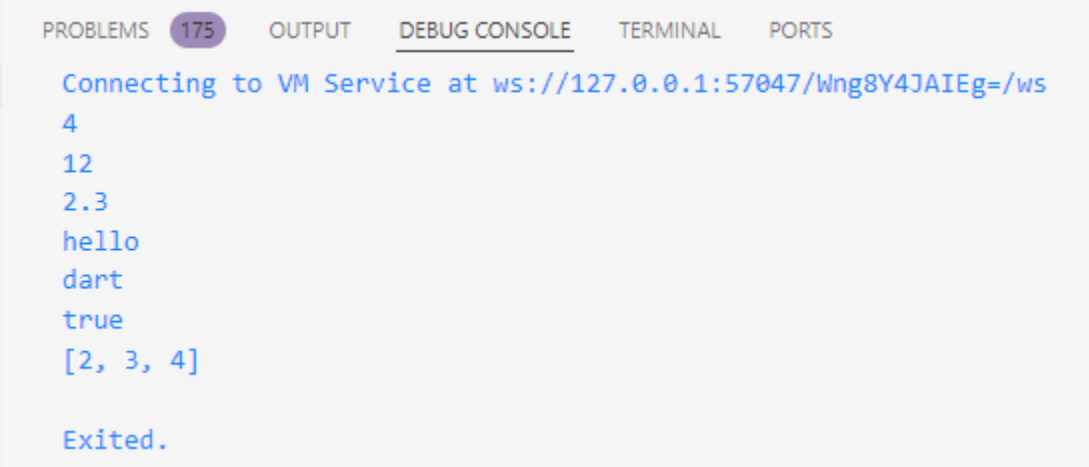
Practical –1

Aim: Program to demonstrate the features of Dart Language

.Variables in dart

```dart
void main() {
  int a = 4;
  double b = 2.3;
  String d="hello";
  var c="dart";
  bool flat=true;
  dynamic e="string";
  e = 12;
  var list=[2,3,4];
  print(a);
  print(e);
  print(b);
  print(d);
  print(c);
  print(flat);
  print(list);
}
```

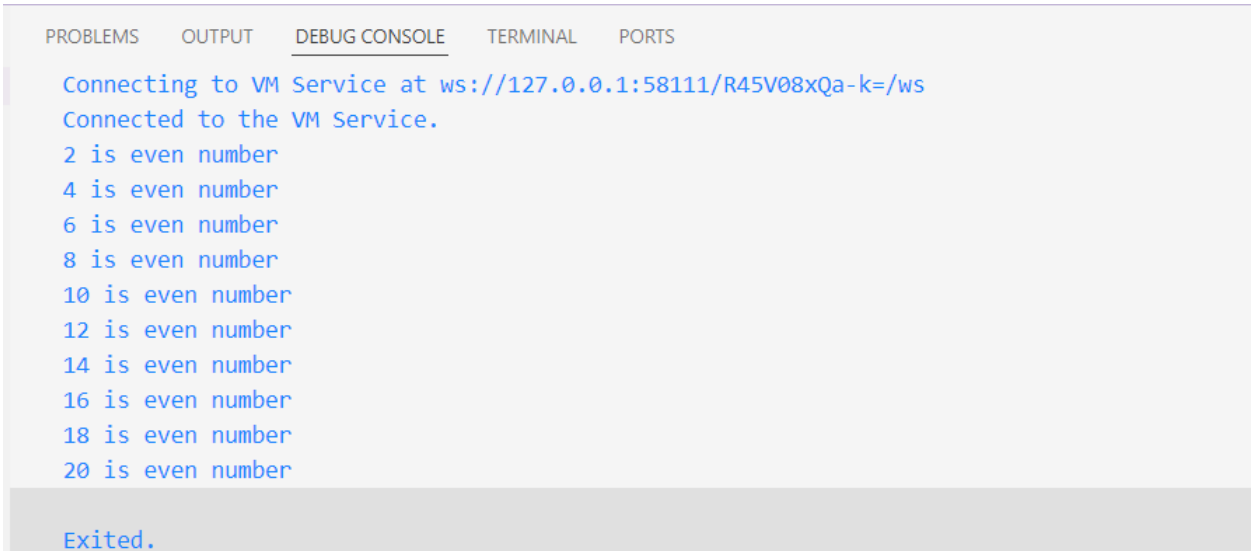
Output:



2.Decision making statement.

```
void main() {
  int i = 1;
  for (i = 1;i <= 20;i++)
  {
    if(i %2== 0)
    {
      print('$i is even number');
    }
  }
}
```

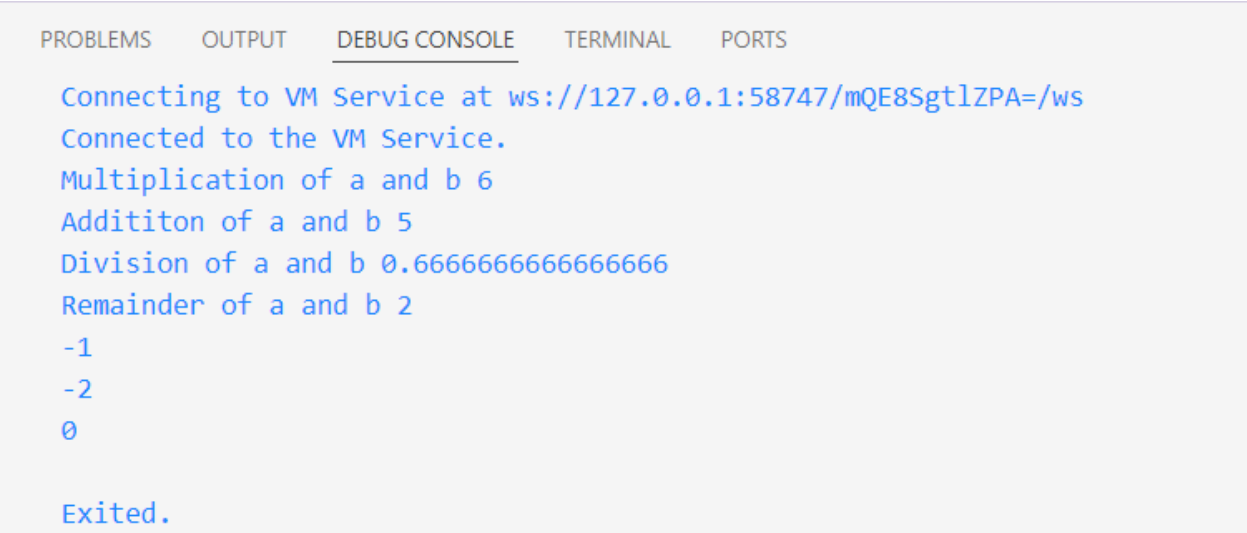
Output:



3. Operators in Flutter

```dart
void main() {
  int a = 2, b = 3;
  var c = a * b;
  print("Multiplication of a and b $c");
  var d = a + b;
  print("Addititon of a and b $d");
  var e = a / b;
  print("Division of a and b $e");
  var f = a % b;
  print("Remainder of a and b $f");
  var g = a - b;
  print("$g");
  var h = -a ;
  print("$h");
  var i = a ~/ b;
  print("$i");
}
```

Output:



4. Factorial

```
void main() {
  print(factorial(6));
}

factorial(number){
  if(number <= 0)
  return 1;
  else
  return(number * factorial(number-1));
}
```

Output:

5. Prime or Not-Prime

```
void main() {
  int number = 13;
  if(isPrime(number))
    print("$number is a prime number");
  else
    print("$number is not a prime number");
}

isPrime(N) {
  for(var i=2;i<=N/i;i++) {
    if(N%i==0) return false;
  }
  return true;
}
```

Output:

```
PROBLEMS 2   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

Connecting to VM Service at ws://127.0.0.1:58800/rs2ILD7g2rU=/ws
Connected to the VM Service.
13 is a prime number

Exited.
```

6. Class and Object

```
class student{
  var stdName;
  var stdAge;
  var stdRoll;
  showStdInfo() {
    print('Student name is:$stdName');
    print('Student age is:$stdAge');
    print('Student roll-no is:$stdRoll');
  }
}

void main() {
  var std = new student();
  std.stdName = 'Shubham';
  std.stdAge = '19';
  std.stdRoll = 'IF23081';
  std.showStdInfo();
}
```

Output:

```
PROBLEMS 5   OUTPUT   DEBUG CONSOLE   TERMINAL   PORTS

Connecting to VM Service at ws://127.0.0.1:58858/QCO3ZqtgQ0g=/ws
Connected to the VM Service.
Student name is:Shubham
Student age is:19
Student roll-no is:IF23081

Exited.
```

7. Input & Output from user

```dart
import 'dart:io';

void main(){
  print('Enter your name');
  String name = stdin.readLineSync()!;

  print('Hello,$name! welcome to dart tutorial');
  print('Enter first number');
  int n1 = int.parse(stdin.readLineSync()!);
  print('Enter second number');
  int n2 = int.parse(stdin.readLineSync()!);
  int sum = n1 + n2;
  print('Sum is $sum');
}
```

Output:

```
PS D:\IF23100\dart_application_2\bin> dart inputinf.dart
enter your name
dhanesh
hello,dhanesh! welcome to dart tutorial
enter first number
12
enter second number
34
sum is 46
```

Practical-2

Aim: Design the mobile app to implement different widgets.

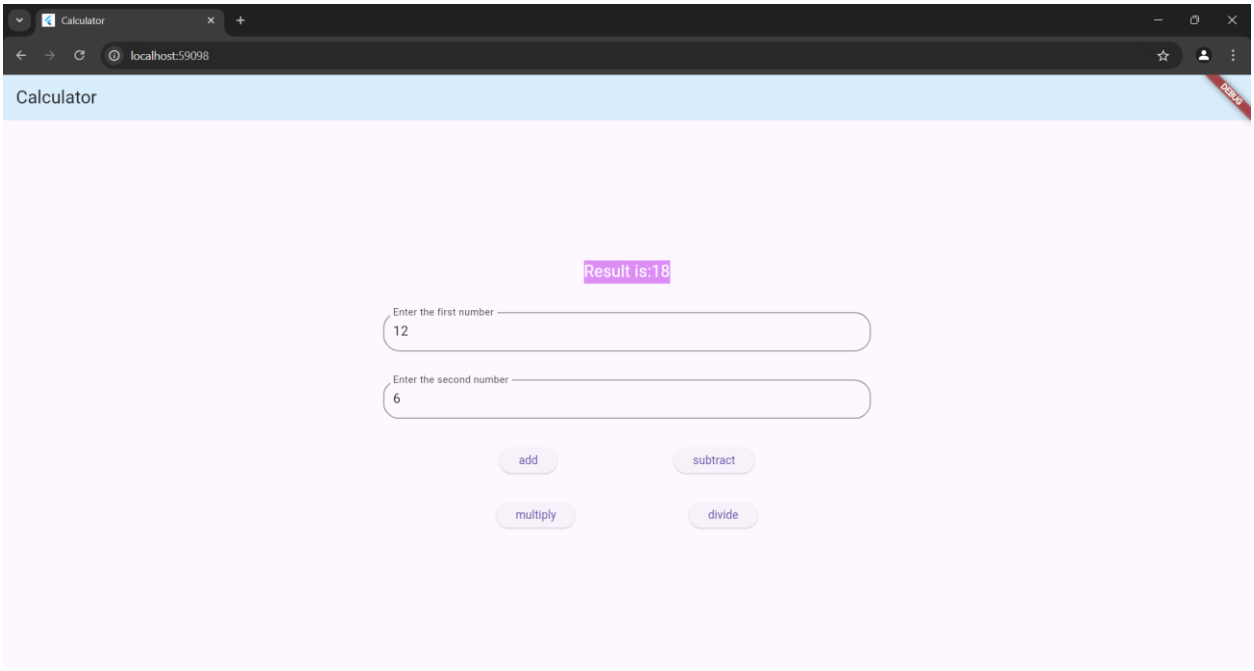
```dart
import 'package:flutter/material.dart';

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    // TODO: implement build
    // throw UnimplementedError();
    return MaterialApp(
      title: "Calculator",
      home: myhomepage(),
    );
  }
}

class myhomepage extends StatefulWidget {
  @override
  State<myhomepage> createState() => _myhomepageState();
}

class _myhomepageState extends State<myhomepage> {
  TextEditingController controller1 = TextEditingController();
  TextEditingController controller2 = TextEditingController();
  dynamic num1 = 0, num2 = 0, result = 0;
  add() {
    setState(() {
      num1 = int.parse(controller1.text);
      num2 = int.parse(controller2.text);
      result = num1 + num2;
    });
  }

  sub() {
    setState(() {
      num1 = int.parse(controller1.text);
```

```
    num2 = int.parse(controller2.text);
    result = num1 - num2;
  });
}

multi() {
  setState(() {
    num1 = int.parse(controller1.text);
    num2 = int.parse(controller2.text);
    result = num1 * num2;
  });
}

div() {
  setState(() {
    num1 = int.parse(controller1.text);
    num2 = int.parse(controller2.text);
    result = num1 / num2;
  });
}

@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
      title: const Text('Calculator'),
      backgroundColor: Color.fromRGBO(169, 227, 247, 0.431),
    ),
    body: Center(
      child: Container(
        height: 400,
        width: 600,
        child: Column(
          mainAxisAlignment: MainAxisAlignment.spaceEvenly,
          children: [
            Text(
              "Result is:$result",
              style: TextStyle(
                fontSize: 20,
                backgroundColor: const Color.fromARGB(255, 221, 142, 245),
                color: const Color.fromARGB(255, 255, 255, 255),
              ),
            ),
```

```
            TextField(
              controller: controller1,
              decoration: InputDecoration(
                  labelText: 'Enter the first number',
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(20))),
            ),
            TextField(
              controller: controller2,
              decoration: InputDecoration(
                  labelText: 'Enter the second number',
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(20))),
            ),
            Row(
              mainAxisAlignment: MainAxisAlignment.spaceEvenly,
              children: [
                ElevatedButton(
                    onPressed: () {
                      add();
                    },
                    child: Text("add")),
                ElevatedButton(
                    onPressed: () {
                      sub();
                    },
                    child: Text("subtract"))
              ],
            ),
            Row(
              mainAxisAlignment: MainAxisAlignment.spaceEvenly,
              children: [
                ElevatedButton(
                    onPressed: () {
                      multi();
                    },
                    child: Text("multiply")),
                ElevatedButton(
                    onPressed: () {
                      div();
                    },
                    child: Text("divide"))
              ],
            ),
```

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

Output:



Navigation

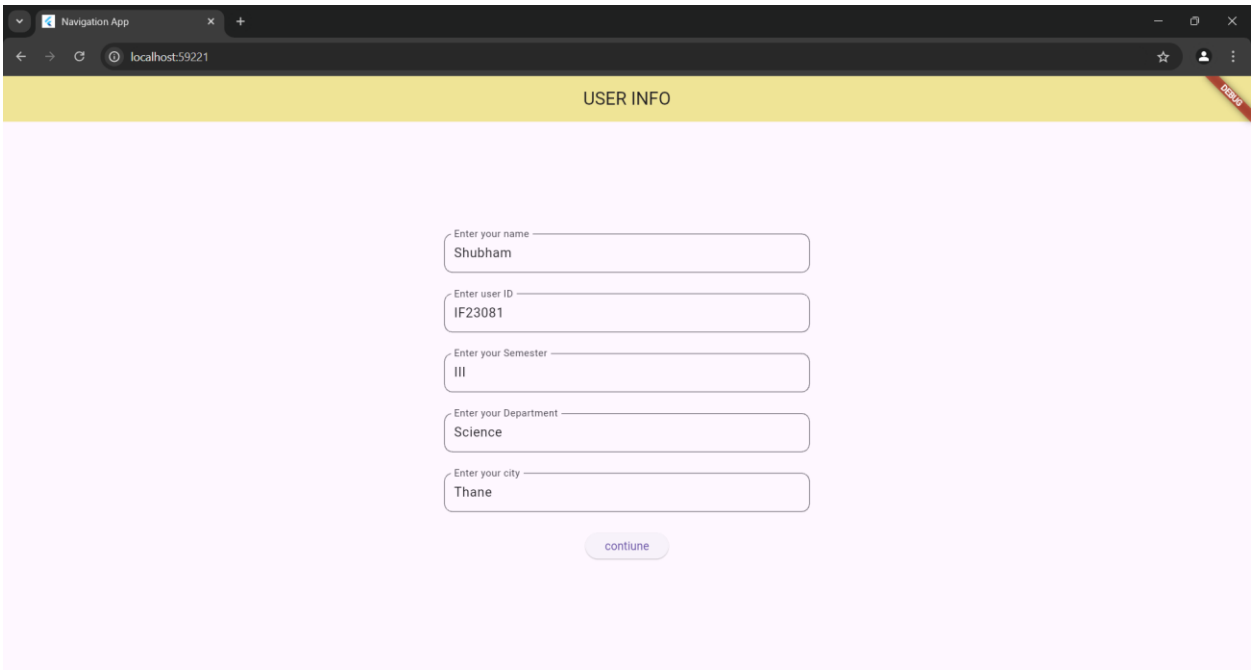
```dart
import 'package:flutter/material.dart';

void main() {
  runApp(MaterialApp(
    title: "Navigation App",
    home: Myapp(),
  ));
}

class Myapp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    TextEditingController name = TextEditingController();
    TextEditingController ID = TextEditingController();
    TextEditingController semester = TextEditingController();
    TextEditingController Department = TextEditingController();
```

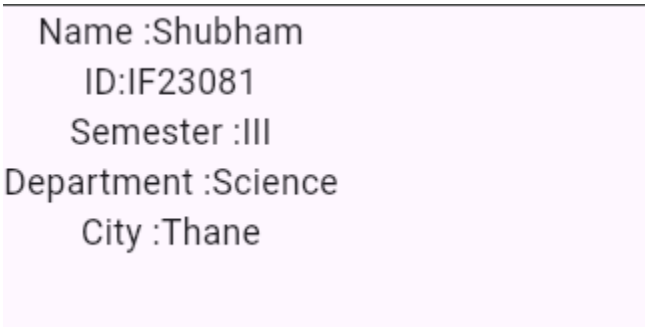
```
  TextEditingController city = TextEditingController();

  return Scaffold(
    appBar: AppBar(
      title: Text("USER INFO"),
      backgroundColor: const Color.fromARGB(255, 239, 228, 150),
      centerTitle: true,
    ),
    body: Center(
      child: Container(
        height: 450,
        width: 450,
        child: Column(
          mainAxisAlignment: MainAxisAlignment.spaceEvenly,
          children: [
            TextField(
              controller: name,
              decoration: InputDecoration(
                  labelText: "Enter your name",
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(10))),
            ),
            TextField(
              controller: ID,
              decoration: InputDecoration(
                  labelText: "Enter user ID",
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(10))),
            ),
            TextField(
              controller: semester,
              decoration: InputDecoration(
                  labelText: "Enter your Semester",
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(10))),
            ),
            TextField(
              controller: Department,
              decoration: InputDecoration(
                  labelText: "Enter your Department",
                  border: OutlineInputBorder(
                      borderRadius: BorderRadius.circular(10))),
            ),
            TextField(
```

```
                controller: city,
                decoration: InputDecoration(
                    labelText: "Enter your city",
                    border: OutlineInputBorder(
                        borderRadius: BorderRadius.circular(10))),
              ),
              ElevatedButton(
                onPressed: () {
                  Navigator.push(
                      context,
                      MaterialPageRoute(
                          builder: ((context) => Nextscreen(
                                name: name.text,
                                id: ID.text,
                                semester: semester.text,
                                department: Department.text,
                                city: city.text,
                              )))).whenComplete(() {
                    name.clear();
                    ID.clear();
                    semester.clear();
                    Department.clear();
                    city.clear();
                  });
                },
                child: Text("contiune"),
              )
            ],
          ),
        ),
      ),
    );
  }
}

class Nextscreen extends StatelessWidget {
  String? name, id, semester, department, city;
  Nextscreen({this.name, this.id, this.semester, this.department, this.city});

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Column(
        children: [
```

```
          Text("Name :" + name.toString()),
          Text("ID:" + id.toString()),
          Text("Semester :" + semester.toString()),
          Text("Department :" + department.toString()),
          Text("City :" + city.toString())
        ],
      ),
    );
  }
}
```

Output:





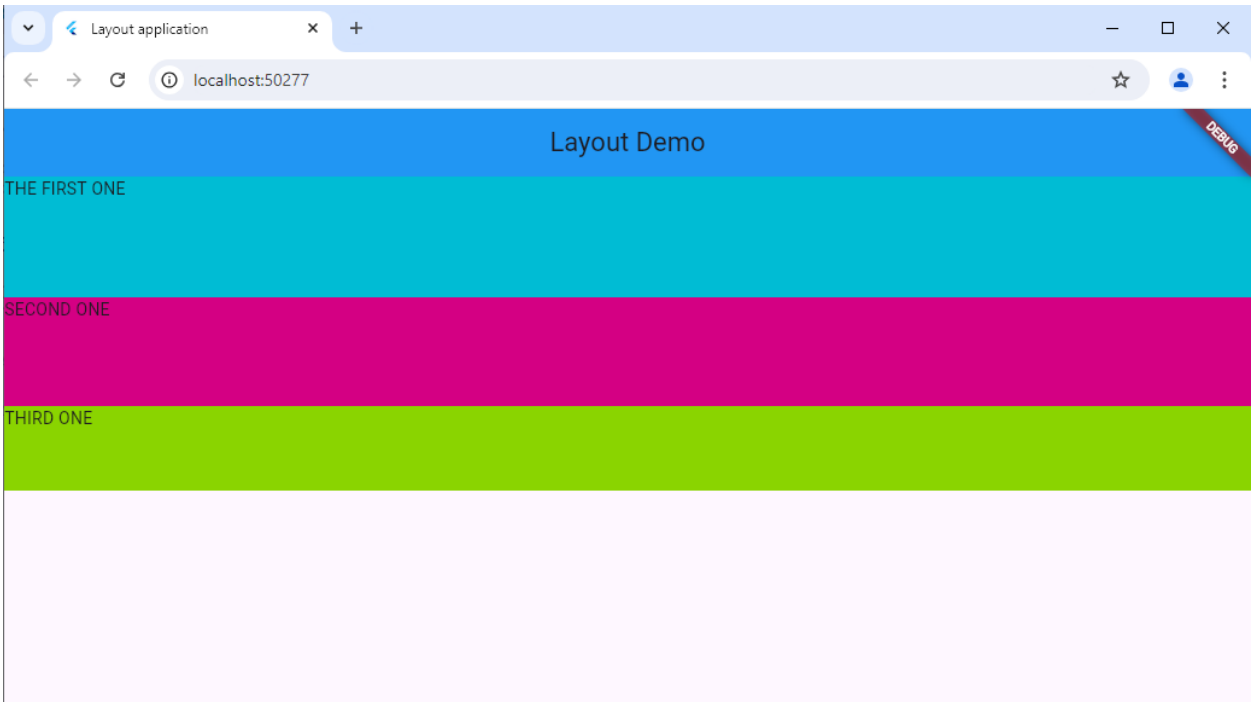
Practical-3

Aim: Designing the mobile app to implement different Layouts

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

void main() {
  runApp(MaterialApp(
    title: "Layout application",
    home: MyApp(),
  ));
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Layout Demo') ,
        backgroundColor: Colors.blue,
        centerTitle: true,
      ),
      body: ListView(
        children: [
          Container(
            child: Text('THE FIRST ONE'),
            height: 100,
            width: 100,
            color: Colors.cyan,
          ),
          Container(
            child: Text('SECOND ONE'),
            height: 90,
            width: 90,
```

```
            color: Color.fromARGB(255, 212, 0, 131),
          ),
          Container(
            child: Text('THIRD ONE'),
            height: 70,
            width: 70,
            color: const Color.fromARGB(255, 138, 212, 0),
          )
        ],
      ));
    }
  }
```

Ouptut:

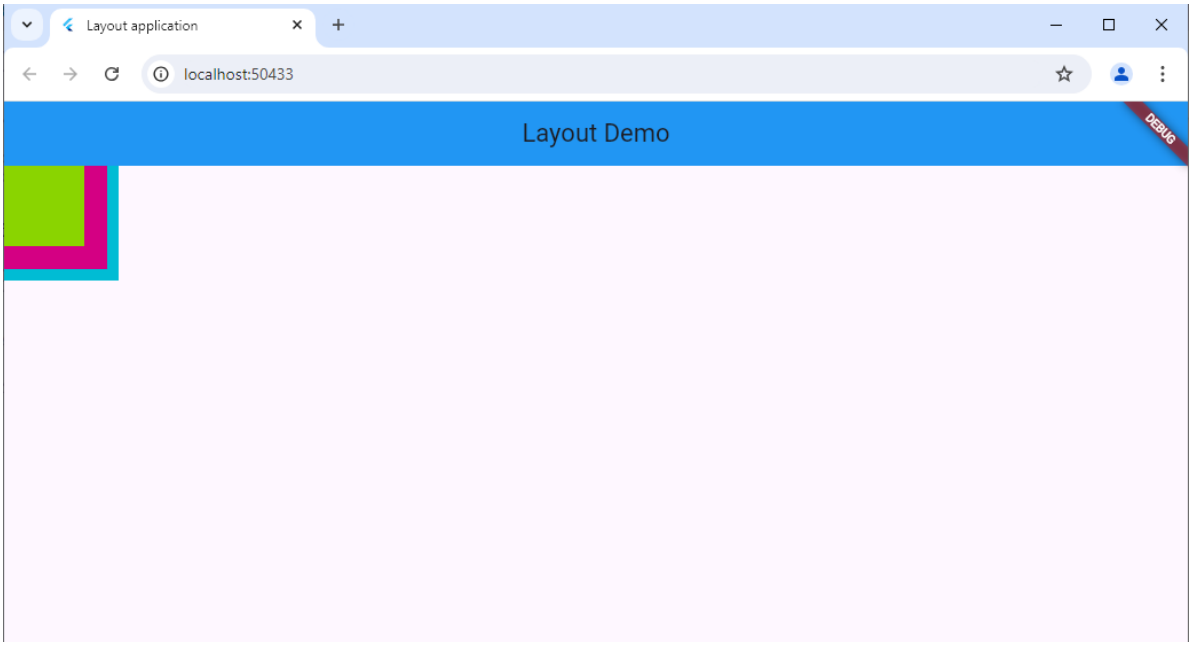


List view-

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

void main() {
  runApp(MaterialApp(
    title: "Layout application",
    home: MyApp(),
  ));
}
```

```
class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Layout Demo') ,
        backgroundColor: Colors.blue,
        centerTitle: true,
      ),
      body: Stack(
        children: [
          Container(

            height: 100,
            width: 100,
            color: Colors.cyan,
          ),
          Container(

            height: 90,
            width: 90,
            color: Color.fromARGB(255, 212, 0, 131),
          ),
          Container(

            height: 70,
            width: 70,
            color: const Color.fromARGB(255, 138, 212, 0),
          )
        ],
      ));
    }
  }
```

Output:



Stack View-

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

void main() {
  runApp(MaterialApp(
    title: "Layout application",
    home: MyApp(),
  ));
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Layout Demo') ,
        backgroundColor: Colors.blue,
        centerTitle: true,
      ),
      body: GridView.count(
        padding: EdgeInsets.all(20),
        crossAxisCount: 3,
        mainAxisSpacing: 20,
        crossAxisSpacing: 30,
        children: [
```

```
          Container(

            height: 100,
            width: 100,
            color: Colors.cyan,
          ),
          Container(

            height: 90,
            width: 90,
            color: Color.fromARGB(255, 212, 0, 131),
          ),
          Container(

            height: 70,
            width: 70,
            color: const Color.fromARGB(255, 138, 212, 0),
          ),
          Container(

            height: 100,
            width: 100,
            color: Colors.green,
          ),
          Container(

            height: 100,
            width: 100,
            color: Colors.orange,
          ),
          Container(

            height: 100,
            width: 100,
            color: Colors.purple,
          ),
        ],
      ));
    }
  }
```

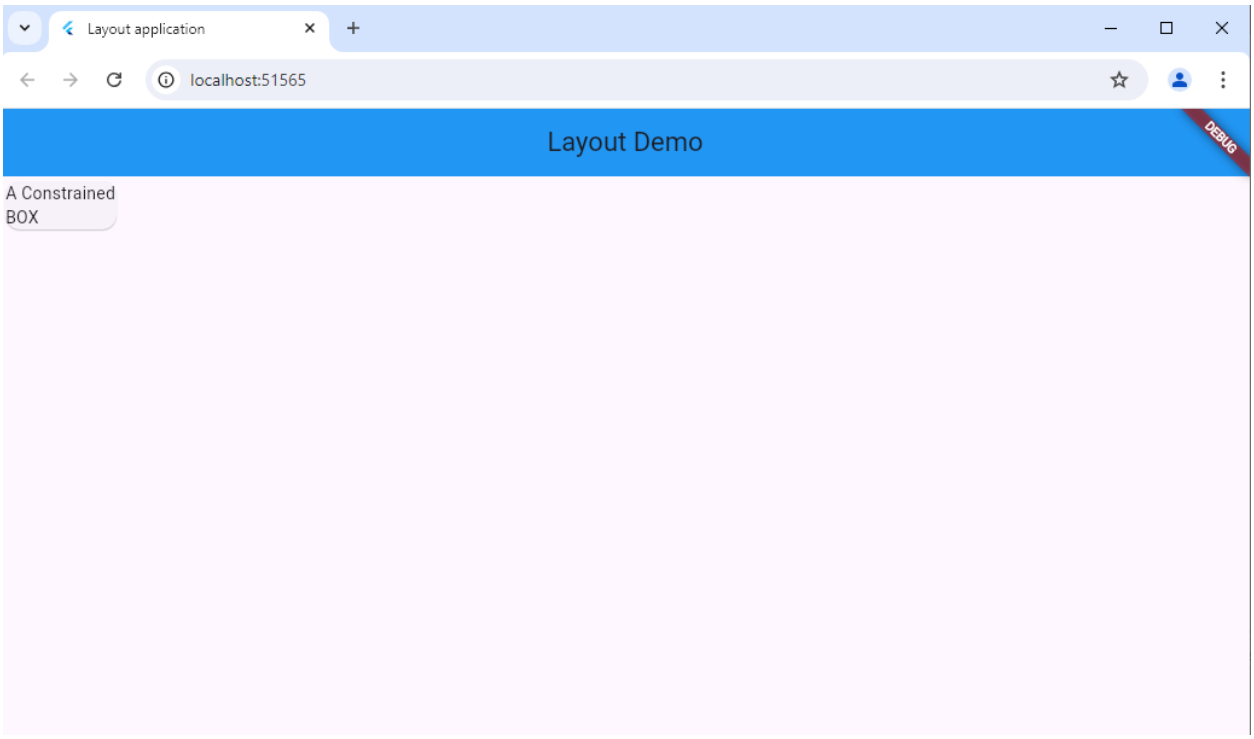
Output:

Constrained Box-

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



void main() {

  runApp(MaterialApp(

    title: "Layout application",

    home: MyApp(),

  ));

}



class MyApp extends StatelessWidget {

  @override
```

```
Widget build(BuildContext context) {

  return Scaffold(

    appBar: AppBar(

      title: Text('Layout Demo') ,

      backgroundColor: Colors.blue,

      centerTitle: true,

    ),

    body: ConstrainedBox(
      constraints: BoxConstraints(
        maxHeight: 50, minHeight: 10, maxWidth: 100, minWidth: 10
      ),
      child: Card(child: Text('A Constrained BOX'))
    ));

  }

}
```

Output:



Practical-4

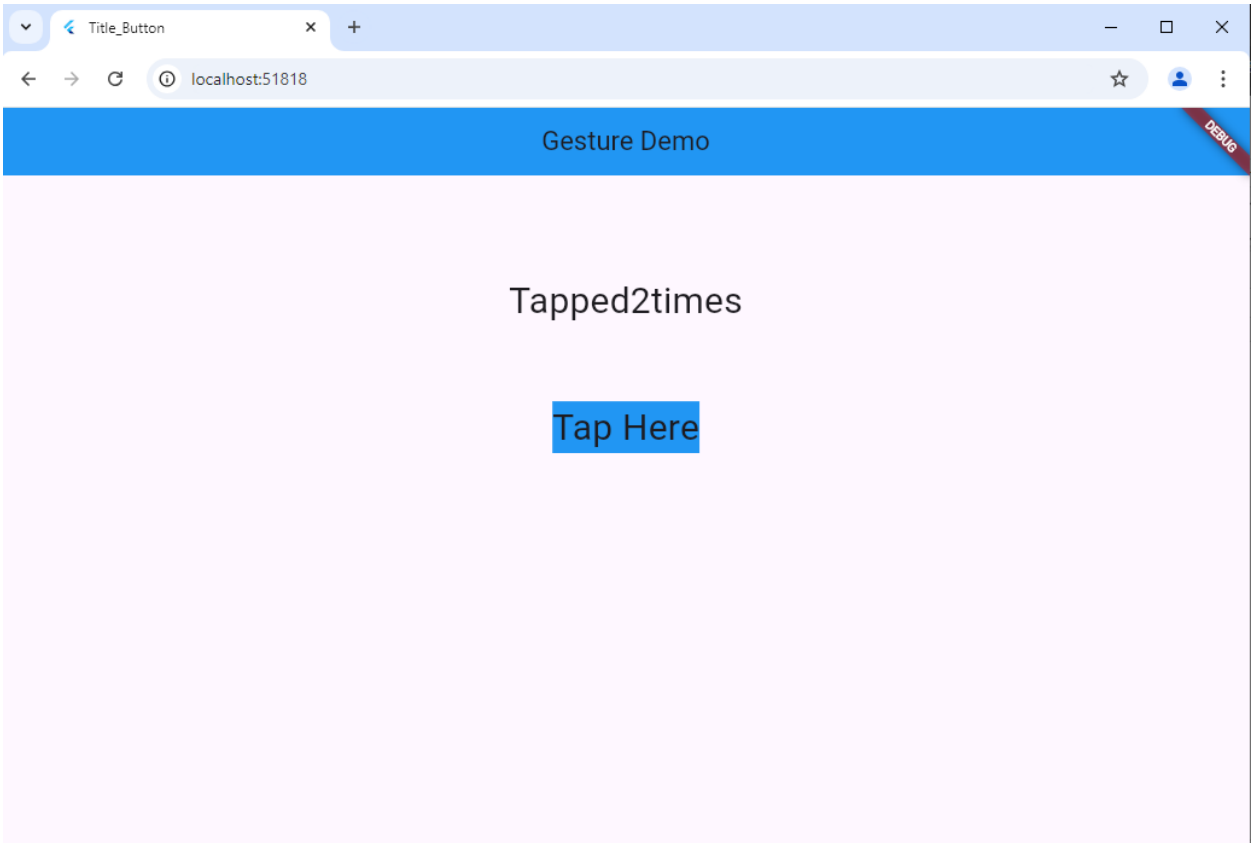
Aim: Designing the mobile app to implement the gesture

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

void main() {
  runApp(MaterialApp(
```

```
    title: "Title_Button",
    home: MyApp(),
  ));
}

class MyApp extends StatefulWidget {
  @override
  State<MyApp> createState() => _MyAppState();
}

class _MyAppState extends State<MyApp> {
  int counter = 0;
  Widget build(BuildContext context) {
    return Scaffold(
        appBar: AppBar(
          title: Text('Gesture Demo'),
          backgroundColor: Colors.blue,
          centerTitle: true,
        ),
        body: Center(
          child: Padding(
            padding: const EdgeInsets.all(82.0),
            child: Column(
              children: [
                Text('Tapped' + counter.toString() + 'times',
                    style: TextStyle(fontSize: 30)),
                GestureDetector(
                  onDoubleTap: () {
                    setState(() {
                      counter=counter+1;
                    });
                  },
                  child: Padding(
                    padding: const EdgeInsets.all(62.0),
                    child: Container(
                      child: Text(
                        'Tap Here',
                        style: TextStyle(backgroundColor: Colors.blue, fontSize:
30),

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

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

Output:



Practical-5

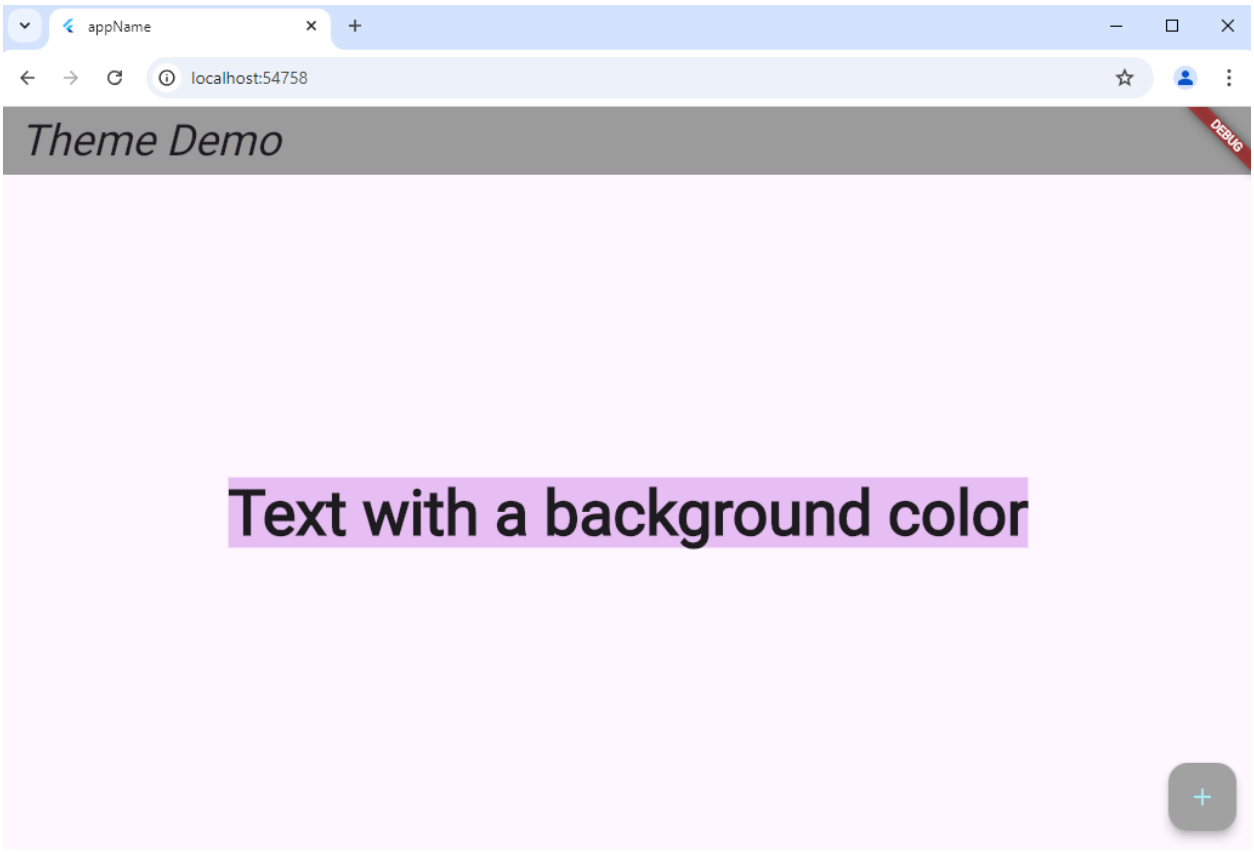
Aim: Designing the mobile app to implement the theming and styling.

```
?import 'dart:js_interop';

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

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

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


  @override
  Widget build(BuildContext context) {
    const appName = 'Custom Themes';

    return MaterialApp(
      title: 'appName',
      theme: ThemeData(
        primaryColor: Color.fromARGB(255, 155, 155, 155),
        primaryColorLight: Color.fromARGB(255, 231, 190, 243),
        secondaryHeaderColor: Color.fromARGB(255, 241, 179, 253),
        floatingActionButtonTheme: const FloatingActionButtonThemeData(
          backgroundColor: Color.fromARGB(255, 161, 161, 161),
          foregroundColor: Color.fromARGB(255, 164, 237, 250),
          hoverColor: Color.fromARGB(255, 242, 212, 250)
        ),
        textTheme: const TextTheme(
          displayLarge: TextStyle(fontSize: 52, fontWeight: FontWeight.bold),
          titleLarge: TextStyle(
            fontSize: 36,
            fontStyle: FontStyle.italic,
          ),
          bodyMedium: TextStyle(fontSize: 14),
        ),
      ),
      home: const MyHomePage(title: appName,
      ),
    );
  }
}

class MyHomePage extends StatelessWidget {
  final String title;
  const MyHomePage({super.key, required this.title});
```

```
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        backgroundColor: Theme.of(context).primaryColor,
        title: Text('Theme Demo'),
      ),
      body: Center(
        child: Container(
          color: Theme.of(context).primaryColorLight,
          child: Text(
            'Text with a background color',
            style: Theme.of(context).textTheme.displayLarge,
          )
        ),
      ),
      floatingActionButton: FloatingActionButton(onPressed: () {},
      child: const Icon(Icons.add),
      splashColor: Theme.of(context).secondaryHeaderColor,
    ));
  }
}
```

Output:



Practical-7

Aim: Designing the mobile app to implement the animation.

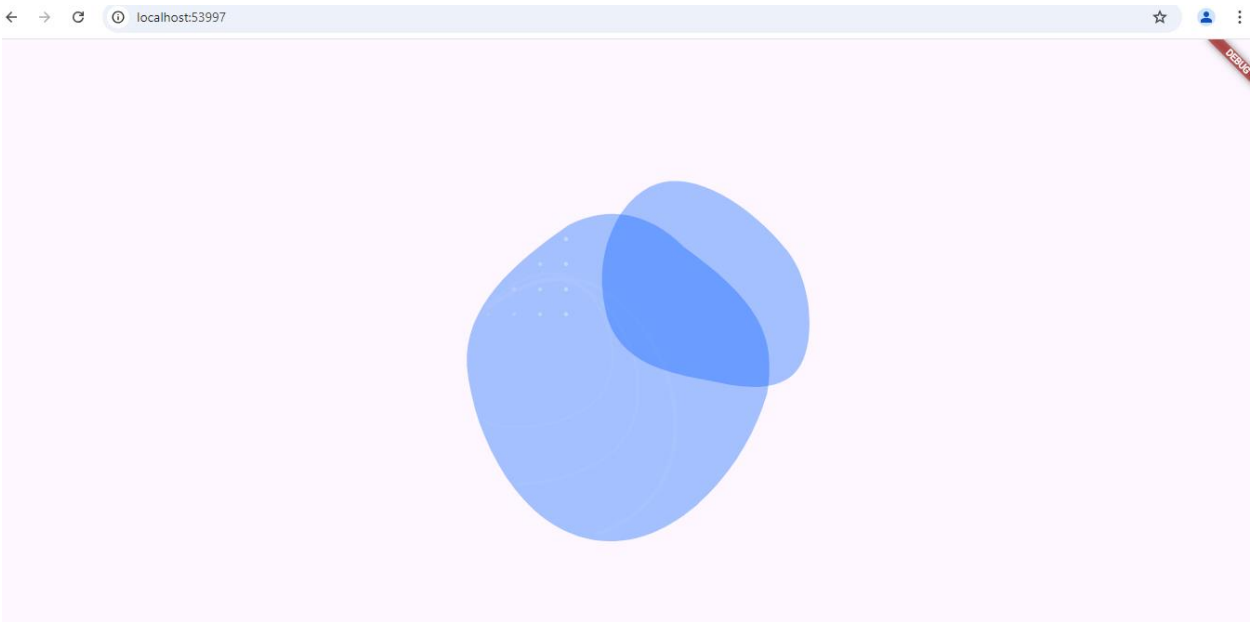
```dart
import 'package:flutter/material.dart';
import 'package:lottie/lottie.dart';
void main() {
  runApp(MaterialApp(
    home: MyApp(),
  ));
}

class MyApp extends StatefulWidget {
  @override
  State<MyApp> createState() => _MyAppState();
}

class _MyAppState extends State<MyApp> with TickerProviderStateMixin {
  @override
  //Animation Controller
  late final AnimationController _controller;
```

```
  @override
  void initState() {
    super.initState();
    _controller =
    AnimationController(duration: Duration(seconds: 10),vsync: this);
  }
   @override
   Widget build(BuildContext context) {
    return Scaffold(
      body: Center(
        child: Lottie.network(
          'https://assets9.lottiefiles.com/packages/lf20_3le10jj4.json'
        ),
      ),
    );
   }

}
```

Edit pubspec.yaml line 32 or 33

Lottie: ^2.0.0

Output:



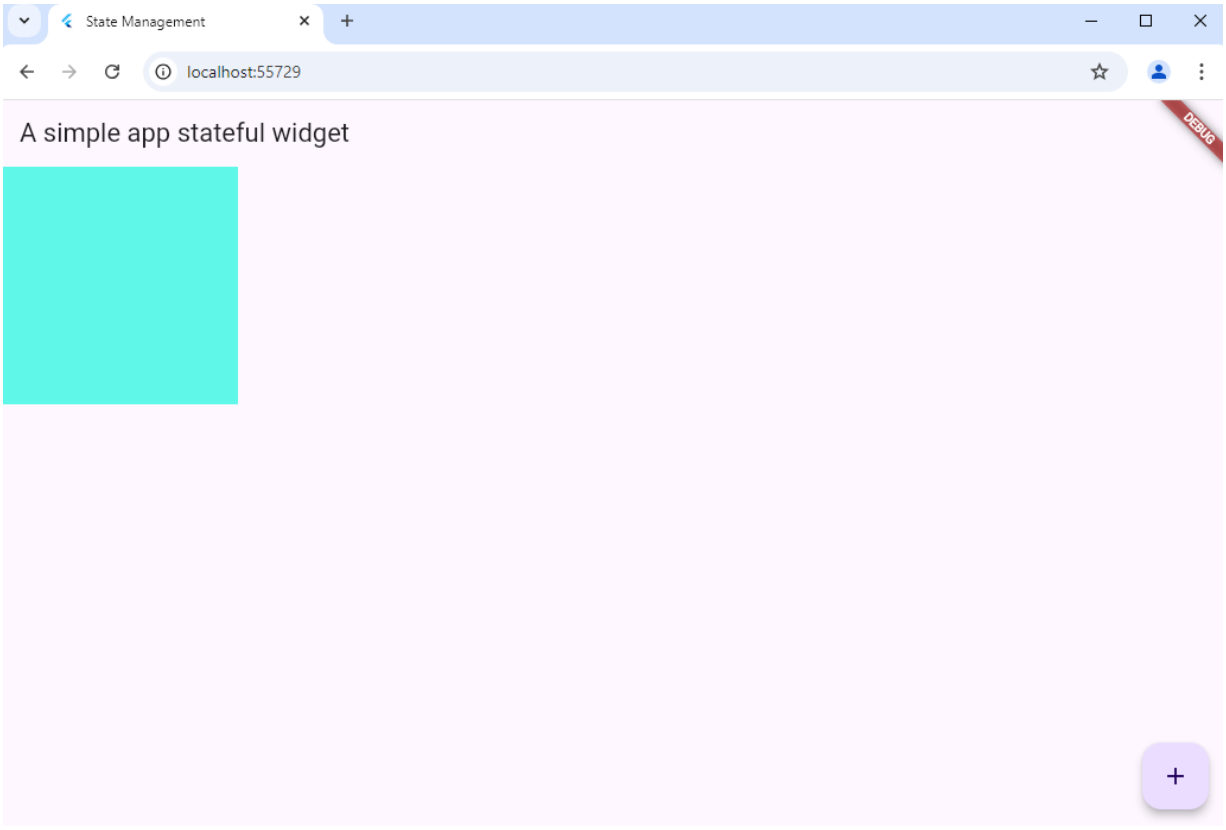
Practical-8

Aim: Designing the mobile app to implement the state management.

```dart
import 'package:flutter/material.dart';
import 'dart:math' as math;

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

class MyApp extends StatefulWidget {
  @override
  State<MyApp> createState() => _MyAppState();
}

class _MyAppState extends State<MyApp> {
  Color _containerColor = const Color.fromARGB(255, 155, 145, 59);
  void changeColor() {
    setState(() {
      _containerColor = Color.fromARGB(
        255,
        math.Random().nextInt(256),
        math.Random().nextInt(256),
        math.Random().nextInt(256),
      );
      /*if(_containerColor=Colors.yellow;){
```

```
      _containerColor=colors.red;
      return;
      }else{
      _containerColor=Color.yellow;
      }*/
    });
  }

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
        title: "State Management",
        home: Scaffold(
          appBar: AppBar(title: Text("A simple app stateful widget")),
          body: Container(
              width: 200,
              height: 200,
              decoration: BoxDecoration(color: _containerColor)),
          floatingActionButton: FloatingActionButton(
            onPressed: changeColor,
            child: Icon(Icons.add),
            tooltip: "Click here",
          ),
        ));
  }
}
```

Output:


State Management
localhost:55729
A simple app stateful widget
DEBUG