EX.NO	DATE	NAME OF THE EXPERIMENT	PAGE NO	MARKS (10)	STAFF SIGNATURE
1		Study and installation of Flutter/Kotlin multi-platform environment	1		
2		Develop an application that uses Widgets, GUI components, Fonts, and Colors.	4		
3		Develop a native calculator application.	8		
4		Develop a gaming application that uses 2-D animations and gestures.	13		
5		Develop a movie rating application (similar to IMDB).	17		
6		Develop an application to connect to a web service and to retrieve data with HTTP.	23		
7		Develop a simple shopping application.	27		
8		Design a web server supporting push notifications.	40		
9		Develop an application by integrating Google maps	45		
10		Mini Projects involving Flutter/Kotlin multi-platform	48		

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.

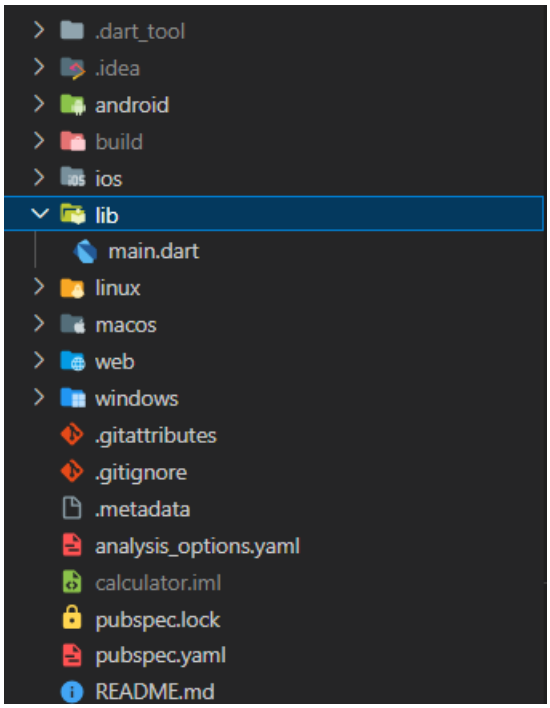
5. Configure Flutter in Android Studio:

- 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.

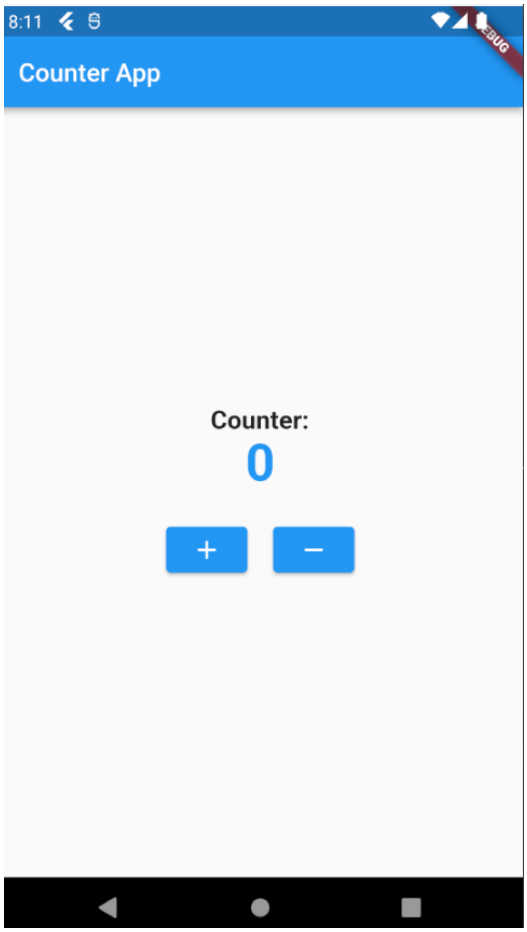
Program :

main.dart

```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

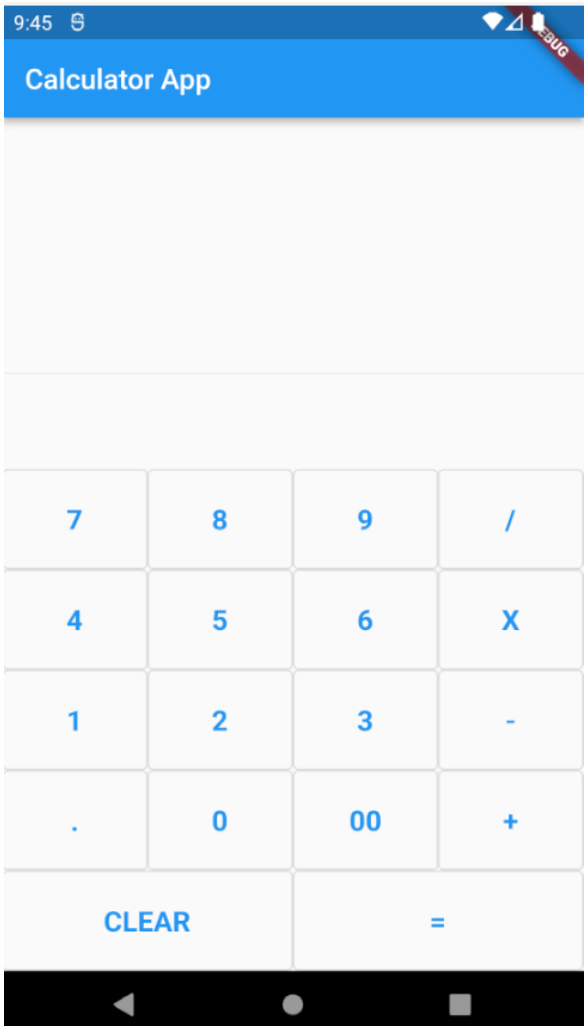
```
import 'package:flutter/material.dart';

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

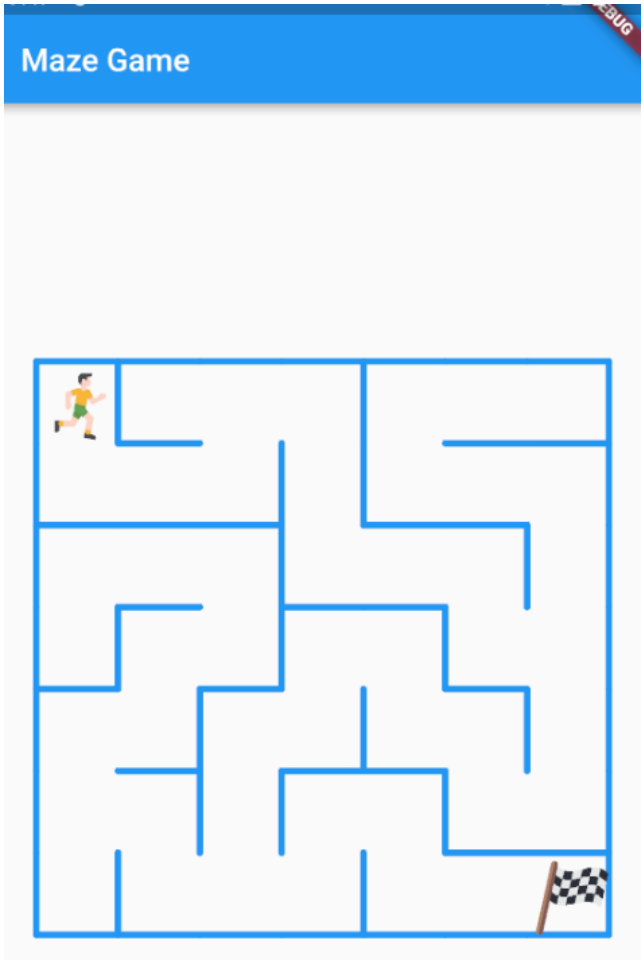
main.dart

```
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
```

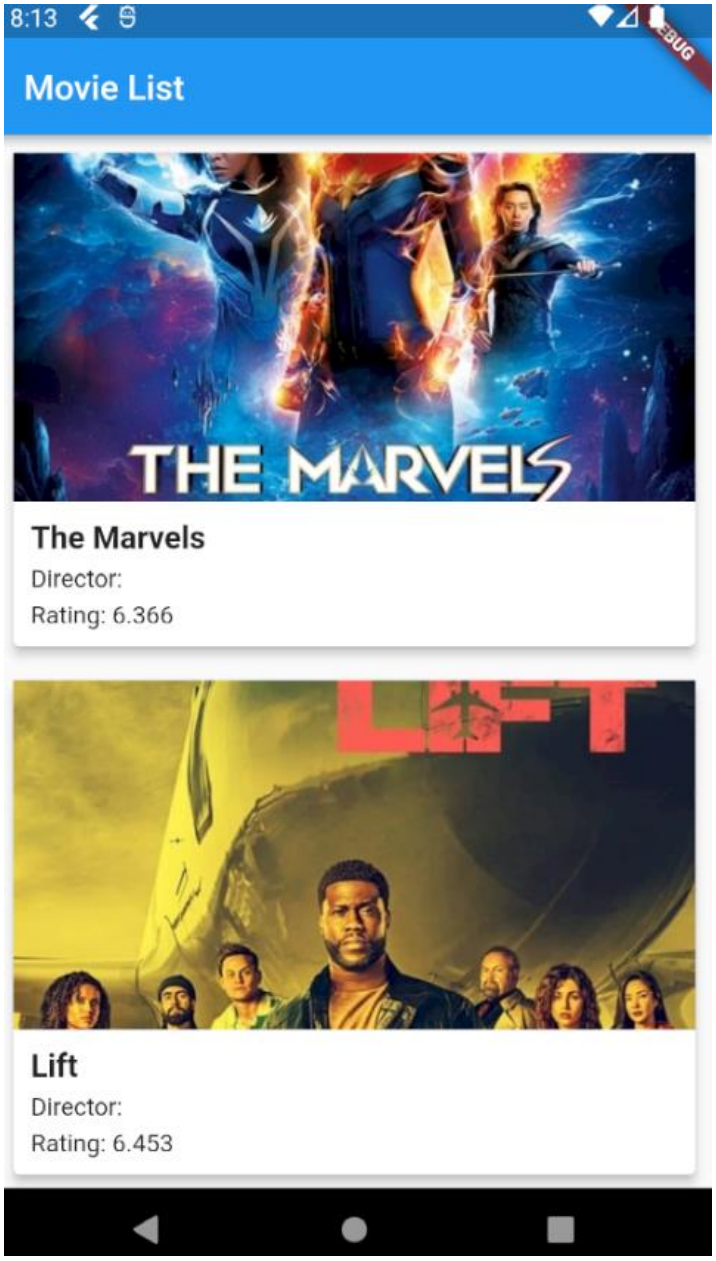
```
  Future<List<Movie>> getMovies() async {
    final response = await http.get(
      Uri.parse('https://api.themoviedb.org/3/movie/popular?api_key=$apiKe
y'),
    );

    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:

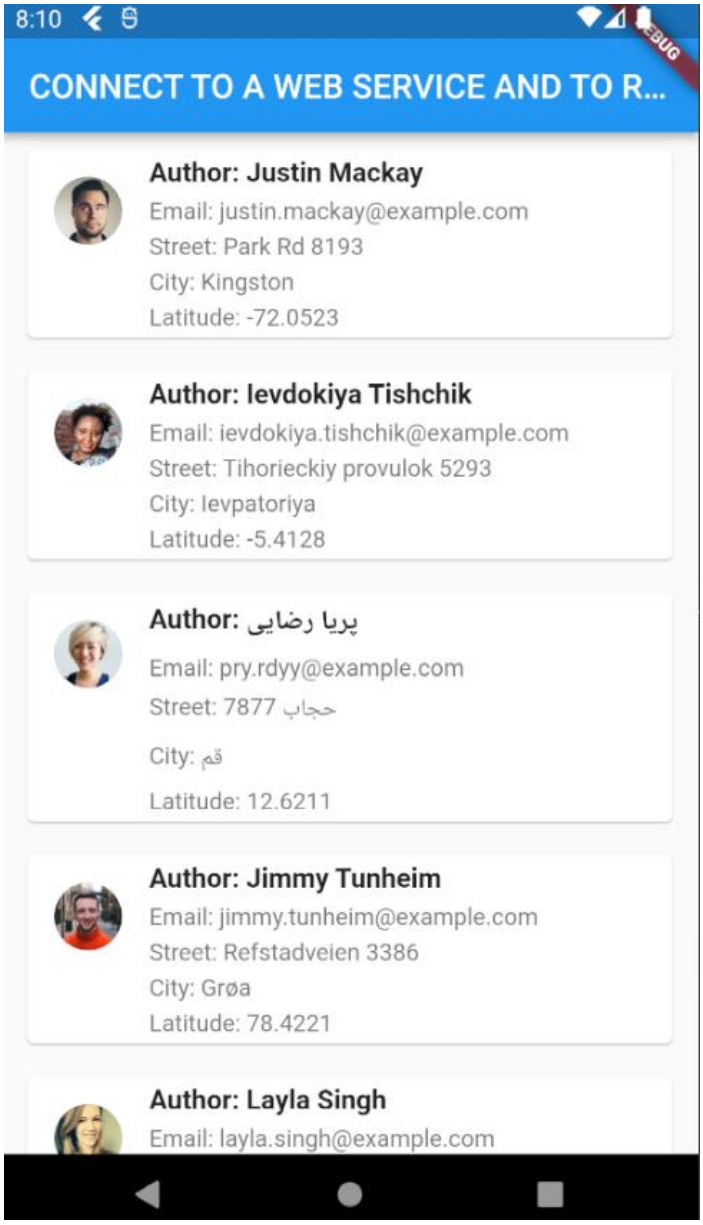
```
dependencies:
  flutter:
    sdk: flutter
  http: ^1.1.0
```

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';
```

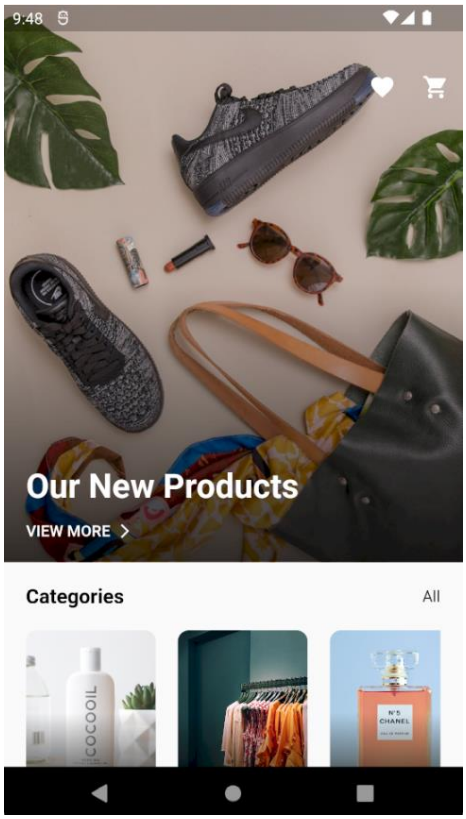
```
class CategoryPage extends StatefulWidget {
  final String? title;
  final String? image;
  final String? tag;

  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

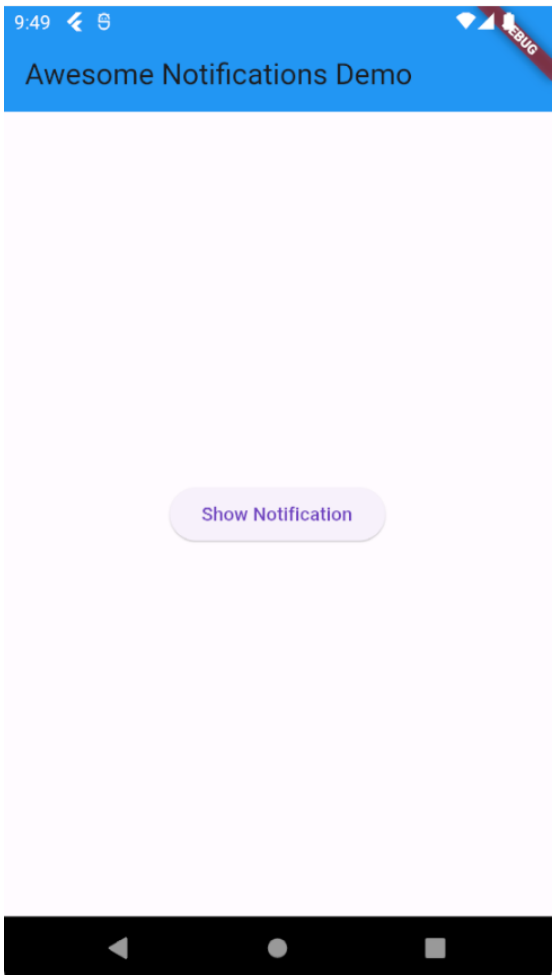
```
import 'package:awesome_notifications/awesome_notifications.dart';
import 'package:flutter/material.dart';
import
'package:flutter_local_notifications_tutorial/notification_controller.dart';

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 {
```

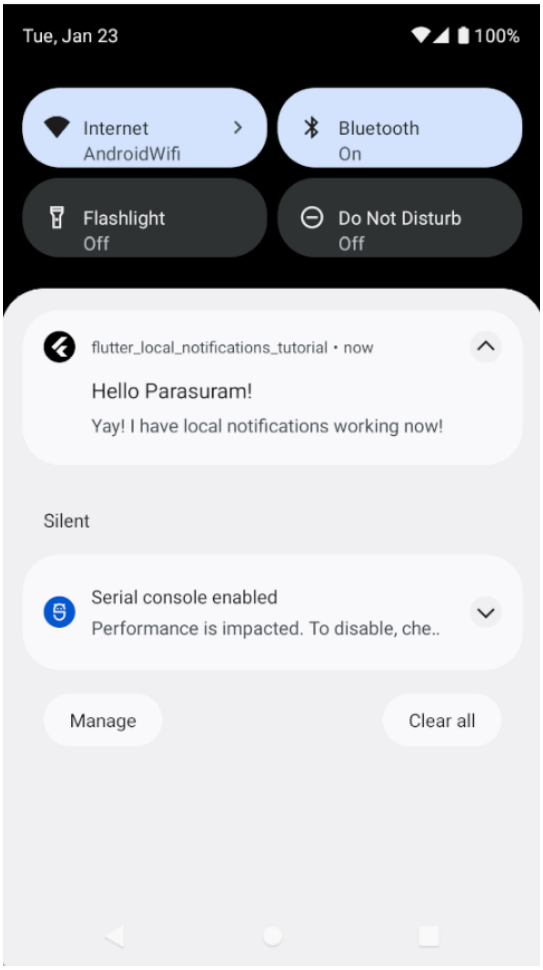
```dart
  const MyApp({super.key});

  @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

```
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
```

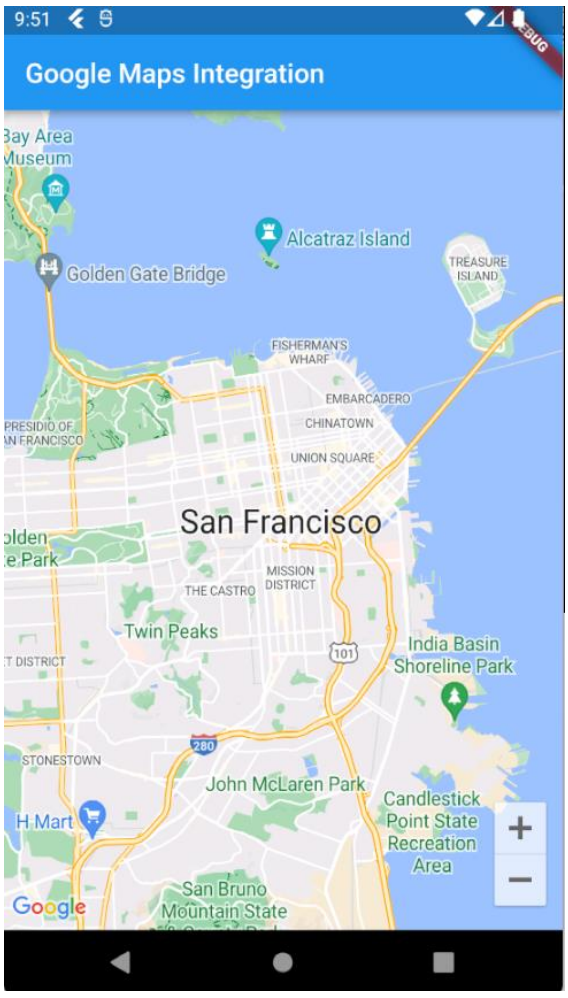
Program :

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);
  });
```

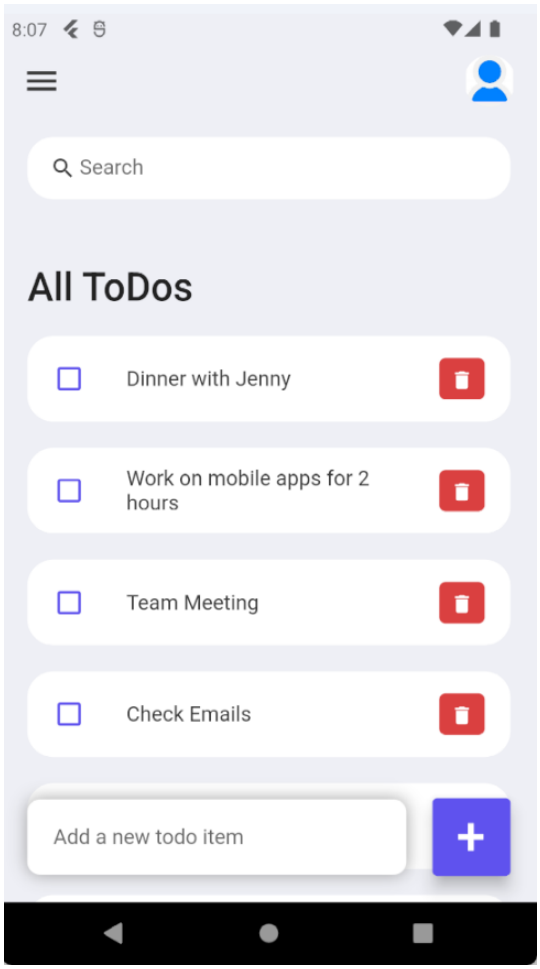
```
}

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.