JAVA MINI PROJECT

Temperature Converter

Introduction :

The **Temperature Converter** mini project is a simple GUI-based Java application developed using the Abstract Window Toolkit (AWT). It allows users to convert temperature values between three commonly used units: **Celsius**, **Fahrenheit**, and **Kelvin**. The goal of this project is to demonstrate the practical use of Java's AWT library for building graphical user interfaces and event-driven programming. With an intuitive layout and interactive components like text fields, buttons, and drop-down choices, this tool provides a user-friendly way to understand and convert temperature units, making it both an educational and functional utility.

This project not only strengthens core Java programming skills but also helps in understanding GUI design concepts, input validation, and implementing basic mathematical logic within an application.

Program :

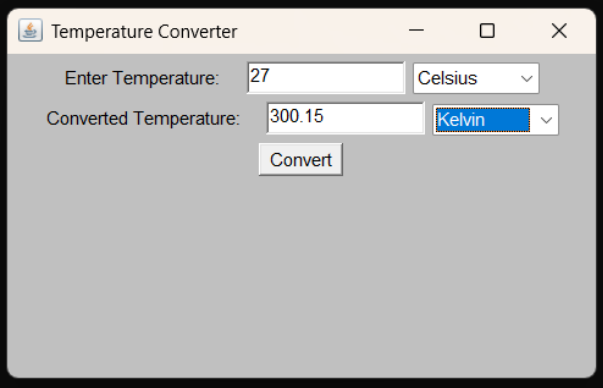
```
import java.awt.*;
import java.awt.event.*;

public class TemperatureConverter extends Frame {

    // Declare UI components
    Label labelInput, labelOutput;
    TextField textInput, textOutput;
    Choice choiceInput, choiceOutput;
    Button convertButton;

    public TemperatureConverter() {
        // Frame setup
        setTitle("Temperature Converter");
        setSize(400, 250);
        setLayout(new FlowLayout());

        // Set background color for the frame
        setBackground(Color.LIGHT_GRAY);

        // Input Label
        labelInput = new Label("Enter Temperature:");
        add(labelInput);

        // Input Text Field
        textInput = new TextField(10);
        add(textInput);

        // Input Choice (Celsius, Fahrenheit, Kelvin)
        choiceInput = new Choice();
        choiceInput.add("Celsius");
        choiceInput.add("Fahrenheit");
        choiceInput.add("Kelvin");
        add(choiceInput);

        // Output Label
        labelOutput = new Label("Converted Temperature:");
        add(labelOutput);

        // Output Text Field (Read-Only)
        textOutput = new TextField(10);
        textOutput.setEditable(false);
        textOutput.setBackground(Color.WHITE);
```

```
        add(textOutput);

        // Output Choice (Celsius, Fahrenheit, Kelvin)
        choiceOutput = new Choice();
        choiceOutput.add("Celsius");
        choiceOutput.add("Fahrenheit");
        choiceOutput.add("Kelvin");
        add(choiceOutput);

        // Convert Button
        convertButton = new Button("Convert");

        convertButton.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                convertTemperature();
            }
        });
        add(convertButton);

        // Window close operation
        addWindowListener(new WindowAdapter() {
            @Override
            public void windowClosing(WindowEvent we) {
                System.exit(0);
            }
        });

        // Make the frame visible
        setVisible(true);
    }

    // Temperature conversion logic
    private void convertTemperature() {
        try {
            // Trim whitespace to prevent errors from accidental spaces
            double inputTemp =
Double.parseDouble(textInput.getText().trim());
            String inputUnit = choiceInput.getSelectedItem();
            String outputUnit = choiceOutput.getSelectedItem();
            double outputTemp;

            // Convert input to Celsius first as a base unit
            if (inputUnit.equals("Fahrenheit")) {
                inputTemp = (inputTemp - 32) * 5.0 / 9.0;
            } else if (inputUnit.equals("Kelvin")) {
```

```
            inputTemp = inputTemp - 273.15;
        }
        // If Celsius, no change needed

        // Convert from Celsius base to selected output unit
        if (outputUnit.equals("Fahrenheit")) {
            outputTemp = (inputTemp * 9.0 / 5.0) + 32.0;
        } else if (outputUnit.equals("Kelvin")) {
            outputTemp = inputTemp + 273.15;
        } else { // Output is Celsius
            outputTemp = inputTemp;
        }

        // Display the result formatted to 2 decimal places
        textOutput.setText(String.format("%.2f", outputTemp));

      } catch (NumberFormatException ex) {
        textOutput.setText("Invalid input");
      }
    }

    public static void main(String[] args) {
      new TemperatureConverter();
    }
}
```

Output :

```
C:\Users\Acer\OneDrive\Desktop\Java Mini Project>javac TemperatureConverter.java

C:\Users\Acer\OneDrive\Desktop\Java Mini Project>java TemperatureConverter
```

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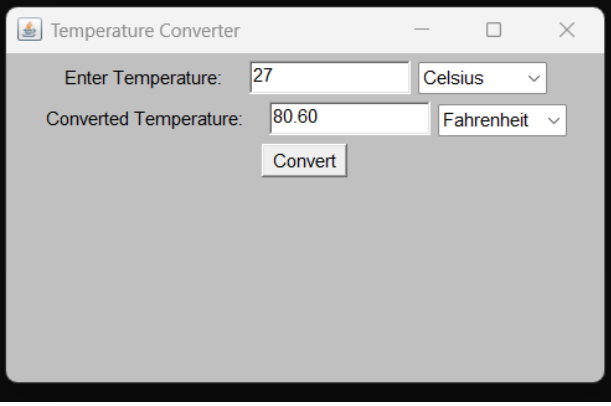

Conclusion :

The **Temperature Converter** project successfully demonstrates how Java can be used to create interactive desktop applications with a graphical user interface. Through the use of AWT components, event listeners, and simple mathematical conversions, the application provides a smooth and accurate user experience.

By working on this mini project, key programming concepts such as event handling, user input validation, conditional logic, and layout management are reinforced. Overall, this project serves as a solid foundation for further exploration into Java GUI development and can be expanded with additional features like history tracking, theme customization, or conversion to other units.