Flutter Basics

Building UI with Code: A Guide for Beginners

What is Flutter?

- **Google's Toolkit** for building natively compiled applications.
- **One Codebase** for Mobile, Web, and Desktop.
- **"Everything is a Widget"** philosophy.
- Think of it like building with **Lego blocks** to create a masterpiece.

Why Flutter uses Dart

Fast Updates

Dart allows for super fast development cycles and "Hot Reload".

One Codebase

Write your logic once in Dart, and it compiles to run on any platform.

Readable

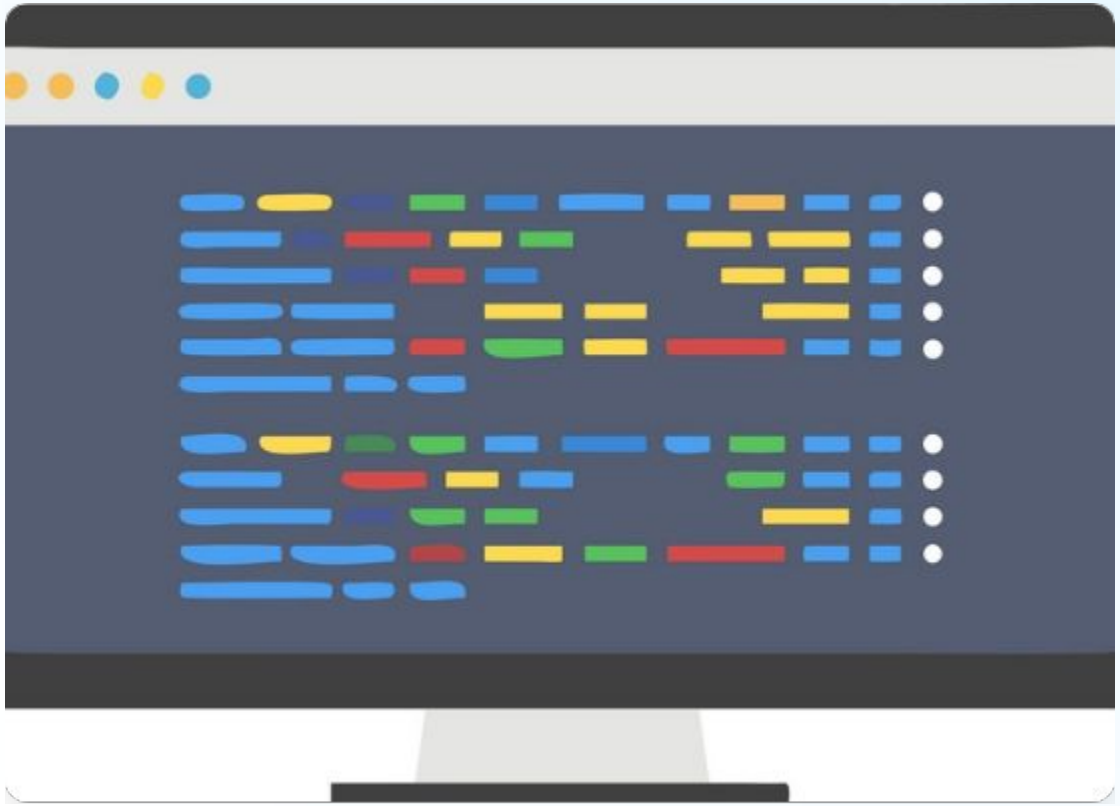
Dart is optimized for UI and is easy to read and learn for beginners.

DartPad: Our Coding Playground

No Installation Needed

We use **DartPad**, an online editor for Flutter & Dart.

- Write code on the left panel.
- See the app instantly on the right.
- Perfect for rapid prototyping and learning.



The Entry Point

Where it all starts

Every Dart program begins with the `main()`

To show a UI in Flutter, we call `runApp()`

This function takes a **Widget** and puts it on the screen.

```dart
// Import the material package
import 'package:flutter/material.dart' ;

void main() {
  runApp(
    const MyApp()
  );
}
```

First Widget: StatelessWidget

Static Content

A **StatelessWidget** is a widget that does not change over time.

The `build()` scribes exactly what to draw on the screen.

```
class MyApp extends StatelessWidget {
  const MyApp({super.key});

  @override
  Widget build(BuildContext context) {
    return const Text('Hello Flutter');
  }
}
```

MaterialApp: The Wrapper

The Root of Your App

Most apps use **MaterialApp** as the top-level widget.

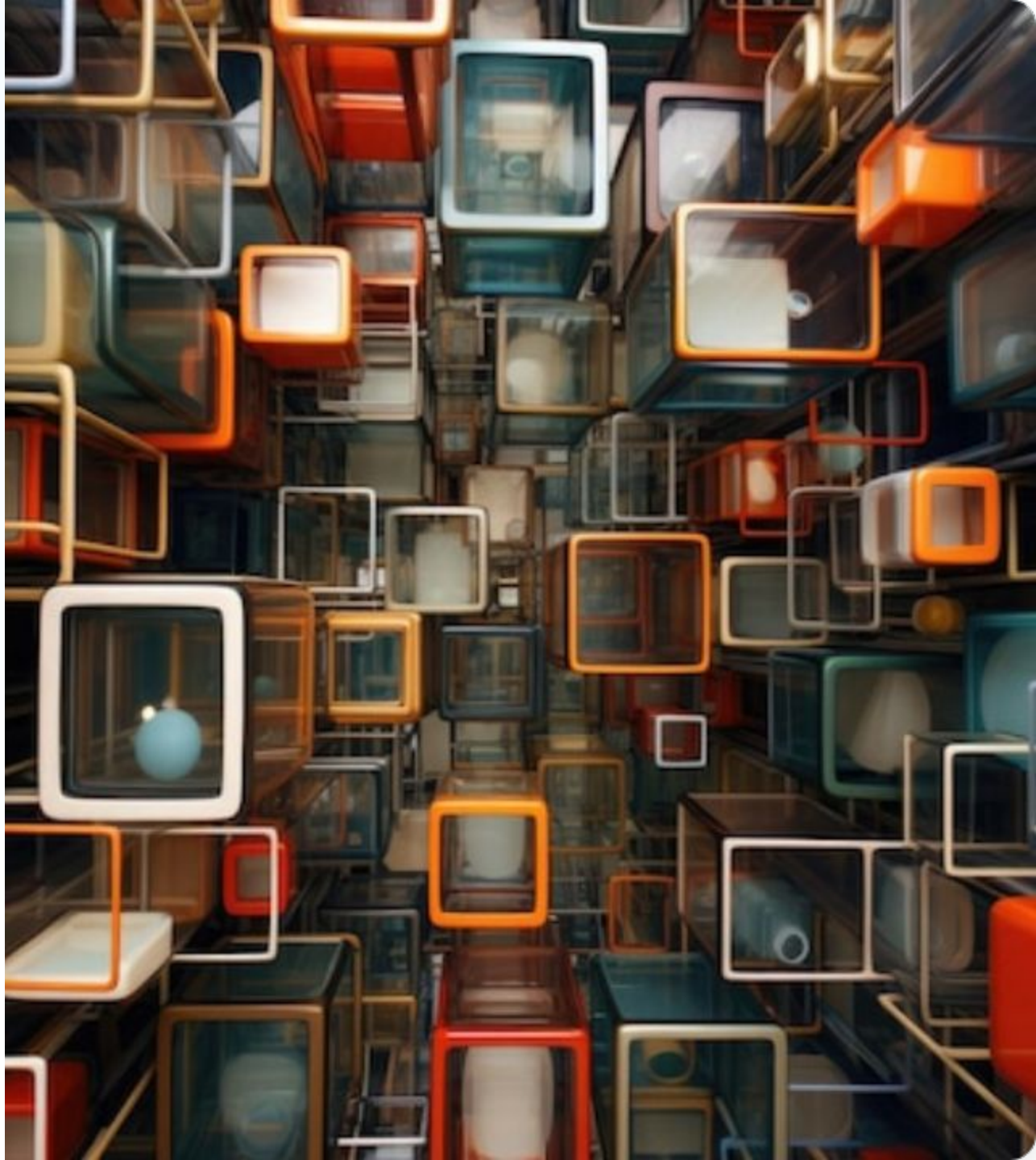
- Provides standard Material Design styling.
- Handles navigation and routing.
- Manages app-wide themes.

Widgets are Nested

Boxes inside Boxes

Widgets live inside other widgets. This hierarchy is called the **Widget Tree**.

For example, a `Text` sits inside a widget t`Center` aligned properly.



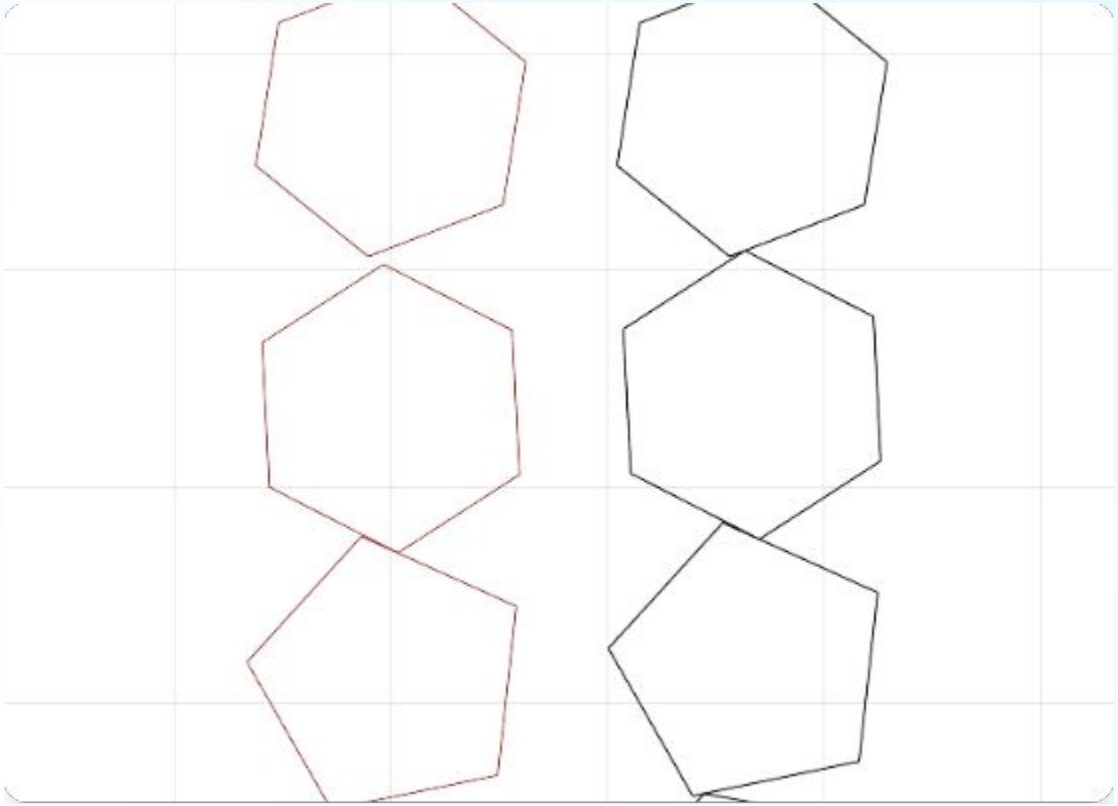
Basic Layout: Column

Stacking Vertically

Use a **Column** widget to arrange children in a vertical list.

It takes a list of widgets called `children: []`

Use **SizedBox** to add invisible spacing between elements.



Buttons and Actions

```
ElevatedButton(
  onPressed: () {
    print('Button clicked');
  },
  child: const Text('Click Me'),
)
```

Making it Interactive

- **ElevatedButton**: A common button style.
- **onPressed**: A function that runs when the button is tapped.
- **child**: Usually a Text widget that acts as the button's label.

Why UI Doesn't Change?

Stateless means Immutable

We used **StatelessWidget**.

Stateless widgets cannot change once they are built. Even if you update a variable, the screen will not reflect that change automatically.

It's "frozen" in time.

Introducing StatefulWidget

Changing Data

To change data, we need **StatefulWidget**.

We use the `setState()`

This tells Flutter: *"Hey! The data changed. Please redraw the screen."*

```
ElevatedButton(
  onPressed: () {
    setState(() {
      count++;
    });
  },
  child: const Text('Increment'),
)
```

Final working app

Key Takeaways

Widgets

The building blocks of Flutter.

Everything is a widget.

Nesting

Put widgets inside other widgets (children) to build layouts.

State

Stateless for static content.

Stateful + setState() for interactive apps.

Image Sources

https://static.vecteezy.com/system/resources/thumbnails/074/016/906/small_2x/wing-butterfly-logo-simple-symbol-abstract-vector.jpg

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