



Flutter

# Flutter - Notes

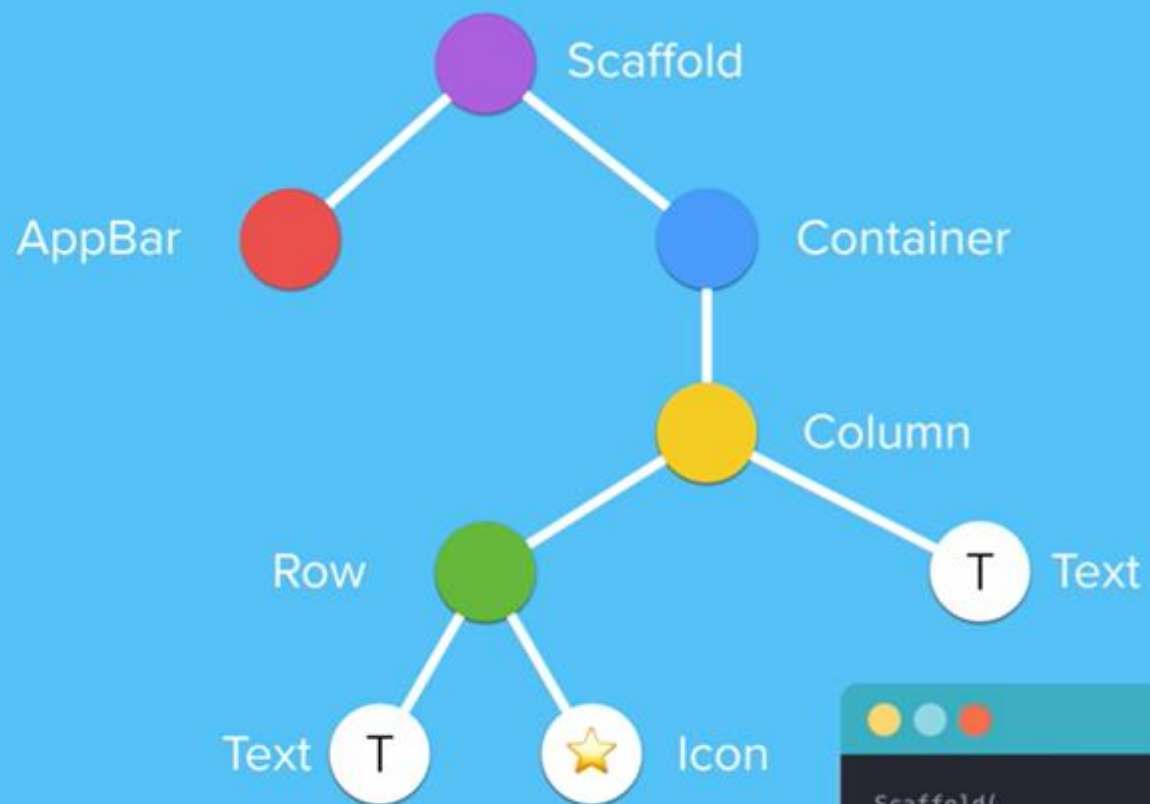
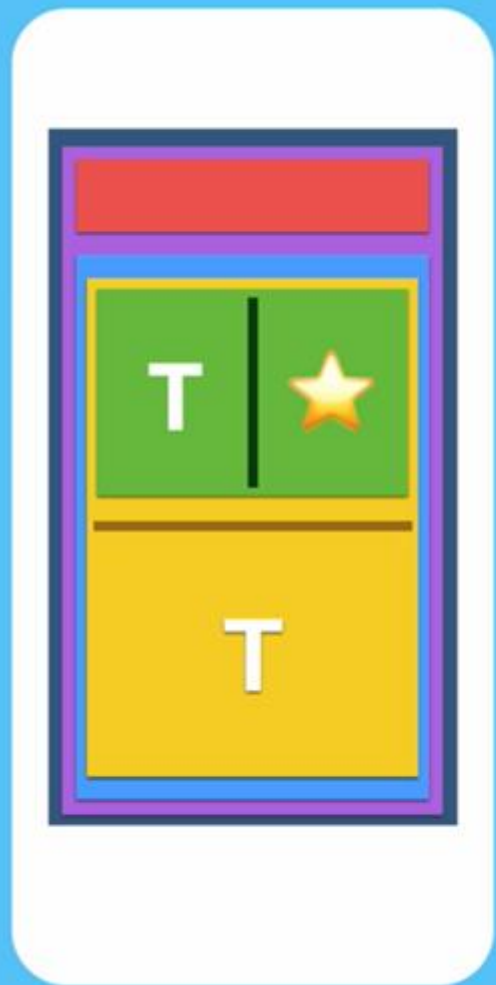
Abdul Hafeez

[www.codehafeez.com](http://www.codehafeez.com)

- The cross-platform development framework has the ability to write one code and can deploy on the various platform (Android, iOS, web, and Desktop).
- **Flutter** developed from Google in **2015** year, written in Dart.

<https://docs.flutter.dev/get-started/install/windows>

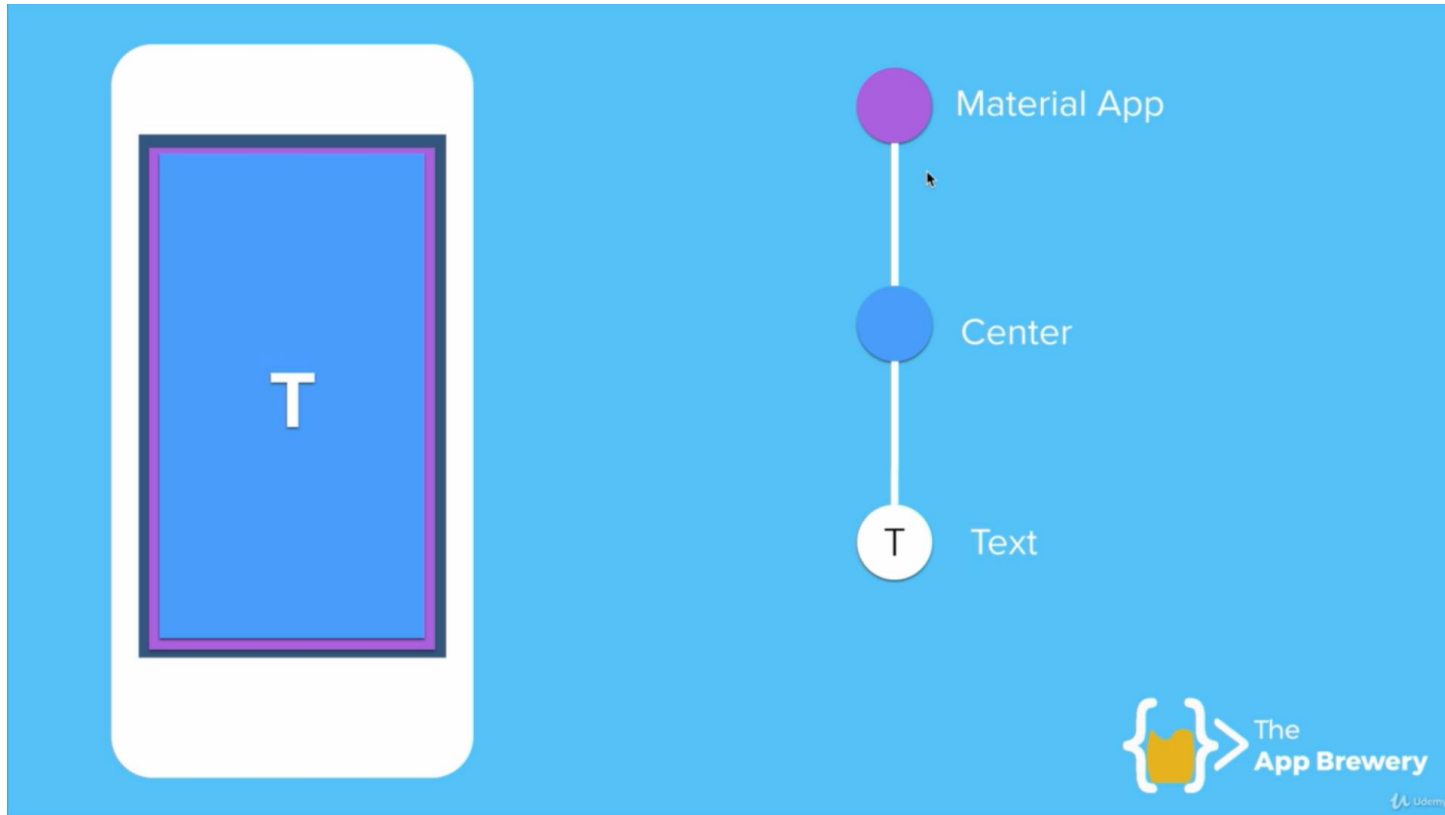
- Install (Git, Android Studio)
- Download flutter file from website and unzip (flutter.zip) c driver.
- Go to c drive flutter folder and run file (flutter\_console.bat)
- Set environment variable
  - Path => C:\flutter\bin
  - JAVA\_HOME => C:\Program Files\Java\jdk-18



```
Scaffold(  
  appBar: AppBar(),  
  body: Container(  
    child: Column(  
      children: [  
        Row(  
          Text(),  
          Icon(),  
        ),  
        Text(),  
      ]  
    )  
  ),  
)
```

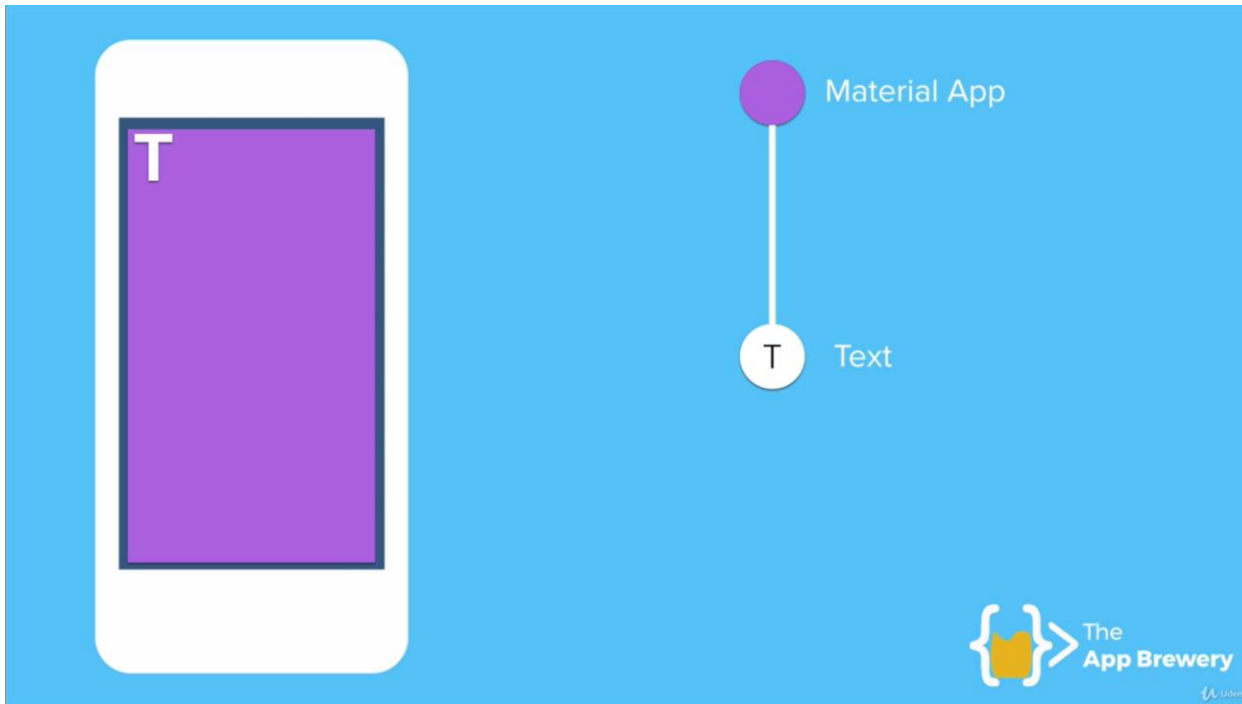
```
import 'package:flutter/material.dart';
```

```
void main() {  
  runApp(  
    MaterialApp(  
      home: Text('test msg'),  
    )  
  );  
}
```



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

```
void main() {  
  runApp(  
    MaterialApp(  
      home: Center(  
        child:Text('test msg'),  
      )  
    )  
  );  
}
```



```

import 'package:flutter/material.dart';

void main() {
  runApp(
    MaterialApp(
      home: Scaffold(

        backgroundColor: Colors.teal,

        appBar: AppBar(
          title: Text('Example1_Hafeez'),
          backgroundColor: Colors.purple,
        ),

        body: Center(
          child: Image(
            image: NetworkImage('https://img.icons8.com/fluency/150/car.png'),
          ),
        ),
      ),
    );
}

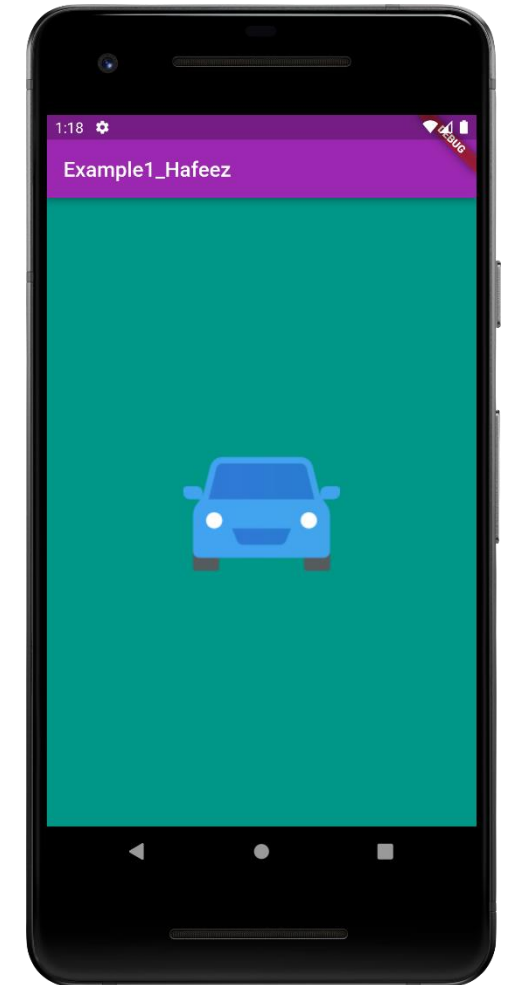
```

```

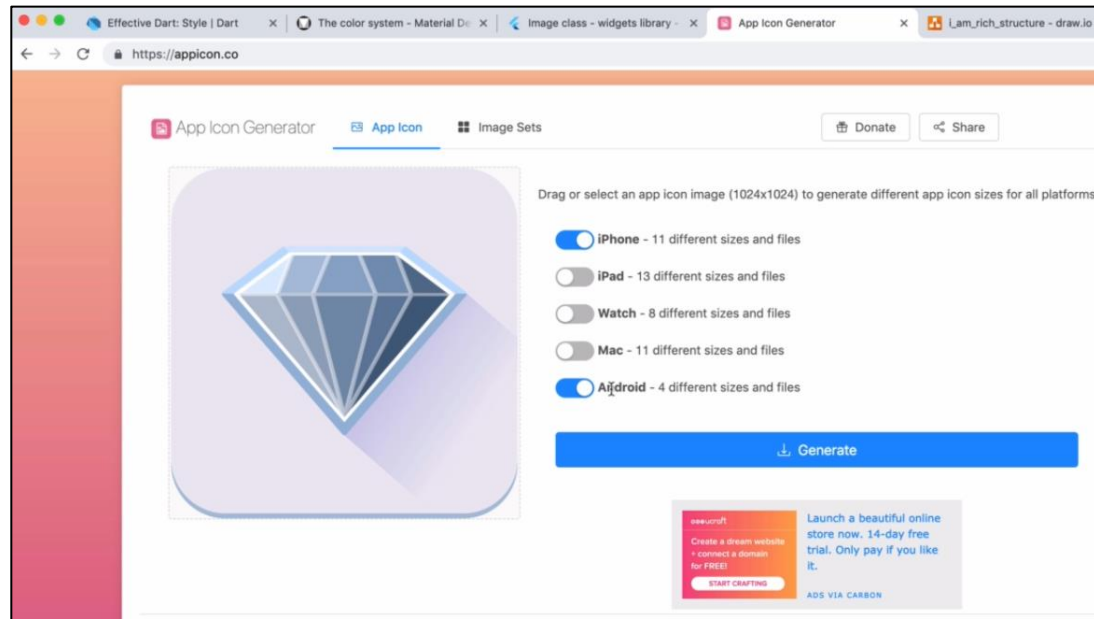
1  import 'package:flutter/material.dart';
2
3  void main() {
4    runApp(
5      MaterialApp(
6        home: Scaffold(
7
8          backgroundColor: Colors.teal,
9
10       appBar: AppBar(
11         title: Text('Example1_Hafeez'),
12         backgroundColor: Colors.purple,
13       ), // AppBar
14
15       body: Center(
16         child: Image(
17           image: NetworkImage('https://img.icons8.com/fluency/150/car.png'),
18         ), // Image
19       ), // Center
20     ), // Scaffold
21   ), // MaterialApp
22 );
23
24

```

Example - 01



<https://appicon.co/>



<https://fonts.google.com/>

<https://www.materialpalette.com/icons>

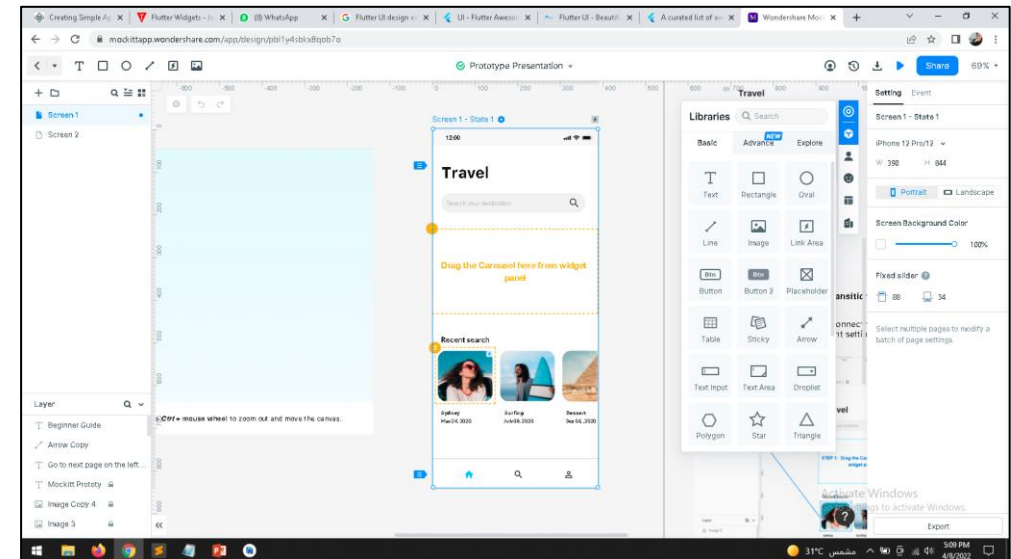
<https://icons8.com/>

<https://www.canva.com/>

<https://www.vecteezy.com/>

<https://flutterawesome.com/tag/ui/>

<https://flutterui.design/>



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

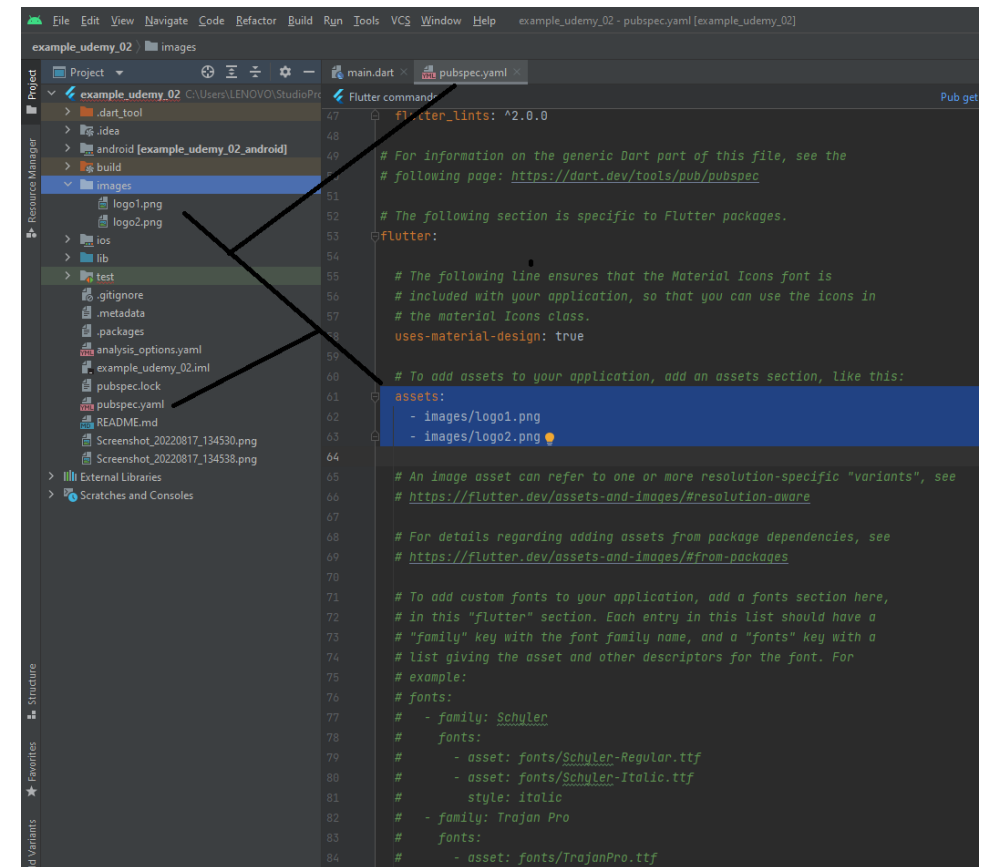
```
void main() {  
  runApp(  
    MaterialApp(  
      home: Scaffold(  
        backgroundColor: Colors.blueGrey,  
  
        appBar: AppBar(  
          title: Text("Show Image by Assets"),  
          backgroundColor: Colors.deepPurple,  
        ),  
  
        body: Center(  
          child: Image(  
            image: AssetImage('images/logo1.png'),  
          ),  
        ),  
      ),  
    ),  
  );  
}
```

Example - 02

```
1 import 'package:flutter/material.dart';  
2  
3 void main() {  
4   runApp(  
5     MaterialApp(  
6       home: Scaffold(  
7         backgroundColor: Colors.blueGrey,  
8  
9         appBar: AppBar(  
10          title: Text("Show Image by Assets"),  
11          backgroundColor: Colors.deepPurple,  
12          ), // AppBar  
13  
14         body: Center(  
15          child: Image(  
16            image: AssetImage('images/logo1.png'),  
17          ), // Image  
18        ), // Center  
19      ), // Scaffold  
20    ), // MaterialApp  
21  );  
22 }  
23
```



## Image Configuration Settings





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

```
void main() {  
  runApp(  
    MaterialApp(  
      home: Scaffold(  
        body: Center(  
          child: Text(  
            "Hello World - Add Font Example",  
            style: TextStyle(  
              fontFamily: 'Schyler',  
              fontStyle: FontStyle.italic,  
              fontSize: 22,  
              color: Colors.teal,  
              fontWeight: FontWeight.bold,  
            ),  
          ),  
        ),  
      ),  
    ),  
  );  
}
```

Example - 03

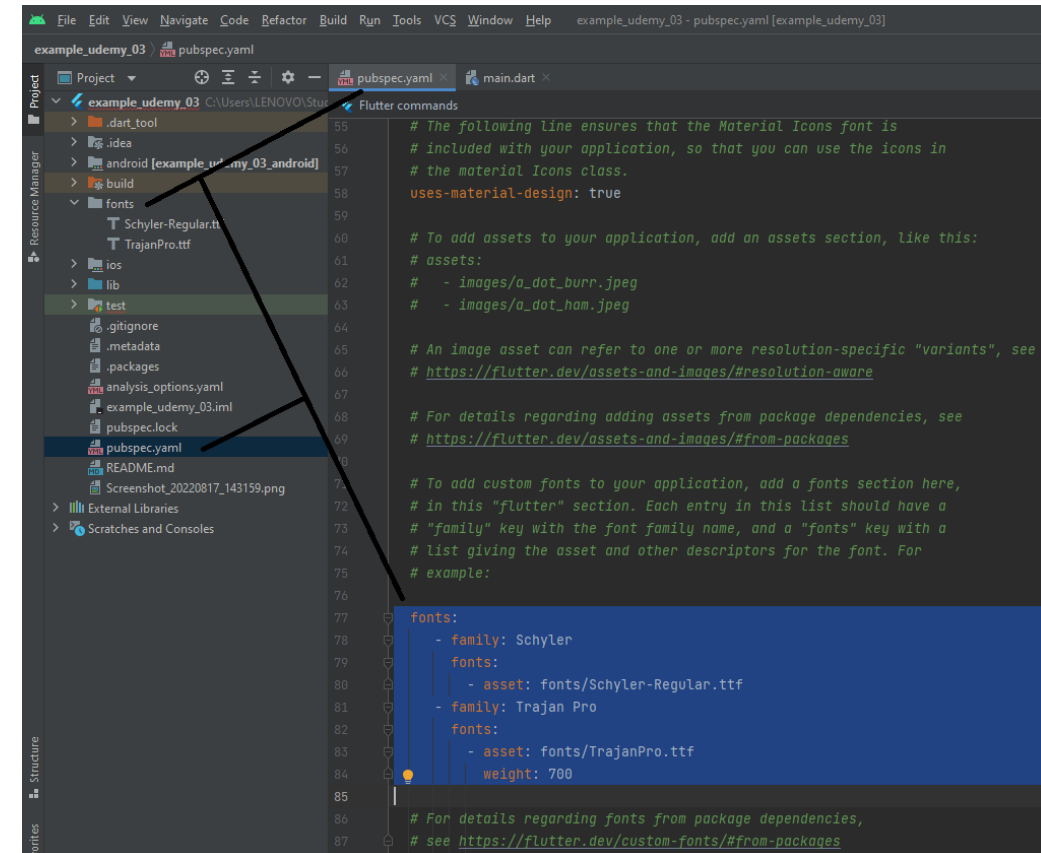
<https://fonts.google.com/>

```
1 import 'package:flutter/material.dart';  
2  
3 void main() {  
4   runApp(  
5     MaterialApp(  
6       home: Scaffold(  
7         body: Center(  
8           child: Text(  
9             "Hello World - Add Font Example",  
10            style: TextStyle(  
11              fontFamily: 'Schyler',  
12              fontStyle: FontStyle.italic,  
13              fontSize: 22,  
14              color: Colors.teal,  
15              fontWeight: FontWeight.bold,  
16            ), // TextStyle  
17          ), // Text  
18        ), // Center  
19      ), // Scaffold  
20    ), // MaterialApp  
21  );  
22 }
```



## Font Style & Add Custom Fonts

### Configuration Settings



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

```
void main() {  
  runApp(  
    HafeezMainApp()  
  );  
}
```

```
class HafeezMainApp extends StatelessWidget {  
  const HafeezMainApp({Key? key}) : super(key: key);
```

```
  @override
```

```
  Widget build(BuildContext context) {  
    return
```

```
    MaterialApp(  
      home: Scaffold(  
        backgroundColor: Colors.red,
```

```
        body: Center(  
          child: Text("Hello World"),
```

```
        ),
```

```
      ),
```

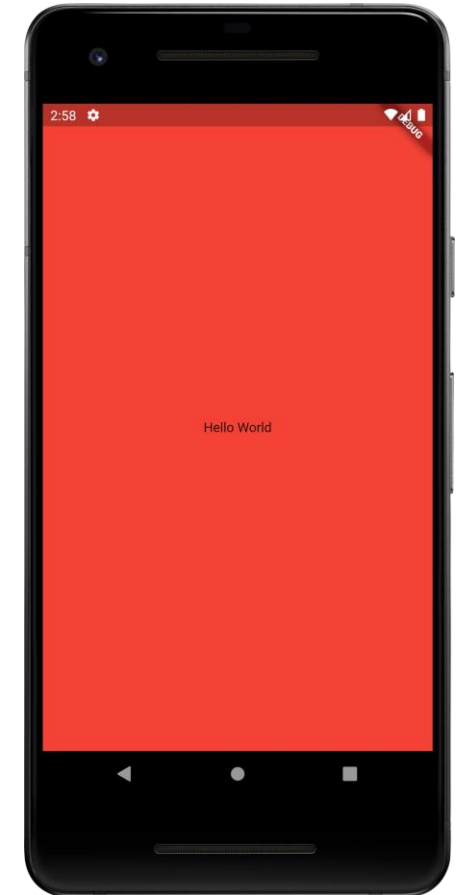
```
    );
```

```
  }
```

```
}
```

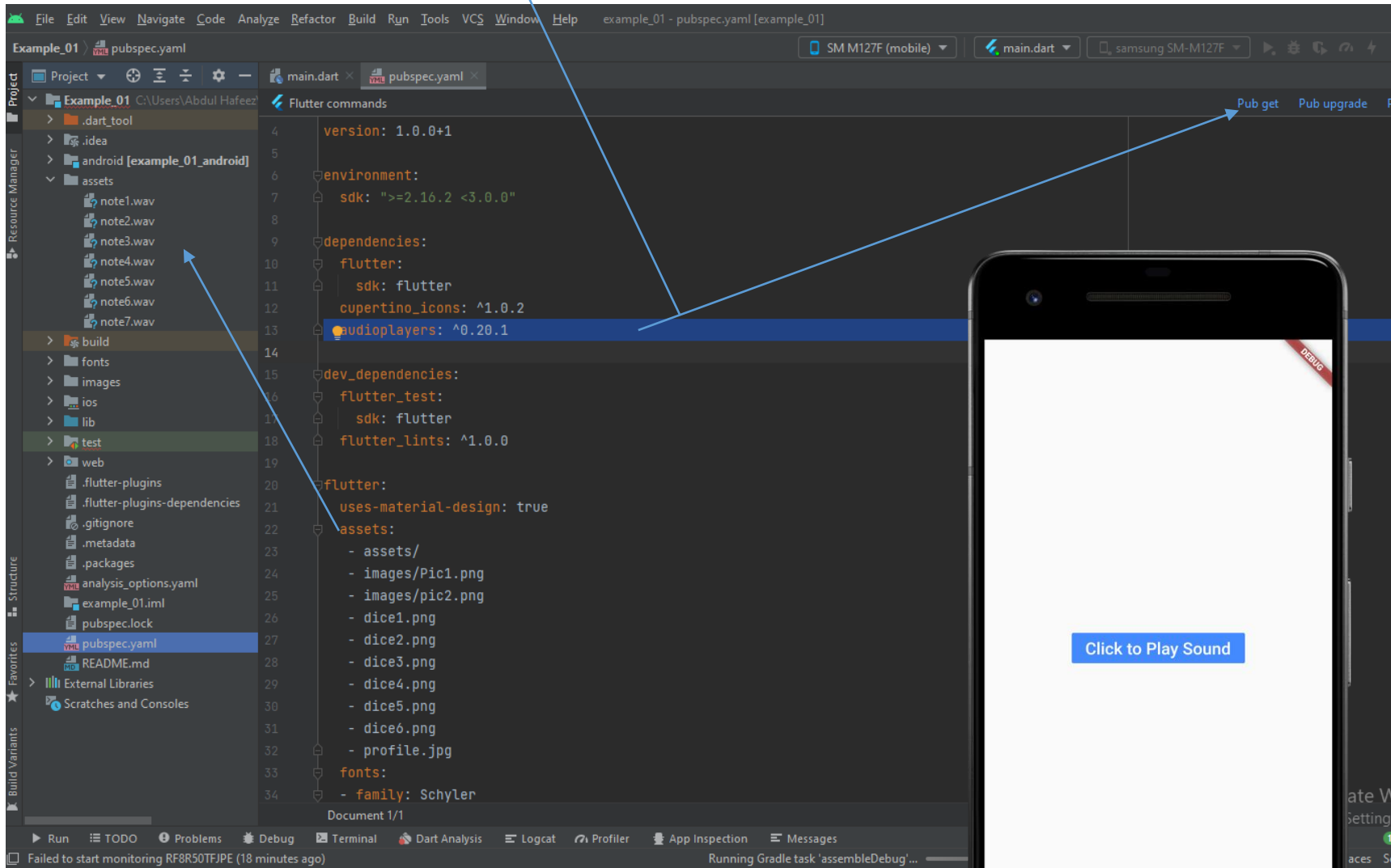
## Example - 04

```
1  import 'package:flutter/material.dart';  
2  
3  >> void main() {  
4    runApp(  
5      HafeezMainApp()  
6    );  
7  }  
8  
9  class HafeezMainApp extends StatelessWidget {  
10    const HafeezMainApp({Key? key}) : super(key: key);  
11  
12    @override  
13    Widget build(BuildContext context) {  
14      return  
15        MaterialApp(  
16          home: Scaffold(  
17            backgroundColor: Colors.red,  
18  
19            body: Center(  
20              child: Text("Hello World"),  
21            ), // Center  
22          ), // Scaffold  
23        ); // MaterialApp  
24      }  
25    }
```



State less wedge auto update/show change when we save file  
Avoid hot reloading (Run again)

<https://pub.dev/packages/audioplayers/install>



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

```
void main() {
  runApp(
    MaterialApp(
      home: Scaffold(
        body: Center(
          child: FlatButton(
            child: Text('Click to Play Sound',
              style: TextStyle(fontSize: 20)
            ),
            color: Colors.blueAccent,
            textColor: Colors.white,
            onPressed: () {
              playSoundFunction();
            },
          ),
        ),
      ),
    );
}
```

```
void playSoundFunction(){
  final player = AudioCache();
  player.play("sounds/note1.wav");
}
```

Example - 05

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

```
void main() {
  runApp(
    HafeezMainApp()
  );
}
```

```
class HafeezMainApp extends StatelessWidget {
  const HafeezMainApp({Key? key}) : super(key: key);
```

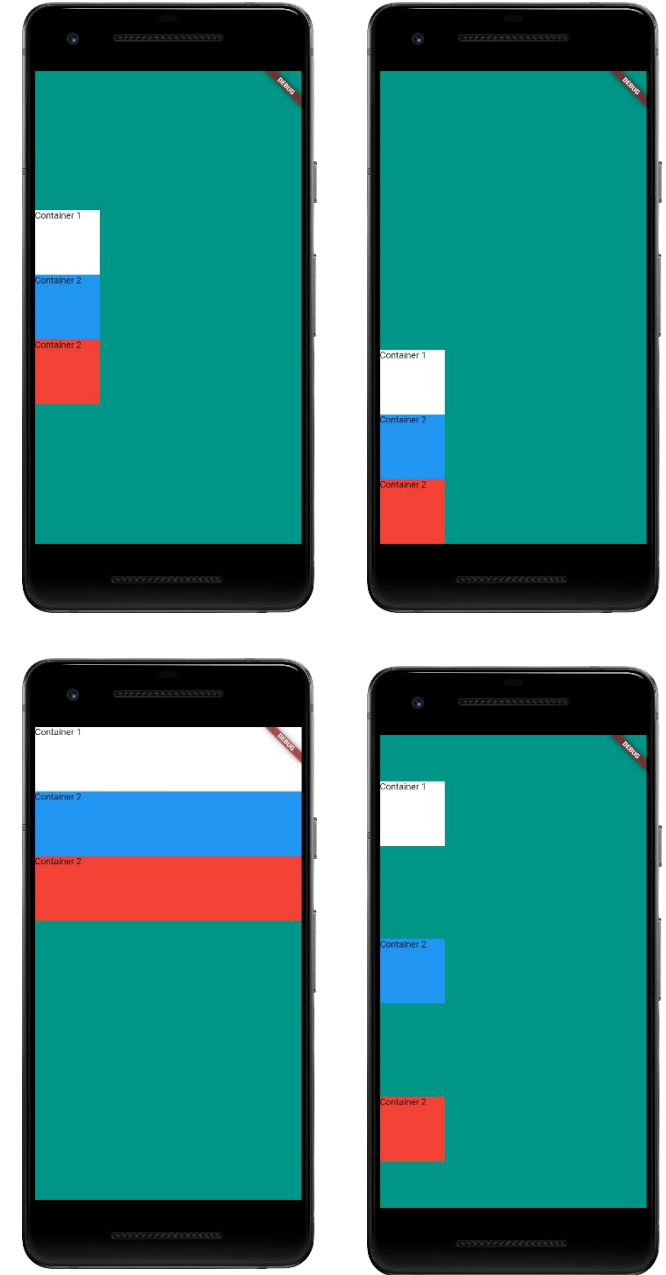
```
  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

          body: SafeArea(
            child: Column(
              // mainAxisAlignment: MainAxisAlignment.end,
              // mainAxisAlignment: MainAxisAlignment.center,
              // mainAxisAlignment: MainAxisAlignment.spaceAround,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Container(
                  width: 100,
                  height: 100,
                  color: Colors.white,
                  child: Text("Container 1"),
                ),
                Container(
                  width: 100,
                  height: 100,
                  color: Colors.blue,
                  child: Text("Container 2"),
                ),
                Container(
                  width: 100,
                  height: 100,
                  color: Colors.red,
                  child: Text("Container 2"),
                ),
              ],
            ),
          ),
        ),
      );
  }
}
```

```
15 | MaterialApp(
16 |   home: Scaffold(
17 |     backgroundColor: Colors.teal,
18 |
19 |     body: SafeArea(
20 |       child: Column(
21 |         // mainAxisAlignment: MainAxisAlignment.end,
22 |         // mainAxisAlignment: MainAxisAlignment.center,
23 |         // mainAxisAlignment: MainAxisAlignment.spaceAround,
24 |         crossAxisAlignment: CrossAxisAlignment.stretch,
25 |         children: [
26 |           Container(
27 |             width: 100,
28 |             height: 100,
29 |             color: Colors.white,
30 |             child: Text("Container 1"), // Container
31 |           ),
32 |           Container(
33 |             width: 100,
34 |             height: 100,
35 |             color: Colors.blue,
36 |             child: Text("Container 2"), // Container
37 |           ),
38 |           Container(
39 |             width: 100,
40 |             height: 100,
41 |             color: Colors.red,
42 |             child: Text("Container 2"), // Container
43 |           ), // Column
44 |         ], // SafeArea, Scaffold
45 |       ), // MaterialApp
46 |     ),
47 |   ),
48 | );
```

## UI Design – Container (Column)

### Example - 06



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

```
void main() {  
  runApp(  
    HafeezMainApp()  
  );  
}
```

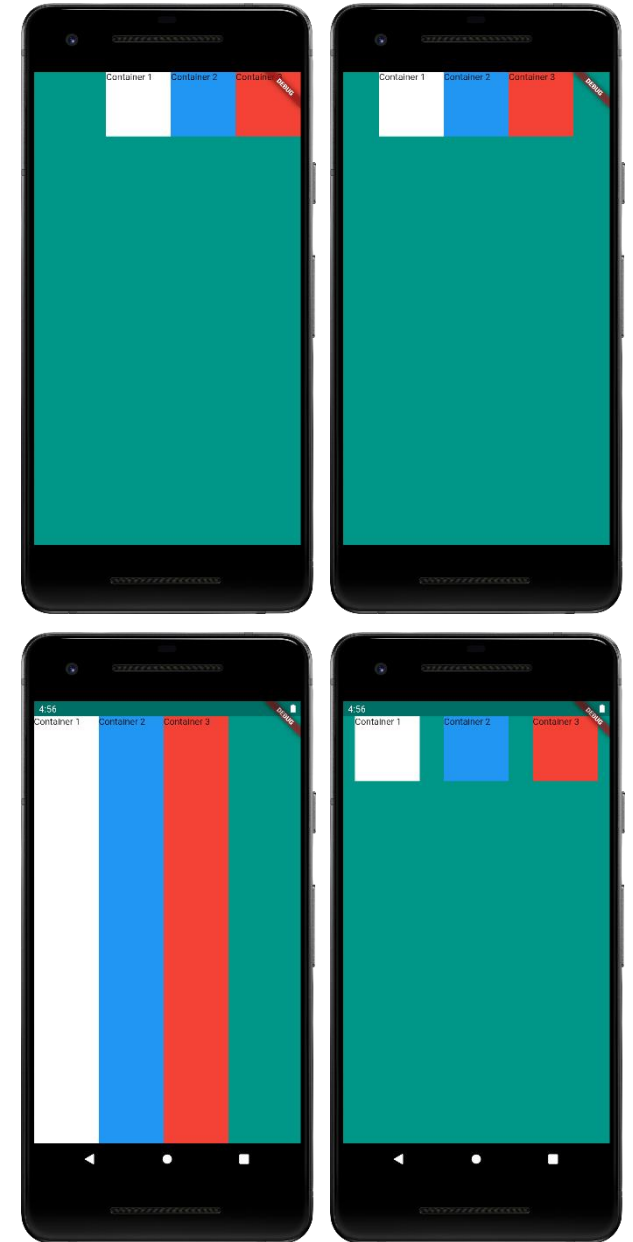
```
class HafeezMainApp extends StatelessWidget {  
  const HafeezMainApp({Key? key}) : super(key: key);
```

```
  @override  
  Widget build(BuildContext context) {  
    return  
      MaterialApp(  
        home: Scaffold(  
          backgroundColor: Colors.teal,  
  
          body: SafeArea(  
            child: Row(  
              mainAxisAlignment: MainAxisAlignment.end,  
              // mainAxisAlignment: MainAxisAlignment.center,  
              // mainAxisAlignment: MainAxisAlignment.spaceAround,  
              // crossAxisAlignment: CrossAxisAlignment.stretch,  
              children: [  
                Container(  
                  width: 100,  
                  height: 100,  
                  color: Colors.white,  
                  child: Text("Container 1"),  
                ),  
                Container(  
                  width: 100,  
                  height: 100,  
                  color: Colors.blue,  
                  child: Text("Container 2"),  
                ),  
                Container(  
                  width: 100,  
                  height: 100,  
                  color: Colors.red,  
                  child: Text("Container 3"),  
                ),  
              ],  
            ),  
          ),  
        ),  
      );  
  }  
}
```

```
15  MaterialApp(  
16    home: Scaffold(  
17      backgroundColor: Colors.teal,  
18  
19      body: SafeArea(  
20        child: Row(  
21          mainAxisAlignment: MainAxisAlignment.end,  
22          // mainAxisAlignment: MainAxisAlignment.center,  
23          // mainAxisAlignment: MainAxisAlignment.spaceAround,  
24          // crossAxisAlignment: CrossAxisAlignment.stretch,  
25          children: [  
26            Container(  
27              width: 100,  
28              height: 100,  
29              color: Colors.white,  
30              child: Text("Container 1"),  
31            ), // Container  
32            Container(  
33              width: 100,  
34              height: 100,  
35              color: Colors.blue,  
36              child: Text("Container 2"),  
37            ), // Container  
38            Container(  
39              width: 100,  
40              height: 100,  
41              color: Colors.red,  
42              child: Text("Container 3"),  
43            ), // Container  
44          ],  
45        ), // Row  
46      ), // SafeArea  
47    ), // Scaffold  
48  ); // MaterialApp  
49  
50 }
```

UI Design – Container (Row)

Example - 07



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

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

class HafeezMainApp extends StatelessWidget {
  const HafeezMainApp({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

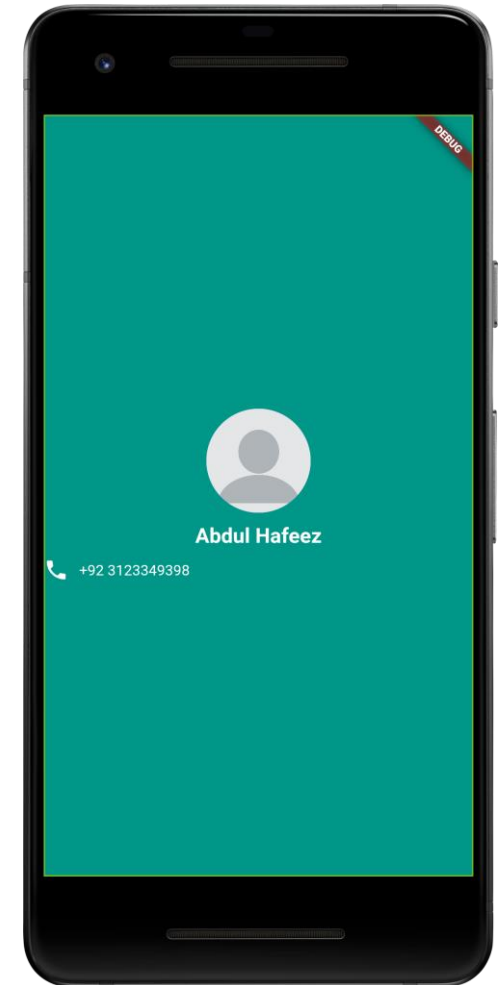
          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.center,
              children: [
                Container(
                  child: CircleAvatar(
                    radius: 50,
                    backgroundImage: AssetImage('images/profile.png'),
                  )
                ),
                Container(
                  margin: EdgeInsets.symmetric(vertical: 10.0, horizontal: 5.0),
                  child: Text(
                    "Abdul Hafeez",
                    textAlign: TextAlign.center,
                    style: TextStyle(
                      color: Colors.white,
                      fontSize: 20,
                      fontWeight: FontWeight.bold,
                    ),
                  ),
                ),
                Container(
                  child: Row(
                    children: [
                      Icon(
                        Icons.phone,
                        color: Colors.white,
                      ),
                      SizedBox(
                        width: 10,
                      ),
                      Text(
                        '+92 3123349398',
                        style: TextStyle(
                          color: Colors.white,
                        ),
                      ),
                    ],
                  ),
                ),
              ],
            ),
          ),
        ),
      );
  }
}

```

```

15      MaterialApp(
16        home: Scaffold(
17          backgroundColor: Colors.teal,
18
19          body: SafeArea(
20            child: Column(
21              mainAxisAlignment: MainAxisAlignment.center,
22              children: [
23                Container(
24                  child: CircleAvatar(
25                    radius: 50,
26                    backgroundImage: AssetImage('images/profile.png'),
27                  ) // CircleAvatar
28                ), // Container
29                Container(
30                  margin: EdgeInsets.symmetric(vertical: 10.0, horizontal: 5.0),
31                  child: Text(
32                    "Abdul Hafeez",
33                    textAlign: TextAlign.center,
34                    style: TextStyle(
35                      color: Colors.white,
36                      fontSize: 20,
37                      fontWeight: FontWeight.bold,
38                    ), // TextStyle
39                  ), // Text
40                ), // Container
41                Container(
42                  child: Row(
43                    children: [
44                      Icon(
45                        Icons.phone,
46                        color: Colors.white,
47                      ), // Icon
48                      SizedBox(
49                        width: 10,
50                      ), // SizedBox
51                      Text(
52                        '+92 3123349398',
53                        style: TextStyle(
54                          color: Colors.white,
55                        ), // TextStyle
56                      ), // Text
57                    ],
58                  ), // Row
59                ), // Container
60              ],
61            ), // Column
62          ), // SafeArea
63        ), // Scaffold
64      ); // MaterialApp
65
66

```



UI Design - Container

Example - 08

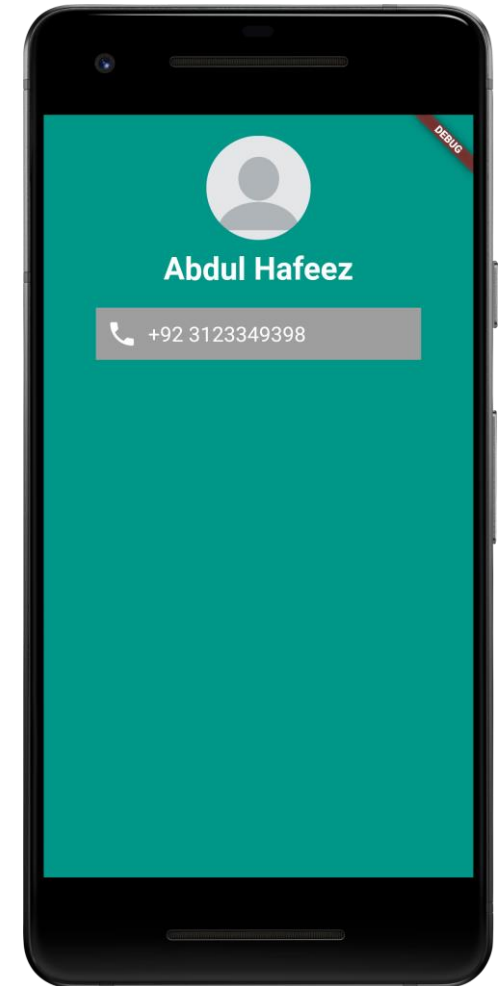
```
import 'package:flutter/material.dart';
```

```
void main() {  
  runApp(  
    HafeezMainApp()  
  );  
}
```

```
class HafeezMainApp extends StatelessWidget {  
  const HafeezMainApp({Key? key}) : super(key: key);
```

```
@override  
Widget build(BuildContext context) {  
  return  
    MaterialApp(  
      home: Scaffold(  
        backgroundColor: Colors.teal,  
  
        body: SafeArea(  
          child: Column(  
            children: [  
  
              SizedBox(height:20),  
  
              Container(  
                child: CircleAvatar(  
                  radius: 50,  
                  backgroundImage: AssetImage('images/profile.png'),  
                ),  
              ),  
  
              SizedBox(height:10),  
  
              Container(  
                child: Text(  
                  "Abdul Hafeez",  
                  textAlign: TextAlign.center,  
                  style: TextStyle(  
                    color: Colors.white,  
                    fontSize: 30,  
                    fontWeight:FontWeight.bold,  
                  ),  
                ),  
              ),  
  
              Container(  
                padding: EdgeInsets.all(10),  
                margin: EdgeInsets.symmetric(vertical:20, horizontal:50),  
                color: Colors.grey,  
                child: Row(  
                  children: [  
                    Icon(  
                      Icons.phone,  
                      color: Colors.white,  
                      size: 30,  
                    ),  
  
                    SizedBox(width:10),  
  
                    Text(  
                      '+92 3123349398',  
                      style: TextStyle(  
                        color: Colors.white,  
                        fontSize: 20,  
                      ),  
                    ),  
                  ],  
                ),  
              ),  
            ],  
          ),  
        ),  
      ),  
    );  
}
```

```
47  
48  
49  
50  
51  
52  
53  
54  
55  
56  
57  
58  
59  
60  
61  
62  
63  
64  
65  
66  
67  
68  
69  
70  
Container(  
  padding: EdgeInsets.all(10),  
  margin: EdgeInsets.symmetric(vertical:20, horizontal:50),  
  color: Colors.grey,  
  child: Row(  
    children: [  
      Icon(  
        Icons.phone,  
        color: Colors.white,  
        size: 30,  
      ), // Icon  
  
      SizedBox(width:10),  
  
      Text(  
        '+92 3123349398'  
        style: TextStyle(  
          color: Colors.white,  
          fontSize: 20,  
        ), // TextStyle  
      ), // Text  
    ],  
  ), // Row  
), // Container
```



UI Design - Container

Example - 09

```

import 'package:flutter/material.dart';

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

class HafeezMainApp extends StatelessWidget {
  const HafeezMainApp({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

          body: SafeArea(
            child: Column(
              children: [

                SizedBox(height:20),

                Container(
                  child: CircleAvatar(
                    radius: 50,
                    backgroundImage: AssetImage('images/profile.png'),
                  )
                ),

                SizedBox(height:10),

                Container(
                  child: Text(
                    "Abdul Hafeez",
                    textAlign: TextAlign.center,
                    style: TextStyle(
                      color: Colors.white,
                      fontSize: 30,
                      fontWeight:FontWeight.bold,
                    ),
                  ),
                ),

                SizedBox(height:10),

                Card(
                  margin: EdgeInsets.symmetric(vertical:20, horizontal:50),
                  color: Colors.grey,
                  child: Padding(
                    padding: const EdgeInsets.all(8.0),
                    child: Row(
                      children: [
                        Icon(
                          Icons.phone,
                          color: Colors.white,
                          size: 30,
                        ),

                        SizedBox(width:10),

                        Text(
                          '+92 3123349398',
                          style: TextStyle(
                            color: Colors.white,
                            fontSize: 20,
                          ),
                        ),
                      ],
                    ),

                ),

                Card(
                  margin: EdgeInsets.symmetric(vertical:0, horizontal:50),
                  color: Colors.grey,
                  child: Padding(
                    padding: const EdgeInsets.all(8.0),
                    child: Row(
                      children: [
                        Icon(
                          Icons.email,
                          color: Colors.white,
                          size: 30,
                        ),

                        SizedBox(width:10),

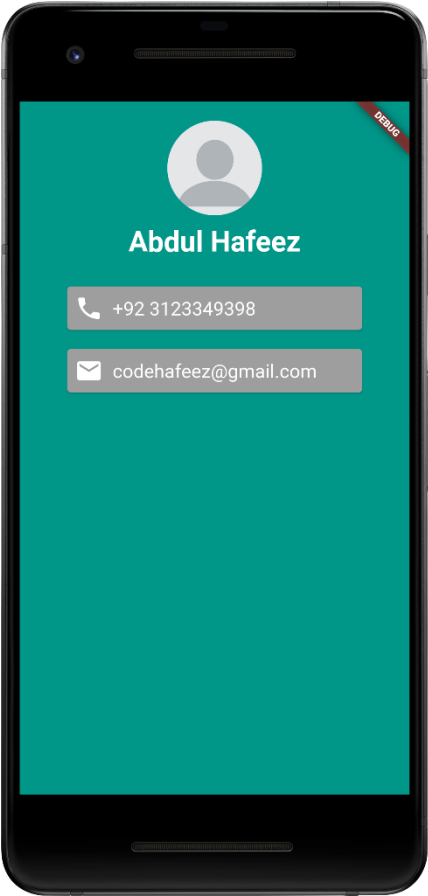
                        Text(
                          'codehafeez@gmail.com',
                          style: TextStyle(
                            color: Colors.white,
                            fontSize: 20,
                          ),
                        ),
                      ],
                    ),
                  ),
                ),
              ],
            ),
          ),
        ),
      );
  }
}

```

```

48 Card(
49   margin: EdgeInsets.symmetric(vertical:20, horizontal:50),
50   color: Colors.grey,
51   child: Padding(
52     padding: const EdgeInsets.all(8.0),
53     child: Row(
54       children: [
55         Icon(
56           Icons.phone,
57           color: Colors.white,
58           size: 30,
59         ), // Icon
60
61         SizedBox(width:10),
62
63         Text(
64           '+92 3123349398',
65           style: TextStyle(
66             color: Colors.white,
67             fontSize: 20,
68           ), // TextStyle
69         ), // Text
70       ],
71     ), // Row
72   ), // Padding
73 ), // Card

```



UI Design - Card

Example - 10



```

import 'package:flutter/material.dart';

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

class HafeezMainApp extends StatelessWidget {
  const HafeezMainApp({Key? key}) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.center,
              children: [

                SizedBox(height:20),

                Container(
                  child: CircleAvatar(
                    radius: 50,
                    backgroundImage: AssetImage('images/profile.png'),
                  ),
                ),

                SizedBox(height:10),

                Container(
                  child: Text(
                    "Abdul Hafeez",
                    textAlign: TextAlign.center,
                    style: TextStyle(
                      color: Colors.white,
                      fontSize: 30,
                      fontWeight:FontWeight.bold,
                    ),
                  ),
                ),

                SizedBox(height:10),

                SizedBox(
                  height:10,
                  width: 150,
                  child: Divider(
                    color: Colors.teal.shade100,
                    height: 20,
                  ),
                ),

                Card(
                  margin: EdgeInsets.symmetric(horizontal:50, vertical:20),
                  child: ListTile(
                    leading: Icon(
                      Icons.phone,
                      color: Colors.teal,
                    ),
                    title: Text(
                      '+92 3123349398',
                      style: TextStyle(
                        color: Colors.teal,
                        fontSize: 20
                      ),
                    ),
                  ),
                ),

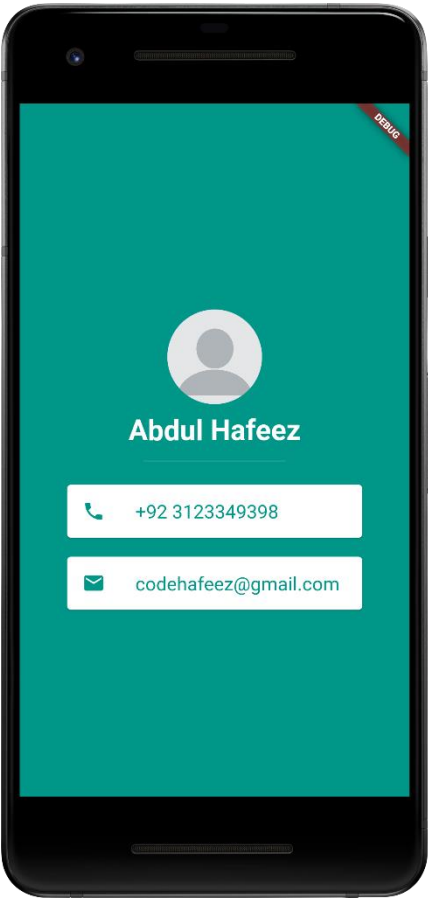
                Card(
                  margin: EdgeInsets.symmetric(horizontal:50, vertical:0),
                  child: ListTile(
                    leading: Icon(
                      Icons.email,
                      color: Colors.teal,
                    ),
                    title: Text(
                      'codehafeez@gmail.com',
                      style: TextStyle(
                        color: Colors.teal,
                        fontSize: 20
                      ),
                    ),
                  ),
                ),
              ],
            ),
          ),
        ),
      );
  }
}

```

```

75      Card(
76        margin: EdgeInsets.symmetric(horizontal:50, vertical:0),
77        child: ListTile(
78          leading: Icon(
79            Icons.email,
80            color: Colors.teal,
81          ), // Icon
82          title: Text(
83            'codehafeez@gmail.com',
84            style: TextStyle(
85              color: Colors.teal,
86              fontSize: 20
87            ), // TextStyle
88          ), // Text
89        ), // ListTile
90      ), // Card

```



UI Design – Card + ListTile

Example - 11

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

```
void main() {
  runApp(HafeezHomeApp());
}
```

```
class HafeezHomeApp extends StatelessWidget {
  const HafeezHomeApp({Key? key}) : super(key: key);
```

```
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        backgroundColor: Colors.red,
```

```
        appBar: AppBar(
          title: Text('Show Images Example'),
          backgroundColor: Colors.blueGrey,
        ),
```

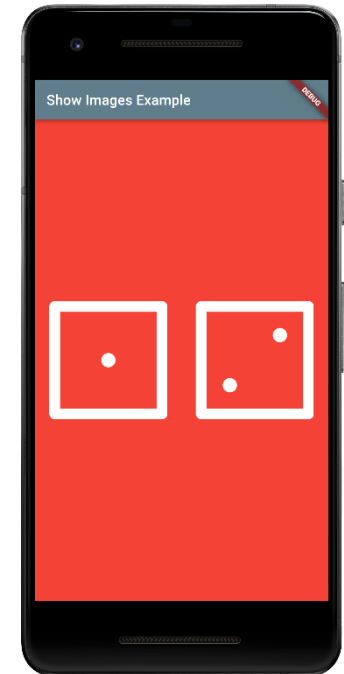
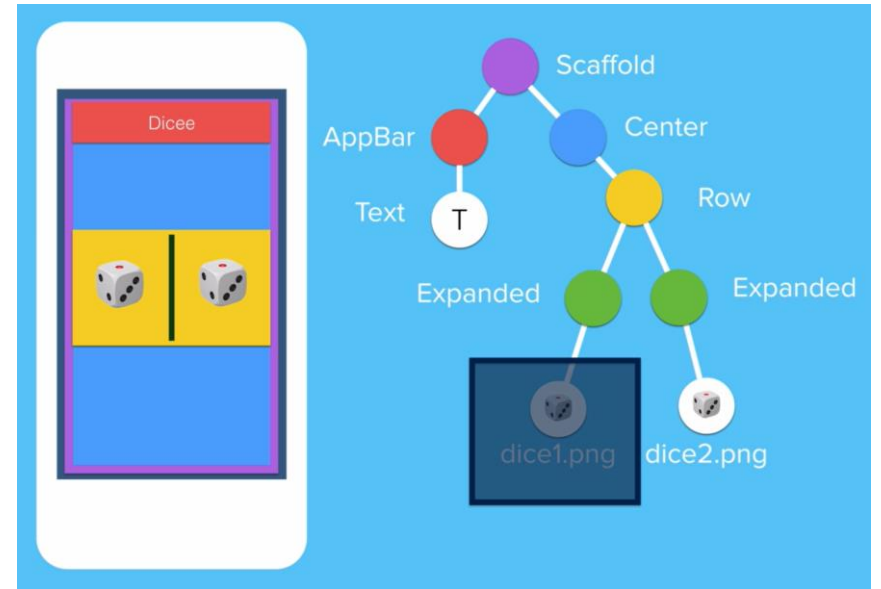
```
        body: SafeArea(
          child: Center(
```

```
            child: Row(
              children: [
                Expanded(
                  child: Padding(
                    padding: const EdgeInsets.all(20),
                    child: Image.asset('images/dice1.png'),
                  ),
                ),
                Expanded(
                  child: Padding(
                    padding: const EdgeInsets.all(20),
                    child: Image.asset('images/dice2.png'),
                  ),
                ),
              ],
            ),
          ),
        ),
      ),
    );
  }
}
```

```
16 | appBar: AppBar(
17 |   title: Text('Show Images Example'),
18 |   backgroundColor: Colors.blueGrey,
19 | ), // AppBar
20 |
21 | body: SafeArea(
22 |   child: Center(
23 |     child: Row(
24 |       children: [
25 |         Expanded(
26 |           child: Padding(
27 |             padding: const EdgeInsets.all(20),
28 |             child: Image.asset('images/dice1.png'),
29 |           ), // Padding
30 |         ), // Expanded
31 |         Expanded(
32 |           child: Padding(
33 |             padding: const EdgeInsets.all(20),
34 |             child: Image.asset('images/dice2.png'),
35 |           ), // Padding
36 |         ), // Expanded
37 |       ],
38 |     ), // Row
39 |   ), // Center
40 | ), // SafeArea
41 |
42 |
```

UI Design – Expanded Image

Example - 12



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

```
void main() {
  runApp(HafeezHomeApp());
}
```

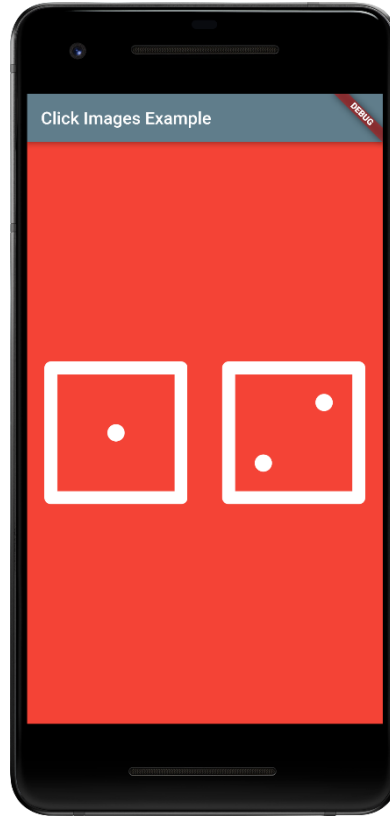
```
class HafeezHomeApp extends StatelessWidget {
  const HafeezHomeApp({Key? key}) : super(key: key);
```

```
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        backgroundColor: Colors.red,

        appBar: AppBar(
          title: Text('Click Images Example'),
          backgroundColor: Colors.blueGrey,
        ),

        body: SafeArea(
          child: Center(

            child: Row(
              children: [
                Expanded(
                  child: FlatButton(
                    padding: const EdgeInsets.all(20),
                    onPressed: () {
                      var currentNum = Random().nextInt(6) + 1; // 1 to 6
                      print('Random Number (1 to 6) : $currentNum');
                    },
                    child: Image.asset('images/dice1.png'),
                  ),
                ),
                Expanded(
                  child: FlatButton(
                    padding: const EdgeInsets.all(20),
                    onPressed: () {
                      print('test msg2');
                    },
                    child: Image.asset('images/dice2.png'),
                  ),
                ),
              ],
            ),
          ),
        ),
      ),
    );
  }
}
```



Example - 13

```
16 | appBar: AppBar(
17 |   title: Text('Click Images Example'),
18 |   backgroundColor: Colors.blueGrey,
19 | ), // AppBar
20 |
21 | body: SafeArea(
22 |   child: Center(
23 |
24 |     child: Row(
25 |       children: [
26 |         Expanded(
27 |           child: FlatButton(
28 |             padding: const EdgeInsets.all(20),
29 |             onPressed: () {
30 |               print('test msg1');
31 |             },
32 |             child: Image.asset('images/dice1.png'),
33 |           ), // FlatButton
34 |         ), // Expanded
35 |         Expanded(
36 |           child: FlatButton(
37 |             padding: const EdgeInsets.all(20),
38 |             onPressed: () {
39 |               print('test msg2');
40 |             },
41 |             child: Image.asset('images/dice2.png'),
42 |           ), // FlatButton
43 |         ), // Expanded
44 |       ],
45 |     ), // Row
46 |
47 |   ), // Center
48 | ), // SafeArea
```

UI Design – Expanded Image Click (Show Random Number Value Print Msg on Console)

```

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

void main() {
  return runApp(HomePage());
}

class HomePage extends StatefulWidget {
  @override
  HomePageState createState() => HomePageState();
}

class HomePageState extends State<HomePage> {

  int myNumber = 0;

  void changeNumberFunction() {
    setState(() {
      myNumber = Random().nextInt(6) + 1; // 0 to 6
    });
  }

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        body: Center(
          child: Column(
            mainAxisAlignment:
MainAxisAlignment.center,
            children: <Widget>[
              Text(
                'Random Number Example',
                style: TextStyle(fontSize: 20),
              ),
              Text('Random Value : $myNumber'),
              FlatButton(
                child: Text('Click Me',
                  style: TextStyle(fontSize: 20),
                ),
                color: Colors.blueAccent,
                textColor: Colors.white,
                onPressed: () { changeNumberFunction(); },
              ),
            ],
          ),
        ),
      ),
    );
  }
}

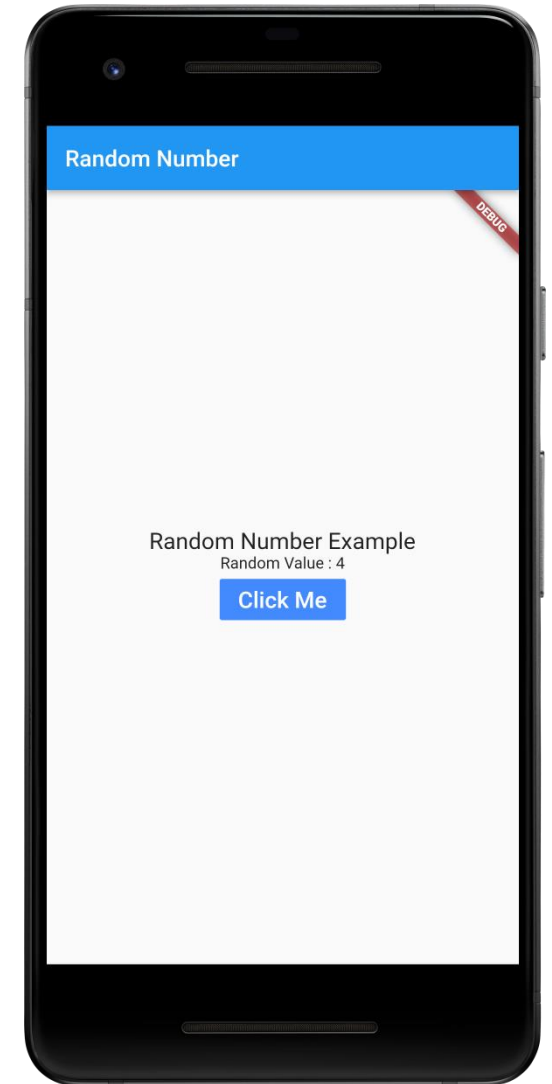
```

```

4  >> void main() {
5      return runApp(HomePage());
6  }
7
8  class HomePage extends StatefulWidget {
9      @override
10     HomePageState createState() => HomePageState();
11 }
12
13 class HomePageState extends State<HomePage> {
14
15     int myNumber = 0;
16
17     void changeNumberFunction() {
18         setState(() {
19             myNumber = Random().nextInt(6) + 1; // 0 to 6
20         });
21     }

```

## Example - 21



Show Random Number using Function (State Full Widget)

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

void main() {
  return runApp(
    MaterialApp(
      debugShowCheckedModeBanner: false,
      home: Scaffold(
        backgroundColor: Colors.red,
        appBar: AppBar(
          title: Text('Dicee'),
          backgroundColor: Colors.red,
        ),
        body: HafeezMainHomeApp(),
      ),
    ),
  );
}

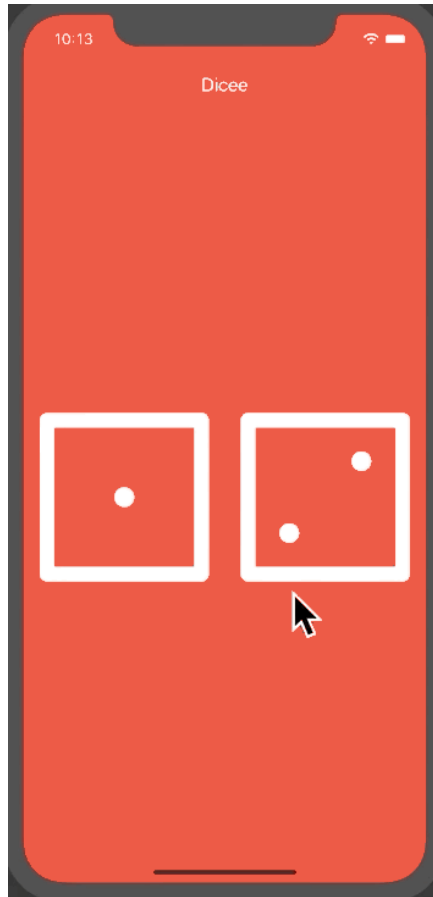
class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

class HafeezPageBody extends State<HafeezMainHomeApp> {

  int leftDiceNumber = 1;
  int rightDiceNumber = 1;

  void changeDiceFace() {
    setState(() {
      leftDiceNumber = Random().nextInt(6) + 1;
      rightDiceNumber = Random().nextInt(6) + 1;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Center(
      child: Row(
        children: <Widget>[
          Expanded(
            child: FlatButton(
              child: Image.asset(
                'images/dice$leftDiceNumber.png',
              ),
              onPressed: () {
                changeDiceFace();
              },
            ),
          ),
          Expanded(
            child: FlatButton(
              child: Image.asset(
                'images/dice$rightDiceNumber.png',
              ),
              onPressed: () {
                changeDiceFace();
              },
            ),
          ),
        ],
      ),
    );
  }
}
```



Example - 14

```
class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

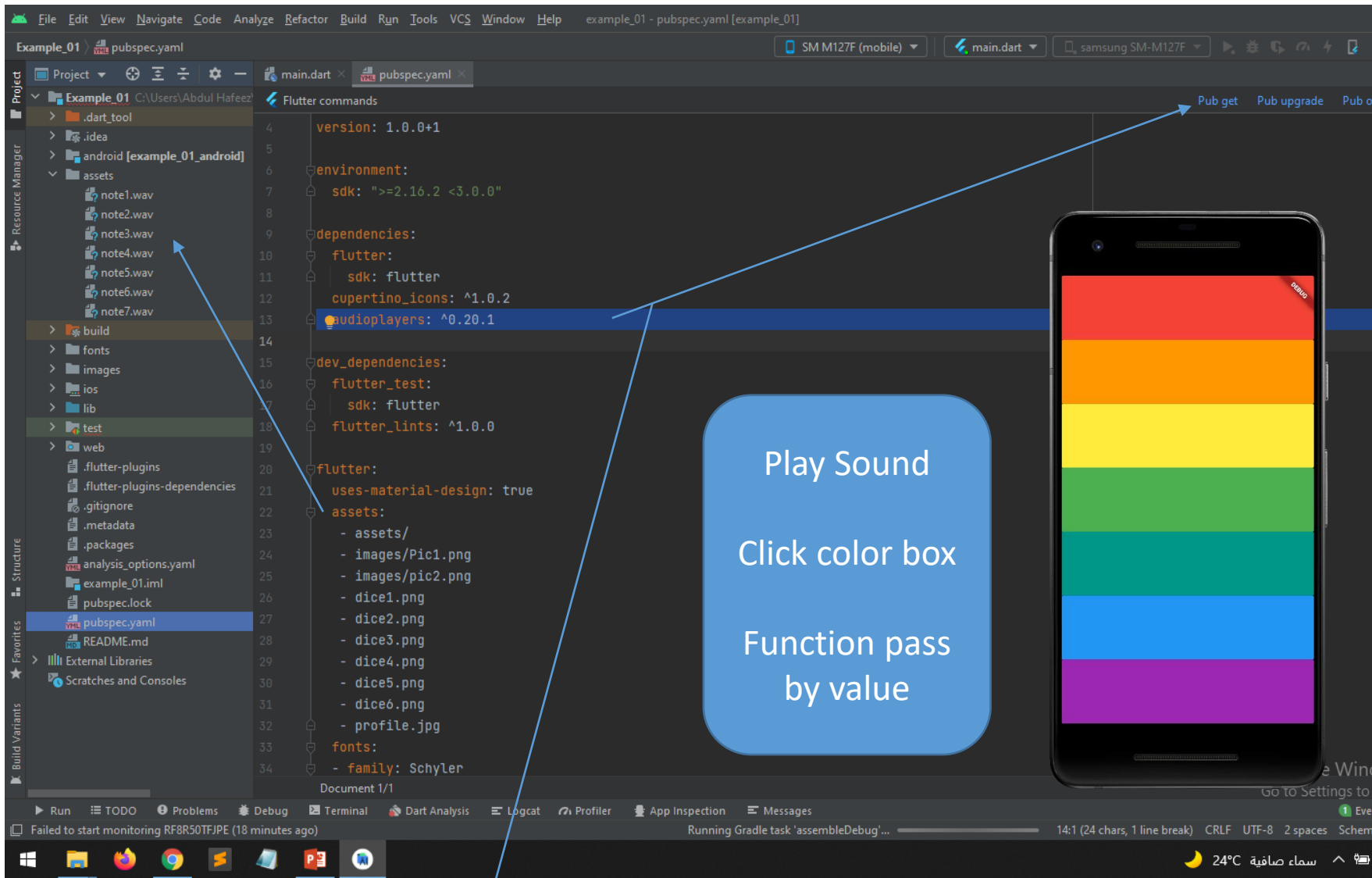
class HafeezPageBody extends State<HafeezMainHomeApp> {

  int leftDiceNumber = 1;
  int rightDiceNumber = 1;

  void changeDiceFace() {
    setState(() {
      leftDiceNumber = Random().nextInt(6) + 1;
      rightDiceNumber = Random().nextInt(6) + 1;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Center(
      child: Row(
        children: <Widget>[
          Expanded(
            child: FlatButton(
              child: Image.asset(
                'images/dice$leftDiceNumber.png',
              ), // Image.asset
              onPressed: () {
                changeDiceFace();
              }, // FlatButton
            ), // Expanded
          ),
          Expanded(
            child: FlatButton(
              child: Image.asset(
                'images/dice$rightDiceNumber.png',
              ), // Image.asset
              onPressed: () {
                changeDiceFace();
              }, // FlatButton
            ), // Expanded
          ), // <Widget>[]
        ], // Row
      ); // Center
    );
  }
}
```

UI Design – Expanded Image Click to Change Image using Random Number



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

```
void main() => runApp(XylophoneApp());
```

```
class XylophoneApp extends StatelessWidget {
  void playSound(int soundNumber) {
    final player = AudioCache();
    player.play('sounds/note$soundNumber.wav');
  }
}
```

```
Expanded buildKey({Color? color, int? soundNumber}) {
  return Expanded(
    child: FlatButton(
      child: Text(""),
      color: color,
      onPressed: () {
        playSound(soundNumber!);
      },
    ),
  );
}
```

```
@override
Widget build(BuildContext context) {
  return MaterialApp(
    home: Scaffold(
      backgroundColor: Colors.black,
      body: SafeArea(
        child: Column(
          crossAxisAlignment: CrossAxisAlignment.stretch,
          children: <Widget>[
            buildKey(color: Colors.red, soundNumber: 1),
            buildKey(color: Colors.orange, soundNumber: 2),
            buildKey(color: Colors.yellow, soundNumber: 3),
            buildKey(color: Colors.green, soundNumber: 4),
            buildKey(color: Colors.teal, soundNumber: 5),
            buildKey(color: Colors.blue, soundNumber: 6),
            buildKey(color: Colors.purple, soundNumber: 7),
          ],
        ),
      ),
    ),
  );
}
```

<https://pub.dev/packages/audioplayers/install>

Example - 15

```

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

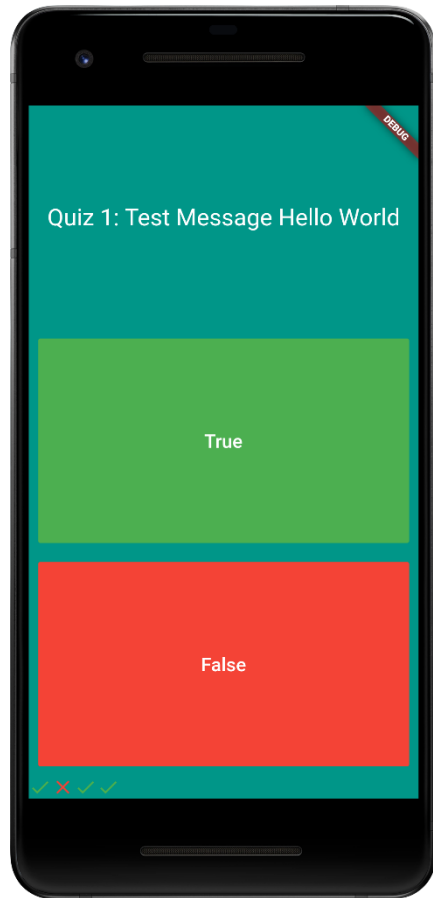
void main() {
  return runApp(HafeezMainHomeApp());
}

class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

class HafeezPageBody extends State<HafeezMainHomeApp> {
  List<Icon> iconsMyList = [
    Icon(
      Icons.check,
      color: Colors.green,
    ),
    Icon(
      Icons.close,
      color: Colors.red,
    ),
    Icon(
      Icons.check,
      color: Colors.green,
    ),
    Icon(
      Icons.check,
      color: Colors.green,
    ),
  ];

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,
          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.spaceBetween,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(10.0),
                    child: Center(
                      child: Text(
                        "Quiz 1: Test Message Hello World",
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          fontSize: 25,
                          color: Colors.white,
                        ),
                      ),
                    ),
                  ),
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(15.0),
                    child: FlatButton(
                      textColor: Colors.white,
                      color: Colors.green,
                      child: Text(
                        "True",
                        style: TextStyle(
                          color: Colors.white,
                          fontSize: 20,
                        ),
                      ),
                      onPressed: () {
                        setState(() {
                          iconsMyList.add(Icon(Icons.check, color: Colors.green));
                        });
                      },
                    ),
                  ),
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(15.0),
                    child: FlatButton(
                      textColor: Colors.white,
                      color: Colors.red,
                      child: Text(
                        "False",
                        style: TextStyle(
                          color: Colors.white,
                          fontSize: 20,
                        ),
                      ),
                      onPressed: () {
                        setState(() {
                          iconsMyList.add(Icon(Icons.close, color: Colors.red));
                        });
                      },
                    ),
                  ),
                // Row(
                //   children: [
                //     Icon(
                //       Icons.check,
                //       color: Colors.green,
                //     ),
                //     Icon(
                //       Icons.close,
                //       color: Colors.red,
                //     ),
                //   ],
                // ),
                Row(children: iconsMyList)
              ],
            ),
          ),
        ),
      );
  }
}

```



## Example - 16

UI Design – Show Icons by ArrayList

```

11 List<Icon> scoreKeeper = [
12     Icon(
13         Icons.check,
14         color: Colors.green,
15     ),
16     Icon(
17         Icons.close,
18         color: Colors.red,
19     ),
20     Icon(
21         Icons.check,
22         color: Colors.green,
23     ),
24     Icon(
25         Icons.check,
26         color: Colors.green,
27     ),
28 ];

```

```

76 Expanded(
77     child: Padding(
78         padding: EdgeInsets.all(10),
79         child: FlatButton(
80             textColor: Colors.white,
81             color: Colors.red,
82             child: Text(
83                 "False",
84                 style: TextStyle(
85                     color: Colors.white,
86                     fontSize: 20,
87                 ), // TextStyle
88             ), // Text
89             onPressed: () {},
90         ), // FlatButton
91     ), // Padding
92 ), // Expanded
93
94 // Row(
95 //     children: [
96 //         Icon(
97 //             Icons.check,
98 //             color: Colors.green,
99 //         ),
100 //         Icon(
101 //             Icons.close,
102 //             color: Colors.red,
103 //         ),
104 //     ],
105 // ),
106
107 Row(children: scoreKeeper)

```

```

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

void main() {
  return runApp(HafeezMainHomeApp());
}

class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

class HafeezPageBody extends State<HafeezMainHomeApp> {
  List<Icon> iconsMyList = [];

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

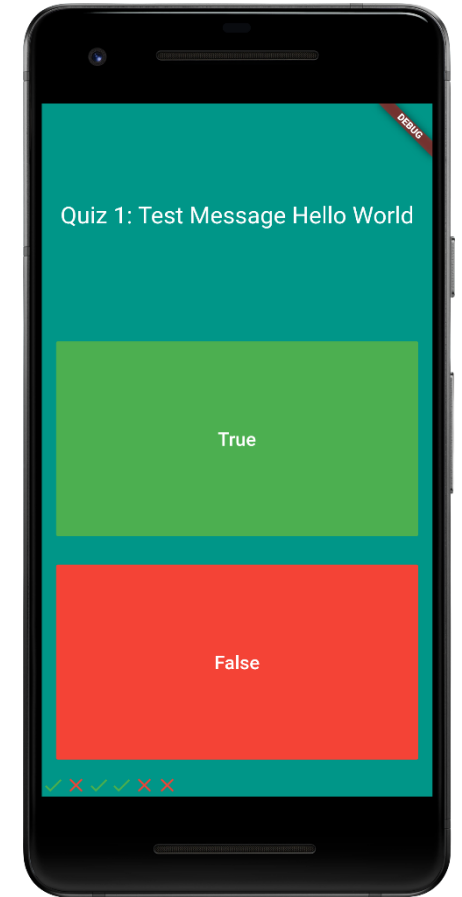
          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.spaceBetween,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(10.0),
                    child: Center(
                      child: Text(
                        "Quiz 1: Test Message Hello World",
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          fontSize: 25,
                          color: Colors.white,
                        ),
                      ),
                    ),
                  ),
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(15.0),
                    child: FlatButton(
                      textColor: Colors.white,
                      color: Colors.green,
                      child: Text(
                        "True",
                        style: TextStyle(
                          color: Colors.white,
                          fontSize: 20,
                        ),
                      ),
                      onPressed: () {
                        setState(() {
                          iconsMyList.add(Icon(Icons.check, color: Colors.green));
                        });
                      },
                    ),
                  ),
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(15.0),
                    child: FlatButton(
                      textColor: Colors.white,
                      color: Colors.red,
                      child: Text(
                        "False",
                        style: TextStyle(
                          color: Colors.white,
                          fontSize: 20,
                        ),
                      ),
                      onPressed: () {
                        setState(() {
                          iconsMyList.add(Icon(Icons.close, color: Colors.red));
                        });
                      },
                    ),
                  ),
                Row(children: iconsMyList),
              ],
            ),
          ),
        ),
      );
  }
}

```

```

67 Expanded(
68   child: Padding(
69     padding: EdgeInsets.all(15.0),
70     child: FlatButton(
71       textColor: Colors.white,
72       color: Colors.red,
73       child: Text(
74         "False",
75         style: TextStyle(
76           color: Colors.white,
77           fontSize: 20,
78         ), // TextStyle
79       ), // Text
80       onPressed: () {
81         setState(() {
82           iconsMyList.add(Icon(Icons.close, color: Colors.red));
83         });
84       },
85     ), // FlatButton
86   ), // Padding
87 ), // Expanded
88
89 Row(children: iconsMyList),

```



## Example - 17

UI Design – ArrayList add dynamic icons



```

import 'package:flutter/material.dart';

void main() {
  return runApp(HafeezMainHomeApp());
}

class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

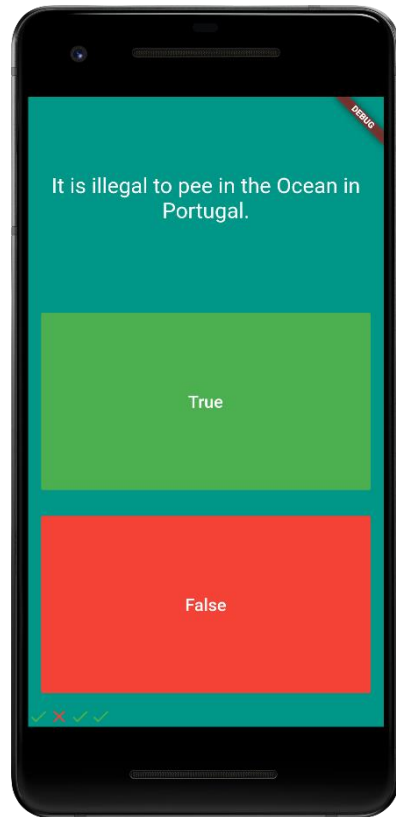
class HafeezPageBody extends State<HafeezMainHomeApp> {
  List<Icon> iconsMyList = [];
  List<String>myQuestions = [
    'Some cats are actually allergic to humans',
    'You can lead a cow down stairs but not up stairs.',
    'Approximately one quarter of human bones are in the feet.',
    'A slug\'s blood is green.',
    'It is illegal to pee in the Ocean in Portugal.'
  ];

  List<bool>myQuestionsAnswer = [true, false, true, true, false];
  var readQuestionNumber = 0;

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,
          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.spaceBetween,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(10.0),
                    child: Center(
                      child: Text(
                        myQuestions[readQuestionNumber],
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          fontSize: 25,
                          color: Colors.white,
                        ),
                      ),
                    ),
                  ),
                  onPressed: () {
                    setState(() {
                      if(myQuestionsAnswer[readQuestionNumber]){
                        iconsMyList.add(Icon(Icons.check, color: Colors.green));
                      }
                      else {
                        iconsMyList.add(Icon(Icons.close, color: Colors.red));
                      }
                    });
                    if(myQuestions.length == readQuestionNumber+1){
                      print('You\'ve reached the end of the quiz.');
```

```

15 List<Icon> iconsMyList = [];
16 List <String>myQuestions = [
17   'Some cats are actually allergic to humans',
18   'You can lead a cow down stairs but not up stairs.',
19   'Approximately one quarter of human bones are in the feet.',
20   'A slug\'s blood is green.',
21   'It is illegal to pee in the Ocean in Portugal.'
22 ];
23
24 List <bool>myQuestionsAnswer = [true, false, true, true, false];
25 var readQuestionNumber = 0;
```



```

91 Expanded(
92   child: Padding(
93     padding: EdgeInsets.all(15.0),
94     child: FlatButton(
95       textColor: Colors.white,
96       color: Colors.red,
97       child: Text(
98         "False",
99         style: TextStyle(
100           color: Colors.white,
101           fontSize: 20,
102         ), // TextStyle
103       ), // Text
104       onPressed: () {
105         setState() {
106           if(myQuestionsAnswer[readQuestionNumber]){
107             iconsMyList.add(Icon(Icons.check, color: Colors.green));
108           }
109           else {
110             iconsMyList.add(Icon(Icons.close, color: Colors.red));
111           }
112
113           if(myQuestions.length == readQuestionNumber+1){
114             print('You\'ve reached the end of the quiz.');
```

## Example - 18

ArrayList add dynamic (icons) according to correct answer – finish print console message and than restart again quiz

```

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

void main() {
  return runApp(HafeezMainHomeApp());
}

class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

class HafeezPageBody extends State<HafeezMainHomeApp> {
  List<Icon> iconsMyList = [];

  List<Question> myQuestionsList = [
    Question('Some cats are actually allergic to humans', true),
    Question('You can lead a cow down stairs but not up stairs', false),
    Question('Approximately one quarter of human bones are in the feet', true),
    Question('A slug's blood is green', true),
    Question('It is illegal to pee in the Ocean in Portugal', true),
  ];

  var readQuestionNumber = 0;

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,
          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.spaceBetween,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(10.0),
                    child: Center(
                      child: Text(
                        myQuestionsList[readQuestionNumber].questionText,
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          fontSize: 25,
                          color: Colors.white,
                        ),
                      ),
                    ),
                  ),
                  child: Padding(
                    padding: EdgeInsets.all(15.0),
                    child: Row(
                      mainAxisAlignment: MainAxisAlignment.spaceBetween,
                      children: [
                        Expanded(
                          child: Text(
                            'True',
                            style: TextStyle(
                              color: Colors.white,
                              fontSize: 20,
                            ),
                          ),
                        Expanded(
                          child: Text(
                            'False',
                            style: TextStyle(
                              color: Colors.white,
                              fontSize: 20,
                            ),
                          ),
                        ),
                      ],
                    ),
                  ),
                ),
                Row(
                  children: iconsMyList,
                ),
              ],
            ),
          ),
        ),
      );
  }

  void _onPressedTrue() {
    setState(() {
      if(myQuestionsList[readQuestionNumber].questionAnswer == true) {
        iconsMyList.add(Icon(Icons.check, color: Colors.green));
      } else {
        iconsMyList.add(Icon(Icons.close, color: Colors.red));
      }

      if(myQuestionsList.length == readQuestionNumber+1) {
        print('You've reached the end of the quiz!');
        readQuestionNumber = 0;
        iconsMyList = [];
      } else {
        readQuestionNumber++;
      }
    });
  }

  void _onPressedFalse() {
    setState(() {
      if(myQuestionsList[readQuestionNumber].questionAnswer == false) {
        iconsMyList.add(Icon(Icons.check, color: Colors.green));
      } else {
        iconsMyList.add(Icon(Icons.close, color: Colors.red));
      }

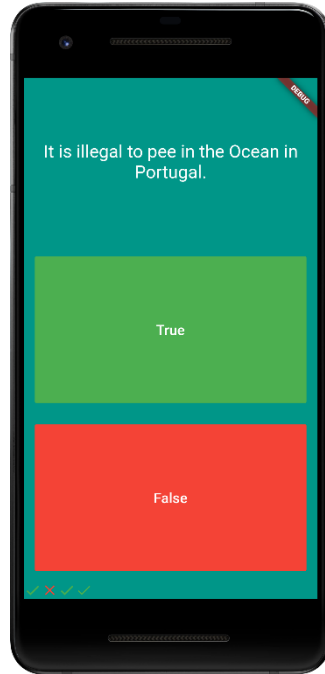
      if(myQuestionsList.length == readQuestionNumber+1) {
        print('You've reached the end of the quiz!');
        readQuestionNumber = 0;
        iconsMyList = [];
      } else {
        readQuestionNumber++;
      }
    });
  }
}

```

```

class Question {
  String questionText;
  bool questionAnswer;
  Question(this.questionText, this.questionAnswer);
}

```



## Example - 19

ArrayList Object add dynamic according to correct answer – finish print console message and than restart again quiz

```

main.dart x question.dart x
1 import 'package:flutter/material.dart';
2 import 'question.dart';
3
4 void main() {
5   return runApp(HafeezMainHomeApp());
6 }
7
8 class HafeezMainHomeApp extends StatefulWidget {
9   @override
10  HafeezPageBody createState() => HafeezPageBody();
11 }
12
13 class HafeezPageBody extends State<HafeezMainHomeApp> {
14
15   List<Icon> iconsMyList = [];
16   List<Question> myQuestionsList = [
17     Question('Some cats are actually allergic to humans', true),
18     Question('You can lead a cow down stairs but not up stairs.', false),
19     Question('Approximately one quarter of human bones are in the feet.', true),
20     Question('A slug's blood is green.', true),
21     Question('It is illegal to pee in the Ocean in Portugal.', true),
22   ];
23
24   var readQuestionNumber = 0;

```

```

assignment_19 C:\Users\LE
> .dart_tool
> .idea
> android
> build
> ios
> lib
  main.dart
  question.dart
1 class Question {
2
3   String questionText;
4   bool questionAnswer;
5   Question(this.questionText, this.questionAnswer);
6
7 }

```

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

QuizBrain quizBrain = QuizBrain();

void main() {
  return runApp(HafeezMainHomeApp());
}

class HafeezMainHomeApp extends StatefulWidget {
  @override
  HafeezPageBody createState() => HafeezPageBody();
}

class HafeezPageBody extends State<HafeezMainHomeApp> {
  List<Icon> iconsMyList = [];

  @override
  Widget build(BuildContext context) {
    return
      MaterialApp(
        home: Scaffold(
          backgroundColor: Colors.teal,

          body: SafeArea(
            child: Column(
              mainAxisAlignment: MainAxisAlignment.spaceBetween,
              crossAxisAlignment: CrossAxisAlignment.stretch,
              children: [
                Expanded(
                  child: Padding(
                    padding: EdgeInsets.all(10.0),
                    child: Center(
                      child: Text(
                        quizBrain.getQuestionText(),
                        textAlign: TextAlign.center,
                        style: TextStyle(
                          fontSize: 25,
                          color: Colors.white,
                        ),
                      ),
                    ),
                  ),
                  Expanded(
                    child: Padding(
                      padding: EdgeInsets.all(15.0),
                      child: FlatButton(
                        textColor: Colors.white,
                        color: Colors.green,
                        child: Text(
                          "True",
                          style: TextStyle(
                            color: Colors.white,
                            fontSize: 20,
                          ),
                        ),
                        onPressed: () {
                          setState(() {
                            quizBrain.reset();
                            iconsMyList.add(Icon(Icons.check, color: Colors.green));
                          });
                        },
                      ),
                    ),
                  Expanded(
                    child: Padding(
                      padding: EdgeInsets.all(15.0),
                      child: FlatButton(
                        textColor: Colors.white,
                        color: Colors.red,
                        child: Text(
                          "False",
                          style: TextStyle(
                            color: Colors.white,
                            fontSize: 20,
                          ),
                        ),
                        onPressed: () {
                          setState(() {
                            if(quizBrain.getCorrectAnswer()){
                              iconsMyList.add(Icon(Icons.check, color: Colors.green));
                            } else {
                              iconsMyList.add(Icon(Icons.close, color: Colors.red));
                            }
                          });
                        },
                      ),
                    ),
                  ),
                ),
                Row(children: iconsMyList,
                  ),
                ),
              ],
            ),
          ),
        ),
      );
  }
}
```

```
class Question {
    String questionText;
    bool questionAnswer;
    Question(this.questionText, this.questionAnswer);
}
```

```
import 'question.dart';
class QuizBrain {
```

```
var readQuestionNumber = 0;
```

```
List<Question> myQuestionsList = [
    Question('Some cats are actually allergic to humans', true),
    Question('You can lead a cow down stairs but not up stairs.', false),
    Question('Approximately one quarter of human bones are in the feet.', true),
    Question('A slug\'s blood is green.', true),
    Question('It is illegal to pee in the Ocean in Portugal.', true),
];
```

```
void nextQuestion() {
    if (readQuestionNumber < myQuestionsList.length - 1) {
        readQuestionNumber++;
    }
}
```

```
String getQuestionText() {
    return myQuestionsList[readQuestionNumber].questionText;
}
```

```
bool getCorrectAnswer() {
    return myQuestionsList[readQuestionNumber].questionAnswer;
}
```

```
bool isFinished() {
    if (readQuestionNumber >= myQuestionsList.length - 1) {
        print('Now returning true');
        return true;
    } else {
        return false;
    }
}
```

```
void reset() {
    readQuestionNumber = 0;
}
```

The screenshot shows an IDE with the following components:

- Top Bar:** File, Edit, View, Navigate, Code, Refactor, Build, Run, Tools, VC, Window, Help. The active window is "assignment\_20 - quiz\_brain.dart".
- Project Explorer (Left):** Shows the project structure for "assignment\_20". The "lib" directory is expanded, showing "main.dart" (selected with a red arrow) and "quiz\_brain.dart". Other files include ".dart\_tool", ".idea", ".android", ".gradle", ".gitignore", "assignment\_20\_android", "build.gradle", "gradle.properties", "gradlew.bat", "local.properties", "settings.gradle", "ios", "test", ".gitignore", ".metadata", ".packages", "analysis\_options.yaml", "assignment\_20.xml", "pubspec.lock", "pubspec.yaml", and "README.md".
- Editor (Right):** Displays the Dart code for "quiz\_brain.dart". The code is as follows:
 

```
import 'question.dart';

class QuizBrain {

  var readQuestionNumber = 0;

  List<Question> myQuestionsList = [
    Question('Some cats are actually allergic to humans', true),
    Question('You can lead a cow down stairs but not up stairs.', false),
    Question('Approximately one quarter of human bones are in the feet.', true),
    Question('A slug\'s blood is green.', true),
    Question('It is illegal to pee in the Ocean in Portugal.', true),
  ];

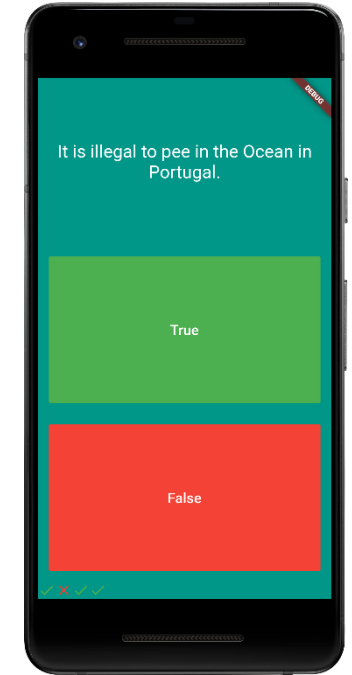
  void nextQuestion() {
    if (readQuestionNumber < myQuestionsList.length - 1) {
      readQuestionNumber++;
    }
  }

  String getQuestionText() {
    return myQuestionsList[readQuestionNumber].questionText;
  }

  bool getCorrectAnswer() {
    return myQuestionsList[readQuestionNumber].questionAnswer;
  }

  bool isFinished() {
    if (readQuestionNumber == myQuestionsList.length - 1) {
      print('Now returning true!');
      return true;
    } else {
      return false;
    }
  }

  void reset() {
    readQuestionNumber = 0;
  }
}
```



## Example - 20

ArrayList Object add dynamic according to correct answer – finish print console message and than restart again quiz

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

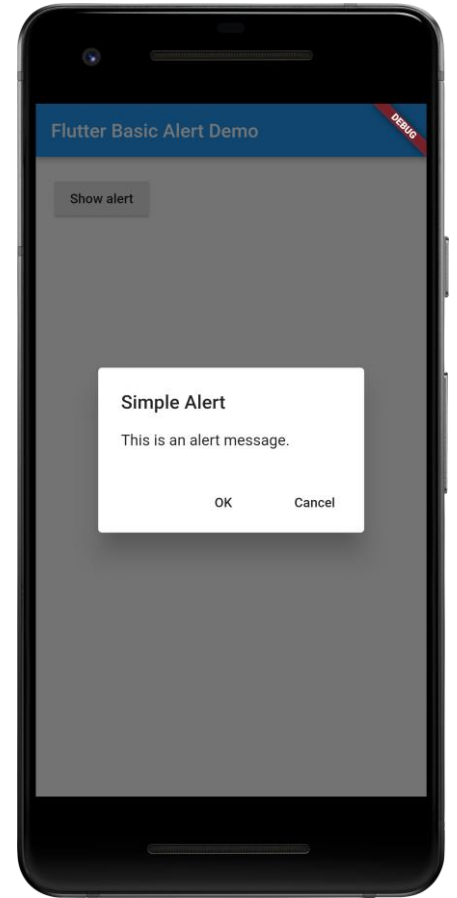
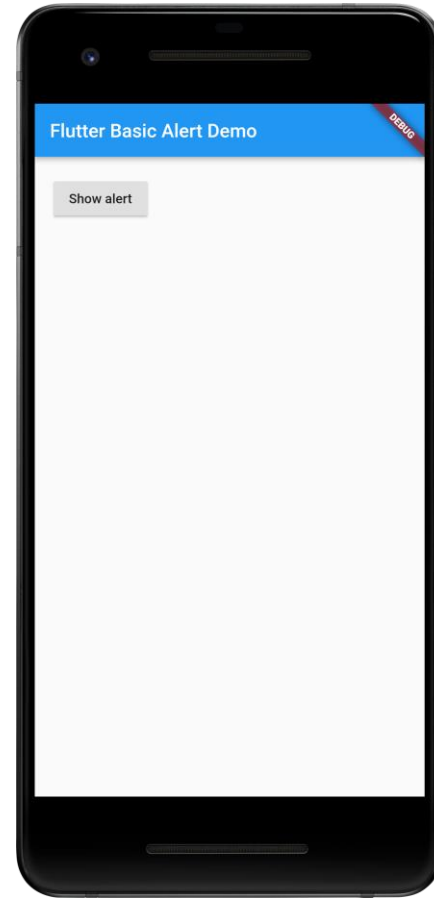
void main() => runApp(MyApp());

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(
          title: Text('Flutter Basic Alert Demo'),
        ),
        body: HomePage(),
      ),
    );
  }
}

class HomePage extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Padding(
      padding: const EdgeInsets.all(20.0),
      child: RaisedButton(
        child: Text('Show alert'),
        onPressed: () {
          showAlertDialog(context);
        },
      ),
    );
  }
}

showAlertDialog(BuildContext context) {
  showDialog(
    context: context,
    builder: (BuildContext context) {
      return AlertDialog(
        title: Text("Simple Alert"),
        content: Text("This is an alert message."),
        actions: [
          FlatButton(
            child: Text("OK"),
            onPressed: () {
              print("okay press");
              Navigator.of(context).pop();
            },
          ),
          FlatButton(
            child: Text("Cancel"),
            onPressed: () {
              print("Cancel press");
              Navigator.of(context).pop();
            },
          ),
        ],
      );
    },
  );
}
```

```
19 class HomePage extends StatelessWidget {
20   @override
21   Widget build(BuildContext context) {
22     return Padding(
23       padding: const EdgeInsets.all(20.0),
24       child: RaisedButton(
25         child: Text('Show alert'),
26         onPressed: () {
27           showAlertDialog(context);
28         },
29       ), // RaisedButton
30     ); // Padding
31   }
32 }
33
34 showAlertDialog(BuildContext context) {
35   showDialog(
36     context: context,
37     builder: (BuildContext context) {
38       return AlertDialog(
39         title: Text("Simple Alert"),
40         content: Text("This is an alert message."),
41         actions: [
42           FlatButton(
43             child: Text("OK"),
44             onPressed: () {
45               print("okay press");
46               Navigator.of(context).pop();
47             },
48           ), // FlatButton
49           FlatButton(
50             child: Text("Cancel"),
51             onPressed: () {
52               print("Cancel press");
53               Navigator.of(context).pop();
54             },
55           ), // FlatButton
56         ],
57       ); // AlertDialog
58     },
59   );
60 }
```



Example - 22

Alert Dialog Simple

```

import 'package:flutter/material.dart';

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

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

class MyHomePage extends StatefulWidget {
  @override
  State<MyHomePage> createState() => _MyHomePageState();
}

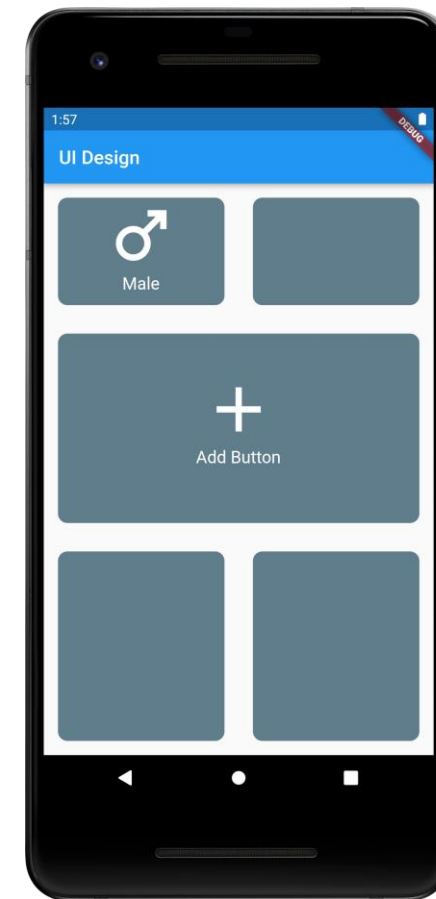
class _MyHomePageState extends State<MyHomePage> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text("UI Design")),
      body: Column(
        children: [
          Expanded(
            child: Row(
              children: [
                Expanded(
                  child: Container(
                    margin: EdgeInsets.all(15),
                    child: Column(
                      children: [
                        Icon(
                          Icons.male, size: 80,
                          color: Colors.white,
                        ),
                        Text(
                          "Male",
                          style: TextStyle(
                            color: Colors.white,
                            fontSize: 18,
                          ),
                        ),
                      ],
                    ),
                    decoration: BoxDecoration(
                      color: Colors.blueGrey,
                      borderRadius: BorderRadius.circular(10),
                    ),
                    height: 200,
                    width: 170,
                  ),
                Expanded(
                  child: Container(
                    margin: EdgeInsets.all(15),
                    decoration: BoxDecoration(
                      color: Colors.blueGrey,
                      borderRadius: BorderRadius.circular(10),
                    ),
                    height: 200,
                    width: 170,
                  ),
                ),
              ],
            ),
          ),
          Row(
            children: [
              Expanded(
                child: Container(
                  margin: EdgeInsets.all(15),
                  child: Column(
                    children: [
                      SizedBox(height: 40),
                      Icon(
                        Icons.add, size: 80,
                        color: Colors.white,
                      ),
                      Text(
                        "Add Button",
                        style: TextStyle(
                          color: Colors.white,
                          fontSize: 18,
                        ),
                      ),
                    ],
                    decoration: BoxDecoration(
                      color: Colors.blueGrey,
                      borderRadius: BorderRadius.circular(10),
                    ),
                    height: 200,
                    width: 170,
                  ),
                ),
              ),
              Row(
                children: [
                  Expanded(
                    child: Container(
                      margin: EdgeInsets.all(15),
                      decoration: BoxDecoration(
                        color: Colors.blueGrey,
                        borderRadius: BorderRadius.circular(10),
                      ),
                      height: 200,
                      width: 170,
                    ),
                  ),
                  Expanded(
                    child: Container(
                      margin: EdgeInsets.all(15),
                      decoration: BoxDecoration(
                        color: Colors.blueGrey,
                        borderRadius: BorderRadius.circular(10),
                      ),
                      height: 200,
                      width: 170,
                    ),
                  ),
                ],
              ),
            ],
          ),
        ],
      ),
    );
  }
}

```

```

Row(
  children: [
    Expanded(
      child: Container(
        margin: EdgeInsets.all(15),
        child: Column(
          children: [
            SizedBox(height: 40),
            Icon(
              Icons.add, size: 80,
              color: Colors.white,
            ), // Icon
            Text(
              "Add Button",
              style: TextStyle(
                color: Colors.white,
                fontSize: 18,
              ), // TextStyle
            ), // Text
          ],
        ), // Column
        decoration: BoxDecoration(
          color: Colors.blueGrey,
          borderRadius: BorderRadius.circular(10),
        ), // BoxDecoration
        height: 200,
        width: 170,
      ), // Container
    ), // Expanded
  ],
), // Row

```



## Example - 23

UI Design Cards within Icon and Text

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

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

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

class MyHomePage extends StatefulWidget {
  @override
  State<MyHomePage> createState() => _MyHomePageState();
}

class _MyHomePageState extends State<MyHomePage> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text("UI Design")),
      body: Column(
        children: [
          MyCard(icon: Icons.male, labelText: "Icon 01"),
          MyCard(icon: Icons.female, labelText: "Icon 02"),
        ],
      ),
    );
  }
}

class MyCard extends StatelessWidget {
  MyCard({required this.icon, required this.labelTxt});
  final IconData icon;
  final String labelTxt;

  @override
  Widget build(BuildContext context) {
    return
    Row(
      children: [
        Expanded(
          child: Container(
            margin: EdgeInsets.all(15),
            child: Column(
              children: [
                SizedBox(height: 40),
                Icon(
                  icon,
                  size: 80,
                ),
                Text(
                  labelTxt,
                  style: TextStyle(
                    color: Colors.white,
                    fontSize: 18,
                  ),
                ),
              ],
            ),
            decoration: BoxDecoration(
              color: Colors.blueGrey,
              borderRadius: BorderRadius.circular(10),
            ),
            height: 200,
            width: 170,
          ),
        ),
      ],
    );
  }
}
```

```
22 class _MyHomePageState extends State<MyHomePage> {
23
24   @override
25   Widget build(BuildContext context) {
26     return Scaffold(
27       appBar: AppBar(title: Text("UI Design")),
28       body: Column(
29         children: [
30           MyCard(icon: Icons.male, labelText: "Icon 01"),
31           MyCard(icon: Icons.female, labelText: "Icon 02"),
32         ],
33       ), // Column
34     ); // Scaffold
35   }
36 }
37
38 class MyCard extends StatelessWidget {
39
40   MyCard({required this.icon, required this.labelTxt});
41   final IconData icon;
42   final String labelTxt;
43
44   @override
45   Widget build(BuildContext context) {
46     return
47     Row(
48       children: [
49         Expanded(
50           child: Container(
51             margin: EdgeInsets.all(15),
52           child: Column(
```



## Example - 24

Create Components – Call Component by Function  
with Parameters (Icon, Text)

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

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

```
class MyApp extends StatelessWidget {
```

```
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: MyHomePage(),
    );
  }
}
```

```
class MyHomePage extends StatefulWidget {
```

```
  @override
  State<MyHomePage> createState() =>
  _MyHomePageState();
}
```

```
class _MyHomePageState extends State<MyHomePage> {
```

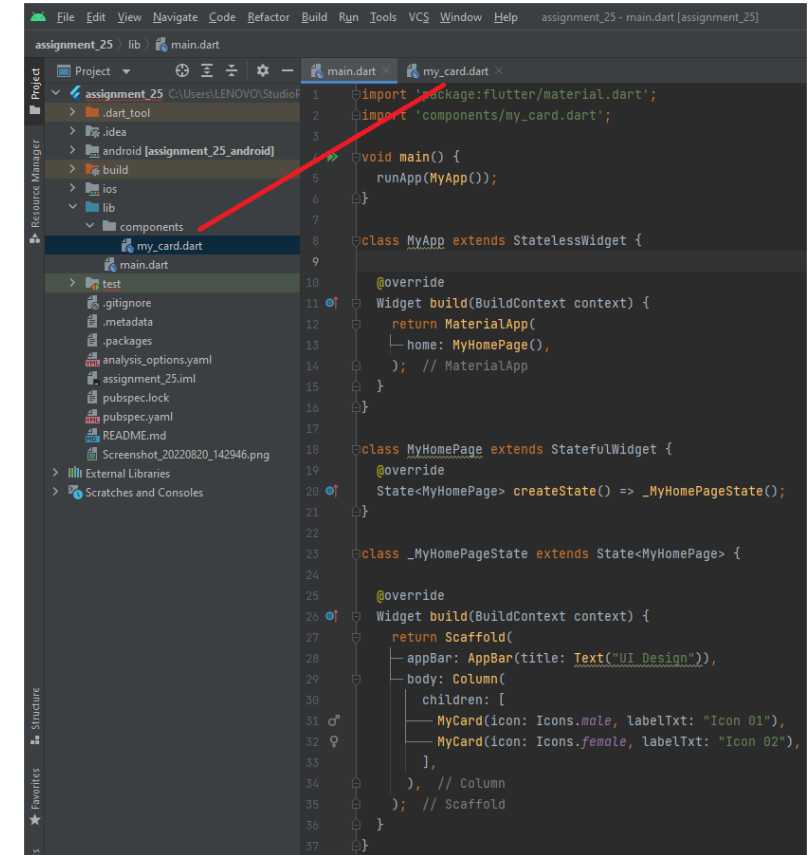
```
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text("UI Design")),
      body: Column(
        children: [
          MyCard(icon: Icons.male, labelText: "Icon 01"),
          MyCard(icon: Icons.female, labelText: "Icon 02"),
        ],
      ),
    );
  }
}
```

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

```
class MyCard extends StatelessWidget {
```

```
  MyCard({required this.icon, required this.labelTxt});
  final IconData icon;
  final String labelTxt;
```

```
  @override
  Widget build(BuildContext context) {
    return
    Row(
      children: [
        Expanded(
          child: Container(
            margin: EdgeInsets.all(15),
            child: Column(
              children: [
                SizedBox(height: 40),
                Icon(
                  icon,
                  size: 80,
                ),
                Text(
                  labelText,
                  style: TextStyle(
                    color: Colors.white,
                    fontSize: 18,
                  ),
                ),
              ],
            ),
            decoration: BoxDecoration(
              color: Colors.blueGrey,
              borderRadius: BorderRadius.circular(10),
            ),
            height: 200,
            width: 170,
          ),
        ),
      ],
    );
  }
}
```



Example - 25

Create Components – Call Component by Function with Parameters (Icon, Text) – Separate File



```

import 'package:flutter/material.dart';

void main() {
  runApp(const MaterialApp(
    title: 'Navigation Basics',
    home: LoginPage(),
  ));
}

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('Login Page'),
      ),
      body: Center(
        child: Column(
          children: [
            ElevatedButton(
              child: const Text('Go to SignUp Page'),
              onPressed: () {
                Navigator.push(
                  context,
                  MaterialPageRoute(builder: (context) => const SignupPage()),
                );
              },
            ),
            ElevatedButton(
              onPressed: () {
                Navigator.pushAndRemoveUntil(
                  context,
                  MaterialPageRoute(
                    builder: (BuildContext context) => HomePage(),
                  ),
                  (route) => false,
                );
              },
              child: const Text('Move to Home Page'),
            ),
          ],
        ),
      ),
    );
  }
}

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('SignUp Page'),
      ),
      body: Center(
        child: Column(
          children: [
            ElevatedButton(
              onPressed: () {
                Navigator.pop(context);
              },
              child: const Text('Back to Login'),
            ),
            ElevatedButton(
              onPressed: () {
                Navigator.pushAndRemoveUntil(
                  context,
                  MaterialPageRoute(
                    builder: (BuildContext context) => HomePage(),
                  ),
                  (route) => false,
                );
              },
              child: const Text('Move to Home Page'),
            ),
          ],
        ),
      ),
    );
  }
}

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: const Text('Home Page'),
      ),
      body: Center(
        child: ElevatedButton(
          onPressed: () {
            Navigator.pushAndRemoveUntil(
              context,
              MaterialPageRoute(
                builder: (BuildContext context) => LoginPage(),
              ),
              (route) => false,
            );
          },
          child: const Text('Logout'),
        ),
      ),
    );
  }
}

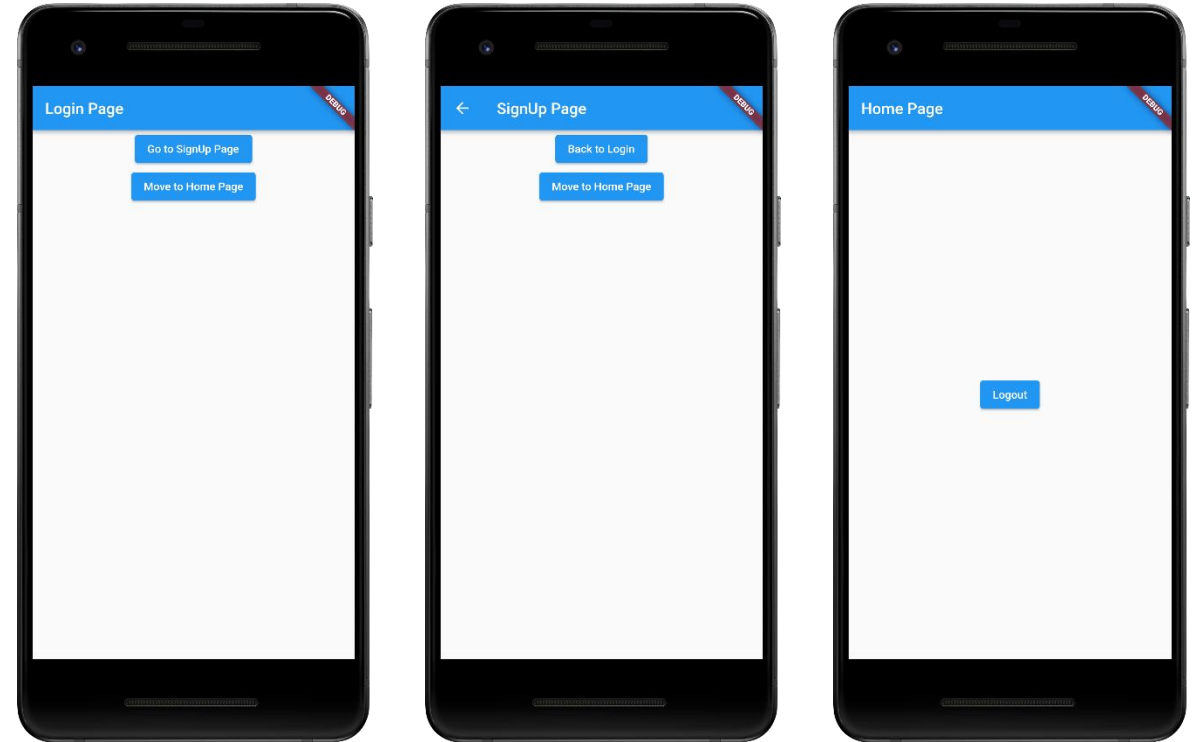
```

```

ElevatedButton(
  child: const Text('Go to SignUp Page'),
  onPressed: () {
    Navigator.push(
      context,
      MaterialPageRoute(builder: (context) => const SignupPage()),
    );
  },
), // ElevatedButton

ElevatedButton(
  onPressed: () {
    Navigator.pushAndRemoveUntil(
      context,
      MaterialPageRoute(
        builder: (BuildContext context) => HomePage(),
      ),
      (route) => false,
    );
  },
  child: const Text('Move to Home Page'),
), // ElevatedButton

```



## Example - 26

Page Navigation Simple  
Call Activity (or) Page

Login -> Signup -> Home



```
import 'package:flutter/material.dart';
void main() => runApp(MyApp());

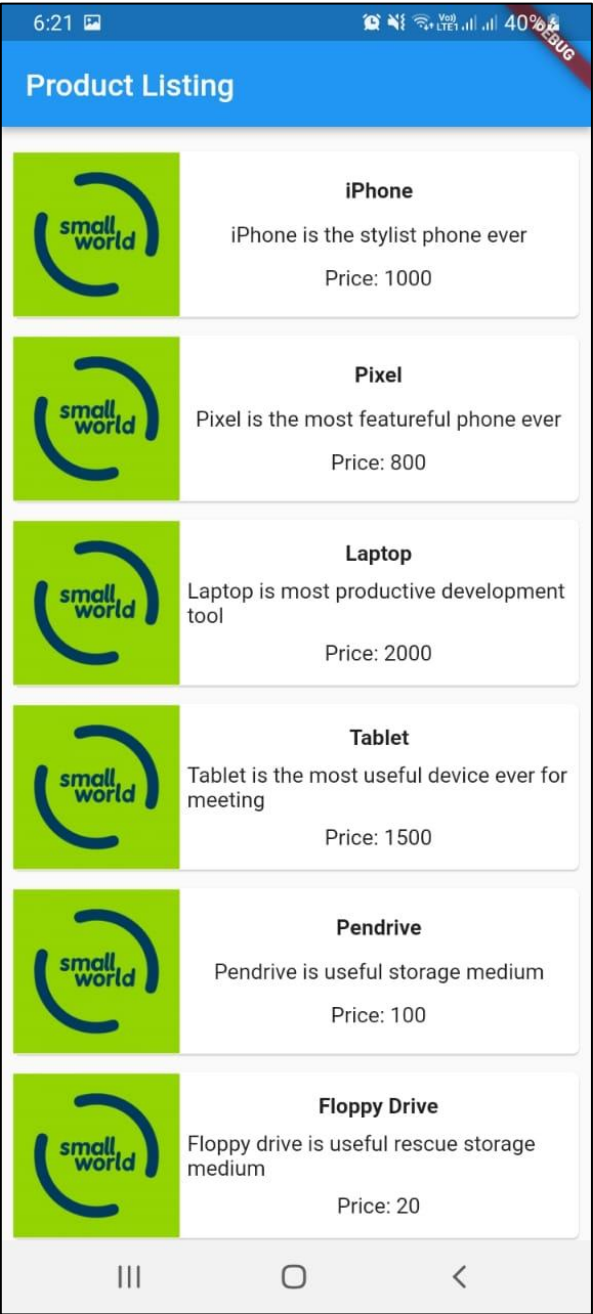
class MyApp extends StatelessWidget {
  // This widget is the root of your application.
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Demo', theme: ThemeData(
        primarySwatch: Colors.blue,
      ),
      home: MyHomePage(title: 'Product layout demo home page'),
    );
  }
}

class MyHomePage extends StatelessWidget {
  MyHomePage(Key? key, required this.title) : super(key: key);
  final String title;

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: Text("Product Listing")),
      body: ListView(
        shrinkWrap: true,
        padding: const EdgeInsets.fromLTRB(2.0, 10.0, 2.0, 10.0),
        children: <Widget>[
          ProductBox(
            name: "iPhone",
            description: "iPhone is the stylist phone ever",
            price: 1000,
            image: "pic2.png"
          ),
          ProductBox(
            name: "Pixel",
            description: "Pixel is the most featureful phone ever",
            price: 800,
            image: "pic2.png"
          ),
          ProductBox(
            name: "Laptop",
            description: "Laptop is most productive development tool",
            price: 2000,
            image: "pic2.png"
          ),
          ProductBox(
            name: "Tablet",
            description: "Tablet is the most useful device ever for meeting",
            price: 1500,
            image: "pic2.png"
          ),
          ProductBox(
            name: "Pendrive",
            description: "Pendrive is useful storage medium",
            price: 100,
            image: "pic2.png"
          ),
          ProductBox(
            name: "Floppy Drive",
            description: "Floppy drive is useful rescue storage medium",
            price: 20,
            image: "pic2.png"
          ),
        ],
      ),
    );
  }
}

class ProductBox extends StatelessWidget {
  ProductBox(Key? key, required this.name, required this.description, required this.price, required this.image) :
    super(key: key);
  final String name;
  final String description;
  final int price;
  final String image;

  Widget build(BuildContext context) {
    return Container(
      padding: EdgeInsets.all(2),
      height: 120,
      child: Card(
        child: Row(
          mainAxisAlignment: MainAxisAlignment.spaceEvenly,
          children: <Widget>[
            Image.asset("images/" + image),
            Expanded(
              child: Container(
                padding: EdgeInsets.all(5),
                child: Column(
                  mainAxisAlignment: MainAxisAlignment.spaceEvenly,
                  children: <Widget>[
                    Text(
                      this.name, style: TextStyle(
                        fontWeight: FontWeight.bold
                      )
                    ),
                    Text(this.description), Text(
                      "Price: " + this.price.toString()
                    ),
                  ],
                ),
              ),
            ),
          ],
        ),
      ),
    );
  }
}
```



[illegible]