Flutter programs list for Mid-1

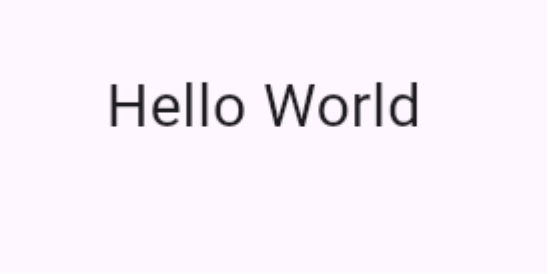
1.a)Write a simple Dart program to understand the language basics

```dart
void main() {
  var name = "Deepthi";
  var rollNo = 40;

  // string interpolation
  print("My name is $name and my roll number is $rollNo");

  var num = 15;
  if (num % 2 == 0) {
    print("$num is Even");
  } else {
    print("$num is Odd");
  }

  // Loop example
  print("Numbers from 1 to 5:");
  for (int i = 1; i <= 5; i++) {
    print(i);
  }

  // Function example
  int sum(int a, int b) { return a + b; }

  var result = sum(10, 20);
  print("The sum of 10 and 20 is $result");
}
```

```
My name is Peter and my roll number is 24
15 is Odd
Numbers from 1 to 5:
1
2
3
4
5
The sum of 10 and 20 is 30
```

b) Write simple Flutter app to displays "Hello World" in the middle of the screen.

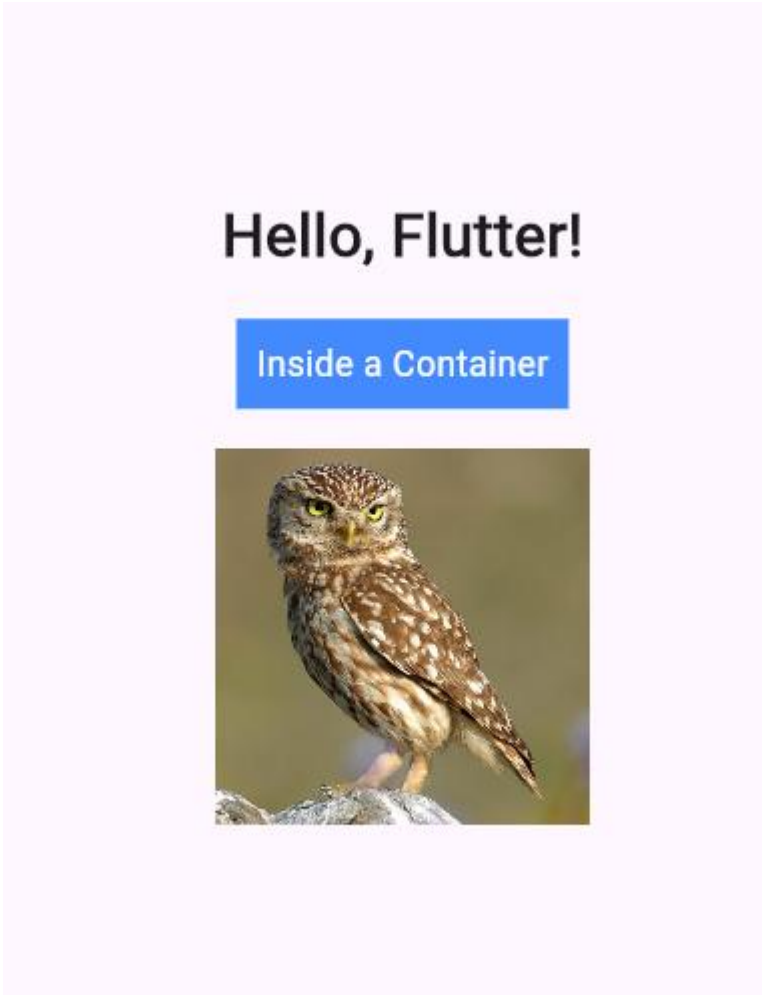
```dart
import 'package:flutter/material.dart';

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        body: Center(
          child: Text(
            'Hello World',
            style: TextStyle(fontSize: 24),
          ),
        ),
      ),
    );
  }
}
```



2.a) Explore various Flutter widgets (Text, Image, Container, etc.).

```
1  import 'package:flutter/material.dart';
2
3  void main() {
4   runApp(MyApp());
5  }
6
7  class MyApp extends StatelessWidget {
8   @override
9   Widget build(BuildContext context) {
10   return MaterialApp(
11    home: Scaffold(
12     body: Center(
13      child: Column(
14       mainAxisAlignment: MainAxisAlignment.center,
15       children: [
16        // Text widget
17        Text(
18         'Hello, Flutter!',
19         style: TextStyle(fontSize: 24, fontWeight: FontWeight.bold),
20        ),
21
22        // Container with background color
23        Container(
24         margin: EdgeInsets.all(16),
25         padding: EdgeInsets.all(8),
26         color: Colors.blueAccent,
27         child: Text(
28          'Inside a Container',
29          style: TextStyle(color: Colors.white),
30         ),
31        ),
32
33        // Image widget
34        Image.network(
35         'https://flutter.github.io/assets-for-api-
36 docs/assets/widgets/owl.jpg',
37         height: 150,
```

```
38            ),
39          ],
40        ),
41      ),
42    ),
43  );
44 }
   }
```



b) Implement different layout structures using Row, Column, and Stack widgets.

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

void main() => runApp(const MyApp());

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

 @override
 Widget build(BuildContext context) {
  return MaterialApp(
   home: Scaffold(
    body: Center(
     child: Column(
      mainAxisSize: MainAxisSize.min,
      children: [
       // ROW
       const Text('ROW (left → right)',
         style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold)),
       const SizedBox(height: 8),
       Row(
        mainAxisSize: MainAxisSize.min,
        children: [
         Container(width: 40, height: 40, color: Colors.red),
         const SizedBox(width: 8),
         Container(width: 40, height: 40, color: Colors.green),
         const SizedBox(width: 8),
         Container(width: 40, height: 40, color: Colors.blue),
        ],
       ),

       const SizedBox(height: 24),

       // COLUMN
       const Text('COLUMN (top → bottom)',
         style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold)),
       const SizedBox(height: 8),
       Column(
        mainAxisSize: MainAxisSize.min,
```

```
39            children: [
40              Container(width: 120, height: 30, color: Colors.orange),
41              const SizedBox(height: 8),
42              Container(width: 120, height: 30, color: Colors.purple),
43              const SizedBox(height: 8),
44              Container(width: 120, height: 30, color: Colors.teal),
45            ],
46          ),
47
48          const SizedBox(height: 24),
49
50          // STACK
51          const Text('STACK (overlap)',
52            style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold)),
53          const SizedBox(height: 8),
54          Stack(
55            alignment: Alignment.center,
56            children: [
57              Container(width: 120, height: 120, color: Colors.red),
58              Container(width: 80, height: 80, color: Colors.green),
59              Container(width: 40, height: 40, color: Colors.blue),
60              const Text('Top', style: TextStyle(fontWeight:
61 FontWeight.bold)),
62            ],
63          ),
64        ],
65      ),
66    ),
67  ),
68 );
69 }
   }
```


ROW (left → right)
COLUMN (top → bottom)
STACK (overlap)
Top

3.a) Design a responsive UI that adapts to different screen sizes.

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

void main() => runApp(MyApp());

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        body: LayoutBuilder(
          builder: (context, c) => Center(
            child: Text(
              'AIML',
              style: TextStyle(
                fontSize: c.maxWidth * 0.1, color: Colors.blue),
            ),
          ),
        ),
      ),
    );
  }
}
```

3b) Implement media queries and breakpoints for responsiveness.

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

void main() => runApp(MyApp());

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(home: ResponsiveLayout());
  }
}

class ResponsiveLayout extends StatelessWidget {
  Widget _box(Color c) => Container(color: c, width: 100, height: 100);

  @override
  Widget build(BuildContext context) {
    double w = MediaQuery.of(context).size.width;

    if (w < 600) {
      return Scaffold(
        appBar: AppBar(title: Text('Mobile Layout')),
        body: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [_box(Colors.red), _box(Colors.green),
_box(Colors.blue)],
        ),
      );
    } else if (w < 1200) {
      return Scaffold(
        appBar: AppBar(title: Text('Tablet Layout')),
        body: Row(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [_box(Colors.red), _box(Colors.green),
_box(Colors.blue)],
        ),
      );
    } else {
      return Scaffold(
        appBar: AppBar(title: Text('Desktop Layout')),
```

```
40        body: GridView.count(
41          crossAxisCount: 3,
42          mainAxisSpacing: 10,
43          crossAxisSpacing: 10,
44          children: [_box(Colors.red), _box(Colors.green),
45 _box(Colors.blue)],
46        ),
47      );
        }
      }
    }
```

Tablet Layout

4.a) Implement Stateless widget

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

void main() => runApp(MyApp());

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(title: Text("Stateless Widget")),
        body: Center(
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: [
              Icon(Icons.star, color: Colors.red, size: 50),
              Text(
                "Hello, I am Stateless!",
                style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold),
              ),
            ],
          ),
        ),
      ),
    );
  }
}
```

Stateless Widget

Hello, I am Stateless!

4b) Implement stateful widget

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

void main() => runApp(MyApp());

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

class _MyAppState extends State<MyApp> {
  bool liked = false; // state variable

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(title: Text("Stateful Widget")),
        body: Center(
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: [
              Icon(
                liked ? Icons.star : Icons.star_border,
                color: Colors.orange,
                size: 60,
              ),
              Text(
                liked ? "You liked this!" : "Press the button 👇",
                style: TextStyle(fontSize: 18, fontWeight: FontWeight.bold),
              ),
              SizedBox(height: 20),
              ElevatedButton(
                onPressed: () => setState(() => liked = !liked),
                child: Text("Toggle"),
              ),
            ],
          ),
        ),
      ),
```

```
40    );
41   }
42 }
```