Experiment No. 2

AIM : To design Flutter UI by including common widgets

Theory:

In Flutter, designing UIs involves combining various widgets to build interactive and visually appealing applications. Here's a more detailed overview of key concepts:

1. **Widgets in Flutter**: Everything in Flutter is a widget. Widgets are the building blocks of the UI. There are two main types:
    - **Stateless Widgets**: These are immutable and don't change over time. They are responsible for displaying UI based on fixed data or input.
    - **Stateful Widgets**: These can change their state over time. They are dynamic and are used when the UI needs to update in response to user interaction or other factors.

2. **Layout Widgets**: The layout of your UI is primarily constructed using widgets like:
    - **Container**: A versatile widget used to hold other widgets and apply styling such as padding, margin, colors, and shapes.
    - **Column**: A widget that arranges its children vertically. It's useful for stacking widgets in a vertical list.
    - **Row**: A widget that arranges its children horizontally. It's useful for placing widgets side by side.
    - **Expanded**: A widget that can be used inside a Column, Row, or Flex to make child widgets flexible and fill available space.

3. **Text and Icons**:
    - **Text**: The Text widget is used to display static or dynamic text. It can be styled with custom fonts, sizes, colors, and more.
    - **Icon**: Flutter provides a large set of material design icons, and the Icon widget lets you display them in various sizes and colors.

4. **Buttons and User Interactions**:

    - Flutter provides multiple button widgets like **ElevatedButton**, **TextButton**, and **IconButton** to handle user interaction. These widgets can trigger actions when tapped.
    - **TextField**: Used for user input. You can configure it to accept different types of text, such as email or password.

- **Checkbox**, **Radio**, and **Switch**: Used for boolean selections, allowing users to choose options in forms or settings.

5. **Navigation**:
   - Flutter's **Navigator** widget is responsible for managing routes or screens. You use Navigator.push to navigate to a new screen, and Navigator.pop to return to the previous one.
   - **Routes** define the pages of an app, and you can pass data between them using arguments.

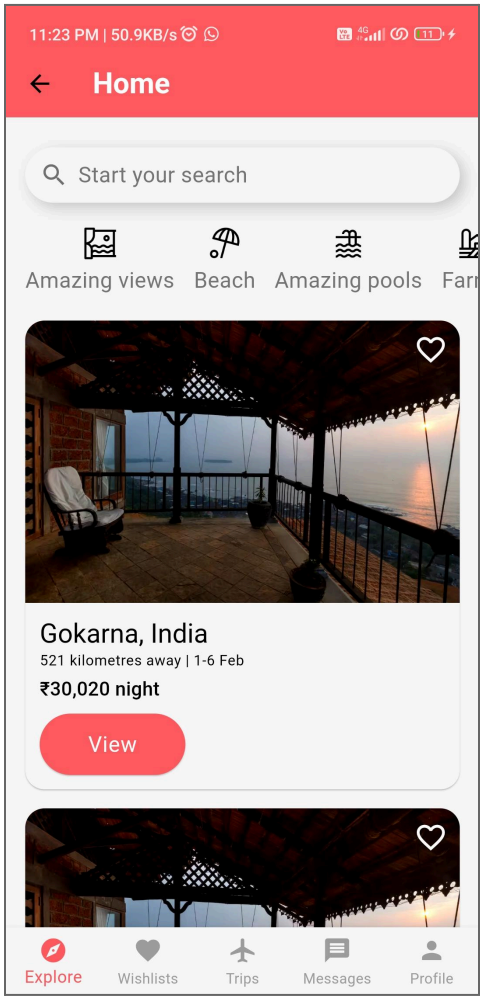
6. **Displaying Lists and Grids**:
   - **ListView**: The ListView widget is used to display a list of items that can scroll. It's perfect for long lists that need to be dynamically generated.
   - **GridView**: This widget allows you to display items in a grid format, with configurable row and column layouts.

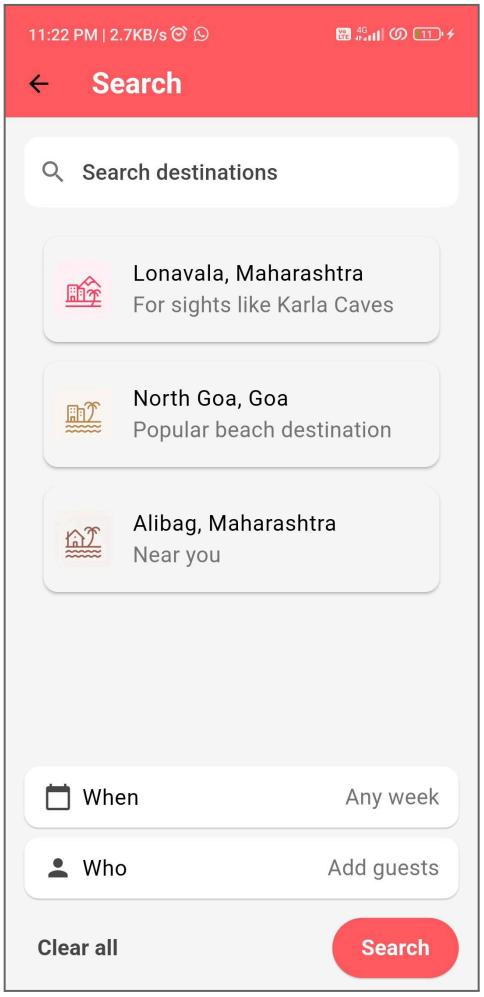
7. **State Management**:
   - Flutter provides a variety of ways to manage state. The simplest approach is using setState() to update the UI. For more complex apps, you can use state management solutions like **Provider**, **Riverpod**, or **Bloc** to separate business logic from UI code.
   - Proper state management ensures your UI stays in sync with the underlying data, especially in interactive or dynamic applications.

8. **Theming and Styling**:
   - Flutter allows you to define a global **Theme** for your app using ThemeData, which ensures consistent styling across the entire app. You can customize colors, typography, and button styles.

9. **Animations and Transitions**:
   - Flutter provides powerful animation support to create smooth and visually appealing transitions between UI states.
   - **AnimatedContainer**: A widget that animates changes in properties like width, height, or color over a given duration.
   - You can also create custom animations using **AnimationController** and **Tween**.

Screenshots:





Code Snippets:

Scaffold & Column Widget

```
class HomeScreen extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text(
          "Home",
          style: TextStyle(color: Colors.white),
        ),
        backgroundColor: primaryColor,
      ),
      body: Padding(
        padding: const EdgeInsets.only(top: 25.0),
        child: Column(
          crossAxisAlignment: CrossAxisAlignment.start,
          children: [
            Padding(
              padding: const EdgeInsets.symmetric(horizontal: 16.0),
              child: GestureDetector(
                onTap: () => Navigator.push(
                  context,
                  MaterialPageRoute(builder: (context) => SearchPage()),
                ),
                child: SearchBar(),
              ),
            ),
            const SizedBox(height: 20),
            CategoryTabs(),
            Expanded(child: PropertyList()),
          ],
        ),
      ),
      bottomNavigationBar: BottomNavBar(),
    );
  }
}
```

Row Widget

```
Row(
        mainAxisAlignment: MainAxisAlignment.spaceBetween,
          children: [
            TextButton(
              onPressed: () {},
              child: Text("Clear all", style: TextStyle(color: darkgrey)),
            ),
            ElevatedButton(
              style: ElevatedButton.styleFrom(
                backgroundColor: primaryColor,
                padding: EdgeInsets.symmetric(horizontal: 24, vertical: 12),
              ),
              onPressed: () {},
              child: Text("Search", style: TextStyle(color: Colors.white)),
            ),
          ],
        ),
```

Search Bar - Container widget

```
class SearchBar extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return Container(
      padding: EdgeInsets.symmetric(horizontal: 12, vertical: 10),
      decoration: BoxDecoration(
        color: Theme.of(context).colorScheme.surface,
        borderRadius: BorderRadius.circular(30),
        boxShadow: [
          BoxShadow(
            color: Colors.black.withOpacity(0.2),
            blurRadius: 10,
            offset: Offset(4, 4),
          ),
        ],
      ),
      child: Row(
        children: [
          Icon(Icons.search, color: Colors.black54),
          SizedBox(width: 8),
          Text("Start your search",
              style: Theme.of(context).textTheme.bodyMedium),
        ],
      ),
    );
  }
}
```