EXPERIMENT NO 2

Aim: To design Flutter UI by including common widgets.

Theory:

Flutter is an open-source UI framework developed by Google used to build cross-platform applications from a single codebase.
With Flutter, you can create apps for Android, iOS, Web, Windows, macOS, and Linux.

In Flutter, everything is a widget buttons, text, images, layouts, padding, even the app itself. Widgets describe how the UI should look and are rebuilt whenever state changes.

Common Flutter Widgets (with Theory + UI Purpose)

1. MaterialApp

Theory:

- Root widget of a Flutter app
- Provides Material Design features (theme, routing, navigation)

UI Use:

- Wraps the whole app

```
MaterialApp(
  home: HomePage(),
```

)

2. Scaffold

Theory:

- Provides basic page structure
- Supports AppBar, Drawer, BottomNavigation, FloatingActionButton

UI Use:

- Every main screen layout

```
Scaffold(
  appBar: AppBar(title: Text("Home")),
  body: Center(child: Text("Welcome")),
)
```

3. AppBar

Theory:

- Top navigation bar
- Displays title, actions, icons

UI Use:

- Page header

```
AppBar(
  title: Text("Flutter UI"),
)
```

4. Text

Theory:

- Displays styled text
- Supports fonts, size, color, weight

UI Use:

- Labels, headings, content

```
Text(
  "Hello Flutter",
  style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold),
```

)

5. Container

Theory:

- A versatile box model widget
- Supports padding, margin, color, decoration

UI Use:

- Card, box, section UI

```
Container(
  padding: EdgeInsets.all(16),
  color: Colors.blue,
  child: Text("Box"),
)
```

6. Row & Column

Theory:

- Row → horizontal layout
- Column → vertical layout

UI Use:

- Arrange widgets in lines

```
Column(
  children: [
    Text("Username"),
    Text("Password"),
  ],
)
```

7. Center

Theory:

- Aligns widget to center

UI Use:

- Center logos, text, buttons

```
Center(
  child: Text("Centered Text"),
)
```

8. Padding

Theory:

- Adds space inside widgets

UI Use:

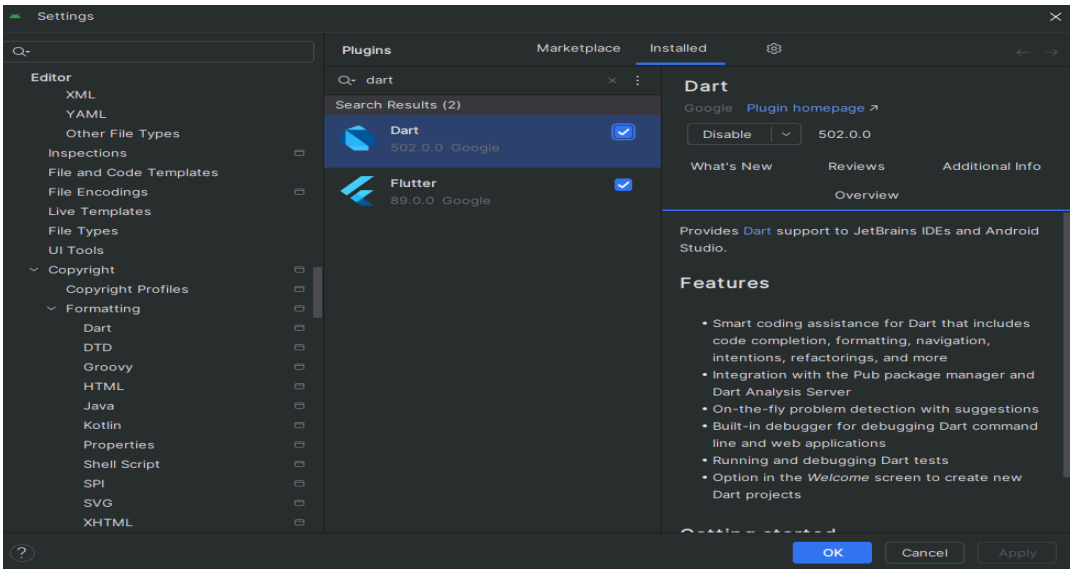
- Improve UI spacing

```
Padding(
  padding: EdgeInsets.all(8),
  child: Text("Padded Text"),
)
```

Procedures:

STEP 1: Install Flutter & Dart Plugins in Android Studio

1. Open Android Studio
2. Go to Settings → Plugins
3. Search and Install- Flutter & Dart
4. Restart android studio

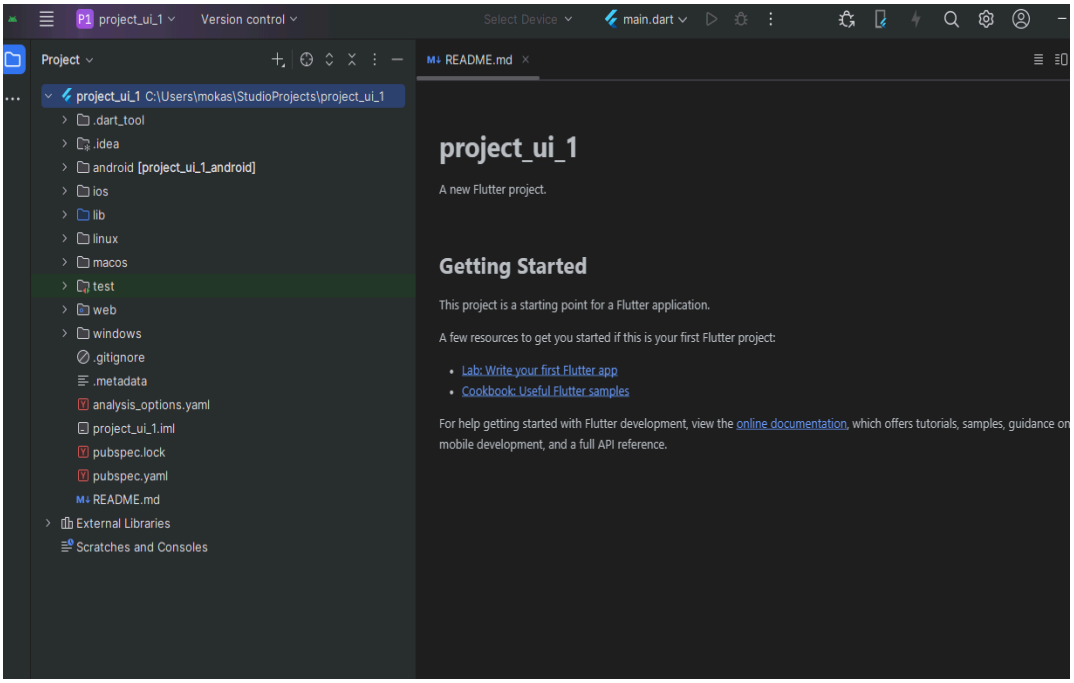


STEP 2: Create a New Flutter Project

1. Open Android Studio

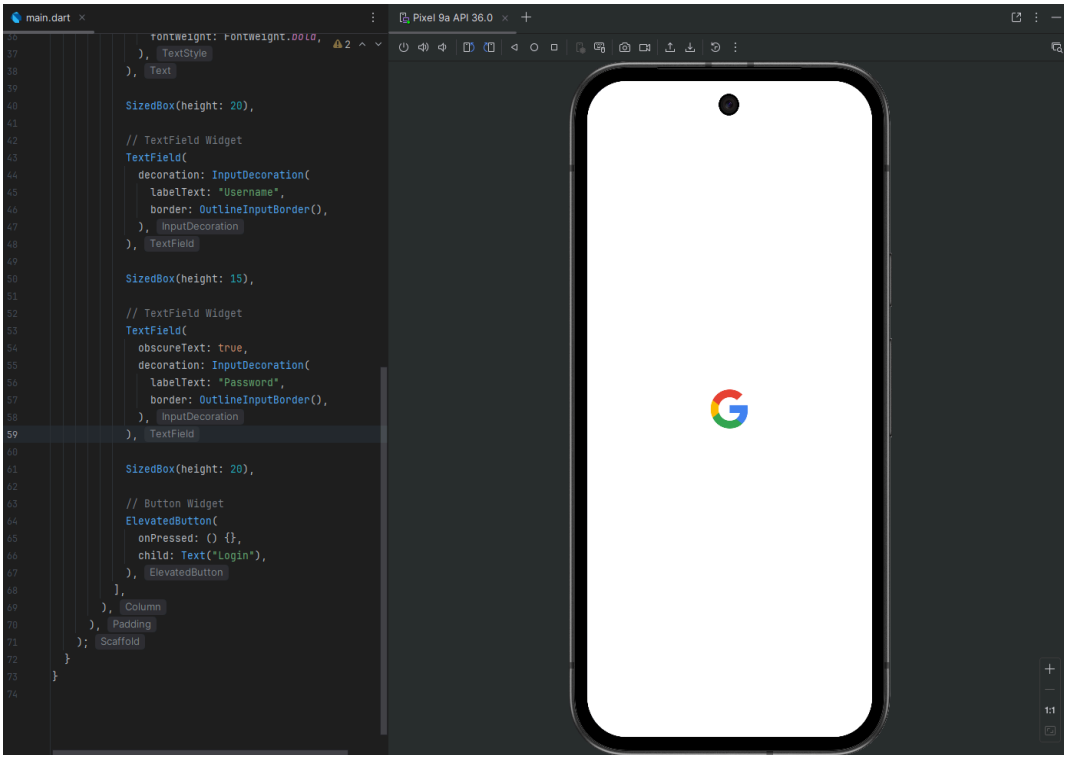
2. Click New Flutter Project
3. Select Flutter Application
4. Choose Flutter SDK path (example):

   C:\flutter
5. Enter:
   - Project name: project_ui_1
   - Language: Dart
6. Click Finish



STEP 3: Set Up Android Emulator

1. Open Tools → Device Manager
2. Click Create Device
3. Choose Phone → Pixel 9a
4. Select System Image (API 30+)
5. Click Finish
6. Start the emulator



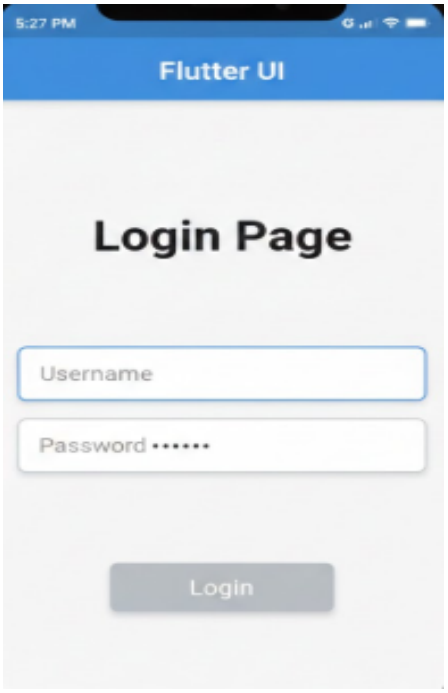
STEP 4: Code

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

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

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

class HomePage extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text("Flutter UI"),
```

```
  centerTitle: true,
),
body: Padding(
  padding: EdgeInsets.all(16),
  child: Column(
    mainAxisAlignment: MainAxisAlignment.center,
    children: [

      // Text Widget
      Text(
        "Login Page",
        style: TextStyle(
          fontSize: 24,
          fontWeight: FontWeight.bold,
        ),
      ),

      SizedBox(height: 20),

      // TextField Widget
      TextField(
        decoration: InputDecoration(
          labelText: "Username",
          border: OutlineInputBorder(),
        ),
      ),

      SizedBox(height: 15),

      // TextField Widget
      TextField(
        obscureText: true,
        decoration: InputDecoration(
          labelText: "Password",
          border: OutlineInputBorder(),
        ),
      ),

      SizedBox(height: 20),

      // Button Widget
      ElevatedButton(
        onPressed: () {},
        child: Text("Login"),
```

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

STEP 6: Output



Conclusion:

Flutter is an open-source UI framework developed by Google for cross-platform app development. It allows developers to build high-performance applications using a single codebase. Flutter provides rich widgets and fast development through Hot Reload.
It supports Android, iOS, web, and desktop platforms.