Experiment 1

Title: Android Studio setup for Flutter development with along with Dart SDK.

Installation Steps :-

1. Download Android Studio:

   Visit the official Android Studio website.

   Click on the "Download Android Studio" button. Save the downloaded file

2. Install Android Studio:

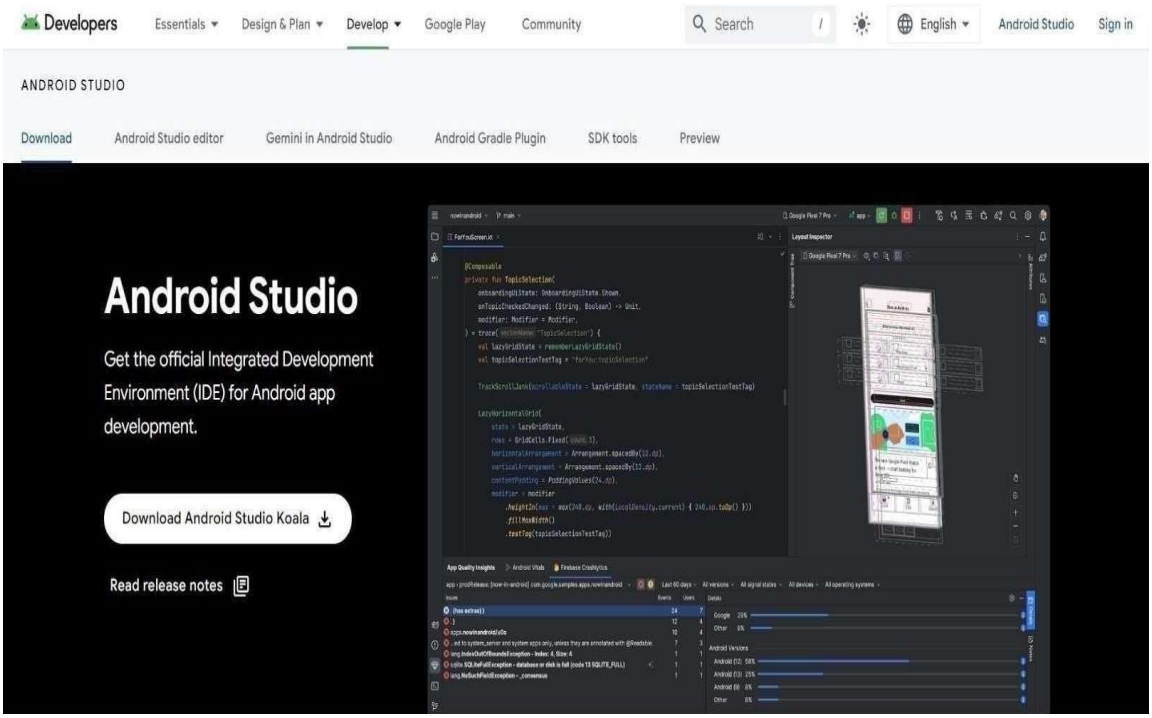
   Double-click the downloaded .exe file to launch the installer.

3. Follow the Setup Wizard:

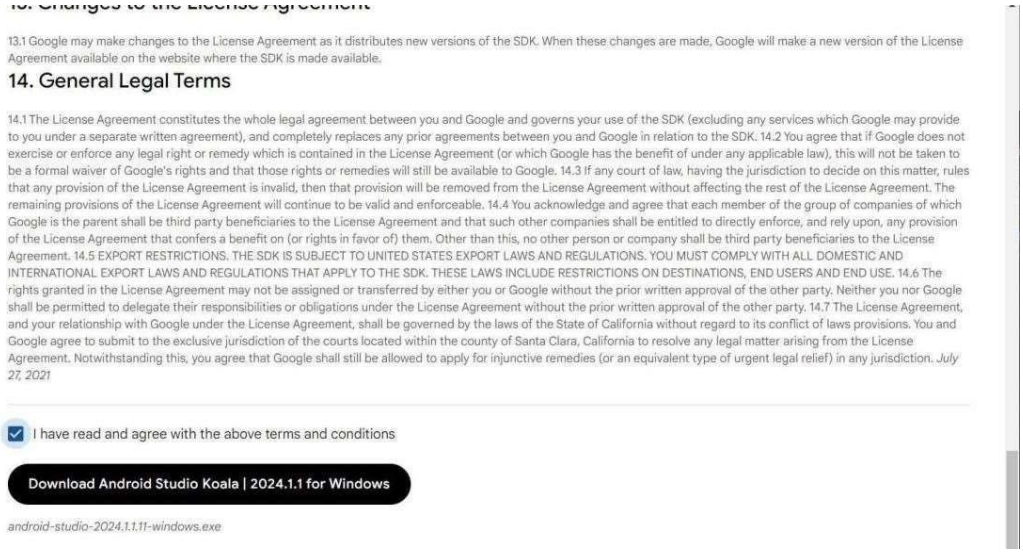
   The Android Studio Setup Wizard will guide you through the installation process.

   Install any recommended SDK packages.

Screenshots:

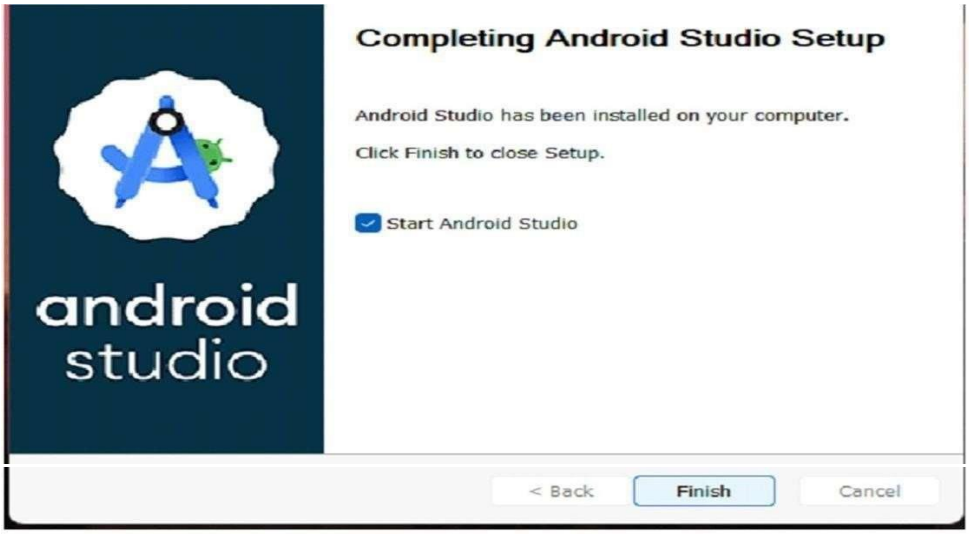


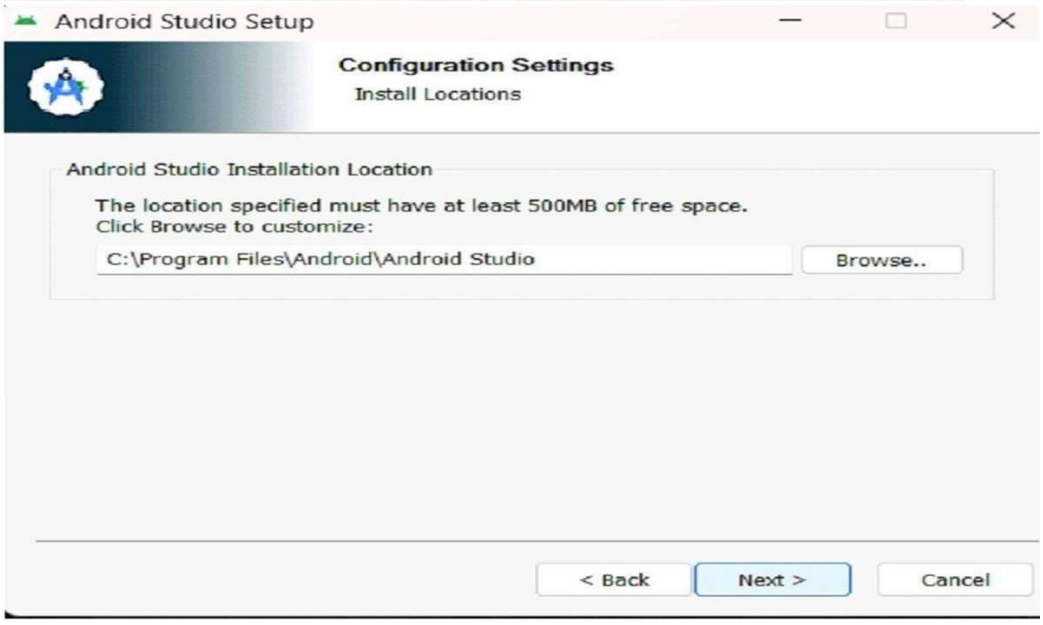
Accept terms&condtions and click download button

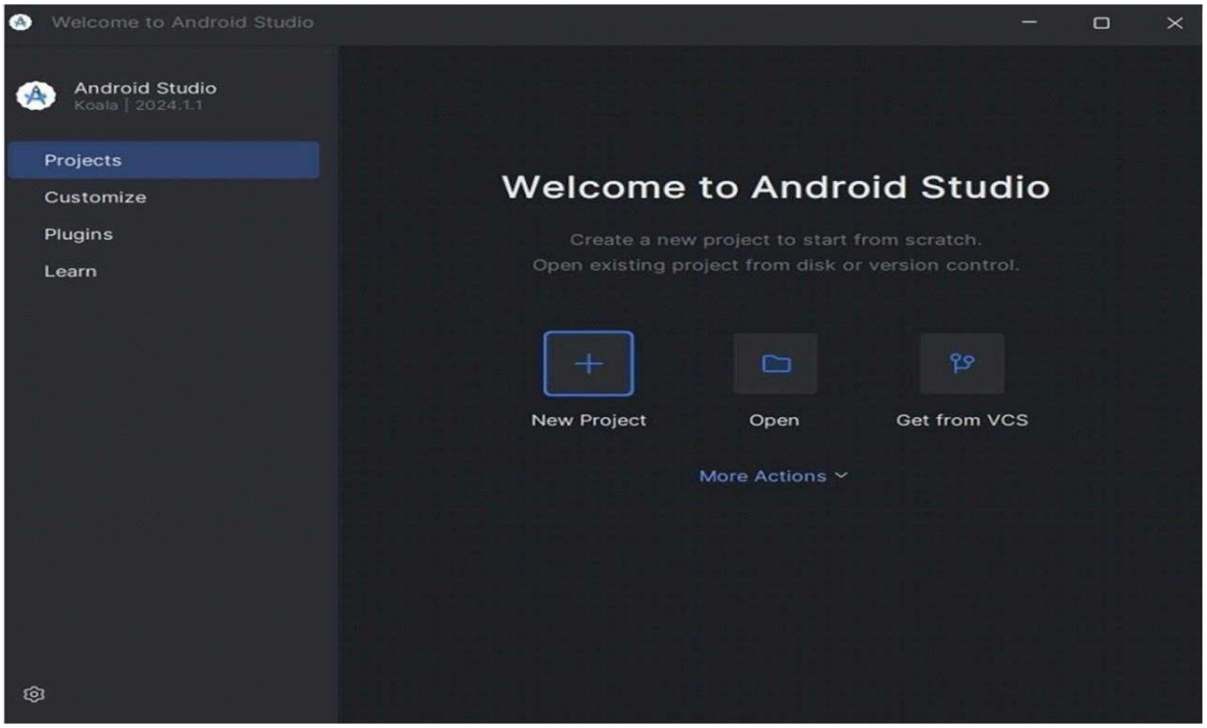


Click on next button

Click on finish button

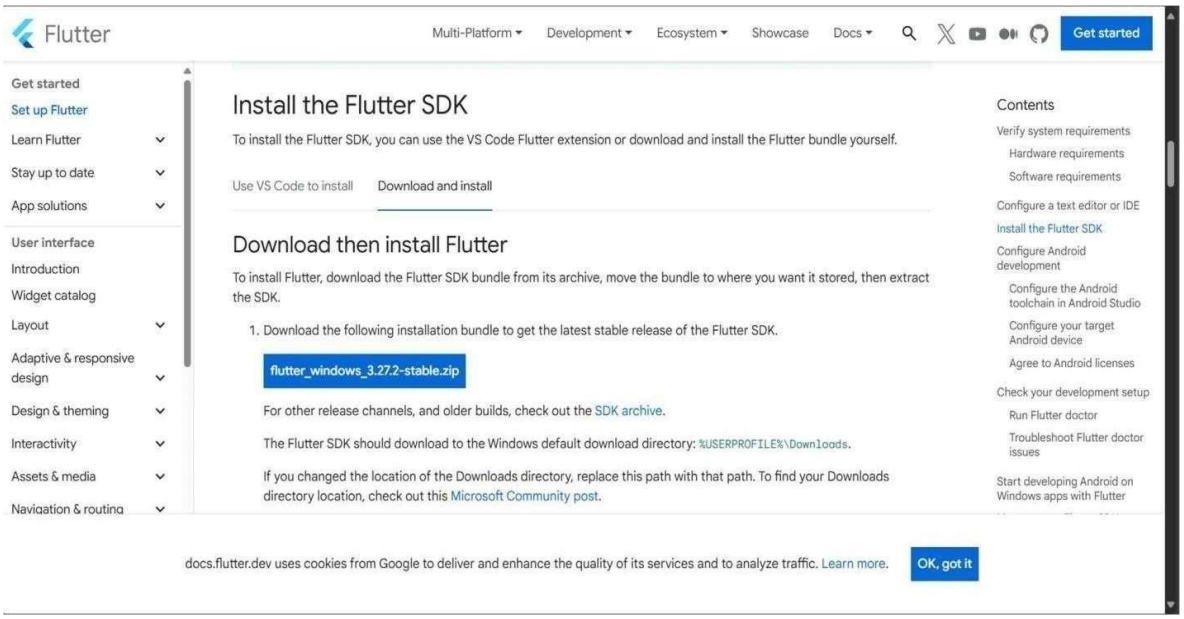




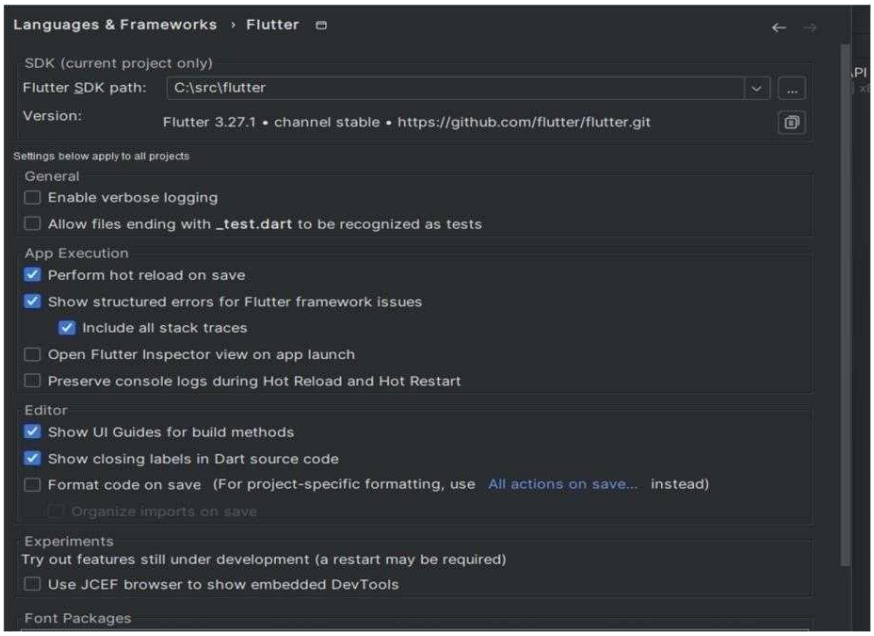


Install fluteer sdk from the flutter website from the below website

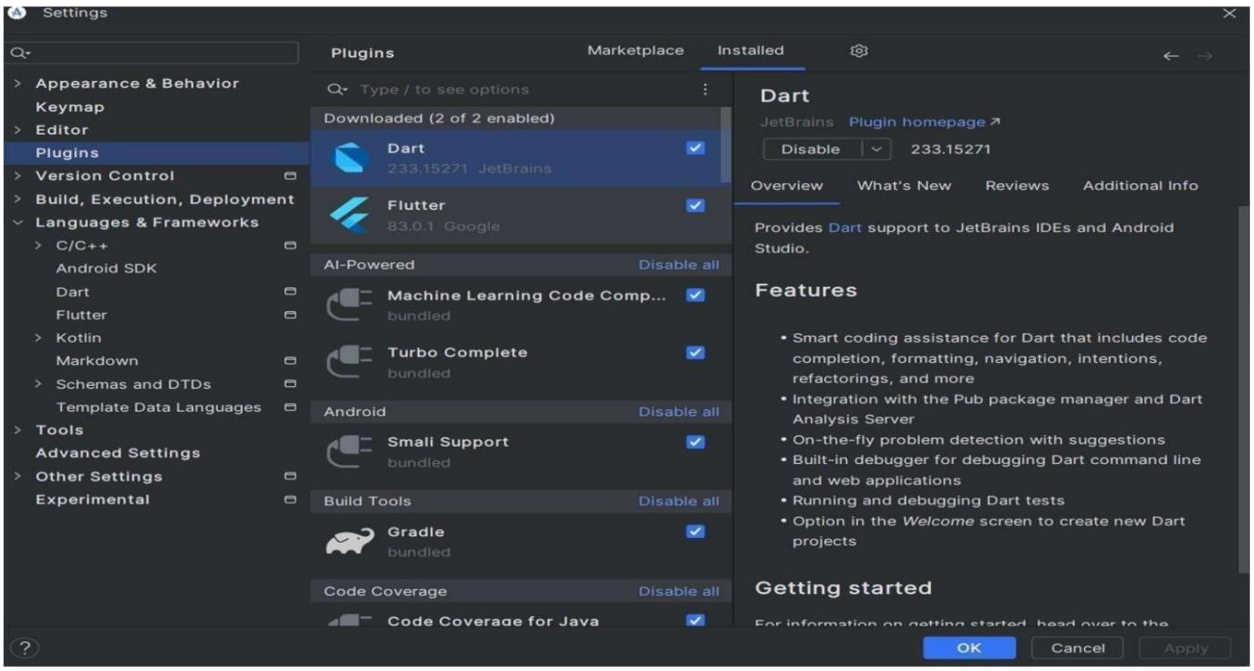
[Make Android apps | Flutter]



Now set the path file in environment variables file and then go into Andriod app and add sdk path into the flutter



In the plugin download 2 plugin flutter and dart



Now apply the changes and create flutter app.

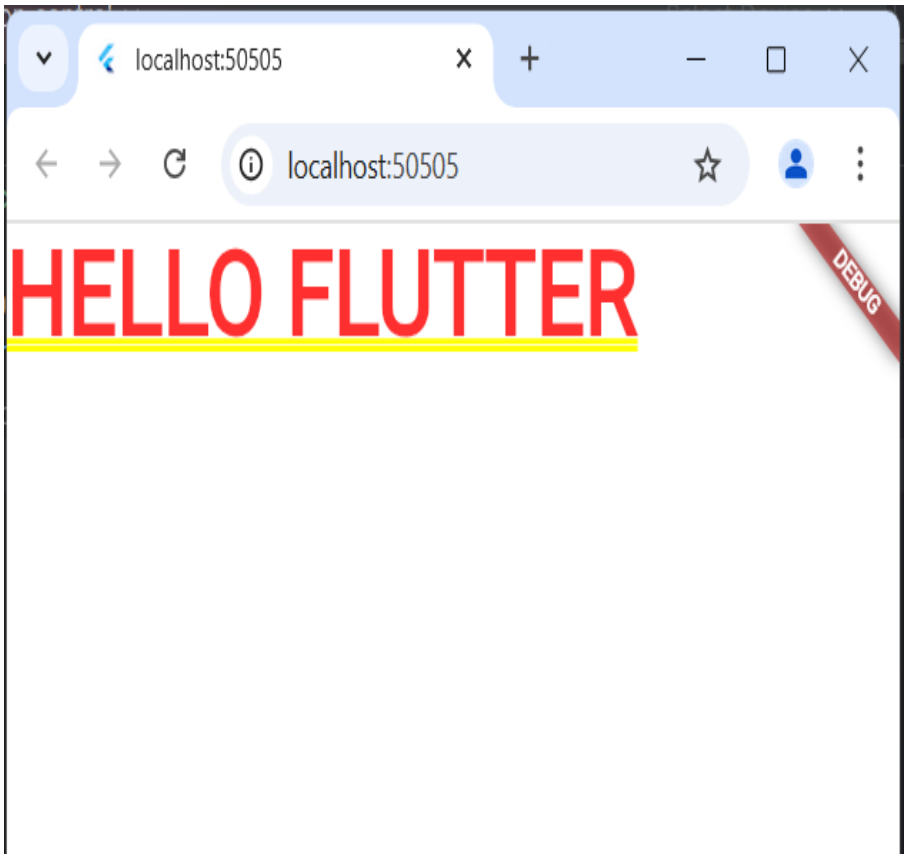
Experiment 2

Title: Create a Hello Flutter ´application.

main.dart

```
import 'package:flutter/material.dart';
void main() {   runApp(MaterialApp(
home: Text("HELLO FLUTTER")
));
}
```

Output:



Experiment 3

Aim: Create and application using Flutter Key Widgets.

main.dart

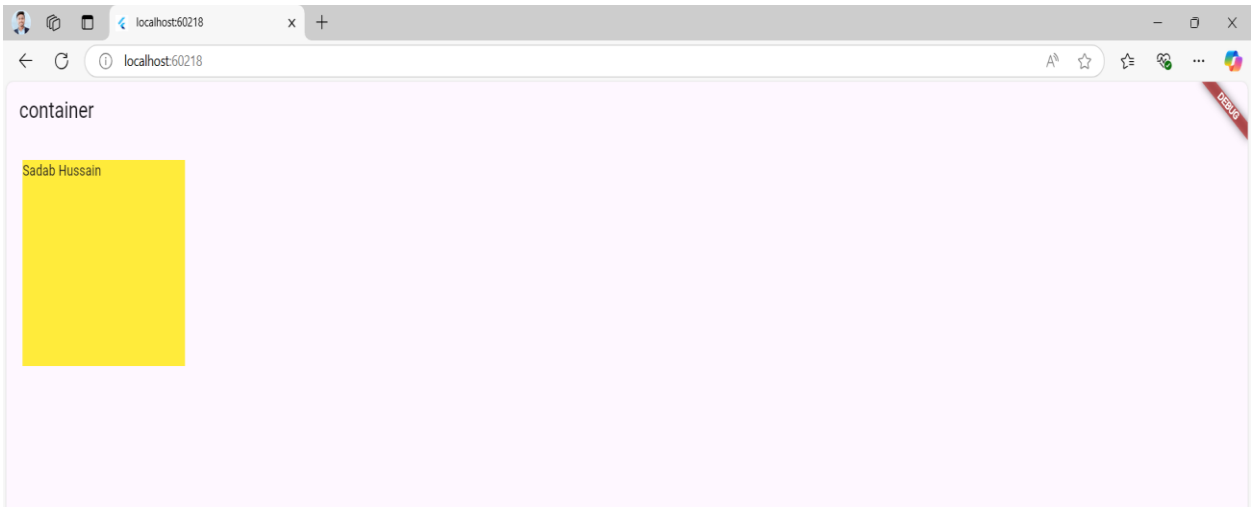
```
import 'package:flutter/material.dart';

void main() {
  runApp(MaterialApp(
    home: Scaffold(
      appBar: AppBar(
        title: Text('Practical_3 part-A'),
      ),
      body: Text(
        "Hello Flutter",
        style: TextStyle(
          fontSize: 48,
          fontWeight: FontWeight.bold,
          color: Colors.blue,
          overflow: TextOverflow.ellipsis,
        ),
      ),
    ),
  ));
}
```

Output:

main.dart

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

void main() {
  runApp(MaterialApp(
    home: Scaffold(
      appBar: AppBar(
        title: Text("container"),
      ),
      body: Container(
        height: 200.0,
        width: 200.0,
        margin: EdgeInsets.all(20.0),
        color: Colors.yellow,
        child: Text("Sadab Hussain"),
      ),
    ),
  ));
}
```

Output:



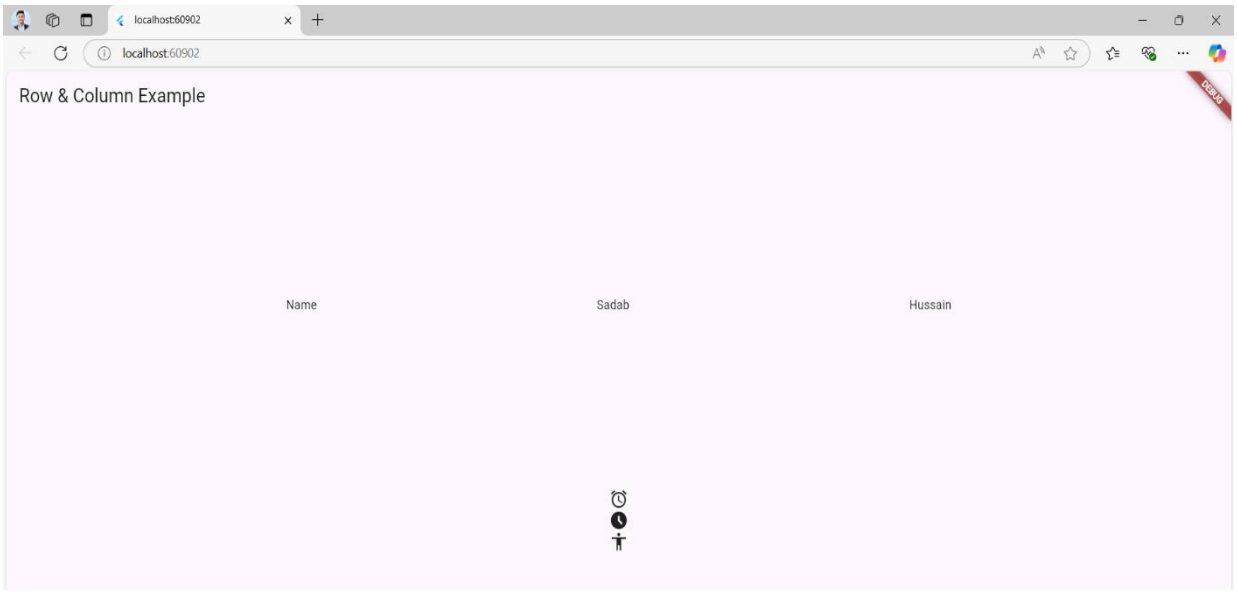
Experiment 4

Aim: Create and application using Flutter Key Widgets.

main.dart

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

void main() {
  runApp(MaterialApp(
    home: Scaffold(
      appBar: AppBar(
        title: Text("Row & Column Example"),
      ),
      body: Column(
        mainAxisAlignment: MainAxisAlignment.spaceEvenly,
        crossAxisAlignment: CrossAxisAlignment.center,
        children: [
          Row(
            mainAxisAlignment: MainAxisAlignment.spaceEvenly,
            crossAxisAlignment: CrossAxisAlignment.center,
            mainAxisSize: MainAxisSize.max,
            textDirection: TextDirection.ltr,
            children: [
              Text("Name"),
              Text("Sadab"),
              Text("Hussain"),
            ],
          ),
          Column(
            mainAxisAlignment: MainAxisAlignment.spaceEvenly,
            crossAxisAlignment: CrossAxisAlignment.start,
            children: [
              Icon(Icons.access_alarm_outlined),
              Icon(Icons.access_time_filled),
              Icon(Icons.accessibility_outlined),
            ],
          ),
        ],
      ),
    ),
  ));
}
```

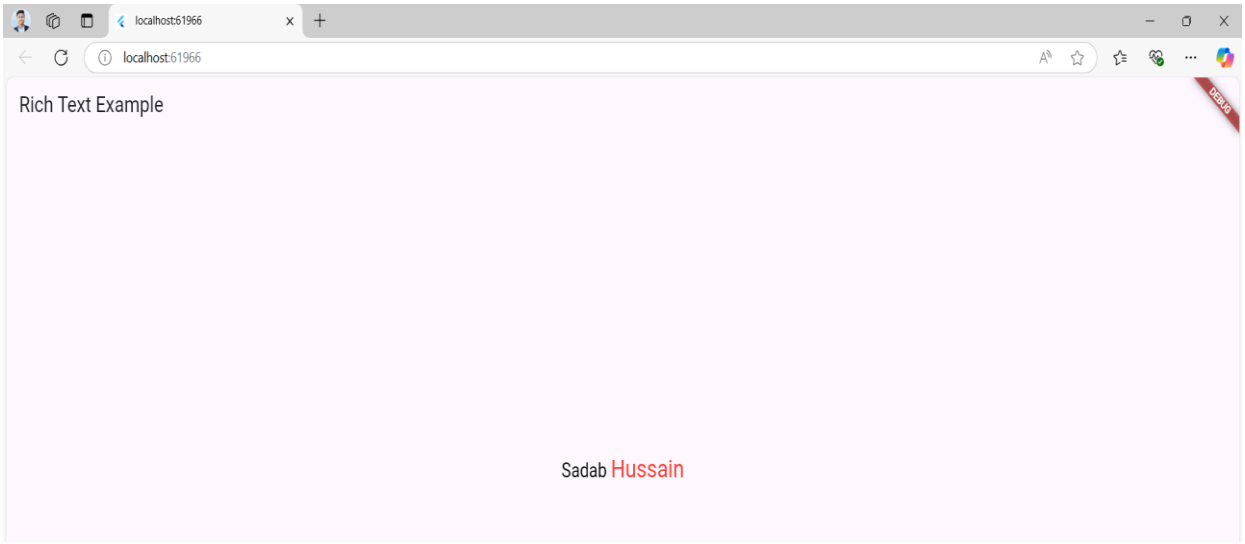
Output:


localhost:60902
localhost:60902
Row & Column Example
DEBUG
Name
Sadab
Hussain

main.dart

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

void main() {
  runApp(MaterialApp(
    home: Scaffold(
      appBar: AppBar(
        title: Text("Rich Text Example"),
      ),
      body: Center(
        child: RichText(
          text: TextSpan(
            text: "Sadab ",
            style: TextStyle(color: Colors.black, fontSize: 20),
            children: [
              TextSpan(
                text: "Hussain",
                style: TextStyle(color: Colors.red, fontSize: 25),
              ),
            ],
          ),
        ),
      ),
    ),
  ));
}
```

Output:



Experiment 5

Aim: Create and application with Flutter UI Components.

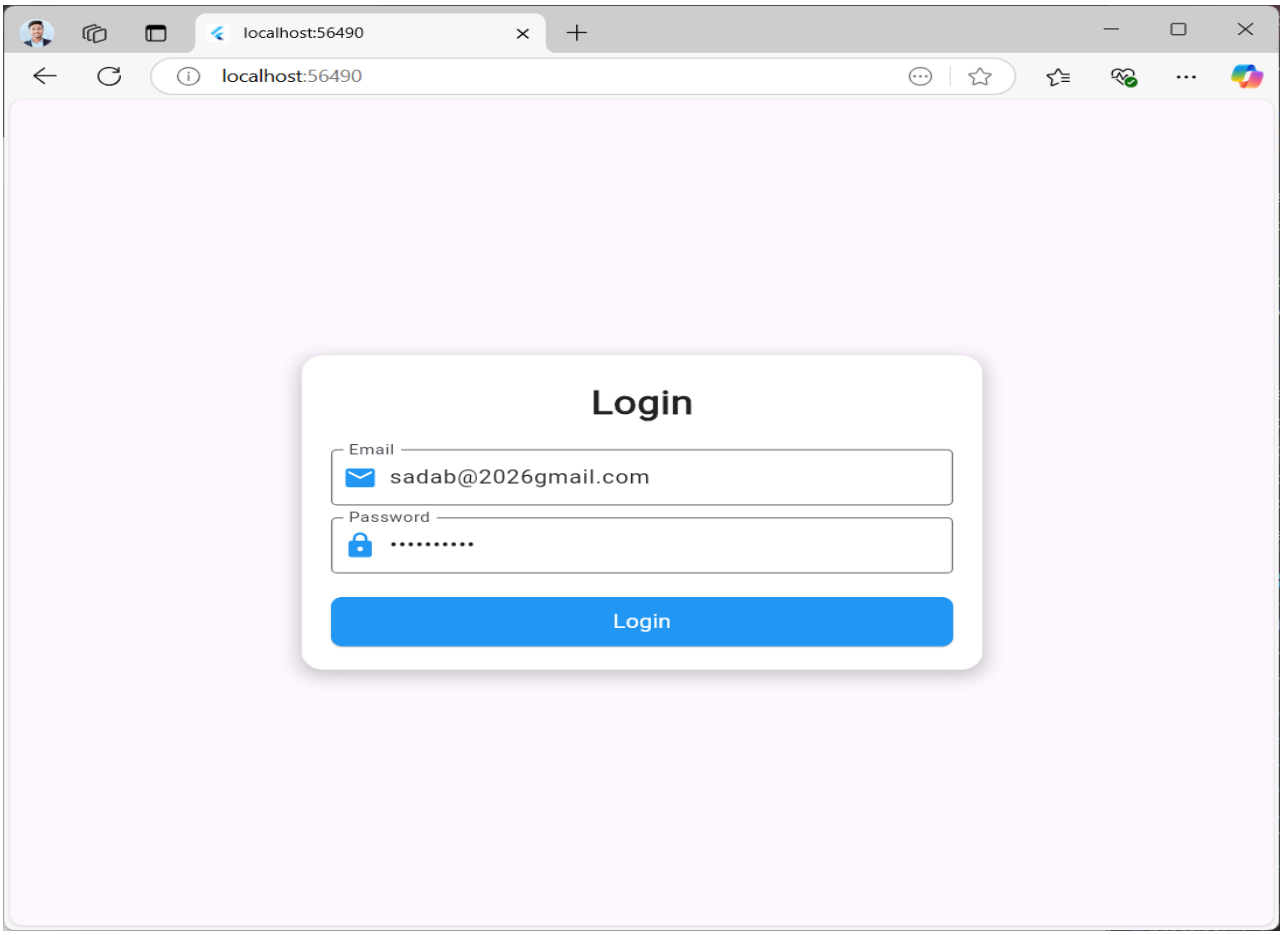
main.dart

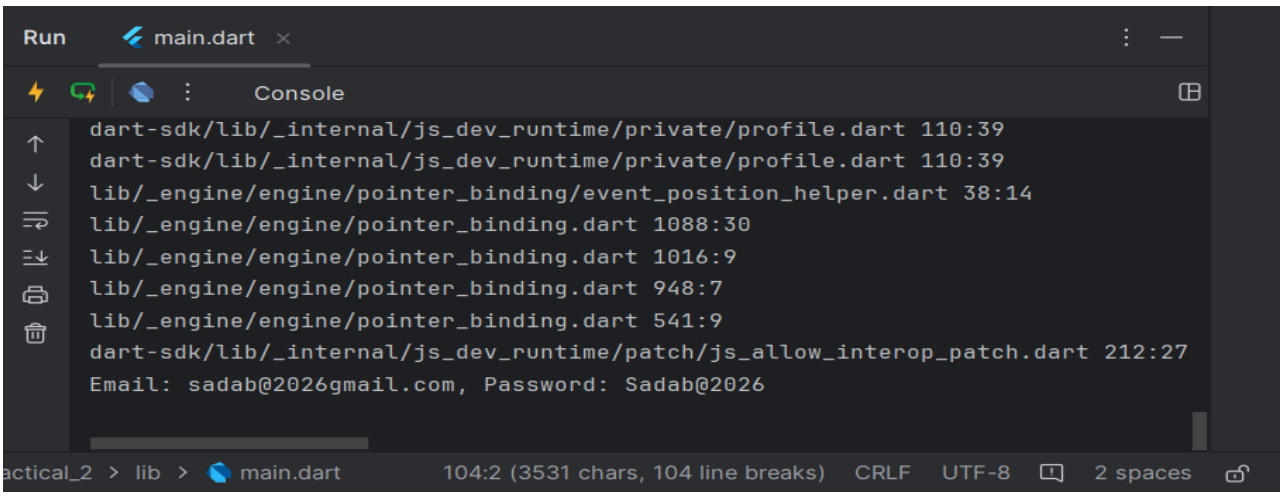
```
import 'package:flutter/material.dart';

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

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

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      home: LoginScreen(),
    );
  }
}

class LoginScreen extends StatelessWidget {
  final TextEditingController emailController = TextEditingController();
  final TextEditingController passwordController = TextEditingController();

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Container(
        width: double.infinity,
        child: Center(
          child: Padding(
            padding: const EdgeInsets.all(200.0),
            child: Container(
              padding: const EdgeInsets.all(20.0),
              decoration: BoxDecoration(
                color: Colors.white, // Login box background color
                borderRadius: BorderRadius.circular(15),
                boxShadow: [
                  BoxShadow(
                    color: Colors.black.withOpacity(0.2),
                    blurRadius: 10,
                    spreadRadius: 2,
```

```
          offset: const Offset(0, 4),
        ),
      ],
    ),
    child: Column(
      mainAxisSize: MainAxisSize.min,
      children: [
        const Text(
          'Login',
          style: TextStyle(
            fontSize: 28,
            fontWeight: FontWeight.bold,
            color: Colors.black87,
          ),
        ),
        const SizedBox(height: 20),
        TextField(
          controller: emailController,
          decoration: const InputDecoration(
            labelText: 'Email',
            border: OutlineInputBorder(),
            prefixIcon: Icon(Icons.email, color: Colors.blue),
          ),
          keyboardType: TextInputType.emailAddress,
        ),
        const SizedBox(height: 10),
        TextField(
          controller: passwordController,
          decoration: const InputDecoration(
            labelText: 'Password',
            border: OutlineInputBorder(),
            prefixIcon: Icon(Icons.lock, color: Colors.blue),
          ),
          obscureText: true,
        ),
        const SizedBox(height: 20),
        ElevatedButton(
          onPressed: () {
            String email = emailController.text;
            String password = passwordController.text;
            // Add login logic here
            print('Email: $email, Password: $password');
          },
          style: ElevatedButton.styleFrom(
            minimumSize: const Size(double.infinity, 50),
            backgroundColor: Colors.blue,
```

```
                shape: RoundedRectangleBorder(
                  borderRadius: BorderRadius.circular(8),
                ),
              ),
              child: const Text(
                'Login',
                style: TextStyle(fontSize: 16, color: Colors.white),
              ),
            ),
          ],
        ),
      ),
    ),
  ),
 ),
 );
 }
}
```

Output:


localhost:56490
localhost:56490
Login
Email
sadab@2026gmail.com
Password
Login


Run
main.dart
Console
dart-sdk/lib/_internal/js_dev_runtime/private/profile.dart 110:39
dart-sdk/lib/_internal/js_dev_runtime/private/profile.dart 110:39
lib/_engine/engine/pointer_binding/event_position_helper.dart 38:14
lib/_engine/engine/pointer_binding.dart 1088:30
lib/_engine/engine/pointer_binding.dart 1016:9
lib/_engine/engine/pointer_binding.dart 948:7
lib/_engine/engine/pointer_binding.dart 541:9
dart-sdk/lib/_internal/js_dev_runtime/patch/js_allow_interop_patch.dart 212:27
Email: sadab@2026gmail.com, Password: Sadab@2026
actical_2 > lib > main.dart
104:2 (3531 chars, 104 line breaks)
CRLF
UTF-8
2 spaces

Experiment 6

Aim: Create and application with Flutter UI Components.

main.dart

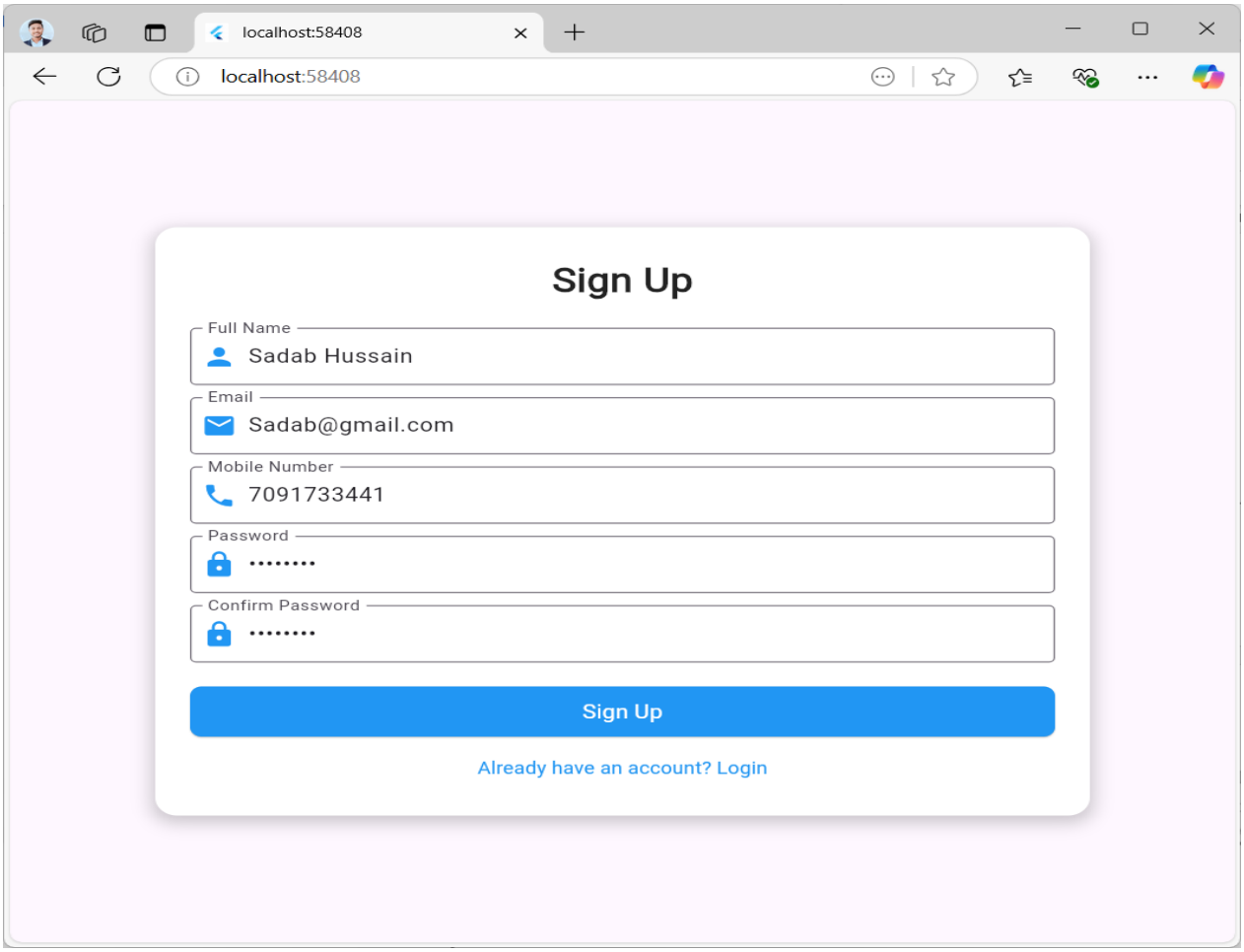
```
import 'package:flutter/material.dart';

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

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

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      home: SignUpScreen(),
    );
  }
}

class SignUpScreen extends StatelessWidget {
  final TextEditingController nameController = TextEditingController();
  final TextEditingController emailController = TextEditingController();
  final TextEditingController phoneController = TextEditingController();
  final TextEditingController passwordController = TextEditingController();
  final TextEditingController confirmPasswordController = TextEditingController();

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Container(
        width: double.infinity,
        child: Center(
          child: Padding(
            padding: const EdgeInsets.all(100.0),
            child: Container(
              padding: const EdgeInsets.all(24.0),
              decoration: BoxDecoration(
                color: Colors.white, // Form background
                borderRadius: BorderRadius.circular(15),
                boxShadow: [
                  BoxShadow(
                    color: Colors.black.withOpacity(0.2),
```

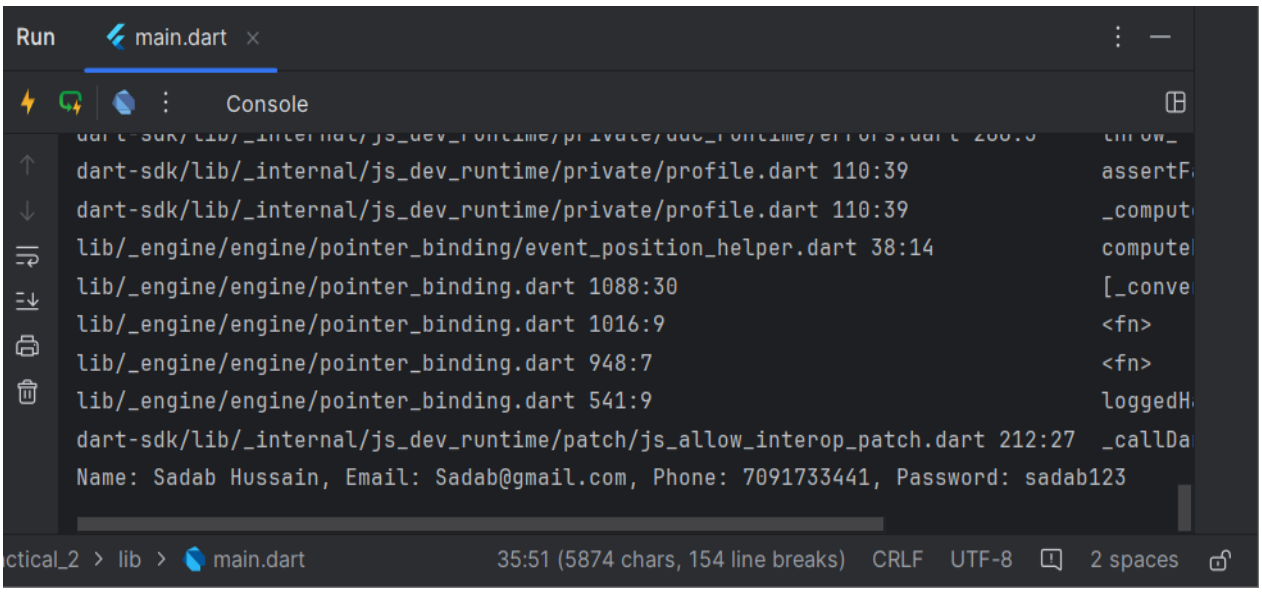
```
            blurRadius: 10,
            spreadRadius: 2,
            offset: const Offset(0, 4),
          ),
        ],
      ),
      child: Column(
        mainAxisSize: MainAxisSize.min,
        children: [
          const Text(
            'Sign Up',
            style: TextStyle(
              fontSize: 28,
              fontWeight: FontWeight.bold,
              color: Colors.black87,
            ),
          ),
          const SizedBox(height: 20),
          TextField(
            controller: nameController,
            decoration: const InputDecoration(
              labelText: 'Full Name',
              border: OutlineInputBorder(),
              prefixIcon: Icon(Icons.person, color: Colors.blue),
            ),
          ),
          const SizedBox(height: 10),
          TextField(
            controller: emailController,
            decoration: const InputDecoration(
              labelText: 'Email',
              border: OutlineInputBorder(),
              prefixIcon: Icon(Icons.email, color: Colors.blue),
            ),
            keyboardType: TextInputType.emailAddress,
          ),
          const SizedBox(height: 10),
          TextField(
            controller: phoneController,
            decoration: const InputDecoration(
              labelText: 'Mobile Number',
              border: OutlineInputBorder(),
              prefixIcon: Icon(Icons.phone, color: Colors.blue),
            ),
            keyboardType: TextInputType.phone,
          ),
```

```
const SizedBox(height: 10),
TextField(
  controller: passwordController,
  decoration: const InputDecoration(
    labelText: 'Password',
    border: OutlineInputBorder(),
    prefixIcon: Icon(Icons.lock, color: Colors.blue),
  ),
  obscureText: true,
),
const SizedBox(height: 10),
TextField(
  controller: confirmPasswordController,
  decoration: const InputDecoration(
    labelText: 'Confirm Password',
    border: OutlineInputBorder(),
    prefixIcon: Icon(Icons.lock, color: Colors.blue),
  ),
  obscureText: true,
),
const SizedBox(height: 20),
ElevatedButton(
  onPressed: () {
    String name = nameController.text;
    String email = emailController.text;
    String phone = phoneController.text;
    String password = passwordController.text;
    String confirmPassword = confirmPasswordController.text;

    // Sign-up validation
    if (password == confirmPassword) {
      print('Name: $name, Email: $email, Phone: $phone, Password: $password');
    } else {
      print('Passwords do not match');
    }
  },
  style: ElevatedButton.styleFrom(
    minimumSize: const Size(double.infinity, 50),
    backgroundColor: Colors.blue,
    shape: RoundedRectangleBorder(
      borderRadius: BorderRadius.circular(8),
    ),
  ),
  child: const Text(
    'Sign Up',
    style: TextStyle(fontSize: 16, color: Colors.white),
```

```
                ),
              ),
              const SizedBox(height: 10),
              TextButton(
                onPressed: () {
                  Navigator.pop(context); // Navigate back to the Login screen
                },
                child: const Text(
                  'Already have an account? Login',
                  style: TextStyle(color: Colors.blue, fontSize: 14),
                ),
              ),
            ],
          ),
        ),
      ),
    ),
  );
 }
}
```

Output:


localhost:58408
localhost:58408
Sign Up
Full Name
Sadab Hussain
Email
Sadab@gmail.com
Mobile Number
7091733441
Password
Confirm Password
Sign Up
Already have an account? Login


Run
main.dart
Console
dart-sdk/lib/_internal/js_dev_runtime/private/profile.dart 110:39
dart-sdk/lib/_internal/js_dev_runtime/private/profile.dart 110:39
lib/_engine/engine/pointer_binding/event_position_helper.dart 38:14
lib/_engine/engine/pointer_binding.dart 1088:30
lib/_engine/engine/pointer_binding.dart 1016:9
lib/_engine/engine/pointer_binding.dart 948:7
lib/_engine/engine/pointer_binding.dart 541:9
dart-sdk/lib/_internal/js_dev_runtime/patch/js_allow_interop_patch.dart 212:27
Name: Sadab Hussain, Email: Sadab@gmail.com, Phone: 7091733441, Password: sadab123
lib
main.dart
35:51 (5874 chars, 154 line breaks)
CRLF
UTF-8
2 spaces

Experiment 7

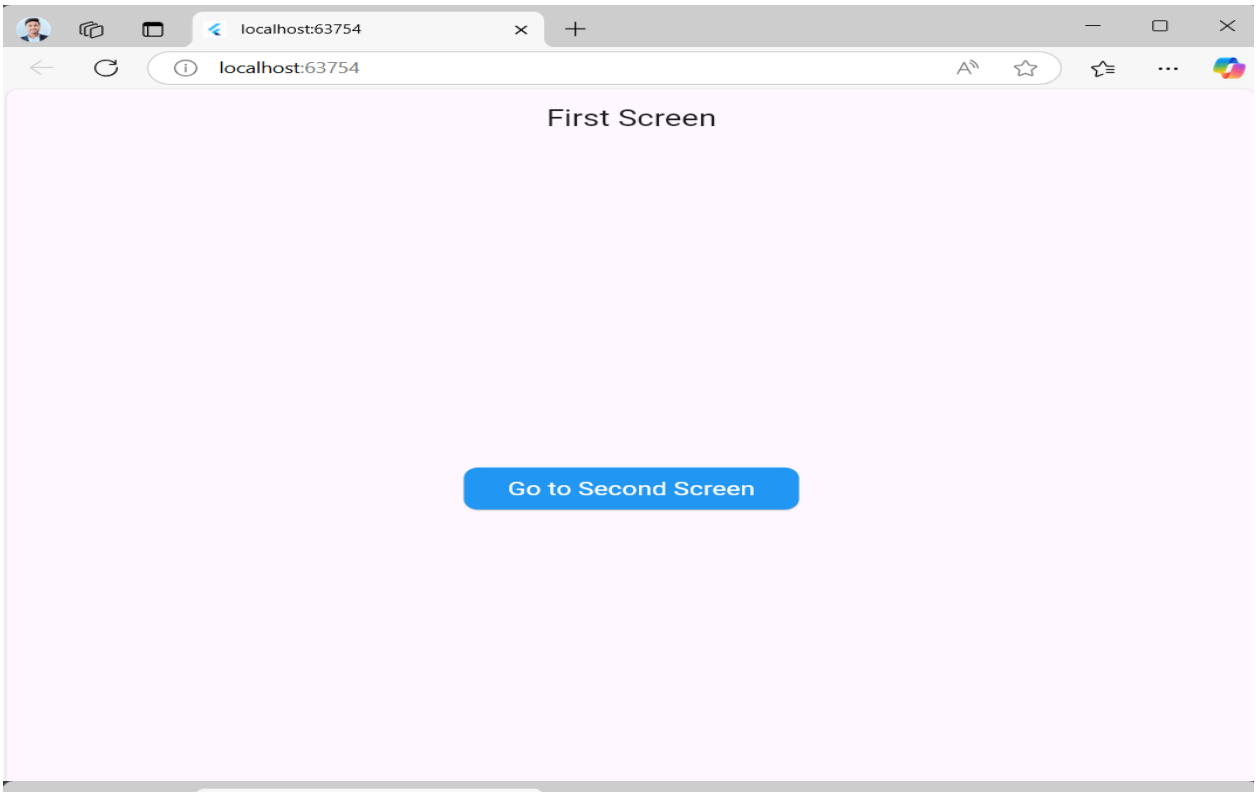
Aim: Create and application with Navigation in Flutter.

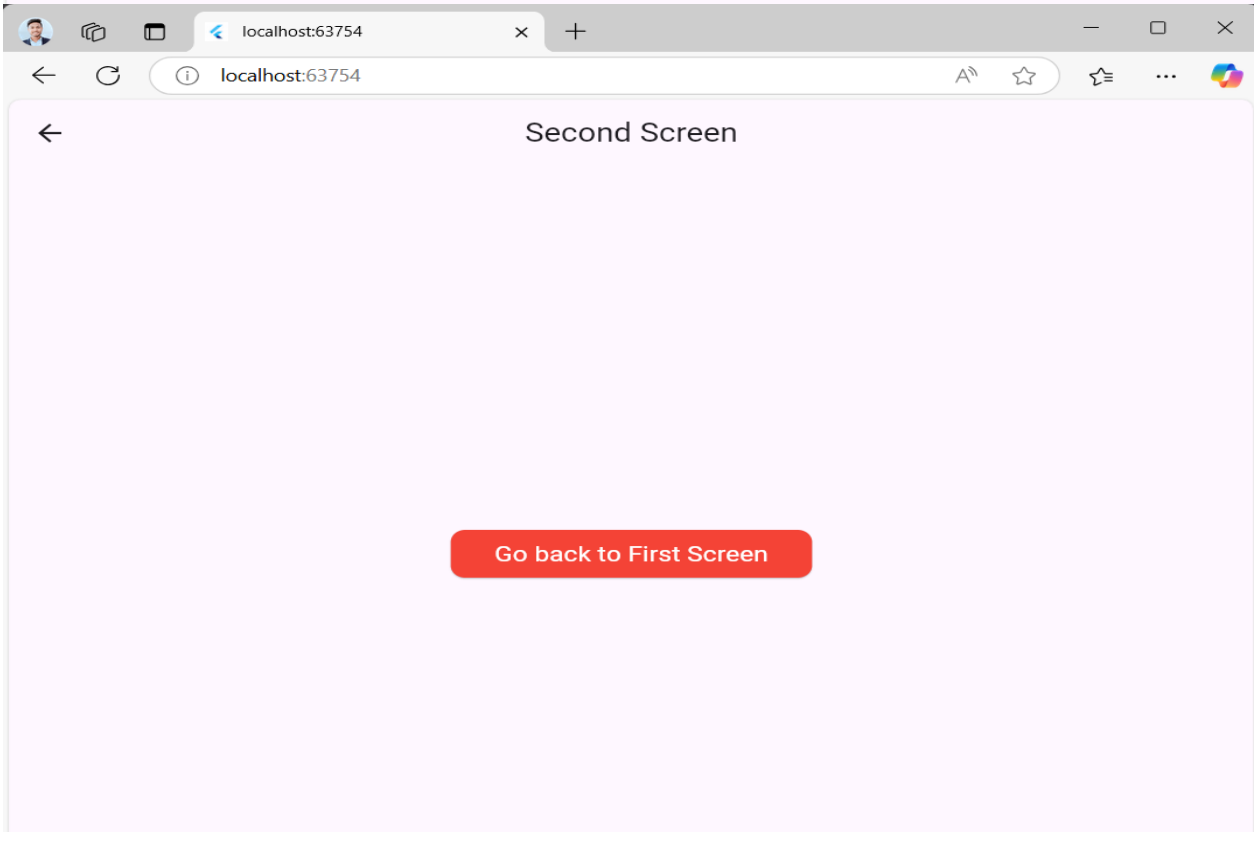
main.dart

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

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      theme: ThemeData(
        primarySwatch: Colors.blue,
      ),
      home: FirstScreen(),
    );
  }
}

class FirstScreen extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('First Screen'),
        centerTitle: true,
      ),
      body: Center(
        child: ElevatedButton(
          style: ElevatedButton.styleFrom(
            padding: EdgeInsets.symmetric(horizontal: 30, vertical: 15),
            backgroundColor: Colors.blue,
            shape: RoundedRectangleBorder(
              borderRadius: BorderRadius.circular(10),
            ),
          ),
          onPressed: () {
            Navigator.push(
              context,
              MaterialPageRoute(builder: (context) => SecondScreen()),
```

```
            );
          },
          child: Text(
            'Go to Second Screen',
            style: TextStyle(fontSize: 18, color: Colors.white),
          ),
        ),
      ),
    );
  }
}

class SecondScreen extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Second Screen'),
        centerTitle: true,
      ),
      body: Center(
        child: ElevatedButton(
          style: ElevatedButton.styleFrom(
            padding: EdgeInsets.symmetric(horizontal: 30, vertical: 15),
            backgroundColor: Colors.red,
            shape: RoundedRectangleBorder(
              borderRadius: BorderRadius.circular(10),
            ),
          ),
          onPressed: () {
            Navigator.pop(context);
          },
          child: Text(
            'Go back to First Screen',
            style: TextStyle(fontSize: 18, color: Colors.white),
          ),
        ),
      ),
    );
  }
}
```

Output:


localhost:63754
localhost:63754
First Screen
Go to Second Screen


localhost:63754
localhost:63754
Second Screen
Go back to First Screen

Experiment 8

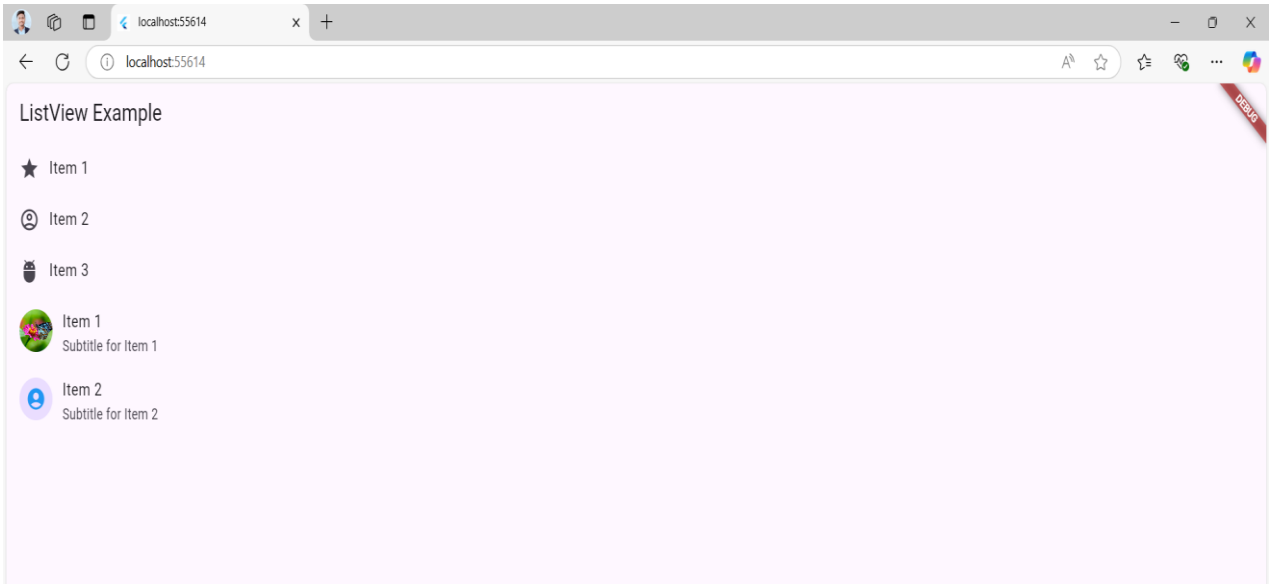
Aim: Create and application with list view in Flutter.

main.dart

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

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(
          title: Text('ListView Example'),
        ),
        body: ListView(
          children: <Widget>[
            ListTile(
              leading: Icon(Icons.star),
              title: Text('Item 1'),
            ),
            ListTile(
              leading: Icon(Icons.account_circle_outlined),
              title: Text('Item 2'),
            ),
            ListTile(
              leading: Icon(Icons.adb_rounded),
              title: Text('Item 3'),
            ),
            ListTile(
              leading: CircleAvatar(
                backgroundImage:
                AssetImage('images/butterfly.png'),
              ),
              title: Text('Item 1'),
              subtitle: Text('Subtitle for Item 1'),
              onTap: () {
              },
            ),
            ListTile(
              leading: CircleAvatar(
              child: Icon(Icons.account_circle_rounded,color: Colors.blue,),
```

```
            ),
            title: Text('Item 2'),
            subtitle: Text('Subtitle for Item 2'),
            onTap: () {
              // Handle tap
            },
          )
        ]
      )
    )
  );
 }
}
```

Output:



Experiment 9

Aim: Create and application with grid view in Flutter.

main.dart

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

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      home: Scaffold(
        appBar: AppBar(
          title: Text('GridView Example'),
        ),
        body: GridView.count(
          crossAxisCount: 3,
          children: List.generate(9, (index) {
            return Container(
              margin: EdgeInsets.all(10.0),
              color: Colors.blueGrey[100 * (index % 9)],
              child: Center(
                child: Text(
                  'Item $index',
                  style: TextStyle(fontSize: 20),
                ),
              ),
            );
          }),
        ),
      ),
    );
  }
}
```

Output:


localhost:58213
localhost:58213
GridView Example
DEBUG
Item 0
Item 1
Item 2
Item 3
Item 4
Item 5
Item 6
Item 7
Item 8

Experiment 10

Aim: Create and application Crud Operation with SQLite in Flutter.

main.dart

```
import 'package:flutter/material.dart';
import 'package:resetapi/sqlHelper.dart';
void main() {
runApp(const MyApp());
}

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

@override
Widget build(BuildContext context) { return MaterialApp(
// Remove the debug banner debugShowCheckedModeBanner: false, title: 'SQLITE', theme:
ThemeData( primarySwatch: Colors.orange,
),
home: const HomePage());
}
}

class HomePage extends StatefulWidget {
const HomePage({Key? key}) : super(key: key);

@override
_HomePageState createState() => _HomePageState();
}

class _HomePageState extends State<HomePage> {
// All journals
List<Map<String, dynamic>> _journals = [];

bool _isLoading = true;
// This function is used to fetch all data from the database void _refreshJournals() async {
 final data = await SQLHelper.getItems(); setState(() {
_journals = data;
_isLoading = false;
});
}

@override
void initState() {
super.initState();
_refreshJournals(); // Loading the diary when the app starts
```

```
}

final TextEditingController _titleController = TextEditingController();
final TextEditingController _descriptionController = TextEditingController();
// This function will be triggered when the floating button is pressed
// It will also be triggered when you want to update an item void _showForm(int? id) async { if (id !=
null) {
// id == null -> create new item
// id != null -> update an existing item final existingJournal =
_journals.firstWhere((element) => element['id'] == id);
_titleController.text = existingJournal['title'];
_descriptionController.text = existingJournal['description'];
}

showModalBottomSheet( context: context, elevation: 5, isScrollControlled: true, builder: (_) =>
Container( padding: EdgeInsets.only( top: 15,
left: 15,
right: 15,
// this will prevent the soft keyboard from covering the text fields bottom:
MediaQuery.of(context).viewInsets.bottom + 120,
),
child: Column(
mainAxisSize: MainAxisSize.min, crossAxisAlignment: CrossAxisAlignment.end, children: [
TextField(
controller: _titleController,
decoration: const InputDecoration(hintText: 'Title'),
),
const SizedBox( height: 10,
),
TextField(
controller: _descriptionController,
decoration: const InputDecoration(hintText: 'Description'),
),
const SizedBox( height: 20,
),
ElevatedButton( onPressed: () async {
// Save new journal

if (id == null) { await _addItem();
}

if (id != null) {
await _updateItem(id);
}

// Clear the text fields
```

```
_titleController.text = '';
_descriptionController.text = '';
)
],
),
));
}// Close the bottom sheet Navigator.of(context).pop();
},
child: Text(id == null ? 'Create New' : 'Update'),

// Insert a new journal to the database Future<void> _addItem() async { await SQLHelper.createItem(
_titleController.text, _descriptionController.text);
_refreshJournals();
}

// Update an existing journal Future<void> _updateItem(int id) async { await SQLHelper.updateItem(
id, _titleController.text, _descriptionController.text);
_refreshJournals();
}

// Delete an item
void _deleteItem(int id) async { await SQLHelper.deleteItem(id);
ScaffoldMessenger.of(context).showSnackBar(const SnackBar( content: Text('Successfully deleted a
journal!'),
));
_refreshJournals();
}

@override
Widget build(BuildContext context) { return Scaffold( appBar: AppBar(
title: const Text('SQL'),
),
body: _isLoading
? const Center(
child: CircularProgressIndicator(),
)
: ListView.builder( itemCount: _journals.length,
itemBuilder: (context, index) => Card( color: Colors.orange[200], margin: const EdgeInsets.all(15),
child: ListTile(
title: Text(_journals[index]['title']),
subtitle: Text(_journals[index]['description']), trailing: SizedBox( width: 100, child: Row( children: [
IconButton(
icon: const Icon(Icons.edit),
onPressed: () => _showForm(_journals[index]['id']),
),
IconButton(
```

```
icon: const Icon(Icons.delete), onPressed: () =>
_deleteItem(_journals[index]['id']),
),
],
),
)),
),
),
floatingActionButton: FloatingActionButton( child: const Icon(Icons.add), onPressed: () =>
_showForm(null),
),
);
}
}
```

sqlHelper.dart:

```
import 'package:flutter/foundation.dart';
import 'package:sqflite/sqflite.dart' as sql;
class SQLHelper {
static Future<void> createTables(sql.Database database) async {
await database.execute("""CREATE
TABLE items(
id INTEGER PRIMARY KEY AUTOINCREMENT NOT NULL,
title TEXT, description TEXT,
createdAt TIMESTAMP NOT NULL DEFAULT CURRENT_TIMESTAMP
)

""");
}
// id: the id of a item
// title, description: name and description of your activity
// created_at: the time that the item was created. It will be automatically handled by SQLite

static Future<sql.Database> db() async { return sql.openDatabase( 'dbtech.db', version: 1,
onCreate: (sql.Database database, int version) async {
 await createTables(database);
},
);
}

// Create new item (journal)
static Future<int> createItem(String title, String? descrption) async {
final db = await SQLHelper.db();

final data = {'title': title, 'description': descrption}; final id = await db.insert('items', data,
conflictAlgorithm: sql.ConflictAlgorithm.replace); return id;
```

```
}

// Read all items (journals)
static Future<List<Map<String, dynamic>>> getItems() async {
final db = await SQLHelper.db(); return db.query('items', orderBy: "id");
}

// Read a single item by id
// The app doesn't use this method but I put here in case you want to see it static
Future<List<Map<String, dynamic>>> getItem(int id) async {
final db = await SQLHelper.db();
return db.query('items', where: "id = ?", whereArgs: [id], limit: 1);
}

// Update an item by id
static Future<int> updateItem(
int id, String title, String? descrption) async { final db = await SQLHelper.db();

final data = { 'title': title, 'description': descrption,
'createdAt': DateTime.now().toString()
};

final result =

await db.update('items', data, where: "id = ?", whereArgs: [id]); return result;
}

// Delete
static Future<void> deleteItem(int id) async { final db = await SQLHelper.db(); try {
await db.delete("items", where: "id = ?", whereArgs: [id]);
} catch (err) {
debugPrint("Something went wrong when deleting an item: $err");
}
}
}

dependencies: flutter:
sdk: flutter sqflite: ^2.0.0
path: ^1.9.0
path_provider: any
```

Output:


SQL
Jay Patel
Jay Dalsaniya
Rajkot
Create New


SQL
Jay Patel
Jay Dalsaniya
Jay Dalsaniya
Rajkot
Update


SQL
Jay Patel
Rajkot
Successfully deleted a journal!


SQL
Jay Dalsaniya
Marwadi University
Manan Varmora
Marwadi University
Hitesh Bhanderi
Marwadi University

Experiment 11

Aim: Create and application Connecting to REST API in Flutter.

main.dart

```
import 'package:flutter/material.dart';
import 'package:resetapi/data_screen.dart';
void main() { runApp(MyApp());
}
class MyApp extends StatelessWidget {
@override
Widget build(BuildContext context) {
return MaterialApp(
debugShowCheckedModeBanner: false,
title: 'Flutter REST API Demo',
theme: ThemeData(
primarySwatch: Colors.blue,
),
home: DataScreen(),
);
}
}
```

api_service.dart:

```
import 'dart:convert';
import 'package:http/http.dart' as http;

class Post { final int userId; final int id; final String title; final String body;

Post({
required this.userId, required this.id, required this.title, required this.body,
});

factory Post.fromJson(Map<String, dynamic> json) { return Post( userId: json['userId'], id: json['id'],
title: json['title'], body: json['body'],
);
}
}

class ApiService {
static const String baseUrl = 'https://jsonplaceholder.typicode.com/todos/1';

static Future<List<Post>> fetchPosts() async {
final response = await http.get(Uri.parse('$baseUrl/posts'));
```

```
if (response.statusCode == 200) {
List<dynamic> jsonResponse = json.decode(response.body); return jsonResponse.map((post) =>
Post.fromJson(post)).toList();
} else {
throw Exception('Failed to load posts');
}
}
}
```

data_screen.dart:

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

class DataScreen extends StatefulWidget { @override
_DataScreenState createState() => _DataScreenState();
}

class _DataScreenState extends State<DataScreen> { late Future<List<Post>> posts;
@override
void initState() { super.initState(); posts = ApiService.fetchPosts();
}
@override
Widget build(BuildContext context) { return Scaffold( appBar: AppBar( title: Text('Posts'),
),
body: Center(
child: FutureBuilder<List<Post>>( future: posts,
builder: (context, snapshot) { if (snapshot.hasData) { return ListView.builder(
itemCount: snapshot.data!.length, itemBuilder: (context, index) { return Card(
elevation: 3,
margin: EdgeInsets.all(10), child: Padding(
padding: EdgeInsets.all(10), child: Column(
crossAxisAlignment: CrossAxisAlignment.start, children: [ Text(
'Post ${index + 1}:', // Add label here style: TextStyle( fontWeight: FontWeight.bold, fontSize: 16,
),
),
SizedBox(height: 5), Text( snapshot.data![index].title, style: TextStyle(
fontWeight: FontWeight.bold, fontSize: 18,
),
),
SizedBox(height: 5), Text(snapshot.data![index].body),
],
),
),
);
},
);
```

```
} else if (snapshot.hasError) { return Text("${snapshot.error}");
}

// By default, show a loading spinner. return CircularProgressIndicator();
},
),
),
);
}
}
```

Output:

Experiment 12

Aim: Create and application Parsing JSON data from REST API in Flutter.

main.dart

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

void main() { runApp(MyApp());
}
class MyApp extends StatelessWidget { @override
Widget build(BuildContext context) {
return MaterialApp( debugShowCheckedModeBanner: false,
 title: 'Flutter REST API Demo',
theme: ThemeData( primarySwatch: Colors.blue,
),
home: DataScreen(),
);
}
}
```

api_service.dart:

```
import 'dart:convert';
import 'package:http/http.dart' as http;

class Post { final int userId; final int id; final String title; final String body;

Post({
required this.userId, required this.id, required this.title, required this.body,
});

factory Post.fromJson(Map<String, dynamic> json) {
return Post( userId: json['userId'], id: json['id'],
title: json['title'], body: json['body'],
);
}
}

class ApiService {
static const String baseUrl = 'https://jsonplaceholder.typicode.com/todos/1';
static Future<List<Post>> fetchPosts() async {
final response = await http.get(Uri.parse('$baseUrl/posts'));

if (response.statusCode == 200) {
```

```
List<dynamic> jsonResponse = json.decode(response.body);
 return jsonResponse.map((post) => Post.fromJson(post)).toList();
} else {
throw Exception('Failed to load posts');
}
}
}
```

data_screen.dart:

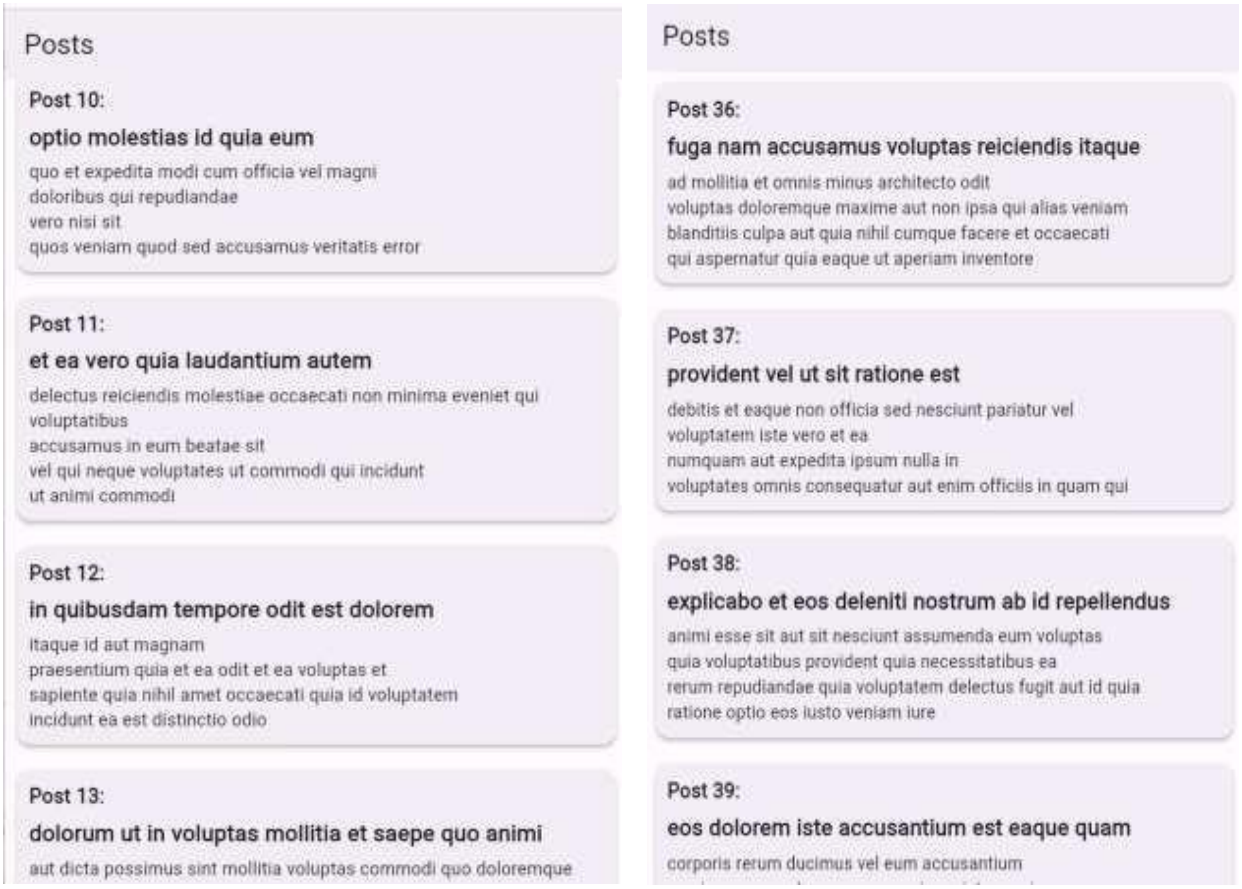
```
import 'package:flutter/material.dart';
import 'package:resetapi/api_service.dart';

class DataScreen extends StatefulWidget { @override
_DataScreenState createState() => _DataScreenState();
}

class _DataScreenState extends State<DataScreen> {
late Future<List<Post>> posts;

@override
void initState() { super.initState(); posts = ApiService.fetchPosts();
}

@override
Widget build(BuildContext context) { return Scaffold(
appBar: AppBar( title: Text('Posts'),
),
body: Center(
child: FutureBuilder<List<Post>>( future: posts, builder: (context, snapshot) {
if (snapshot.hasData) { return ListView.builder(
itemCount: snapshot.data!.length, itemBuilder: (context, index) {


return Card( elevation: 3, margin: EdgeInsets.all(10), child: Padding(
padding: EdgeInsets.all(10), child: Column(
crossAxisAlignment: CrossAxisAlignment.start, children: [
Text(
'Post ${index + 1}:', // Add label here style: TextStyle( fontWeight: FontWeight.bold, fontSize: 16,
),
),
SizedBox(height: 5), Text(
snapshot.data![index].title, style: TextStyle( fontWeight: FontWeight.bold, fontSize: 18,
),
),
SizedBox(height: 5), Text(snapshot.data![index].body),
],
```

```
),
),
);
},
);
} else if (snapshot.hasError) { return Text("${snapshot.error}");
}

// By default, show a loading spinner. return CircularProgressIndicator();
},
),
),
);
}
}
```

post_model.dart:

```
class Post {
 final int userId; final int id;
final String title;
final String body;
Post({
required this.userId,
 required this.id,
required this.title,
required this.body,
});

factory Post.fromJson(Map<String, dynamic> json) {
return Post( userId: json['userId'], id: json['id'],
title: json['title'], body: json['body'],
);
}
}

dev_dependencies: flutter_test:
 sdk: flutter http: ^0.13.3
```

Output:


Posts
Post 10:
optio molestias id quia eum
quo et expedita modi cum officia vel magni
doloribus qui repudiandae
vero nisi sit
quos veniam quod sed accusamus veritatis error
Post 11:
et ea vero quia laudantium autem
delectus reiciendis molestiae occaecati non minima eveniet qui voluptatibus
accusamus in eum beatae sit
vel qui neque voluptates ut commodi qui incidunt
ut animi commodi
Post 12:
in quibusdam tempore odit est dolorem
itaque id aut magnam
praesentium quia et ea odit et ea voluptas et
sapiente quia nihil amet occaecati quia id voluptatem
incidunt ea est distinctio odio
Post 13:
dolorum ut in voluptas mollitia et saepe quo animi
aut dicta possimus sint mollitia voluptas commodi quo doloremque
Posts
Post 36:
fuga nam accusamus voluptas reiciendis itaque
ad mollitia et omnis minus architecto odit
voluptas doloremque maxime aut non ipsa qui alias veniam
blanditiis culpa aut quia nihil cumque facere et occaecati
qui aspernatur quia eaque ut aperiam inventore
Post 37:
provident vel ut sit ratione est
debitis et eaque non officia sed nesciunt pariatur vel
voluptatem iste vero et ea
numquam aut expedita ipsum nulla in
voluptates omnis consequatur aut enim officiis in quam qui
Post 38:
explicabo et eos deleniti nostrum ab id repellendus
animi esse sit aut sit nesciunt assumenda eum voluptas
quia voluptatibus provident quia necessitatibus ea
rerum repudiandae quia voluptatem delectus fugit aut id quia
ratione optio eos iusto veniam iure
Post 39:
eos dolorem iste accusantium est eaque quam
corporis rerum ducimus vel eum accusantium

Experiment 13

Aim: Create and application using Hardware Interaction in Flutter.

main.dart

```
import 'package:flutter/material.dart';
import 'home_screen.dart';
void main(){
runApp(MyApp());
}

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

@override
Widget build(BuildContext context) { return
MaterialApp(
debugShowCheckedModeBanner: false, title:
"Text To Speech",
theme: ThemeData( primarySwatch:
Colors.indigo,
),
home: HomeScreen(),
);
}
}
```

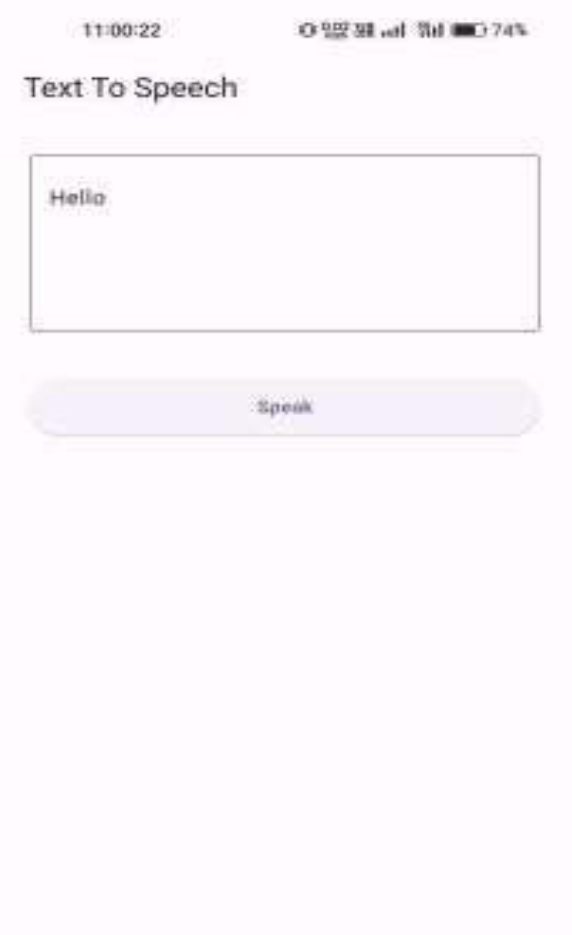
homescreen.dart:

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

class HomeScreen extends StatefulWidget {
const HomeScreen({super.key});

@override
State<HomeScreen> createState() => _HomeScreenState();
}

class _HomeScreenState extends State<HomeScreen> {
final FlutterTts flutterTts = FlutterTts();
final TextEditingController textController = TextEditingController();

@override
```

```
 void dispose() { textController.dispose();
  super.dispose();
 }
 Future<void> speak(String text) async{
  await   flutterTts.setLanguage('en-US');
  await flutterTts.setPitch(1.0);
  await   flutterTts.setSpeechRate(0.5);
  await flutterTts.speak(text);
 }
 Widget build(BuildContext context) {
  return Scaffold(
   appBar: AppBar(
    title: Text("Text To Speech"),
   ),
   body: Padding(
    padding: EdgeInsets.all(20),
    child: Column(
     crossAxisAlignment: CrossAxisAlignment.stretch,
     children: [
      TextField(
       controller: textController, decoration:
       InputDecoration( hintText: 'Enter
       Text',
        border: OutlineInputBorder(),
       ),
       maxLines: 4,
      ),
      SizedBox(height: 30,),
      ElevatedButton(onPressed: () {
      speak(textController.text);
      }
       child: Text('Speak'),
      ),
     ],
    ),
   ),
  );
 }
}
```

Output:


11:00:12
74%
Text To Speech
Enter Text
Speak


11:00:22
74%
Text To Speech
Hello
Speak