A SwiftUI Kickstart

Introducing the SwiftUI User Interface Framework
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Introducing The SwiftUI User Interface Framework

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Editors Cut
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Book Version

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Grids

In this section we use grids to layout our symbols. The grid views don't replace `List`, they replace `VStack` and `HStack`. We begin this section by backing up a bit and then we replace a `VStack` with a `LazyVGrid`. After that we look at several ways to layout our grid.

Back up

Let's begin by backing up a bit. Here's the current state of our `List`.

```
04/05/Symbols/Symbols/ContentView.swift

struct ContentView: View {
    var body: some View {
        List(symbols){symbol in
            SystemLabel(name: symbol.name)
        }
    }
}
```

Let's back up to where we used `ScrollView`, `VStack`, and `ForEach`. 
struct ContentView: View {
    var body: some View {
        ScrollView {
            LazyVStack(spacing: 20) {
                ForEach(symbols) { symbol in
                    SystemLabel(name: symbol.name)
                }
            }
        }
    }
}

Let's convert the LazyVStack to a LazyVGrid.

Introducing a Grid

Grids are either vertical or horizontal. If we use a vertical grid then we have to specify how the horizontal part, the columns, will be presented. Each row will be filled using that rule and then the grid will manage the vertical axis.

We'll specify the columns using an array of GridItems. We then use that array in our LazyVGrid.
04/05/Symbols/Symbols/ContentView.swift

struct ContentView: View {
    let columns = [GridItem(.flexible())]

    var body: some View {
        ScrollView {
            LazyVGrid(columns: columns, spacing: 20) {
                ForEach(symbols) { symbol in
                    SystemLabel(name: symbol.name)
                }
            }
        }
    }

    This looks the same as the VStack version.
Let's display only the symbols and experiment with the grid layout.

**Flexible**

Replace `SystemLabel` with `Image` and allow the image to grow to fill the space allowed.
struct ContentView: View {
    let columns = [GridItem(.flexible())]

    var body: some View {
        ScrollView {
            LazyVGrid(columns: columns,
                      spacing: 20){
                ForEach(symbols){symbol in
                    Image(systemName: symbol.name)
                        .resizable()
                        .scaledToFit()
                }
            }
        }
    }
}

I've selected the line containing Image so you can see the blue rectangle that the image is being sized to fit.
The columns are an array containing a single GridItem that is flexible so it grows to fill the space. As you typed in `.flexible()` you should have seen a completion that allows you to specify a minimum and maximum value.

Now, check out what happens if we add two more columns of flexible() items.
Again, I've selected Image so you can see the bounding rectangles. Note that after the spacing is accounted for, the remaining horizontal space is divided into three equal pieces to accommodate the flexible items.
You're beginning to feel the power of grids. But there's more!

**Fixed**

We can also specify the size of the items in a column using the `fixed GridItem`. 
This sets the first column to be a fixed width of 200 and splits the remainder among the three remaining columns. It looks like this.
We use fixed and flexible either by themselves or in combination with each other to specify a layout for a specified number of columns. There is another type of GridItem.

Adaptive
The third type of `GridItem` is `adaptive`. In this final example we use the `adaptive` choice with the restriction that the symbols must be at least 60 wide. The result is to fit as many symbols in a row as we can of equal size so long as they are at least 60 wide.

```
04/05/Symbols/Symbols/ContentView.swift

struct ContentView: View {
  let columns = [GridItem(.adaptive(minimum: 60))]
  //...
}
```

In this screenshot of the preview you can see even rows that each have five symbols across.
This is a great setting in which to experiment with different settings for columns and view the results. Play a little bit before we return to Lists in the next section.