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Experiment 2

Aim: To design Flutter UI by including common widgets.

Theory:

What are Flutter Widgets?

Flutter Widgets are essentially the building blocks of Flutter applications. They are the UI elements that are used to construct the user interface of the app. Widgets can be simple, like a button or a text field, or they can be complex, like a page layout or an animation.

Properties of Widgets:
Immutable: Widgets in Flutter are immutable. Once created, their properties cannot be changed. Instead, when a property needs to be updated, a new widget with the updated property is created.

Composable: Widgets in Flutter are composable, meaning they can be nested and combined to create complex UIs. This allows for easy reuse of UI components and building blocks.
Declarative: Flutter uses a declarative approach to UI development, meaning that UIs are described in terms of their desired state rather than in terms of the steps needed to achieve that state.

- StatelessWidget: Represents static UI elements that do not change over time. Stateless widgets are immutable and only have a build method to describe their UI.

- StatefulWidget: Represents dynamic UI elements that can change over time based on user interactions or other factors. StatefulWidget maintains state that can change during the widget's lifetime. It consists of two classes: one for the widget itself and one for the mutable state.

Common Categories of Widgets:

- Layout Widgets: -

Column: Arranges its children widgets vertically.
- SingleChildScrollView: Provides a scrollable view for its child widget.

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● Material Design Widgets: - Scaffold: Provides a basic layout structure for the app, including app bar and body.
- AppBar: Represents the app bar at the top of the screen.

- Card: Represents a rectangular card with a shadow, used for containing information.

● Text Display Widgets: - Text: Displays a string of text with the specified style.
● Input and Interaction Widgets: - ElevatedButton: Represents a button that becomes elevated with a shadow when pressed.

● Utility Widgets: - Padding: Adds padding around its child widget. - SizedBox: Creates a box with a specified size.

● Styling and Theming: - ThemeData: Defines the overall theme for the app, including colors and text styles. - TextStyle: Defines the style of text, such as font size, font weight, etc.

CODE:-

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

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

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'ToDo App',
      home: ToDoScreen(),
    );
  }
}

class ToDoScreen extends StatefulWidget {
  @override
```

```
  _ToDoScreenState createState() => _ToDoScreenState();
}

class _ToDoScreenState extends State<ToDoScreen> {
  List<Task> tasks = [];

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('ToDo App'),
      ),
      body: Column(
        children: [
          Expanded(
            child: ListView.builder(
              itemCount: tasks.length,
              itemBuilder: (context, index) {
                return ListTile(
                  leading: Checkbox(
                    value: tasks[index].isCompleted,
                    onChanged: (value) {
                      setState(() {
                        tasks[index].isCompleted = value!;
                      });
                    },
                  ),
                  title: Text(
                    tasks[index].taskName,
                    style: TextStyle(
                      decoration: tasks[index].isCompleted
                          ? TextDecoration.lineThrough
```

```
                    : null,
              ),
            ),
            trailing: IconButton(
              icon: Icon(Icons.delete),
              onPressed: () {
                // Handle task deletion
                setState(() {
                  tasks.removeAt(index);
                });
              },
            ),
          );
        },
      ),
    ),
    Padding(
      padding: const EdgeInsets.all(8.0),
      child: TextField(
        onSubmitted: (value) {
          // Handle task addition
          setState(() {
            tasks.add(Task(taskName: value));
          });
        },
        decoration: InputDecoration(
          hintText: 'Add a new task...',
          suffixIcon: Icon(Icons.add),
        ),
      ),
    ),
    ElevatedButton(
```

```
            onPressed: () {
              // Clear completed tasks
              setState(() {
                tasks.removeWhere((task) => task.isCompleted);
              });
            },
            child: Text('Clear Completed Tasks'),
          ),
          Text('Total Tasks: ${tasks.length}'),
        ],
      ),
    );
  }
}

class Task {
  String taskName;
  bool isCompleted;

  Task({required this.taskName, this.isCompleted = false});
}
```

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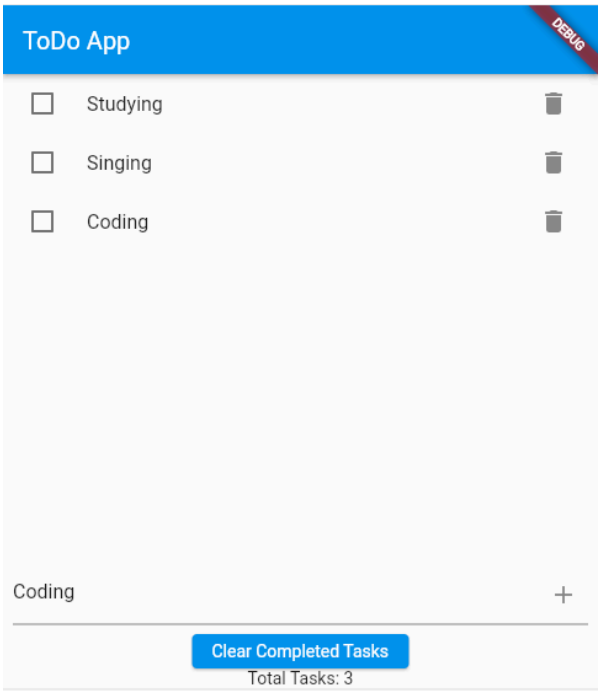

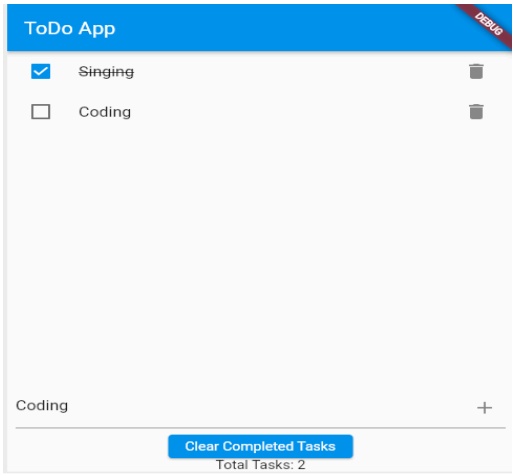

Conclusion:Successfully implemented the Widgets such as Stateful Widget and Stateless Widget.