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Class: TE-ITA/B, Semester: VI

Subject: **MAD & PWA LAB**

Experiment – 4: Designing the App layout for mobile Apps.

1. **Aim:** To design a layout of Flutter App using layout widgets.

2. **Objectives:** After study of this experiment, the student will be able to
   - Develop the App UI by using layout widgets.

3. **Outcomes:** After study of this experiment, the student will be able to
   - Design and Develop an interactive Flutter App by using widgets. (L604.2)

4. **Prerequisite:** Dart Programming Language.

5. **Requirements:** Android Studio, Flutter framework, Internet Connection.

6. **Pre-Experiment Exercise:**
   Brief Theory:

   For proper UI design, we have to do 5 things.
   1. Layout the entire screen (aka scene)
   2. Position widgets above and below each other or side by side.
   3. Handle extra space in the scene.
   4. Handle situations when we run out of space and overflow the scene.
   5. Make finer adjustments in positioning.

   The Flutter API provides an extensive set of widgets that can be used to layout the design elements on the app screen, in the form of Layout widgets. Using the layout widgets, we can place widgets side by side or above and beneath, making them scrollable, making them wrap, determining the space around widgets so that they don't feel crowded, and so on. The layout widgets are listed in Figure 1.

Align	FittedBox	Padding
AppBar	Flow	PageView
AspectRatio	FractionallySizedBox	Placeholder
Baseline	GridView	Row
BottomSheet	IndexedStack	Scaffold
ButtonBar	IntrinsicHeight	Scrollable
Card	IntrinsicWidth	Scrollbar
Center	LayoutBuilder	SingleChildScrollView
Column	LimitedBox	SizedBox
ConstrainedBox	ListBody	SizedOverflowBox
Container	ListTile	SliverAppBar
CustomMultiChildLayout	ListView	SnackBar
Divider	MediaQuery	Stack
Expanded	NestedScrollview	Table
ExpansionPanel	OverflowBox	Wrap

Figure 1. Layout widgets in Flutter

7. Laboratory Exercise

A. Program

1. Design the layout of the mobile app by using the following widgets.
   Material App, Scaffold, Container, Row, Column, ListView, GridView, Table.

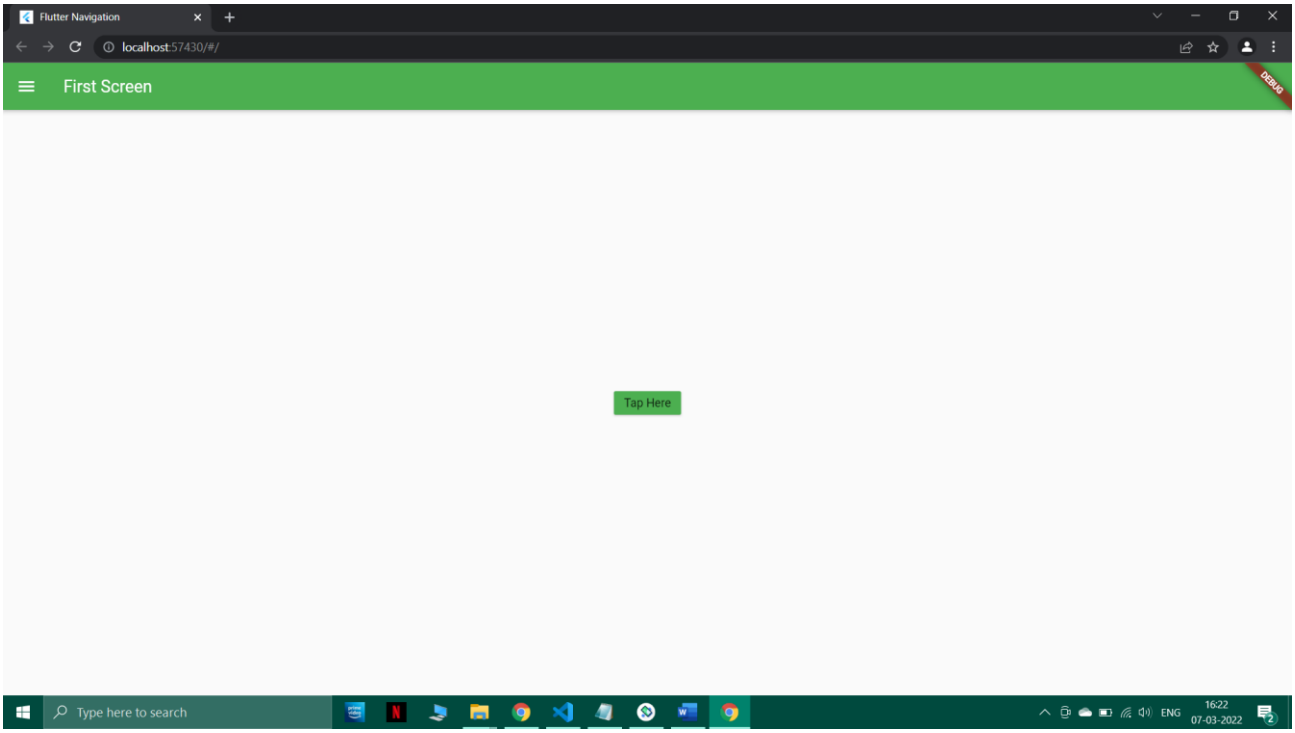
B. Result/Observation

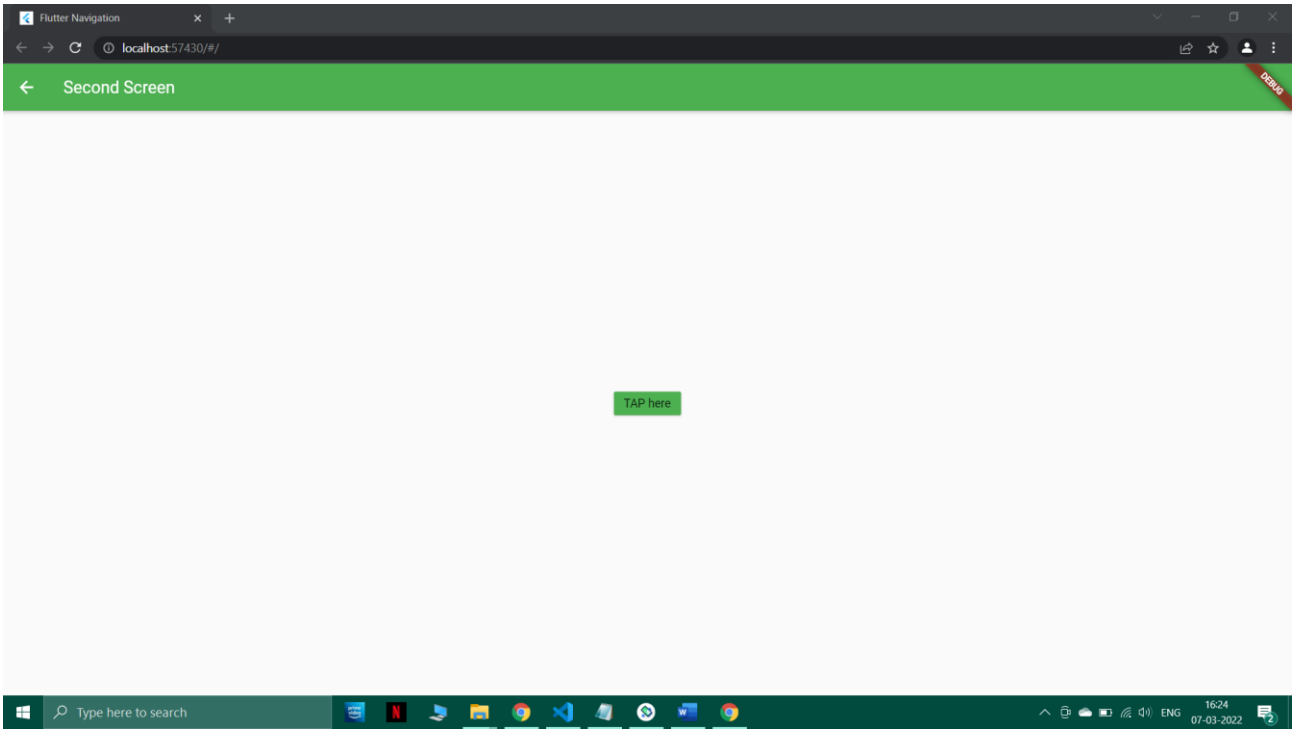
1. Print out of program code and output.

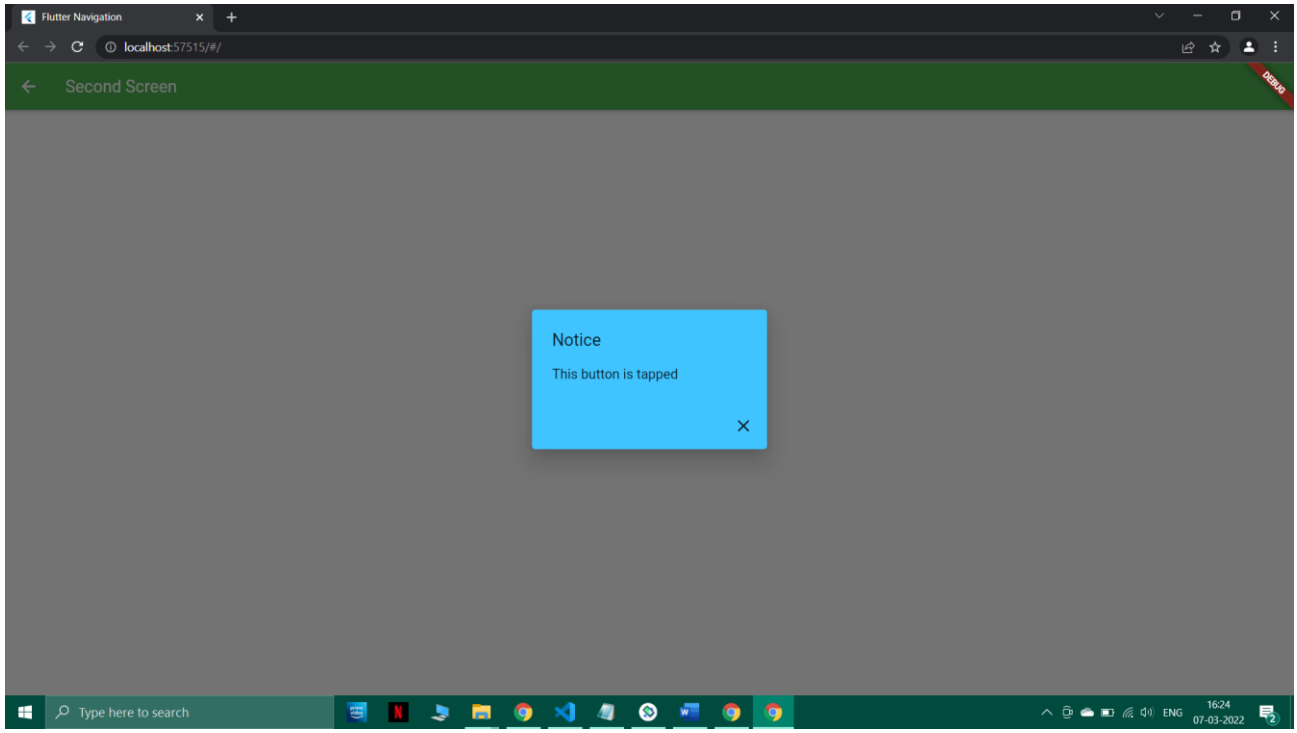
```
import 'package:flutter/material.dart';

void main() {
  runApp(MaterialApp(
    title: 'Flutter Navigation',
    theme: ThemeData(
      // This is the theme of your application.
      primarySwatch: Colors.green,
    ),
    home: FirstRoute(),
  ));
}

class FirstRoute extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      drawer: Drawer(
        child: ListView(
          // Important: Remove any padding from the ListView.
```

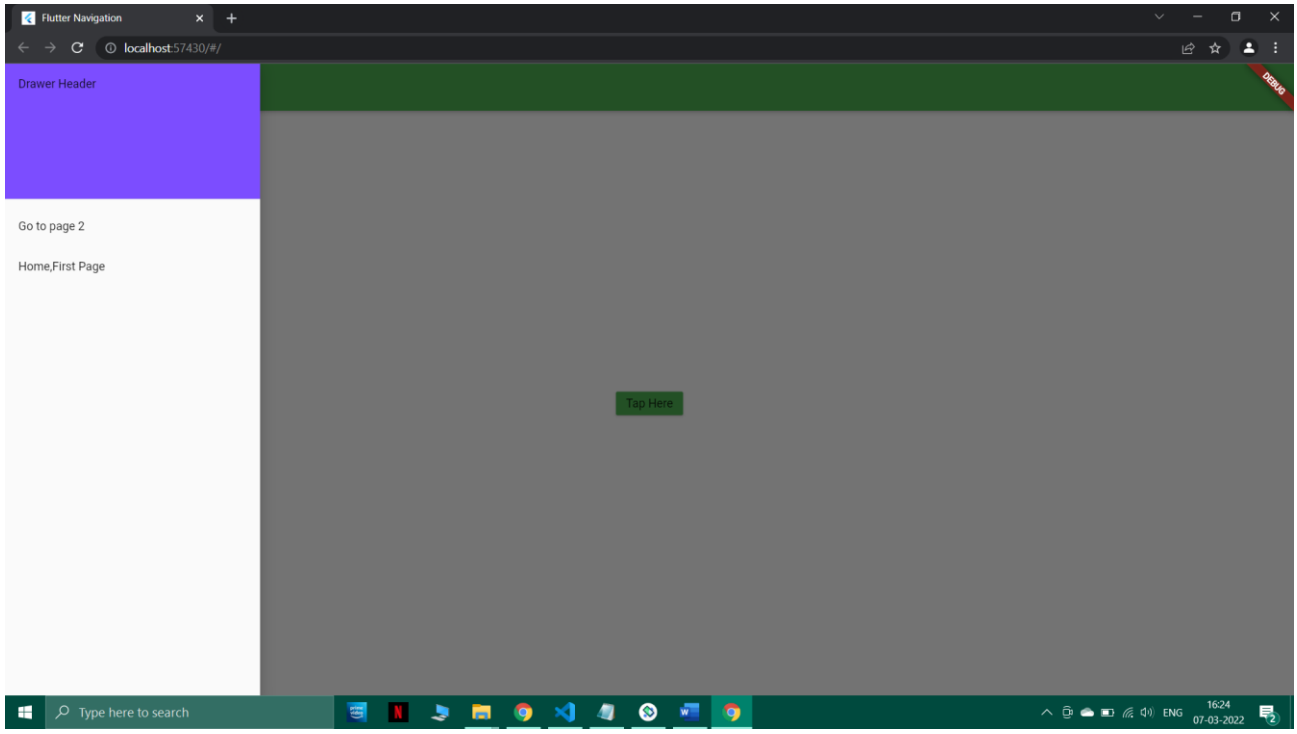
```
      padding: EdgeInsets.zero,
      children: [
        const DrawerHeader(
          decoration: BoxDecoration(
            color: Colors.deepPurpleAccent,
          ),
          child: Text('Drawer Header'),
        ),
        ListTile(
          title: const Text('Go to page 2'),
          onTap: () {
            Navigator.push(
              context,
              MaterialPageRoute(builder: (context) => SecondRoute()),
            );
          },
        ),
        ListTile(
          title: const Text("Home,First Page"),
          onTap: () {
            Navigator.push(
              context,
              MaterialPageRoute(builder: (context) => FirstRoute()),
            );
          },
        ),
      ],
    ),
  ),
  appBar: AppBar(
    title: Text('First Screen'),
  ),
  body: Center(
    child: RaisedButton(
      child: Text('Tap Here'),
      color: Colors.green,
      onPressed: () {
        Navigator.push(
          context,
          MaterialPageRoute(builder: (context) => SecondRoute()),
        );
      },
    ),
  ),
);
```

```
  }
}

class SecondRoute extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text("Second Screen"),
      ),
      body: Center(
        child: RaisedButton(
          color: Colors.green,
          onPressed: () {
            showDialog(
                context: context,
                builder: (BuildContext context) => new AlertDialog(
                      backgroundColor: Colors.lightBlueAccent,
                      actions: <Widget>[
                        new IconButton(
                            icon: new Icon(Icons.close),
                            onPressed: () {
                              Navigator.pop(context);
                            })
                      ],
                      title: new Text('Notice'),
                      content: new Text('This button is tapped '),
                    ));
            ;
          },
          child: Text('TAP here'),
        ),
      ),
    );
  }
}
```


Flutter Navigation
localhost:57430/#/
First Screen
DEBUG
Tap Here
Type here to search
ENG
16:22
07-03-2022


Flutter Navigation
localhost:57430/#/
Second Screen
DEBUG
TAP here
Type here to search
ENG
16:24
07-03-2022





8. Post-Experiments Exercise

A. Questions:

1. Explain the following layout widgets. Scaffold, Container, Row, Column, Expanded, ListView, GridView, Table, Snackbar.

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Q.8 A

1. Explain the following layout widgets Scaffold, container, row, column, List view & grid view.

→ * Scaffold: It is a class in flutter which provides many widget or APIs like Drower, Snack Bar, Bottom navigation - Bar, floating Action Button, AppBar etc. Scaffold will expand or occupy the whole screen. It will provide a framework to implement the basic material design layout of the application.

* container: It is a parent widget that can contain multiple child widgets and manage them efficiently through width, height, padding, bg color etc. It is a class to store one or more widgets

* Row: This widget arranges its children in a horizontal direction on the screen. A row widget does not appear scrollable because it displays the widgets within the visible view

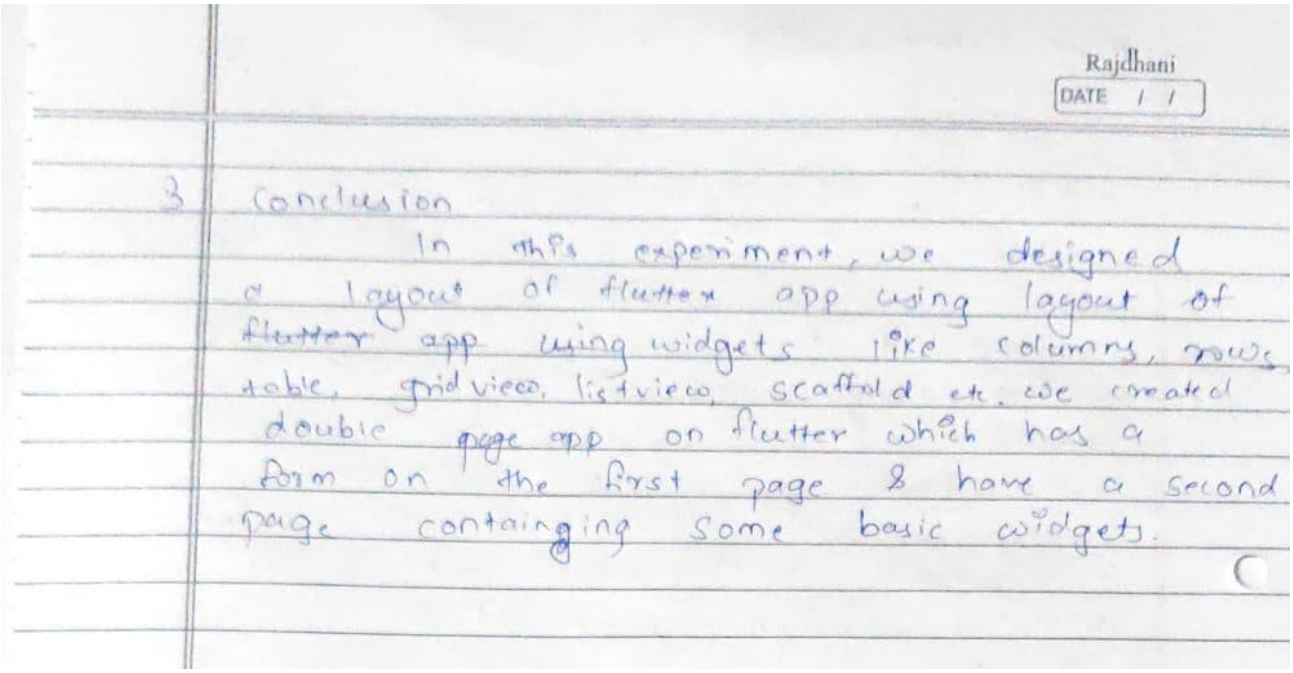
* column: This widget arranges its children in a vertical direction on the screen.

* List view: It is a scrollable list of widgets arranged linearly

* Gridview: It is a graphical control element used to show items the tabular form

B. Conclusion:

1. Write what you have learnt in the experiment.



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3 Conclusion

In this experiment, we designed a layout of flutter app using layout of ~~flutter~~ app using widgets like columns, rows, table, gridview, listview, scaffold etc. We created double page app on flutter which has a form on the first page & have a second page containing some basic widgets.

C. References:

1. Beginning App Development with Flutter: Create Cross-Platform Mobile Apps, By Rap Payne, 2019.
2. Google Flutter Mobile Development Quick Start Guide, Packt Publishing, 2019.