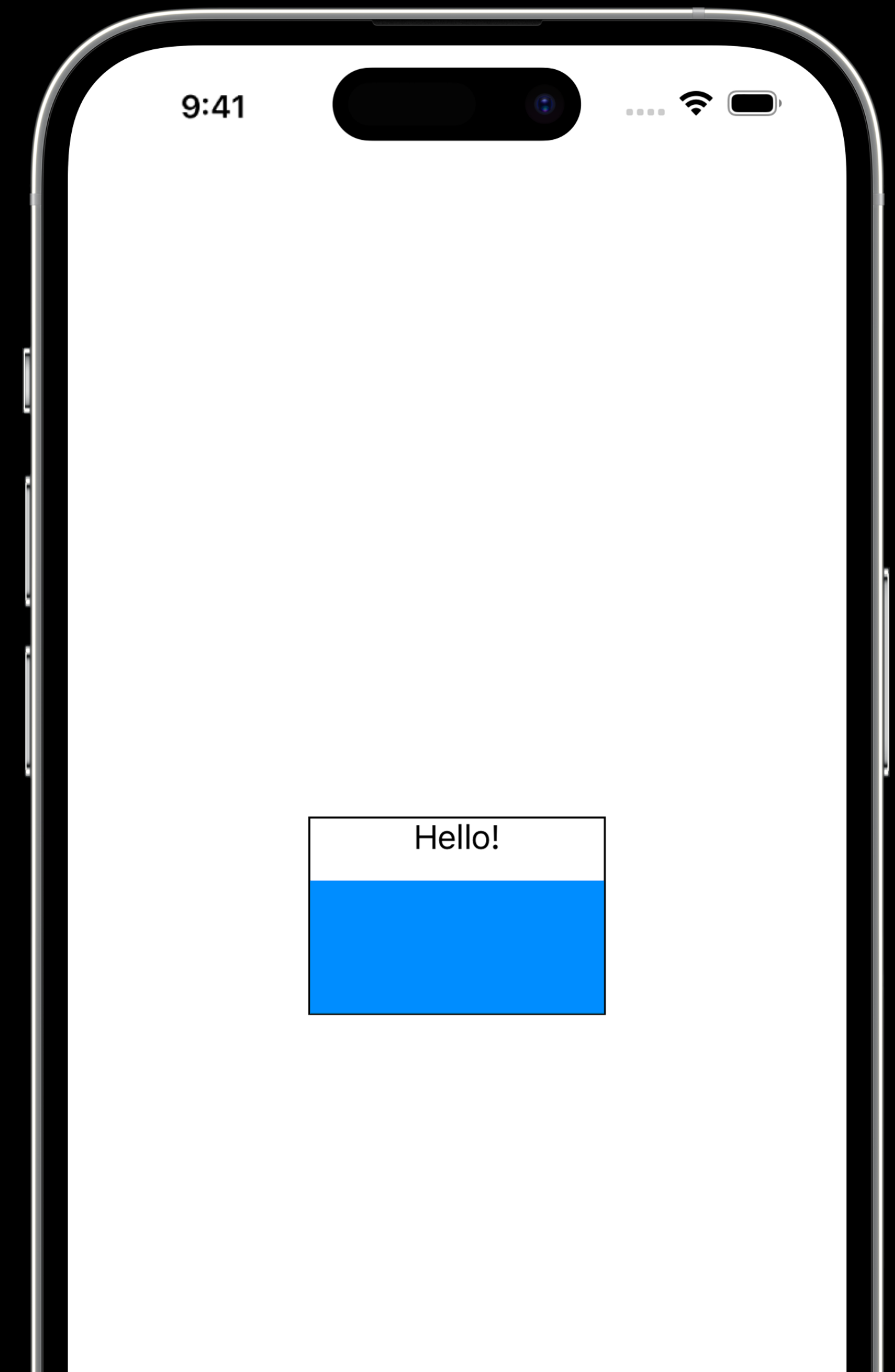
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```
VStack {  
  
}  
    .frame(width: 150, height: 100)
```

```
var MyRectangle: some View{  
    Rectangle()  
        .fill(Color.blue)
```

```
}
```

```
}
```



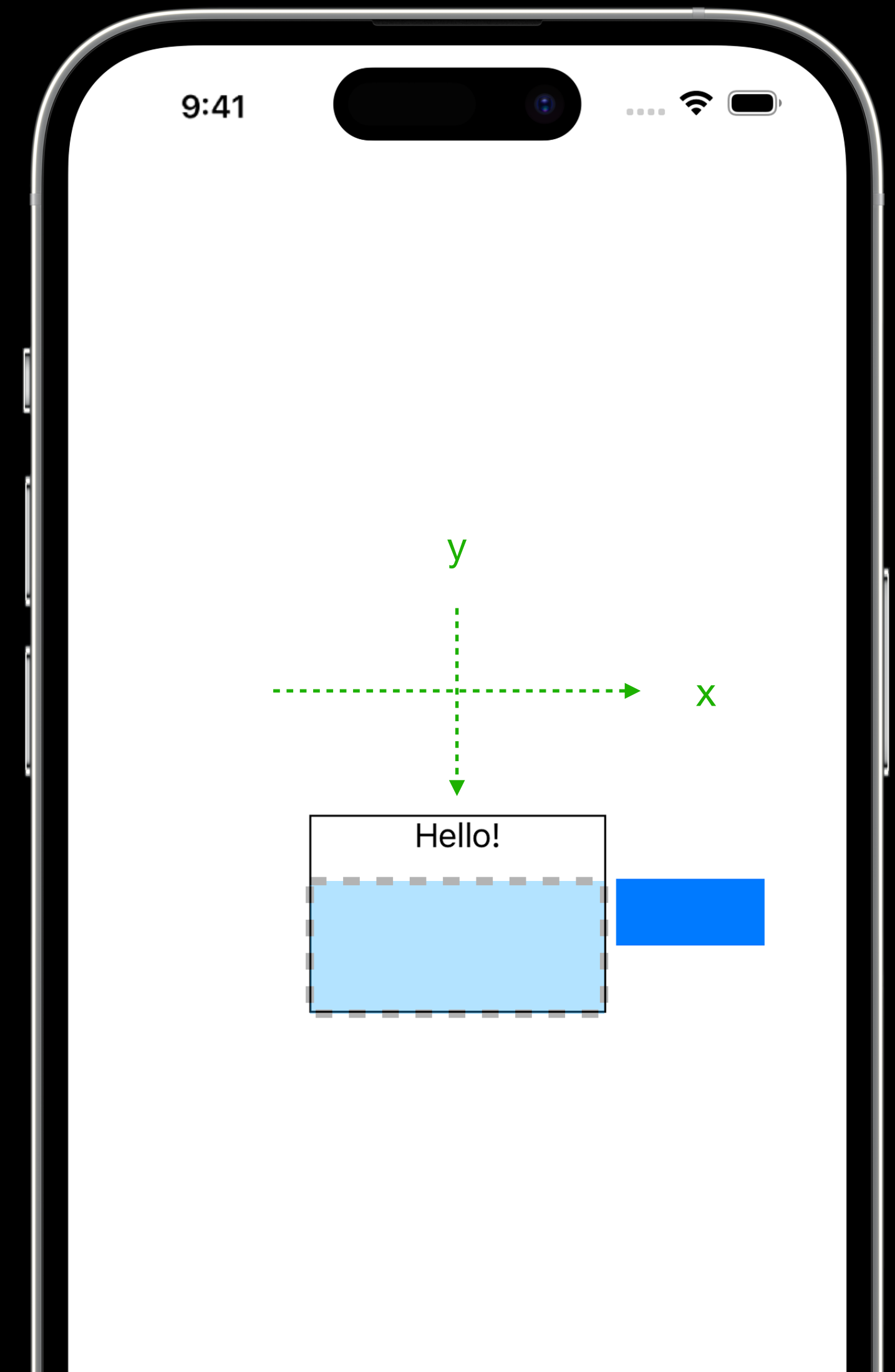
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The details you must understand about SwiftUI



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```
var MyRectangle: some View{  
    GeometryReader { geometry in  
        Rectangle()  
        .path(in: CGRect(x: geometry.size.width + 5,  
                          y: 0,  
                          width: geometry.size.width / 2.0,  
                          height: geometry.size.height / 2.0))  
        .fill(Color.blue)  
    }  
}
```



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The details you must understand about SwiftUI



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1. 父视图提供自己的Frame大小给子视图

The parent proposes a size for the child.

2. 子视图利用父视图的尺寸去决定自己的Frame大小

The child uses that to determine its own size.

3. 最后父视图根据子视图提供的位置去放置子视图

The parent uses that to position the child appropriately.

你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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大度的

Generous

守规矩的

Well-Behaved

自私的

Selfish

搞破坏的

Badly-behaved

组件

你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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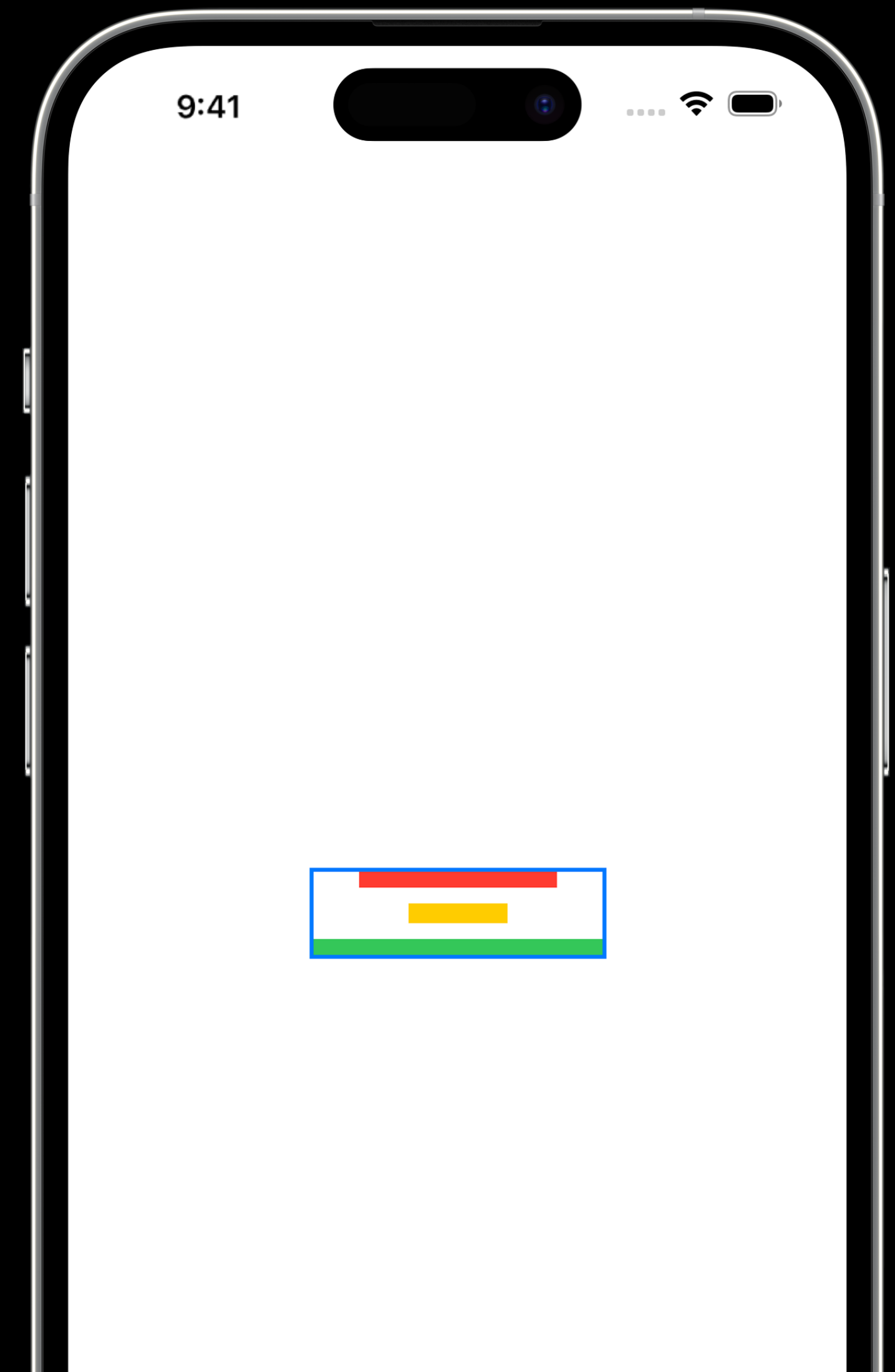
大度的组件

Generous

```
struct ContentView: View {
    var body: some View {
        VStack{
            Rectangle()
                .fill(.red)
                .frame(width: 100, height: 10)

            Rectangle()
                .fill(.yellow)
                .frame(width: 50, height: 10)

            Rectangle()
                .fill(.green)
                .frame(width: 150, height: 10)
        }
        .border(Color.blue, width: 2)
    }
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

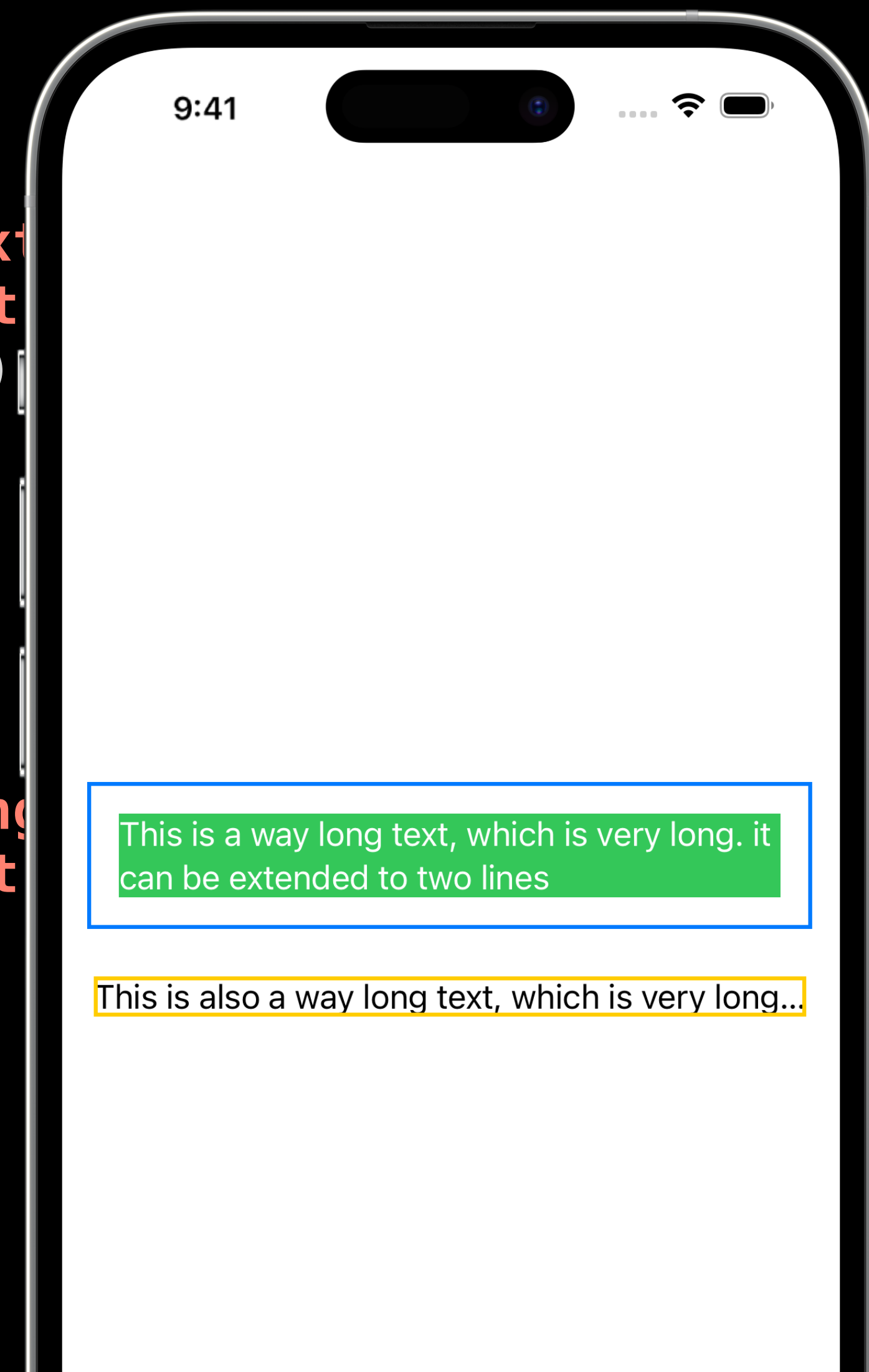


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守规矩的 组件

Well-Behaved

```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            VStack{  
                Text("This is a way long text  
                    which is very long. it  
                    .foregroundColor(.white)  
                    .background(.green)  
                    .padding()  
            }  
            .border(Color.blue, width: 2)  
  
            VStack{  
                Text("This is also a way long  
                    which is very long. it  
                    .lineLimit(1)  
            }  
            .border(Color.yellow, width: 2)  
            .padding()  
        }  
    }  
}
```



你需要知道的SwiftUI细节

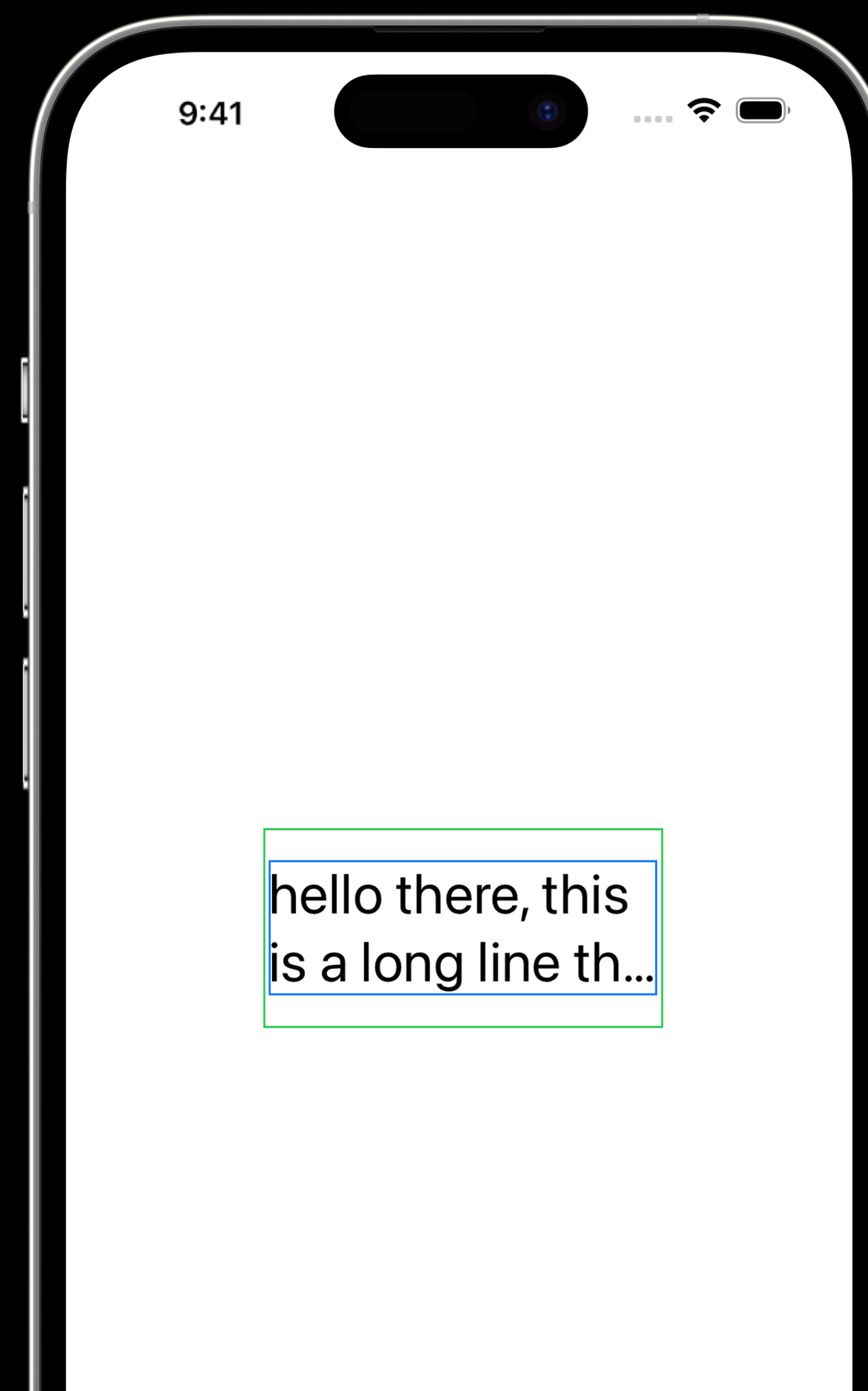
The details you must understand about SwiftUI



守规矩的 组件

Well-Behaved

```
struct ContentView: View {  
    var body: some View {  
        Text("hello there, this is a long line  
            that won't fit parent's size.")  
            .border(.blue)  
            .frame(width: 200, height: 100)  
            .border(.green)  
            .font(.title)  
    }  
}
```



你需要知道的SwiftUI细节

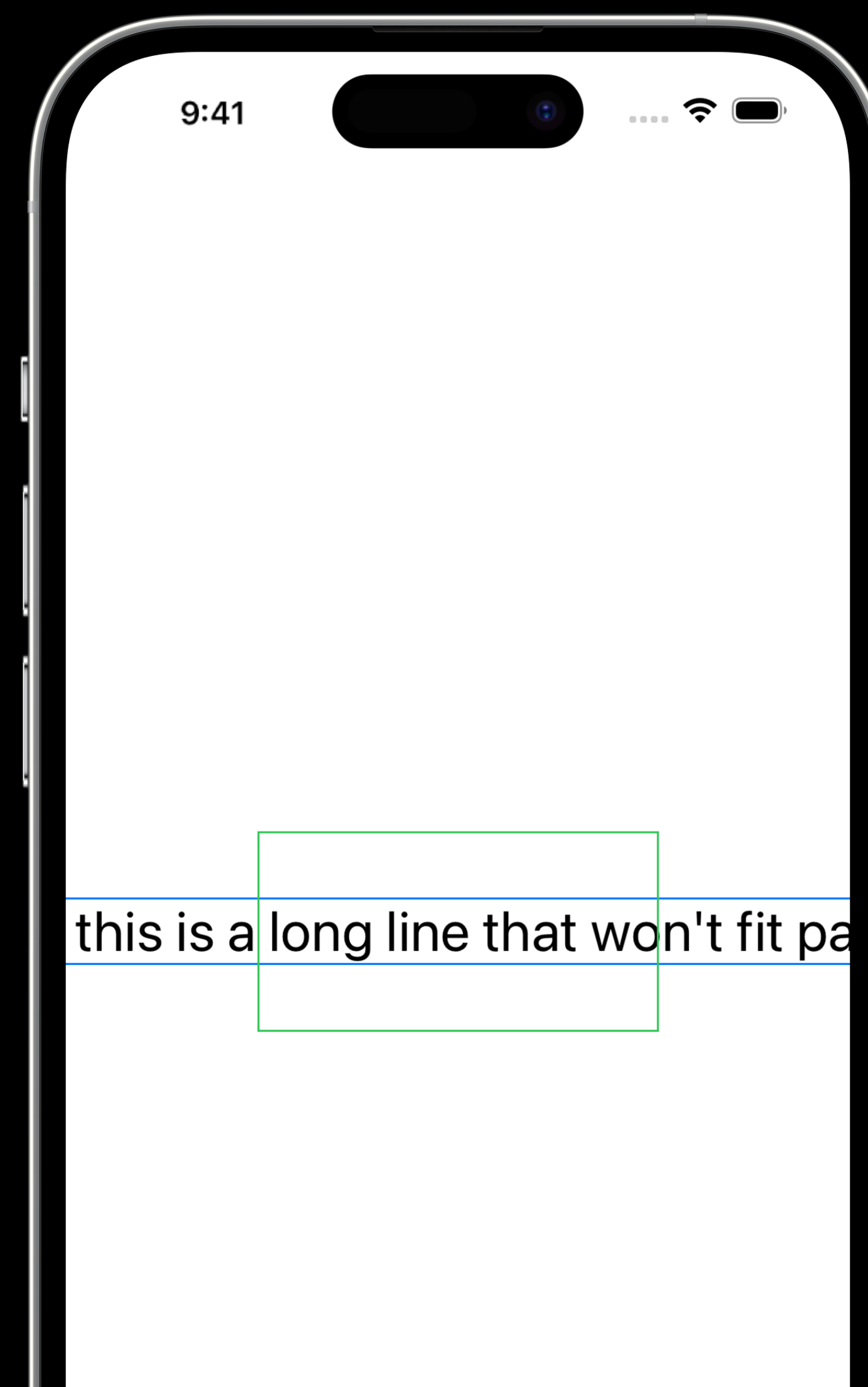
The details you must understand about SwiftUI



守规矩的 组件

Well-Behaved

```
struct ContentView: View {  
    var body: some View {  
        Text("hello there, this is a long line  
            that won't fit parent's size.")  
            .fixedSize(horizontal: true,  
                        vertical: false)  
            .border(.blue)  
            .frame(width: 200, height: 100)  
            .border(.green)  
            .font(.title)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

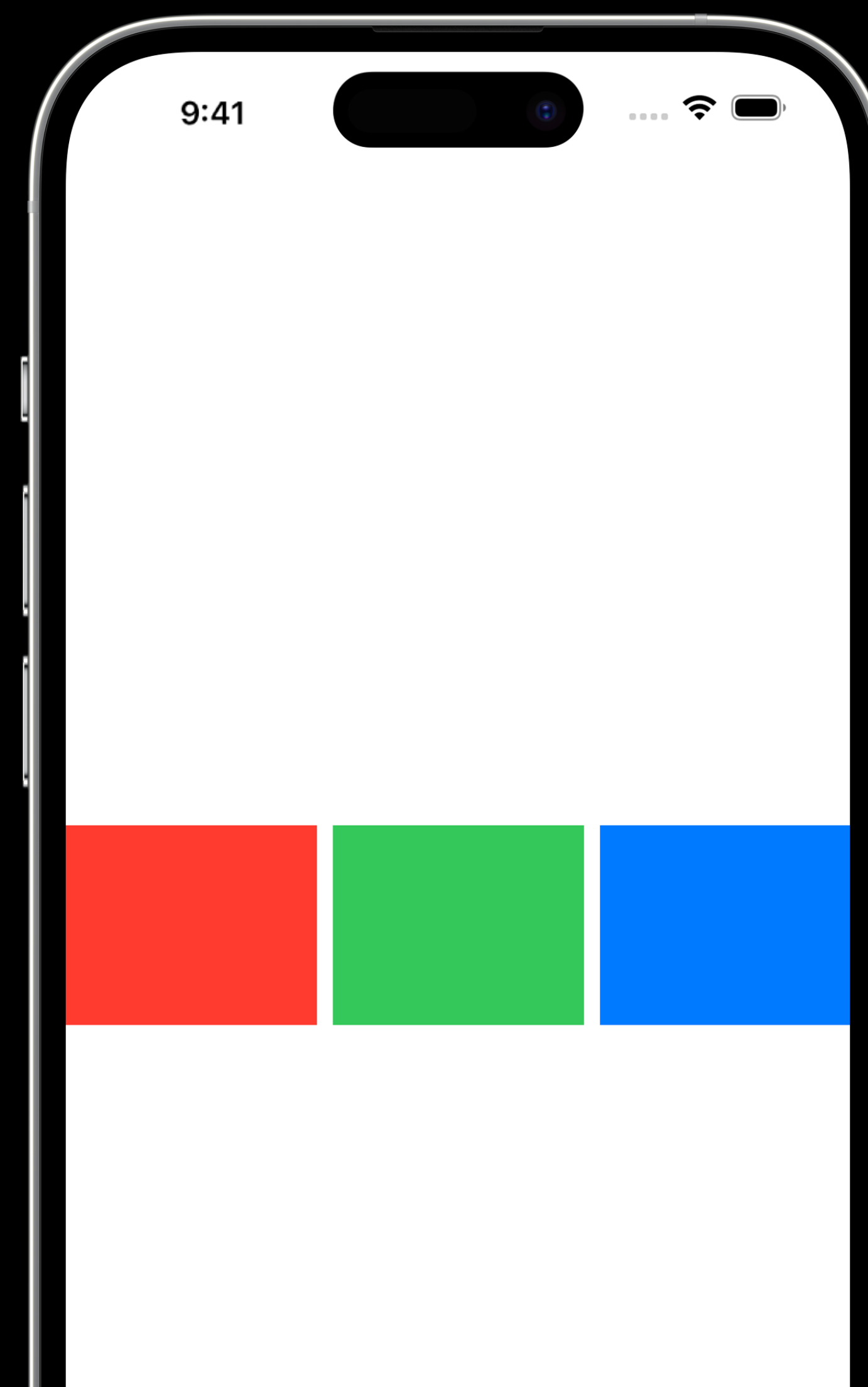


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自私的 组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack {  
            Color.red  
            Color.green  
            Color.blue  
        }  
        .frame(height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

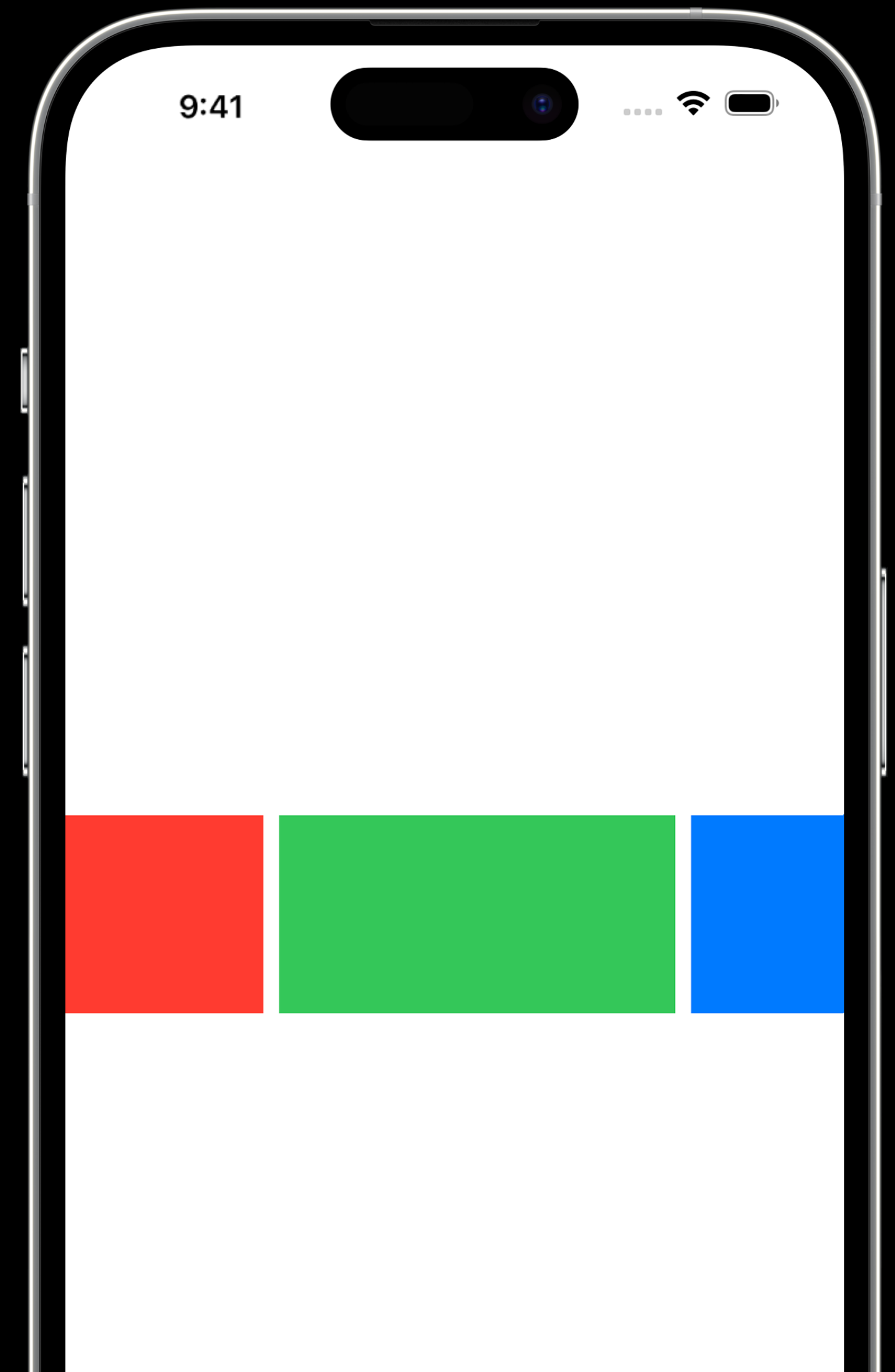


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自私的 组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack {  
            Color.red  
                .frame(width: 100.0)  
            Color.green  
                .frame(width: 200.0)  
            Color.blue  
        }  
        .frame(height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

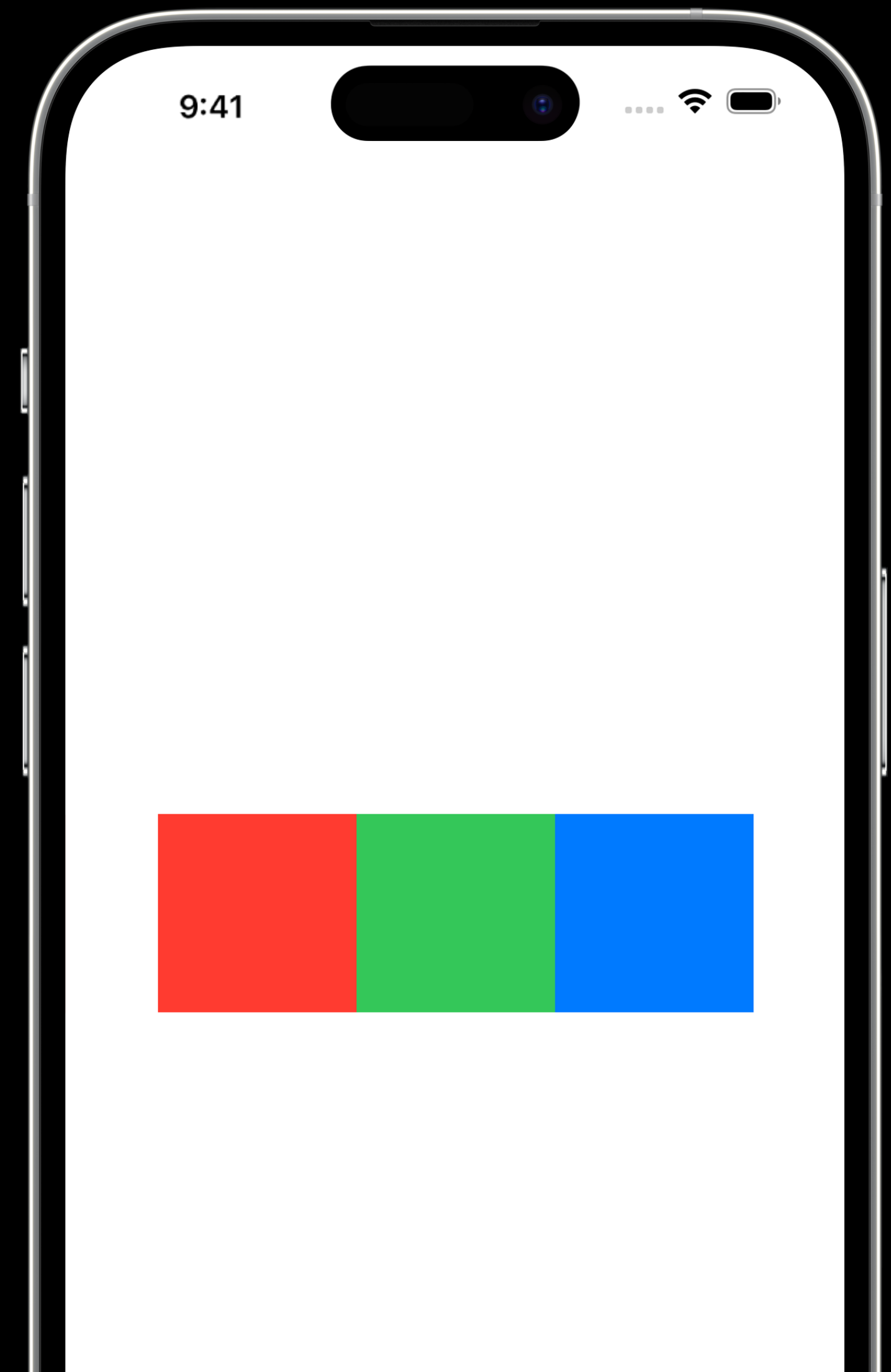


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自私的组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack(spacing: 0) {  
            Color.red  
                .frame(minWidth: 80.0)  
            Color.green  
                .frame(minWidth: 30.0,  
                    idealWidth: 40.0,  
                    maxWidth: 110)  
            Color.blue  
                .frame(minWidth: 60)  
        }  
        .frame(width: 300, height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

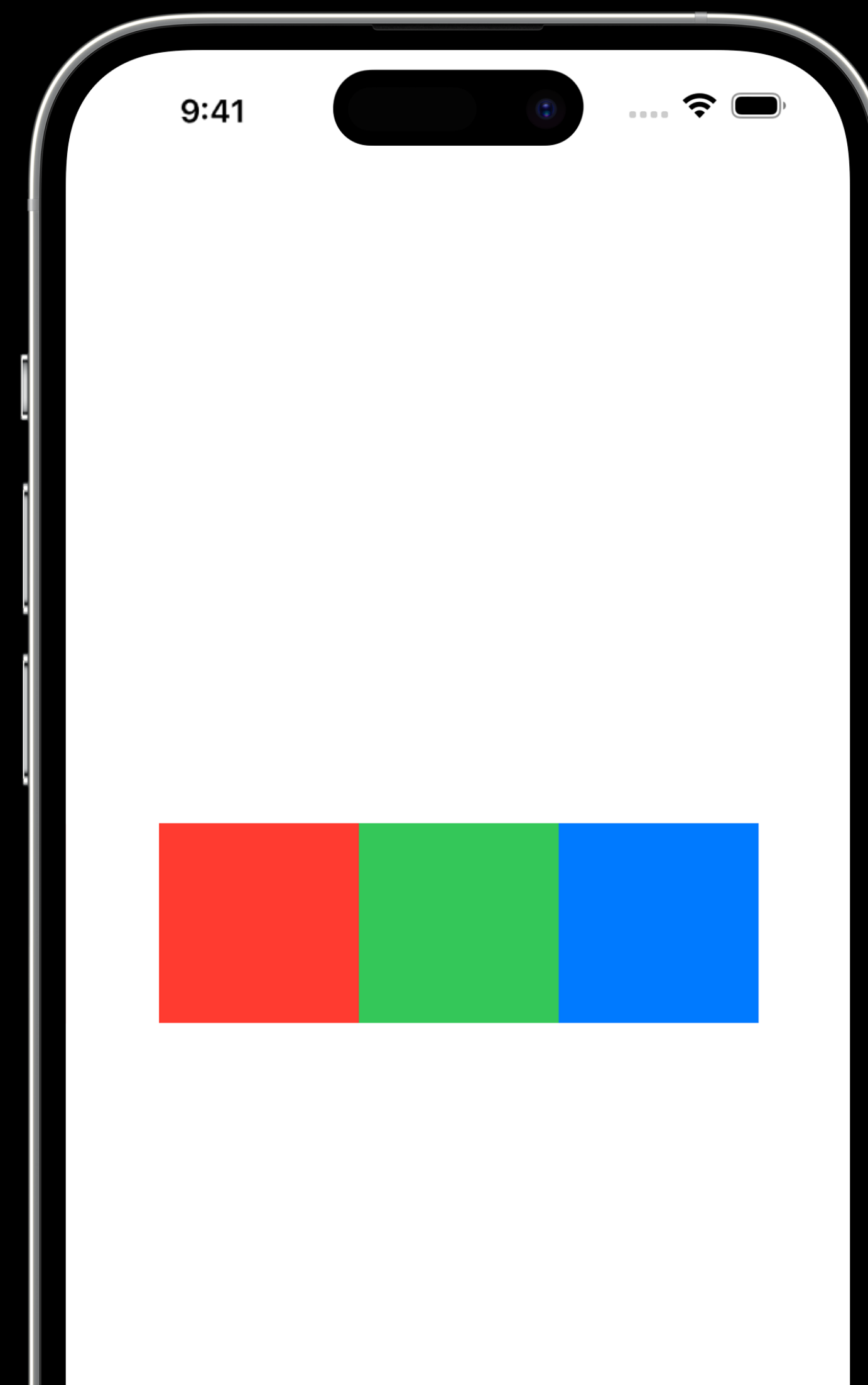
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自私的 组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack(spacing: 0) {  
  
            Color.red  
  
            Color.green  
  
            Color.blue  
  
        }  
        .frame(width: 300, height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

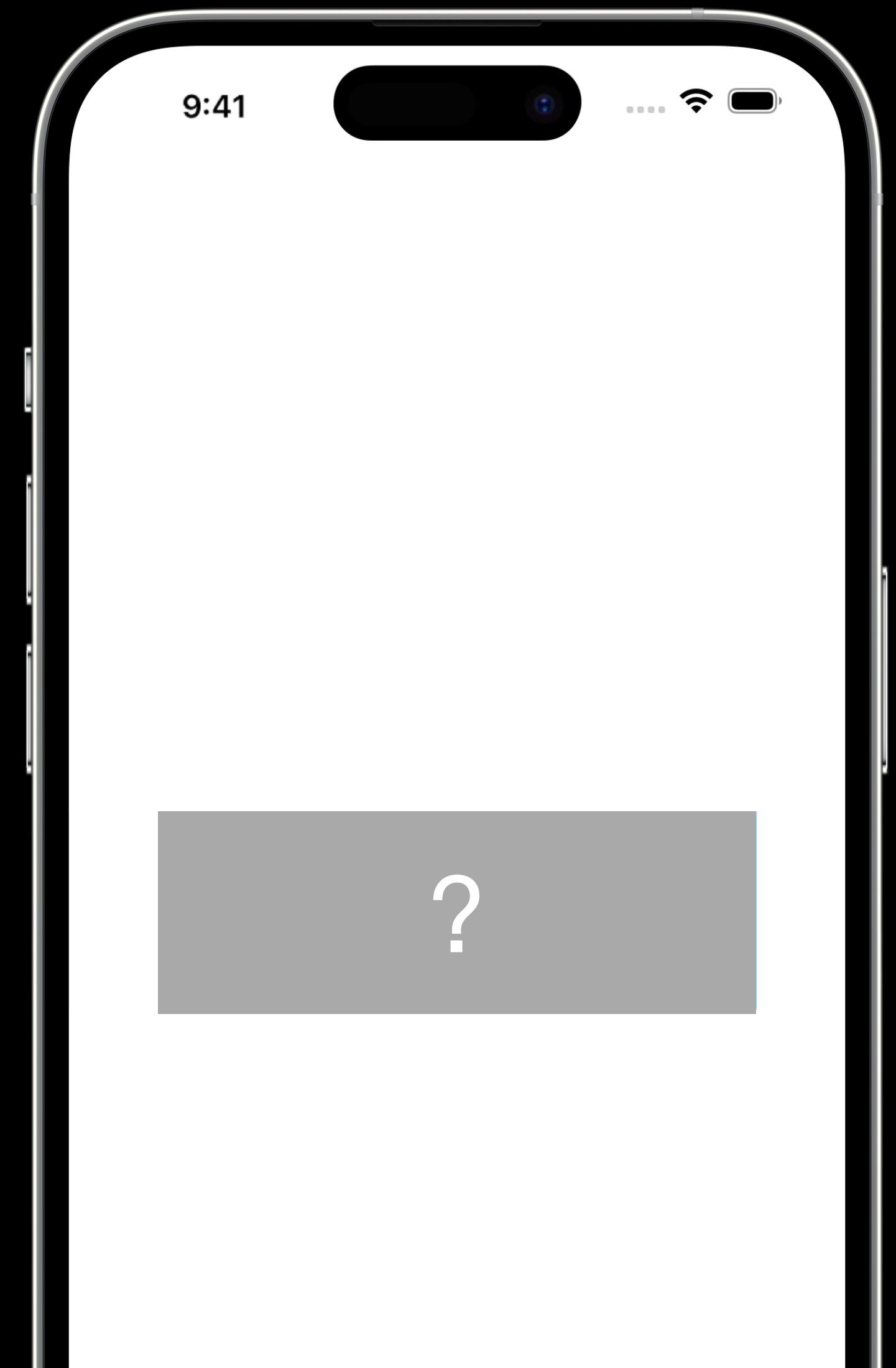


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自私的组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack(spacing: 0)  
            Color.red {  
                .frame(minWidth: 80.0)  
  
                Color.green  
                .frame(minWidth: 30.0,  
                    idealWidth: 40.0,  
                    maxWidth: 110)  
                .layoutPriority(1.0)  
  
                Color.blue  
                .frame(minWidth: 60)  
  
            }  
        .frame(width: 300, height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

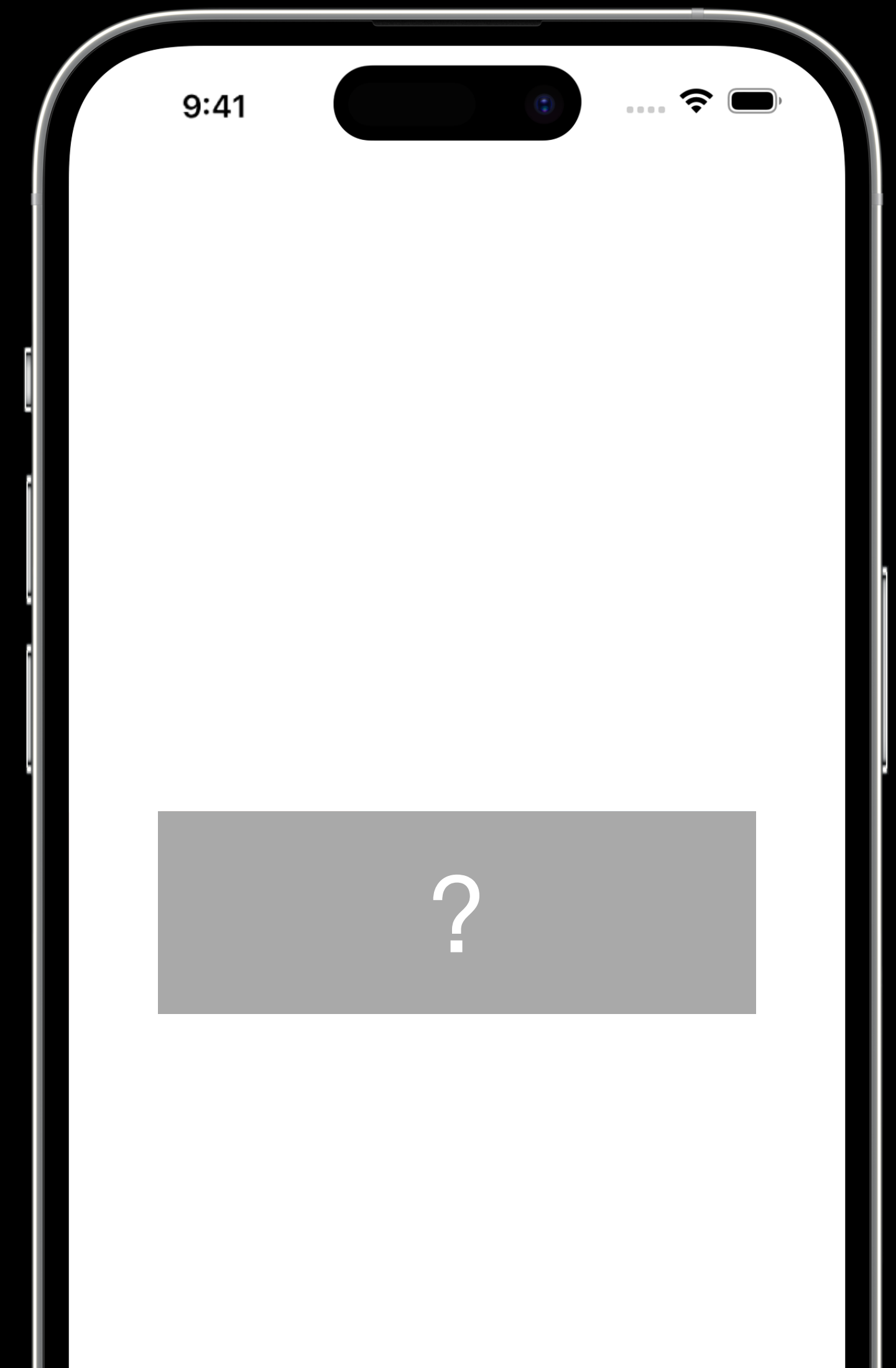


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自私的组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack(spacing: 0)  
            Color.red {  
                .frame(minWidth: 80.0)  
  
                Color.green  
                    .frame(minWidth: 30.0,  
                           idealWidth: 40.0,  
                           maxWidth: 110)  
                    .layoutPriority(1.0)  
  
                Color.blue  
                    .frame(minWidth: 60)  
                    .layoutPriority(1.0)  
            }  
        .frame(width: 300, height: 100)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

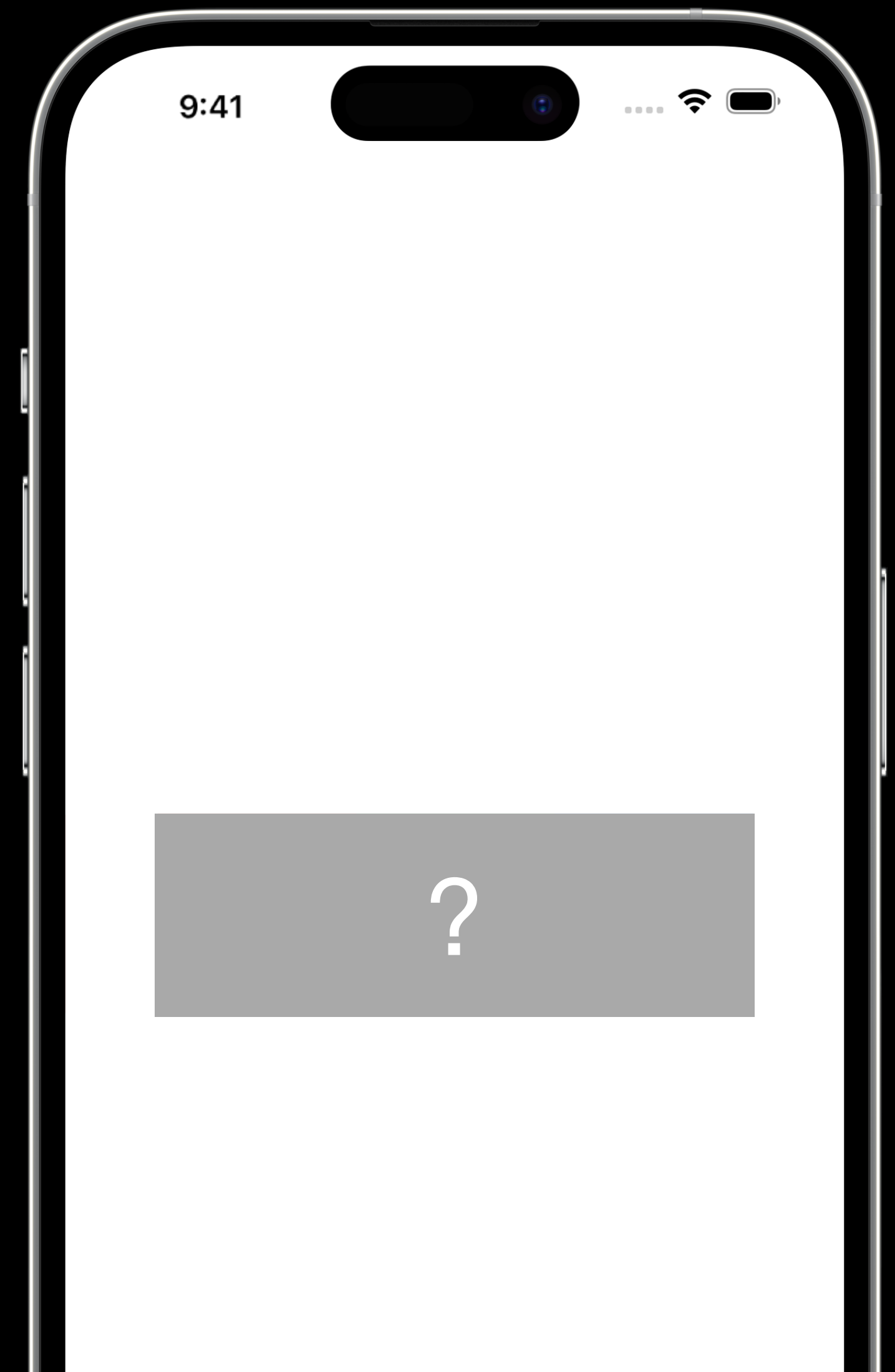


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自私的 组件

Selfish

```
struct ContentView: View {  
    var body: some View {  
        HStack(spacing: 0)  
        {  
            Color.red  
                .frame(minWidth: 10.0)  
                .layoutPriority(1.0)  
            Color.green  
                .frame(minWidth: 30.0,  
                    idealWidth: 40.0,  
                    maxWidth: 110)  
                .layoutPriority(1.0)  
            Color.blue  
                .frame(minWidth: 60)  
        }  
        .frame(width: 300, height: 100)  
    }  
}
```

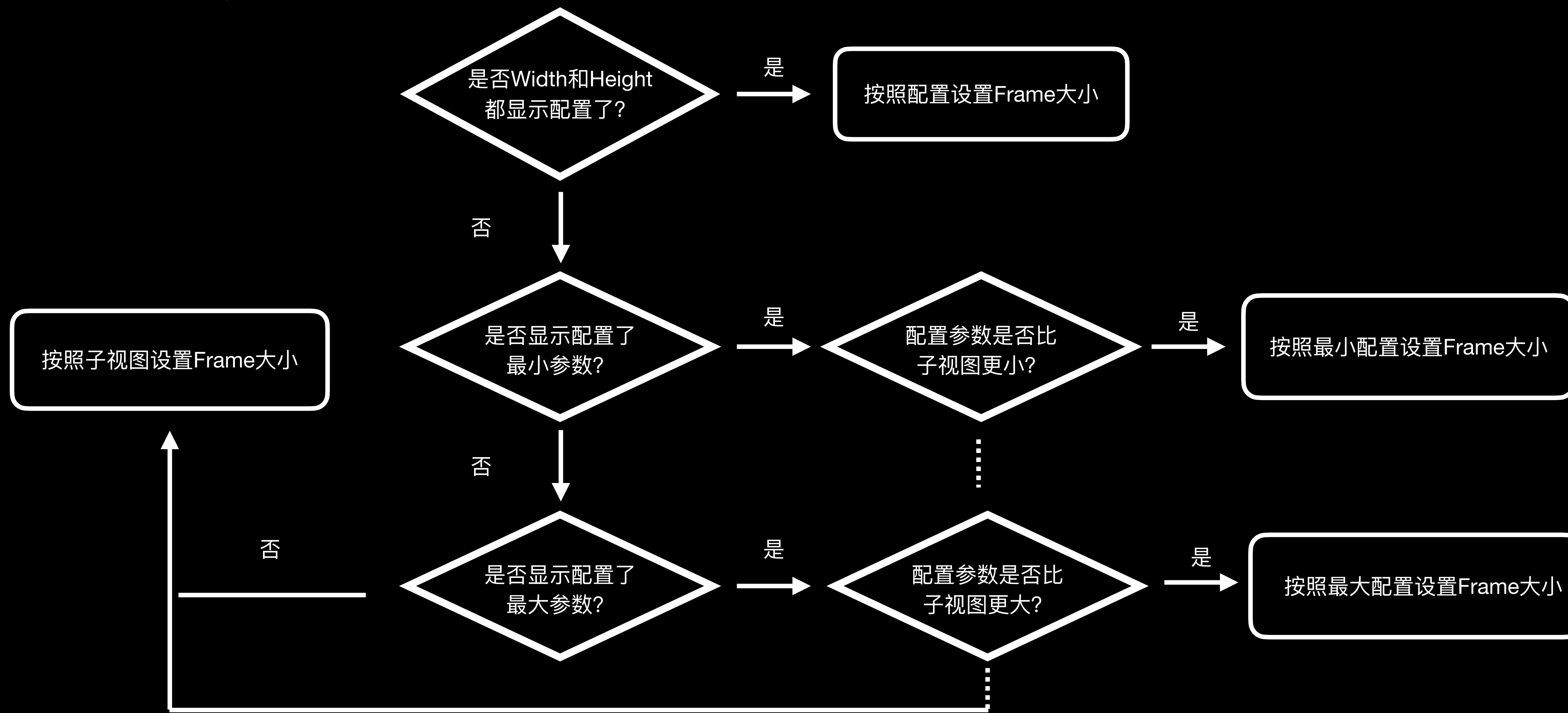


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The details you must understand about SwiftUI



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The details you must understand about SwiftUI

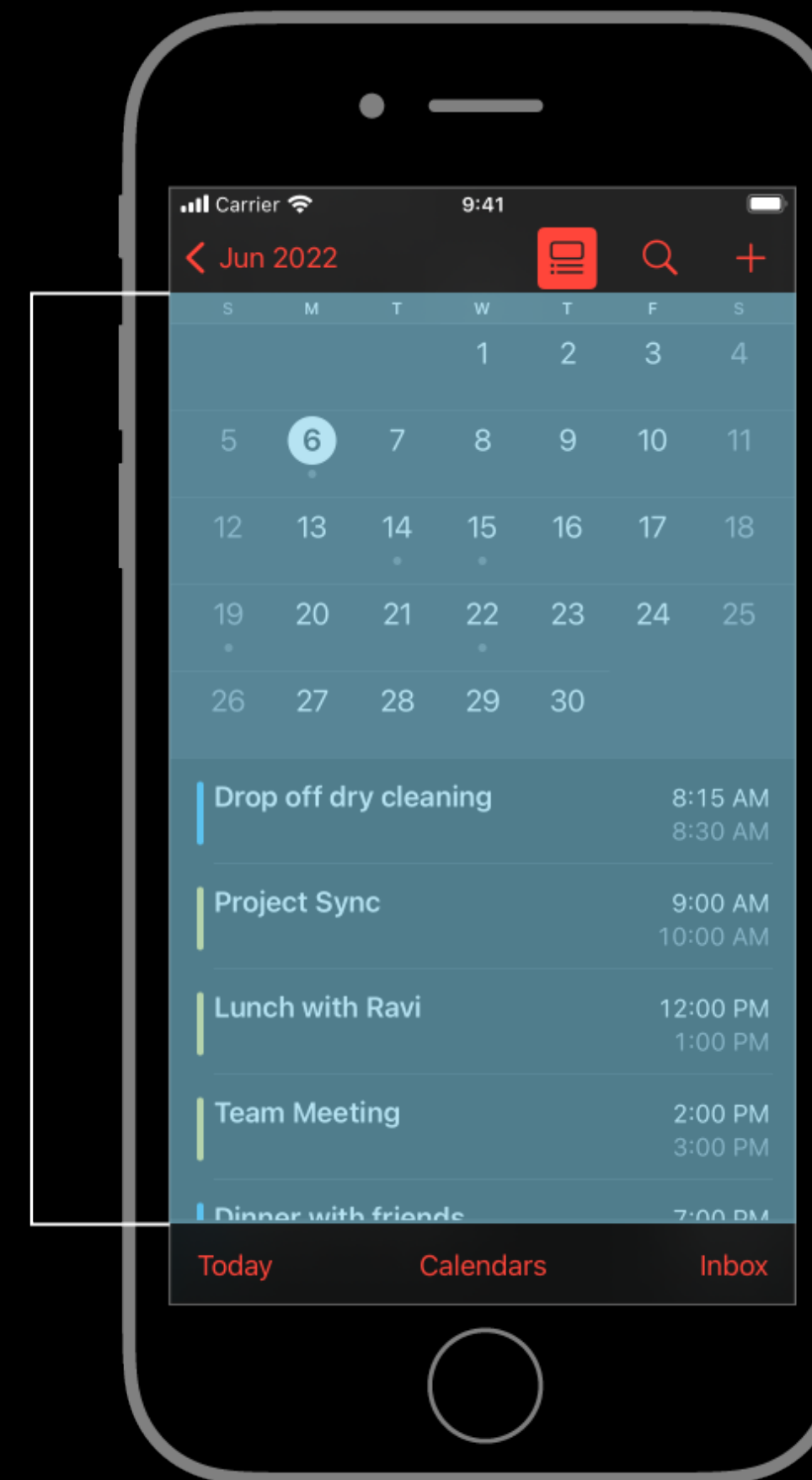
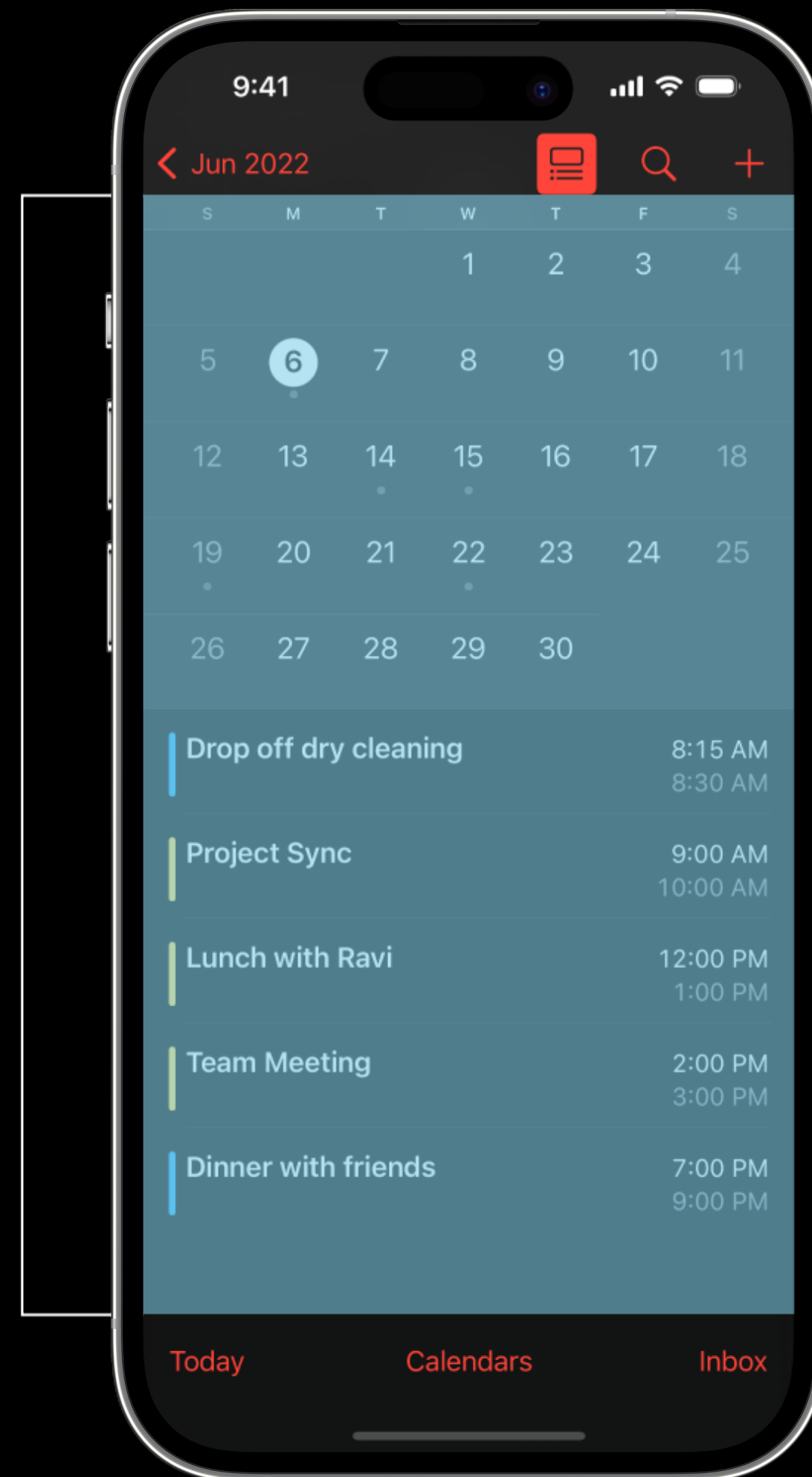


如何快速**靠左上方**放置一个组件？

你需要知道的SwiftUI细节

The details you must understand about SwiftUI

SafeArea

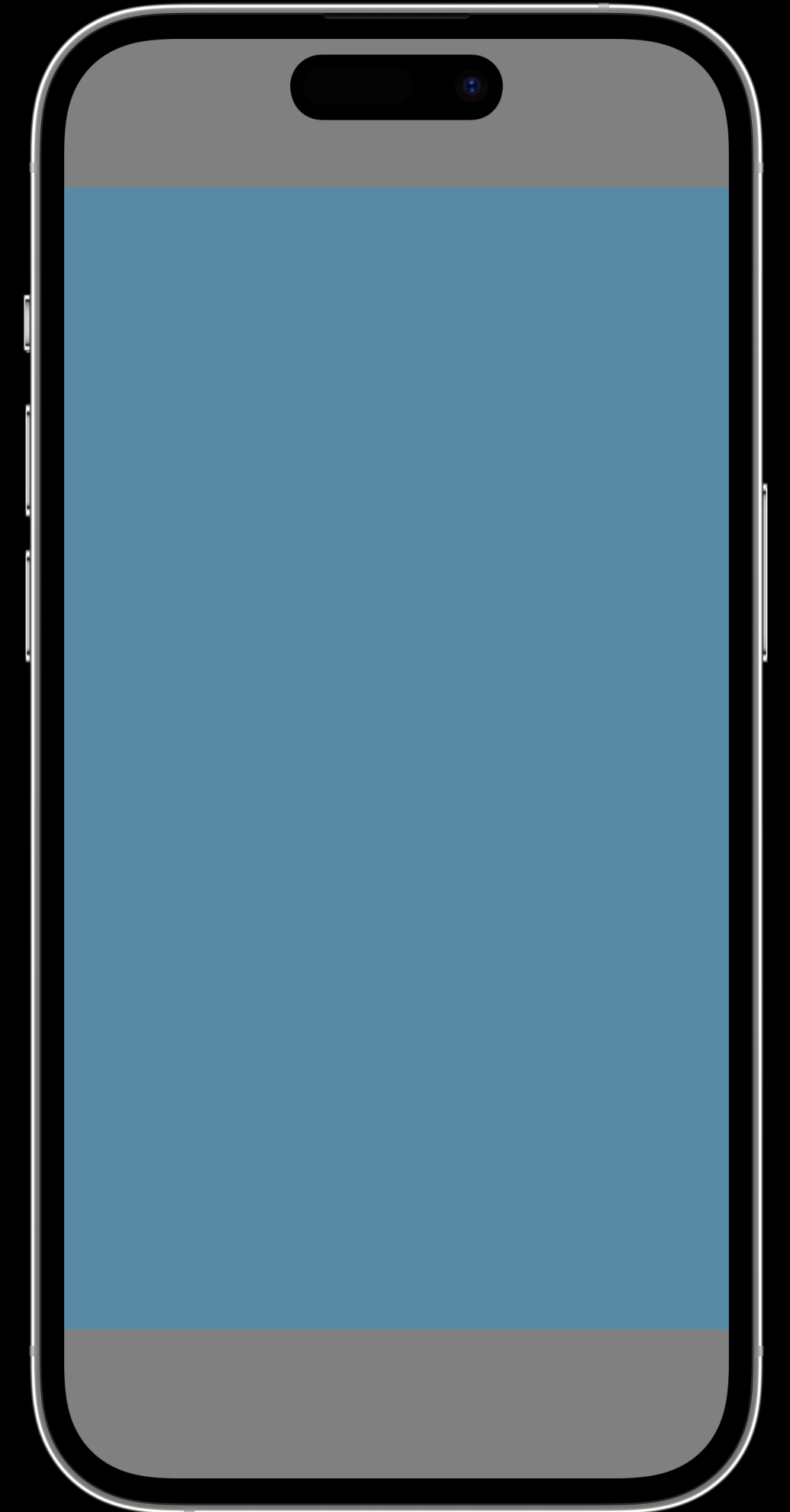


你需要知道的SwiftUI细节

The details you must understand about SwiftUI



```
struct ContentView: View {  
    var body: some View {  
  
    }  
}
```

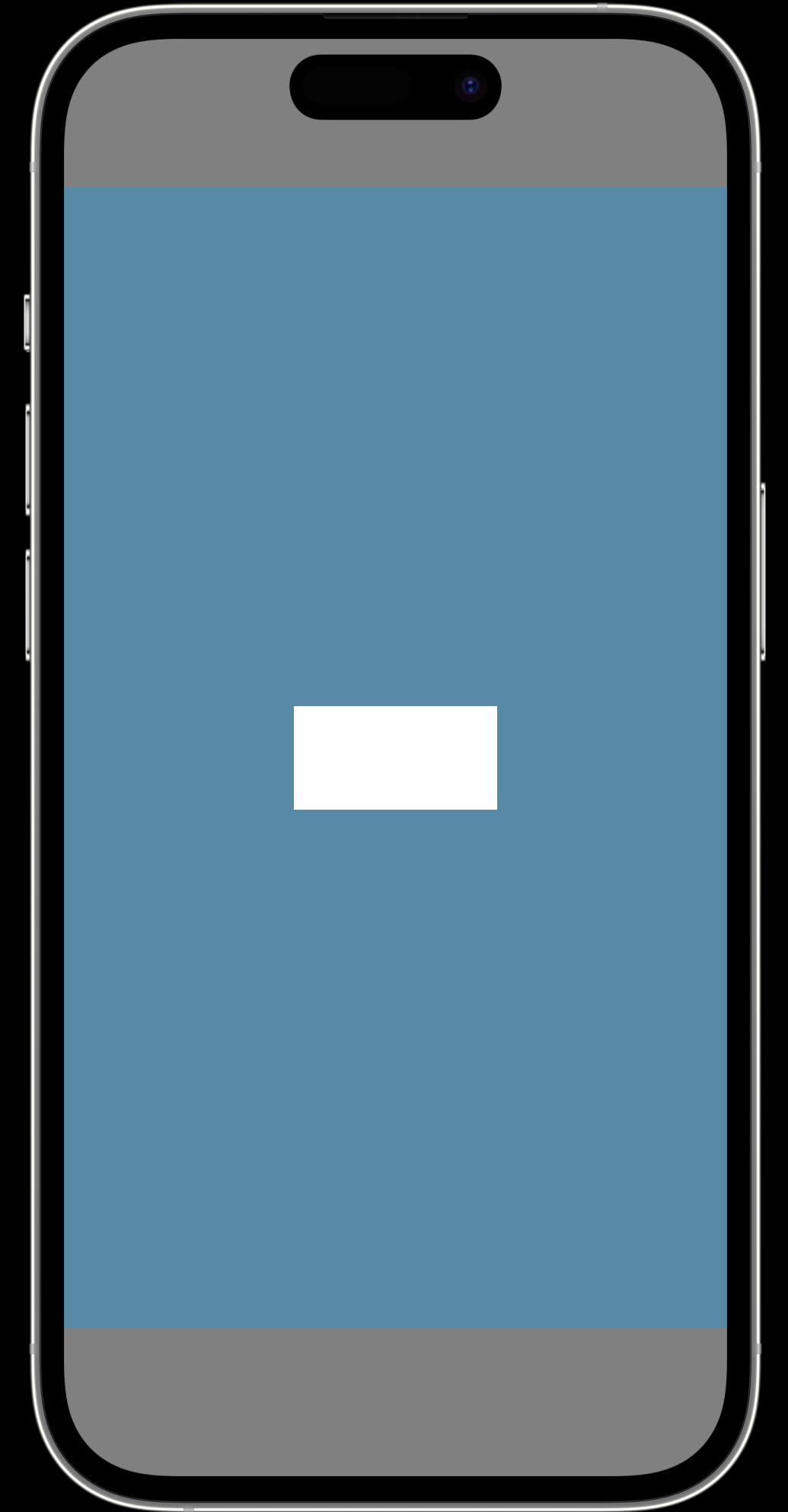


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The details you must understand about SwiftUI



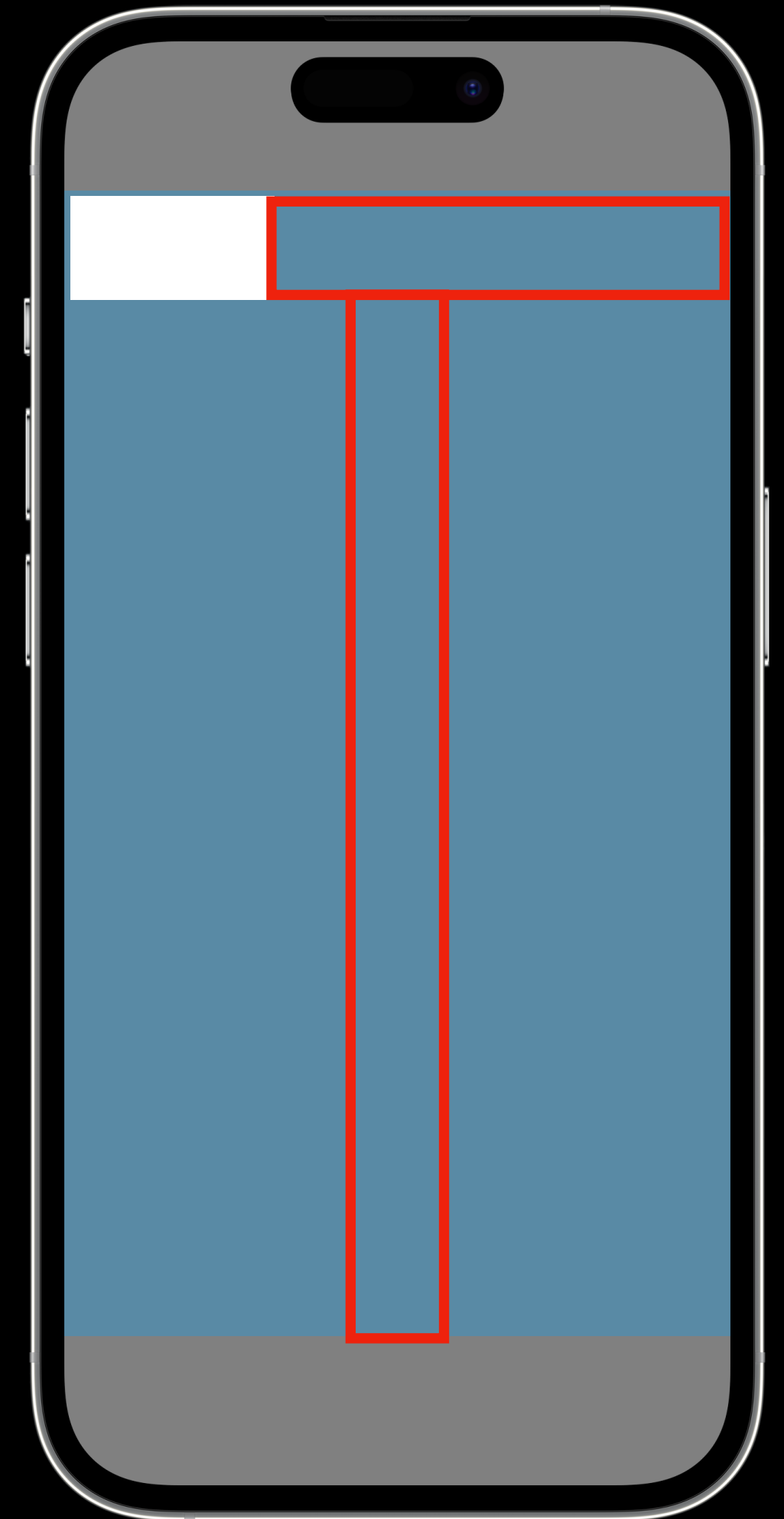
```
struct ContentView: View {  
    var body: some View {  
        Text("Hello!")  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI

```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            HStack {  
                Text("Hello!")  
                Spacer()  
            }  
            Spacer()  
        }  
    }  
}
```



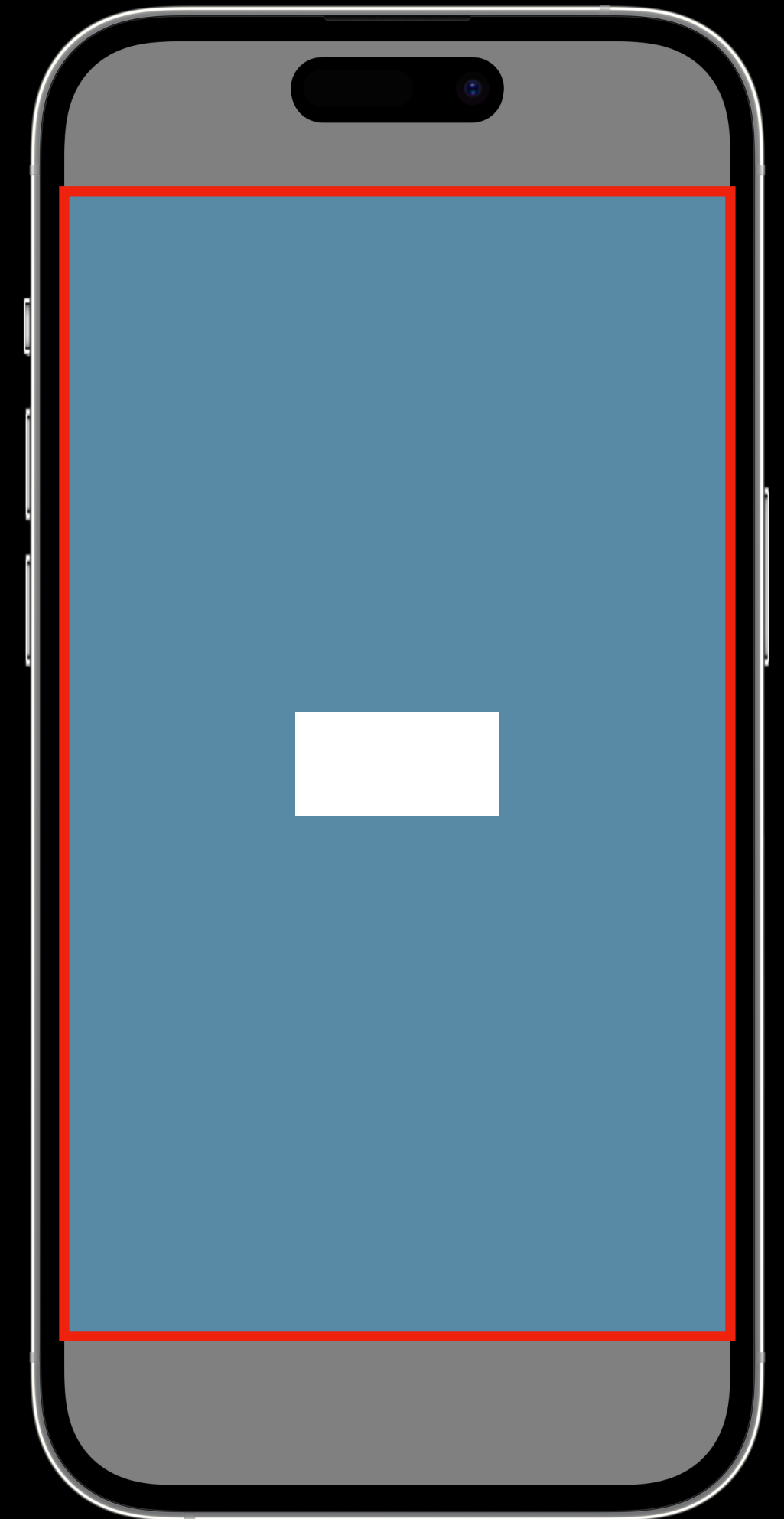
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```
struct ContentView: View {  
    var body: some View {  
        Text("Hello!")  
        .frame(maxWidth: .infinity,  
               maxHeight: .infinity,  
               alignment: .center)  
    }  
}
```



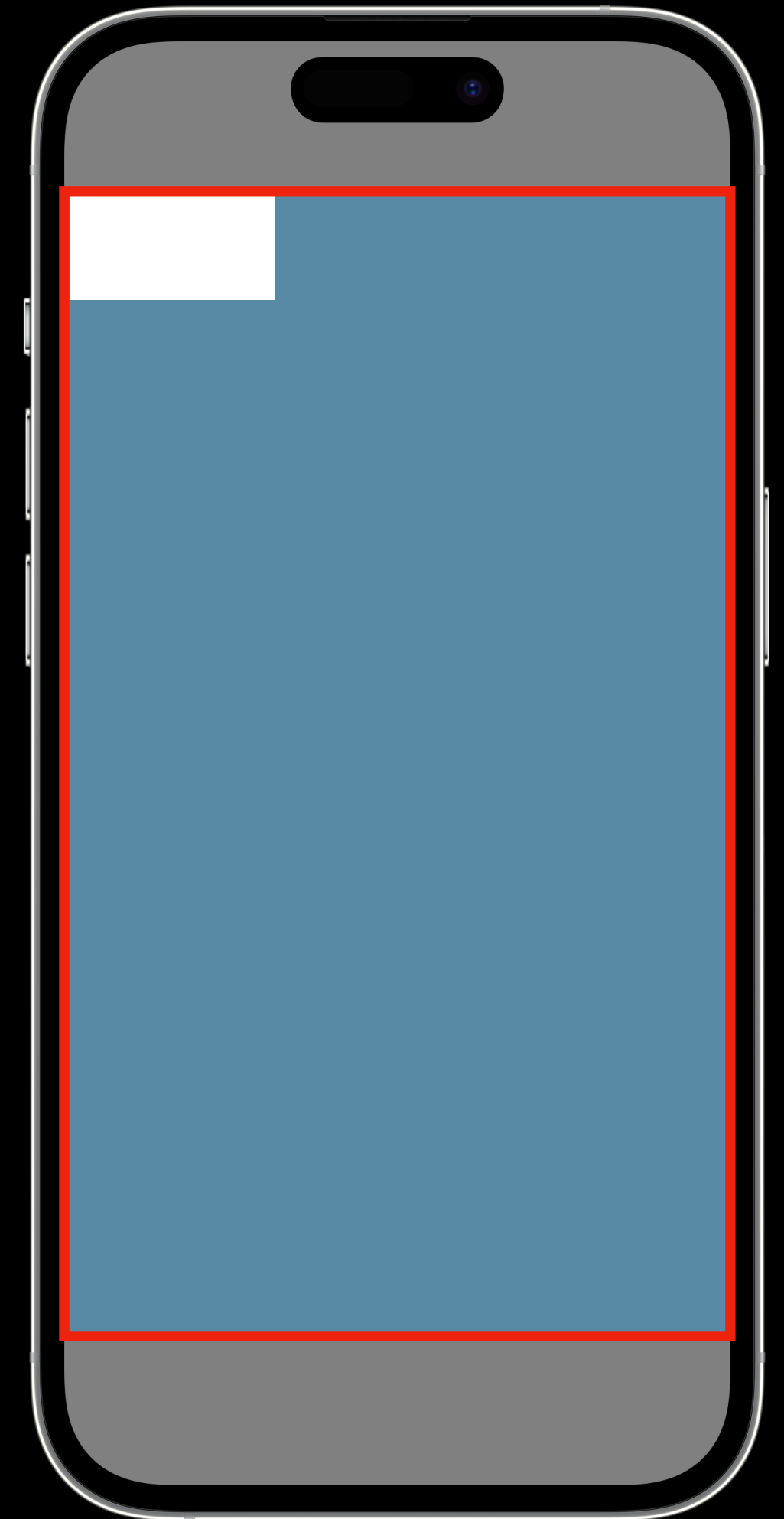
你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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```
struct ContentView: View {  
    var body: some View {  
        Text("Hello!")  
        .frame(maxWidth: .infinity,  
               maxHeight: .infinity,  
               alignment: .topLeading)  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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如何自适应屏幕尺寸

How to adapt to the screen size

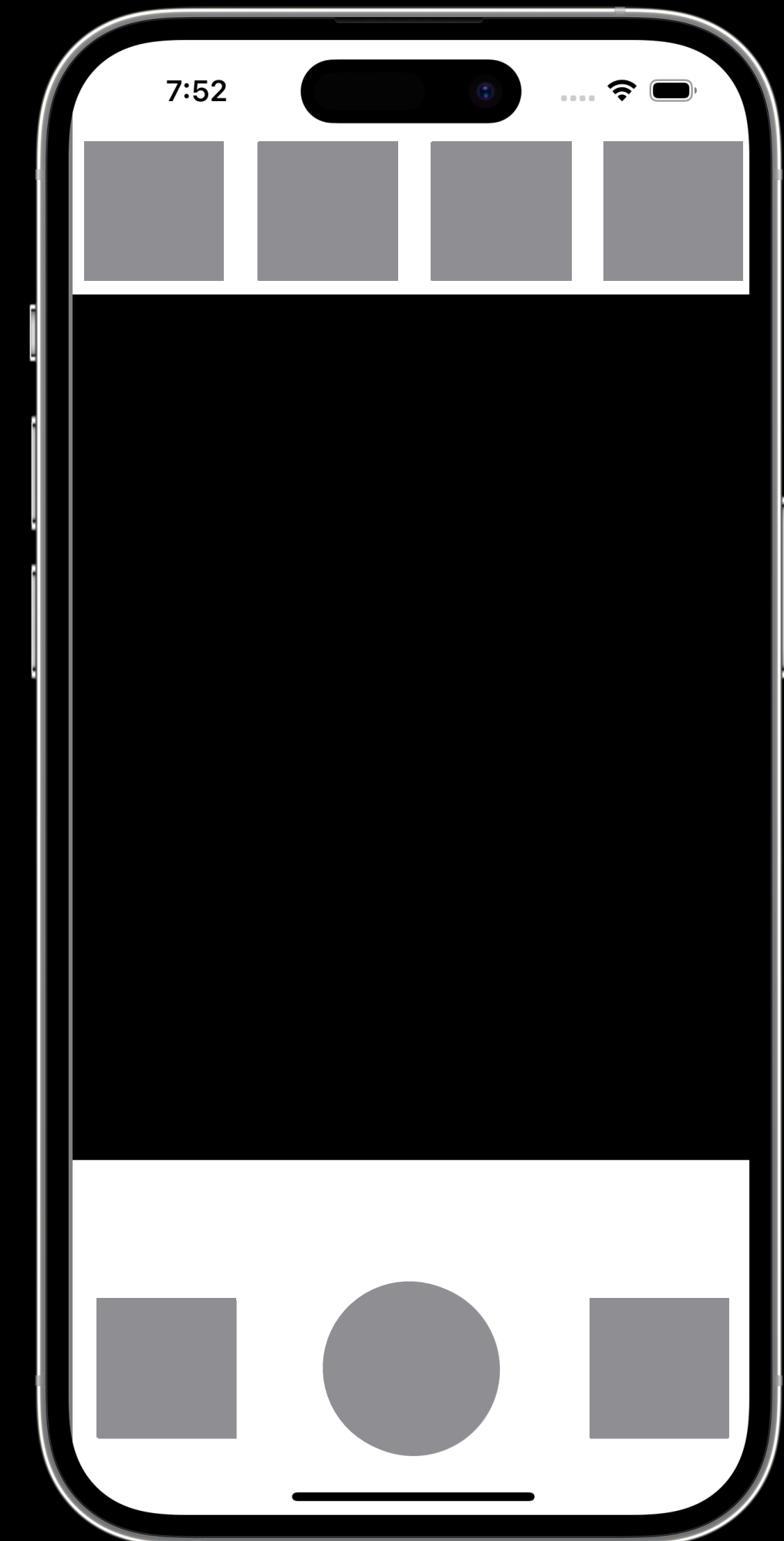
你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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```
struct ViewThatFit: View {  
    var body: some View {  
        VStack{  
            TopTools  
            Rectangle()  
                .frame(height: 500)  
            Spacer()  
            BottomTools  
        }  
    }  
}
```



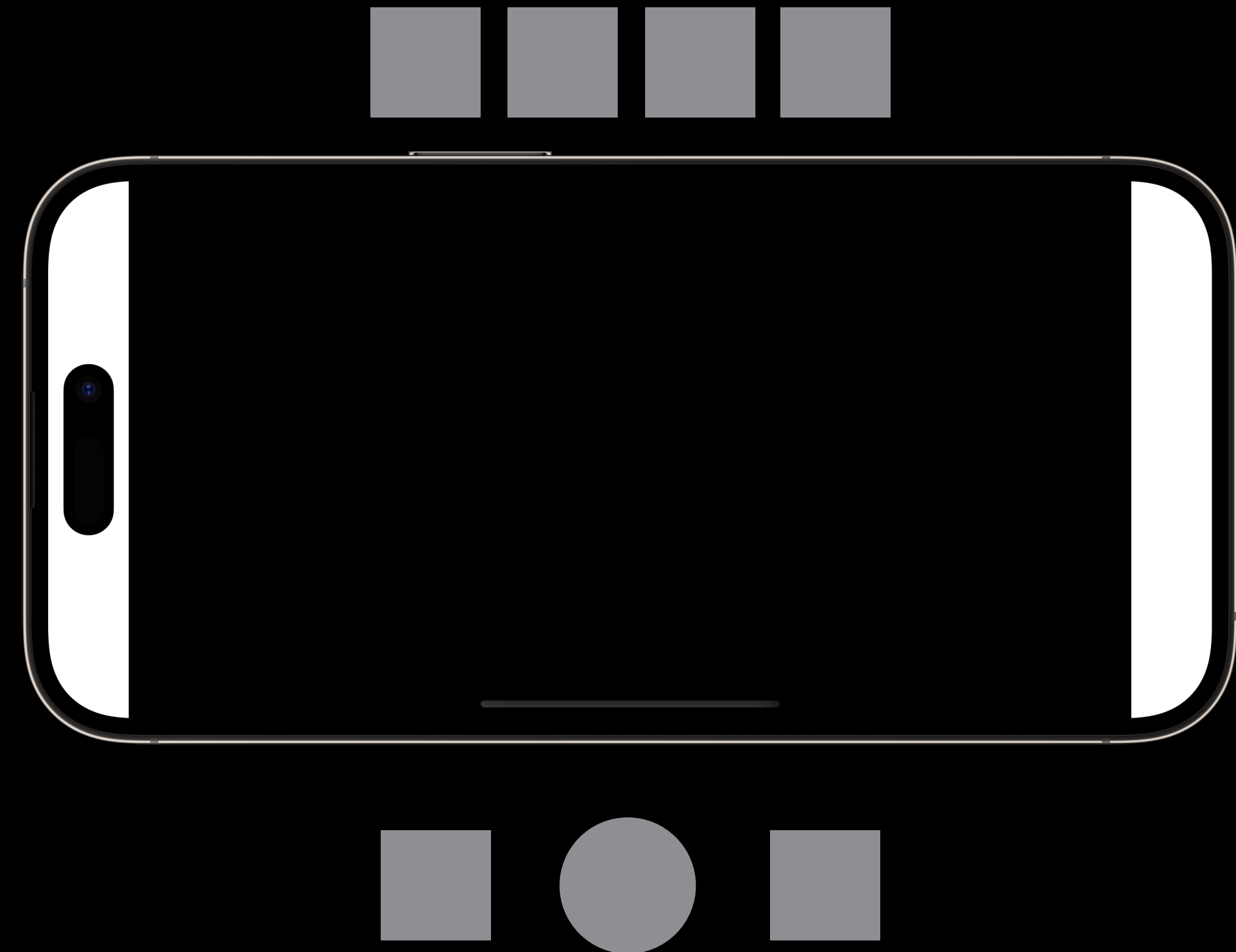
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```
struct ViewThatFit: View {  
    var body: some View {  
        VStack{  
            TopTools  
            Rectangle()  
                .frame(height: 500)  
            Spacer()  
            BottomTools  
        }  
    }  
}
```



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```
struct ViewThatFit: View {  
    var body: some View {  
        VStack{  
            TopTools  
            Rectangle()  
                .frame(height: 500)  
            Spacer()  
            BottomTools  
        }  
    }  
}
```



你需要知道的SwiftUI细节

The details you must understand about SwiftUI



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```
struct ViewThatFit: View {  
    var body: some View {  
        ViewThatFits(in: .vertical) {  
            VStack{  
                TopTools  
                Rectangle()  
                    .frame(height: 500)  
                Spacer()  
                BottomTools  
            }  
            HStack{  
                TopToolsVertical  
                Rectangle()  
                    .ignoresSafeArea()  
                Spacer()  
                BottomToolsVertical  
            }  
        }  
    }  
}
```



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The details you must understand about SwiftUI



容器内的每个视图都有对齐方式

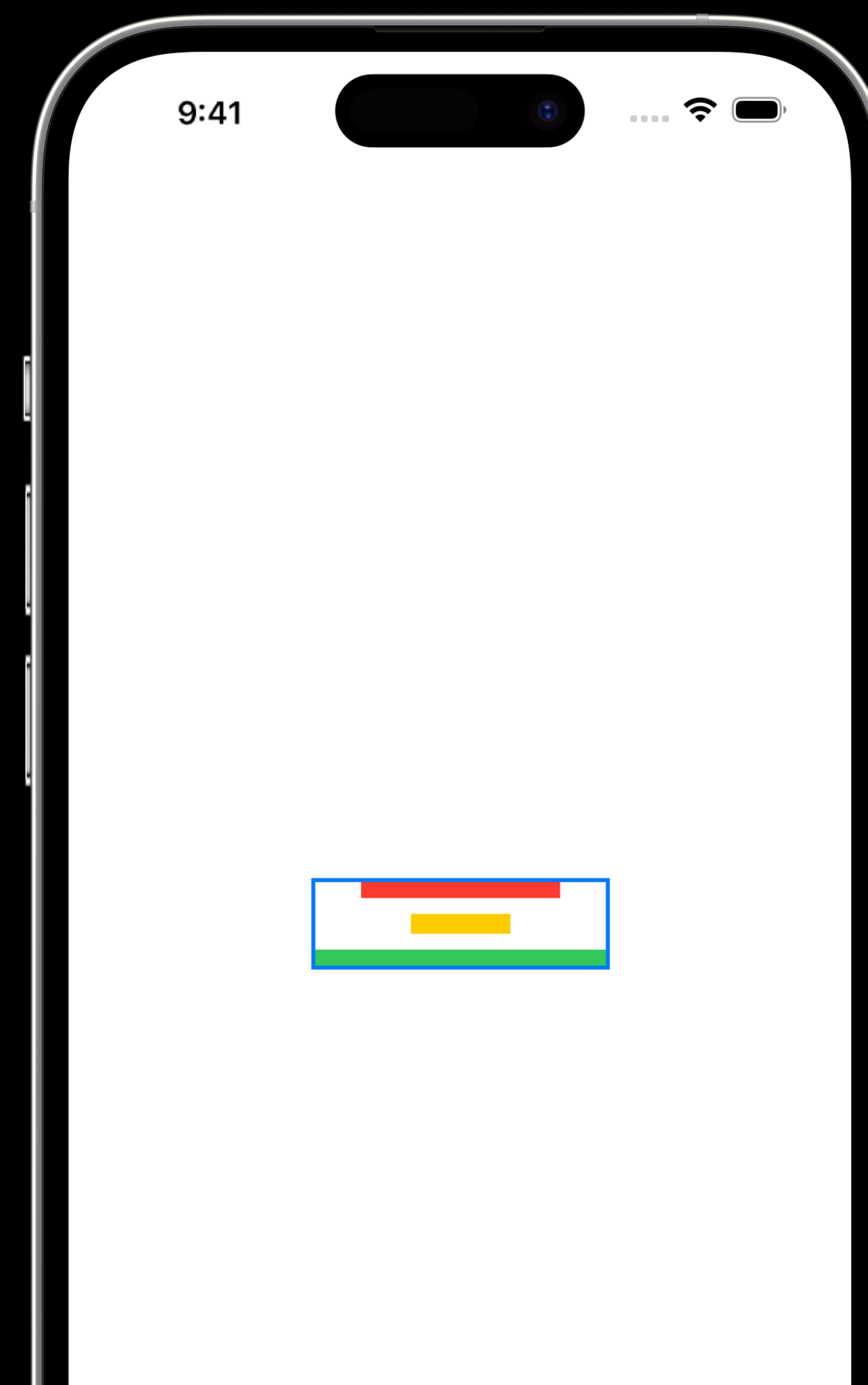
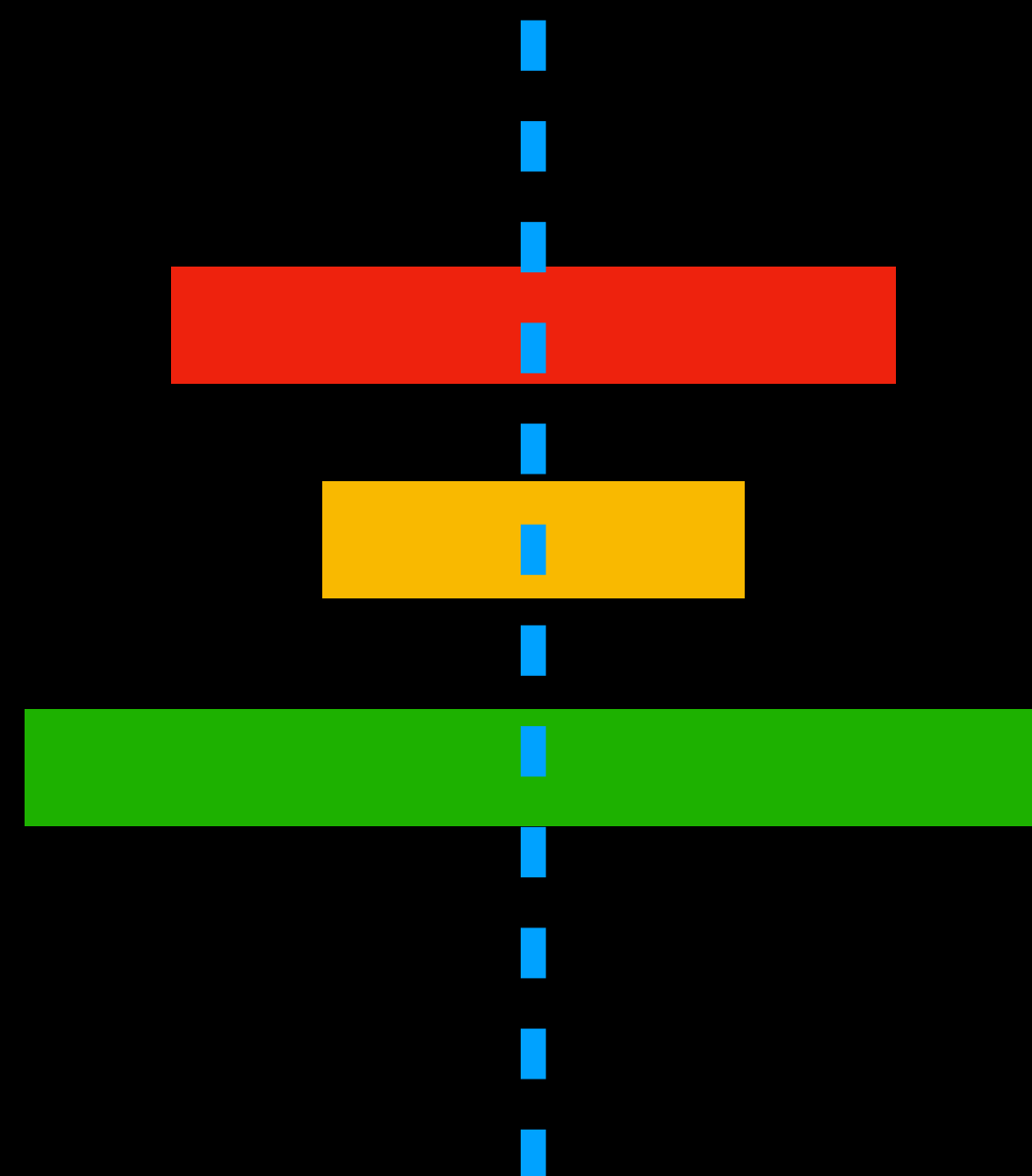
EVERY VIEW inside a container, has an alignment guide.

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The details you must understand about SwiftUI

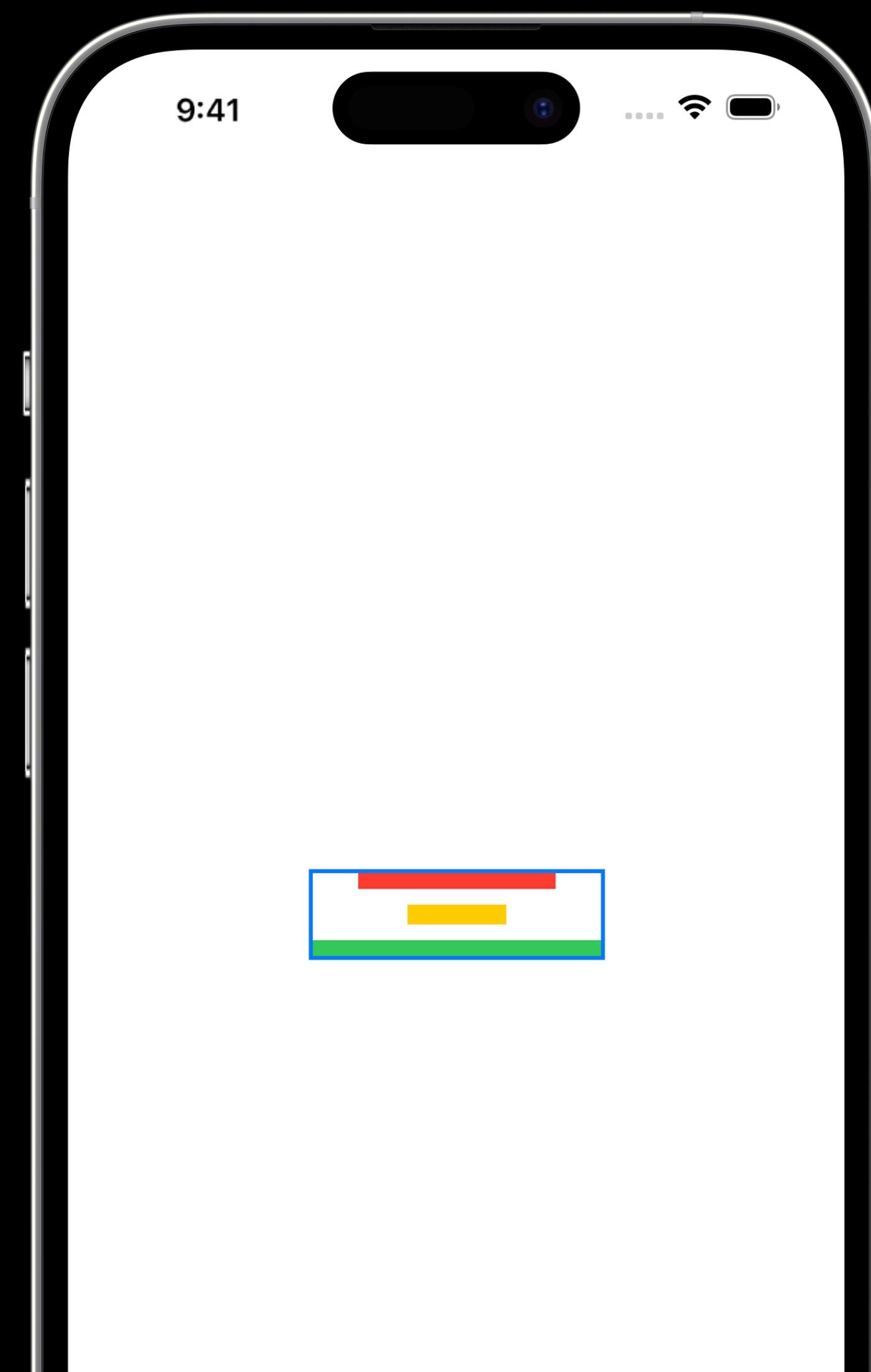
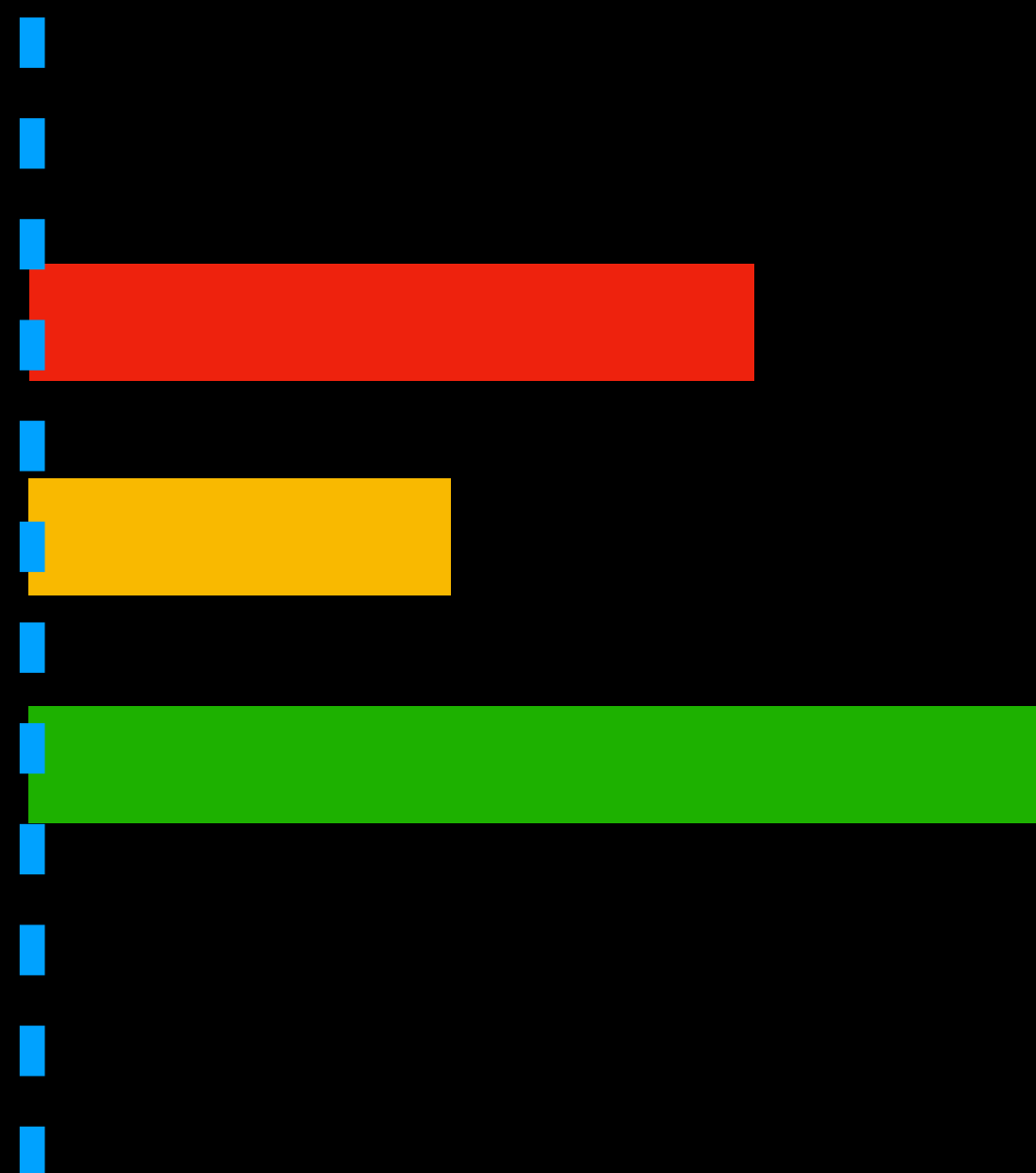


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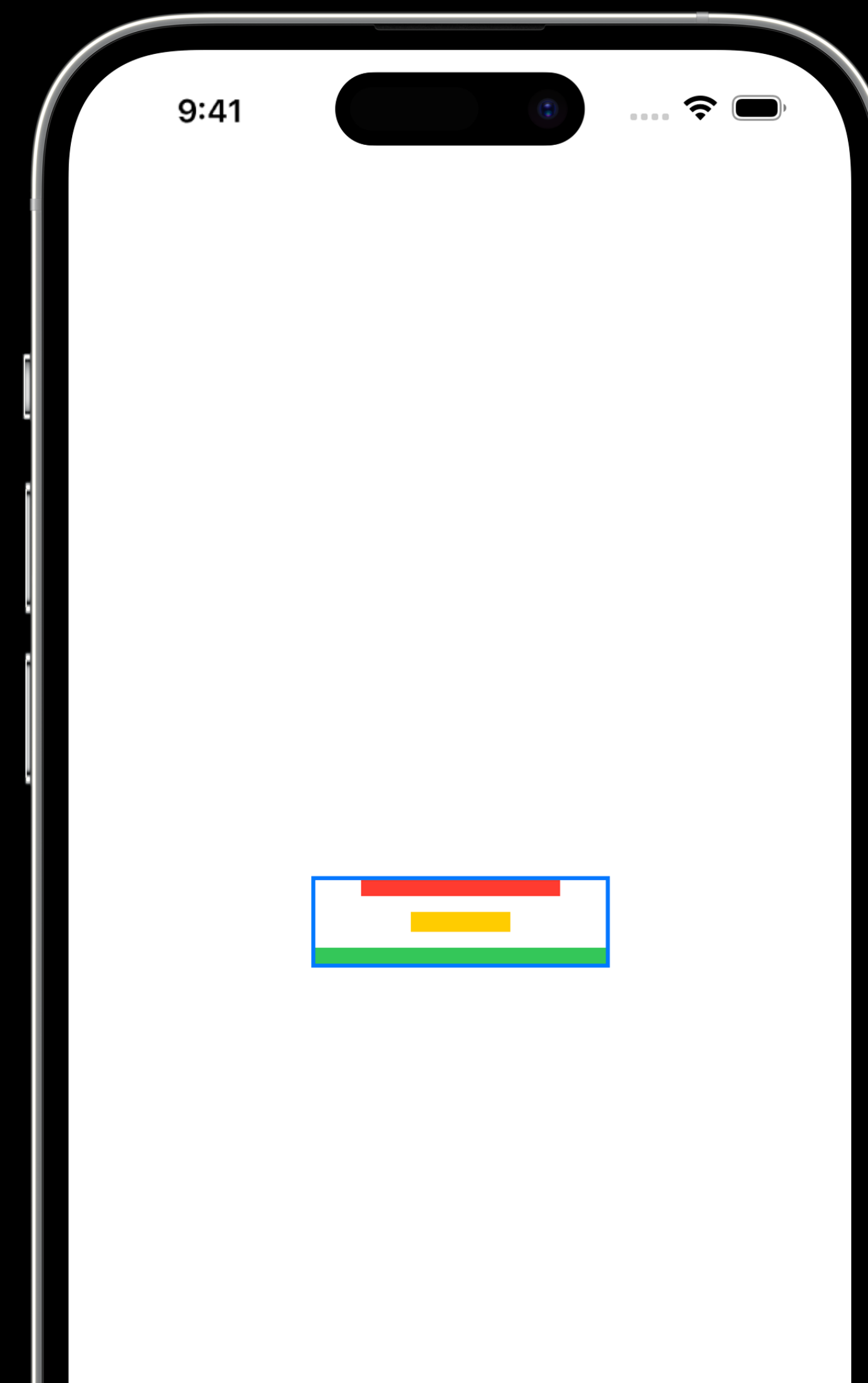
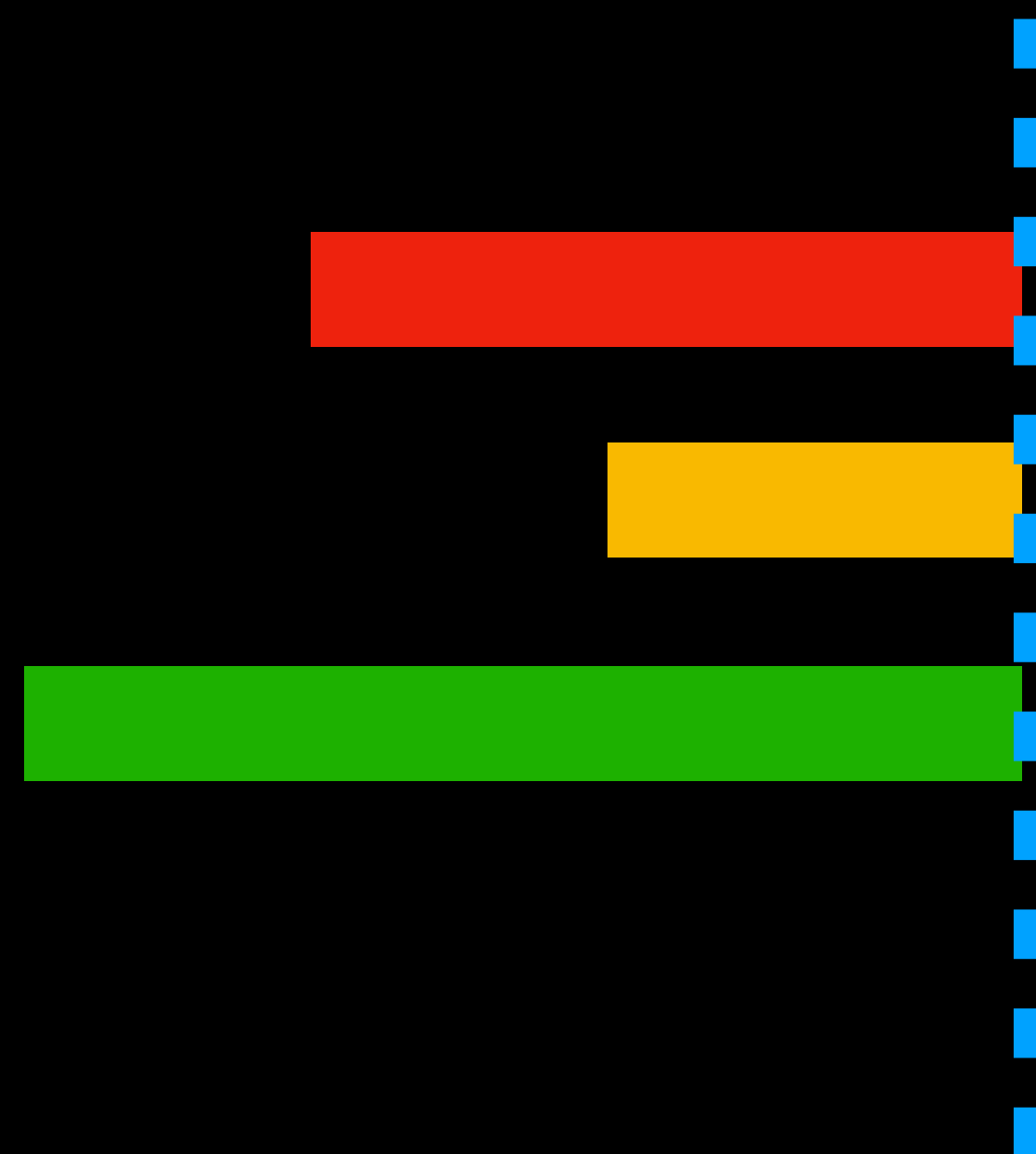


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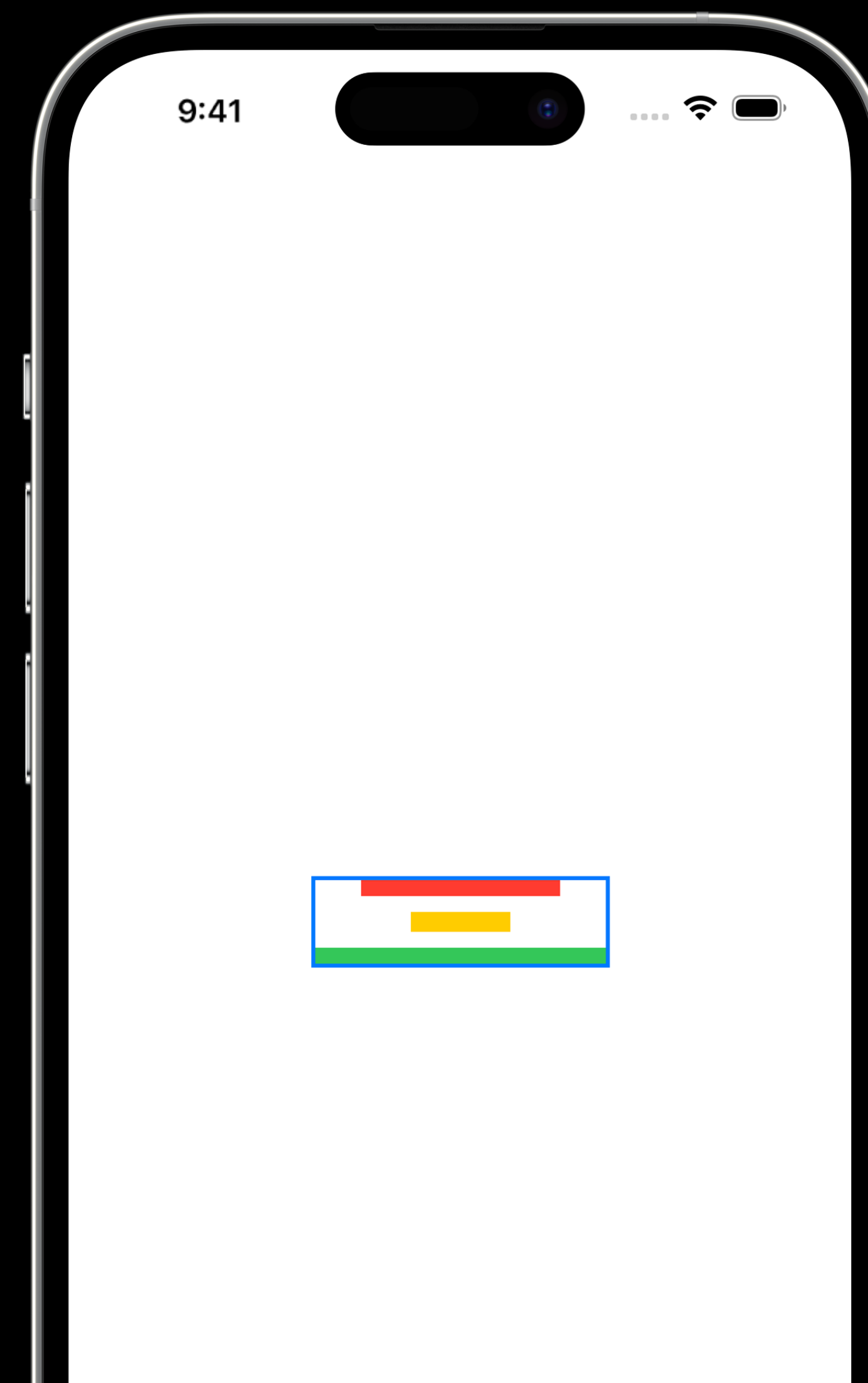


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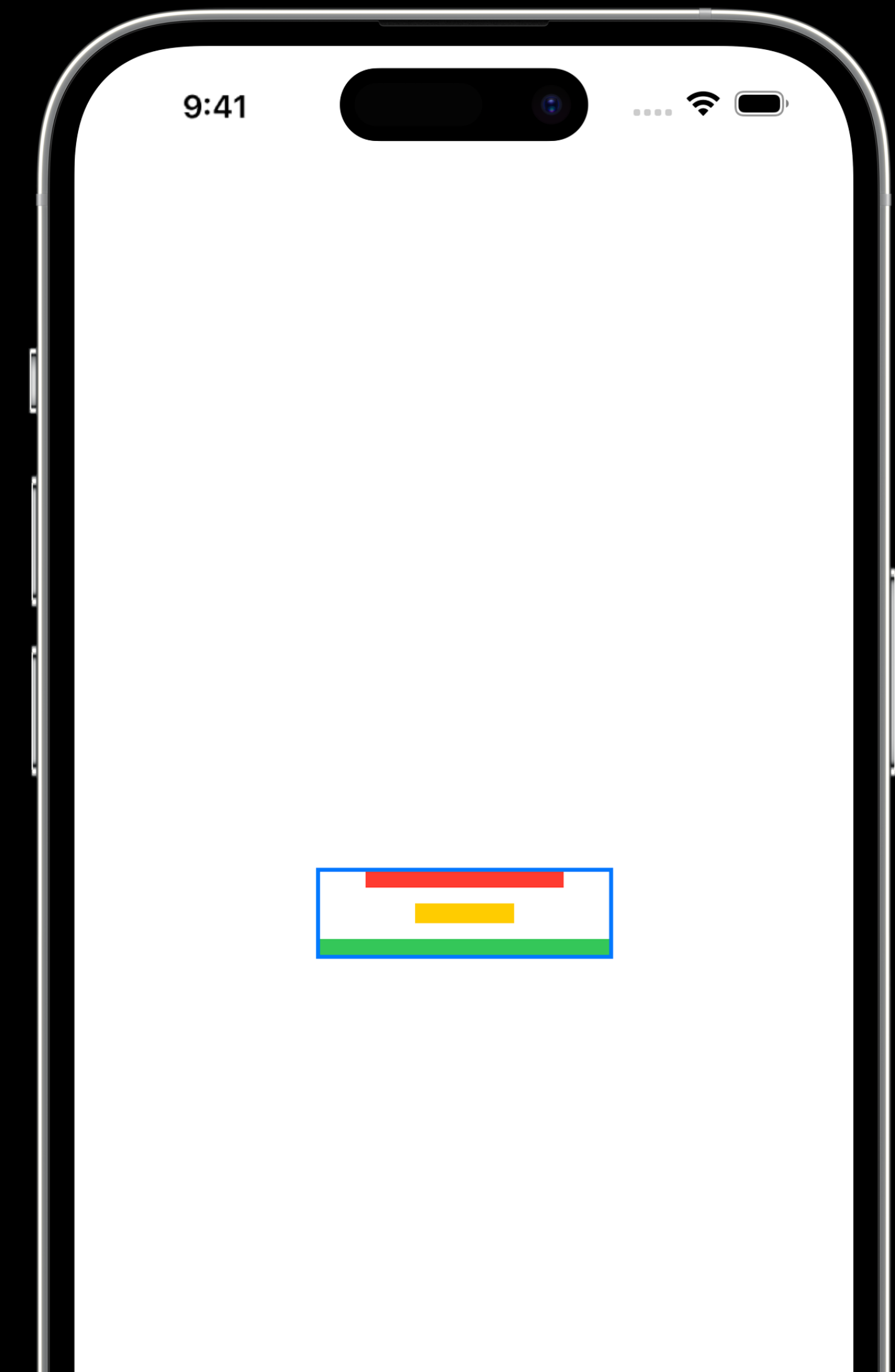
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The details you must understand about SwiftUI

```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            Rectangle()  
                .fill(.red)  
                .frame(width: 100, height: 10)  
  
            Rectangle()  
                .fill(.yellow)  
                .frame(width: 50, height: 10)  
  
            Rectangle()  
                .fill(.green)  
                .frame(width: 150, height: 10)  
        }  
        .border(Color.blue, width: 2)  
    }  
}
```

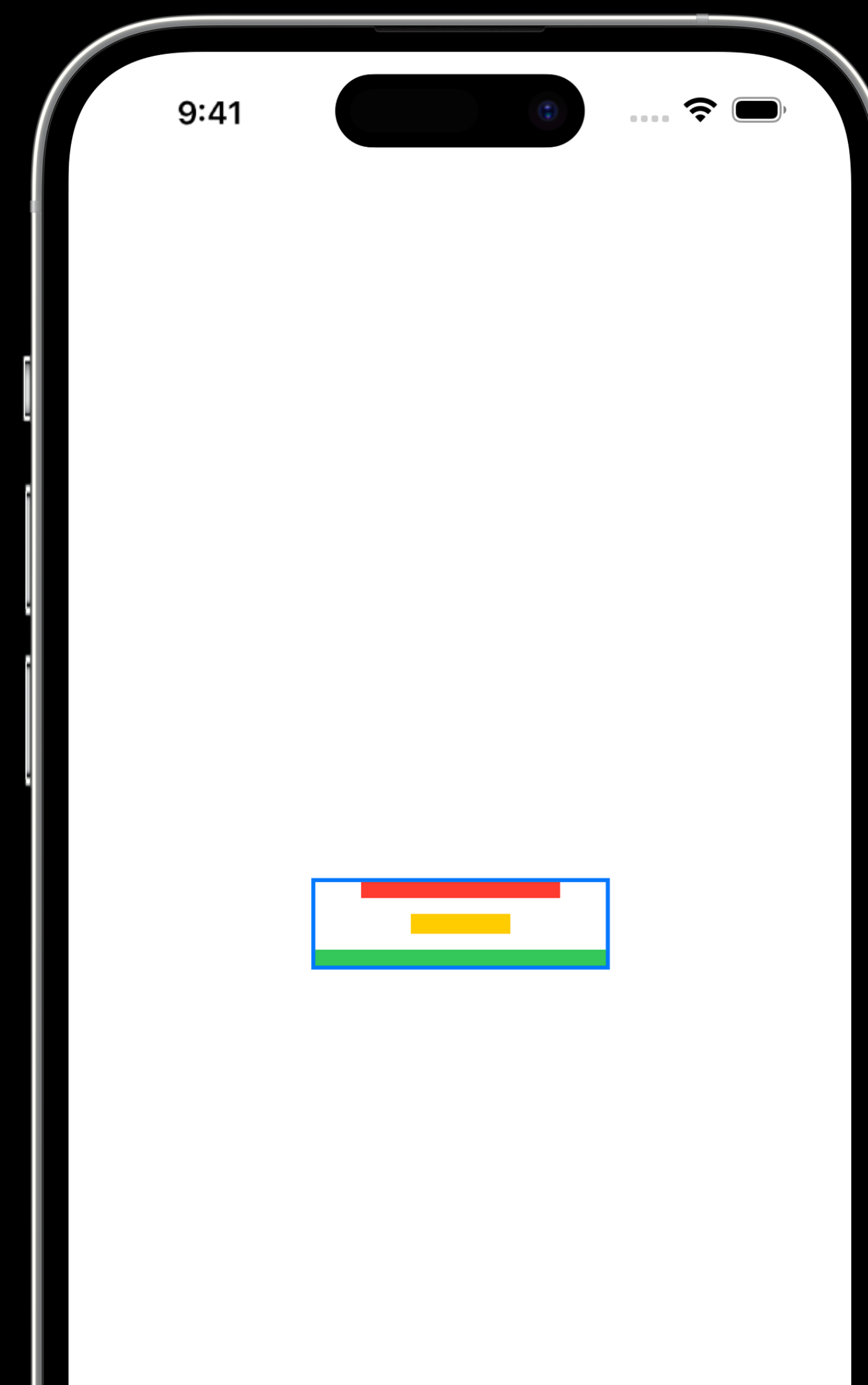


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The details you must understand about SwiftUI



```
VStack(alignment: .center) {
```



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The details you must understand about SwiftUI



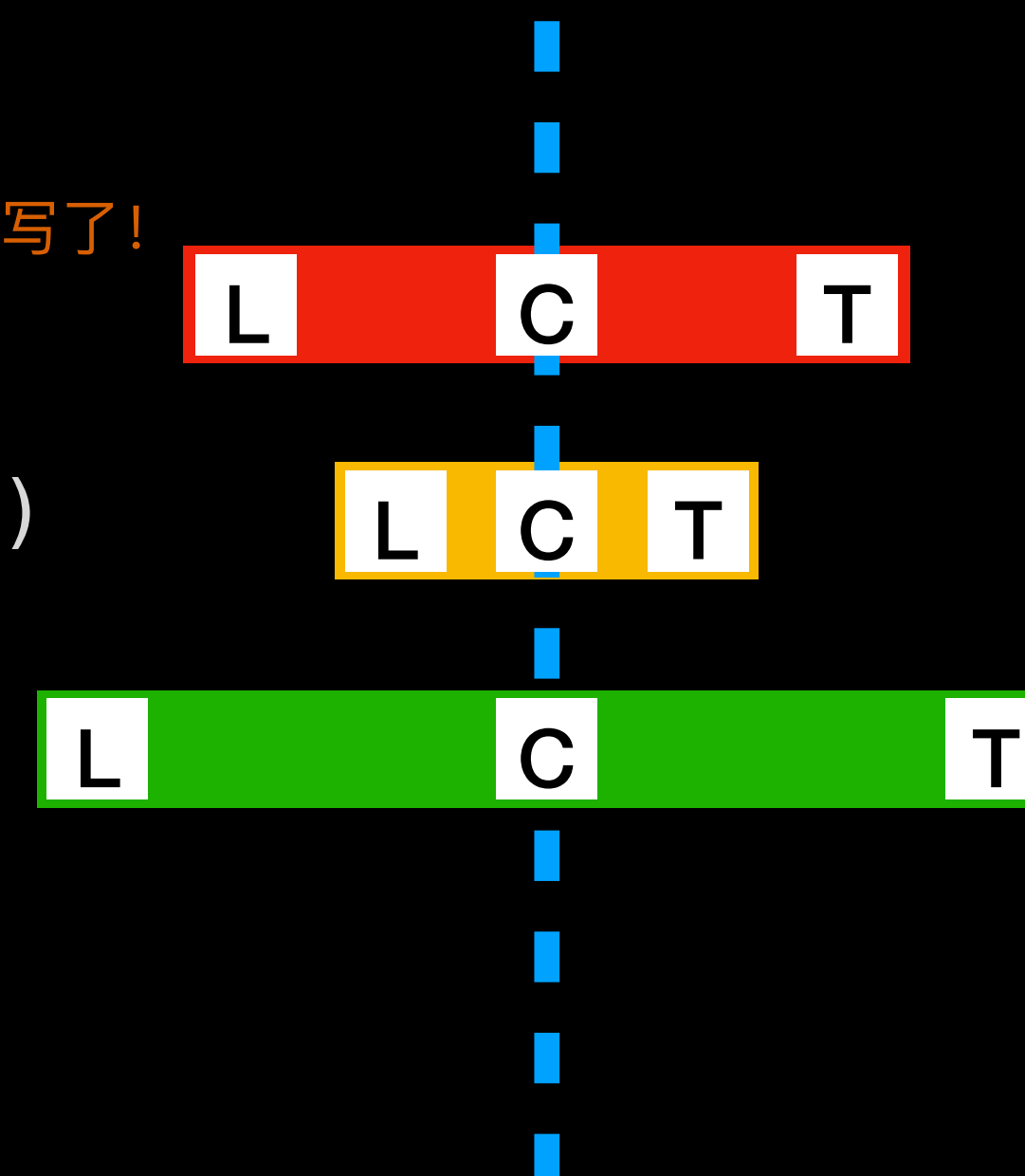
HorizontalAlignment

```
VStack(alignment: .center) {
```

```
    .alignmentGuide(.center,
                    computeValue: { d in d[.center] } )
```

这里缩写了!

这里也缩写了!



```
}
```


你需要知道的SwiftUI细节

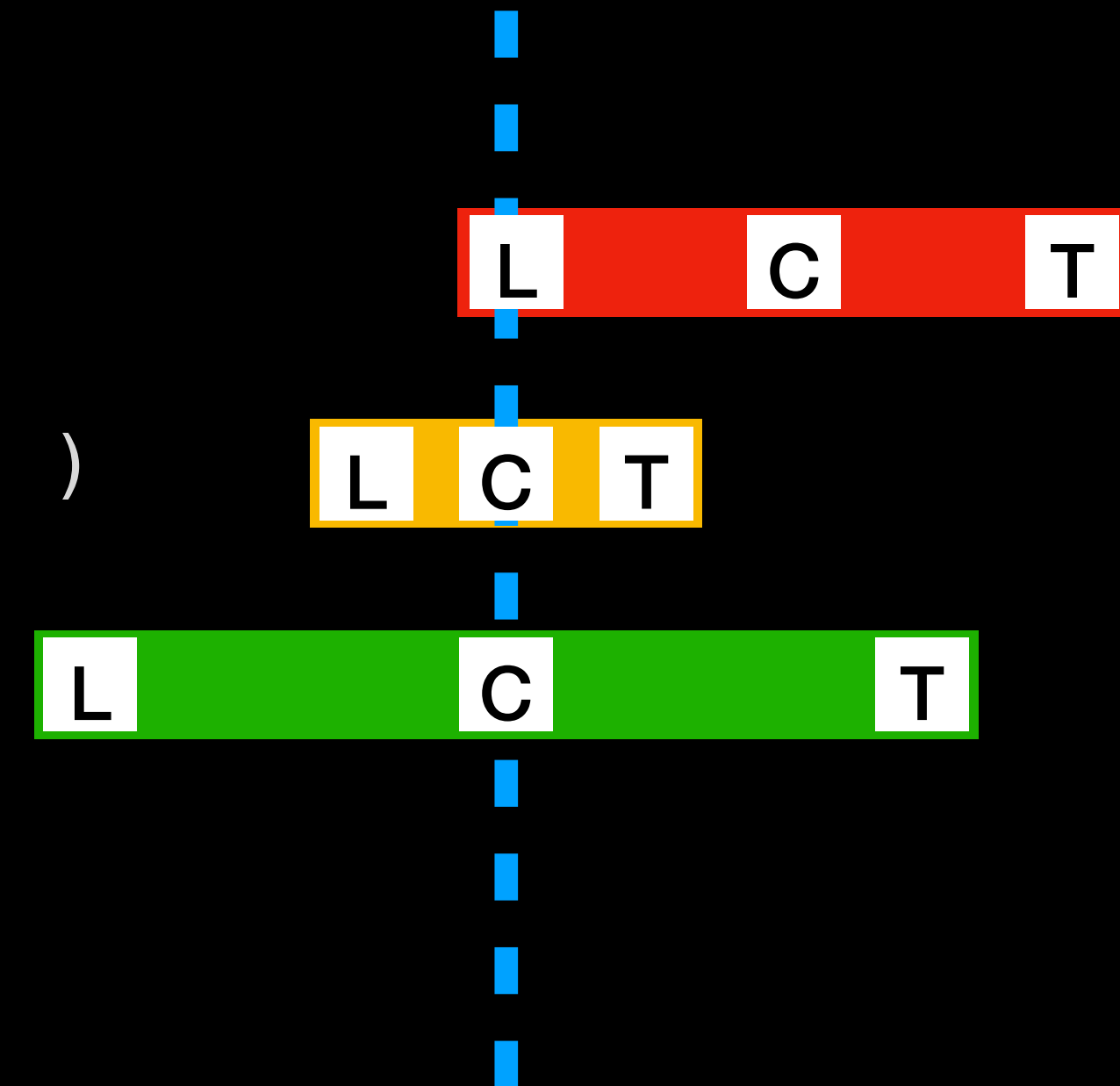
The details you must understand about SwiftUI



```
VStack(alignment: .center) {
```

```
    .alignmentGuide(.center,  
                    computeValue: { d in d[.leading] } )
```

这里缩写了!



```
    }  
}
```


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The details you must understand about SwiftUI



```
VStack(alignment: .center) {
```

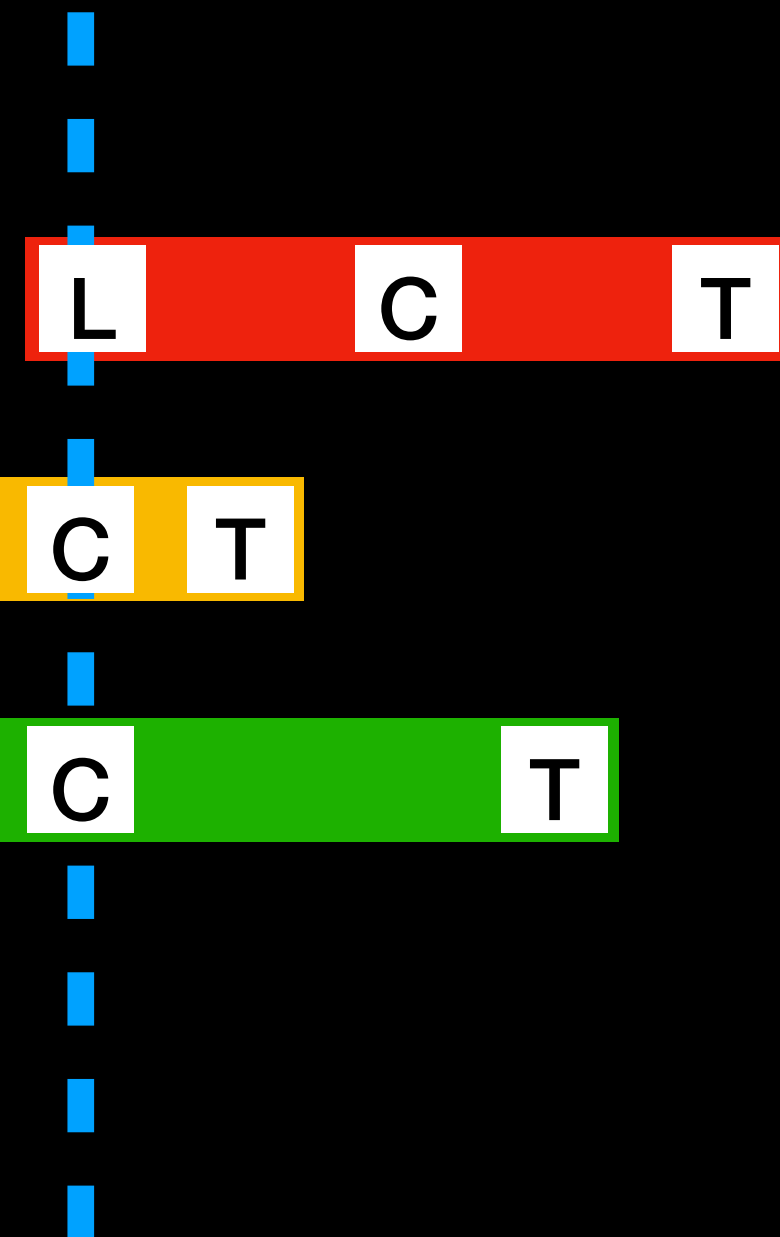
```
    .alignmentGuide(.center,  
                    computeValue: { d in d[.leading] } )
```

```
    .alignmentGuide(.leading,  
                    computeValue: { d in d[.trailing]})
```

```
}
```

```
}
```

这里缩写了!



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The details you must understand about SwiftUI

```
HStack(alignment: .top){  
    Rectangle()  
        .fill(.red)  
        .frame(width: 10, height: 100)  
        .alignmentGuide(.bottom,  
                        computeValue: { d in d[.bottom]})  
  
    Rectangle()  
        .fill(.yellow)  
        .frame(width: 10, height: 50)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[HorizontalAlignment.center]})  
  
    Rectangle()  
        .fill(.green)  
        .frame(width: 10, height: 150)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[.bottom]})  
}
```

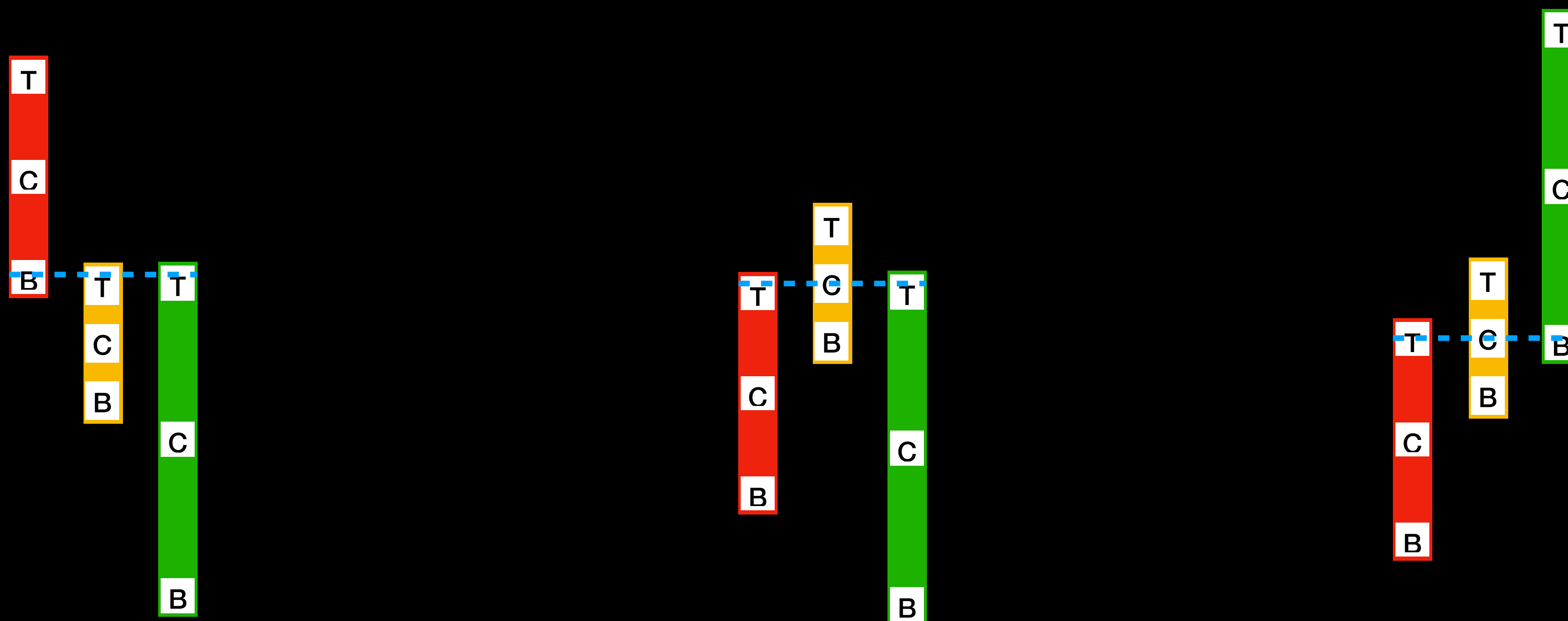


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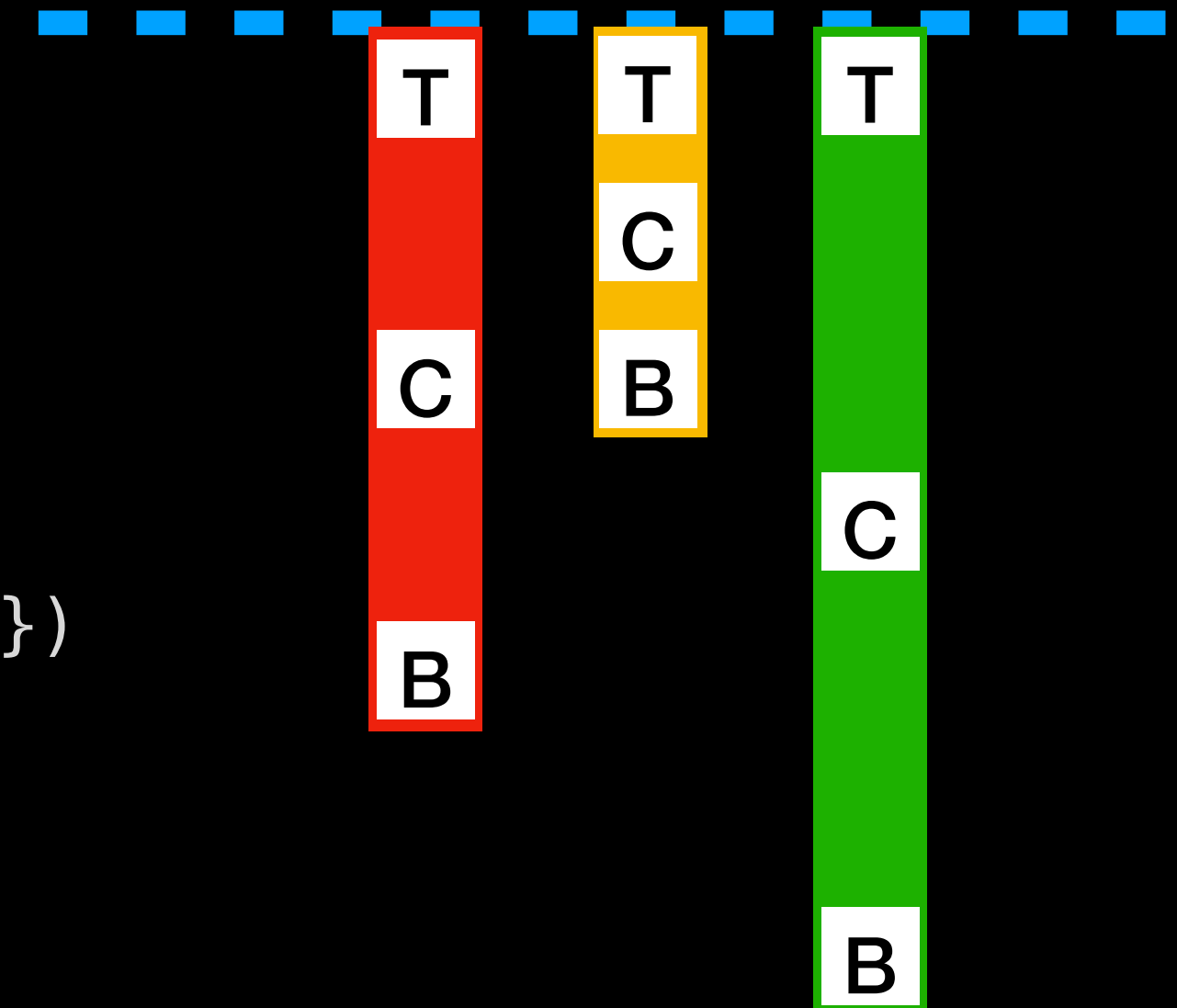
The details you must understand about SwiftUI



```
HStack(alignment: .top){
    Rectangle()
        .fill(.red)
        .frame(width: 10, height: 100)
        .alignmentGuide(.bottom,
            computeValue: { d in d[.bottom]})

    Rectangle()
        .fill(.yellow)
        .frame(width: 10, height: 50)
        .alignmentGuide(.top,
            computeValue: { d in d[HorizontalAlignment.center]})

    Rectangle()
        .fill(.green)
        .frame(width: 10, height: 150)
        .alignmentGuide(.top,
            computeValue: { d in d[.bottom]})
}
```



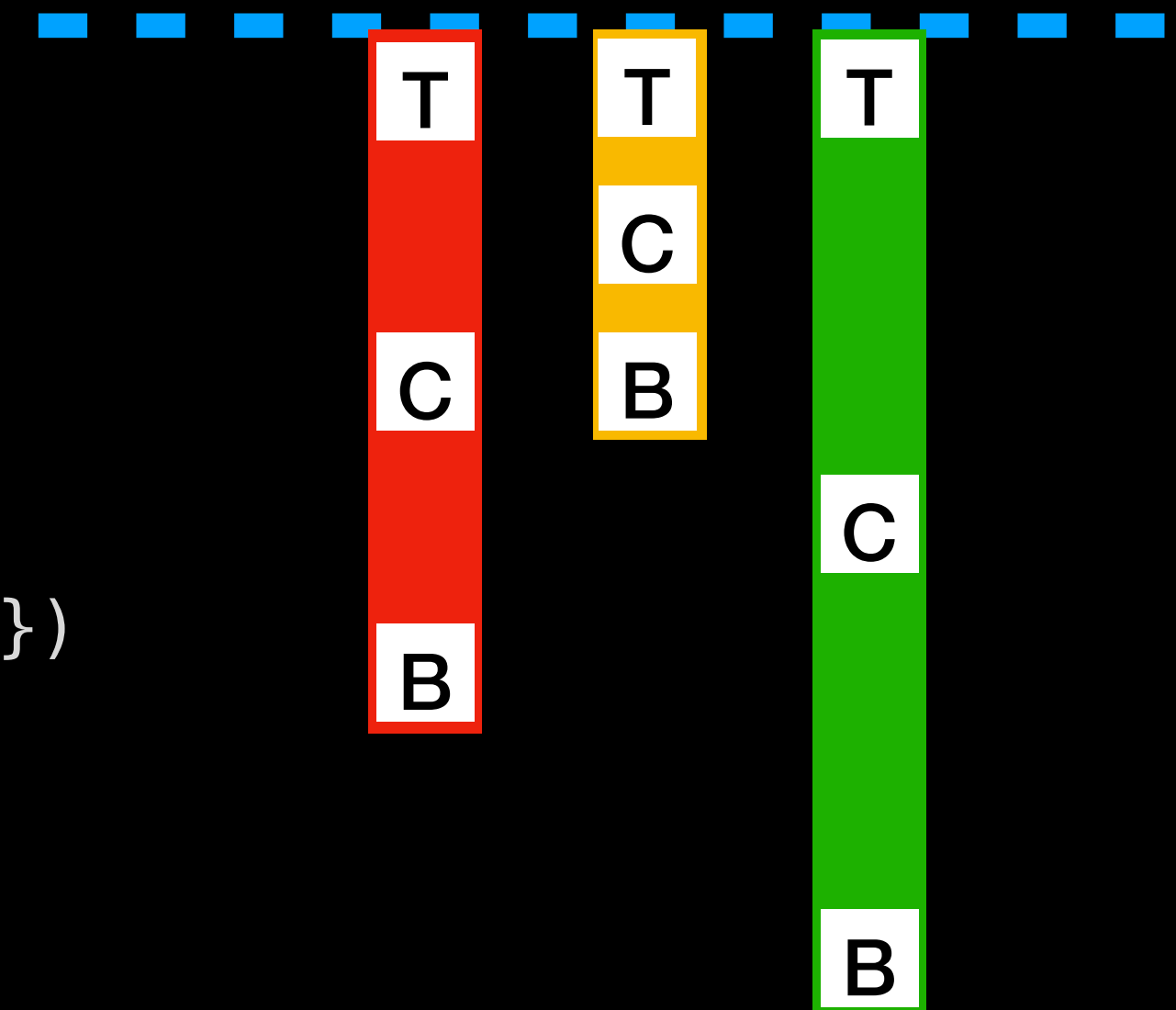
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```
HStack(alignment: .top){  
    Rectangle()  
        .fill(.red)  
        .frame(width: 10, height: 100)  
        .alignmentGuide(.bottom,  
                        computeValue: { d in d[.bottom]})  
  
    Rectangle()  
        .fill(.yellow)  
        .frame(width: 10, height: 50)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[HorizontalAlignment.center]})  
  
    Rectangle()  
        .fill(.green)  
        .frame(width: 10, height: 150)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[.bottom]})  
}
```



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The details you must understand about SwiftUI

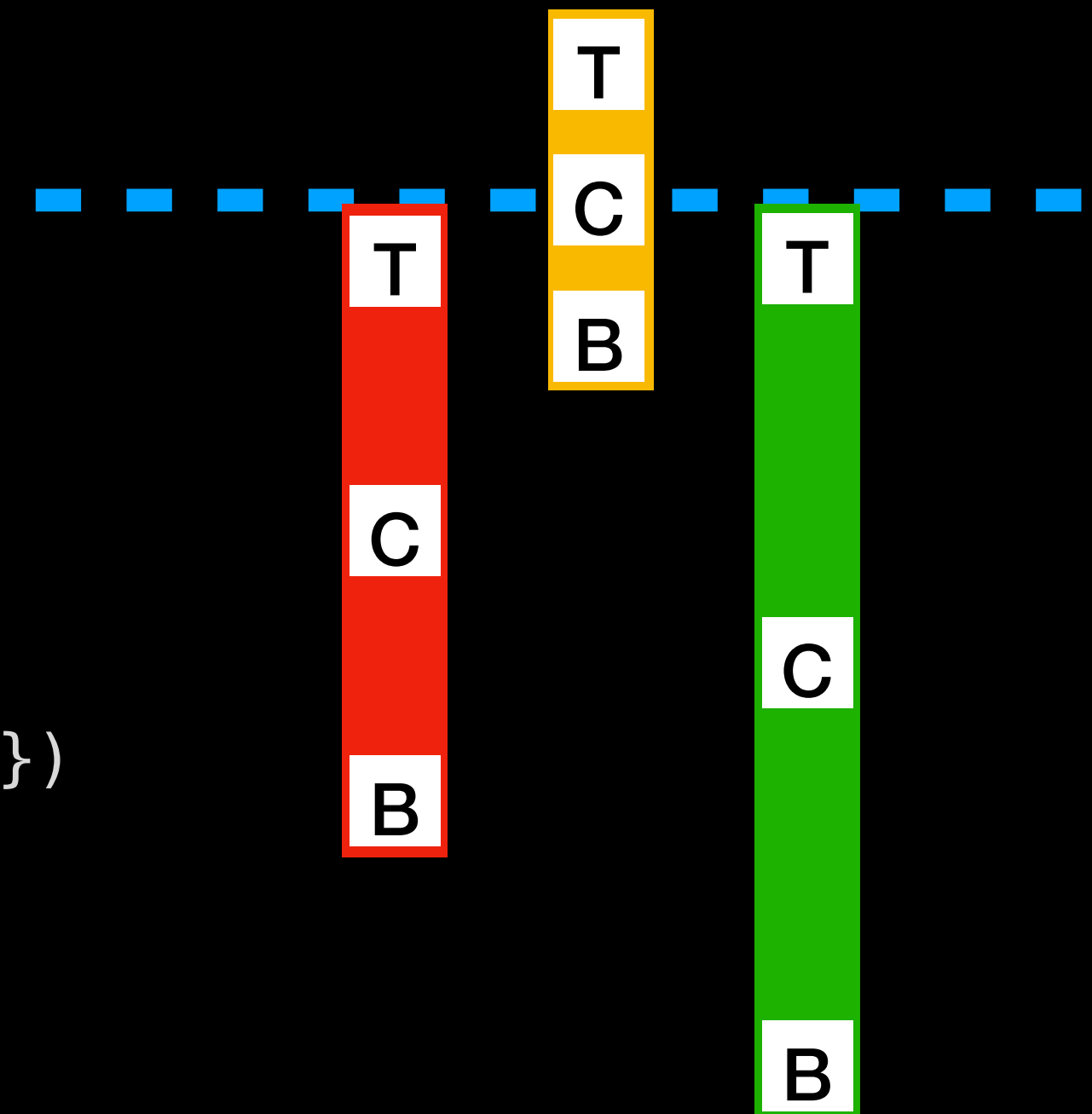


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```
HStack(alignment: .top){
    Rectangle()
        .fill(.red)
        .frame(width: 10, height: 100)
        .alignmentGuide(.bottom,
            computeValue: { d in d[.bottom]})

    Rectangle()
        .fill(.yellow)
        .frame(width: 10, height: 50)
        .alignmentGuide(.top,
            computeValue: { d in d[HorizontalAlignment.center]})

    Rectangle()
        .fill(.green)
        .frame(width: 10, height: 150)
        .alignmentGuide(.top,
            computeValue: { d in d[.bottom]})
}
```



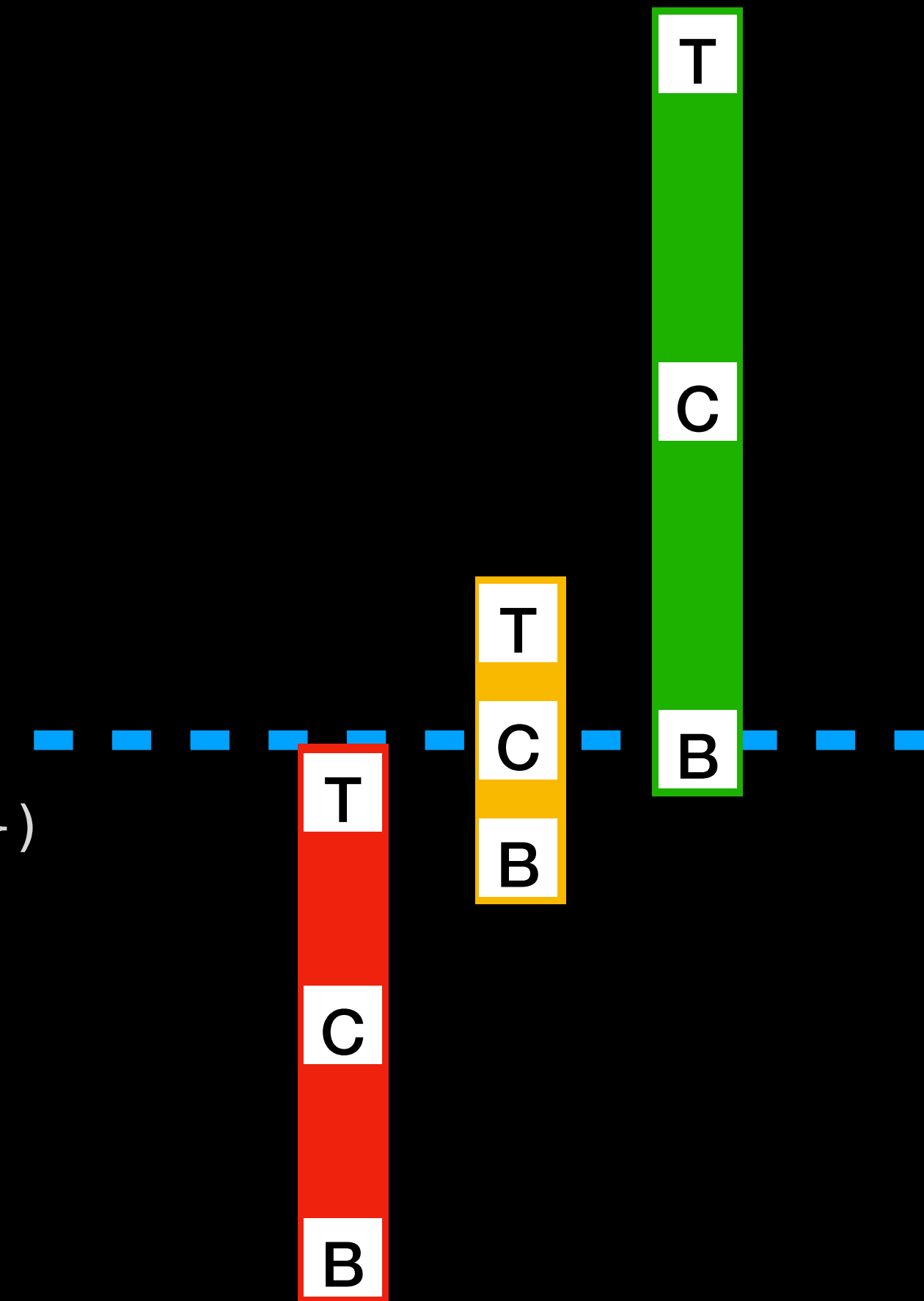
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The details you must understand about SwiftUI



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```
HStack(alignment: .top){  
    Rectangle()  
        .fill(.red)  
        .frame(width: 10, height: 100)  
        .alignmentGuide(.bottom,  
                        computeValue: { d in d[.bottom]})  
  
    Rectangle()  
        .fill(.yellow)  
        .frame(width: 10, height: 50)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[HorizontalAlignment.center]})  
  
    Rectangle()  
        .fill(.green)  
        .frame(width: 10, height: 150)  
        .alignmentGuide(.top,  
                        computeValue: { d in d[.bottom]})  
}
```



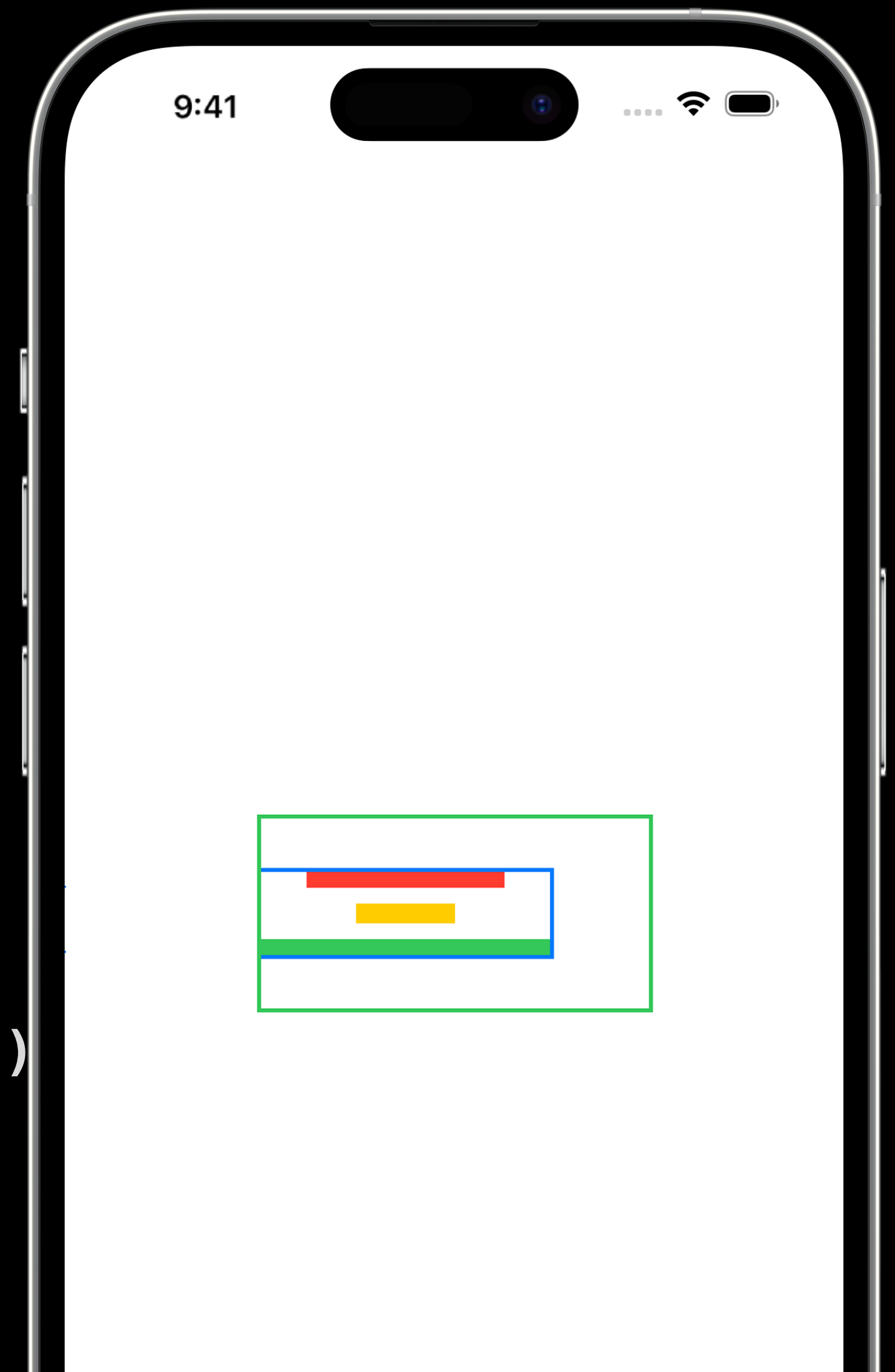
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The details you must understand about SwiftUI



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```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            Rectangle()  
                .fill(.red)  
                .frame(width: 100, height: 10)  
  
            Rectangle()  
                .fill(.yellow)  
                .frame(width: 50, height: 10)  
  
            Rectangle()  
                .fill(.green)  
                .frame(width: 150, height: 10)  
        }  
        .border(Color.blue, width: 2)  
        .frame(width: 200, height: 100, alignment: .leading)  
        .border(Color.green, width: 2)  
    }  
}
```



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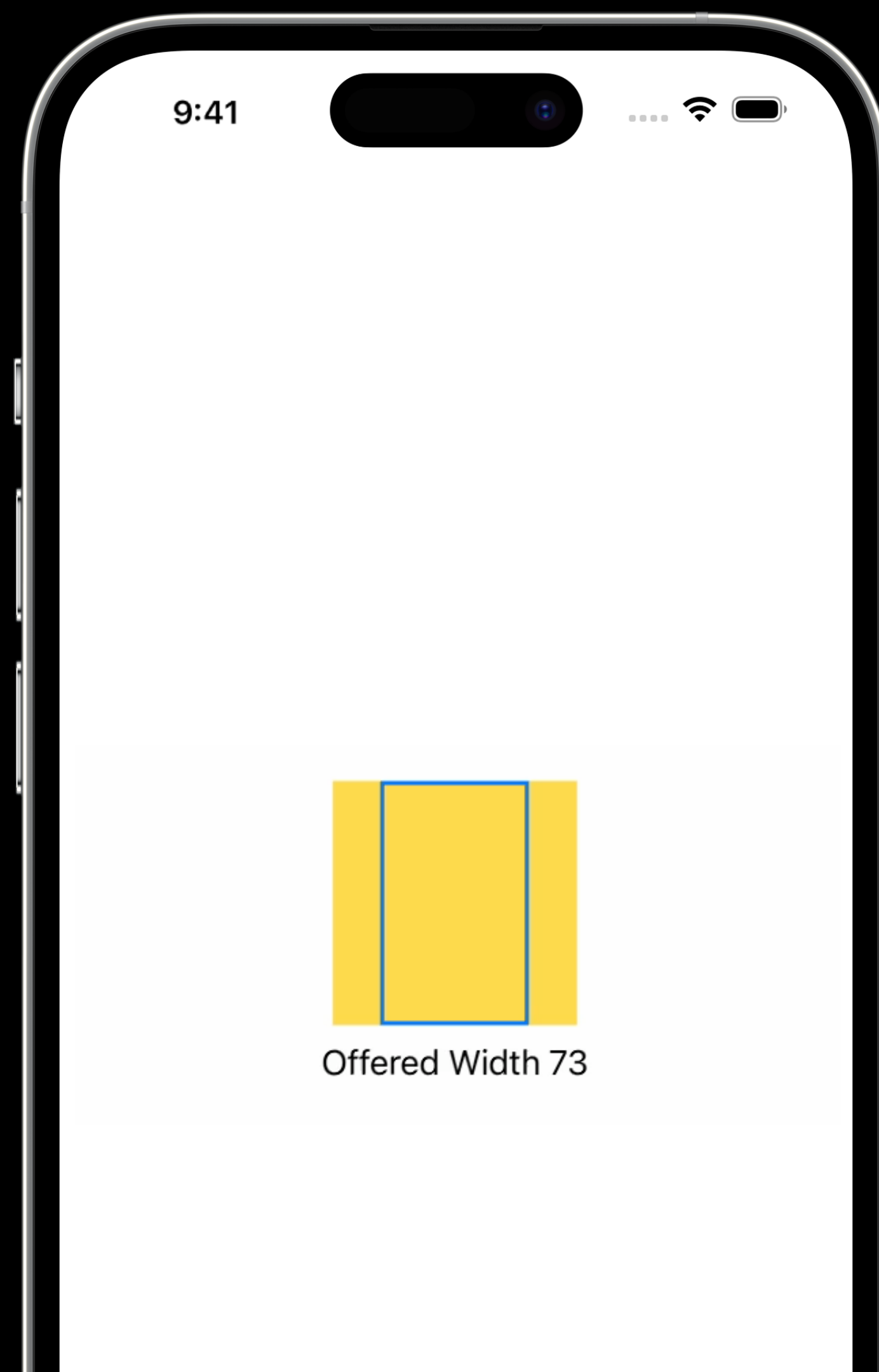
The details you must understand about SwiftUI



GeometryReader 不是一个容器

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The details you must understand about SwiftUI



你需要知道的SwiftUI细节

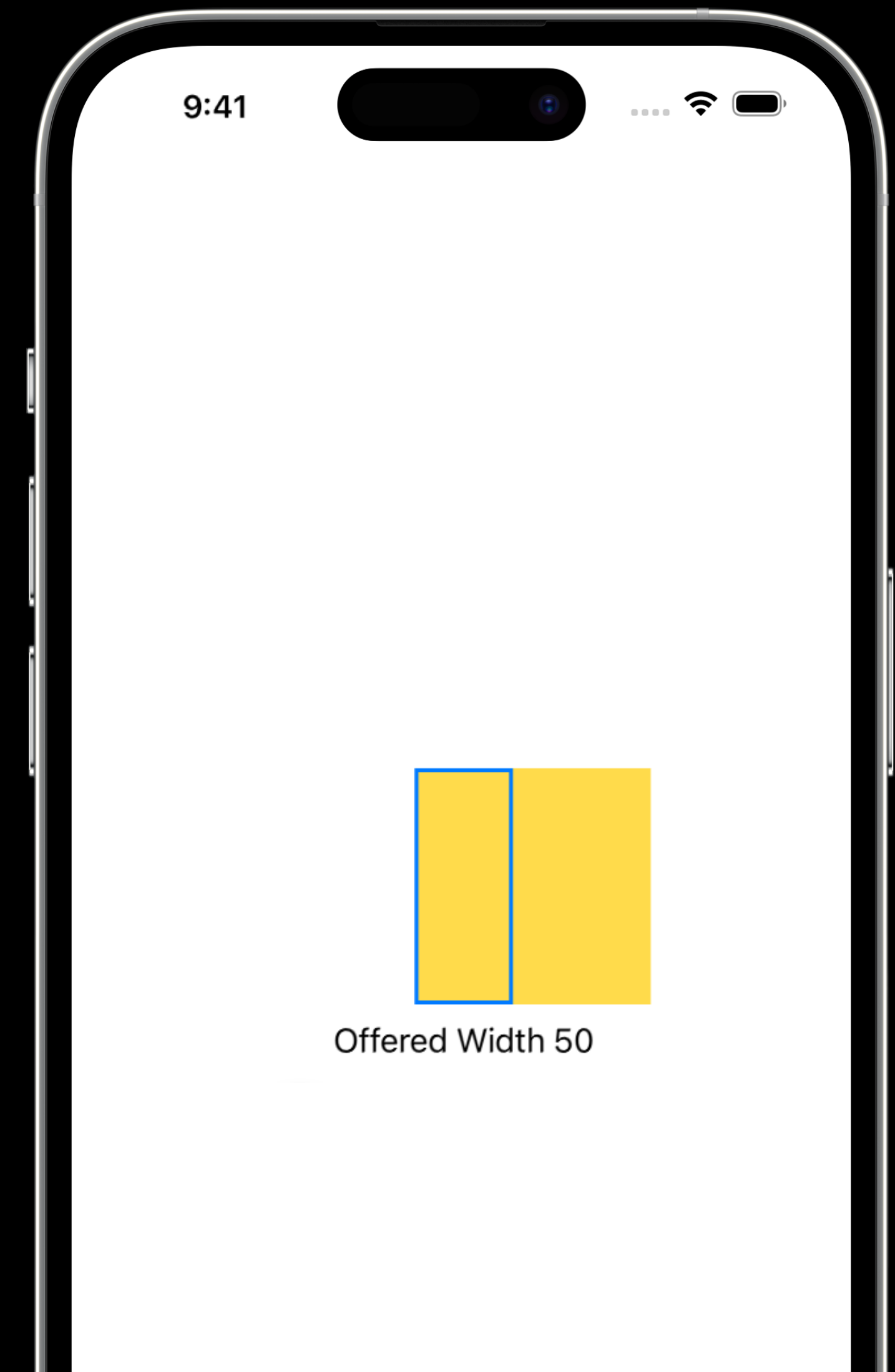
The details you must understand about SwiftUI

```
struct ContentView: View {
    @State private var width: CGFloat = 50

    var body: some View {
        VStack {
            subView
                .frame(width: width, height: 120)
                .border(Color.blue, width: 2)

            Text("Offered Width \((Int(width))")
        }
        .padding()
    }

    var subView: some View{
        GeometryReader { proxy in
            Rectangle()
                .fill(Color.yellow.opacity(0.7))
                .frame(width: max(proxy.size.width, 120),
                    height: max(proxy.size.height, 120))
        }
    }
}
```



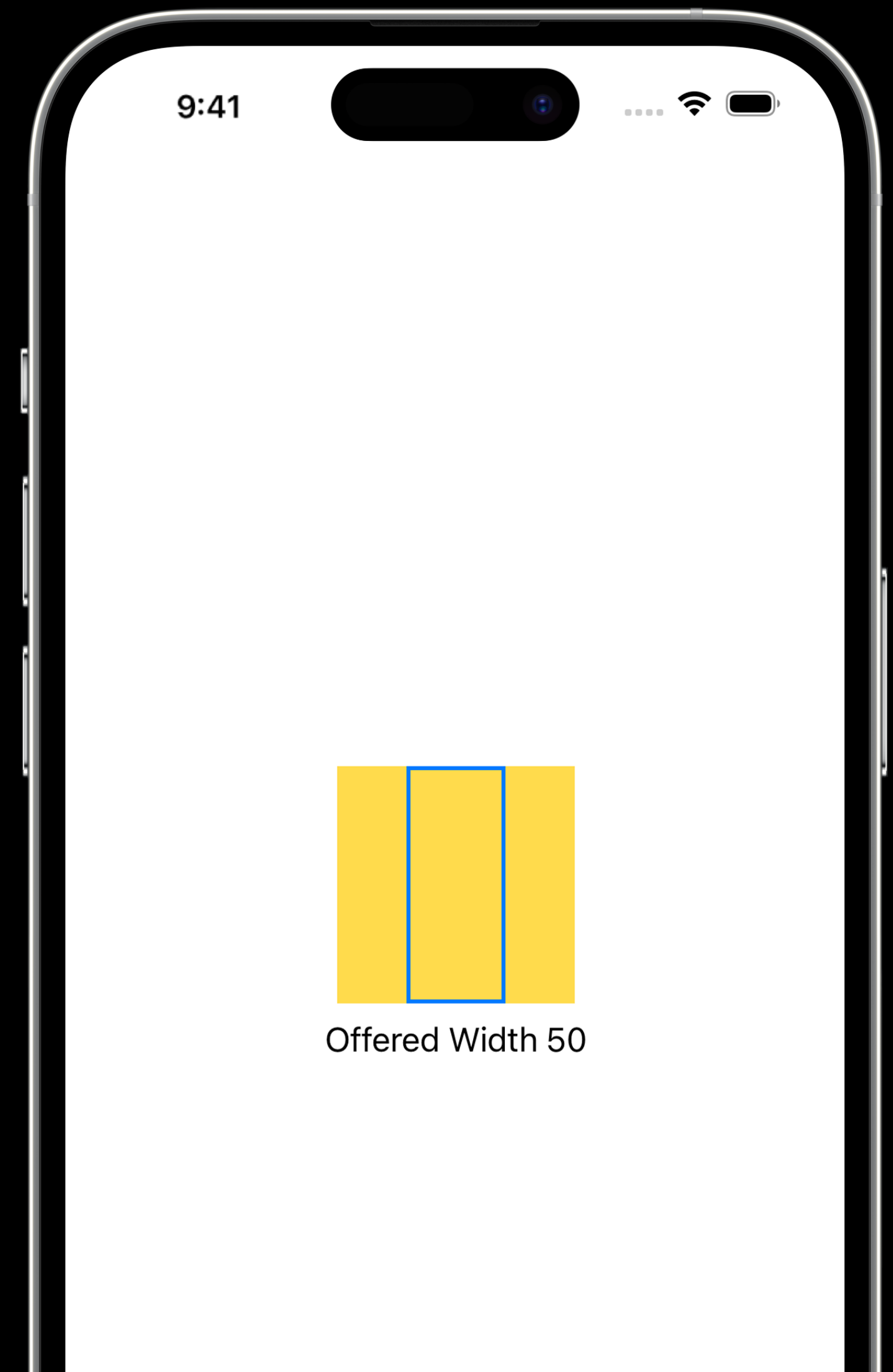
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```
var subView: some View{  
    GeometryReader { proxy in  
        Rectangle()  
            .fill(Color.yellow.opacity(0.7))  
            .frame(width: max(proxy.size.width, 120),  
                  height: max(proxy.size.height, 120))  
    }  
}
```



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The details you must understand about SwiftUI

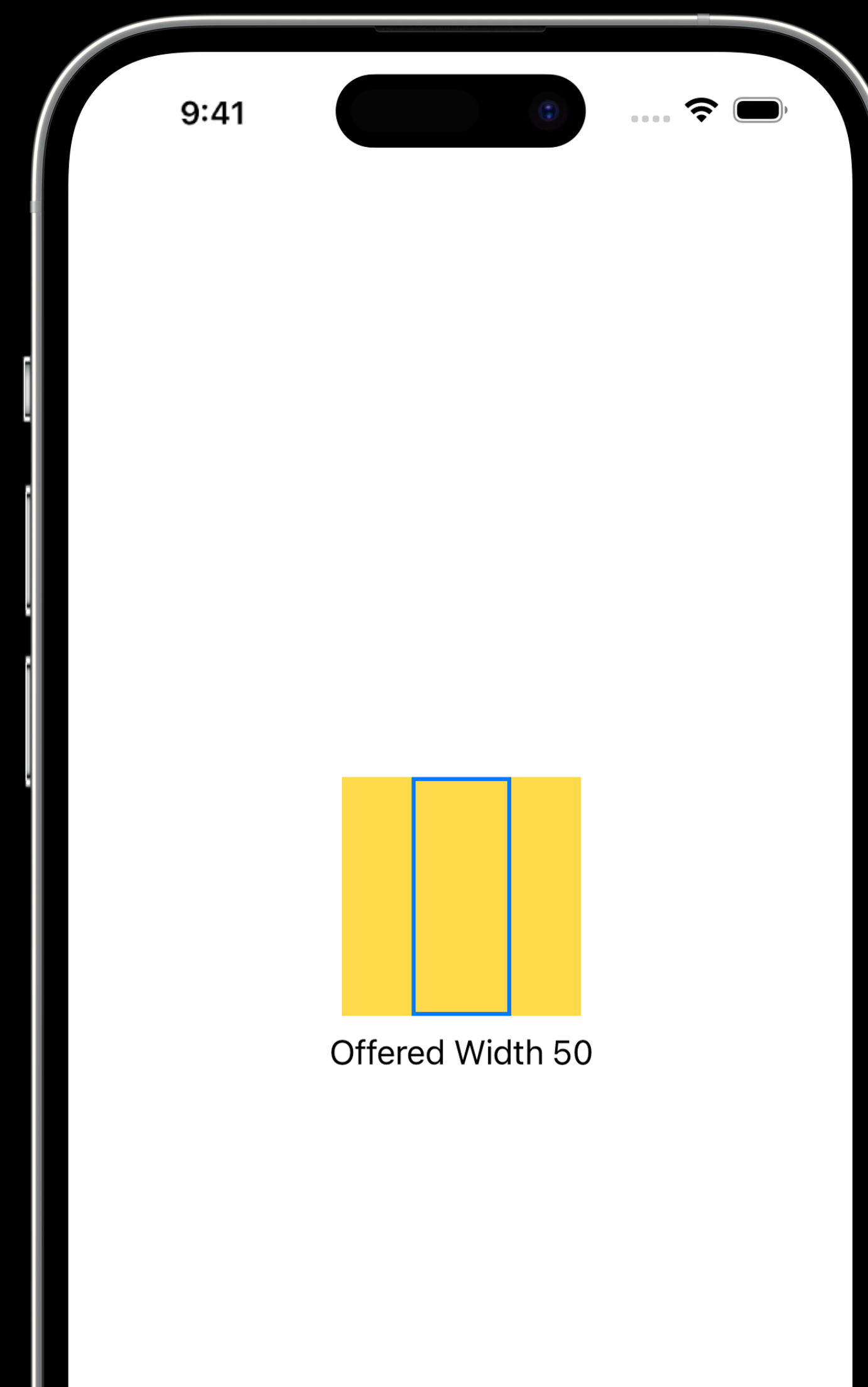


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```
ZStack{
```

```
}
```

```
.frame(width: proxy.size.width)
```



从头开始创建一个App原型

你需要知道的SwiftUI细节

现代UI/UX设计趋势与实现方法

从头开始创建一个App原型

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像素



拟物



扁平



新拟态

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像素

拟物

扁平

新拟态

???

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扁平



新拟态

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新拟态设计关注的是光在三维空间中的移动方式.....

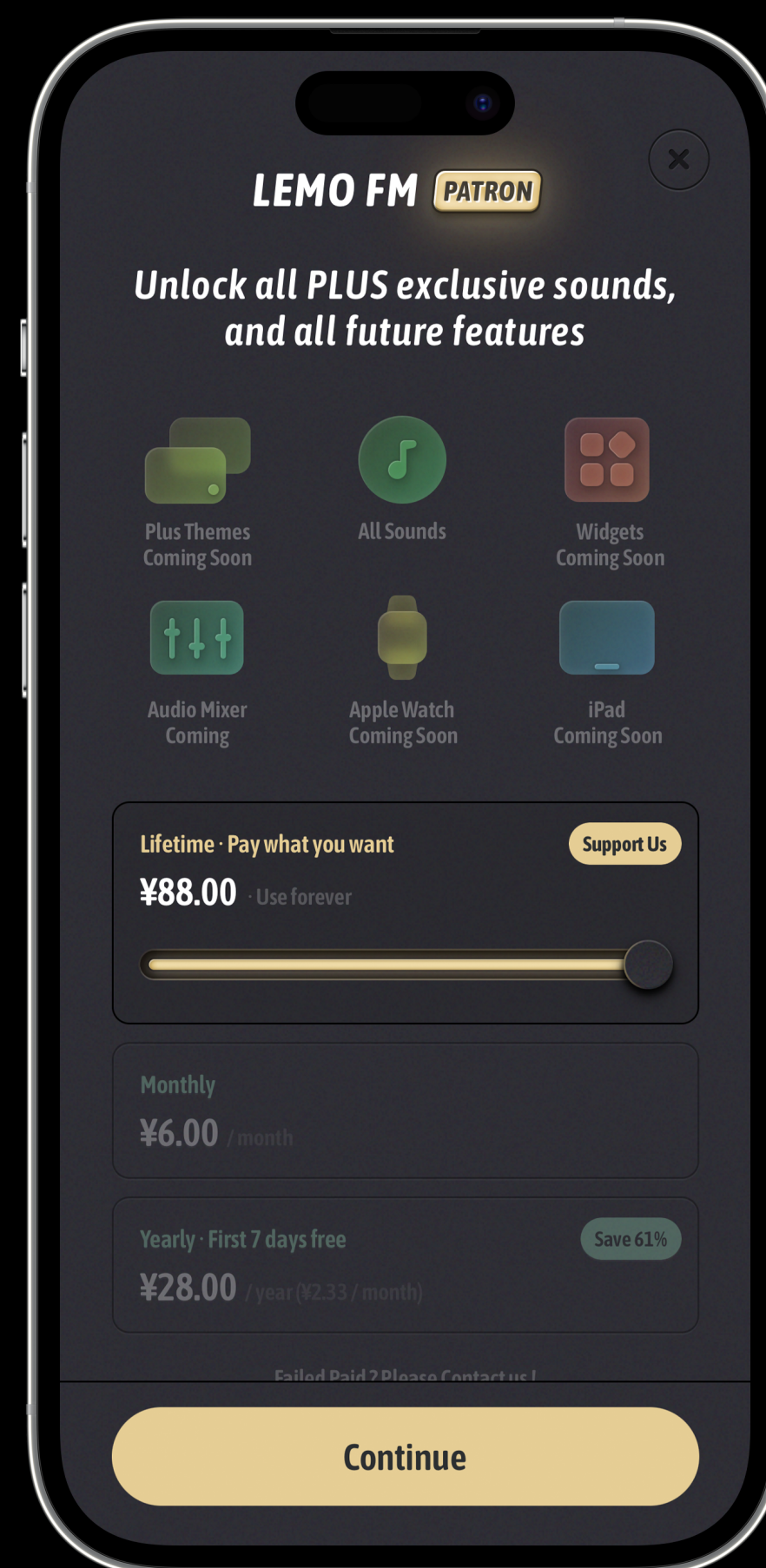
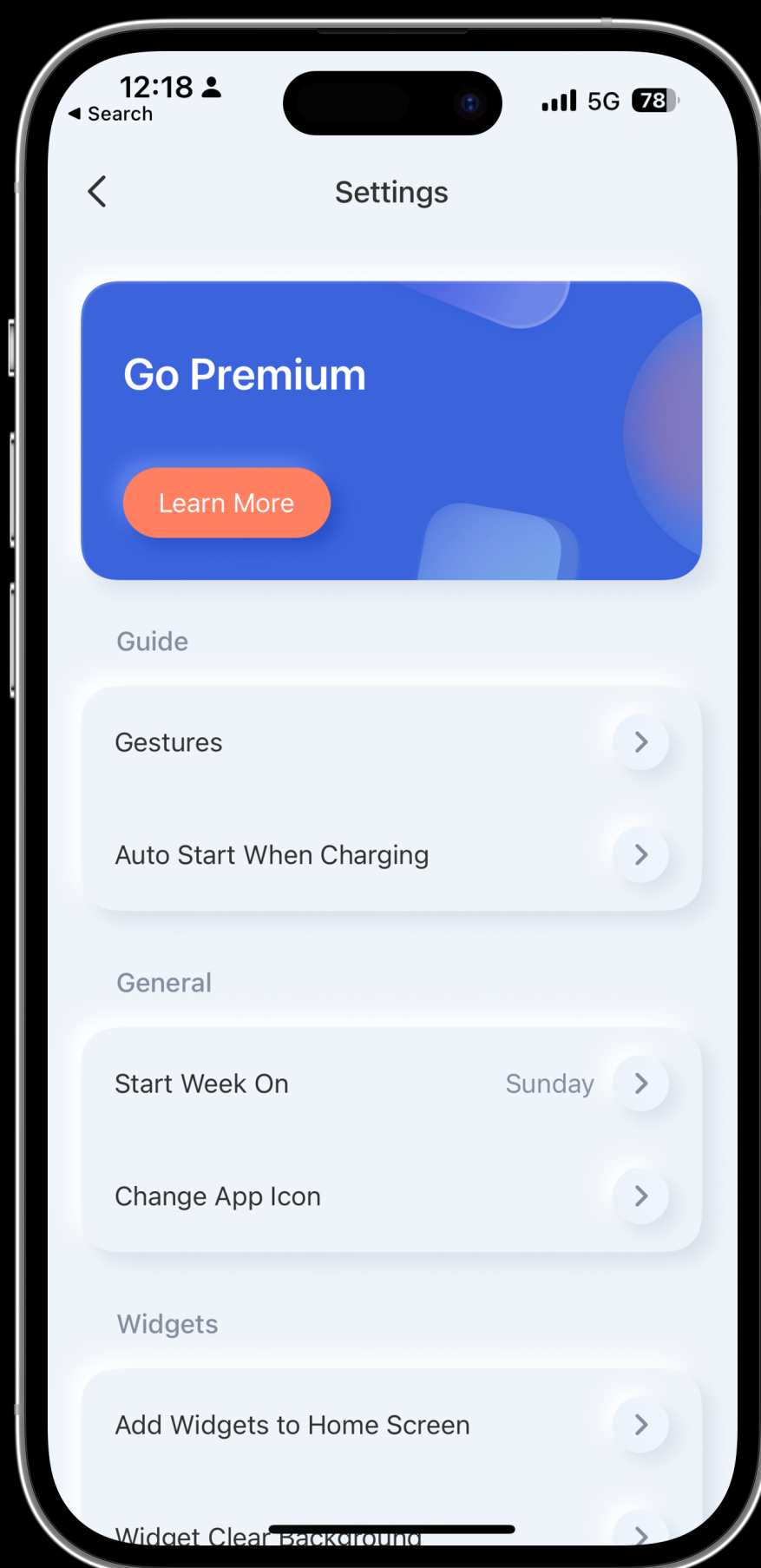
When you boil it down, neumorphism is a focus on how light moves in three-dimensional space....

重点在于光本身以及如何与各种物体相互作用

What sets neumorphism apart from its progenitor is that the focus is on the light itself and how it interacts with a variety of objects in a purely digital space.

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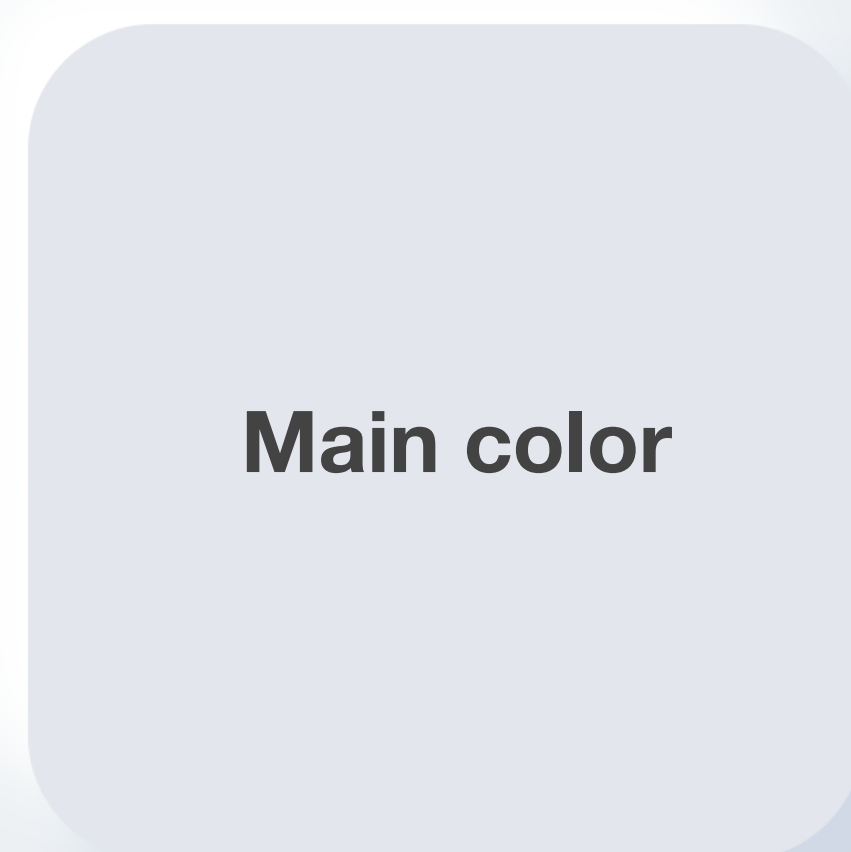
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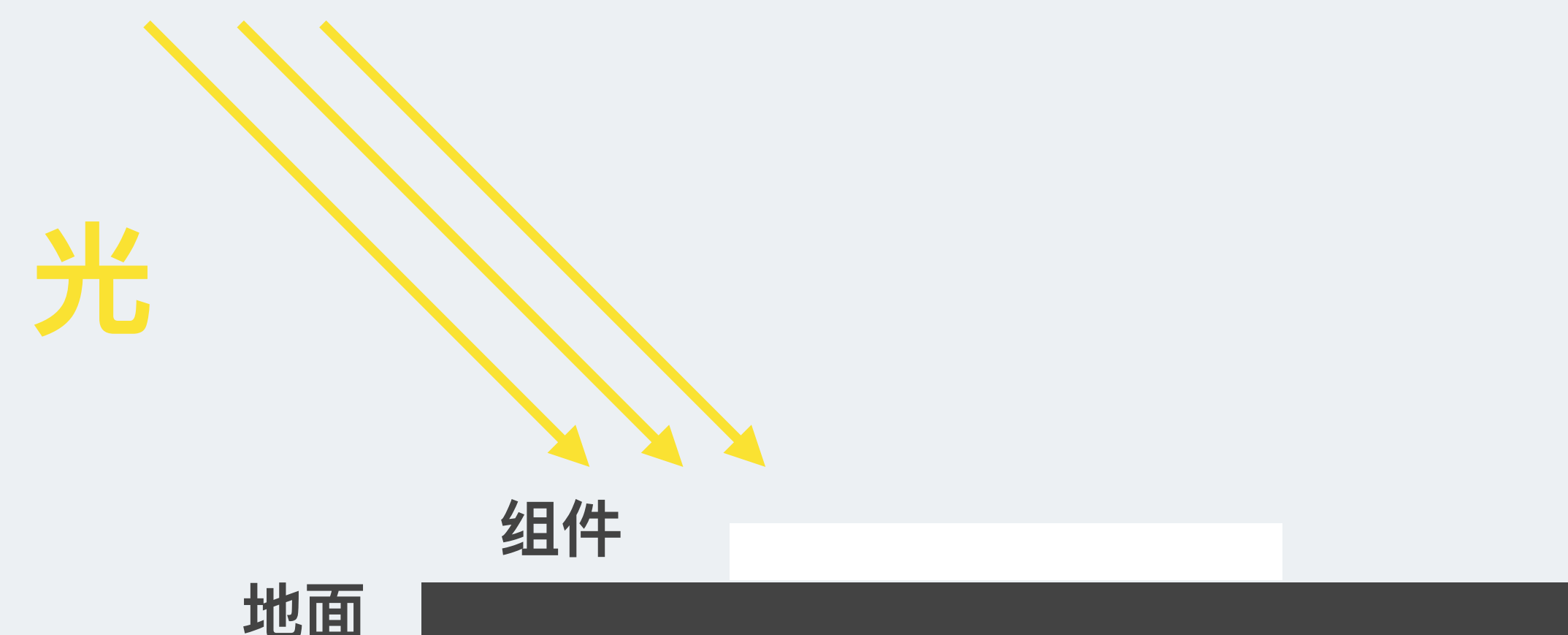
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Light shadow color



DROP SHADOW

Dark shadow color



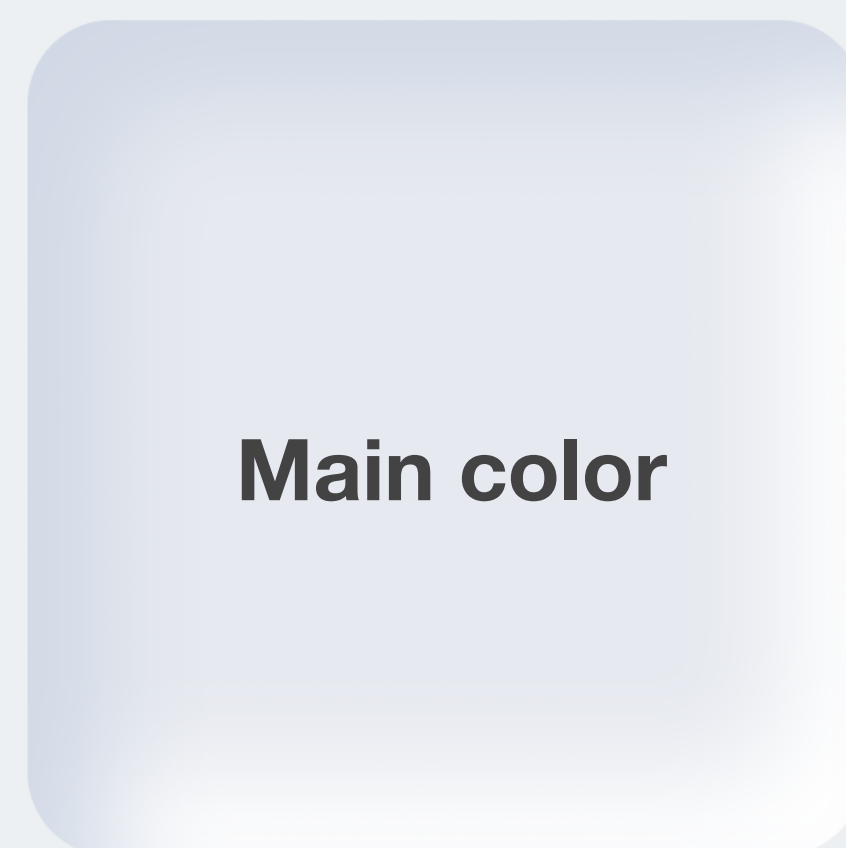
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Dark inner shadow color

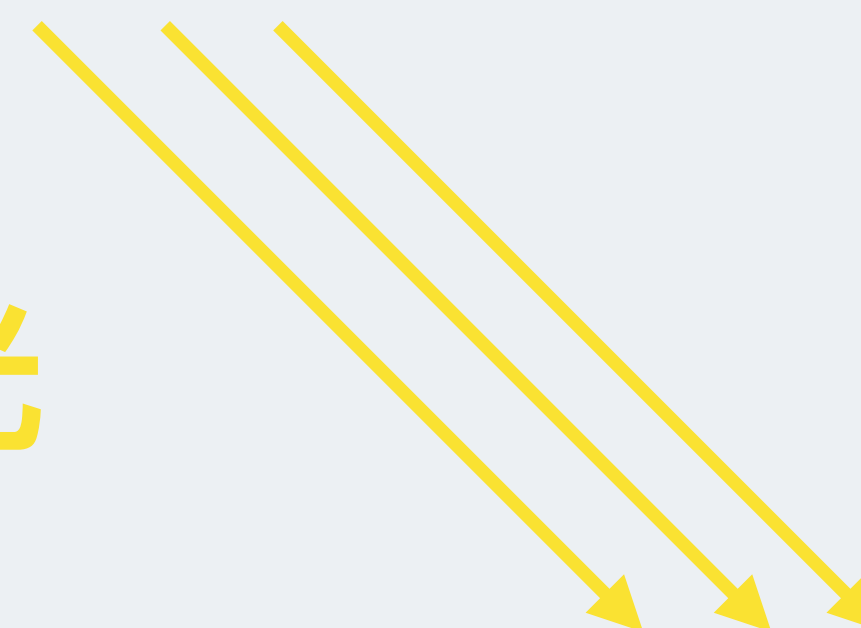


Main color

INNER SHADOW

Light inner shadow color

光



组件

地面



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```
struct SwiftUIView: View {  
    var body: some View {  
        ZStack{  
            background  
            myShape  
        }  
    }  
  
    var myShape: some View{  
        RoundedRectangle(cornerRadius: 30, style: .continuous)  
            .fill(Color(uiColor: mainColor))  
            .frame(width: 200, height: 100)  
            .shadow(color: Color(uiColor: lightShadowColor),  
                  radius: 3, x: 6, y: 6)  
            .shadow(color: Color(uiColor: darkShadowColor),  
                  radius: 3, x: -6, y: -6)  
    }  
}
```

iOS开发中的UI基础



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使用Extension让代码更易读

View Extensions for Better Code Readability

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```
struct SwiftUIView: View {  
  
    var body: some View {  
        ZStack{  
            background  
            myShape  
        }  
    }  
  
    var myShape: some View{  
        RoundedRectangle(cornerRadius: 30, style: .continuous)  
            .fill(Color(uiColor: mainColor))  
            .frame(width: 200, height: 100)  
            .shadow(color: Color(uiColor: lightShadowColor),  
                  radius: 3, x: 6, y: 6)  
            .shadow(color: Color(uiColor: darkShadowColor),  
                  radius: 3, x: -6, y: -6)  
    }  
}
```

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```
struct SoftUIView: View {  
    var body: some View {  
        ZStack{  
            background  
            myShape  
        }  
    }  
  
    var myShape: some View{  
        RoundedRectangle(cornerRadius: 30, style: .continuous)  
            .fill(Color(uiColor: mainColor))  
            .frame(width: 200, height: 100)  
            .softUImodifier()  
    }  
}
```

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```
struct SoftUIModifier: ViewModifier{
    let lightShadowColor = UIColor(red: 0.820, green: 0.851,
                                   blue: 0.902, alpha: 1.0)

    let darkShadowColor = UIColor(red: 1.000, green: 1.000,
                                   blue: 1.000, alpha: 1.0)

    func body(content: Content) -> some View {
        return content
            .shadow(color: Color(uiColor: lightShadowColor),
                   radius: 3, x: 6, y: 6)
            .shadow(color: Color(uiColor: darkShadowColor),
                   radius: 3, x: -6, y: -6)
    }
}
```


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```
struct SoftUIView: View {  
  
    var body: some View {  
        ZStack{  
            background  
            myShape  
        }  
    }  
  
    var myShape: some View{  
        RoundedRectangle(cornerRadius: 30, style: .continuous)  
            .fill(Color(uiColor: mainColor))  
            .frame(width: 200, height: 100)  
            .modifier(SoftUIModifier())  
    }  
}
```

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```
struct SwiftUIView: View {  
    var body: some View {  
        ZStack{  
            background  
            myShape  
        }  
    }  
  
    var myShape: some View{  
        RoundedRectangle(cornerRadius: 30, style: .continuous)  
            .fill(Color(uiColor: mainColor))  
            .frame(width: 200, height: 100)  
            .softUIModifier()  
    }  
}  
  
extension View {  
    func softUIModifier() -> some View { modifier(SoftUIModifier()) }  
}
```


Any Questions ?