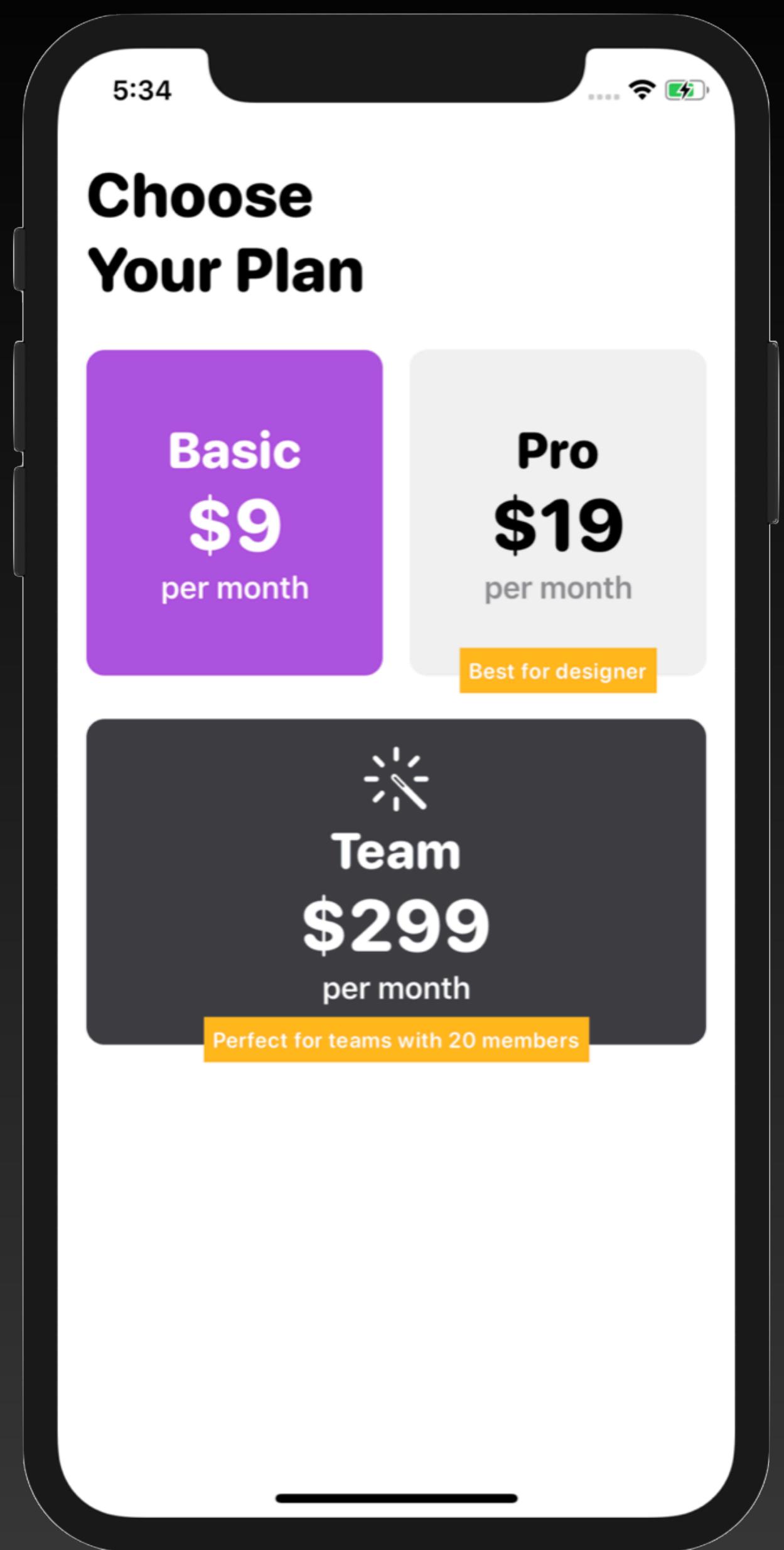
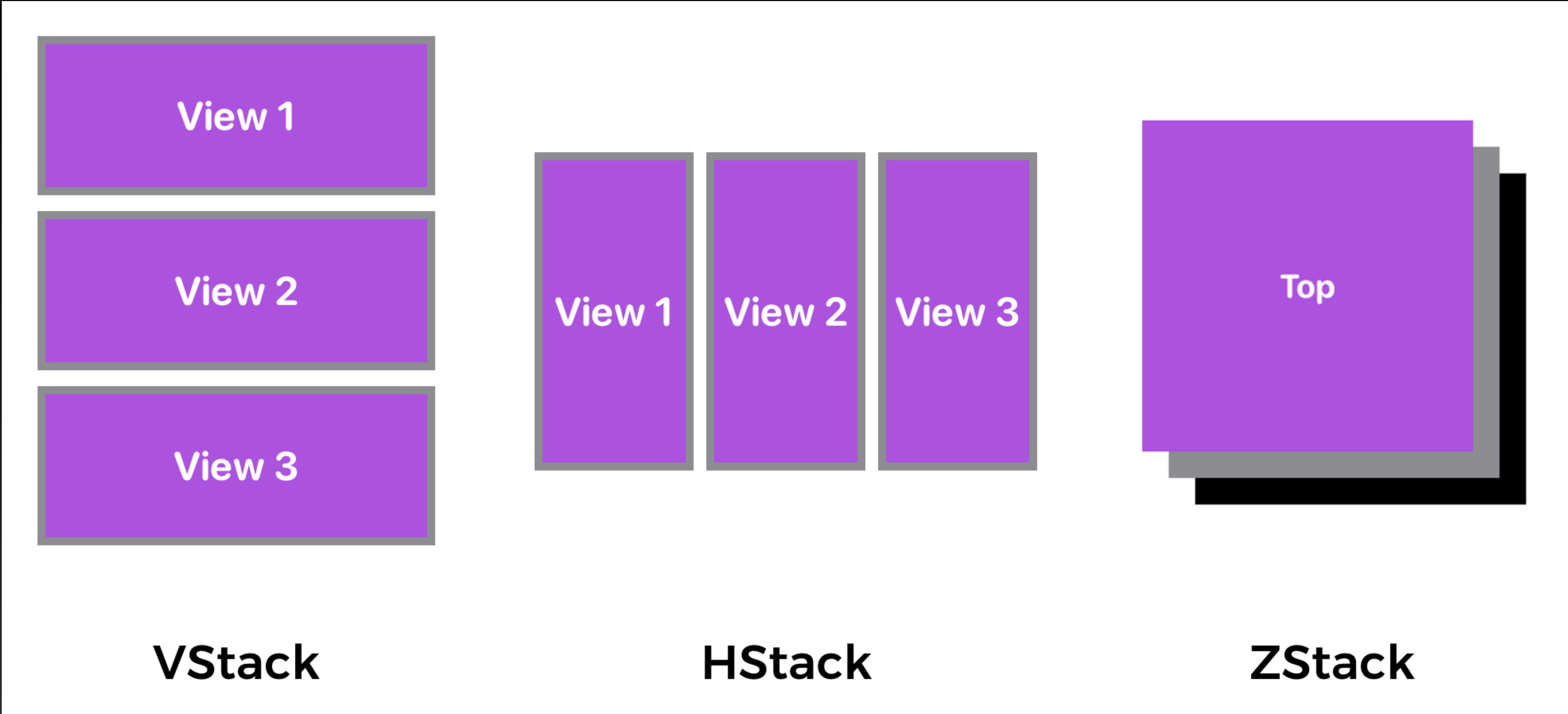


# SwiftUI - Layout UI with stacks

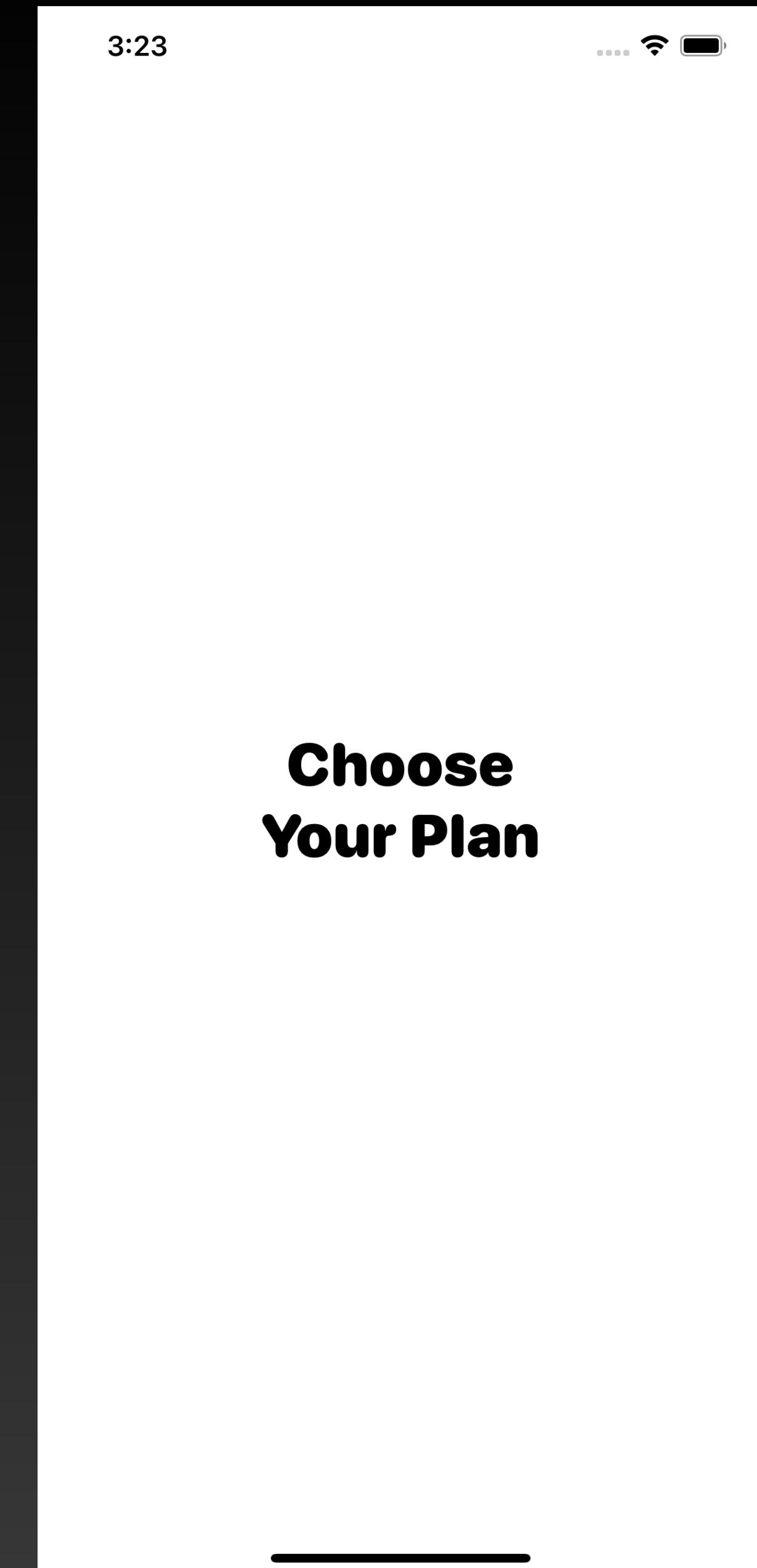


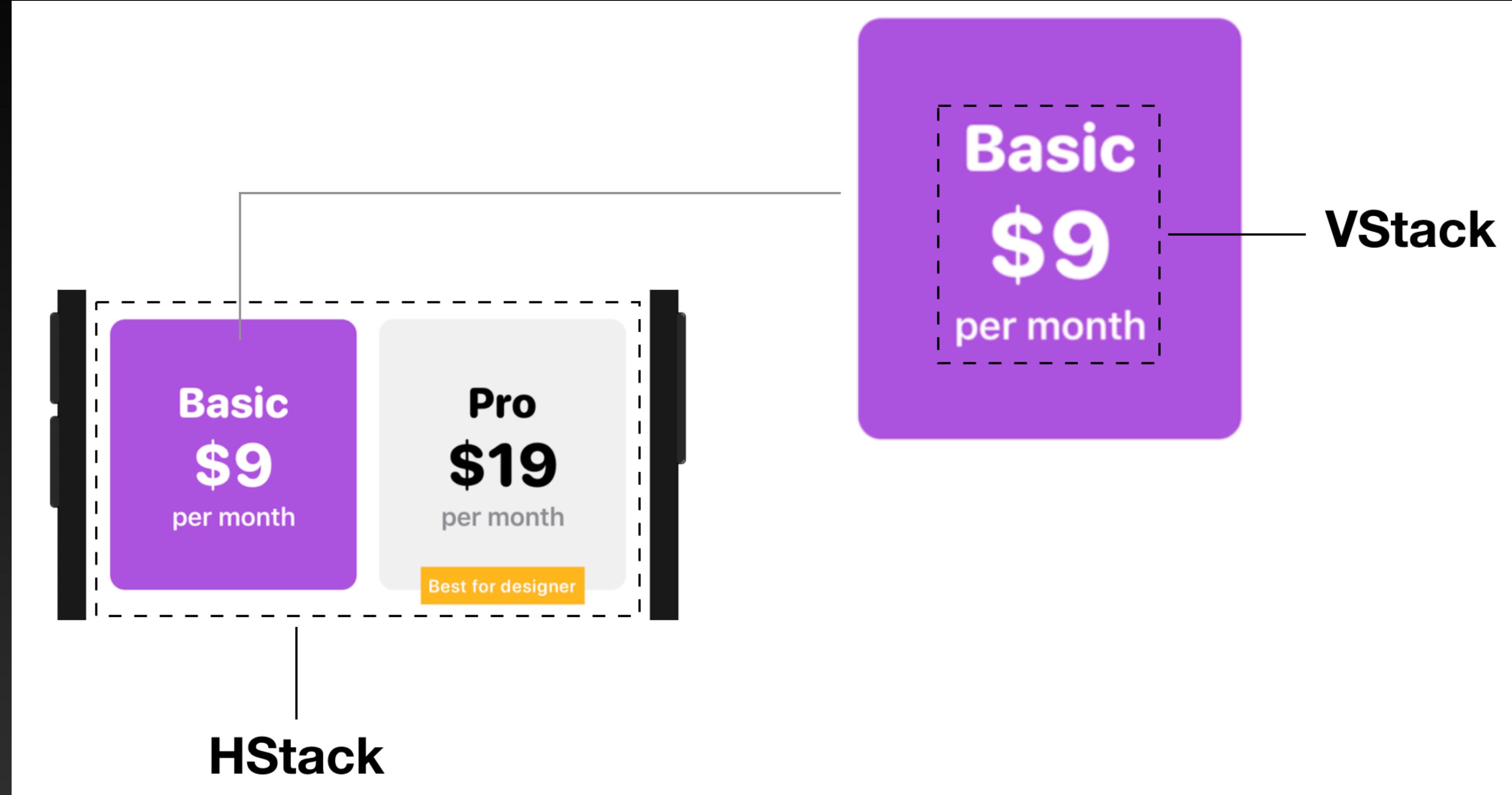


Different types of stack view

# VStack

```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            Text("Choose")  
                .font(.system(.largeTitle,  
design: .rounded))  
                .fontWeight(.black)  
            Text("Your Plan")  
                .font(.system(.largeTitle,  
design: .rounded))  
                .fontWeight(.black)  
        }  
    }  
}
```





Layout the pricing plans

The screenshot shows the Xcode interface with a SwiftUI preview. The preview displays a black rounded rectangle containing the text "Choose Your Plan" in bold black font, enclosed in a blue-bordered box. The code editor shows a Swift file with the following code:

```
1 //  
2 //  
3 // on 14/8/2020.  
4 //  
5 //  
6 //  
7 //  
8 import SwiftUI  
9  
10 struct ContentView: View {  
11     var body: some View {  
12         VStack(alignment: .leading, spacing: 2) {  
13             Text("Choose")  
14                 .font(.system(.largeTitle, design: .rounded))  
15                 .fontWeight(.black)  
16             Text("Your Plan")  
17                 .font(.system(.largeTitle, design: .rounded))  
18                 .fontWeight(.black)  
19         }  
20     }  
21 }  
22
```

A context menu is open over the first `VStack` line, with the "Embed in VStack" option selected. The status bar at the top right shows "SwiftUIStacks | Build for Previews SwiftUIStacks: Succeeded | Today at 10:48 AM".

# Embed in VStack (command + click Vstack)

SwiftUIStacks | Build for Previews SwiftUIStacks: Succeeded | Today at 10:48 AM ⚠ 1

```
1 //  
2 // C  
3 // S  
4 //  
5 // C  
6 //  
7 // Show SwiftUI Inspector... ⌘`  
8 import Extract Subview  
9  
10 struct Extract to Variable  
11 Extract to Method  
12 Extract All Occurrences  
13 VStack(alignment: .leading, spacing: 2) {  
14     Text("Choose")  
15         .font(.system(.largeTitle, design: .rounded))  
16         .fontWeight(.black)  
17     Text("Your Plan")  
18         .font(.system(.largeTitle, design: .rounded))  
19         .fontWeight(.black)  
20 }  
21 }  
22 }  
23 }
```



The screenshot shows an iPhone X simulator displaying a SwiftUI view. The view consists of two large, bold, black text labels: "Choose" and "Your Plan", both in a large title font. The "Choose" label is positioned above the "Your Plan" label. The entire view is contained within a vertical stack with leading alignment and a spacing of 2.

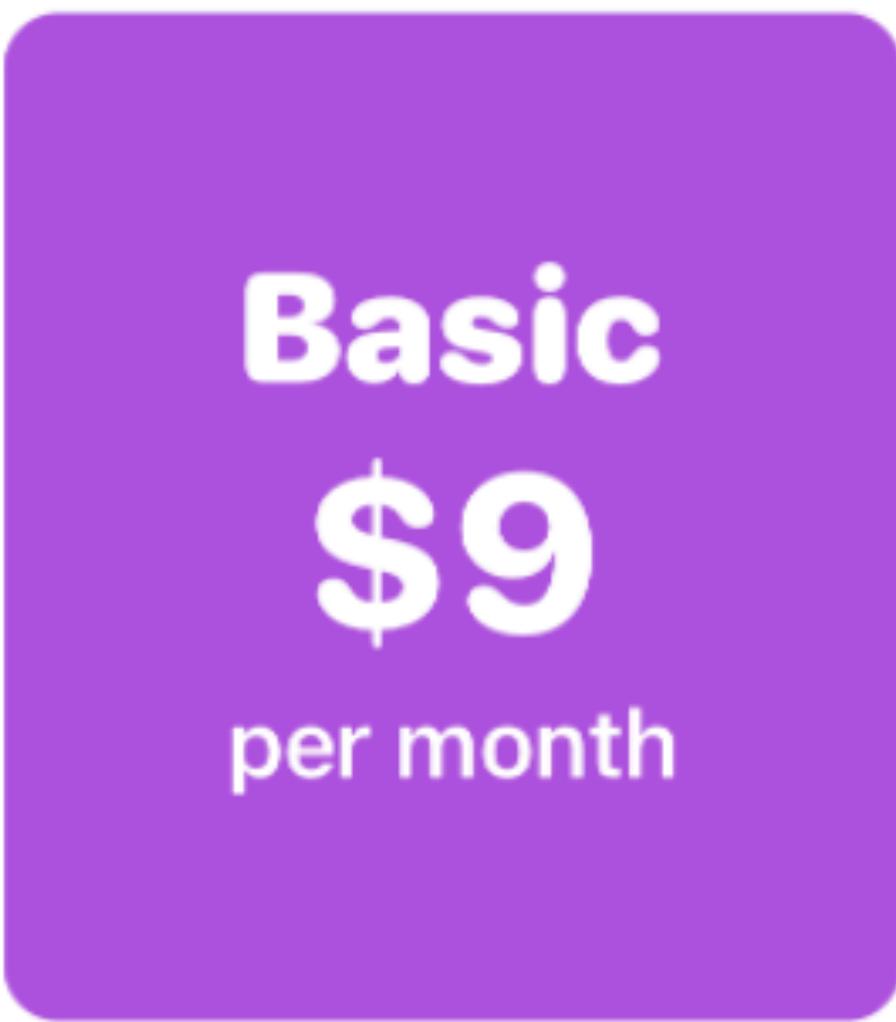
# Extract subview

# Extract subview

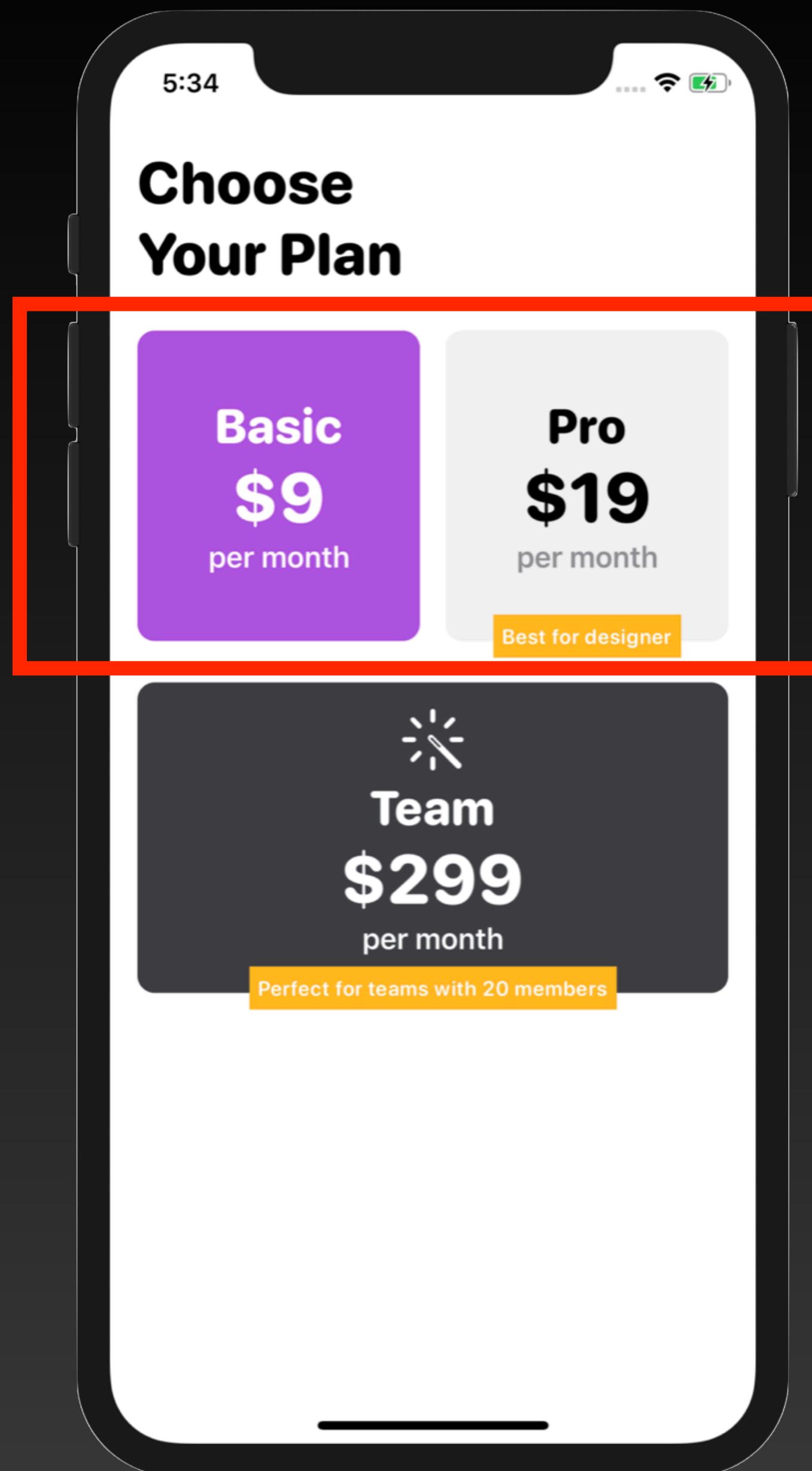
```
11 struct ContentView: View {  
12     var body: some View {  
13         VStack {  
14             HeaderView()  
15         }  
16     }  
17 }  
18  
19 struct ContentView_Previews: PreviewProvider {  
20     static var previews: some View {  
21         ContentView()  
22     }  
23 }  
24  
25 struct HeaderView: View {  
26     var body: some View {  
27         VStack(alignment: .leading, spacing: 2) {  
28             Text("Choose")  
29                 .font(.system(.largeTitle, design: .rounded))  
30                 .fontWeight(.black)  
31             Text("Your Plan")  
32                 .font(.system(.largeTitle, design: .rounded))  
33                 .fontWeight(.black)  
34         }  
35     }  
36 }  
37
```

```
struct ContentView: View {  
    var body: some View {  
        VStack {  
            HeaderView()  
  
            VStack {  
                Text("Basic")  
                    .font(.system(.title, design: .rounded))  
                    .fontWeight(.black)  
                    .foregroundColor(.white)  
                Text("$9")  
                    .font(.system(size: 40, weight: .heavy, design: .rounded))  
                    .foregroundColor(.white)  
                Text("per month")  
                    .font(.headline)  
                    .foregroundColor(.white)  
            }  
            .padding(40)  
            .background(Color.purple)  
            .cornerRadius(10)  
        }  
    }  
}
```

# Choose Your Plan

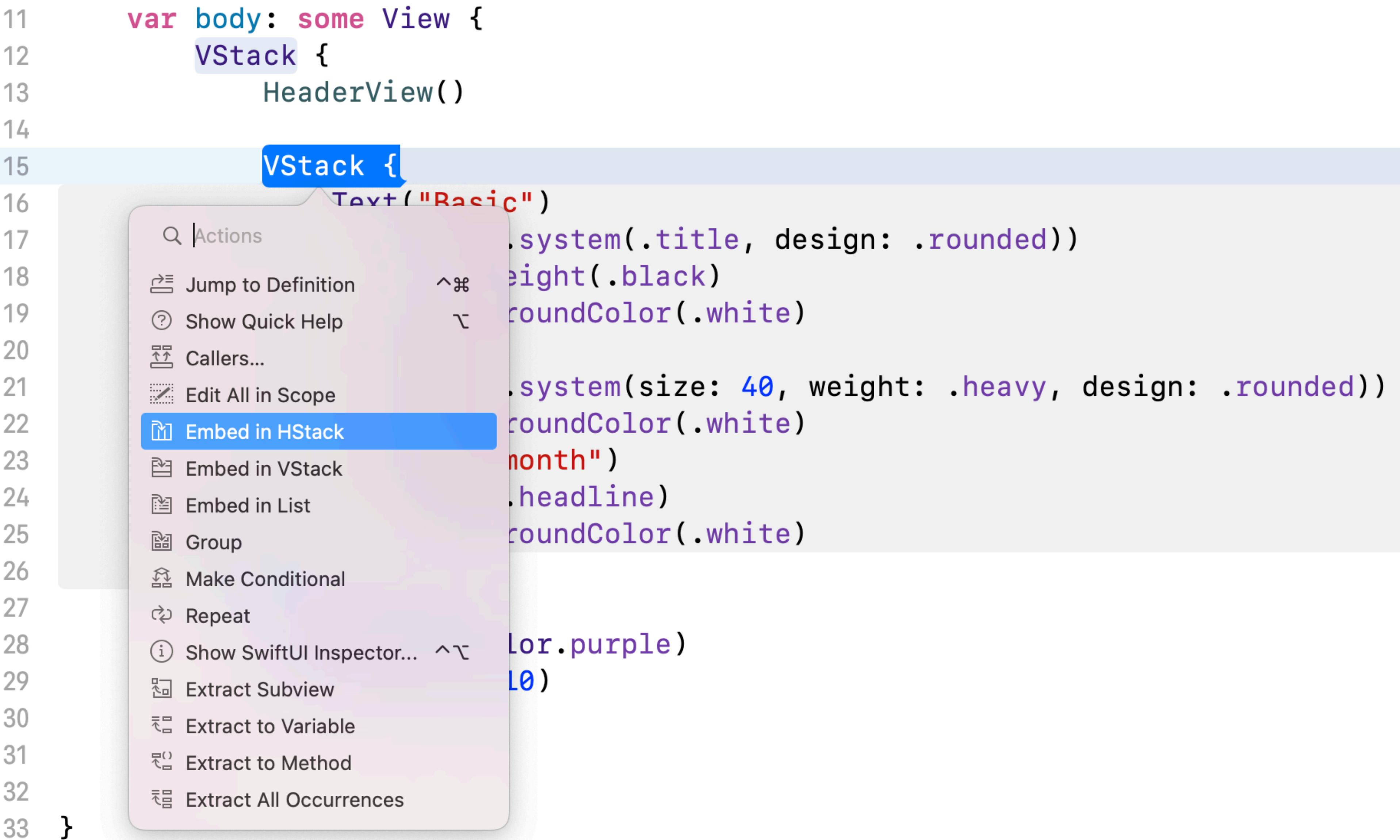


The basic plan



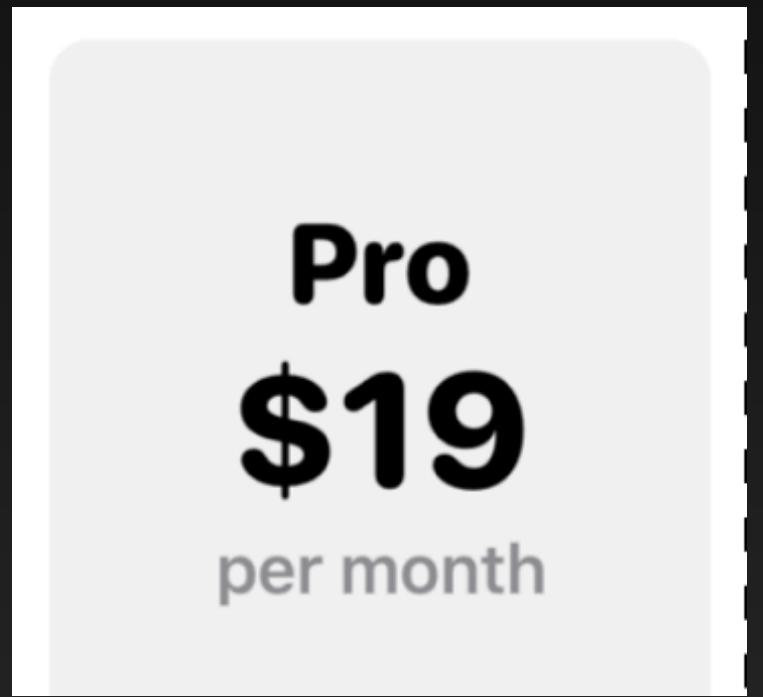
## Embed in HStack

```
11  var body: some View {  
12    VStack {  
13      HeaderView()  
14  
15      VStack {  
16        Text("Basic")  
17        .system(.title, design: .rounded)  
18        .weight(.black)  
19        .fontColor(.white)  
20  
21        .system(size: 40, weight: .heavy, design: .rounded)  
22        .fontColor(.white)  
23        month)  
24        .headline)  
25        .fontColor(.white)  
26  
27        lor.purple)  
28        L0)  
29  
30  
31  
32  
33 }
```



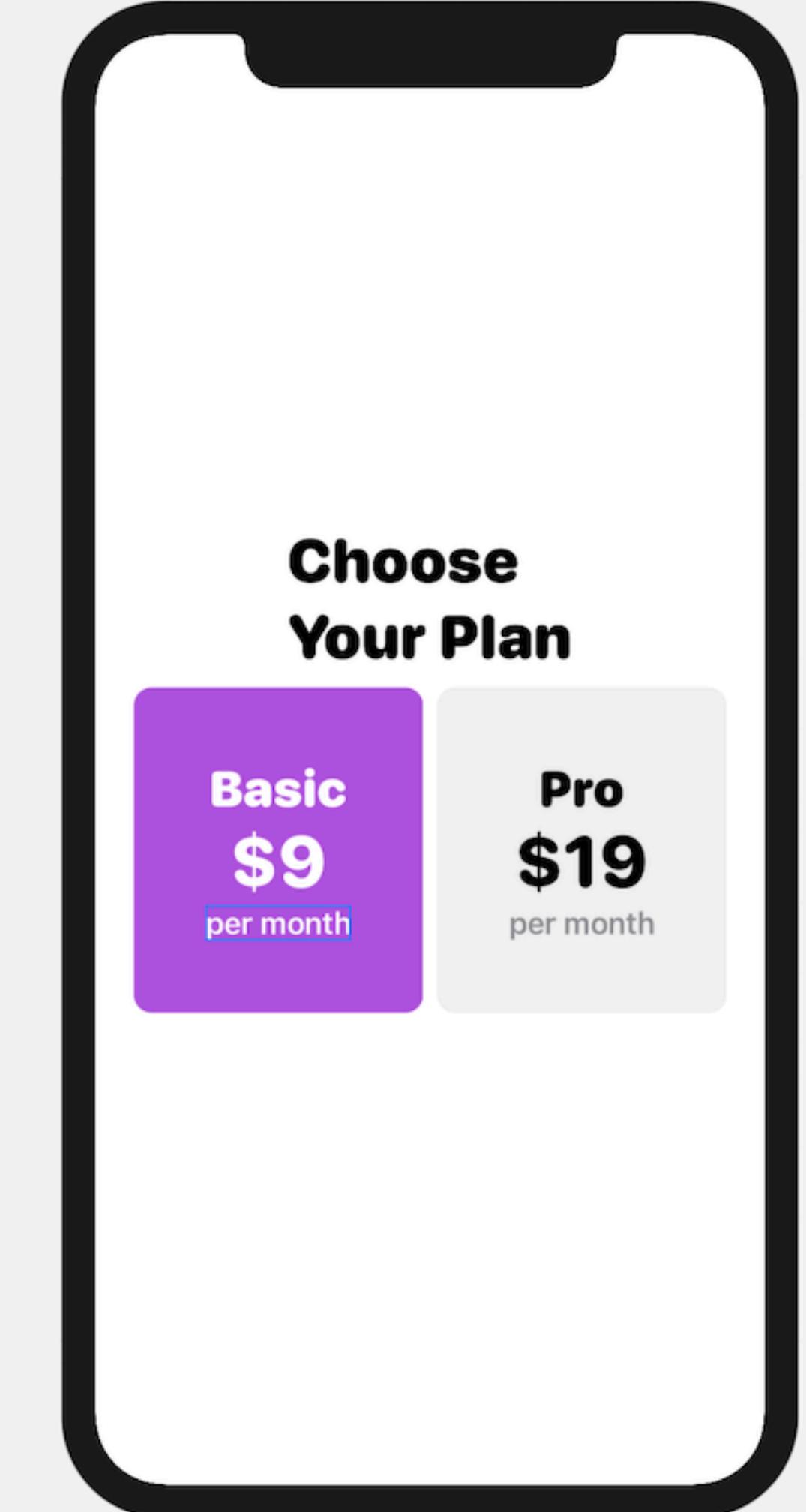
```
HStack {  
    VStack {  
        Text("Basic")  
            .font(.system(.title, design: .rounded))  
            .fontWeight(.black)  
            .foregroundColor(.white)  
        Text("$9")  
            .font(.system(size: 40, weight: .heavy, design: .rounded))  
            .foregroundColor(.white)  
        Text("per month")  
            .font(.headline)  
            .foregroundColor(.white)  
    }  
    .padding(40)  
    .background(Color.purple)  
    .cornerRadius(10)  
}
```

```
 VStack {  
     Text("Pro")  
         .font(.system(.title, design: .rounded))  
         .fontWeight(.black)  
     Text("$19")  
         .font(.system(size: 40, weight: .heavy, design: .rounded))  
     Text("per month")  
         .font(.headline)  
         .foregroundColor(.gray)  
 }  
.padding(40)  
.background(Color(red: 240/255, green: 240/255, blue: 240/255))  
.cornerRadius(10)
```



UI of the *Pro* plan

```
ContentView.swift
SwiftUIStacks > SwiftUIStacks > ContentView.swift > body
14
15     HStack {
16         VStack {
17             Text("Basic")
18                 .font(.system(.title, design: .rounded))
19                 .fontWeight(.black)
20                 .foregroundColor(.white)
21             Text("$9")
22                 .font(.system(size: 40, weight: .heavy, design:
23                             .rounded))
24                 .foregroundColor(.white)
25             Text("per month")
26                 .font(.headline)
27                 .foregroundColor(.white)
28         }
29         .padding(40)
30         .background(Color.purple)
31         .cornerRadius(10)
32
33         VStack {
34             Text("Pro")
35                 .font(.system(.title, design: .rounded))
36                 .fontWeight(.black)
37             Text("$19")
38                 .font(.system(size: 40, weight: .heavy, design:
39                             .rounded))
40             Text("per month")
41                 .font(.headline)
42                 .foregroundColor(.gray)
43         }
44         .padding(40)
45         .background(Color(red: 240/255, green: 240/255, blue: 240/255))
46         .cornerRadius(10)
47     }
48 }
```



The preview shows an iPhone X displaying a user interface for selecting a plan. The title "Choose Your Plan" is at the top. Below it are two cards: a purple "Basic" plan card and a gray "Pro" plan card. The Basic plan costs \$9 per month, and the Pro plan costs \$19 per month.

Using HStack to layout two views horizontally

10:33

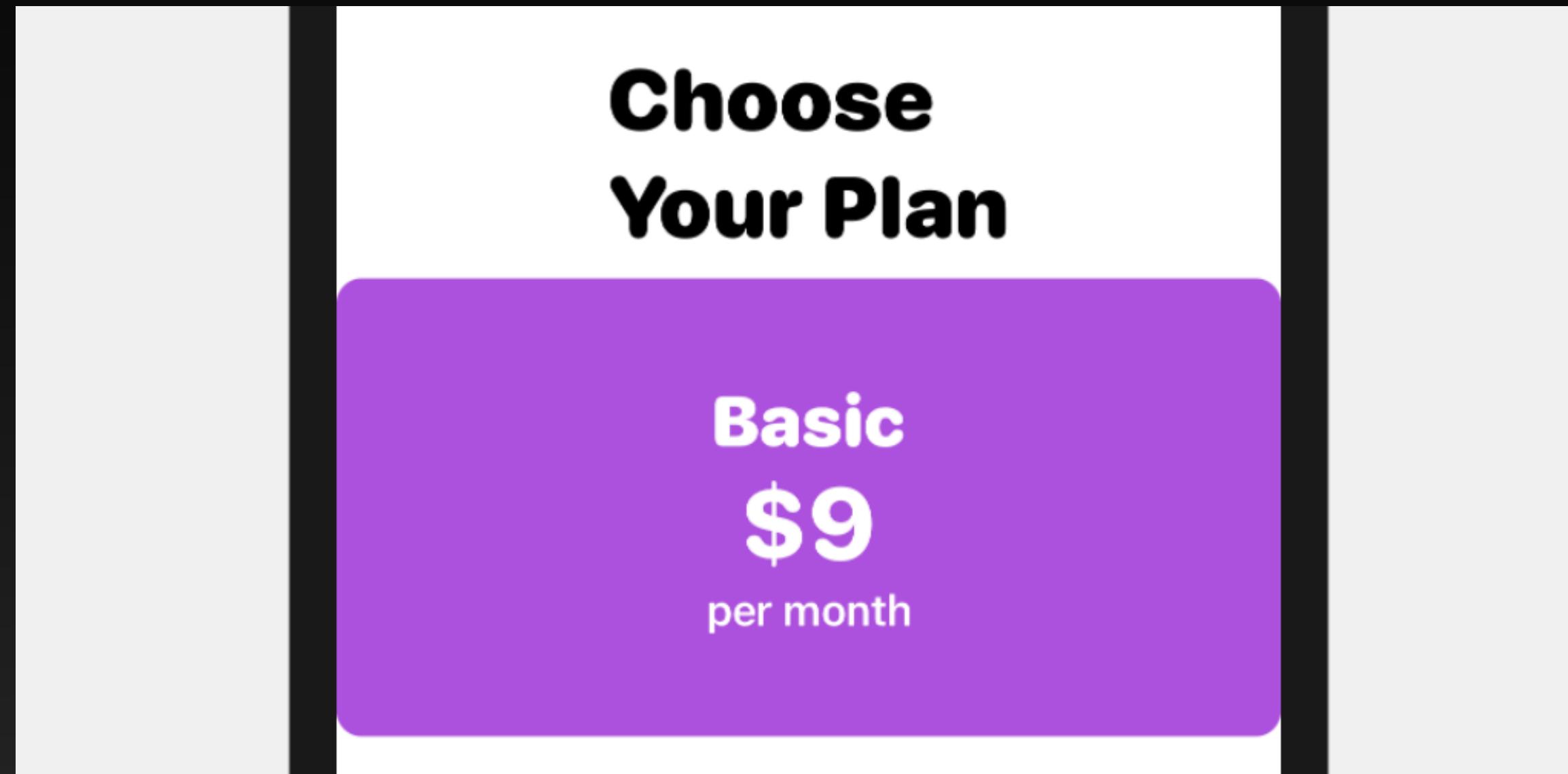


## Choose Your Plan

**Basic**  
**\$9**  
per month

**Profession  
al**  
**\$19**  
per month

change the word "Pro" to "Professional"



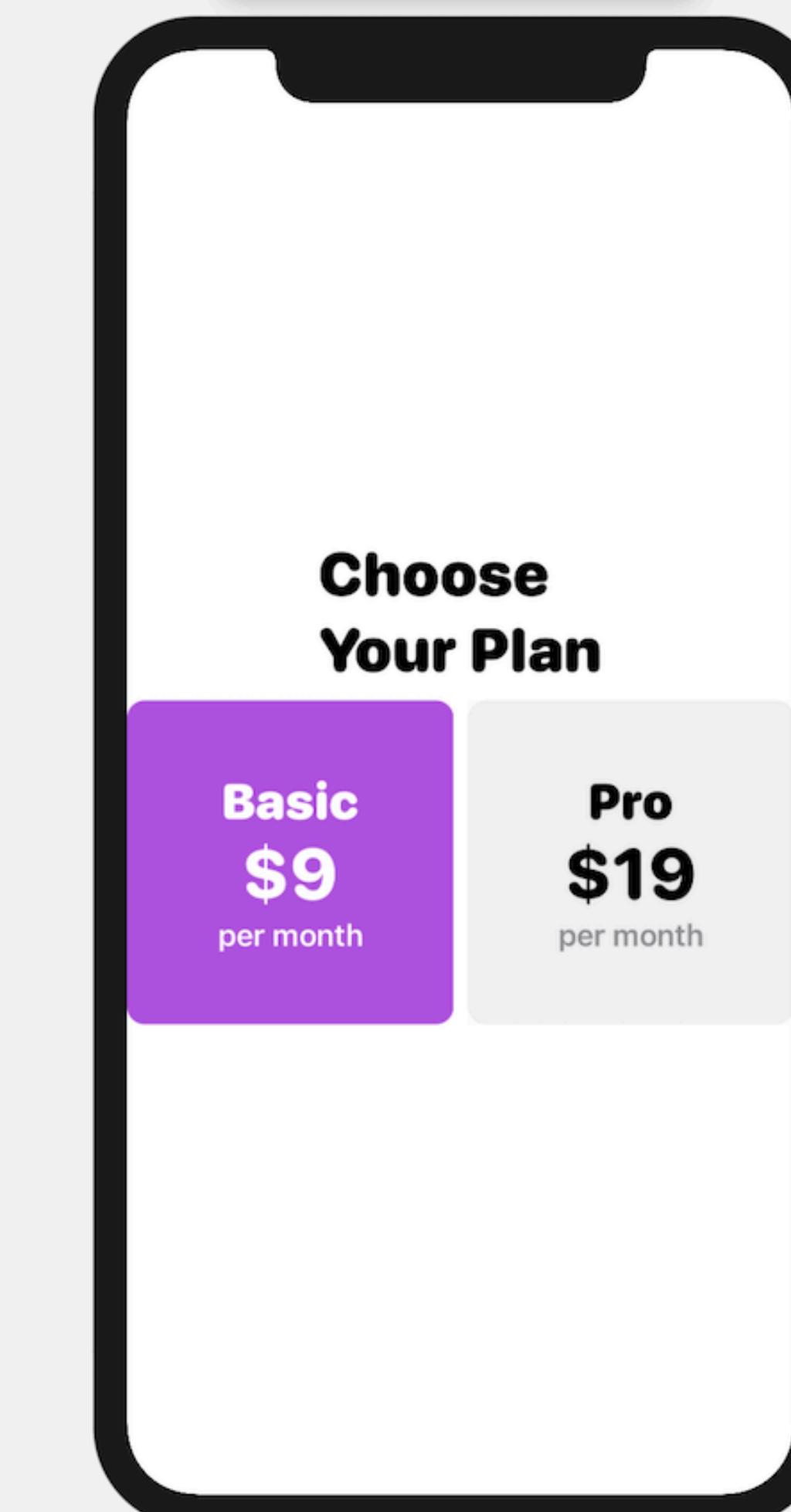
```
.frame(minWidth: 0, maxWidth: .infinity, minHeight: 100)
```

Setting the maxWidth to .infinity

```
ContentView.swift
```

```
SwiftUIStacks > SwiftUIStacks > ContentView.swift > No Selection
```

```
16    VStack {  
17        Text("Basic")  
18            .font(.system(.title, design: .rounded))  
19            .fontWeight(.black)  
20            .foregroundColor(.white)  
21        Text("$9")  
22            .font(.system(size: 40, weight: .heavy, design:  
23                .rounded))  
24            .foregroundColor(.white)  
25        Text("per month")  
26            .font(.headline)  
27            .foregroundColor(.white)  
28    }  
29    .frame(minWidth: 0, maxWidth: .infinity, minHeight: 100)  
30    .padding(40)  
31    .background(Color.purple)  
32    .cornerRadius(10)  
33  
34    VStack {  
35        Text("Pro")  
36            .font(.system(.title, design: .rounded))  
37            .fontWeight(.black)  
38        Text("$19")  
39            .font(.system(size: 40, weight: .heavy, design:  
40                .rounded))  
41        Text("per month")  
42            .font(.headline)  
43            .foregroundColor(.gray)  
44    }  
45    .frame(minWidth: 0, maxWidth: .infinity, minHeight: 100)  
46    .padding(40)  
47    .background(Color(red: 240/255, green: 240/255, blue: 240/255))  
        .cornerRadius(10)
```



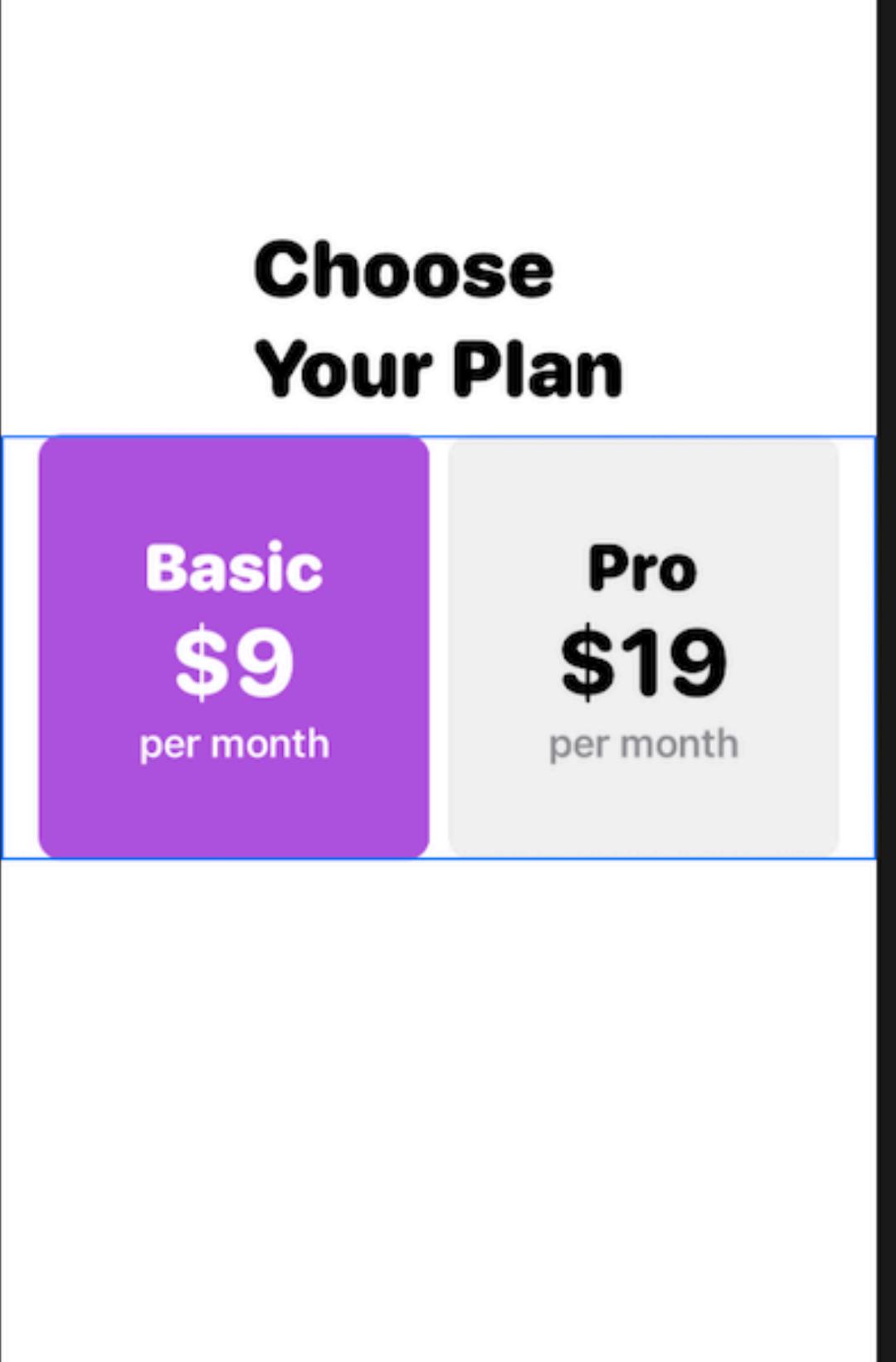
Choose  
Your Plan

**Basic**  
**\$9**  
per month

**Pro**  
**\$19**  
per month

Arranging both pricing blocks with equal width

```
34     VStack {  
35         Text("Pro")  
36             .font(.system(.title, design: .rounded))  
37             .fontWeight(.black)  
38         Text("$19")  
39             .font(.system(size: 40, weight: .heavy, design:  
40                 .rounded))  
41         Text("per month")  
42             .font(.headline)  
43             .foregroundColor(.gray)  
44     }  
45     .frame(minWidth: 0, maxWidth: .infinity, minHeight: 100)  
46     .padding(40)  
47     .background(Color(red: 240/255, green: 240/255, blue: 240/255))  
48     .cornerRadius(10)  
49     .padding(.horizontal)  
50 }  
51 }  
52 }
```



Adding some paddings for the stack view

# Organizing the Code

the *Basic* and *Pro* pricing plan

similar except:

- name of the pricing plan
- price
- text color
- background color

```
15     HStack {  
16         VStack {  
17             Text("Basic")  
18             Actions  
19             ▾ Jump to Definition  
20             ▾ Show Quick Help  
21             ▾ Callers...  
22             ▾ Edit All in Scope  
23             ▾ Embed in HStack  
24             ▾ Embed in VStack  
25             ▾ Embed in List  
26             ▾ Group  
27             ▾ Make Conditional  
28             ▾ Repeat  
29             ▾ Show SwiftUI Inspector... ▾ Extract Subview  
30             ▾ Extract to Variable  
31             ▾ Extract to Method  
32             ▾ Extract All Occurrences  
33     }  
     system(.title, design: .rounded)  
     ight(.black)  
     oundColor(.white)  
  
     system(size: 40, weight: .heavy, design:  
     unded)  
     oundColor(.white)  
     onth")  
     headline)  
     oundColor(.white)  
  
     : 0, maxWidth: .infinity, minHeight: 100)  
     or.purple)  
     0)
```

## Extract subview: PricingView

```
struct PricingView: View {  
  
    var title: String  
    var price: String  
    var textColor: Color  
    var bgColor: Color  
  
    var body: some View {  
        VStack {  
            Text(title)  
                .font(.system(.title, design: .rounded))  
                .fontWeight(.black)  
                .foregroundColor(textColor)  
            Text(price)  
                .font(.system(size: 40, weight: .heavy, design: .rounded))  
                .foregroundColor(textColor)  
            Text("per month")  
                .font(.headline)  
                .foregroundColor(textColor)  
        }  
        .frame(minWidth: 0, maxWidth: .infinity, minHeight: 100)  
        .padding(40)  
        .background(bgColor)  
        .cornerRadius(10)  
    }  
}
```

```
15     HStack {  
16         PricingView()  
17             .  
18             .  
19         VStack {  
20             Text("Pro")  
21                 .  
22                     .fontWeight(.black)
```

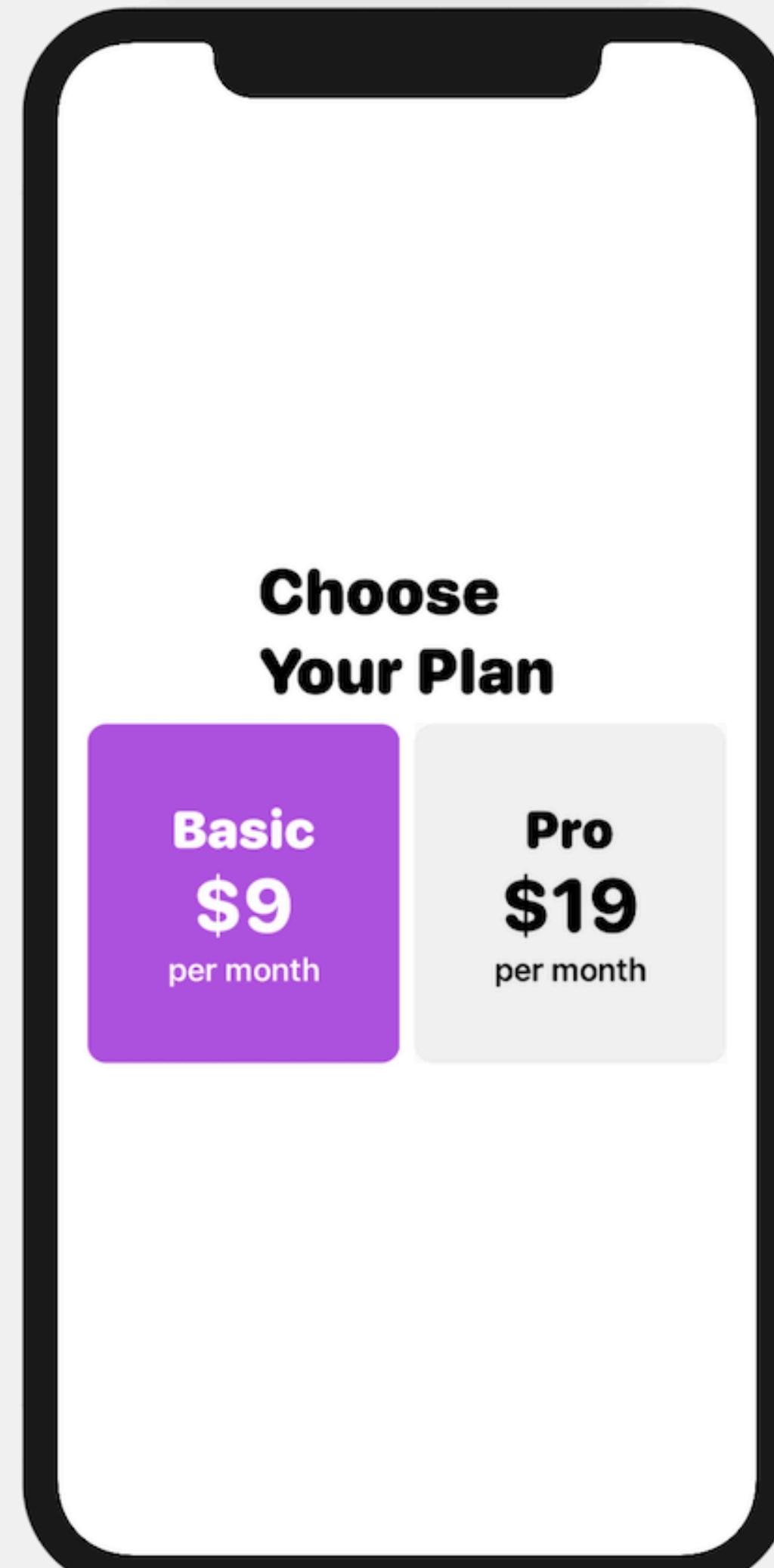
Missing arguments for parameters 'title', 'price', 'textColor', 'bgColor' in call  
Insert 'title: <#String#>, price: <#String#>, textColor: <#Color#>, bgColor: <#Color#>' Fix

Xcode indicates an error on the PricingView

```
PricingView(title: "Basic", price: "$9", textColor: .white, bgColor: .purple)
```

```
PricingView(title: "Pro", price: "$19", textColor: .black, bgColor: Color(red: 240/255, green: 240/255, blue: 240/255))
```

```
ContentView.swift
SwiftUIStacks > SwiftUIStacks > ContentView.swift > No Selection
7
8 import SwiftUI
9
10 struct ContentView: View {
11     var body: some View {
12         VStack {
13             HeaderView()
14
15             HStack {
16                 PricingView(title: "Basic", price: "$9", textColor: .white,
17                             bgColor: .purple)
18
19                 PricingView(title: "Pro", price: "$19", textColor: .black,
20                             bgColor: Color(red: 240/255, green: 240/255, blue:
21                                         240/255))
22             }
23         }
24     }
25
26     struct ContentView_Previews: PreviewProvider {
27         static var previews: some View {
28             ContentView()
29         }
30     }
31
32     struct HeaderView: View {
33         var body: some View {
34             VStack(alignment: .leading, spacing: 2) {
35                 Text("Choose")
36                     .font(.system(.largeTitle, design: .rounded))
37                     .fontWeight(.black)
38                 Text("Your Plan")
39             }
40         }
41     }
42 }
```



The screenshot shows the 'ContentView' code in Xcode and its corresponding preview on an iPhone X. The preview displays a dark-themed user interface with a large title 'Choose Your Plan' at the top. Below it are two cards: a purple 'Basic' plan card with '\$9 per month' and a grey 'Pro' plan card with '\$19 per month'. The Xcode interface includes a navigation bar with 'ContentView.swift', a sidebar with 'SwiftUIStacks > SwiftUIStacks', and a bottom status bar indicating '82%'. The preview window has a toolbar with icons for play, stop, preview, and others.

ContentView after refactoring the code

# Using ZStack

```
ZStack {
```

```
    PricingView(title: "Pro", price: "$19", textColor: .black, bgColor: Color(red: 240/255, green: 240/255, blue: 240/255))
```

```
    Text("Best for designer")
```

```
        .font(.system(.caption, design: .rounded))
```

```
        .fontWeight(.bold)
```

```
        .foregroundColor(.white)
```

```
        .padding(5)
```

```
        .background(Color(red: 255/255, green: 183/255, blue: 37/255))
```

```
}
```

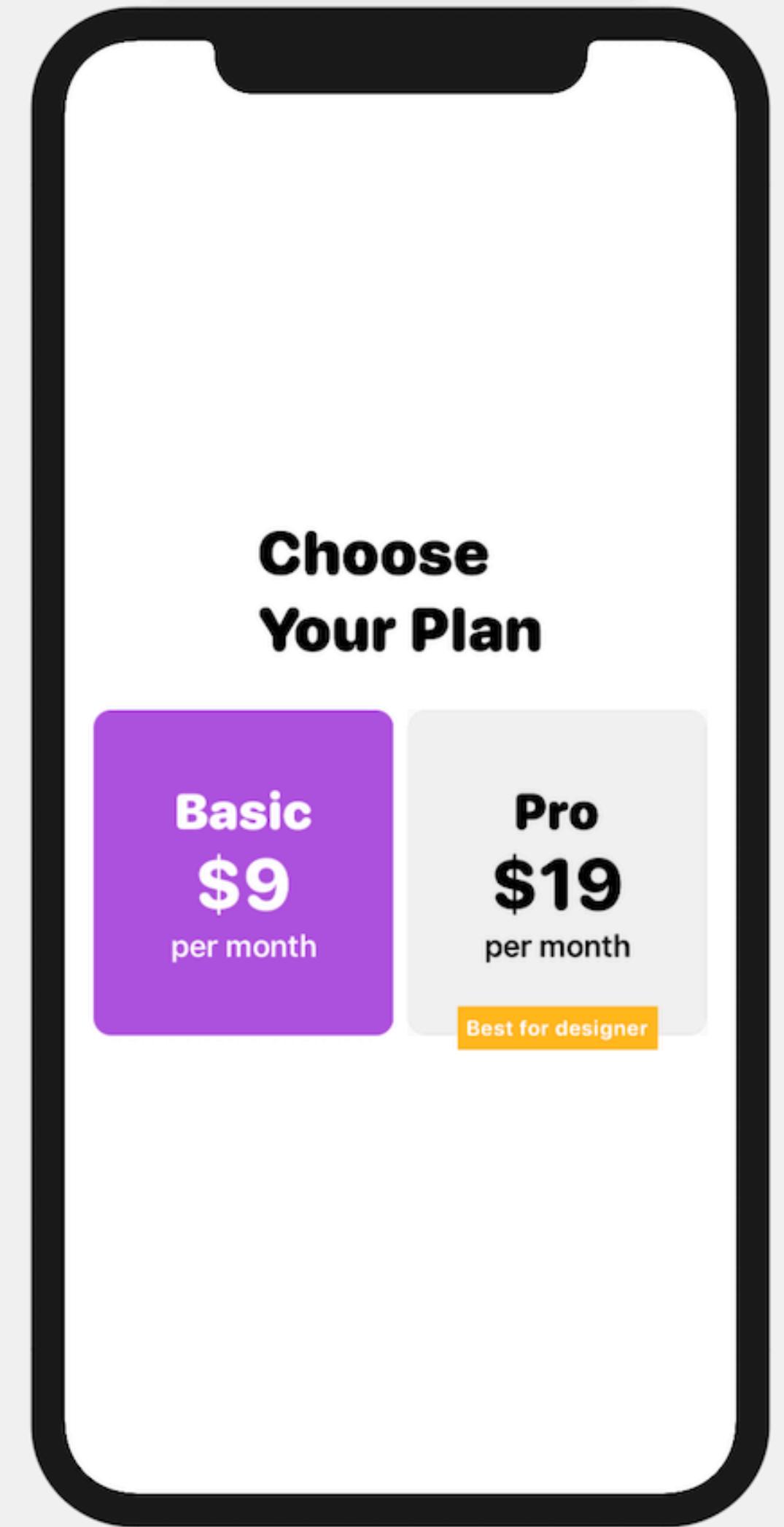
**Choose  
Your Plan**

**Basic**  
**\$9**  
per month

**Pro**  
Best for designer  
**\$19**  
per month

```
ContentView.swift
SwiftUIStacks > SwiftUIStacks > ContentView.swift > No Selection

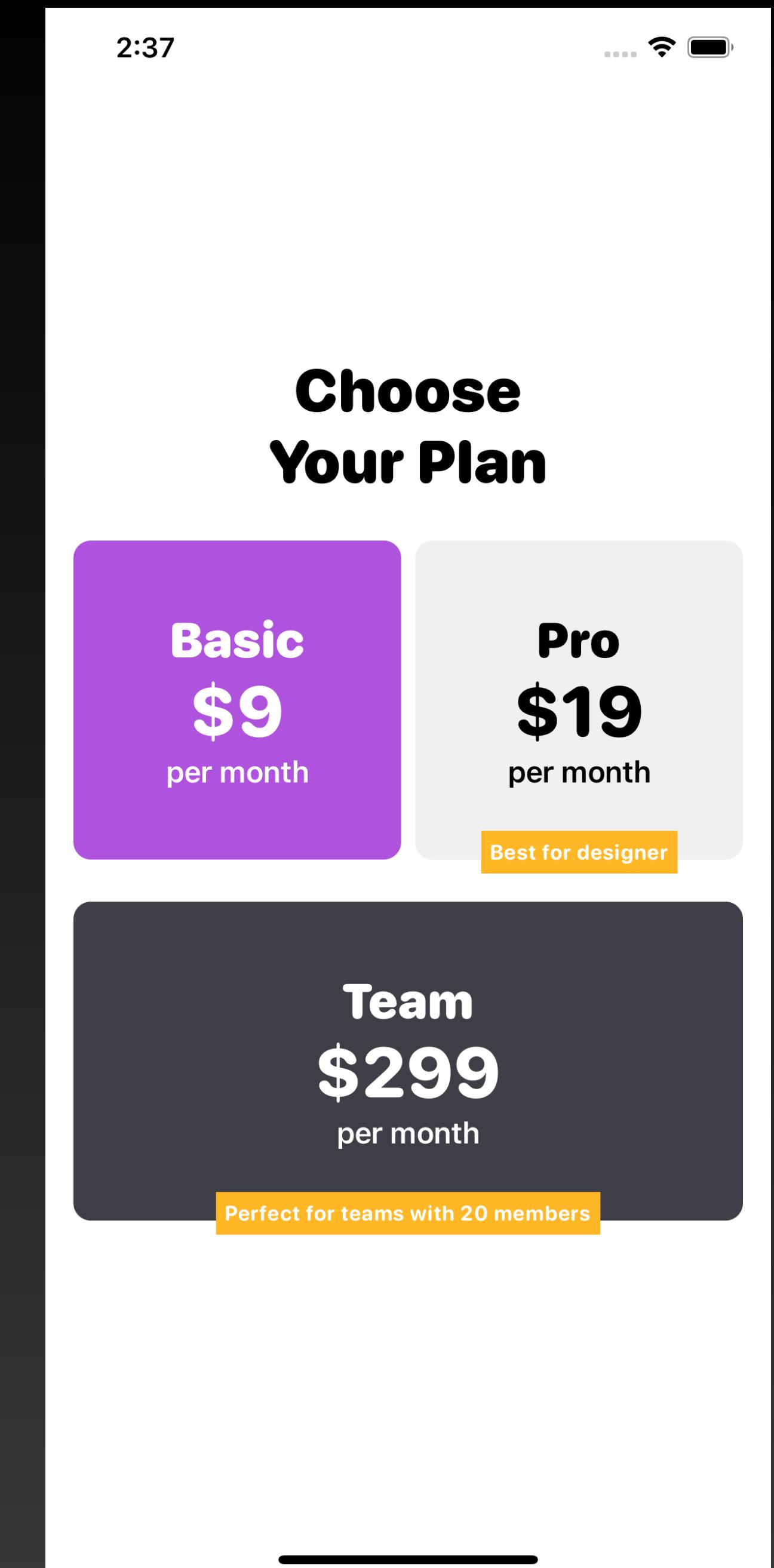
8 import SwiftUI
9
10 struct ContentView: View {
11     var body: some View {
12         VStack {
13             HeaderView()
14
15             HStack {
16                 PricingView(title: "Basic", price: "$9", textColor: .white,
17                             bgColor: .purple)
18
19                 ZStack {
20                     PricingView(title: "Pro", price: "$19", textColor: .black,
21                                 bgColor: Color(red: 240/255, green: 240/255, blue:
22                                     240/255))
23
24                     Text("Best for designer")
25                         .font(.system(.caption, design: .rounded))
26                         .fontWeight(.bold)
27                         .foregroundColor(.white)
28                         .padding(5)
29                         .background(Color(red: 255/255, green: 183/255, blue:
30                             37/255))
31                         .offset(x: 0, y: 87)
32
33             }
34
35         }
36
37     }
38
39     struct ContentView_Previews: PreviewProvider {
40         static var previews: some View {
41             ContentView()
42         }
43     }
44 }
```



Position the text view using `.offset(x: 0, y: 87)`

`.offset(x: 0, y: 87)`

# Exercise



# Handling Optionals in SwiftUI

**Choose  
Your Plan**

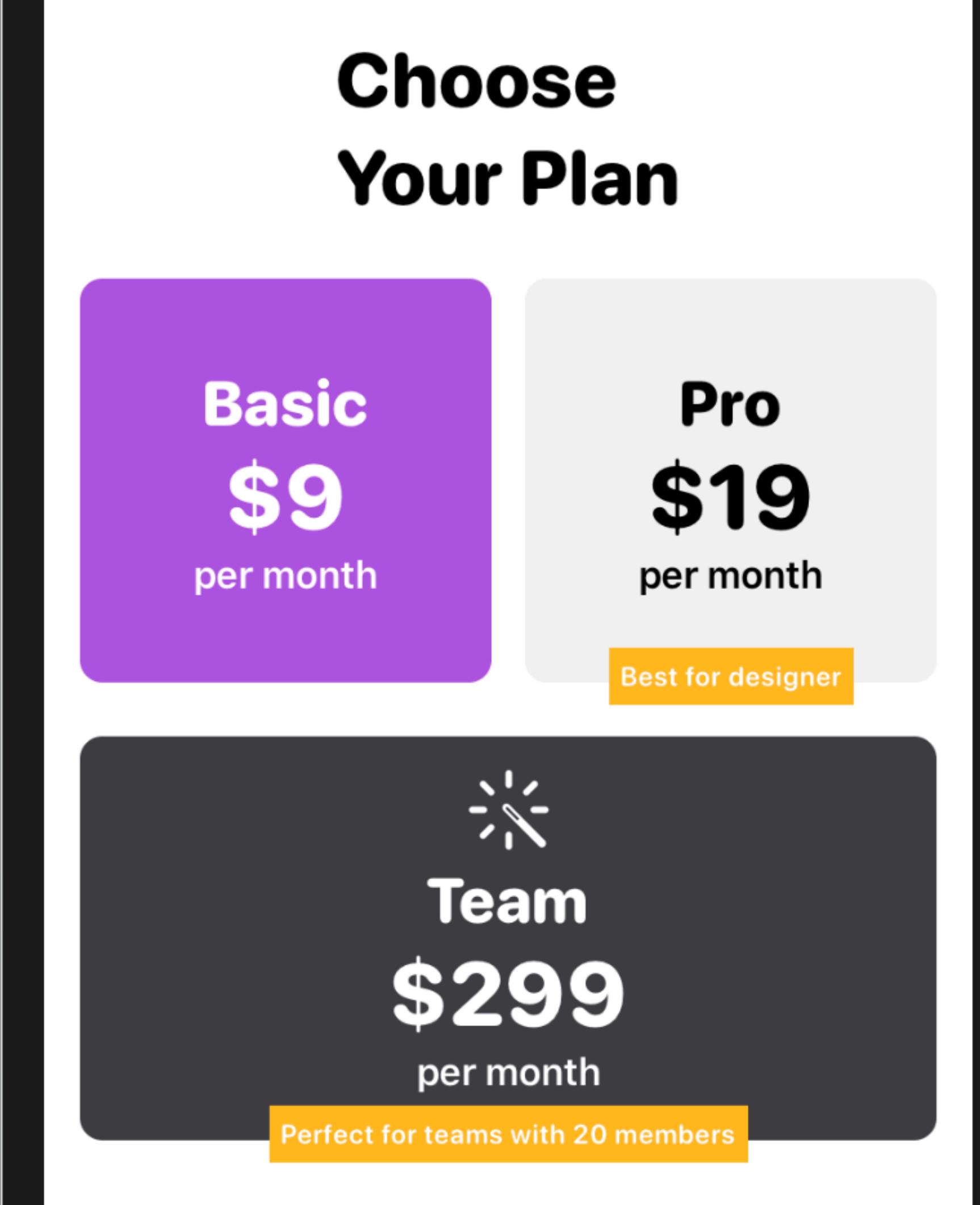
**Basic**  
**\$9**  
per month

**Pro**  
**\$19**  
per month

Best for designer

  
**Team**  
**\$299**  
per month

Perfect for teams with 20 members



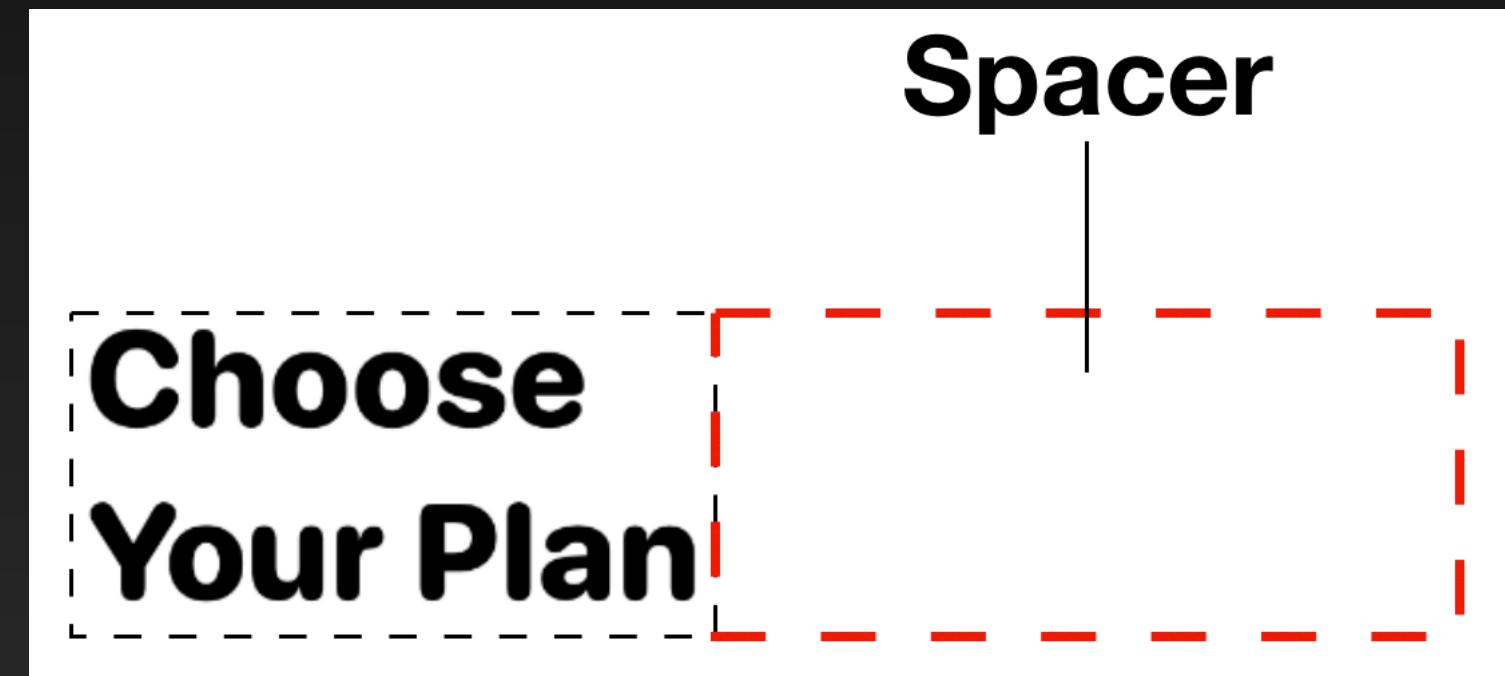
## declare an optional in PricingView:

```
struct PricingView: View {  
  
    var title: String  
    var price: String  
    var textColor: Color  
    var bgColor: Color  
    var icon: String?  
  
    var body: some View {  
        VStack {  
  
            if let icon2 = icon {  
  
                Image(systemName: icon2)  
                    .font(.largeTitle)  
                    .foregroundColor(textColor)  
  
            }  
        }  
    }  
}
```

```
PricingView(title: "Team",  
            price: "$299",  
            textColor: .white,  
            bgColor: Color(red: 62/255, green:  
                            63/255, blue: 70/255),  
            icon: "wand.and.rays").padding()
```

# Using Spacer

```
struct HeaderView: View {  
    var body: some View {  
        HStack {  
            VStack(alignment: .leading, spacing: 2) {  
                Text("Choose")  
                    .font(.system(.largeTitle, design: .rounded))  
                    .fontWeight(.black)  
                Text("Your Plan")  
                    .font(.system(.largeTitle, design: .rounded))  
                    .fontWeight(.black)  
            }  
            Spacer()  
        }  
        .padding()  
    }  
}
```



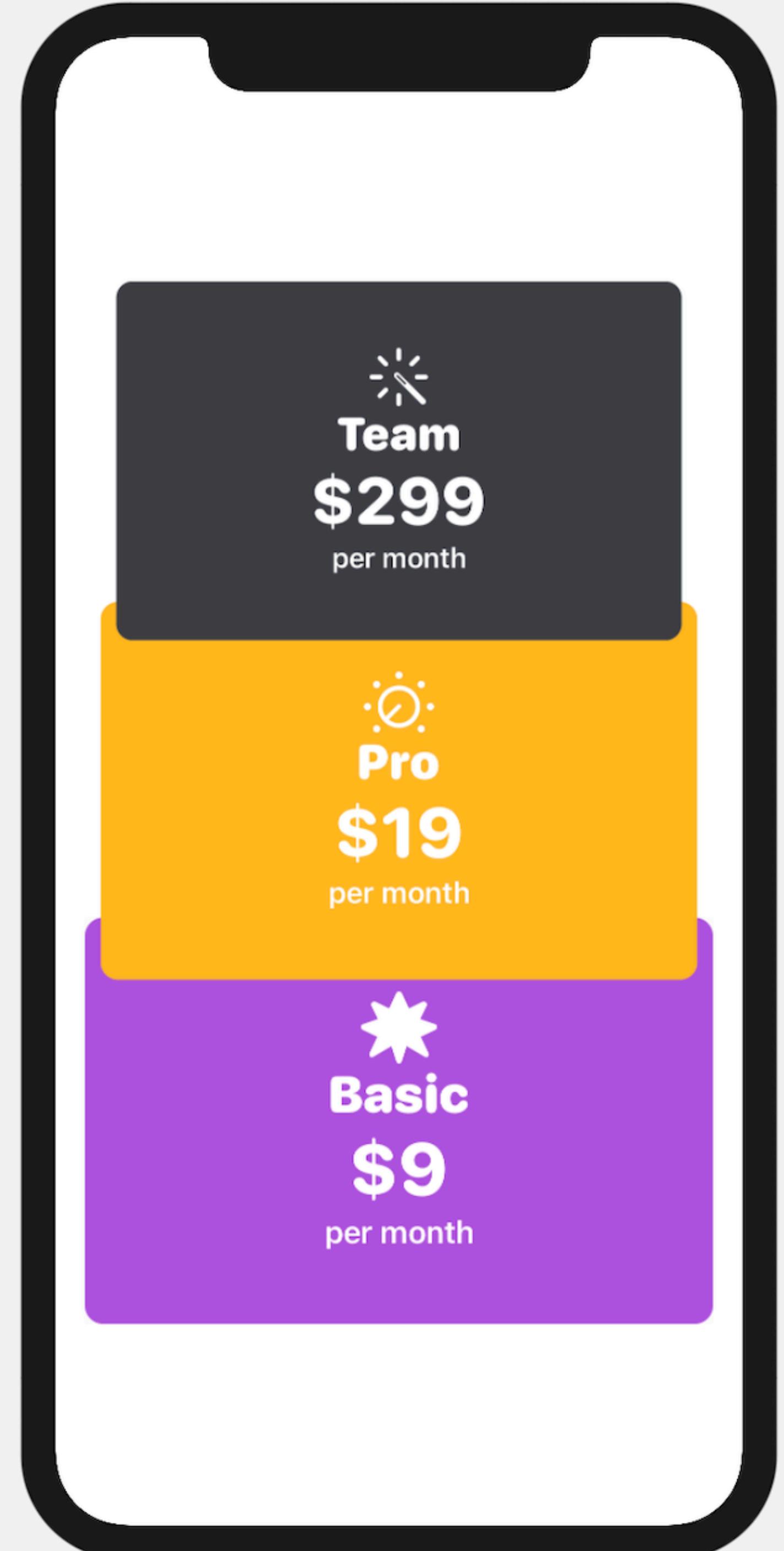
```
ContentView.swift
SwiftUIStacks > SwiftUIStacks > ContentView.swift > body

20
21     Text("Best for designer")
22         .font(.system(.caption, design: .rounded))
23         .fontWeight(.bold)
24         .foregroundColor(.white)
25         .padding(5)
26         .background(Color(red: 255/255, green: 183/255, blue:
27             37/255))
28         .offset(x: 0, y: 87)
29     }
30     .padding(.horizontal)
31
32 ZStack {
33     PricingView(title: "Team", price: "$299", textColor: .white,
34         bgColor: Color(red: 62/255, green: 63/255, blue: 70/255),
35         icon: "wand.and.rays")
36         .padding()
37
38     Text("Perfect for teams with 20 members")
39         .font(.system(.caption, design: .rounded))
40         .fontWeight(.bold)
41         .foregroundColor(.white)
42         .padding(5)
43         .background(Color(red: 255/255, green: 183/255, blue:
44             37/255))
45         .offset(x: 0, y: 87)
46         // Add a spacer
47         Spacer()
48     }
49 }
```

The image shows an iPhone X preview of a SwiftUI application. The screen displays a title 'Choose Your Plan' and two plan options: 'Basic \$9 per month' and 'Pro \$19 per month'. A callout bubble highlights the 'Basic' plan with the text 'Best for designer'. Below the plans is a large dark card for the 'Team' plan (\$299 per month) with the text 'Perfect for teams with 20 members'. A red box highlights the 'Spacer()' line in the code.

# Using Spacer in VStack

**Homework**  
**systemName:**  
1.burst.fill  
2.dial  
3.wand.and.rays



```
struct ContentView: View {
    var body: some View {
        VStack(alignment: .leading){
            HeaderView()
            HStack {
                PricingView(title: "Basic", price: "$9", textColor: .white, bgColor: .purple)
                ZStack{
                    PricingView(title: "Pro", price: "$19", textColor: .black, bgColor: Color(red: 240/255,
green: 240/255, blue: 240/255))
                    Text("Best for designer")
                        .font(.system(.caption, design: .rounded))
                        .fontWeight(.bold)
                        .foregroundColor(.white)
                        .padding(5)
                        .background(Color(red: 255/255, green: 183/255, blue: 37/255))
                        .offset(x: 0, y:87)
                }
            }.padding(.horizontal)
            ZStack{
                PricingView(title: "Team", price: "$299", textColor: .white, bgColor: .black)
                Text("Best for designer")
                    .font(.system(.caption, design: .rounded))
                    .fontWeight(.bold)
                    .foregroundColor(.white)
                    .padding(5)
                    .background(Color(red: 255/255, green: 183/255, blue: 37/255))
                    .offset(x: 0, y:87)
            }.padding()
            Spacer()
        }
    }
}
```