



# *Index*

Name,  
Subject,  
Semester,

Mansi Waghela

ADF

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### Year.

2025

### Class

~~GTC4-B~~

**Roll No.**

92310103019



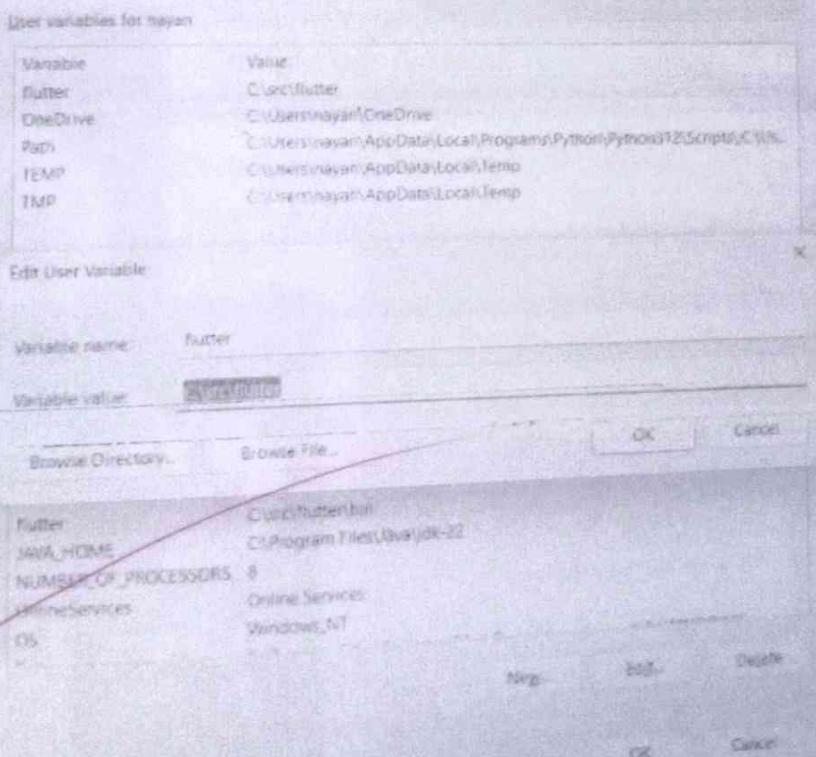
## Practical 1

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

### Solution:

#### Step 1: Install Flutter

1. Check System Requirements
  - Flutter supports Windows, macOS, and Linux.
  - macOS: Requires Xcode.
  - Linux: Install Git and required dependencies.
2. Download Flutter
  - Visit: <https://docs.flutter.dev/get-started/install>
  - Download and extract it to C:\src\flutter (Windows).
3. Set Up Environment Variables
  - Add C:\src\flutter\bin to the PATH variable.



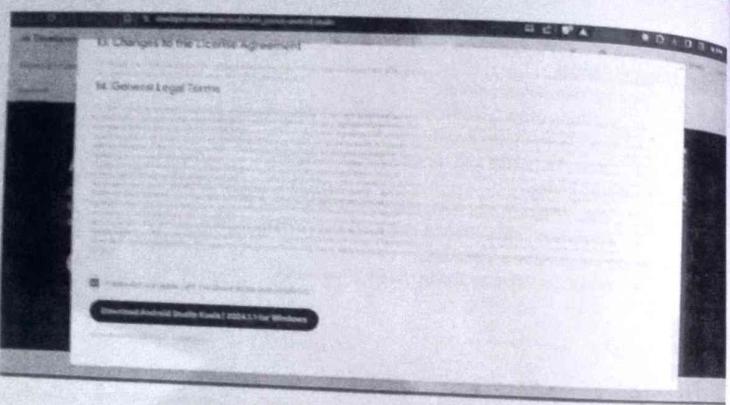
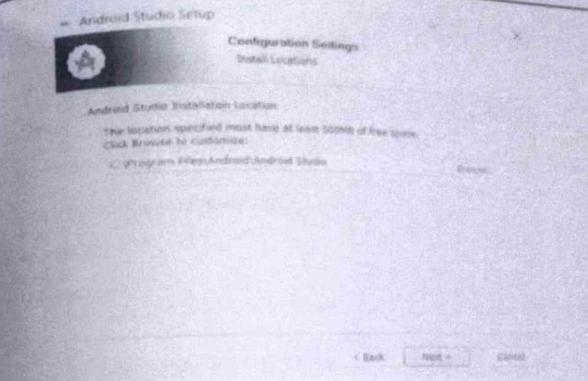
#### 4. Run Flutter Doctor

- Open Command Prompt and run:
  - flutter doctor
  - Follow the instructions to install missing dependencies.

**Marwadi University** NAAC A+ **FACULTY OF ENGINEERING AND TECHNOLOGY**  
Department of Computer Engineering  
**01CE0610- App Development Using Flutter**

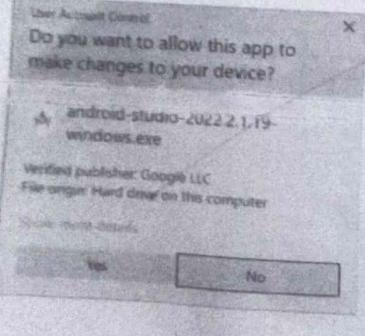
**Step 2: Install Android Studio**

- Download & Install Android Studio
  - Visit: [Android Studio Download](#)
  - Download and install the Windows version.


**2. Install Required Components**

- Open Android Studio → SDK Manager
- Install Android SDK, SDK Tools, and Emulator.




**3. Accept Android Licenses**

- Run in the command prompt:
- `flutter doctor --android-licenses`

## Practical 2

**AIM:** Create a "Hello Flutter" Application.

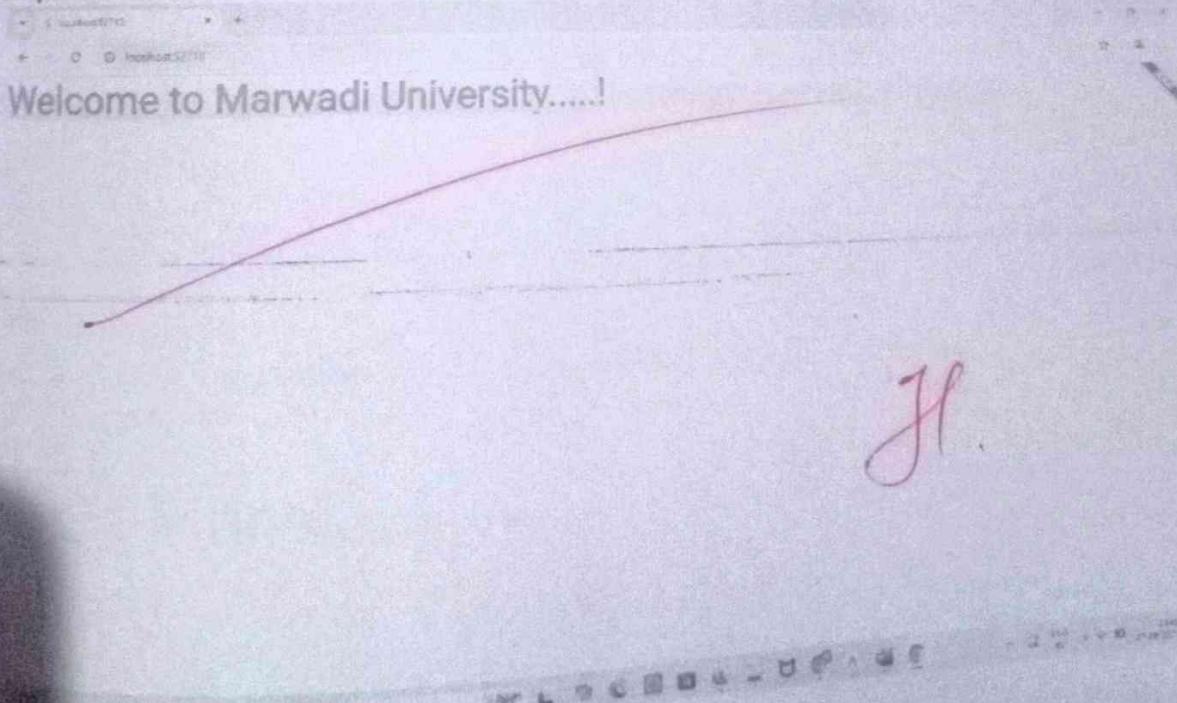
**Solution:**

Source code:

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

void main(){
    runApp(
        MaterialApp(
            home:Text("Welcome to Marwadi University",style: TextStyle(color: Colors.blue))
        )
    );
}
```

**Output:**





### Practical 3

**AIM:** Create an application using Flutter Key Widgets

**solution:**

Source Code:

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

void main(){
  runApp(
    MaterialApp(home:
      Scaffold(appBar:
        AppBar(title:
          Text("prc_3"),),body:
        Text("Hello Mansi....!",style:
          TextStyle(color:Colors.blueGrey,fontSize: 99,fontWeight:FontWeight.bold),),))
};
```

**Output:**

Hello Mansi....!

JL.



### Practical 4

**AIM:** Create and application using Flutter Key Widgets

**Solution:**

Source Code:

```
import 'package:flutter/material.dart';
void main(){
  runApp(
    MaterialApp(
      home: Scaffold(
        appBar: AppBar(
          title: Text("Practical 4"),
        ),
        body: Row(
          mainAxisAlignment: MainAxisAlignment.spaceEvenly,
          crossAxisAlignment: CrossAxisAlignment.center,
          mainAxisSize: MainAxisSize.max,
          textDirection: TextDirection.ltr,
          children: [
            Column(
              children: [
                Text("Roll no.",style: TextStyle(color: Colors.blue,fontWeight: FontWeight.bold)),
                Text("1",style: TextStyle(color: Colors.red)),
                Text("2",style: TextStyle(color: Colors.blue)),
                Text("3",style: TextStyle(color: Colors.blue)),
                TextButton(
                  onPressed: () {
                    print('TextButton pressed!');
                  }
                )
              ],
            )
          ],
        ),
      ),
    )
}
```

```
        ],
        child: Text('Press Me'),
    ),
),
],
Column{
    children: [
        Text("Name",style: TextStyle(color: Colors.blue,fontWeight: FontWeight.bold)),
        Text("Mansi",style: TextStyle(color: Colors.red)),
        Text("ABC",style: TextStyle(color: Colors.blue)),
        Text("DEF",style: TextStyle(color: Colors.blue)),
        OutlinedButton(
            onPressed: () {
                print('OutlinedButton pressed!');
            },
            child: Text('Press Me'),
        ),
),
],
Column{
    children: [
        Text("Marks",style: TextStyle(color: Colors.blue,fontWeight: FontWeight.bold)),
        Text("80",style: TextStyle(color: Colors.red)),
        Text("87",style: TextStyle(color: Colors.blue)),
        Text("90",style: TextStyle(color: Colors.blue)),
        FloatingActionButton(
            onPressed: () {
                print('FloatingActionButton pressed');
            },
            child: Text('Press Me'),
        ),
    ],
}
```

```
        backgroundColor: Colors.blue,  
        foregroundColor: Colors.white,  
        elevation: 6.0,  
        tooltip: 'Add',  
  
,
```

### Output:

Practical 4

Roll no.	Name	Marks
1	Mansi	90
2	ABC	87
3	DEF	93
Press Me	Press Me	Press Me

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## Part-2

### Code:

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

void main() {
  runApp(MaterialApp(home: Scaffold(appBar: AppBar(title: Text("rich text")),
  body: RichText(text: TextSpan(text: "MANSI ",children:
  [TextSpan(text: "WAGHELA",style: TextStyle(color: Colors.blueGrey,fontSize: 30))]))),);
}
```

### Output:

```
Rich Text
  MANSI
    WAGHELA
```

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## Practical 5

**AIM:** Create an application with Flutter UI Components.

**Solution:**

**Source code:**

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

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

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

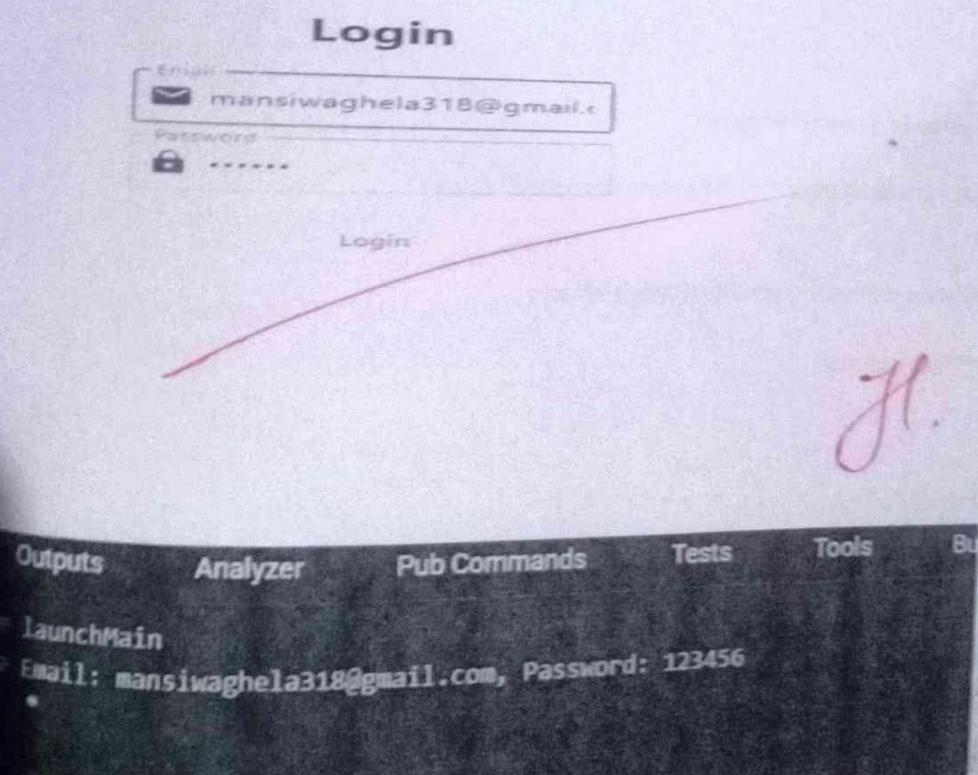
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      home: LoginScreen(),
    );
  }
}

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

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Center(
        child: Padding(
          padding: const EdgeInsets.all(20.0),
          child: Container(
            width: 300,
            child: Column(
              mainAxisSize: MainAxisSize.min,
```

```
children: [
    const Text(
        'Login',
        style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
    ),
    const SizedBox(height: 20),
    SizedBox(
        width: 250,
        child: TextField(
            controller: emailController,
            decoration: InputDecoration(
                labelText: 'Email',
                border: OutlineInputBorder(),
                prefixIcon: Icon(Icons.email),
            ),
            keyboardType: TextInputType.emailAddress,
        ),
    ),
    const SizedBox(height: 10),
    SizedBox(
        width: 250,
        child: TextField(
            controller: passwordController,
            decoration: InputDecoration(
                labelText: 'Password',
                border: OutlineInputBorder(),
                prefixIcon: Icon(Icons.lock),
            ),
            obscureText: true,
        ),
    ),
    const SizedBox(height: 20),
    SizedBox(
        width: 250,
        child: ElevatedButton(
            onPressed: () {
                String email = emailController.text;
                String password = passwordController.text;
                // Add login logic here
                print('Email: $email, Password: $password');
            }
        ),
    ),
]
```

#### **Output:**



## Practical 6

**AIM:** Create an application with Flutter UI Components.

**Solution:**

**Source code:**

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

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

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

class RegistrationForm extends StatefulWidget {
  @override
  State<RegistrationForm> createState() => _RegistrationFormState();
}

class _RegistrationFormState extends State<RegistrationForm> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Center(
        child: Padding(
          padding: EdgeInsets.all(20.0),
          child: Column(
            mainAxisAlignment: MainAxisAlignment.min,
            children: [
              const Text(
                "Registration Form",
                style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
              ),
              const SizedBox(height: 20),
              SizedBox(
                width: 400,
```

```
App D

child: TextField(
  decoration: InputDecoration(
    labelText: "Username",
    hintText: "Enter Username",
    border: OutlineInputBorder(),
    prefixIcon: Icon(Icons.verified_user),
  ),
  keyboardType: TextInputType.emailAddress,
),
),
const SizedBox(height: 20),
SizedBox(
  width: 400,
  child: TextField(
    decoration: InputDecoration(
      labelText: "Email address",
      hintText: "Email",
      border: OutlineInputBorder(),
      prefixIcon: Icon(Icons.email),
    ),
  ),
),
),
const SizedBox(height: 20),
SizedBox(
  width: 400,
  child: TextField(
    decoration: InputDecoration(
      labelText: "Phone Number",
      border: OutlineInputBorder(),
      prefixIcon: Icon(Icons.phone),
    ),
  ),
),
),
const SizedBox(height: 20),
SizedBox(
  width: 400,
  child: TextField(
    decoration: InputDecoration(
      labelText: "Date of Birth",
      border: OutlineInputBorder(),
      prefixIcon: Icon(Icons.date_range),
    ),
    obscureText: true,
  ),
),
),
const SizedBox(height: 20),
SizedBox(
  width: 400,
  child: TextField(
    decoration: InputDecoration(

```



```
        labelText: "Password",
        hintText: "Enter Password",
        border: OutlineInputBorder(),
        prefixIcon: Icon(Icons.lock),
        obscureText: true,
      ),
    ),
    const SizedBox(height: 20),
    SizedBox(
      width: 200,
      child: TextField(
        decoration: InputDecoration(
          labelText: "Confirm Password",
          border: OutlineInputBorder(),
          prefixIcon: Icon(Icons.lock),
        ),
        obscureText: true,
      ),
    ),
    const SizedBox(height: 20),
    ElevatedButton(
      onPressed: () {},
      child: Text("Sign Up"),
    ),
  ],
)
```

Output:

## Registration Form

Username

manz

E-mail Address

manusvaghela316@gmail.com

Mobile Number

9321547488

Date of Birth

...

Password

....

Confirm Password

....

SignUp

First Name: Prushti, Last Name: Bhalala, Email: prushti.bhalala116134@marwadiuniversity.ac.in , PassWord: 123456, Confirm Password: 123456, Address: Gondal, Phone: 1234567890

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**Practical 7****AIM: Create and application with Navigation in Flutter.****Solution:****Source Code:**

```

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: Center(
        child: Padding(
          padding: const EdgeInsets.all(20.0),
          child: Container(
            width: 300,
            child: Column(
              mainAxisAlignment: MainAxisAlignment.min,
              children: [
                const Text(
                  'Login',
                  style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
                ),
              ],
            ),
          ),
        ),
      ),
    );
  }
}

```



```
const SizedBox(height: 20),
SizedBox(
width: 250,
child: TextField(
controller: emailController,
decoration: const InputDecoration(
labelText: 'Email',
border: OutlineInputBorder(),
prefixIcon: Icon(Icons.email),
),
keyboardType: TextInputType.emailAddress,
),
),
const SizedBox(height: 10),
SizedBox(
width: 250,
child: TextField(
controller: passwordController,
decoration: const InputDecoration(
labelText: 'Password',
border: OutlineInputBorder(),
prefixIcon: Icon(Icons.lock),
),
obscureText: true,
),
),
const SizedBox(height: 20),
SizedBox(
width: 250,
child: 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),
),
child: const Text('Login'),
),
),
```

```
    TextButton(
      onPressed: () {
        Navigator.of(context).push(
          MaterialPageRoute(builder: (context) => RegisterScreen()),
        );
      },
      child: const Text("Don't have an account? Register"),
    ),
  ],
),
),
),
),
);
}
}

class RegisterScreen extends StatelessWidget {
final TextEditingController firstnameController = TextEditingController();
final TextEditingController lastnameController = TextEditingController();
final TextEditingController emailController = TextEditingController();
final TextEditingController passwordController = TextEditingController();
final TextEditingController confirmPasswordController =
  TextEditingController();
final TextEditingController addressController = TextEditingController();
final TextEditingController phoneController = TextEditingController();

@Override
Widget build(BuildContext context) {
  return Scaffold(
    body: Center(
      child: Padding(
        padding: const EdgeInsets.all(20.0),
        child: Container(
          width: 300,
          child: Column(
            mainAxisAlignment: MainAxisAlignment.min,
            children: [
              const Text(
                'Register',
                style: TextStyle(fontSize: 28, fontWeight: FontWeight.bold),
              ),
            ],
          ),
        ),
      ),
    ),
  );
}
```

```
const SizedBox(height: 20),
buildTextField(
firstnameController,
'First Name',
Icons.person,
),
const SizedBox(height: 10),
buildTextField(lastnameController, 'Last Name', Icons.person),
const SizedBox(height: 10),
buildTextField(
emailController,
'Email',
Icons.email,
keyboardType: TextInputType.emailAddress,
),
const SizedBox(height: 10),
buildTextField(
passwordController,
>Password',
Icons.lock,
obscureText: true,
),
const SizedBox(height: 10),
buildTextField(
confirmPasswordController,
'Confirm Password',
Icons.lock,
obscureText: true,
),
const SizedBox(height: 10),
buildTextField(addressController, 'Address', Icons.home),
const SizedBox(height: 10),
buildTextField(
phoneController,
'Phone Number',
Icons.phone,
keyboardType: TextInputType.phone,
),
const SizedBox(height: 20),
ElevatedButton(
 onPressed: () {
String firstname = firstnameController.text;
```



String name = TextEditingController(text: ''),

String email = TextEditingController(text: ''),

String password = TextEditingController(text: ''),

String confirmPassword = TextEditingController(text: ''),

String address = TextEditingController(text: ''),

String phone = TextEditingController(text: ''),

print(

'First Name: \$firstname, Last Name: \$lastname, Email: \$email'

'Password: \$password, Confirm Password: \$confirmPassword'

'Address: \$address, Phone: \$phone' );

},

),

style: ElevatedButton.styleFrom(

minimumSize: const Size(double.infinity, 50),

),

child: const Text('Register'),

),

TextButton(

onPressed: () {

Navigator.of(context).pop();

},

child: const Text("Back to Login"),

),

),

),

),

),

),

),

Widget buildTextField(

TextEditingController controller,

String label,

IconData icon, {

TextInputType keyboardType = TextInputType.text,

bool obscureText = false,

}) {

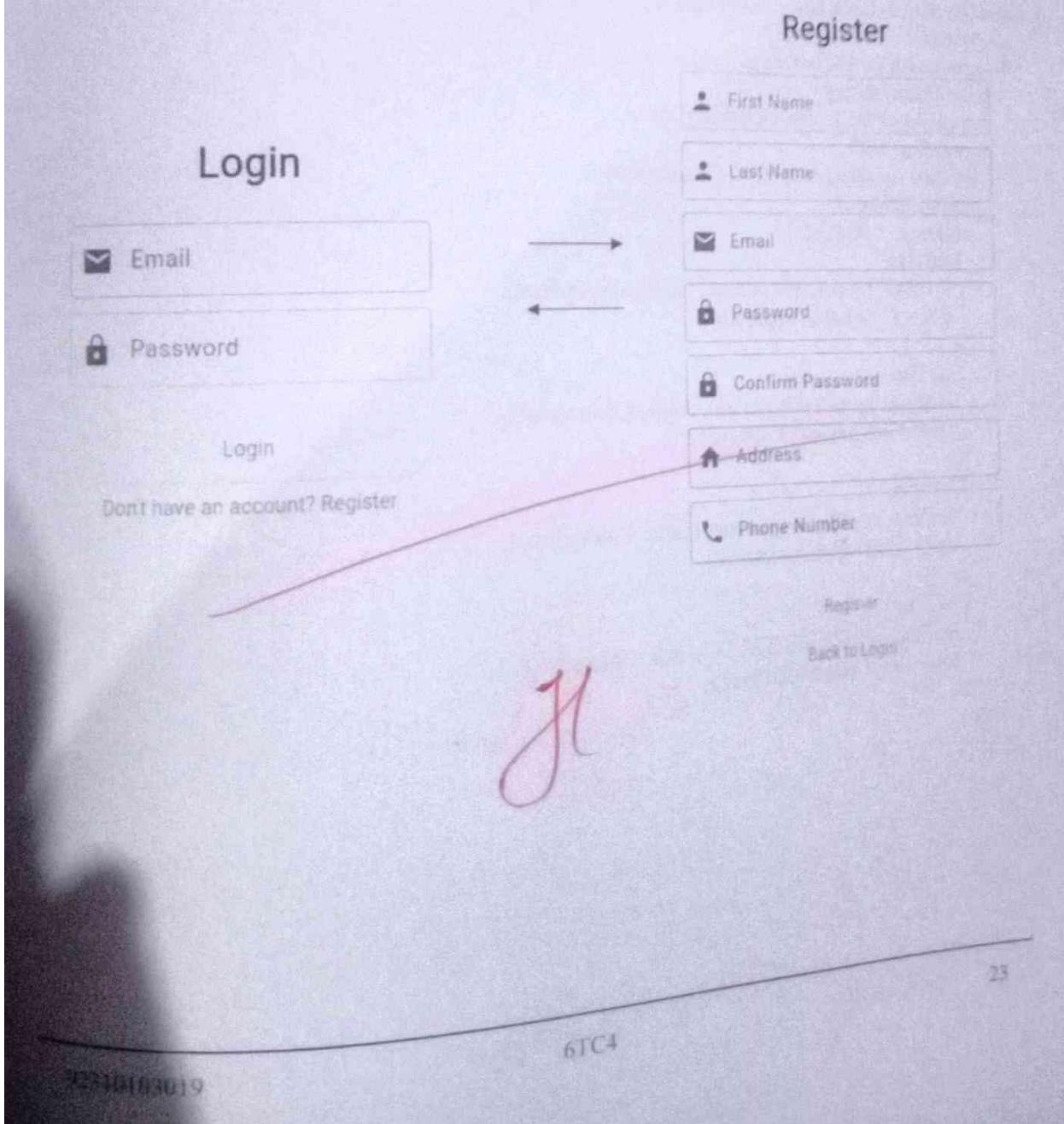
return TextField(

controller: controller,

decoration: InputDecoration(

```
labelText: label,  
border: const OutlineInputBorder(),  
prefixIcon: Icon(icon),  
  
keyBoardType: keyboardType,  
obscureText: obscureText,  
},  
,
```

**Output:**



### Practical 8

AIM: Create and application with list view in Flutter.

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www.ams.org

```
class MyApp extends StatelessWidget {  
  @override  
  Widget build(BuildContext context) {  
    return MaterialApp(  
      debugShowCheckedModeBanner: false,  
      home: Scaffold(  
        appBar: AppBar(title: Text('Contact List')),  
        body: ListView(  
          children: <Widget>[  
            ListTile(  
              leading: Icon(Icons.person, color: Colors.blue),  
              title: Text('harsh nagar sir'),  
            ),  
            ListTile(  
              leading: Icon(Icons.person, color: Colors.blue),  
              title: Text('mansi Waghela'),  
            ),  
            ListTile(  
              leading: Icon(Icons.person, color: Colors.blue),  
              title: Text('vaishnavi kam'),  
            ),  
            ListTile(  
              leading: Icon(Icons.person, color: Colors.blue),  
              title: Text('shashank kam'),  
            ),  
          ],  
        ),  
      ),  
    );  
  }  
}
```

**Output:**

Contact List

Shashank Kali

Sneha Waghela

Vishwanath

Shashank Kali

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## Practical 9

**AIM:** Create an application with grid view in Flutter.

### Solution:

#### Source Code:

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

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

class MyApp extends StatelessWidget {
  final List<Map<String, dynamic>> contacts = [
    {'name': 'Prushti Bhalala', 'icon': Icons.person, 'color': Colors.blue},
    {'name': 'Densi Thummar', 'icon': Icons.person_outline, 'color': Colors.green},
    {'name': 'Nensi Antala', 'icon': Icons.account_circle, 'color': Colors.red},
    {'name': 'Mishva Sheladiya', 'icon': Icons.emoji_people, 'color': Colors.orange},
    {'name': 'Janvi Thanki', 'icon': Icons.face, 'color': Colors.purple},
    {'name': 'Sunny Chauhan', 'icon': Icons.person_pin, 'color': Colors.teal},
  ];
}

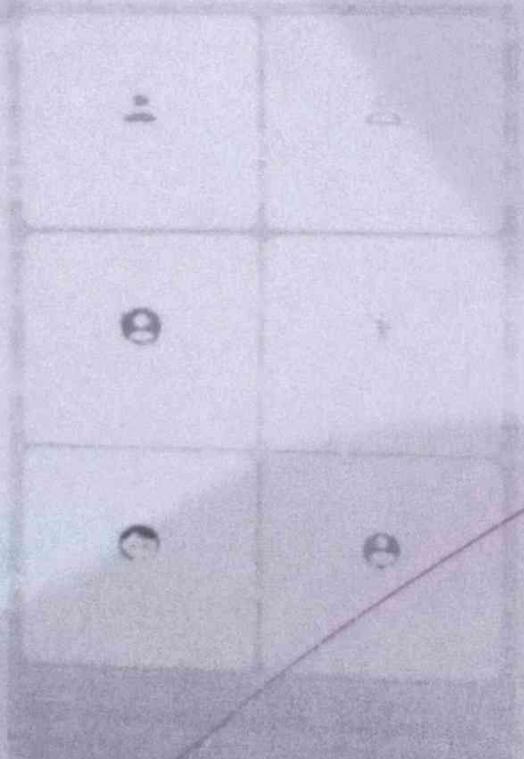
@Override
Widget build(BuildContext context) {
  return MaterialApp(
    debugShowCheckedModeBanner: false,
    home: Scaffold(
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: [
            Text(
              "GridView Example",
              style: TextStyle(fontSize: 20, fontWeight: FontWeight.bold),
            ),
            SizedBox(height: 15),
            Container(
              width: 300, // Fixed square container
              height: 500,
              decoration: BoxDecoration(

```



```
    child: Column(
      mainAxisSize: MainAxisSize.min,
      children: [
        Container(
          decoration: BoxDecoration(
            color: Colors.white,
            border: Border.all(color: Colors.grey),
            padding: EdgeInsets.all(10),
            borderRadius: BorderRadius.circular(10),
            boxShadow: [
              BoxShadow(
                color: Colors.grey.withOpacity(0.5),
                blurRadius: 4,
              ),
            ],
          ),
          child: Column(
            mainAxisSize: MainAxisSize.min,
            children: [
              Icon(
                contacts[index]['icon'],
                color: contacts[index]['color'],
                size: 30,
              ),
              SizedBox(height: 5),
              Text(
                contacts[index]['name'],
                textAlign: TextAlign.center,
                style: TextStyle(
                  fontSize: 18,
                  fontWeight: FontWeight.bold,
                ),
              ),
            ],
          ),
        ),
      ],
    ),
  ),
}
```

```
    },  
    },  
    },  
    },  
    },  
    },  
    },  
    }  
};
```

**Output:****GridView Example**

## Practical 10

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

**Solution:****Source Code:****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(
      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> {
  List<Map<String, dynamic>> _journals = [];
}
```



```
bool _isLoading = true;
void refreshJournals() async {
  final data = await SQLHelper.getItem();
  setState(() {
    _journals = data;
    _isLoading = false;
  });
}

@override
void initState() {
  super.initState();
  refreshJournals();
}

final TextEditingController _titleController = TextEditingController();
final TextEditingController _descriptionController = TextEditingController();

void _showForm(int? id) async {
  if (id != null) {
    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,
        bottom: MediaQuery.of(context).viewInsets.bottom + 120,
      ),
      child: Column(
        mainAxisSize: MainAxisSize.min,
        crossAxisAlignment: CrossAxisAlignment.end,
        children: [
          TextField(
            controller: _titleController,
            decoration: const InputDecoration(hintText: 'Title'),

```

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```
  },
  @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/sqlite.dart' as sqflite;  
  
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  
    );  
    ...  
  };  
  
  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? description) async {  
    final db = await SQLHelper.db();  
    final data = {'title': title, 'description': description};  
    final id = await db.insert(  
      'items',  
      data,  
      conflictAlgorithm: sql.ConflictAlgorithm.replace,  
    );  
    return id;  
  };  
}
```

Read all items (journals)  
Future<List<Map<String, dynamic>>> getItems() async {



```
final db = await SQLHelper.db();
return db.query('items', orderBy: "id");
}

// Read a single item by id
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);
}

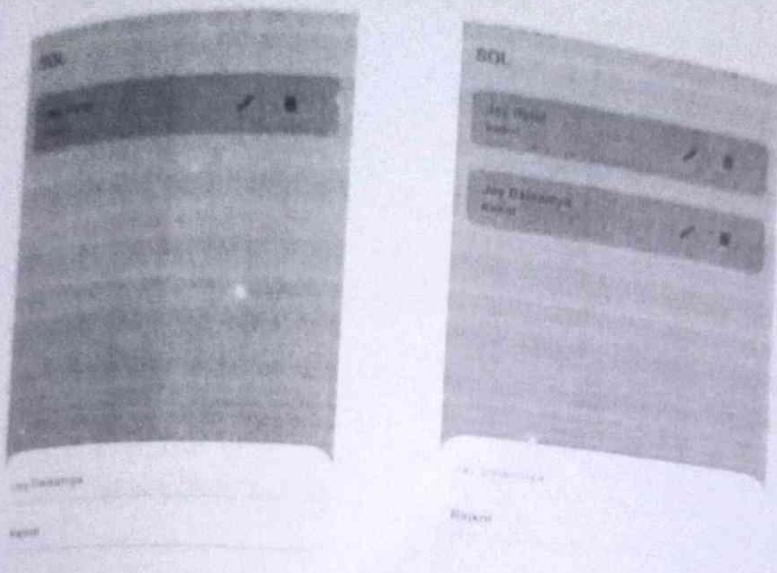
// Update an item by id
static Future<int> updateItem(int id, String title, String? description) async {
    final db = await SQLHelper.db();
    final data = {
        'title': title,
        'description': description,
        'createdAt': DateTime.now().toString(),
    };
    final result = await db.update('items', data, where: "id = ?", whereArgs: [id]);
    return result;
}

// Delete an item
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: ^2.0.0
  path_provider: ^1.9.4
```

path\_provider: ^1.9.4

Output:



SQL

Get Started

SQL

Get Database

Logout

Get Started

University of Engineering &amp; Technology

## Practical 11

**AIM:** Create an application Connecting to REST API in Flutter.

**Solution:**

**Source Code:**

**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';  
  
    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}!',  
                            style: TextStyle(  
                              fontWeight: FontWeight.bold,  
                              fontSize: 16,  
                            ),  
                          ),  
                        ],  
                      ),  
                    ),  
                  );  
                },  
              );  
            }  
            return CircularProgressIndicator();  
          },  
        ),  
      ),  
    );  
  }  
}
```

```
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}");  
}  
return CircularProgressIndicator();  
},  
),  
);  
};
```

H

**Output:**

**Post 10:**

**optio molestias id quia eum**

Sed ut perspiciatis unde omnis officia vel illum

qui dolorem ipsum quod.

est sit amet.

Quis autem vel eum iure conatur exceptio-

**Post 11:**

**et ea vero quia laudantium autem**

multo remissis voluptatis officiis non minus et enim quia

autem.

explicabo et ea vero quia

et ea vero quia laudantium autem.

et ea vero quia laudantium autem.

**Post 12:**

**In quibusdam tempore odit est dolorem**

Itaque id autem.

propter quia et ea odit et ea voluptas et

saepe quia nullus amet occaecati quia id voluptatem

modicam et ea distinctio odio.

**Post 13:**

**dolorum ut in voluptas mollitia et saepe quo animi**

aut dicta possimus sibi mollitia voluptas commodi que doloremque

**Posts**

**Post 36:**

**fuga nam accusamus voluptas reiciendis itaque**  
ad remissa et summae habens. modicam et ea  
voluptas et ea distinctio odio. que doloremque  
modicam et ea distinctio odio. que doloremque  
modicam et ea distinctio odio. que doloremque

**Post 37:**

**provident vel ut sit ratione est**

debet et ergo non officia sed haec sunt per se ipsa  
voluptatem iste vero et ea  
modicam aut expedita ipsi immixta in  
voluptates omnes consequatur aut enim officia in quam quia

**Post 38:**

**explicabo et eos deleniti nostrum ab id repellendus**

animi esse sit aut sit nesciunt assumenda eum voluptas  
qua voluptetibus provident quia necessitatibus ea  
rerum repudiandae quia voluptatem delectus fugit aut id qua  
ratione optio eos iusto veniam iure

**Post 39:**

**eos dolorem iste accusantium est eaque quam**

corporis rerum ducimus vel eum accusantium



### Practical 12

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

**Solution:**

**Source Code:**

**main.dart:**

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

```
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.connectionState == ConnectionState.waiting) {
            return CircularProgressIndicator();
          } else if (snapshot.hasError) {
            return Text("Error: ${snapshot.error}");
          } else if (!snapshot.hasData || snapshot.data!.isEmpty) {
            return Text("No posts available");
          }

          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}!",
                        style: TextStyle(
                          fontWeight: FontWeight.bold,
                          fontSize: 16,
                        ),
                      ),
                      SizedBox(height: 5),
                      Text(
                        snapshot.data![index].title,
                        style: TextStyle(
                          fontWeight: FontWeight.bold,
                          fontSize: 18,
                        ),
                      ),
                    ],
                  ),
                ),
              );
            },
          );
        },
      ),
    ),
  );
}
```

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:  
      - flutter:  
        sdk: flutter  
        http: ^0.13.3
```

**Output:**

Posts

Post 10:

**optio molestias id quia eum**

et ea vero qui laudantium autem  
in voluptate vel ea officia vel magni  
molestias id quia eum  
vel ea vero qui laudantium  
autem officia vel magni

Post 11:

**et ea vero qui laudantium autem**

autem officia vel magni  
molestias id quia eum  
autem officia vel magni  
et ea vero qui laudantium  
autem officia vel magni

Post 12:

**in quibusdam tempore odit est dolore**

et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
autem officia vel magni  
et ea vero qui laudantium  
autem officia vel magni

Post 13:

**dolorum ut in voluptas mollitia et saepe quo animi**  
autem officia vel magni  
molestias id quia eum  
autem officia vel magni

Posts

Post 36:

**fuga nam accusamus voluptas reiciendo deus**  
ad mollitia et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
et ea vero qui laudantium  
autem officia vel magni

Post 37:

**provident vel ut sit ratione est**

et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
et ea vero qui laudantium  
autem officia vel magni

Post 38:

**explicabo et eos deleniti nostrum ab id repellentes**

et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
et ea vero qui laudantium  
autem officia vel magni  
molestias id quia eum  
et ea vero qui laudantium  
autem officia vel magni

Post 39:

**eos dolorem iste accusantium est eaque quam**

corporis rerum ducimus vel eum accusantium

### Practical 13

**AIM:** Create an application using Hardware Interaction in Flutter.

**Solution:**

**Source Code:**

**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(),
    );
}
```

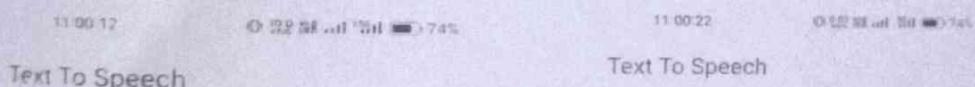
**homescreen.dart:**

```
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);  
  }  
  
  @override  
  Widget build(BuildContext context) {  
    return Scaffold(  
      appBar: AppBar(  
        title: const Text("Text To Speech"),  
      ),  
      body: Padding(  
        padding: const EdgeInsets.all(20),  
        child: Column(  
          crossAxisAlignment: CrossAxisAlignment.stretch,  
          children: [  
            TextField(  
              controller: textController,  
              decoration: const InputDecoration(  
                hintText: 'Enter Text',  
                border: OutlineInputBorder(),  
              ),  
              maxLines: 4,  
            ),  
          ],  
        ),  
      ),  
    );  
  }  
}
```

```
},
const SizedBox(height: 30),
ElevatedButton(
 onPressed: () {
 speak(textController.text);
 },
child: const Text('Speak'),
),
),
),
);
}
}
```

### Output:



J