

Experiment 2: Basic Temperature

Converter

1. Objective

Develop an application that converts temperatures between Celsius and Fahrenheit. This will introduce basic UI elements, event handling, and simple arithmetic operations in Android development.

2. Steps to Complete the Application

1. Design the Layout:

Open activity_main.xml in the layout directory.

Use a LinearLayout or ConstraintLayout to arrange the UI elements vertically.

Add two EditText elements for input - one for Celsius and one for Fahrenheit.

Insert two Button elements for the conversion - one to convert Celsius to Fahrenheit and another for the reverse.

Include two TextView elements to display the results.

2. Configure EditText for Temperature Input:

Set the inputType of each EditText to numberDecimal to allow for decimal values.

Add hints to each EditText to indicate which temperature scale to enter.

```
<EditText  
  
    android:id="@+id/etCelsius"  
  
    android:layout_width="match_parent"  
  
    android:layout_height="wrap_content"
```

```
    android:hint="Enter Celsius"

    android:inputType="numberDecimal" />
```

```
<EditText

    android:id="@+id/etFahrenheit"

    android:layout_width="match_parent"

    android:layout_height="wrap_content"

    android:hint="Enter Fahrenheit"

    android:inputType="numberDecimal" />
```

3. Add Buttons for Conversion:

Assign text to each button indicating their function.

```
<Button

    android:id="@+id/btnToFahrenheit"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:text="Convert to Fahrenheit" />
```

```
<Button

    android:id="@+id/btnToCelsius"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:text="Convert to Celsius" />
```

4. Display Results in TextView:

The results will be displayed in these TextViews.

```
<TextView

    android:id="@+id/tvResultFahrenheit"
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:textSize="18sp" />
```

```
<TextView
```

```
    android:id="@+id/tvResultCelsius"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="18sp" />
```

5. Write the Conversion Logic in MainActivity:

In MainActivity.java, set up event listeners for the buttons.

Retrieve the input values from the EditText elements when a button is clicked.

Perform the temperature conversion based on which button was clicked.

Display the result in the corresponding TextView.

```
public class MainActivity extends AppCompatActivity {

    EditText etCelsius, etFahrenheit;
    Button btnToFahrenheit, btnToCelsius;
    TextView tvResultFahrenheit, tvResultCelsius;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

```

        etCelsius = findViewById(R.id.etCelsius);

        etFahrenheit = findViewById(R.id.etFahrenheit);

        btnToFahrenheit = findViewById(R.id.btnToFahrenheit);

        btnToCelsius = findViewById(R.id.btnToCelsius);

        tvResultFahrenheit =
findViewById(R.id.tvResultFahrenheit);

        tvResultCelsius = findViewById(R.id.tvResultCelsius);


        btnToFahrenheit.setOnClickListener(new
View.OnClickListener() {

            @Override

            public void onClick(View v) {

                if (!etCelsius.getText().toString().isEmpty())

{

                    double celsius =
Double.parseDouble(etCelsius.getText().toString());

                    double fahrenheit = (celsius * 9/5) + 32;

tvResultFahrenheit.setText(String.format("%.2f Fahrenheit",
fahrenheit));

                }

            }

        });

        btnToCelsius.setOnClickListener(new
View.OnClickListener() {

```

```

        @Override

        public void onClick(View v) {

            if

            (!etFahrenheit.getText().toString().isEmpty()) {

                double                fahrenheit                =

                Double.parseDouble(etFahrenheit.getText().toString());

                double celsius = (fahrenheit - 32) * 5/9;

                tvResultCelsius.setText(String.format("%.2f                Celsius",

                celsius));

            }

        }

    });

}

}

```

3. Explanation

The EditText elements capture user input for temperatures in Celsius and Fahrenheit.

The Button elements are set with OnClickListener to trigger conversion when clicked.

The conversion logic is straightforward: Celsius to Fahrenheit is $C * 9/5 + 32$, and Fahrenheit to Celsius is $(F - 32) * 5/9$.

The results are formatted to two decimal places and displayed in TextView elements.