UNIVERSITY COLLEGE OF ENGINEERING

TINDIVANAM

(A Constituent College of Anna University, Chennai)

B.TECH SIXTH SEMESTER
RECORD FOR

MOBILE APPLICATIONS DEVELOPMENT LABORATORY (IT3681)

DEPARTMENT OF INFORMATION TECHNOLOGY

LABORATORY RECORD NOTE BOOK

2024-2025

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LABORATORY RECORD NOTE BOOK

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This is to certify that is a bonafide record of the work done by Mr./Ms. _____ Register Number _____ Of **3rd Year** B.Tech, Department of **Information Technology** in the **Mobile Applications Development Laboratory (IT3681)** in the VI Semester.

University **Examination held on .....**

Staff In-Charge **Head of the Department**

Internal Examiner **External Examiner**

Ex .No: 1 Date :	Study and installation of Flutter/Kotlin multi-platform environment .	Page No : 1

Aim:

The aim of this guide is to help you set up a Flutter multi-platform development environment using Android Studio. This includes installing Flutter, configuring Android Studio, and creating a basic Flutter project that can be run on both Android and iOS platforms.

1. Install Flutter SDK:

- Download the Flutter SDK from the official website: Flutter SDK
- Extract the downloaded zip file to a location on your machine.
- Add the Flutter bin directory to your system PATH. This step is crucial for running Flutter commands from the terminal.

2. Install Dart SDK:

- Flutter requires Dart SDK. Download it from the Dart SDK website: Dart SDK
- Extract the Dart SDK and add its bin directory to your system PATH.

3. Verify Flutter Installation

- Open a terminal and run the following command to verify Flutter is correctly installed:
  $ flutter doctor
- Fix any issues reported by flutter doctor until all checks pass.

4. Install Android Studio:

- Download and install Android Studio from the official website: Android Studio
- Open Android Studio, and install the Flutter and Dart plugins from the marketplace.

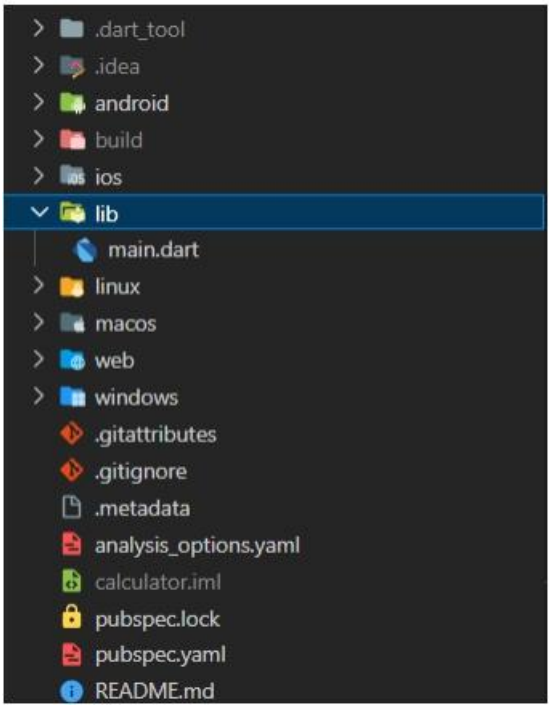
5. Configure Flutter in Android Studio:

- Open Android Studio, go to Preferences on macOS or Settings on Windows/Linux.
- Navigate to Languages & Frameworks > Flutter.
- Set the Flutter SDK path to the location where you extracted the Flutter SDK.

5. Create a Flutter Project:

- Open Android Studio and click on **File > New > New Flutter Project.**
- Choose a Flutter application template.
- Set the **project name, location**, and other details.
- Click Finish to create the project.

Project Structure :



- **android/:** Android-specific code and configurations.
- **build/:** Auto-generated build files.
- **ios/:** iOS-specific code and configurations.
- **lib/:** Dart code for your Flutter application.
  main.dart: The entry point of your Flutter app.
- **test/:** Folder for unit tests.
- **.gitignore:** File to specify files and directories to ignore in version control.
- **.metadata:** Flutter-specific metadata file.
- **.packages:** Flutter package dependencies.
- **.vscode/:** Configuration files for Visual Studio Code (if used).
- **android.iml:** Android Studio project file.
- **pubspec.lock:** Lock file specifying exact versions of dependencies.
- **pubspec.yaml:** YAML file for project configuration, including dependencies.

7. Run on Android Device:

- Connect an Android device or start an emulator.
- Open the terminal in Android Studio and navigate to your project directory.
- Run flutter devices to see the available devices.
- Run flutter run to build and run the Flutter app on the selected device.

8. Run on iOS Simulator (macOS only):

- Open the project in Android Studio.
- Open a terminal and navigate to your project directory.
- Run flutter devices to ensure an iOS simulator is available.
- Run flutter run with the target device set to the iOS simulator.

9. Study Notes:

- Understand the Flutter project structure, especially the lib directory where your Dart code resides.
- Explore the **pubspec.yaml** file for managing dependencies.
- Study Flutter widgets and their properties.
- Learn how to navigate between screens using **Navigator**.
- Understand the concept of **Stateful** and **Stateless** widgets.

Result:

Successfully Installation Of Flutter Multi-Platform Environment

Ex .No : 2 Date :	Develop an application that uses Widgets, GUI components, Fonts, and Colors.	Page No : 4

Aim:

To Develop an application that uses Widgets, GUI components, Fonts, and Colors.

Algorithm :

Widget Tree Structure:

- The program begins with the main function, which calls the runApp method to start the Flutter application.
- The MyApp class is a stateless widget representing the entire application.
- MyApp creates a MaterialApp with a custom theme and sets the home page to an instance of MyHomePage.

Home Page Widget (MyHomePage):

- MyHomePage is a stateful widget that holds the mutable state of the counter.
- It has a corresponding state class _MyHomePageState that extends State<MyHomePage>.

State Class (_MyHomePageState):

- The state class _MyHomePageState contains the mutable state for the counter.
- It includes an integer variable _counter initialized to 0.
- There are two methods, _incrementCounter and _decrementCounter, to handle the increment and decrement operations, respectively.
- The setState method is used in both methods to trigger a rebuild of the UI when the counter changes.

Build Method (build):

- The build method is responsible for creating the widget tree.
- It returns a Scaffold widget, which provides the basic structure of the app, including an AppBar and a body.
- The body contains a Center widget with a Column of child widgets.
- The first child is a text widget displaying the label "Counter" with a specified style.
- The second child is another text widget displaying the current counter value, using a larger font size and a specific color.
- A SizedBox is used to add some spacing between the text and the buttons.
- The third child is a Row containing two ElevatedButton widgets with icons for increment and decrement operations.
- Each button has an onPressed callback linked to _incrementCounter and _decrementCounter methods.

Increment and Decrement Methods:

- incrementCounter and _decrementCounter methods modify the _counter variable using the setState function to trigger a rebuild of the UI.

UI Update:

- When the user taps the increment or decrement buttons, the corresponding _incrementCounter or decrementCounter method is called.
- setState is used to notify Flutter that the internal state has changed, triggering a rebuild of the widget tree.
- The updated counter value is reflected in the UI.

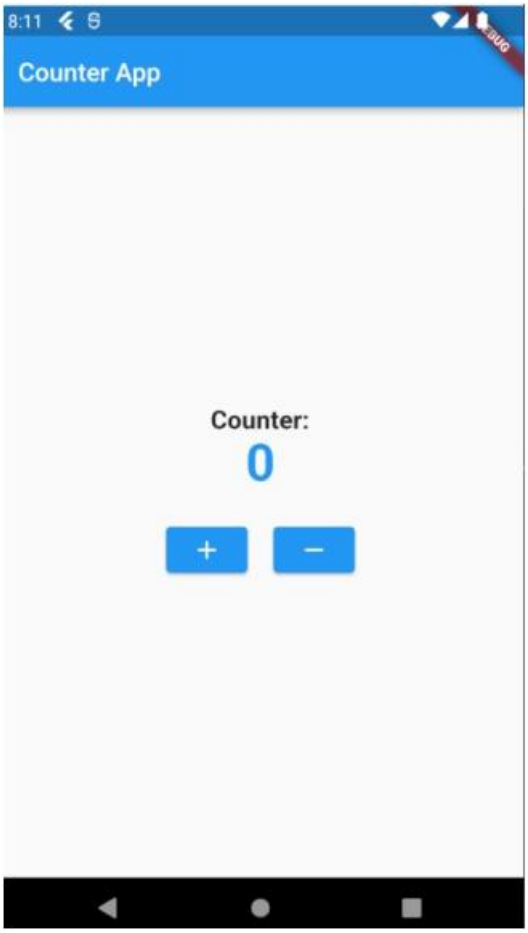
Program:

main.dart

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

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Counter App',
      theme: ThemeData(
        primarySwatch: Colors.blue,
        fontFamily: 'Roboto', // Setting a custom font
      ),
      home: MyHomePage(),
    );
  }
}

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

class _MyHomePageState extends State<MyHomePage> {
  int _counter = 0;

  void _incrementCounter() {
    setState(() {
      _counter++;
    });
  }

  void _decrementCounter() {
    setState(() {
      _counter--;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Counter App'),
      ),
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: <Widget>[
```

```
            Text(
              'Counter:',
              style: TextStyle(
                fontSize: 20.0,
                fontWeight: FontWeight.bold,
              ),
            ),
            Text(
              '$_counter',
              style: TextStyle(
                fontSize: 40.0,
                color: Colors.blue,
                fontWeight: FontWeight.bold,
              ),
            ),
            SizedBox(height: 20.0),
            Row(
              mainAxisAlignment: MainAxisAlignment.center,
              children: [
                ElevatedButton(
                  onPressed: _incrementCounter,
                  child: Icon(Icons.add),
                ),
                SizedBox(width: 20.0),
                ElevatedButton(
                  onPressed: _decrementCounter,
                  child: Icon(Icons.remove),
                ),
              ],
            ),
          ],
        ),
      ),
    );
  }
}
```

Output:



Result:

Successfully Develop an application that uses Widgets, GUI components, Fonts, and Colors.

Ex .No : 3 Date :	Develop a native calculator application.	Page No : 8

Aim:

To Develop a native calculator application.

Algorithm :

Initialization:

- Initialize the necessary variables, including _output, num1, num2, and operand.
- Set up the UI structure using Flutter's MaterialApp and Scaffold widgets.

Button Press Handling (operations function):

- The operations function is called when a button is pressed.
- It performs different actions based on the pressed button:
- If the button is a digit (0-9), it appends the digit to the current output.
- If the button is ".", it adds a decimal point to the output if one doesn't already exist.
- If the button is an arithmetic operation (+, -, *, /), it updates num1 with the current output value, sets the operand, and resets the output for the next input.
- If the button is "=", it calculates the result based on num1, num2, and the operand.
- If the button is "CLEAR", it resets all variables for a new calculation.
- The setState function is used to update the UI with the current output.

Button Widget (button function):

- The button function is a utility function to create a stylized button with a specified label and onPressed function.
- It returns an OutlinedButton widget with the given properties.

UI Structure:

- The UI is structured using Column and Row widgets to arrange buttons in a grid-like format.
- The top section displays the previous value (history) and the current output.
- The bottom section consists of rows of digit and operation buttons.

Program:

main.dart

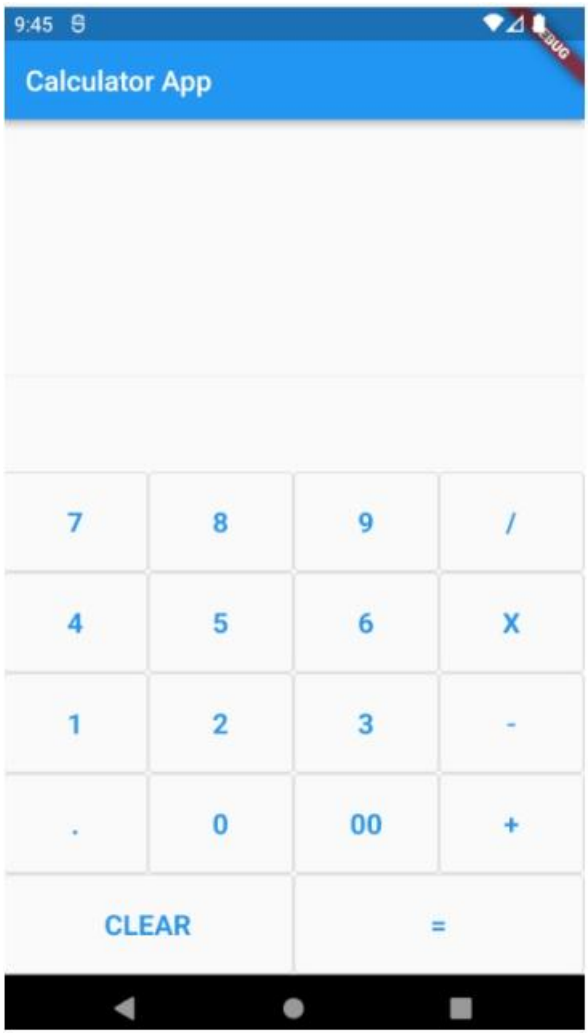
```
import 'package:flutter/material.dart';

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

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

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Demo',
      theme: ThemeData(
        primarySwatch: Colors.blue,
        visualDensity: VisualDensity.adaptivePlatformDensity,
      ),
      home: const MyHomePage(),
    );
  }
}

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

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

class _MyHomePageState extends State<MyHomePage> {
  String output = "";
  String previousValue = "";

  String _output = "0";
  double num1 = 0.0;
  double num2 = 0.0;
  String operand = "";

  @override
  Widget build(BuildContext context) {
    operations(String value) {
      if (value == "CLEAR") {
        _output = "0";
        num1 = 0.0;
        num2 = 0.0;
        operand = "";
        previousValue = "";
      } else if (value == "+" || value == "-" || value == "/" || value ==
"X") {
        print(output);
```

```
        num1 = double.parse(output);
        operand = value;
        previousValue = output + " " + operand;
        _output = "0";
      } else if (value == ".") {
        if (_output.contains(".")) {
          print("Already contains a decimal");
          return;
        } else {
          _output = _output + value;
        }
      } else if (value == "=") {
        num2 = double.parse(output);
        if (operand == "+") {
          _output = (num1 + num2).toString();
        }
        if (operand == "-") {
          _output = (num1 - num2).toString();
        }
        if (operand == "X") {
          _output = (num1 * num2).toString();
        }
        if (operand == "/") {
          _output = (num1 / num2).toString();
        }
        previousValue = output + " " + operand + " " + num2.toString();
        num1 = 0.0;
        num2 = 0.0;
        operand = "";
      } else {
        _output = _output + value;
      }

      setState(() {
        output = double.parse(_output).toStringAsFixed(2);
      });
    }

    Widget button(String buttonText, Function() onPressed) {
      return Expanded(
        child: OutlinedButton(
          onPressed: onPressed,
          style: ButtonStyle(
            padding: MaterialStateProperty.all(const
EdgeInsets.all(24.0)),
          ),
          child: Text(
            buttonText,
            style: const TextStyle(fontSize: 20.0, fontWeight:
FontWeight.bold),
          ),
        ),
      );
    }
```

```
    return Scaffold(
      appBar: AppBar(
        title: const Text("Calculator App"),
      ),
      body: Container(
        child: Column(
          children: <Widget>[
            Container(
              alignment: Alignment.centerRight,
              padding:
                  const EdgeInsets.symmetric(vertical: 24.0, horizontal:
12.0),
              child: Column(
                crossAxisAlignment: CrossAxisAlignment.end,
                children: [
                  Text(
                    previousValue,
                    style: const TextStyle(
                        fontSize: 20.0, fontWeight: FontWeight.normal),
                  ),
                  Text(
                    output,
                    style: const TextStyle(
                        fontSize: 36.0, fontWeight: FontWeight.bold),
                  ),
                ],
              ),
            ),
            const Expanded(child: Divider()),
            Column(
              children: [
                Row(children: [
                  button("7", () => operations("7")),
                  button("8", () => operations("8")),
                  button("9", () => operations("9")),
                  button("/", () => operations("/")),
                ]),
                Row(children: [
                  button("4", () => operations("4")),
                  button("5", () => operations("5")),
                  button("6", () => operations("6")),
                  button("X", () => operations("X")),
                ]),
                Row(children: [
                  button("1", () => operations("1")),
                  button("2", () => operations("2")),
                  button("3", () => operations("3")),
                  button("-", () => operations("-")),
                ]),
                Row(children: [
                  button(".", () => operations(".")),
                  button("0", () => operations("0")),
                  button("00", () => operations("00")),
```

```
                button("+", () => operations("+")),
              ]),
              Row(children: [
                button("CLEAR", () => operations("CLEAR")),
                button("=", () => operations("=")),
              ]),
            ],
          )
        ],
      ),
    ),
  );
 }
}
```

Output:



Result:

Successfully Develop a native calculator application .

Ex .No : 4 Date :	Develop a gaming application that uses 2-D animations and gestures.	Page No : 13

Aim:

To Develop a gaming application that uses 2-D animations and gestures.

Algorithm :

Widget Tree Structure:

- The program starts with the main function, calling runApp to initiate the Flutter application.
- MyApp is a stateless widget representing the entire application, and it creates a MaterialApp with the home set to an instance of MazeGame.

Maze Game Widget (MazeGame):

- MazeGame is a stateful widget with a corresponding state class _MazeGameState.
- **State Class (_MazeGameState):**
- _MazeGameState contains the mutable state for the maze game.
- It includes a boolean variable success to track whether the player successfully completed the maze.

Build Method (build):

- The build method creates a Scaffold with an AppBar and a body containing a Center widget.
- Inside the Center, there's a ListView containing a Column with child widgets.
- The Maze widget is used to display the maze game with a specified player, columns, rows, wall thickness, wall color, finish, and a callback function onFinish triggered when the player reaches the destination.

Game Completion (onFinish Callback):

- The onFinish callback is triggered when the player successfully completes the maze.
- It sets the success variable to true and calls _showSuccessDialog to display a congratulatory dialog box.

Success Dialog (_showSuccessDialog Method):

- _showSuccessDialog creates and displays an AlertDialog when the player successfully completes the maze.
- The dialog contains a title, content, and two ElevatedButton widgets for restarting the game or closing the dialog.
- Pressing the "Restart" button resets the game state, and pressing "Close" can perform additional actions.

Dependencies Packages:

```
dependencies:
  flutter:
    sdk: flutter
  cupertino_icons: ^1.0.2
  maze: ^3.0.0
```

Program :

Download Assets From : https://github.com/ramtsps/flutter_Assets/tree/main/Ex4-assets

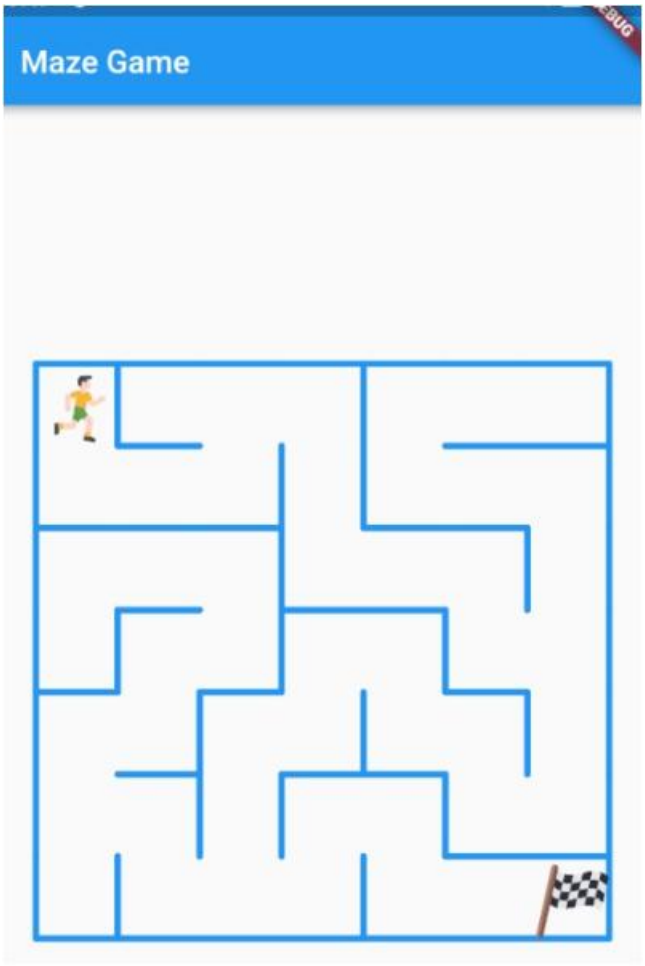
main.dart

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

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

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

class MazeGame extends StatefulWidget {
  @override
  _MazeGameState createState() => _MazeGameState();
}

class _MazeGameState extends State<MazeGame> {
  bool success = false;

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Maze Game'),
      ),
      body: Center(
        child: ListView(
          children: [
            Column(
              mainAxisAlignment: MainAxisAlignment.center,
              children: [
                Maze(
```

```
                    player: MazeItem(
                      'assets/player.png',
                      ImageType.asset,
                    ),
                    columns: 7, // Increase the number of columns
                    rows: 7, // Increase the number of rows
                    wallThickness: 4.0,
                    wallColor: Colors.blue,
                    finish: MazeItem(
                      'assets/finish.png',
                      ImageType.asset,
                    ),
                    onFinish: () {
                      // Handle game completion
                      setState(() {
                        success = true;
                      });
                      _showSuccessDialog(context);
                    },
                  ),
                  SizedBox(height: 20),
                  if (success)
                    Text(
                      'Congratulations! You reached the destination!',
                      style: TextStyle(fontSize: 18, fontWeight:
FontWeight.bold),
                    ),
                ],
              ),
            ],
          ),
        ),
      );
    }

    void _showSuccessDialog(BuildContext context) {
      showDialog(
        context: context,
        builder: (BuildContext context) {
          return AlertDialog(
            title: Text('Congratulations!'),
            content: Text('You successfully completed the maze!'),
            actions: [
              ElevatedButton(
                onPressed: () {
                  Navigator.of(context).pop();
                  // Reset the game state
                  setState(() {
                    success = false;
                  });
                },
                child: Text('Restart'),
              ),
              ElevatedButton(
```

```
                onPressed: () {
                  Navigator.of(context).pop();
                  // Additional actions after closing the dialog
                },
                child: Text('Close'),
              ),
            ],
          );
        },
      );
    }
}
```

Output:



Result:

Successfully Develop a gaming application that uses 2-D animations and gestures.

Ex .No : 5 Date :	Develop a movie rating application (similar to IMDB).	Page No : 17

Aim:

To Develop a movie rating application (similar to IMDB).

Algorithm :

Model Class (Movie):

- The Movie class represents a movie with attributes like id, title, overview, director, rating, and imageUrl.
- It includes a factory method fromJson to create a Movie instance from a JSON map.
- **Movie Service (MovieService):**
- MovieService is responsible for making API requests to retrieve movie data.
- The class includes methods like getMovies and getMovieDetails.
- The getMovies method fetches a list of popular movies from the TMDb API.
- The getMovieDetails method fetches details for a specific movie using its ID.

App Entry Point (main):

- The main function calls runApp to start the Flutter application with the MyApp widget as the root.

Root Widget (MyApp):

- MyApp is a stateless widget representing the entire application.
- It creates a MaterialApp with a title, theme, and sets MovieListScreen as the home screen.

Movie List Screen (MovieListScreen):

- MovieListScreen is a stateless widget displaying a list of movies.
- It includes a FutureBuilder to handle the asynchronous loading of movie data using MovieService.

Movie Card Widget (MovieCard):

- MovieCard is a stateless widget representing a card for each movie in the list.
- It includes an InkWell for a tap gesture, leading to the MovieDetailScreen.
- The widget displays the movie's image, title, director, and rating.

Movie Detail Screen (MovieDetailScreen):

- MovieDetailScreen is a stateless widget displaying detailed information about a specific movie.
- It includes a FutureBuilder to handle the asynchronous loading of movie details using MovieService.

UI Building in Movie Detail Screen:

- The UI includes the movie title, director, rating, an image of the movie, and an overview.

Navigation Between Screens:

- Tapping on a movie card in MovieListScreen navigates to the MovieDetailScreen with the selected movie's ID.

Error Handling:

- The FutureBuilder widget handles different states (loading, error, data) and displays appropriate widgets based on the state.

Dependencies Packages:

```
dependencies:
  flutter:
    sdk: flutter
  http: ^1.0.0
```

Program :

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

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

class Movie {
  final int id;
  final String title;
  final String overview;
  final String director;
  final double rating;
  final String imageUrl;

  Movie({
    required this.id,
    required this.title,
    required this.overview,
    required this.director,
    required this.rating,
    required this.imageUrl,
  });

  factory Movie.fromJson(Map<String, dynamic> json) {
    return Movie(
      id: json['id'],
      title: json['title'],
      overview: json['overview'],
      director: json['director'] ??
          '', // Replace 'director' with the appropriate field from your
API
      rating: (json['vote_average'] ?? 0.0).toDouble(),
      imageUrl: 'https://image.tmdb.org/t/p/w500${json['poster_path']}',
    );
  }
}

class MovieService {
  final String apiKey =
      '6e88b2c6b20e981d818f3d9a68b045d9'; // Replace with your TMDb API
key
```

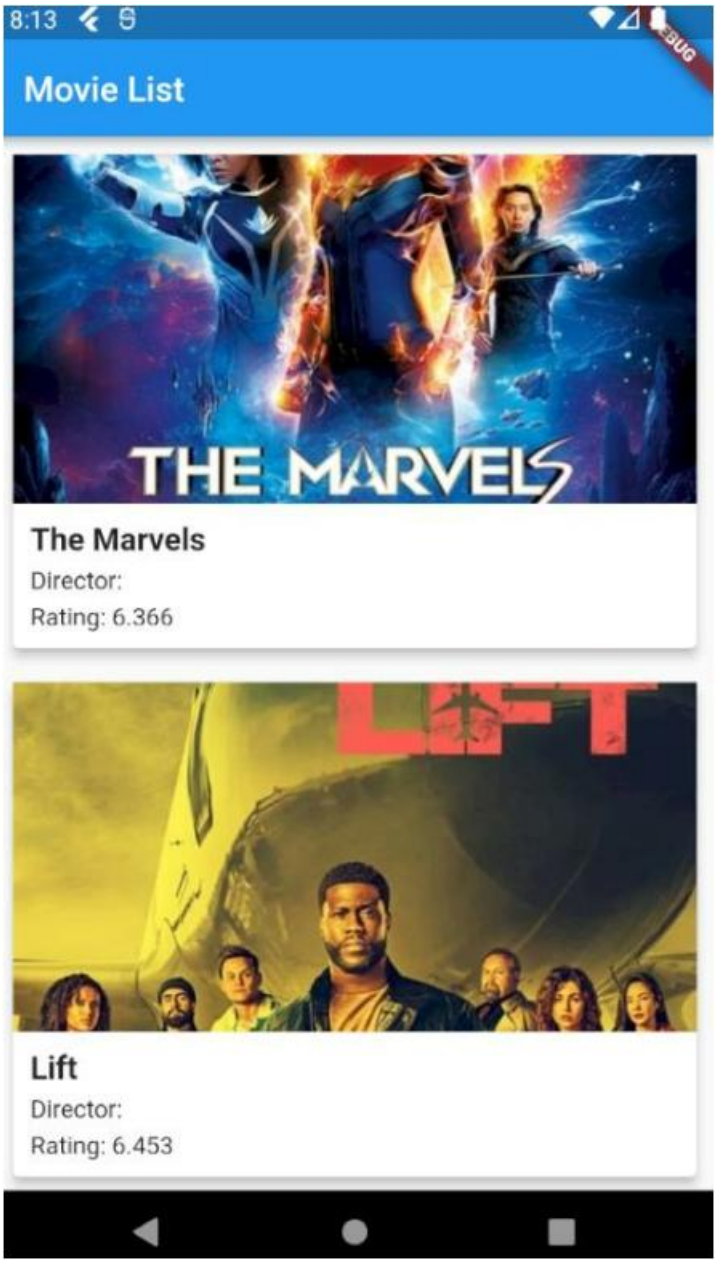
```
  Future<List<Movie>> getMovies() async {
    final response = await http.get(
      Uri.parse('https://api.themoviedb.org/3/movie/popular?api_key=$apiKe
y'),
    );

    if (response.statusCode == 200) {
      final List<dynamic> data = json.decode(response.body)['results'];
      return data.map((json) => Movie.fromJson(json)).toList();
    } else {
      throw Exception('Failed to load movies');
    }
  }

  Future<Movie> getMovieDetails(int movieId) async {
    final response = await http.get(
      Uri.parse('https://api.themoviedb.org/3/movie/$movieId?api_key=$apiK
ey'),
    );

    if (response.statusCode == 200) {
      final Map<String, dynamic> data = json.decode(response.body);
      return Movie.fromJson(data);
    } else {
      throw Exception('Failed to load movie details');
    }
  }
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Movie Rating App',
      theme: ThemeData(
        primarySwatch: Colors.blue,
      ),
      home: MovieListScreen(),
    );
  }
}

class MovieListScreen extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Movie List'),
      ),
      body: FutureBuilder<List<Movie>>(
        future: MovieService().getMovies(),
        builder: (context, snapshot) {
          if (snapshot.connectionState == ConnectionState.waiting) {
```

```
            return Center(child: CircularProgressIndicator());
          } else if (snapshot.hasError) {
            return Center(child: Text('Error: ${snapshot.error}'));
          } else if (!snapshot.hasData || snapshot.data!.isEmpty) {
            return Center(child: Text('No movies available.'));
          } else {
            return ListView.builder(
              itemCount: snapshot.data!.length,
              itemBuilder: (context, index) {
                return MovieCard(movie: snapshot.data![index]);
              },
            );
          }
        },
      ),
    );
  }
}

class MovieCard extends StatelessWidget {
  final Movie movie;

  MovieCard({required this.movie});

  @override

  Widget build(BuildContext context) {
    return Card(
      elevation: 5,
      margin: EdgeInsets.all(10),
      child: InkWell(
        onTap: () {
          Navigator.push(
            context,
            MaterialPageRoute(
              builder: (context) => MovieDetailScreen(movieId: movie.id),
            ),
          );
        },
        child: Column(
          crossAxisAlignment: CrossAxisAlignment.start,
          children: [
            Image.network(
              movie.imageUrl,
              height: 200,
              width: double.infinity,
              fit: BoxFit.cover,
            ),
            Padding(
              padding: const EdgeInsets.all(10.0),
              child: Column(
                crossAxisAlignment: CrossAxisAlignment.start,
                children: [
                  Text(
                    movie.title,
```

```
                    style: TextStyle(fontSize: 18, fontWeight:
FontWeight.bold),
                  ),
                  SizedBox(height: 5),
                  Text('Director: ${movie.director}'),
                  SizedBox(height: 5),
                  Text('Rating: ${movie.rating}'),
                ],
              ),
            ),
          ],
        ),
      ),
    );
  }
}

class MovieDetailScreen extends StatelessWidget {
  final int movieId;

  MovieDetailScreen({required this.movieId});

  @override

  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Movie Details'),
      ),
      body: FutureBuilder<Movie>(
        future: MovieService().getMovieDetails(movieId),
        builder: (context, snapshot) {
          if (snapshot.connectionState == ConnectionState.waiting) {
            return Center(child: CircularProgressIndicator());
          } else if (snapshot.hasError) {
            return Center(child: Text('Error: ${snapshot.error}'));
          } else {
            return Padding(
              padding: const EdgeInsets.all(16.0),
              child: Column(
                crossAxisAlignment: CrossAxisAlignment.start,
                children: [
                  Text(
                    snapshot.data!.title,
                    style: TextStyle(fontSize: 24, fontWeight:
FontWeight.bold),
                  ),
                  SizedBox(height: 10),
                  Text('Director: ${snapshot.data!.director}'),
                  SizedBox(height: 10),
                  Text('Rating: ${snapshot.data!.rating}'),
                  SizedBox(height: 20),
                  Image.network(snapshot.data!.imageUrl),
                  SizedBox(height: 20),
                  Text('Overview: ${snapshot.data!.overview}'),
```

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

Output:



Result:

Successfully Develop a movie rating application (similar to IMDB).

Ex .No : 6 Date :	Develop an application to connect to a web service and to retrieve data with HTTP.	Page No : 23

Aim:

To Develop an application to connect to a web service and to retrieve data with HTTP.

Algorithm :

App Initialization (main function):

- The program starts with the main function, which calls runApp to start the Flutter application with MyApp as the root widget.

Root Widget (MyApp):

- MyApp is a stateless widget representing the entire application.
- It creates a MaterialApp and sets MyHomePage as the home screen.

Home Page Widget (MyHomePage):

- MyHomePage is a stateful widget representing the main screen of the application.
- It includes a list of user data fetched from the web service.

Initialization (initState method):

- The initState method is called when the MyHomePage widget is created.
- Inside initState, the fetchData method is called to fetch user data from the web service.

Data Fetching (fetchData method):

- The fetchData method sends an HTTP GET request to the 'https://randomuser.me/api/?results=10' endpoint to retrieve user data.
- If the response status code is 200 (OK), the JSON data is decoded and stored in the data list.
- If there is an error or the response code is not 200, an exception is thrown.

UI Building (build method):

- The build method returns a Scaffold widget containing an AppBar and a ListView.builder.
- The ListView.builder generates a list of Card widgets, each representing user information.
- The user information includes a profile picture, name, email, street, city, and latitude.

User Information Display (ListView.builder):

- For each user in the data list, a Card is created with a ListTile containing user information.
- The CircleAvatar displays the user's profile picture, and the ListTile displays the user's name, email, street, city, and latitude.

Dependencies Packages:

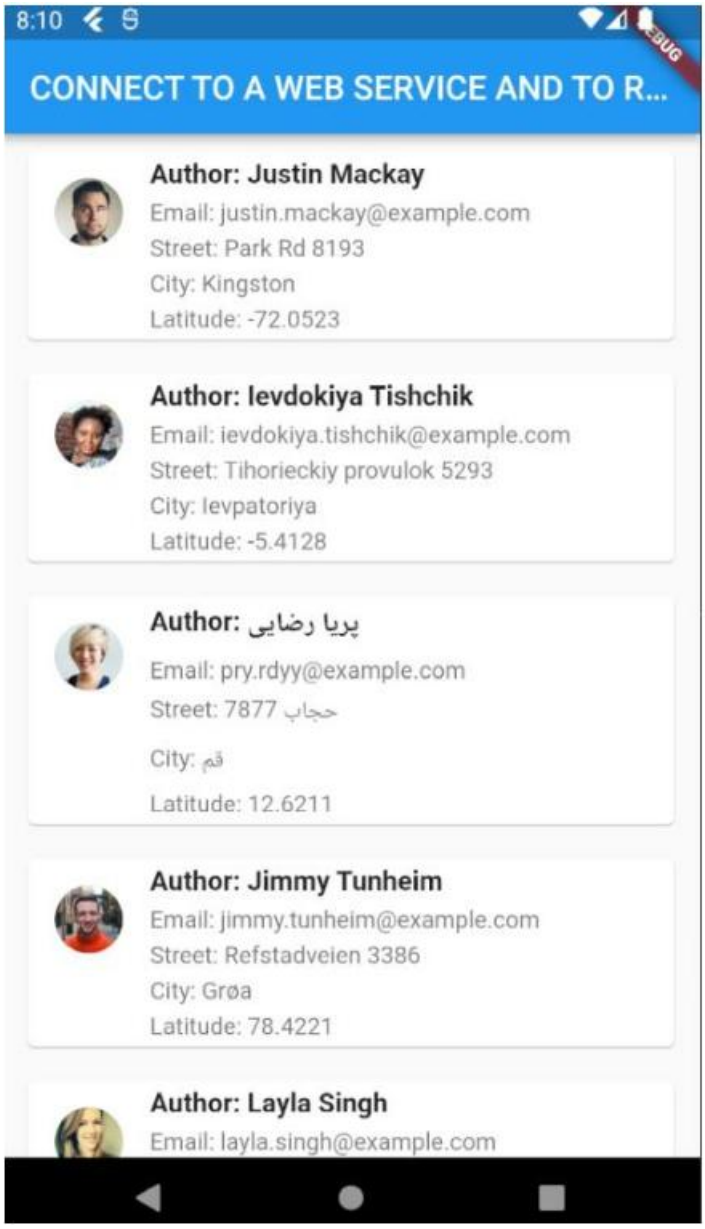
```
dependencies:
  flutter:
    sdk: flutter
  http: ^1.1.0
```

Program :

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

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

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

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

class _MyHomePageState extends State<MyHomePage> {
  List<dynamic> data = [];

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

  Future<void> fetchData() async {
    final response =
        await
http.get(Uri.parse('https://randomuser.me/api/?results=10'));

    if (response.statusCode == 200) {
      // If the server returns a 200 OK response, parse the data
      Map<String, dynamic> userData = json.decode(response.body);
      List<dynamic> users = userData['results'];
      setState(() {
        data = users;
      });
```

```
    } else {
      // If the server did not return a 200 OK response,
      // throw an exception.
      throw Exception('Failed to load data');
    }
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('CONNECT TO A WEB SERVICE AND TO RETRIEVE DATA '),
      ),
      body: ListView.builder(
        itemCount: data.length,
        itemBuilder: (context, index) {
          var user = data[index];
          var picture = user['picture'];
          var address = user['location'];
          var coordinates = address['coordinates'];

          return Card(
            margin: EdgeInsets.symmetric(vertical: 10, horizontal: 15),
            child: ListTile(
              leading: CircleAvatar(
                backgroundImage: NetworkImage(picture['large']),
              ),
              title: Text(
                'Author: ${user['name']['first']}
${user['name']['last']}',
                style: TextStyle(fontWeight: FontWeight.bold),
              ),
              subtitle: Column(
                crossAxisAlignment: CrossAxisAlignment.start,
                children: [
                  SizedBox(height: 5),
                  Text('Email: ${user['email']}'),
                  SizedBox(height: 5),
                  Text(
                      'Street: ${address['street']['name']}
${address['street']['number']}'),
                  SizedBox(height: 5),
                  Text('City: ${address['city']}'),
                  SizedBox(height: 5),
                  Text('Latitude: ${coordinates['latitude']}'),
                ],
              ),
            ),
          );
        },
      ),
    );
  }
}
```

Output:



Result:

Successfully Develop an application to connect to a web service and to retrieve data with HTTP.

Ex .No : 7 Date :	Develop a simple shopping application.	Page No : 27

Aim:

To Develop a simple shopping application.

Algorithm :

Initialize Flutter Project:

- Use Flutter CLI or an IDE to create a new Flutter project.

Define Product Model:

- Create a Dart class to represent the product model with attributes like id, name, price, and image.

Create Product Data:

- Define a list of sample products within the main Dart file or a dedicated data file.

Design Product List Screen:

- Create a widget for displaying a list of products using ListView.builder.

Design Product Card Widget:

- Create a widget for displaying a product card with details like image, name, price, and an "Add to Cart" button.

Create Shopping Cart Model:

- Define a shopping cart model to manage selected products.

Design Shopping Cart Screen:

- Create a screen to display the contents of the shopping cart, listing selected products.

Integrate Navigation:

- Implement navigation between the product list screen and the shopping cart screen using the Navigator class.

Implement Add to Cart Functionality:

- Update the ProductCard widget to handle the "Add to Cart" button tap and add the selected product to the shopping cart.

Navigate to Shopping Cart Screen:

- Add a button in the ProductListScreen to navigate to the shopping cart screen.

Run the Application:

- Execute the Flutter run command to test the application on an emulator or physical device.

Test the Application:

- Interact with the application, add products to the cart, and navigate between screens to ensure proper functionality.

Dependencies Packages:

```
dependencies:
  flutter:
    sdk: flutter
  animate_do: ^2.1.0
  page_transition: ^2.1.0
  cupertino_icons: ^1.0.2
  font_awesome_flutter: ^10.6.0
```

Program :

Download Assets From : https://github.com/ramtsps/flutter_Assets/tree/main/Ex7-assets/images

main.dart

```
import 'package:animate_do/animate_do.dart';
import 'package:shoppingapp/Pages/ShopPage.dart';
import 'package:flutter/material.dart';
import 'package:page_transition/page_transition.dart';

void main() =>
    runApp(MaterialApp(debugShowCheckedModeBanner: false, home:
HomePage()));

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

class _HomePageState extends State<HomePage> with TickerProviderStateMixin
{
  late AnimationController _scaleController;
  late Animation<double> _scaleAnimation;

  bool hide = false;

  @override
  void initState() {
    // TODO: implement initState
    super.initState();

    _scaleController =
        AnimationController(vsync: this, duration: Duration(milliseconds:
800));

    _scaleAnimation = Tween<double>(begin: 1.0, end: 30.0)
        .animate(_scaleController)
      ..addStatusListener((status) {
        if (status == AnimationStatus.completed) {
          Navigator.push(context,
```

```
              PageTransition(type: PageTransitionType.fade, child:
ShopPage()));
          }
        });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Container(
        width: double.infinity,
        decoration: BoxDecoration(
            image: DecorationImage(
                image: AssetImage('assets/images/splash.jpg'),
                fit: BoxFit.cover)),
        child: Container(
          decoration: BoxDecoration(
              gradient: LinearGradient(begin: Alignment.bottomRight,
colors: [
            Colors.black.withOpacity(.9),
            Colors.black.withOpacity(.4),
          ])),
          child: Padding(
            padding: const EdgeInsets.all(30.0),
            child: Column(
              crossAxisAlignment: CrossAxisAlignment.start,
              mainAxisAlignment: MainAxisAlignment.end,
              children: <Widget>[
                FadeInUp(
                    duration: Duration(milliseconds: 1000),
                    child: Text(
                      "Brand New Perspective",
                      style: TextStyle(
                          color: Colors.white,
                          fontSize: 40,
                          fontWeight: FontWeight.bold),
                    )),
                SizedBox(
                  height: 20,
                ),
                FadeInUp(
                    duration: Duration(milliseconds: 1300),
                    child: Text(
                      "Let's start with our summer collection.",
                      style: TextStyle(color: Colors.white, fontSize: 20),
                    )),
                SizedBox(
                  height: 100,
                ),
                InkWell(
                  onTap: () {
                    setState(() {
                      hide = true;
                    });
```

```
                    _scaleController.forward();
                  },
                  child: AnimatedBuilder(
                    animation: _scaleController,
                    builder: (context, child) => Transform.scale(
                      scale: _scaleAnimation.value,
                      child: FadeInUp(
                          duration: Duration(milliseconds: 1500),
                          child: Container(
                            height: 50,
                            decoration: BoxDecoration(
                                color: Colors.white,
                                borderRadius: BorderRadius.circular(50)),
                            child: Center(
                              child: hide == false
                                  ? Text(
                                      "Get Start",
                                      style: TextStyle(
                                          fontWeight: FontWeight.bold),
                                    )
                                  : Container(),
                            ),
                          )),
                    ),
                  ),
                ),
                SizedBox(
                  height: 20,
                ),
                FadeInUp(
                    duration: Duration(milliseconds: 1700),
                    child: Container(
                      height: 50,
                      decoration: BoxDecoration(
                          border: Border.all(color: Colors.white),
                          borderRadius: BorderRadius.circular(50)),
                      child: Center(
                        child: Text(
                          "Create Account",
                          style: TextStyle(
                              color: Colors.white, fontWeight:
FontWeight.bold),
                        ),
                      ),
                    )),
                SizedBox(
                  height: 30,
                ),
              ],
            ),
          ),
        ),
      ),
    );
```

```
  }
}
```

ShopPage.dart

```
import 'package:animate_do/animate_do.dart';
import 'package:shoppingapp/Pages/CategoryPage.dart';
import 'package:flutter/material.dart';

class ShopPage extends StatefulWidget {
  @override
  _ShopPageState createState() => _ShopPageState();
}

class _ShopPageState extends State<ShopPage> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: SingleChildScrollView(
        child: Column(
          children: <Widget>[
            FadeInUp(
                duration: Duration(milliseconds: 1000),
                child: Container(
                  height: 500,
                  decoration: BoxDecoration(
                      image: DecorationImage(
                          image: AssetImage('assets/images/background.jpg'),
                          fit: BoxFit.cover)),
                  child: Container(
                    decoration: BoxDecoration(
                        gradient: LinearGradient(
                            begin: Alignment.bottomRight,
                            colors: [
                          Colors.black.withOpacity(.8),
                          Colors.black.withOpacity(.2),
                        ])),
                    child: Padding(
                      padding: const EdgeInsets.only(top: 50.0),
                      child: Column(
                        crossAxisAlignment: CrossAxisAlignment.start,
                        mainAxisAlignment: MainAxisAlignment.spaceBetween,
                        children: <Widget>[
                          Row(
                            mainAxisAlignment: MainAxisAlignment.end,
                            children: <Widget>[
                              FadeInUp(
                                  duration: Duration(milliseconds: 1200),
                                  child: IconButton(
                                    icon: Icon(
                                      Icons.favorite,
                                      color: Colors.white,
                                    ),
                                    onPressed: () {},
                                  )),
                              FadeInUp(
```

```
                        duration: Duration(milliseconds: 1300),
                        child: IconButton(
                          icon: Icon(
                            Icons.shopping_cart,
                            color: Colors.white,
                          ),
                          onPressed: () {},
                        )),
                  ],
                ),
                Padding(
                  padding: const EdgeInsets.all(20.0),
                  child: Column(
                    crossAxisAlignment: CrossAxisAlignment.start,
                    children: <Widget>[
                      FadeInUp(
                          duration: Duration(milliseconds: 1500),
                          child: Text(
                            "Our New Products",
                            style: TextStyle(
                                color: Colors.white,
                                fontSize: 30,
                                fontWeight: FontWeight.bold),
                          )),
                      SizedBox(
                        height: 15,
                      ),
                      FadeInUp(
                          duration: Duration(milliseconds: 1700),
                          child: Row(
                            children: <Widget>[
                              Text(
                                "VIEW MORE",
                                style: TextStyle(
                                    color: Colors.white,
                                    fontWeight: FontWeight.w600),
                              ),
                              SizedBox(
                                width: 5,
                              ),
                              Icon(
                                Icons.arrow_forward_ios,
                                color: Colors.white,
                                size: 15,
                              )
                            ],
                          ))
                    ],
                  ),
                ),
              ],
            ),
          ),
        ),
      )),
  FadeInUp(
      duration: Duration(milliseconds: 1400),
      child: Container(
        padding: EdgeInsets.all(20),
```

```
child: Column(
  children: <Widget>[
    Row(
      mainAxisAlignment: MainAxisAlignment.spaceBetween,
      children: <Widget>[
        Text(
          "Categories",
          style: TextStyle(
              color: Colors.black,
              fontSize: 18,
              fontWeight: FontWeight.bold),
        ),
        Text("All")
      ],
    ),
    SizedBox(
      height: 20,
    ),
    Container(
      height: 150,
      child: ListView(
        scrollDirection: Axis.horizontal,
        children: <Widget>[
          makeCategory(
              image: 'assets/images/beauty.jpg',
              title: 'Beauty',
              tag: 'beauty'),
          makeCategory(
              image: 'assets/images/clothes.jpg',
              title: 'Clothes',
              tag: 'clothes'),
          makeCategory(
              image: 'assets/images/perfume.jpg',
              title: 'Perfume',
              tag: 'perfume'),
          makeCategory(
              image: 'assets/images/glass.jpg',
              title: 'Glass',
              tag: 'glass'),
        ],
      ),
    ),
    SizedBox(
      height: 40,
    ),
    Row(
      mainAxisAlignment: MainAxisAlignment.spaceBetween,
      children: <Widget>[
        Text(
          "Best Selling by Category",
          style: TextStyle(
              color: Colors.black,
              fontSize: 18,
              fontWeight: FontWeight.bold),
        ),
        Text("All")
      ],
    ),
    SizedBox(
```

```
                    height: 20,
                  ),
                  Container(
                    height: 150,
                    child: ListView(
                      scrollDirection: Axis.horizontal,
                      children: <Widget>[
                        makeBestCategory(
                            image: 'assets/images/tech.jpg', title: 'Tech'),
                        makeBestCategory(
                            image: 'assets/images/watch.jpg',
                            title: 'Watch'),
                        makeBestCategory(
                            image: 'assets/images/perfume.jpg',
                            title: 'Perfume'),
                        makeBestCategory(
                            image: 'assets/images/glass.jpg',
                            title: 'Glass'),
                      ],
                    ),
                  ),
                  SizedBox(
                    height: 80,
                  ),
                ],
              ),
            ))
        ],
      ),
    ),
  );
}

Widget makeCategory({image, title, tag}) {
  return AspectRatio(
    aspectRatio: 2 / 2.2,
    child: Hero(
      tag: tag,
      child: GestureDetector(
        onTap: () {
          Navigator.push(
              context,
              MaterialPageRoute(
                  builder: (context) => CategoryPage(
                        image: image,
                        title: title,
                        tag: tag,
                      )));
        },
        child: Material(
          child: Container(
            margin: EdgeInsets.only(right: 20),
            decoration: BoxDecoration(
                borderRadius: BorderRadius.circular(10),
                image: DecorationImage(
                    image: AssetImage(image), fit: BoxFit.cover)),
            child: Container(
              padding: EdgeInsets.all(10),
              decoration: BoxDecoration(
```

```
                    borderRadius: BorderRadius.circular(10),
                    gradient:
                        LinearGradient(begin: Alignment.bottomRight, colors: [
                      Colors.black.withOpacity(.8),
                      Colors.black.withOpacity(.0),
                    ])),
                child: Align(
                    alignment: Alignment.bottomLeft,
                    child: Text(
                      title,
                      style: TextStyle(
                          color: Colors.white,
                          fontWeight: FontWeight.bold,
                          fontSize: 16),
                    )),
              ),
            ),
          ),
        ),
      ),
    );
  }

  Widget makeBestCategory({image, title}) {
    return AspectRatio(
      aspectRatio: 3 / 2.2,
      child: Container(
        margin: EdgeInsets.only(right: 20),
        decoration: BoxDecoration(
            borderRadius: BorderRadius.circular(10),
            image:
                DecorationImage(image: AssetImage(image), fit: BoxFit.cover)),
        child: Container(
          padding: EdgeInsets.all(10),
          decoration: BoxDecoration(
              borderRadius: BorderRadius.circular(10),
              gradient: LinearGradient(begin: Alignment.bottomRight, colors: [
                Colors.black.withOpacity(.8),
                Colors.black.withOpacity(.0),
              ])),
          child: Align(
              alignment: Alignment.bottomLeft,
              child: Text(
                title,
                style: TextStyle(
                    color: Colors.white,
                    fontWeight: FontWeight.bold,
                    fontSize: 16),
              )),
        ),
      ),
    );
  }
}
```

CategoryPage.dart

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

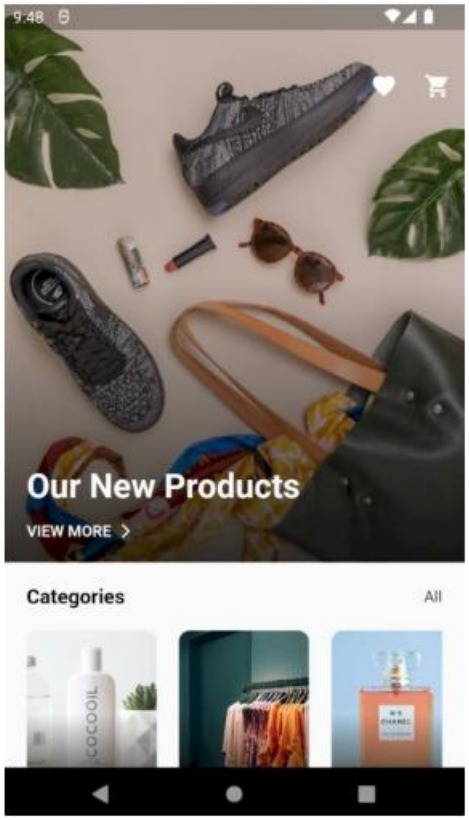
```
class CategoryPage extends StatefulWidget {
  final String? title;
  final String? image;
  final String? tag;

  const CategoryPage({Key? key, this.title, this.image, this.tag}) : super(key:
key);

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

class _CategoryPageState extends State<CategoryPage> {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: Colors.white,
      body: SingleChildScrollView(
        child: Column(
          children: <Widget>[
            Hero(
              tag: widget.tag!,
              child: Material(
                child: Container(
                  height: 360,
                  decoration: BoxDecoration(
                    image: DecorationImage(
                      image: AssetImage(widget.image!),
                      fit: BoxFit.cover
                    )
                  ),
                  child: Container(
                    padding: EdgeInsets.all(10),
                    decoration: BoxDecoration(
                      gradient: LinearGradient(
                        begin: Alignment.bottomRight,
                        colors: [
                          Colors.black.withOpacity(.8),
                          Colors.black.withOpacity(.1),
                        ]
                      )
                    ),
                    child: Column(
                      children: <Widget>[
                        SizedBox(height: 40,),
                        Row(
                          mainAxisAlignment: MainAxisAlignment.spaceBetween,
                          children: <Widget>[
                            IconButton(
                              icon: Icon(Icons.arrow_back_ios, color:
Colors.white,),

                              onPressed: () {
                                Navigator.pop(context);
                              },
                            ),
                            Row(
                              mainAxisAlignment: MainAxisAlignment.end,
                              children: <Widget>[
```

```
                                FadeInUp(duration: Duration(milliseconds: 1200),
child: IconButton(
                                  icon: Icon(Icons.search, color: Colors.white,),
onPressed: () {},
                                )),
                                FadeInUp(duration: Duration(milliseconds: 1200),
child: IconButton(
                                  icon: Icon(Icons.favorite, color:
Colors.white,), onPressed: () {},
                                )),
                                FadeInUp(duration: Duration(milliseconds: 1300),
child: IconButton(
                                  icon: Icon(Icons.shopping_cart, color:
Colors.white,), onPressed: () {},
                                )),
                              ],
                            ),
                          ],
                        ),
                        SizedBox(
                          height: 40,
                        ),
                        FadeInUp(duration: Duration(milliseconds: 1200), child:
Text(widget.title!, style: TextStyle(color: Colors.white, fontWeight:
FontWeight.bold, fontSize: 40),))
                      ],
                    ),
                  ),
                ),
              ),
            ),
            Padding(
              padding: EdgeInsets.all(20),
              child: Column(
                children: <Widget>[
                  FadeInUp(duration: Duration(milliseconds: 1400), child: Row(
                    mainAxisAlignment: MainAxisAlignment.spaceBetween,
                    children: <Widget>[
                      Text("New Product", style: TextStyle(color: Colors.black,
fontSize: 18, fontWeight: FontWeight.bold),),
                      Row(
                        children: <Widget>[
                          Text("View More", style: TextStyle(color:
Colors.grey),),
                          SizedBox(width: 5,),
                          Icon(Icons.arrow_forward_ios, size: 11, color:
Colors.grey,)
                        ],
                      ),
                    ],
                  )),
                  SizedBox(height: 20,),
                  FadeInUp(duration: Duration(milliseconds: 1500),
child: makeProduct(image: 'assets/images/beauty-1.jpg', title: 'Beauty', price:
'100\$')),
                  FadeInUp(duration: Duration(milliseconds: 1600),
child: makeProduct(image: 'assets/images/clothes-1.jpg', title: 'Clothes', price:
'100\$')),
```

```
                    FadeInUp(duration: Duration(milliseconds: 1700),
child: makeProduct(image: 'assets/images/glass.jpg', title: 'Glass', price:
'100\$')),
                    FadeInUp(duration: Duration(milliseconds: 1800),
child: makeProduct(image: 'assets/images/perfume.jpg', title: 'Perfume', price:
'100\$')),
                    FadeInUp(duration: Duration(milliseconds: 1900),
child: makeProduct(image: 'assets/images/person.jpg', title: 'Person', price:
'100\$')),
                  ],
                ),
              )
            ],
          ),
        ),
      );
    }

    Widget makeProduct({image, title, price}) {
      return Container(
        height: 200,
        width: double.infinity,
        margin: EdgeInsets.only(bottom: 20),
        decoration: BoxDecoration(
          borderRadius: BorderRadius.circular(10),
          image: DecorationImage(
            image: AssetImage(image),
            fit: BoxFit.cover
          )
        ),
        child: Container(
          padding: EdgeInsets.all(10),
          decoration: BoxDecoration(
            borderRadius: BorderRadius.circular(10),
            gradient: LinearGradient(
              begin: Alignment.bottomRight,
              colors: [
                Colors.black.withOpacity(.8),
                Colors.black.withOpacity(.1),
              ]
            )
          ),
          child: Column(
            crossAxisAlignment: CrossAxisAlignment.start,
            mainAxisAlignment: MainAxisAlignment.spaceBetween,
            children: <Widget>[
              FadeInUp(duration: Duration(milliseconds: 1400), child: Align(
                alignment: Alignment.topRight,
                child: Icon(Icons.favorite_border, color: Colors.white,),
              )),
              Row(
                mainAxisAlignment: MainAxisAlignment.spaceBetween,
                crossAxisAlignment: CrossAxisAlignment.end,
                children: <Widget>[
                  Column(
                    crossAxisAlignment: CrossAxisAlignment.start,
                    children: <Widget>[
                      FadeInUp(duration: Duration(milliseconds: 1500), child:
Text(title, style: TextStyle(color: Colors.white, fontSize: 20),)),
```

```
                    FadeInUp(duration: Duration(milliseconds: 1500), child:
Text(price, style: TextStyle(color: Colors.white, fontSize: 30, fontWeight:
FontWeight.bold),)),
                  ],
                ),
                FadeInUp(duration: Duration(milliseconds: 2000), child: Container(
                  width: 40,
                  height: 40,
                  margin: EdgeInsets.only(bottom: 10),
                  decoration: BoxDecoration(
                    shape: BoxShape.circle,
                    color: Colors.white
                  ),
                  child: Center(
                    child: Icon(Icons.add_shopping_cart, size: 18, color:
Colors.grey[700],),
                  )
                ))
              ],
            ),
          ],
        ),
      )
    );
  }
}
```

Output:



Result:

Successfully Develop a simple shopping application.

Ex .No : 8 Date :	Design a web server supporting push notifications.	Page No : 40

Aim:

To Design a web server supporting push notifications.

Algorithm :

Initialize Awesome Notifications:

- Call AwesomeNotifications().initialize in the main function to initialize the Awesome Notifications library.
- Define a notification channel and channel group to categorize notifications.

Request Notification Permission:

- Check if the app is allowed to send notifications using AwesomeNotifications().isNotificationAllowed.
- If not allowed, request permission using AwesomeNotifications().requestPermissionToSendNotifications.

Set Notification Listeners:

- In the initState method of MyApp, set up notification listeners using AwesomeNotifications().setListeners.
- Listeners include methods for handling notification creation, display, dismissal, and action reception.

Build Flutter Application:

- Create a Flutter application with a MaterialApp as the root widget.
- Use Scaffold with an AppBar and an ElevatedButton to trigger the display of a notification.

Notification Button Press Handling:

- Inside the ElevatedButton onPressed callback, use AwesomeNotifications().createNotification to send a notification.
- Define the notification content using NotificationContent.

Implement NotificationController:

- Create a separate class NotificationController to handle notification-related methods.
- The class includes methods for notification creation, display, dismissal, and action reception.
- These methods are annotated with @pragma("vm:entry-point") to ensure they are recognized by the Dart VM.

Run the Flutter Application:

- Use the Flutter CLI or an IDE to run the application on an emulator or physical device.
- Ensure that the notification library is correctly configured and that permissions are granted.

Testing the Application:

- Interact with the application by tapping the "Show Notification" button.
- Observe the behavior of the notifications and verify that the notification-related methods in NotificationController are called appropriately.

Additional Considerations:

- Explore customization options provided by the Awesome Notifications library to enhance the appearance and behavior of notifications.
- Handle more complex scenarios such as scheduled notifications or notifications with specific actions.

Android Manifest Configuration:

- Update the **AndroidManifest.xml** file.

```
<uses-permission android:name="android.permission.VIBRATE"/> <uses-
permission android:name="android.permission.RECEIVE_BOOT_COMPLETED"/>
```

Dependencies Packages:

```
dependencies:
  flutter:
    sdk: flutter
  cupertino_icons: ^1.0.2
  awesome_notifications: ^0.8.2
```

Program:

main.dart

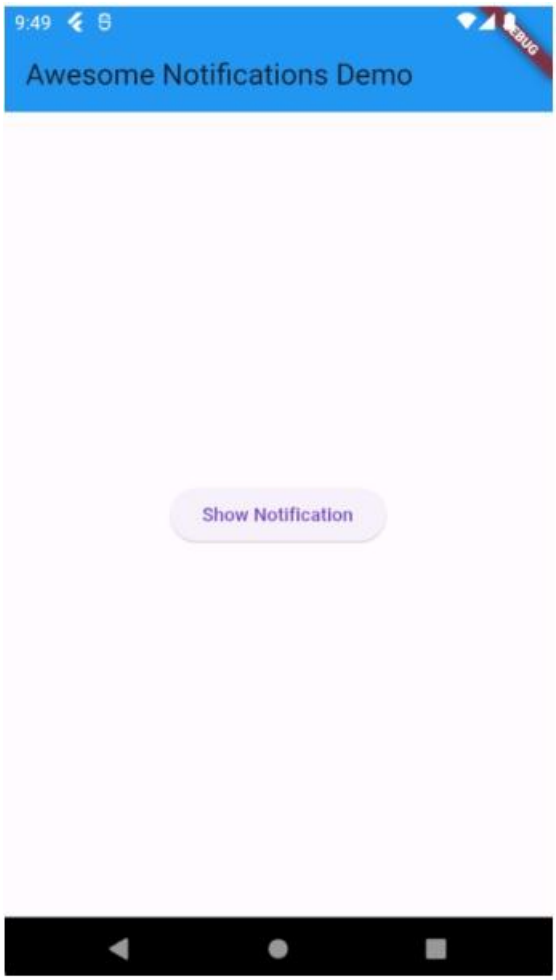
```
import 'package:awesome_notifications/awesome_notifications.dart';
import 'package:flutter/material.dart';
import
'package:flutter_local_notifications_tutorial/notification_controller.dart';

void main() async {
  await AwesomeNotifications().initialize(null, [
    NotificationChannel(
      channelGroupKey: "basic_channel_group",
      channelKey: "basic_channel",
      channelName: "Basic Notification",
      channelDescription: "Basic notifications channel",
    )
  ], channelGroups: [
    NotificationChannelGroup(
      channelGroupKey: "basic_channel_group",
      channelGroupName: "Basic Group",
    )
  ]);
  bool isAllowedToSendNotification =
      await AwesomeNotifications().isNotificationAllowed();
  if (!isAllowedToSendNotification) {
    AwesomeNotifications().requestPermissionToSendNotifications();
  }
  runApp(const MyApp());
}

class MyApp extends StatefulWidget {
```

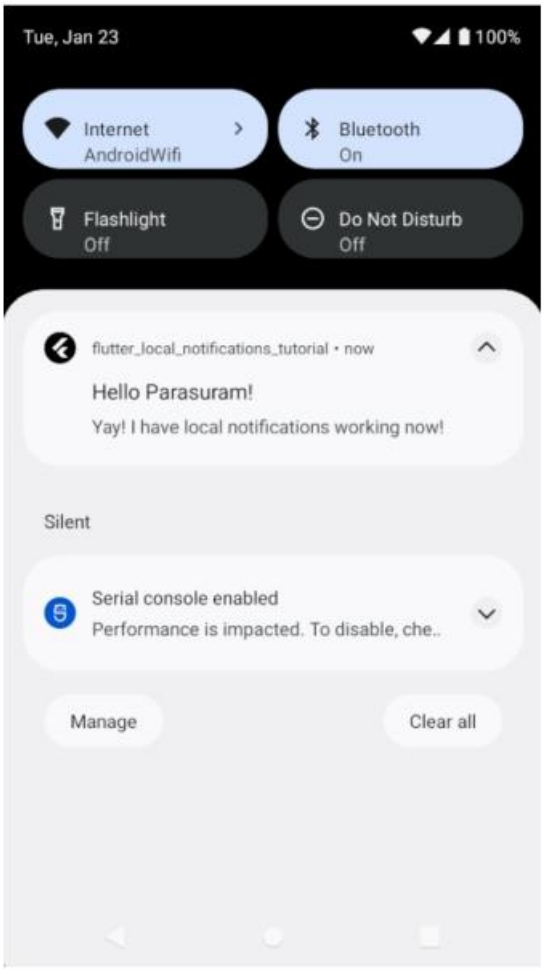
```
  const MyApp({super.key});

  @override
  State<MyApp> createState() => _MyAppState();
}

class _MyAppState extends State<MyApp> {
  @override
  void initState() {
    AwesomeNotifications().setListeners(
        onActionReceivedMethod: NotificationController.onActionReceivedMethod,
        onNotificationCreatedMethod:
            NotificationController.onNotificationCreatedMethod,
        onNotificationDisplayedMethod:
            NotificationController.onNotificationDisplayedMethod,
        onDismissActionReceivedMethod:
            NotificationController.onDismissActionReceivedMethod);
    super.initState();
  }

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Demo',
      theme: ThemeData(
        colorScheme: ColorScheme.fromSeed(seedColor: Colors.deepPurple),
        useMaterial3: true,
      ),
      home: Scaffold(
        appBar: AppBar(
          title: Text('Awesome Notifications Demo'),
          backgroundColor: Colors.blue, // Set background color to primary blue
        ),
        body: Center(
          child: ElevatedButton(
            onPressed: () {
              AwesomeNotifications().createNotification(
                content: NotificationContent(
                  id: 1,
                  channelKey: "basic_channel",
                  title: "Hello Parasuram!",
                  body: "Yay! I have Push notifications working now!",
                ),
              );
            },
            style: ElevatedButton.styleFrom(
              primary: Colors.blue, // Set background color to blue
            ),
            child: Text(
              'Show Notification',
              style: TextStyle(color: Colors.white), // Set text color to white
            ),
          ),
        ),
      ),
    );
  }
}
```

notification_controller.dart

```dart
import 'package:awesome_notifications/awesome_notifications.dart';

class NotificationController {
  /// Use this method to detect when a new notification or a schedule is created
  @pragma("vm:entry-point")
  static Future<void> onNotificationCreatedMethod(
      ReceivedNotification receivedNotification) async {}

  /// Use this method to detect every time that a new notification is displayed
  @pragma("vm:entry-point")
  static Future<void> onNotificationDisplayedMethod(
      ReceivedNotification receivedNotification) async {}

  @pragma("vm:entry-point")
  static Future<void> onDismissActionReceivedMethod(
      ReceivedAction receivedAction) async {}

  /// Use this method to detect when the user taps on a notification or action
button
  @pragma("vm:entry-point")
  static Future<void> onActionReceivedMethod(
      ReceivedAction receivedAction) async {}
}
```

Output:





Result:

Successfully Design a web server supporting push notifications.

Ex .No : 9 Date :	Develop an application by integrating Google maps.	Page No : 45

Aim:

To Develop an application by integrating Google maps .

Algorithm :

Initialize Flutter Project:

- Use Flutter CLI or an IDE to create a new Flutter project.

  $ flutter create google_maps_integration

  $ cd google_maps_integration

Add Dependencies:

- Open the pubspec.yaml file and add the Google Maps Flutter plugin as a dependency.

  dependencies:

  flutter:

  sdk: flutter

  google_maps_flutter: ^2.0.6

Run flutter pub get:

- Execute the flutter pub get command to fetch and install the new dependency.

  $ flutter pub get

Create Google Maps API Key:

- Obtain a Google Maps API key from the Google Cloud Console.

Enable Google Maps API:

- Enable the Google Maps API for Android and iOS in the Google Cloud Console.

Android Manifest Configuration:

- Update the **AndroidManifest.xml** file with the Google Maps API key.

```
<application>
  <meta-data
    android:name="com.google.android.geo.API_KEY"
    android:value="YOUR_API_KEY_HERE" />
</application>
```

Create MyApp and MyMap Widgets:

- Implement a simple Flutter app with a MyApp widget containing a MyMap widget.

MyMap Widget:

- Create a MyMap stateful widget with a GoogleMap widget.
- Use the onMapCreated callback to get the reference to the GoogleMapController.

GoogleMap Initialization:

- Initialize the GoogleMap widget with an initial camera position and default location.

Run the Application:

- Use the Flutter CLI or an IDE to run the application on an emulator or physical device.

  $ flutter run

Testing the Application:

- Interact with the application, and you should see a Google Map displayed on the screen with the specified initial camera position.

Dependencies Packages:

```
dependencies:
  flutter:
    sdk: flutter
  google_maps_flutter: ^2.2.8
```

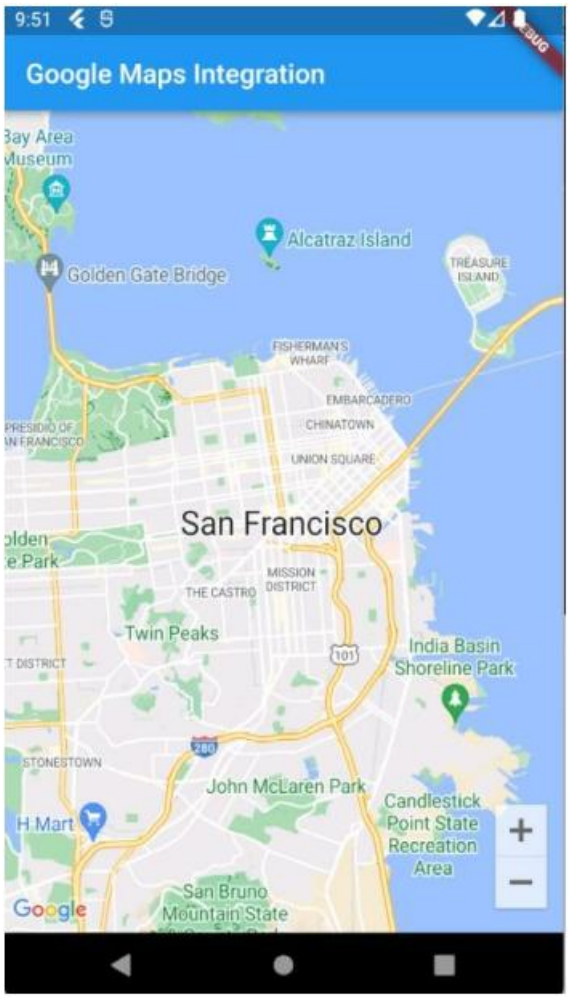
Program:

main.dart

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

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

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

class MyMap extends StatefulWidget {
  @override
  _MyMapState createState() => _MyMapState();
}

class _MyMapState extends State<MyMap> {
  GoogleMapController? mapController;

  @override
```

```
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Google Maps Integration'),
      ),
      body: GoogleMap(
        onMapCreated: (controller) {
          setState(() {
            mapController = controller;
          });
        },
        initialCameraPosition: CameraPosition(
          target: LatLng(12.17, 79.04), // Default location (San Francisco)
          zoom: 12.0,
        ),
      ),
    );
  }
}
```

Output:



Result:

Successfully Develop an application by integrating Google maps.

Ex .No : 10 Date :	Mini Projects Involving Flutter/Kotlin Multi-Platform .	Page No : 48

Aim:

To Develop Mini Projects involving Flutter/Kotlin multi-platform .

Algorithm :

Define ToDo Class:

- Create a class ToDo with attributes id, todoText, and isDone.
- Include a static method to generate a sample list of todos.

Initialize State:

- Create a stateful widget (Home) with a state class (_HomeState).
- Initialize state variables such as todosList, _foundToDo, and _todoController.

Build Main UI:

- Implement the build method in _HomeState to construct the main UI using Flutter widgets.
- Include a search box, a list view to display todos, and an input field for adding new todos.

Handle ToDo Changes:

- Implement a method to handle changes in todo status (_handleToDoChange).
- Toggle the isDone property of the selected todo.

Delete ToDo Item:

- Implement a method to delete a todo item (_deleteToDoItem).
- Remove the selected todo from the todosList.

Add ToDo Item:

- Implement a method to add a new todo item (_addToDoItem).
- Create a new ToDo object and add it to the todosList.

Run Filter:

- Implement a method (_runFilter) to filter todos based on the entered keyword.
- Update the _foundToDo list with the filtered results.

Search Box Widget:

- Create a separate method (searchBox) to build the search box widget.

ToDo Item Widget:

- Create a separate stateless widget (ToDoItem) to display each todo item.Include checkboxes, todo text, and a delete button.

AppBar Widget:

- Implement a method (_buildAppBar) to create the app bar with a menu icon and user avatar.

Run Application:

- Run the application using flutter run.

Test Application:

- Test the application by interacting with the UI, adding, checking, and deleting todos.

Dependencies Packages:

```
dev_dependencies:s
  flutter_test:
    sdk: flutter
  flutter_lints: ^2.0.0
```

Program :

Download Assets From https://github.com/ramtsps/flutter_Assets/tree/main/Ex10-assets/images

main.dart

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

const Color tdRed = Color(0xFFDA4040);
const Color tdBlue = Color(0xFF5F52EE);
const Color tdBlack = Color(0xFF3A3A3A);
const Color tdGrey = Color(0xFF717171);
const Color tdBGColor = Color(0xFFEEEFF5);

class ToDo {
  String? id;
  String? todoText;
  bool isDone;

  ToDo({
    required this.id,
    required this.todoText,
    this.isDone = false,
  });

  static List<ToDo> todoList() {
    return [
      ToDo(id: '01', todoText: 'Morning Excercise', isDone: true),
      ToDo(id: '02', todoText: 'Buy Groceries', isDone: true),
      ToDo(id: '03', todoText: 'Check Emails'),
```

```
      ToDo(id: '04', todoText: 'Team Meeting'),
      ToDo(id: '05', todoText: 'Work on mobile apps for 2 hours'),
      ToDo(id: '06', todoText: 'Dinner with Jenny'),
    ];
  }
}

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

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

  @override
  Widget build(BuildContext context) {
    SystemChrome.setSystemUIOverlayStyle(
        SystemUiOverlayStyle(statusBarColor: Colors.transparent));
    return MaterialApp(
      debugShowCheckedModeBanner: false,
      title: 'ToDo App',
      home: Home(),
    );
  }
}

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

  @override
  State<Home> createState() => _HomeState();
}

class _HomeState extends State<Home> {
  final todosList = ToDo.todoList();
  List<ToDo> _foundToDo = [];
  final _todoController = TextEditingController();

  @override
  void initState() {
```

```
    _foundToDo = todosList;
    super.initState();
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      backgroundColor: tdBGColor,
      appBar: _buildAppBar(),
      body: Stack(
        children: [
          Container(
            padding: EdgeInsets.symmetric(
              horizontal: 20,
              vertical: 15,
            ),
            child: Column(
              children: [
                searchBox(),
                Expanded(
                  child: ListView(
                    children: [
                      Container(
                        margin: EdgeInsets.only(
                          top: 50,
                          bottom: 20,
                        ),
                        child: Text(
                          'All ToDos',
                          style: TextStyle(
                            fontSize: 30,
                            fontWeight: FontWeight.w500,
                          ),
                        ),
                      ),
                      for (ToDo todoo in _foundToDo.reversed)
                        ToDoItem(
                          todo: todoo,
                          onToDoChanged: _handleToDoChange,
                          onDeleteItem: _deleteToDoItem,
```

```
                ),
              ],
            ),
          )
        ],
      ),
    ),
    Align(
      alignment: Alignment.bottomCenter,
      child: Row(children: [
        Expanded(
          child: Container(
            margin: EdgeInsets.only(
              bottom: 20,
              right: 20,
              left: 20,
            ),
            padding: EdgeInsets.symmetric(
              horizontal: 20,
              vertical: 5,
            ),
            decoration: BoxDecoration(
              color: Colors.white,
              boxShadow: const [
                BoxShadow(
                  color: Colors.grey,
                  offset: Offset(0.0, 0.0),
                  blurRadius: 10.0,
                  spreadRadius: 0.0,
                ),
              ],
              borderRadius: BorderRadius.circular(10),
            ),
            child: TextField(
              controller: _todoController,
              decoration: InputDecoration(
                  hintText: 'Add a new todo item',
                  border: InputBorder.none),
            ),
          ),
```

```
            ),
            Container(
              margin: EdgeInsets.only(
                bottom: 20,
                right: 20,
              ),
              child: ElevatedButton(
                child: Text(
                  '+',
                  style: TextStyle(
                    fontSize: 40,
                  ),
                ),
                onPressed: () {
                  _addToDoItem(_todoController.text);
                },
                style: ElevatedButton.styleFrom(
                  primary: tdBlue,
                  minimumSize: Size(60, 60),
                  elevation: 10,
                ),
              ),
            ),
          ]),
        ),
      ],
    ),
  );
}

void _handleToDoChange(ToDo todo) {
  setState(() {
    todo.isDone = !todo.isDone;
  });
}

void _deleteToDoItem(String id) {
  setState(() {
    todosList.removeWhere((item) => item.id == id);
  });
```

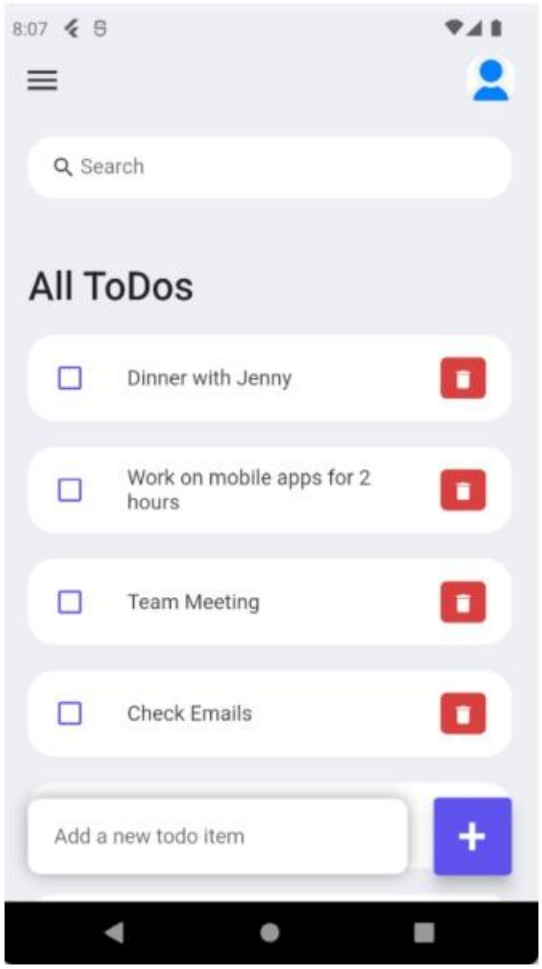
```
}

void _addToDoItem(String toDo) {
  setState(() {
    todosList.add(ToDo(
      id: DateTime.now().millisecondsSinceEpoch.toString(),
      todoText: toDo,
    ));
  });
  _todoController.clear();
}

void _runFilter(String enteredKeyword) {
  List<ToDo> results = [];
  if (enteredKeyword.isEmpty) {
    results = todosList;
  } else {
    results = todosList
        .where((item) => item.todoText!
            .toLowerCase()
            .contains(enteredKeyword.toLowerCase()))
        .toList();
  }

  setState(() {
    _foundToDo = results;
  });
}

Widget searchBox() {
  return Container(
    padding: EdgeInsets.symmetric(horizontal: 15),
    decoration: BoxDecoration(
      color: Colors.white,
      borderRadius: BorderRadius.circular(20),
    ),
    child: TextField(
      onChanged: (value) => _runFilter(value),
      decoration: InputDecoration(
        contentPadding: EdgeInsets.all(0),
```

```
            prefixIcon: Icon(
              Icons.search,
              color: tdBlack,
              size: 20,
            ),
            prefixIconConstraints: BoxConstraints(
              maxHeight: 20,
              minWidth: 25,
            ),
            border: InputBorder.none,
            hintText: 'Search',
            hintStyle: TextStyle(color: tdGrey),
          ),
        ),
      );
    }

    AppBar _buildAppBar() {
      return AppBar(
        backgroundColor: tdBGColor,
        elevation: 0,
        title: Row(mainAxisAlignment: MainAxisAlignment.spaceBetween, children: [
          Icon(
            Icons.menu,
            color: tdBlack,
            size: 30,
          ),
          Container(
            height: 40,
            width: 40,
            child: ClipRRect(
              borderRadius: BorderRadius.circular(20),
              child: Image.asset('assets/images/avatar.jpeg'),
            ),
          ),
        ]),
      );
    }
  }
```

```dart
class ToDoItem extends StatelessWidget {
  final ToDo todo;
  final onToDoChanged;
  final onDeleteItem;

  const ToDoItem({
    Key? key,
    required this.todo,
    required this.onToDoChanged,
    required this.onDeleteItem,
  }) : super(key: key);

  @override
  Widget build(BuildContext context) {
    return Container(
      margin: EdgeInsets.only(bottom: 20),
      child: ListTile(
        onTap: () {
          onToDoChanged(todo);
        },
        shape: RoundedRectangleBorder(
          borderRadius: BorderRadius.circular(20),
        ),
        contentPadding: EdgeInsets.symmetric(horizontal: 20, vertical: 5),
        tileColor: Colors.white,
        leading: Icon(
          todo.isDone ? Icons.check_box : Icons.check_box_outline_blank,
          color: tdBlue,
        ),
        title: Text(
          todo.todoText!,
          style: TextStyle(
            fontSize: 16,
            color: tdBlack,
            decoration: todo.isDone ? TextDecoration.lineThrough : null,
          ),
        ),
        trailing: Container(
          padding: EdgeInsets.all(0),
          margin: EdgeInsets.symmetric(vertical: 12),
```

```
            height: 35,
            width: 35,
            decoration: BoxDecoration(
              color: tdRed,
              borderRadius: BorderRadius.circular(5),
            ),
            child: IconButton(
              color: Colors.white,
              iconSize: 18,
              icon: Icon(Icons.delete),
              onPressed: () {
                onDeleteItem(todo.id);
              },
            ),
          ),
        ),
      );
    }
}
```

Output:



Result:

Successfully Develop Mini Projects involving Flutter/Kotlin multi-platform.