Name : Naikwadi Yash Shivdas

MPL Practical 02

Aim: To design a Flutter UI by including common widgets.

Introduction

Flutter is an open-source UI toolkit by Google that allows developers to build cross-platform applications for Android, iOS, web, and desktop using a single codebase. It uses the Dart programming language and provides a rich set of pre-built widgets to create beautiful and responsive user interfaces.

A Flutter UI is structured using widgets, which can be broadly classified into:

- StatelessWidget: A widget that does not change over time.
- StatefulWidget: A widget that can update dynamically based on user interaction.

Flutter applications typically use a Scaffold widget, which provides a structure that includes an AppBar, body, floating action buttons, bottom navigation bars, and other UI elements.

Implementation in GreenFund Connect

"GreenFund Connect" is a renewable energy crowdfunding platform where users can explore and support various green energy projects. The UI is designed to be simple, user-friendly, and visually appealing.

Key Features in the UI

1. AppBar – Displays the application title at the top.
2. BottomNavigationBar – Allows users to switch between "Projects" and "About" sections.
3. GridView – Used to display renewable energy projects in a structured way.
4. Card Widget – Displays each project with a clear layout.
5. FloatingActionButton – Provides an option for quick actions.

Code Explanation

1. Main Application (main.dart)

- The MaterialApp widget initializes the app with a green theme.
- The HomeScreen widget is defined as a StatefulWidget because the bottom navigation bar requires state management.

2. HomeScreen Widget

- Contains a BottomNavigationBar with two sections: Projects and About.
- Uses setState to switch between the two sections dynamically.
- Includes a FloatingActionButton for additional actions.

3. ProjectGrid Widget

- Uses GridView.builder to create a grid layout for displaying projects.
- Each project is shown inside a Card widget, ensuring a clean UI.

4. AboutSection Widget

- Displays a brief description of the platform.

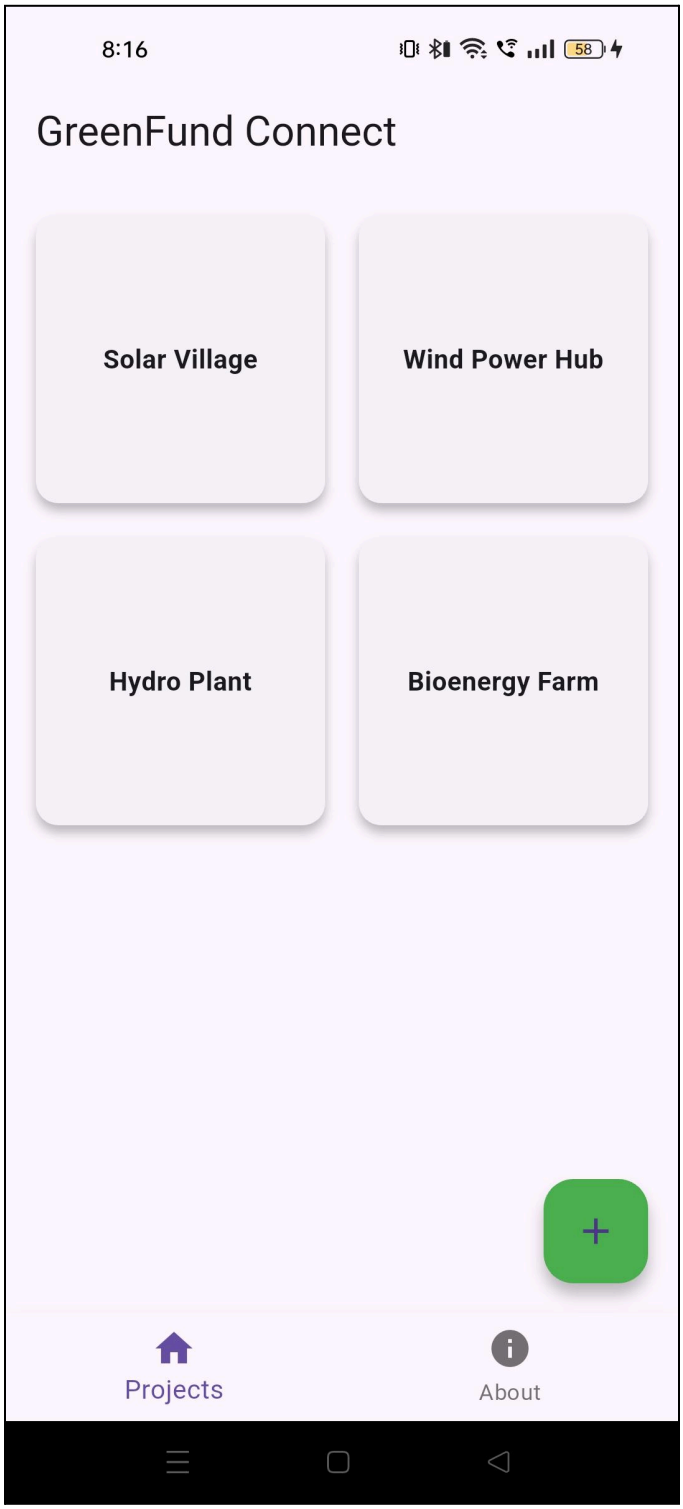
Code:

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

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

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

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      debugShowCheckedModeBanner: false, // Removes the Debug Banner
      title: 'GreenFund Connect',
      theme: ThemeData(
        primarySwatch: Colors.green,
      ),
      home: const HomeScreen(),
    );
  }
}

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

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

class _HomeScreenState extends State<HomeScreen> {
  int _selectedIndex = 0;

  void _onItemTapped(int index) {
    setState(() {
      _selectedIndex = index;
    });
  }

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(title: const Text('GreenFund Connect')),
      body: Padding(
```

```
      padding: const EdgeInsets.all(12.0),
      child: _selectedIndex == 0 ? const ProjectGrid() : const AboutSection(),
    ),
    floatingActionButton: FloatingActionButton(
      backgroundColor: Colors.green,
      onPressed: () {},
      child: const Icon(Icons.add),
    ),
    bottomNavigationBar: BottomNavigationBar(
      currentIndex: _selectedIndex,
      onTap: _onItemTapped,
      items: const [
        BottomNavigationBarItem(icon: Icon(Icons.home), label: 'Projects'),
        BottomNavigationBarItem(icon: Icon(Icons.info), label: 'About'),
      ],
    ),
  );
 }
}

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

 final List<String> projects = const [
  "Solar Village",
  "Wind Power Hub",
  "Hydro Plant",
  "Bioenergy Farm"
 ];

 @override
 Widget build(BuildContext context) {
  return GridView.builder(
   gridDelegate: const SliverGridDelegateWithFixedCrossAxisCount(
    crossAxisCount: 2,
    childAspectRatio: 1,
    crossAxisSpacing: 10,
    mainAxisSpacing: 10,
   ),
   itemCount: projects.length,
   itemBuilder: (context, index) {
    return Card(
     elevation: 4,
     child: Center(
```

```
          child: Padding(
            padding: const EdgeInsets.all(8.0),
            child: Text(
              projects[index],
              style: const TextStyle(fontWeight: FontWeight.bold),
              textAlign: TextAlign.center,
            ),
          ),
        ),
      );
    },
  );
 }
}

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

 @override
 Widget build(BuildContext context) {
  return const Center(
    child: Text(
      "GreenFund Connect aims to support renewable energy projects worldwide.",
      style: TextStyle(fontSize: 18),
      textAlign: TextAlign.center,
    ),
  );
 }
}
```

Screenshot:



Conclusion

In this project, we implemented a unique Flutter UI using BottomNavigationBar, GridView, and FloatingActionButton to create an interactive layout for GreenFund Connect. Initially, we faced issues with GridView alignment and state management in BottomNavigationBar, but we resolved them by adjusting childAspectRatio and correctly updating the selected index using setState.