Flutter Layout Cheat Sheet

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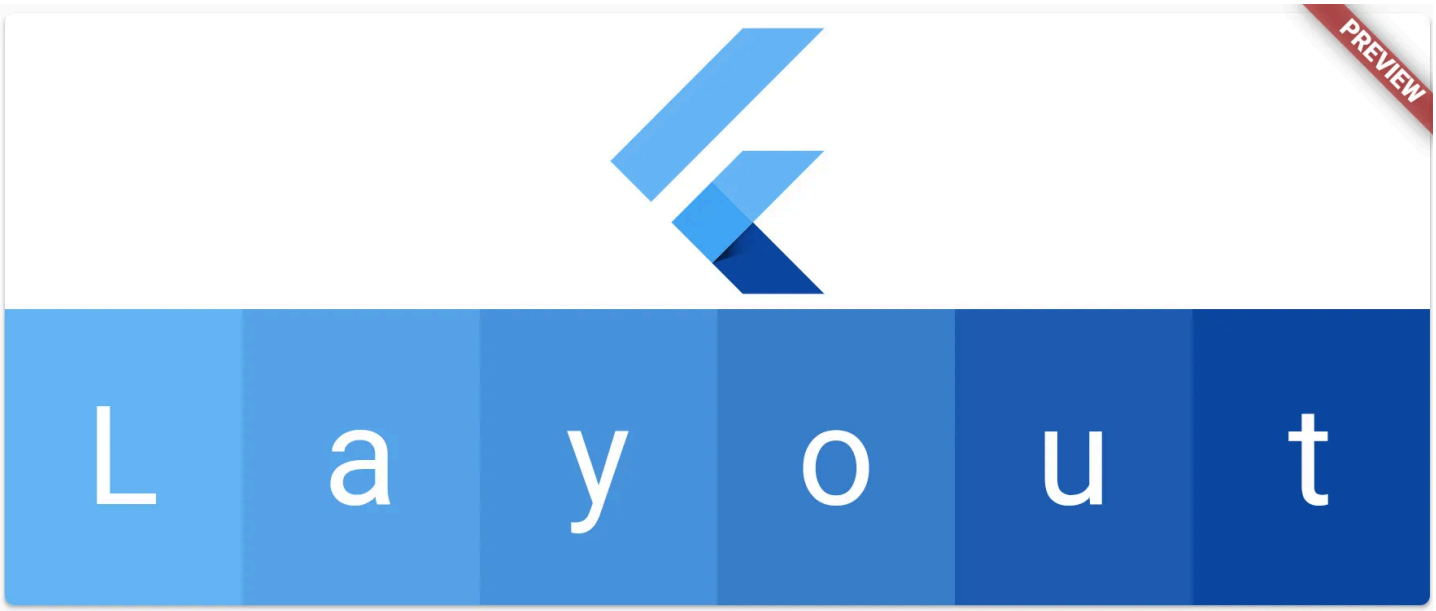

Do you need simple layout samples for Flutter?
I present you my set of Flutter layout code snippets. I will keep it short, sweet and simple with loads of visual examples.
Still, it is work in progress — the catalogue of samples will grow. I will focus more on the usage of Flutter widgets rather than showcasing the components (Flutter Gallery is great for that!).
If you have an issue with “layouting” your Flutter or you wanna share your snippets with others, please drop a line!

This article is also available in:

- Portuguese by Eddy

In case you are interested in a similar article about **Animations**, then visit **Flutter Animations Cheat Sheet**.

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- SizedBox
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Row and Column

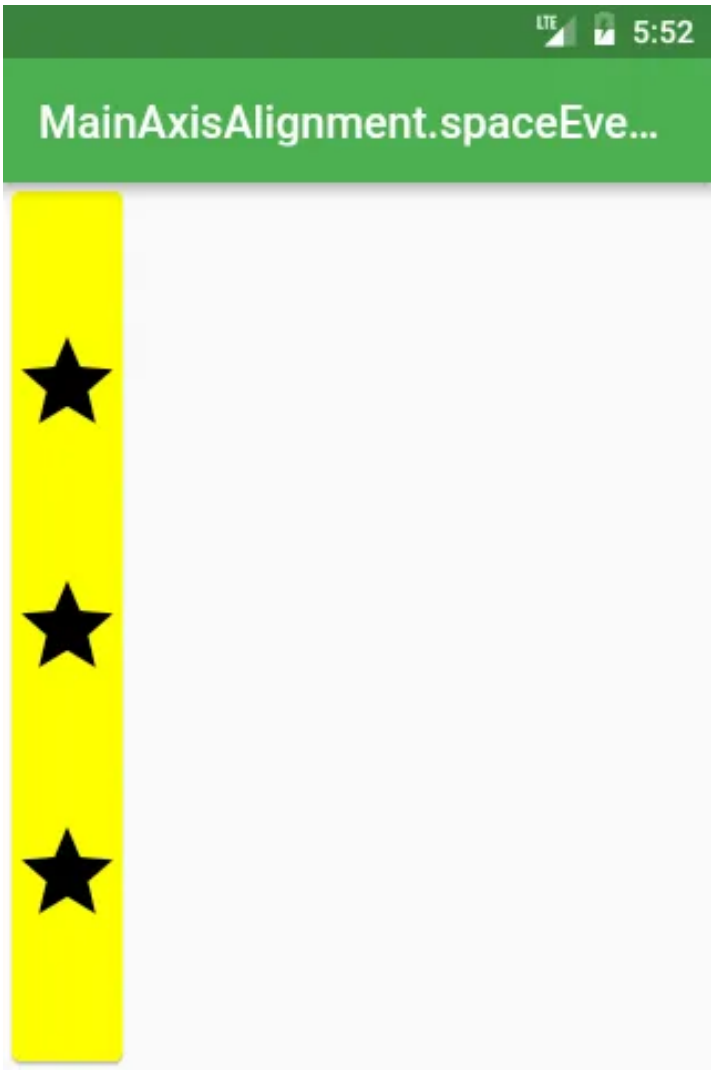
MainAxisAlignment


```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.start,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```

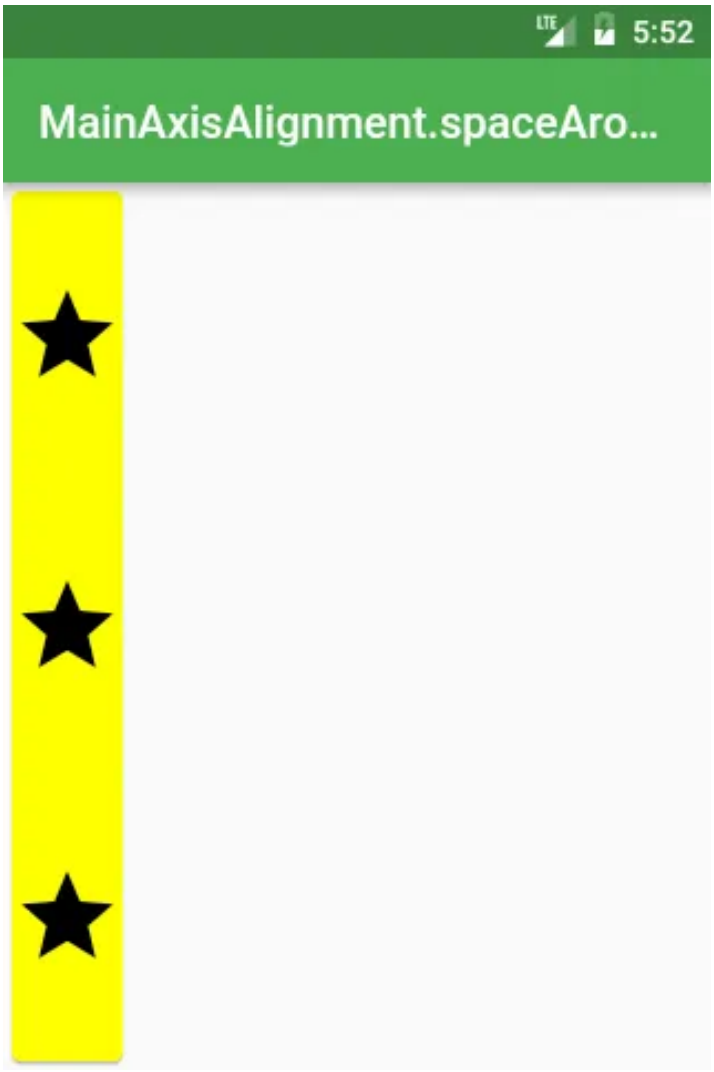

```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.center,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.end,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.spaceBetween,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```




```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.spaceEvenly,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```




```
Row /*or Column*/(
  mainAxisAlignment: MainAxisAlignment.spaceAround,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```

You should use `CrossAxisAlignment.baseline` if you require for the baseline of different text be aligned.

```
Row(
  crossAxisAlignment: CrossAxisAlignment.baseline,
  textBaseline: TextBaseline.alphabetic,
  children: <Widget>[
    Text(
      'Baseline',
      style: Theme.of(context).textTheme.display3,
    ),
    Text(
      'Baseline',
      style: Theme.of(context).textTheme.body1,
    ),
  ],
),
```

CrossAxisAlignment


```
Row /*or Column*/(
  crossAxisAlignment: CrossAxisAlignment.start,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 200),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  crossAxisAlignment: CrossAxisAlignment.center,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 200),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  crossAxisAlignment: CrossAxisAlignment.end,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 200),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  crossAxisAlignment: CrossAxisAlignment.stretch,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 200),
    Icon(Icons.star, size: 50),
  ],
),
```

MainAxisSize

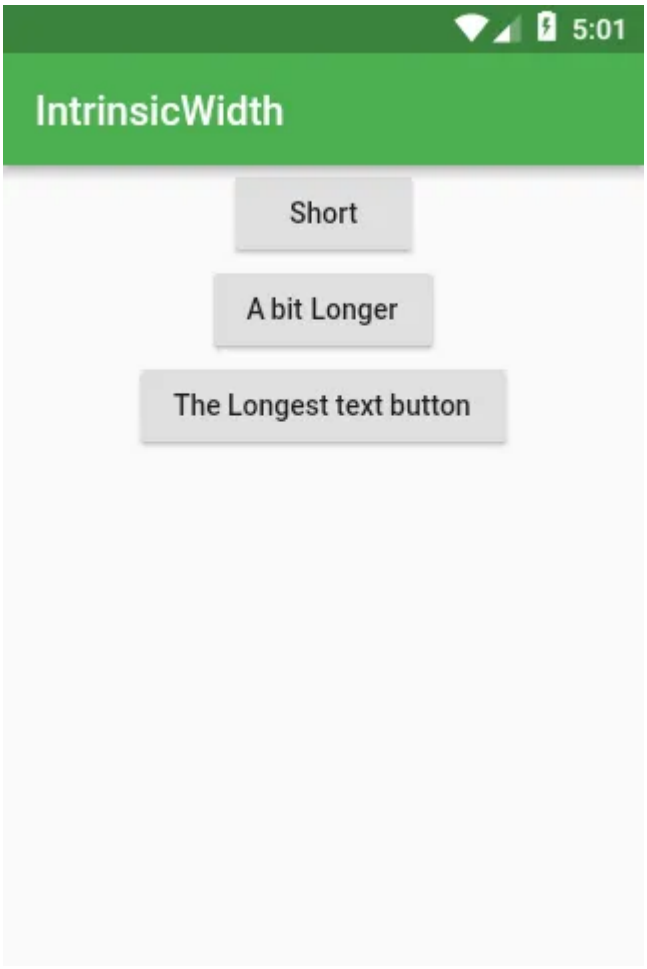

```
Row /*or Column*/(
  mainAxisSize: MainAxisSize.max,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```


```
Row /*or Column*/(
  mainAxisSize: MainAxisSize.min,
  children: <Widget>[
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```

IntrinsicWidth and IntrinsicHeight

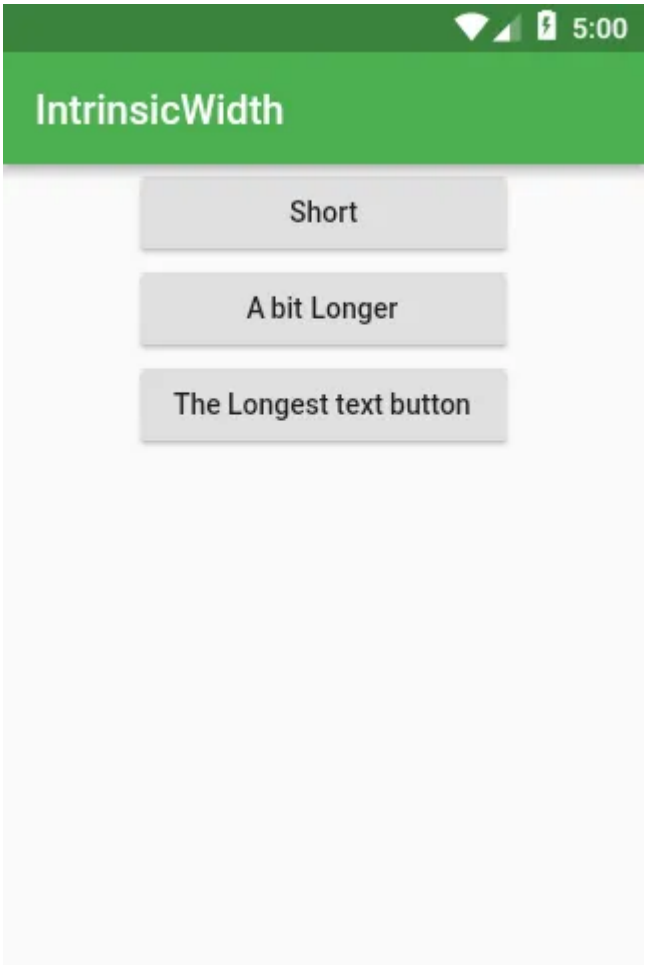
Want all the widgets inside Row or Column to be as tall/wide as the tallest/widest widget? Search no more!

In case you have this kind of layout:




```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('IntrinsicWidth')),
    body: Center(
      child: Column(
        children: <Widget>[
          RaisedButton(
            onPressed: () {},
            child: Text('Short'),
          ),
          RaisedButton(
            onPressed: () {},
            child: Text('A bit Longer'),
          ),
          RaisedButton(
            onPressed: () {},
            child: Text('The Longest text button'),
          ),
        ],
      ),
    ),
  );
}
```

But you would like to have all buttons as **wide** as **the widest**, just use `IntrinsicWidth` :




```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('IntrinsicWidth')),
    body: Center(
      child: IntrinsicWidth(
        child: Column(
          crossAxisAlignment: CrossAxisAlignment.stretch,
          children: <Widget>[
            RaisedButton(
              onPressed: () {},
              child: Text('Short'),
            ),
            RaisedButton(
              onPressed: () {},
              child: Text('A bit Longer'),
            ),
            RaisedButton(
              onPressed: () {},
              child: Text('The Longest text button'),
            ),
          ],
        ),
```

```
        ),
      ),
    );
  }
```

In case you have a similar problem but you would like to have all the widgets as **tall** as **the tallest** just use a combination of `IntrinsicHeight` and `Row` widgets.

Stack

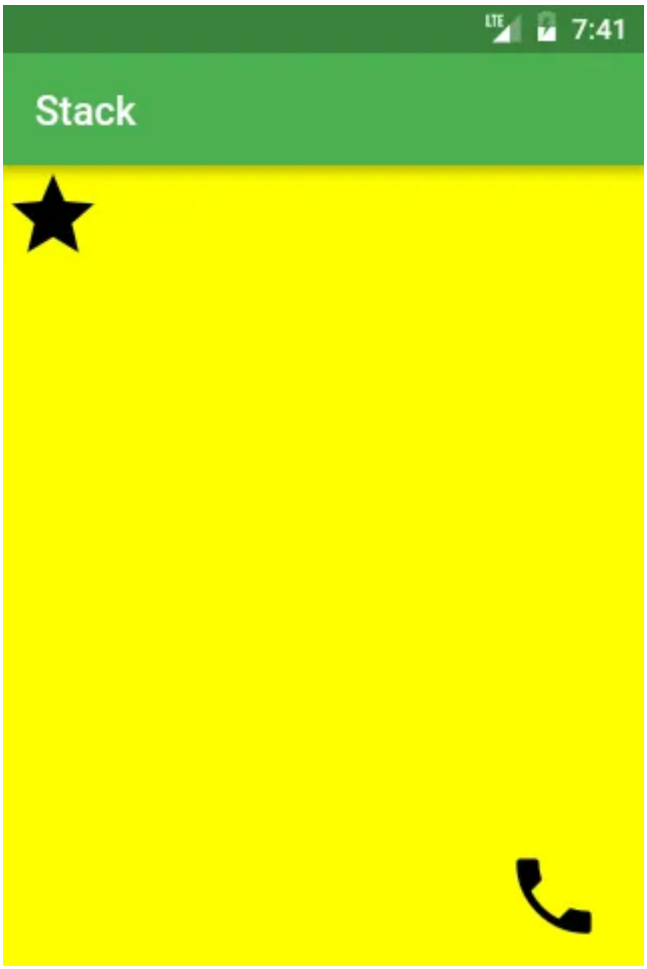
Perfect for overlaying Widgets on top of each other


```
@override
Widget build(BuildContext context) {
  Widget main = Scaffold(
    appBar: AppBar(title: Text('Stack')),
  );

  return Stack(
```

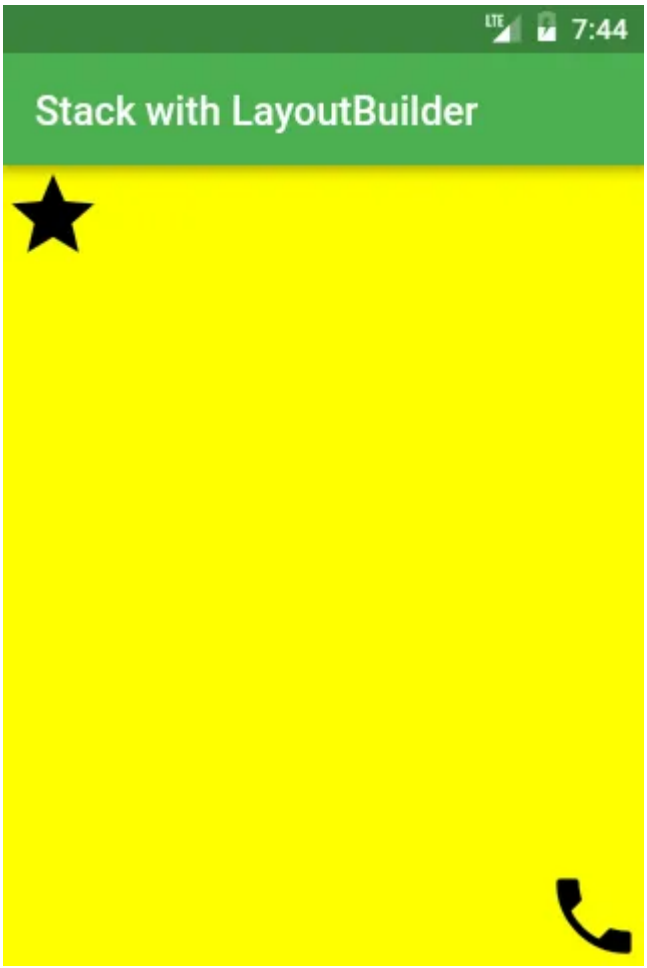
```
      fit: StackFit.expand,
      children: <Widget>[
        main,
        Banner(
          message: "Top Start",
          location: BannerLocation.topStart,
        ),
        Banner(
          message: "Top End",
          location: BannerLocation.topEnd,
        ),
        Banner(
          message: "Bottom Start",
          location: BannerLocation.bottomStart,
        ),
        Banner(
          message: "Bottom End",
          location: BannerLocation.bottomEnd,
        ),
      ],
    );
  }
```

With your own Widgets, you need to place them in `Positioned` Widget




```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Stack')),
    body: Stack(
      fit: StackFit.expand,
      children: <Widget>[
        Material(color: Colors.yellowAccent),
        Positioned(
          top: 0,
          left: 0,
          child: Icon(Icons.star, size: 50),
        ),
        Positioned(
          top: 340,
          left: 250,
          child: Icon(Icons.call, size: 50),
        ),
      ],
    ),
  );
}
```

If you don't want to guess the top/bottom values you can use `LayoutBuilder` to retrieve them

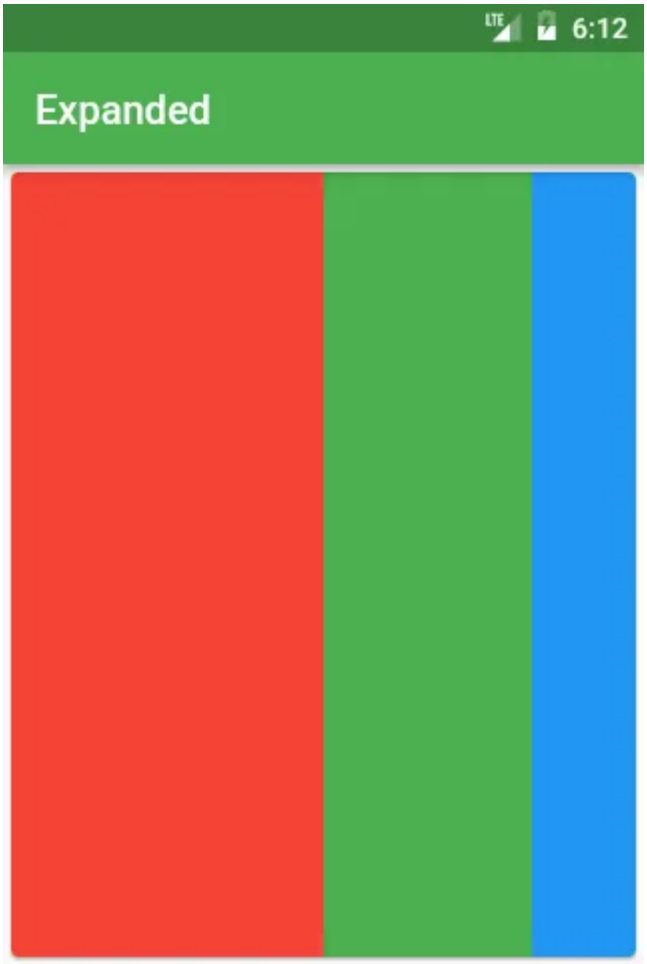



```
Widget build(BuildContext context) {
  const iconSize = 50;
  return Scaffold(
    appBar: AppBar(title: Text('Stack with LayoutBuilder')),
    body: LayoutBuilder(
      builder: (context, constraints) =>
        Stack(
          fit: StackFit.expand,
          children: <Widget>[
            Material(color: Colors.yellowAccent),
            Positioned(
              top: 0,
              child: Icon(Icons.star, size: iconSize),
            ),
            Positioned(
              top: constraints.maxHeight - iconSize,
              left: constraints.maxWidth - iconSize,
              child: Icon(Icons.call, size: iconSize),
            ),
          ],
```

```
        ),
      ),
    );
  }
```

Expanded

`Expanded` works with Flex\Flexbox layout and is great for distributing space between multiple items.

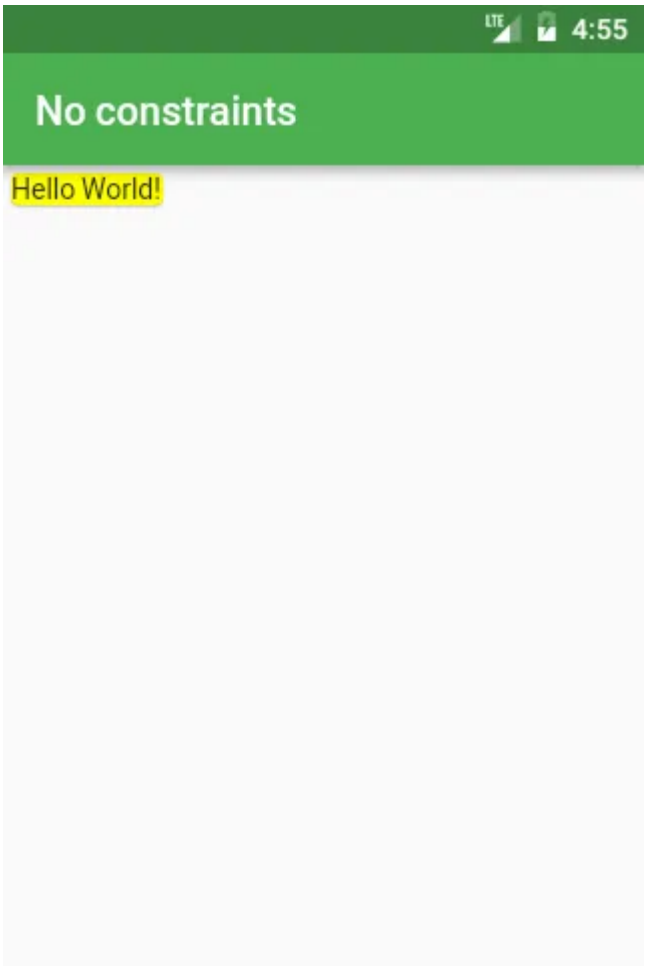



```
Row(
  children: <Widget>[
    Expanded(
      child: Container(
        decoration: const BoxDecoration(color: Colors.red),
      ),
      flex: 3,
    ),
    Expanded(
      child: Container(
```

```
          decoration: const BoxDecoration(color: Colors.green),
        ),
        flex: 2,
      ),
      Expanded(
        child: Container(
          decoration: const BoxDecoration(color: Colors.blue),
        ),
        flex: 1,
      ),
    ],
  ),
```

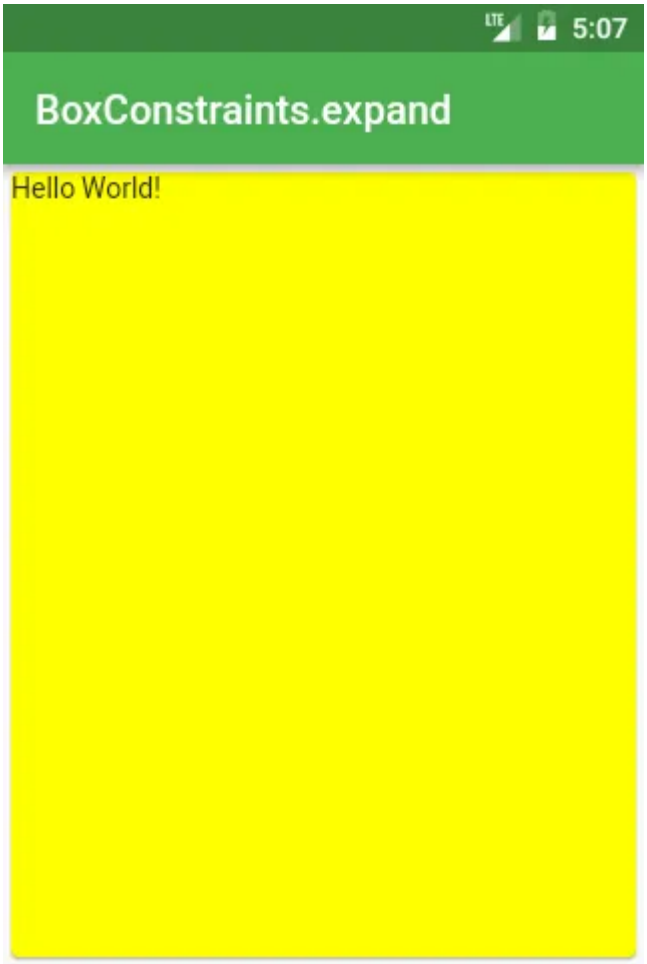
ConstrainedBox

By default, most of the widgets will use as little space as possible:




```
Card(child: const Text('Hello World!'), color: Colors.yellow)
```

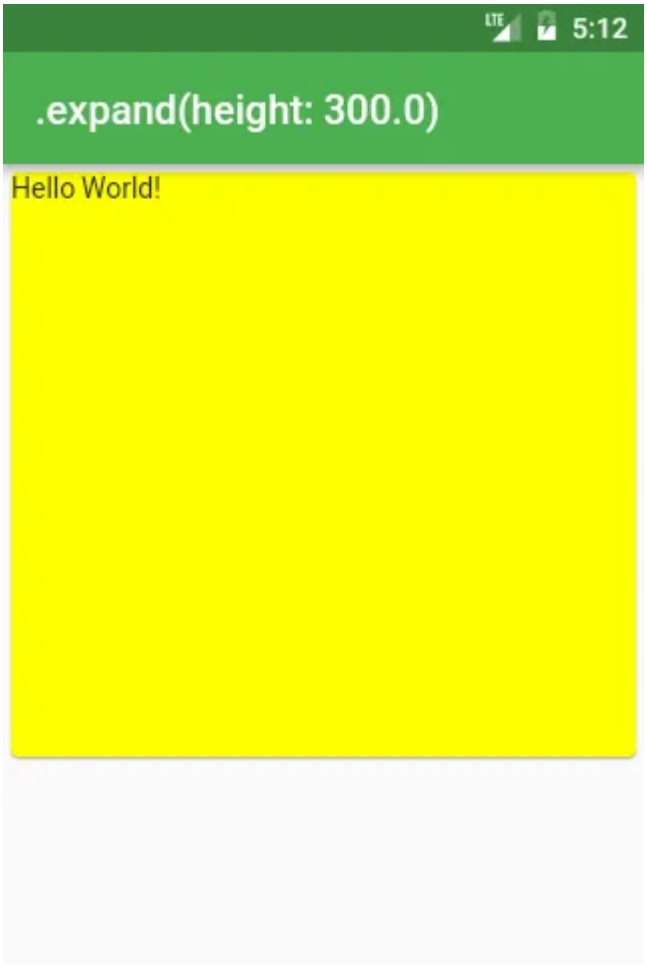
`ConstrainedBox` allows a widget to use the remaining space as desired.




```
ConstrainedBox(
  constraints: BoxConstraints.expand(),
  child: const Card(
    child: const Text('Hello World!'),
    color: Colors.yellow,
  ),
),
```

Using `BoxConstraints` you specify how much space a widget can have — you specify `min` / `max` of `height` / `width`.

`BoxConstraints.expand` uses infinite (all the available) amount of space unless specified:




```
ConstrainedBox(
  constraints: BoxConstraints.expand(height: 300),
  child: const Card(
    child: const Text('Hello World!'),
    color: Colors.yellow,
  ),
),
```

And it's the same as:

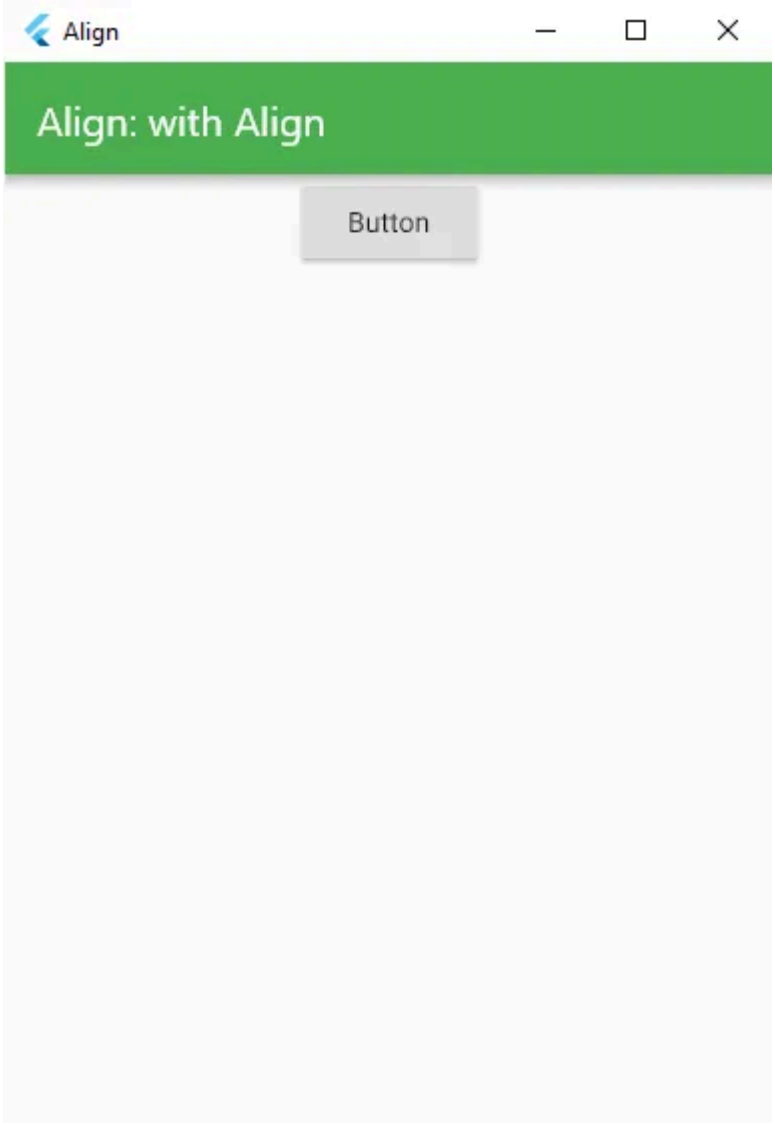
```
ConstrainedBox(
  constraints: BoxConstraints(
    minWidth: double.infinity,
    maxWidth: double.infinity,
    minHeight: 300,
    maxHeight: 300,
  ),
  child: const Card(
```

```
      child: const Text('Hello World!'),
      color: Colors.yellow,
    ),
  ),
```

Align

Sometimes you struggle to set our widget to a proper size — for example, it is constantly stretch when you do not want to:

The above happens for example when you have a `Column` with `CrossAxisAlignment.stretch` and you want only for the button not to be stretched:




```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Align: without Align')),
    body: Column(
      crossAxisAlignment: CrossAxisAlignment.stretch,
      children: <Widget>[
        Align(
          child: RaisedButton(
            onPressed: () {},
            child: const Text('Button'),
          ),
        ),
      ],
    ),
  );
}
```

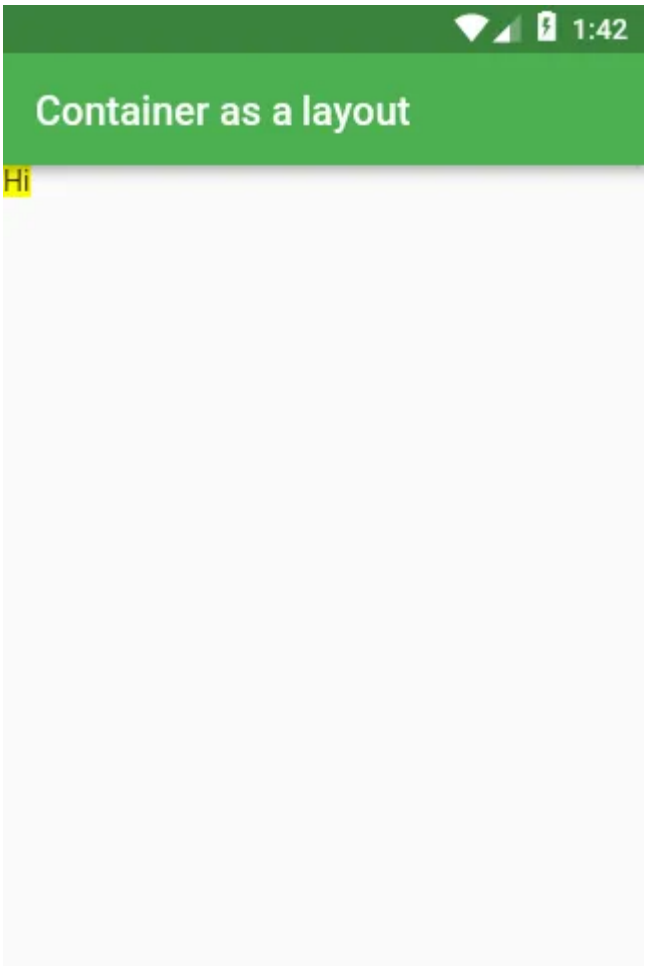
Always when your widget does not listen to the constraints that you try to set up, first try to wrap it with `Align` .

Container

One of the most used Widgets — and for good reasons:

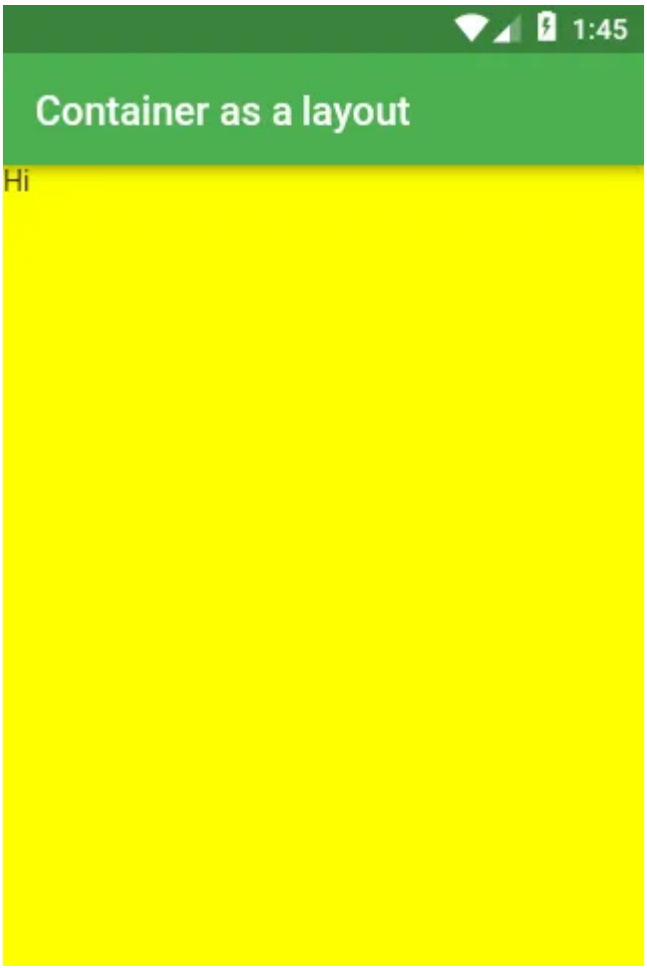
Container as a layout tool

When you don't specify the `height` and the `width` of the `Container`, it will match its `child`'s size




```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Container as a layout')),
    body: Container(
      color: Colors.yellowAccent,
      child: Text("Hi"),
    ),
  );
}
```

If you want to stretch the `Container` to match its parent, use `double.infinity` for the `height` and `width` properties

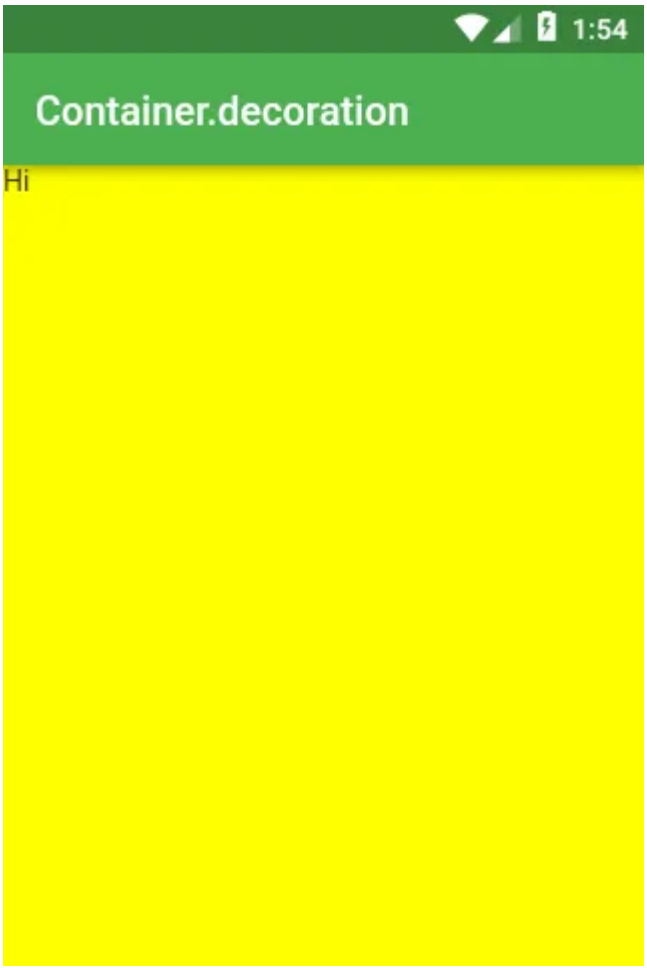



```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Container as a layout')),
    body: Container(
      height: double.infinity,
      width: double.infinity,
      color: Colors.yellowAccent,
      child: Text("Hi"),
    ),
  );
}
```

Container as decoration

You can use color property to affect `Container`'s background but `decoration` and `foregroundDecoration`. (With those two properties, you can completely change how `Containe` r looks like but I will be talking about different decorations later as it quite a big topic)

`decoration` is always placed behind the child, whereas `foregroundDecoration` is on top of the `child`



decoration

```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Container.decoration')),
    body: Container(
      height: double.infinity,
      width: double.infinity,
      decoration: BoxDecoration(color: Colors.yellowAccent),
      child: Text("Hi"),
    ),
  );
}
```

decoration and foregroundDecoration

```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Container.foregroundDecoration')),
    body: Container(
      height: double.infinity,
      width: double.infinity,
      decoration: BoxDecoration(color: Colors.yellowAccent),
      foregroundDecoration: BoxDecoration(
        color: Colors.red.withOpacity(0.5),
      ),
      child: Text("Hi"),
    ),
  );
}
```

Container as Transform

If you don't want to use `Transform` widget to change your layout, you can use `transform` property straight from the `Container`

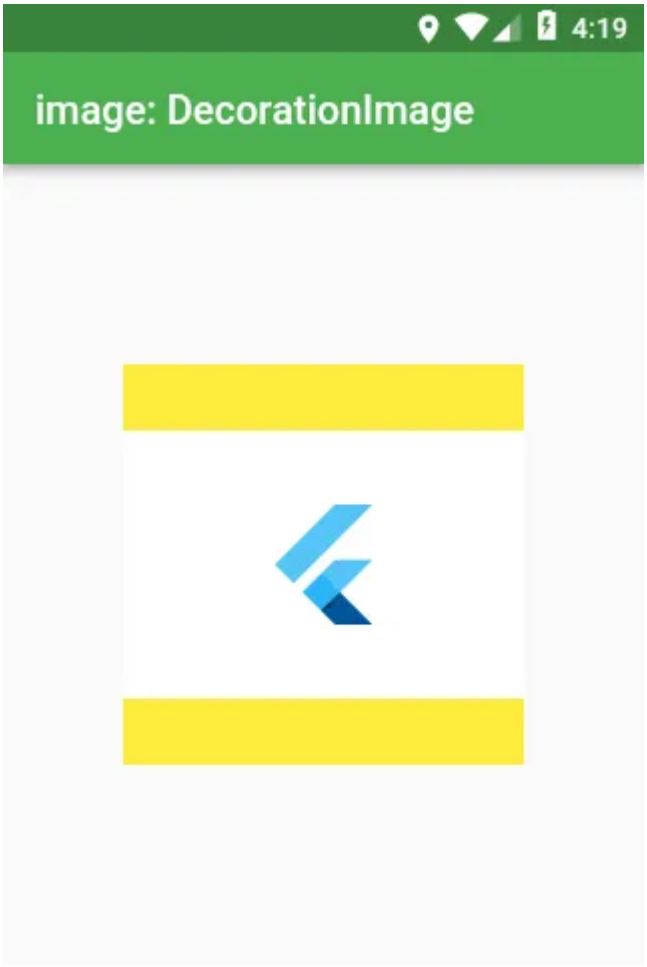

```
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(title: Text('Container.transform')),
    body: Container(
      height: 300,
      width: 300,
      transform: Matrix4.rotationZ(pi / 4),
      decoration: BoxDecoration(color: Colors.yellowAccent),
      child: Text(
        "Hi",
        textAlign: TextAlign.center,
      ),
    ),
  );
}
```

BoxDecoration

The decoration is usually used on a Container widget to change how the container looks.

image: DecorationImage

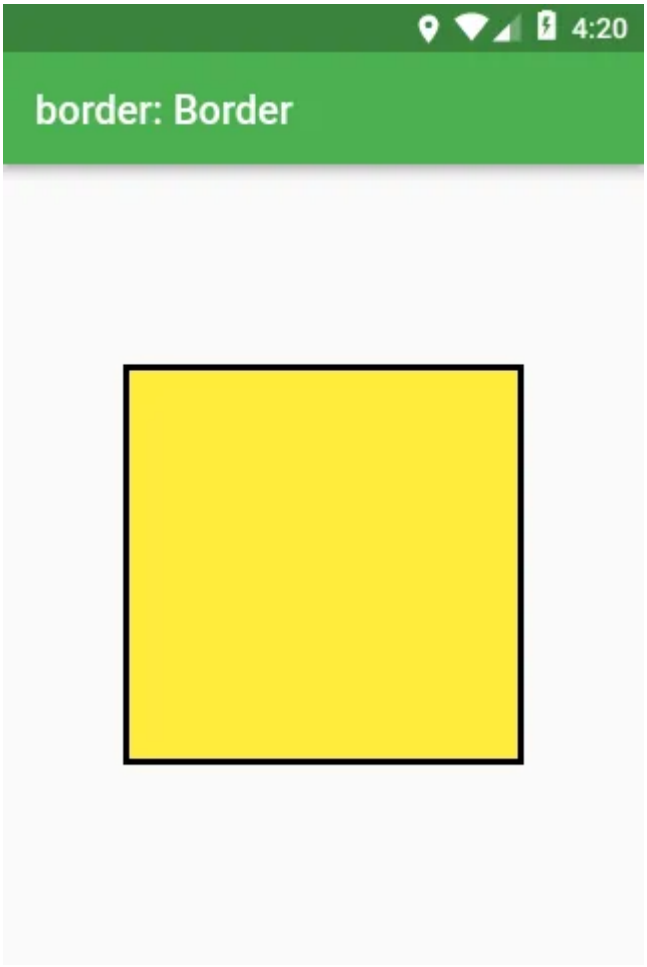
Puts an image as a background:




```
Scaffold(
  appBar: AppBar(title: Text('image: DecorationImage')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        color: Colors.yellow,
        image: DecorationImage(
          fit: BoxFit.fitWidth,
          image: NetworkImage(
            'https://flutter.io/images/catalog-widget-
placeholder.png',
          ),
        ),
      ),
    ),
  ),
);
```

border: Border

Specifies how should the border of the Container look like.

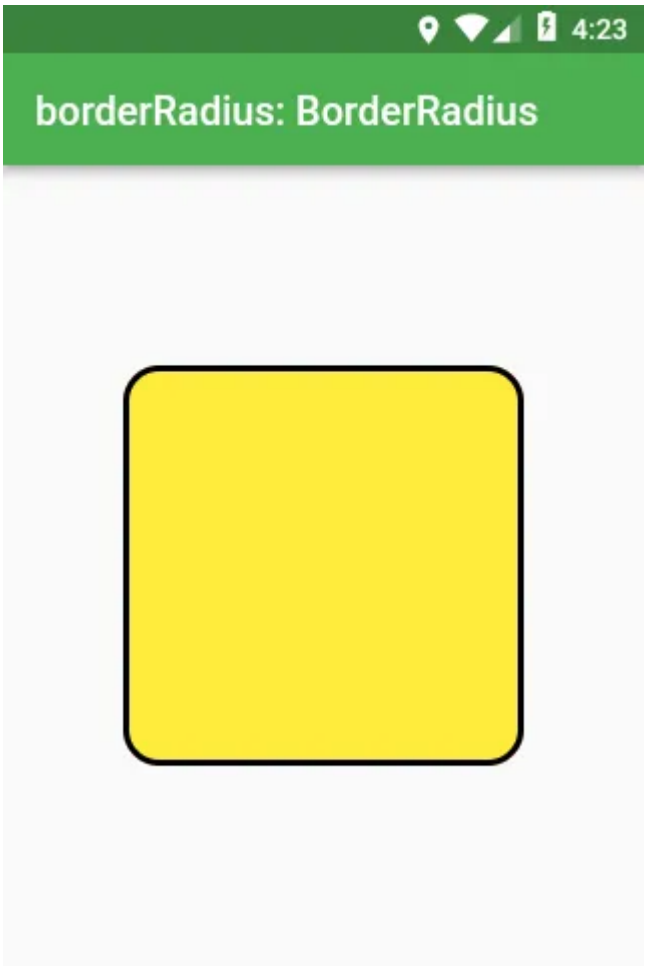



```
Scaffold(
  appBar: AppBar(title: Text('border: Border')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        color: Colors.yellow,
        border: Border.all(color: Colors.black, width: 3),
      ),
    ),
  ),
);
```

borderRadius: BorderRadius

Enables border corners to be rounded.

`borderRadius` *does not work if the* `shape` *of the decoration is* `BoxShape.circle`

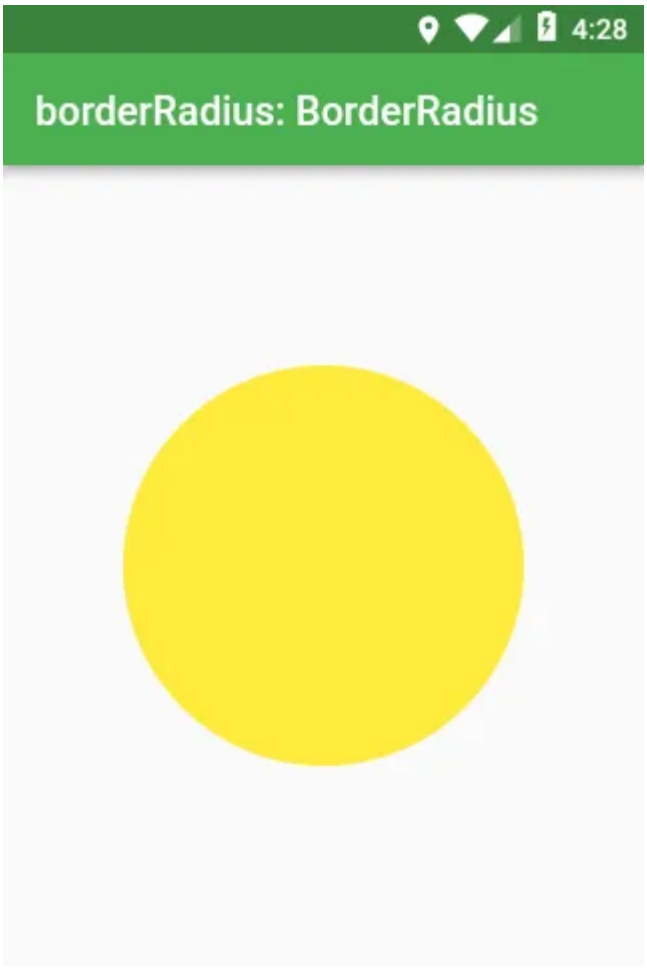



```
Scaffold(
  appBar: AppBar(title: Text('borderRadius: BorderRadius')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        color: Colors.yellow,
        border: Border.all(color: Colors.black, width: 3),
        borderRadius: BorderRadius.all(Radius.circular(18)),
      ),
    ),
  ),
);
```

shape: BoxShape

Box decoration can be either a rectangle/square or an ellipse/circle.

For any other shape, you can use `ShapeDecoration` *instead of* `BoxDecoration`

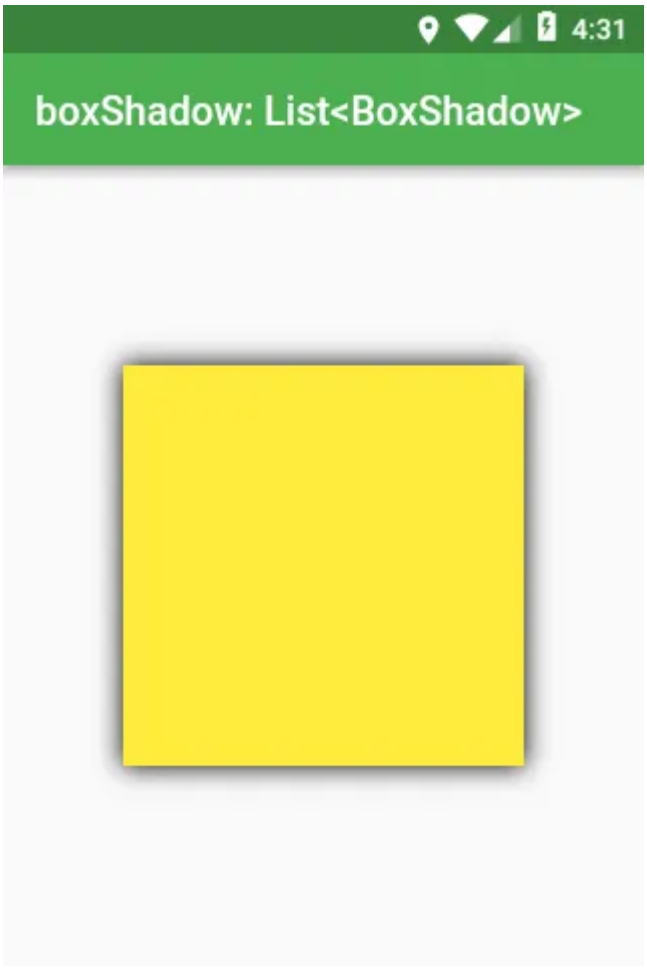



```
Scaffold(
  appBar: AppBar(title: Text('shape: BoxShape')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        color: Colors.yellow,
        shape: BoxShape.circle,
      ),
    ),
  ),
);
```

boxShadow: List<BoxShadow>

Adds shadow to the Container.

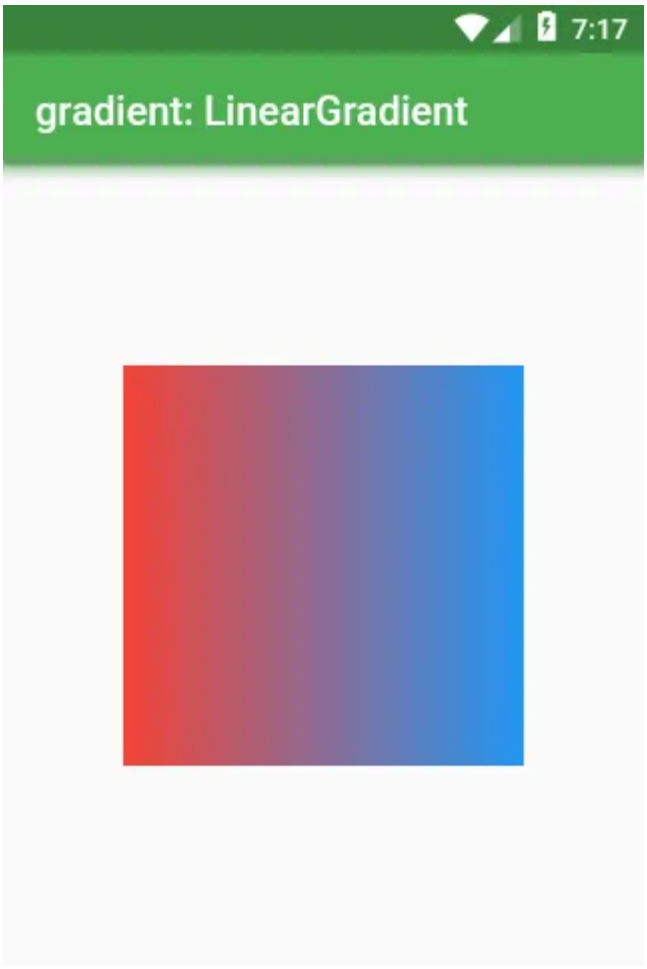
This parameter is a list because you can specify multiple different shadows and merge them together.




```
Scaffold(
  appBar: AppBar(title: Text('boxShadow: List<BoxShadow>')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        color: Colors.yellow,
        boxShadow: const [
          BoxShadow(blurRadius: 10),
        ],
      ),
    ),
  ),
);
```

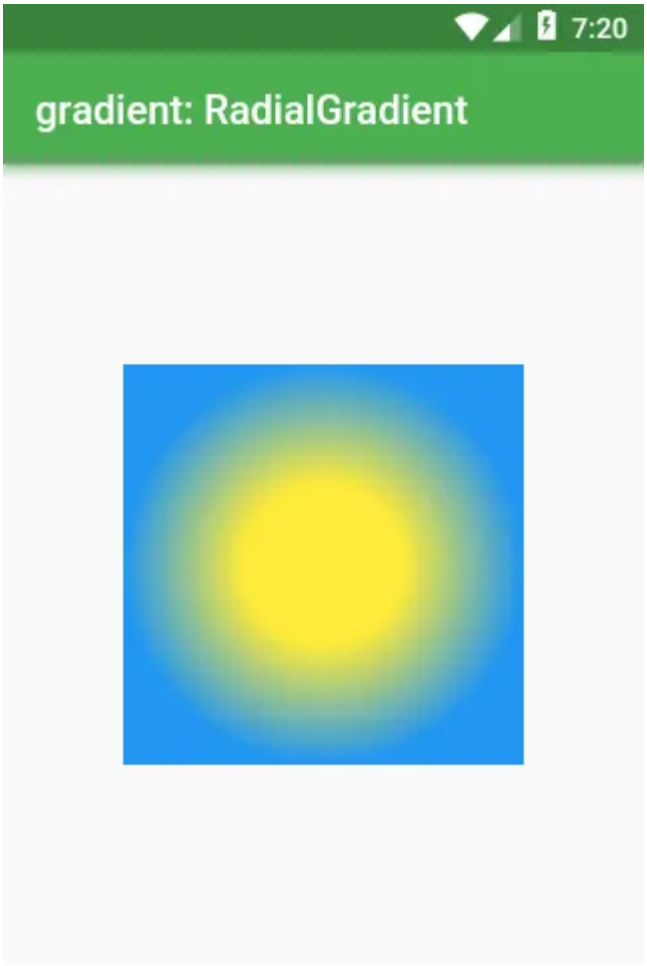
gradient

There are three types of gradients: `LinearGradient`, `RadialGradient` and `SweepGradient`.



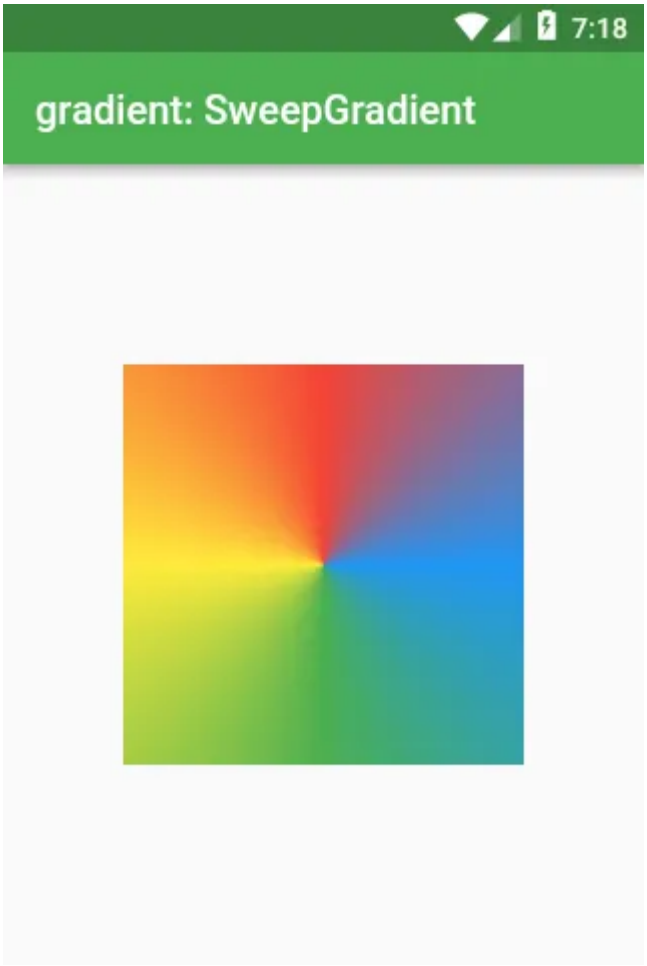
LinearGradient

```
Scaffold(
  appBar: AppBar(title: Text('gradient: LinearGradient')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        gradient: LinearGradient(
          colors: const [
            Colors.red,
            Colors.blue,
          ],
        ),
      ),
    ),
  ),
);
```



RadialGradient

```
Scaffold(
  appBar: AppBar(title: Text('gradient: RadialGradient')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        gradient: RadialGradient(
          colors: const [Colors.yellow, Colors.blue],
          stops: const [0.4, 1.0],
        ),
      ),
    ),
  ),
);
```



SweepGradient

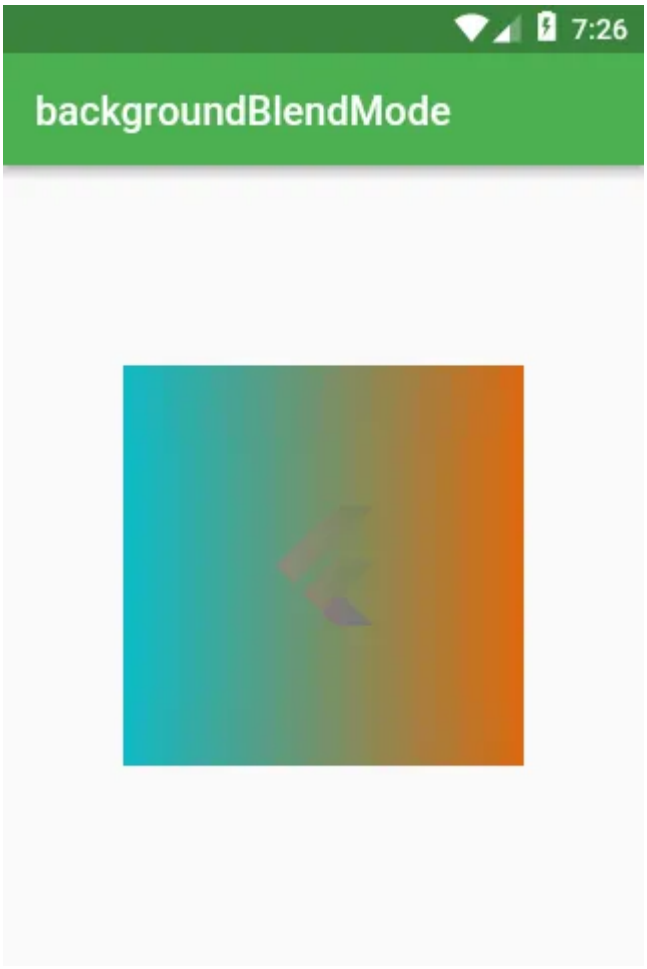
```
Scaffold(
  appBar: AppBar(title: Text('gradient: SweepGradient')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      decoration: BoxDecoration(
        gradient: SweepGradient(
          colors: const [
            Colors.blue,
            Colors.green,
            Colors.yellow,
            Colors.red,
            Colors.blue,
          ],
          stops: const [0.0, 0.25, 0.5, 0.75, 1.0],
        ),
      ),
    ),
  ),
);
```

backgroundBlendMode

`backgroundBlendMode` is the most complex property of `BoxDecoration`.
It's responsible for mixing together colors/gradients of `BoxDecoration` and whatever `BoxDecoration` is on top of.

With `backgroundBlendMode` you can use a long list of algorithms specified in `BlendMode` enum.

First, let's set `BoxDecoration` as `foregroundDecoration` which is drawn on top of `Container`'s child (whereas `decoration` is drawn behind the child).



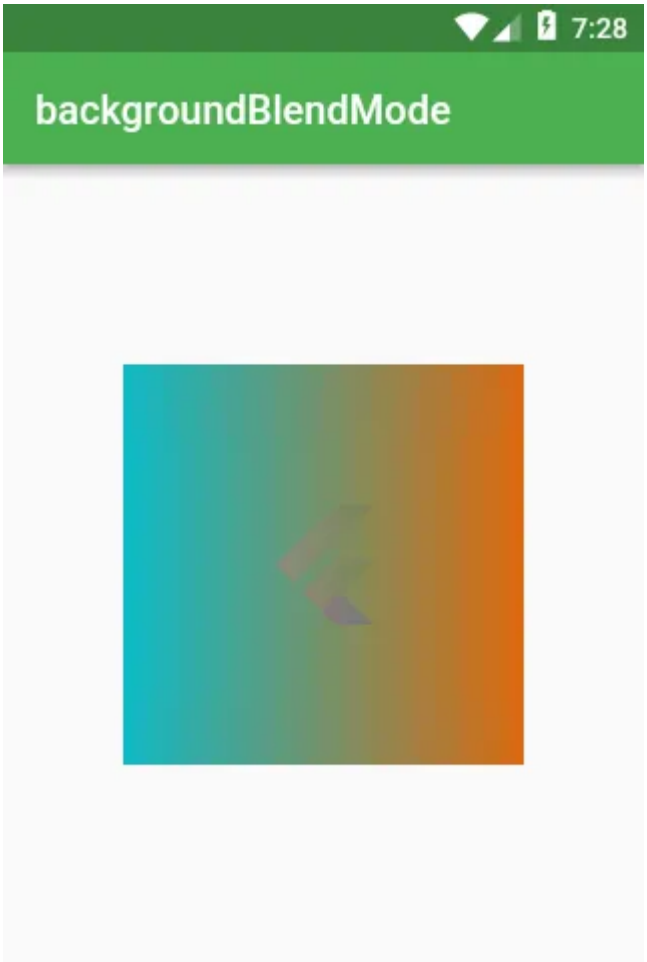

```
Scaffold(
  appBar: AppBar(title: Text('backgroundBlendMode')),
  body: Center(
    child: Container(
      height: 200,
      width: 200,
      foregroundDecoration: BoxDecoration(
        backgroundBlendMode: BlendMode.exclusion,
        gradient: LinearGradient(
          colors: const [
            Colors.red,
```

```
                Colors.blue,
              ],
            ),
          ),
          child: Image.network(
            'https://flutter.io/images/catalog-widget-placeholder.png',
          ),
        ),
      ),
    );
```

`backgroundBlendMode` does not affect only the `Container` it's located in.

`backgroundBlendMode` changes the color of anything that is up the widget tree from the `Container`.

The following code has a parent `Container` that draws an `image` and child `Container` that uses `backgroundBlendMode`. Still, you would get the same effect as previously.

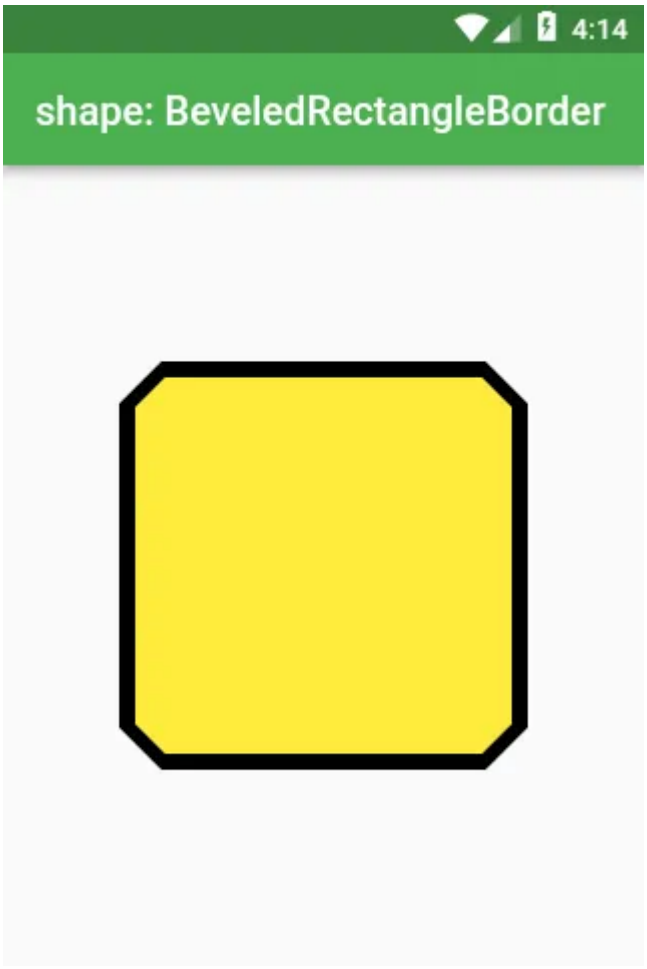



```
Scaffold(
  appBar: AppBar(title: Text('backgroundBlendMode')),
  body: Center(
    child: Container(
```

```
        decoration: BoxDecoration(
          image: DecorationImage(
            image: NetworkImage(
              'https://flutter.io/images/catalog-widget-
placeholder.png',
            ),
          ),
        ),
        child: Container(
          height: 200,
          width: 200,
          foregroundDecoration: BoxDecoration(
            backgroundBlendMode: BlendMode.exclusion,
            gradient: LinearGradient(
              colors: const [
                Colors.red,
                Colors.blue,
              ],
            ),
          ),
        ),
      ),
    ),
  );
```

Material

Border with cut corners

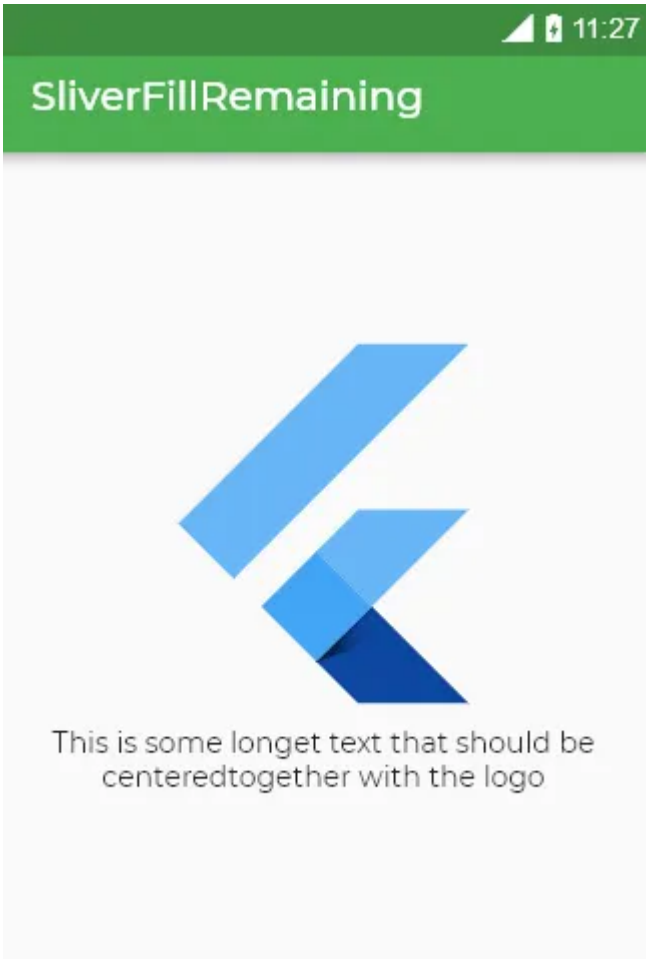



```
Scaffold(
  appBar: AppBar(title: Text('shape: BeveledRectangleBorder')),
  body: Center(
    child: Material(
      shape: const BeveledRectangleBorder(
        borderRadius: BorderRadius.all(Radius.circular(20)),
        side: BorderSide(color: Colors.black, width: 4),
      ),
      color: Colors.yellow,
      child: Container(
        height: 200,
        width: 200,
      ),
    ),
  ),
);
```

Slivers

SliverFillRemaining

This Widget is irreplaceable when you want to center your content even if there is not enough space for it. Interactive example

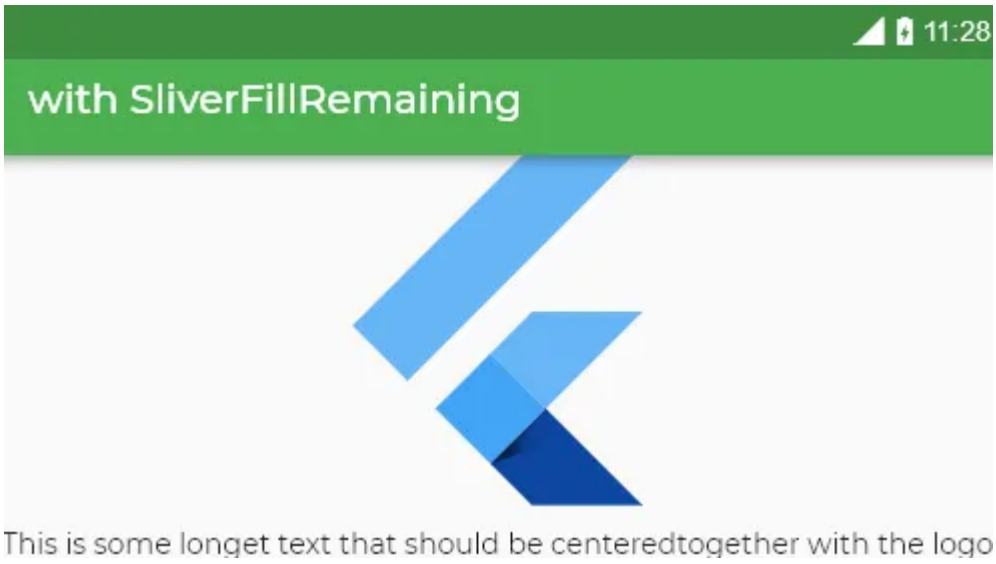


Enough vertical space

```
Scaffold(
  appBar: AppBar(title: Text('SliverFillRemaining')),
  body: CustomScrollView(
    slivers: [
      SliverFillRemaining(
        hasScrollBody: false,
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: const [
            FlutterLogo(size: 200),
            Text(
              'This is some longest text that should be centered'
              'together with the logo',
              textAlign: TextAlign.center,
            ),
          ],
        ),
      ),
    ],
```

```
      ),
    );
```

In case there is no enough space for the centred content, `SliverFillRemaining` will become scrollable:



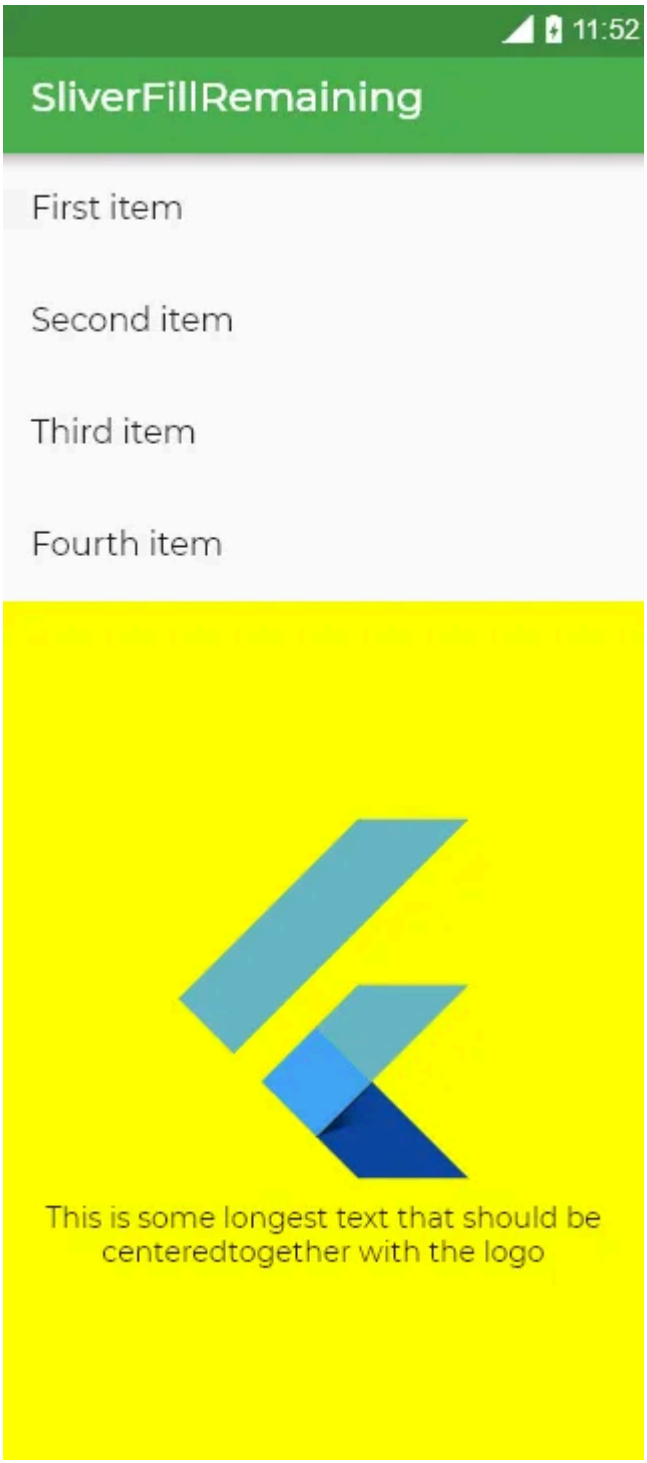
Not enough vertical space

If it was not for `SliverFillRemaining` , the content would overflow like this:

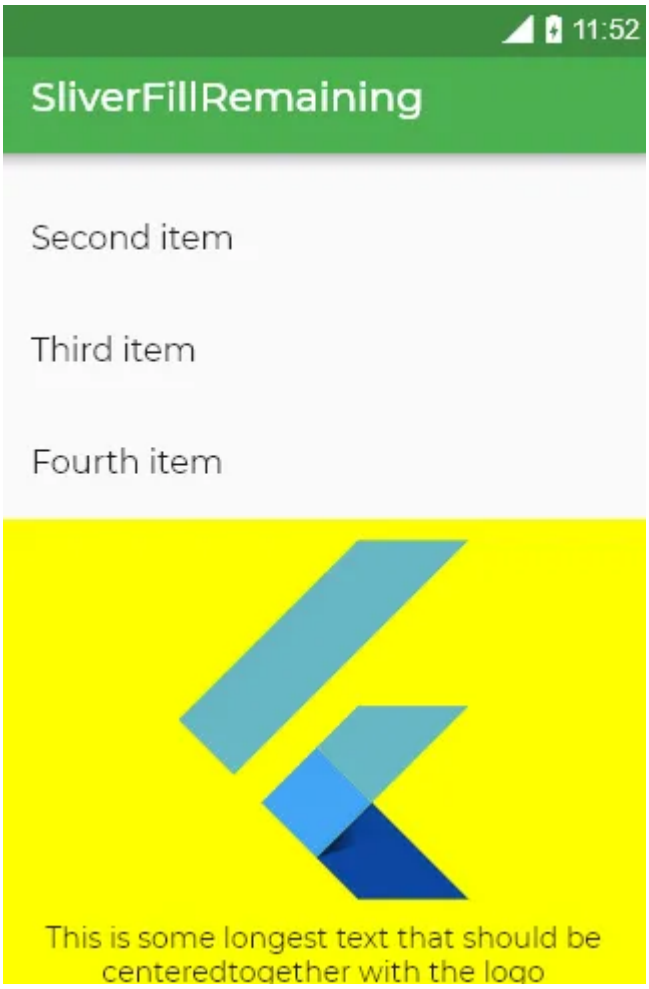
Not enough space without SliverFillRemaining

Filling the remaining space

Apart from being useful for centering your content, `SliverFillRemaining` will fill the remainings viewport's free space. To do that this widget has to be placed in `CustomScrollView` and needs to be the last sliver



In case there is not enough space, the widget becomes scrollable:




```
Scaffold(
  appBar: AppBar(title: Text('SliverFillRemaining')),
  body: CustomScrollView(
    slivers: [
      SliverList(
        delegate: SliverChildListDelegate(const [
          ListTile(title: Text('First item')),
          ListTile(title: Text('Second item')),
          ListTile(title: Text('Third item')),
          ListTile(title: Text('Fourth item')),
        ]),
      ),
      SliverFillRemaining(
        hasScrollBody: false,
        child: Container(
          color: Colors.yellowAccent,
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: const [
              FlutterLogo(size: 200),
              Text(
                'This is some longest text that should be centered'
                'together with the logo',
                textAlign: TextAlign.center,
              ),
            ],
```

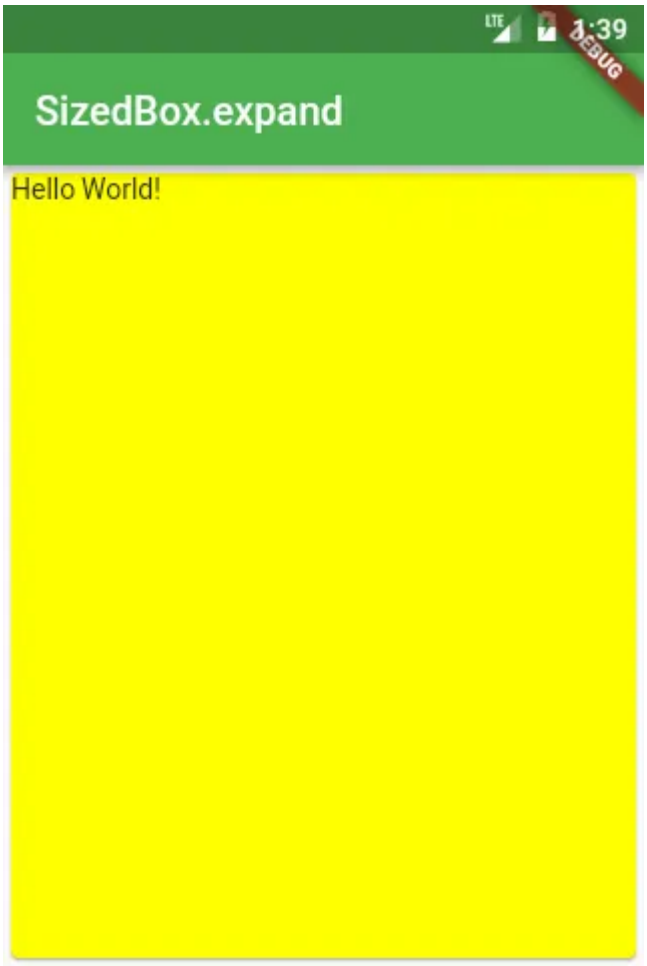
```
            ),
          ),
        ),
      ],
    ),
  );
```

SizedBox

It's one of the simplest but most useful Widgets

SizedBox as ConstrainedBox

`SizedBox` can work in a similar fashion as `ConstrainedBox`




```
SizedBox.expand(
  child: Card(
    child: Text('Hello World!'),
    color: Colors.yellowAccent,
```

```
    ),
  ),
```

SizedBox as padding

When in need of adding padding or margin, you might choose `Padding` or `Container` widgets. But they can be more verbose and less readable than adding a `Sizedbox`


```
Column(
  children: <Widget>[
    Icon(Icons.star, size: 50),
    const SizedBox(height: 100),
    Icon(Icons.star, size: 50),
    Icon(Icons.star, size: 50),
  ],
),
```

SizedBox as an Invisible Object

Many time you would like to hide/show a widget depending on a `bool`


```
Widget build(BuildContext context) {
  bool isVisible = ...
  return Scaffold(
    appBar: AppBar(
      title: Text('isVisible = $isVisible'),
    ),
    body: isVisible
      ? Icon(Icons.star, size: 150)
      : const SizedBox(),
  );
}
```

Because `SizedBox` has a `const` constructor, using `const SizedBox()` is really cheap**.

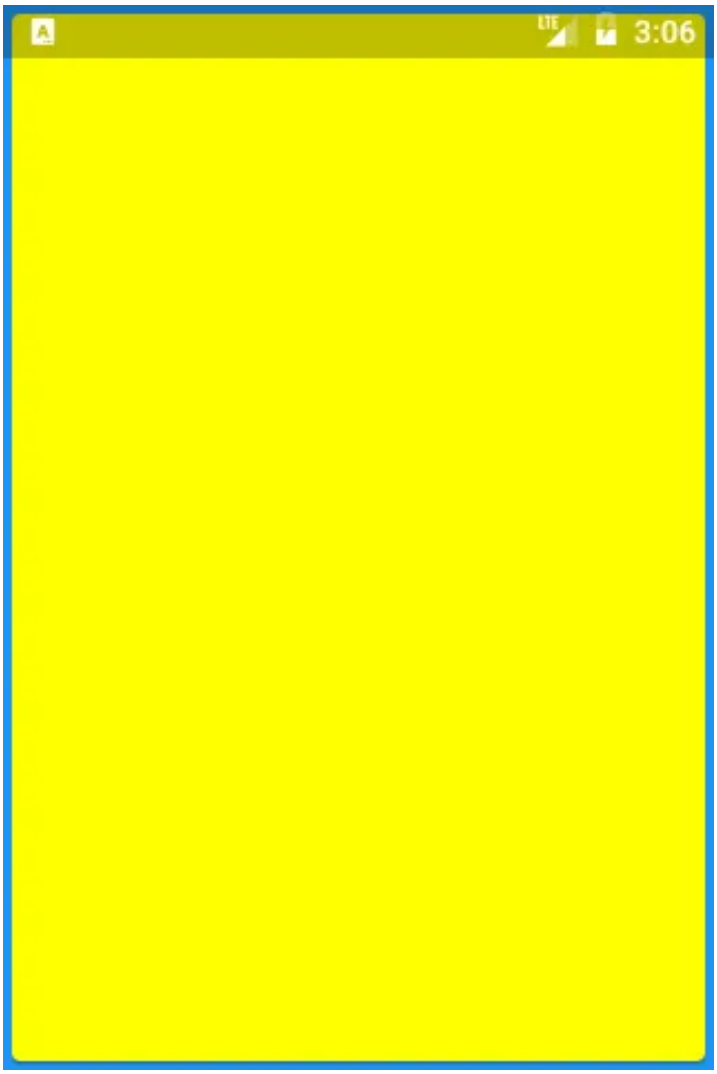
** One cheaper solution would be to use `Opacity` widget and change the `opacity` value to `0.0` . The drawback of this solution is that the given widget would be only

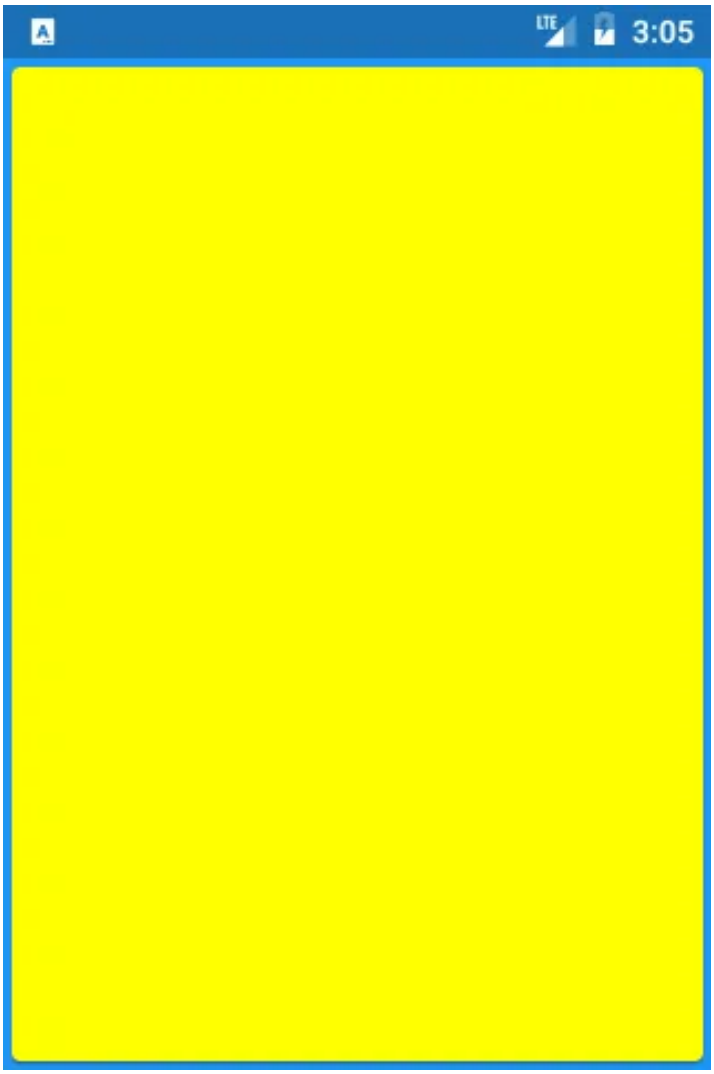
invisible, still would occupy the space.

SafeArea

On different platforms, there are special areas like Status Bar on Android or the Notch on iPhone X that we might avoid drawing under.

The solution to this problem is `SafeArea` widget (example without/with `SafeArea`)






```
Widget build(BuildContext context) {
  return Material(
    color: Colors.blue,
    child: SafeArea(
      child: SizedBox.expand(
        child: Card(color: Colors.yellowAccent),
      ),
    ),
```

```
    );
  }
```

In case you have a question that is important to you and don't want me to miss it, you can send me a private message at twitter.

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