LAB SESSION 15

BMI Calculator

Objective:
The objective of this lab exercise is to develop a simple Body Mass Index (BMI) calculator using Flutter and Dart. Students will learn how to handle user input, perform basic mathematical calculations, and update the UI based on the results.

Introduction:
Body Mass Index (BMI) is a measure that uses a person's weight and height to gauge if their weight falls within a healthy range. It is a widely used tool to assess whether a person is underweight, normal weight, overweight, or obese. The formula to calculate BMI is:

$$\text{BMI} = \frac{\text{weight (kg)}}{\text{height (m)}^2}$$

In this lab exercise, you will create a BMI calculator application using Flutter. The app will allow users to input their weight in kilograms and height in meters. Upon pressing a button, the app will calculate the BMI and display it along with a corresponding weight category.

Theory:
User Input Handling:
Utilize TextFields to take user inputs for weight and height.
Implement input validation to ensure the values entered are numeric and non-negative.

Mathematical Calculations:
Use Dart's arithmetic operators to perform the BMI calculation.
Understand the BMI formula and how to apply it in the context of a Flutter app.

State Management:
Use Flutter's setState() method to manage and update the state of the application. Ensure that the UI updates dynamically to reflect the calculated BMI.

UI Components:
Design a simple and intuitive user interface.
Use widgets such as Column, Text, TextField, and ElevatedButton to build the layout.
Display the calculated BMI and corresponding weight category (underweight, normal weight, overweight, obese) to the user.

By completing this lab, students will gain practical experience in developing a Flutter application that integrates user input handling, basic calculations, state management, and dynamic UI updates. This exercise will reinforce their understanding of fundamental Flutter concepts and prepare them for more complex application development tasks

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

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

class MyApp extends StatelessWidget {
  const MyApp({super.key});
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'flutter demo',
      debugShowCheckedModeBanner: false,
      theme: ThemeData(
          ),
      home: const MyHomePage(),
    );
  }
}

class MyHomePage extends StatefulWidget {
  const MyHomePage({Key? key}) : super(key: key);
  @override
  State<MyHomePage> createState() =>
_MyHomePageState(); }

class _MyHomePageState extends State<MyHomePage> {
  var wtcontroller = TextEditingController();
  var ftcontroller = TextEditingController();
  var incontroller = TextEditingController();
  var result = "";
  var bg = Colors.indigo.shade200;
  @override
  Widget build(BuildContext context) {
    return Scaffold(
```



```dart
        body: Container(
            child: Center(
                child: Container(
                    color: bg,
                    width: 300,
                    child: Column(
```

```
                mainAxisAlignment: MainAxisAlignment.center,
                    children: [
                      Text(
                        'BMI',
                        style: TextStyle(
                          fontSize: 24,
                          fontWeight: FontWeight.w700,
                        ),
                      ),
                      SizedBox(
                        height: 21,
                      ),
                      TextField(
                        controller: wtcontroller,
                        decoration: InputDecoration(
                    label: Text('enter your weight in kg'),
                      prefixIcon: Icon(Icons.line_weight),
                        ),
                        keyboardType: TextInputType.number,
                      ),
                      SizedBox(
                        height: 10,
                      ),
                      TextField(
                        controller: ftcontroller,
                        decoration: InputDecoration(
                            label: Text('enter your height in
feet'),
                          prefixIcon: Icon(Icons.height),
                        ),
                        keyboardType: TextInputType.number,
                      ),
                      SizedBox(
```



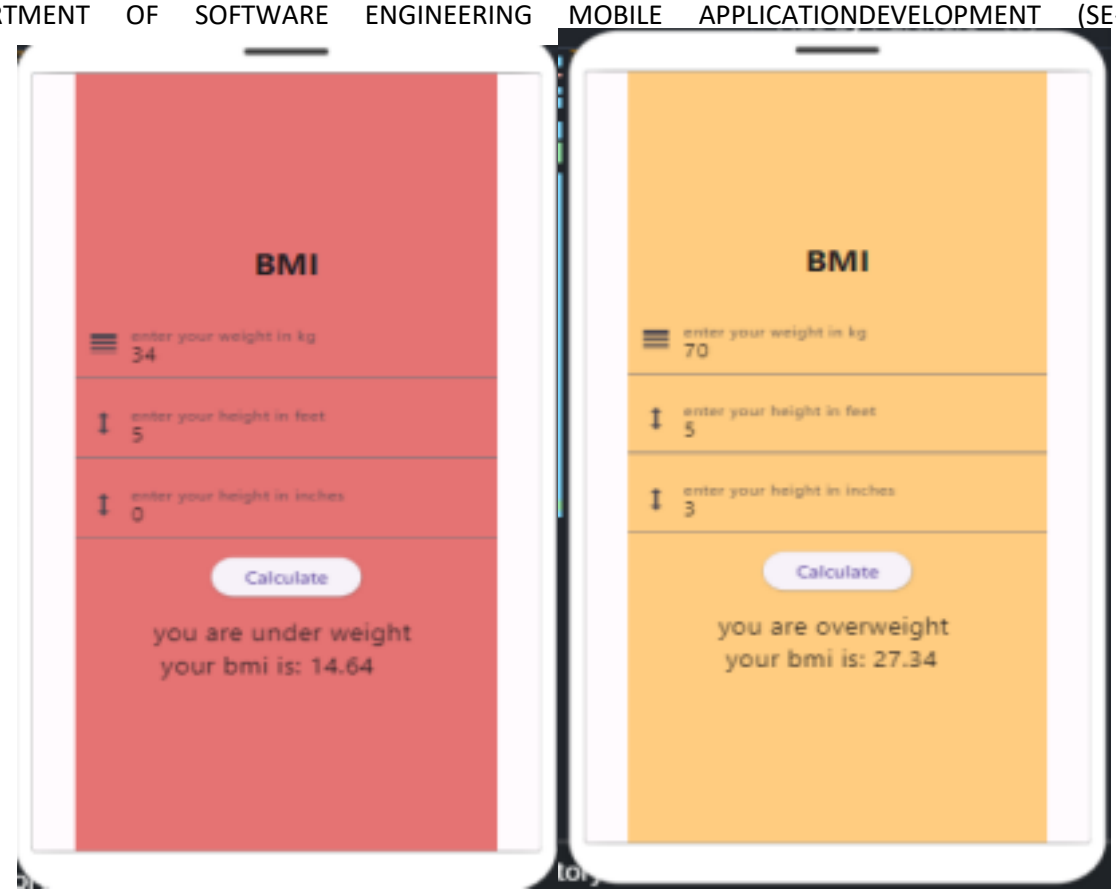
```
                        height: 10,
                      ),
                      TextField(
                        controller: incontroller,
                        decoration: InputDecoration(
                    label: Text('enter your height in inches'),
                          prefixIcon: Icon(Icons.height),
                        ),
```

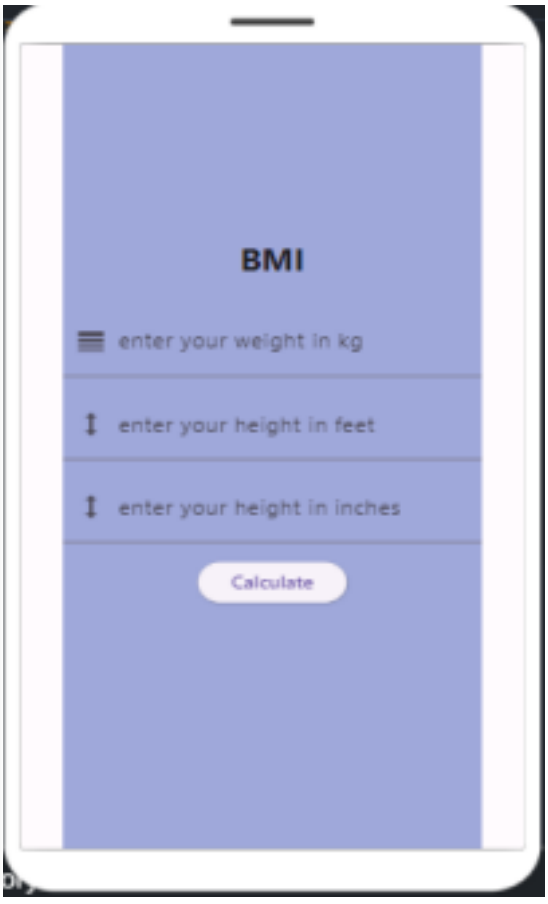
```
                keyboardType: TextInputType.number,
              ),
              SizedBox(
                height: 16,
              ),
              ElevatedButton(
                onPressed: () {
                  var wt = wtcontroller.text.toString();
                  var ft = ftcontroller.text.toString();
                  var inc = incontroller.text.toString();
                  if (wt != "" && ft != "" && inc != "") {
                    var iwt = int.parse(wt);
                    var ift = int.parse(ft);
                    var Iinch = int.parse(inc);
                    var totalinch = (ift * 12) + Iinch;
                    var tcm = totalinch * 2.54;
                    var total_m = tcm / 100;
                    var bmi = iwt / (total_m * total_m);
                    var msg = "";
                    if (bmi > 25) {
                      msg = "you are overweight";
                      bg = Colors.orange.shade200;
                    } else if (bmi < 18) {
                      msg = "you are under weight";
                      bg = Colors.red.shade300;
                    } else {
                      msg = "you are healthy";
                      bg = Colors.green.shade200;
                    }

                    setState(() {
```

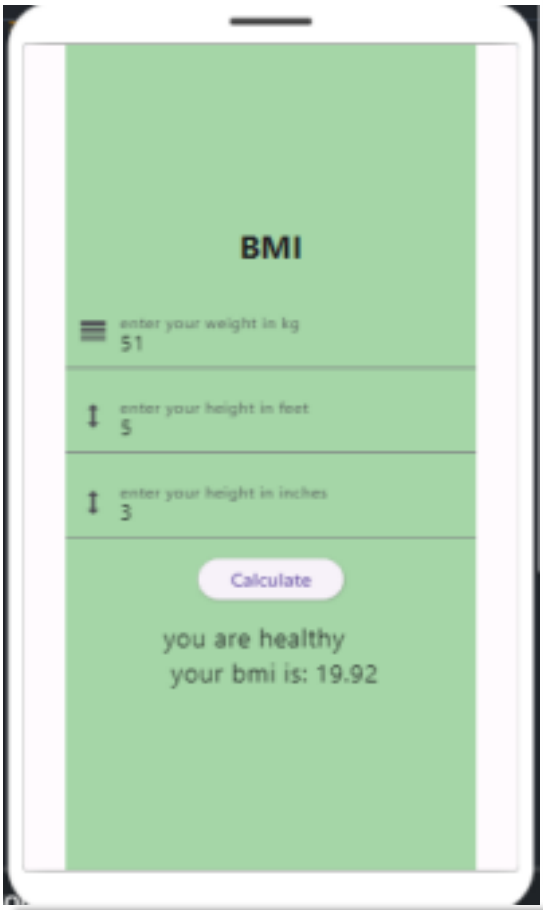


```
                      result =
                  "$msg \n your bmi is: ${bmi.toStringAsFixed(2)}";
                    });
                  } else {
                    setState(() {
                  result ="please fill all the required fields";
                    });
                  }
                },
                child: Text('Calculate'),
```

```
            ),
            SizedBox(
              height: 16,
            ),
            Text(
              result,
              style: TextStyle(fontSize: 19),
            ),
          ])))));
    }
}
```


BMI
enter your weight in kg
enter your height in feet
enter your height in inches
Calculate


BMI
enter your weight in kg
51
enter your height in feet
5
enter your height in inches
3
Calculate
you are healthy
your bmi is: 19.92

Exercise:

Question 1:
Implement the same App with range sliders.

Code

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

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

class MyApp extends StatelessWidget {
  const MyApp({super.key});

  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Demo',
      debugShowCheckedModeBanner: false,
      theme: ThemeData(),
      home: const MyHomePage(),
    );
  }
}

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

  @override
  State<MyHomePage> createState() => _MyHomePageState();
}

class _MyHomePageState extends State<MyHomePage> {
  // Variables to store weight, height in feet, and height in inches
  double weight = 60; // Default weight
  double heightFeet = 5; // Default height in feet
  double heightInches = 6; // Default height in inches
  String result = ""; // Result string to show BMI and message
  Color bgColor = Colors.indigo.shade200; // Background color

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      body: Container(
        color: bgColor,
        child: Center(
```

```
        child: Container(
          width: 300,
          padding: const EdgeInsets.all(16.0),
          decoration: BoxDecoration(
            color: bgColor,
            borderRadius: BorderRadius.circular(10),
          ),
          child: Column(
            mainAxisAlignment: MainAxisAlignment.center,
            children: [
              const Text(
                'BMI Calculator',
                style: TextStyle(
                  fontSize: 24,
                  fontWeight: FontWeight.w700,
                ),
              ),
              const SizedBox(height: 21),
              // Weight Slider
              const Text('Weight (kg)'),
              Slider(
                value: weight,
                min: 30,
                max: 150,
                divisions: 120,
                label: weight.round().toString(),
                onChanged: (value) {
                  setState(() {
                    weight = value;
                  });
                },
              ),
              Text('${weight.round()} kg'),
              const SizedBox(height: 10),
              // Height Feet Slider
              const Text('Height (feet)'),
              Slider(
                value: heightFeet,
                min: 3,
                max: 7,
                divisions: 4,
                label: heightFeet.round().toString(),
                onChanged: (value) {
                  setState(() {
                    heightFeet = value;
                  });
                },
              ),
```

```
                Text('${heightFeet.round()} ft'),
                const SizedBox(height: 10),
                // Height Inches Slider
                const Text('Height (inches)'),
                Slider(
                  value: heightInches,
                  min: 0,
                  max: 11,
                  divisions: 11,
                  label: heightInches.round().toString(),
                  onChanged: (value) {
                    setState(() {
                      heightInches = value;
                    });
                  },
                ),
                Text('${heightInches.round()} in'),
                const SizedBox(height: 16),
                ElevatedButton(
                  onPressed: () {
                    // Calculate BMI
                    double totalInches = (heightFeet * 12) + heightInches;
                    double totalCm = totalInches * 2.54;
                    double totalM = totalCm / 100;
                    double bmi = weight / (totalM * totalM);

                    // Determine message and background color
                    String msg;
                    if (bmi > 25) {
                      msg = "You are overweight";
                      bgColor = Colors.orange.shade200;
                    } else if (bmi < 18) {
                      msg = "You are underweight";
                      bgColor = Colors.red.shade300;
                    } else {
                      msg = "You are healthy";
                      bgColor = Colors.green.shade200;
                    }

                    setState(() {
                      result = "$msg \nYour BMI is
${bmi.toStringAsFixed(2)}";
                    });
                  },
                  child: const Text('Calculate'),
                ),
                const SizedBox(height: 16),
                Text(
```

```
                result,
                style: const TextStyle(fontSize: 19),
                textAlign: TextAlign.center,
              ),
            ],
          ),
        ),
      ),
    ),
  );
  }
}
```

Output