**Problem 1**

**Exercise Objective:** Develop a measurement converter application that converts Centimetres into inches.

**Problem Statement 1:** The app should have input field for Centimetre and a button Convert for Conversion. Upon pressing the "Convert" button, the app should display the value in inches.

**Expected Output:** The app displays the proper conversion from Centimetres into inches.

**activity\_main.xml**

<?xml *version*="1.0" *encoding*="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout *xmlns:android*="http://schemas.android.com/apk/res/android"

*xmlns:app*="http://schemas.android.com/apk/res-auto"

*xmlns:tools*="http://schemas.android.com/tools"

*android:layout\_width*="match\_parent"

*android:layout\_height*="match\_parent"

*android:padding*="16dp"

*tools:context*=".MainActivity">

    <!-- Title TextView -->

    <TextView

*android:id*="@+id/titleTextView"

*android:layout\_width*="wrap\_content"

*android:layout\_height*="wrap\_content"

*android:text*="Centimeter to Inch Converter"

*android:textSize*="24sp"

*android:textStyle*="bold"

*android:textColor*="@android:color/holo\_blue\_dark"

*app:layout\_constraintEnd\_toEndOf*="parent"

*app:layout\_constraintStart\_toStartOf*="parent"

*app:layout\_constraintTop\_toTopOf*="parent"

*android:layout\_marginTop*="32dp"/>

    <!-- EditText for Centimeter Input -->

    <EditText

*android:id*="@+id/cmEditText"

*android:layout\_width*="0dp"

*android:layout\_height*="wrap\_content"

*android:layout\_marginTop*="32dp"

*android:hint*="Enter Centimeters"

*android:inputType*="numberDecimal"

*android:minHeight*="48dp"

*android:padding*="12dp"

*app:layout\_constraintEnd\_toEndOf*="parent"

*app:layout\_constraintStart\_toStartOf*="parent"

*app:layout\_constraintTop\_toBottomOf*="@+id/titleTextView" />

    <!-- Convert Button -->

    <Button

*android:id*="@+id/convertButton"

*android:layout\_width*="0dp"

*android:layout\_height*="wrap\_content"

*android:layout\_marginTop*="24dp"

*android:text*="Convert to Inches"

*android:textSize*="18sp"

*android:textStyle*="bold"

*android:backgroundTint*="@android:color/holo\_green\_dark"

*android:textColor*="@android:color/white"

*app:layout\_constraintEnd\_toEndOf*="parent"

*app:layout\_constraintStart\_toStartOf*="parent"

*app:layout\_constraintTop\_toBottomOf*="@+id/cmEditText" />

    <!-- TextView to display Inches -->

    <TextView

*android:id*="@+id/inchesResultTextView"

*android:layout\_width*="wrap\_content"

*android:layout\_height*="wrap\_content"

*android:layout\_marginTop*="32dp"

*android:text*="Result: "

*android:textSize*="20sp"

*android:textStyle*="italic"

*android:textColor*="@android:color/black"

*app:layout\_constraintEnd\_toEndOf*="parent"

*app:layout\_constraintStart\_toStartOf*="parent"

*app:layout\_constraintTop\_toBottomOf*="@+id/convertButton" />

</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.java**

package com.example.measurementconverter;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast; // Import Toast for displaying messages

import java.text.DecimalFormat; // Import DecimalFormat for formatting output

public class MainActivity extends *AppCompatActivity* {

    // Declare UI elements

    private *EditText* cmEditText;

    private *Button* convertButton;

    private *TextView* inchesResultTextView;

    @*Override*

    protected *void* onCreate(*Bundle* *savedInstanceState*) {

*super*.onCreate(savedInstanceState);

        setContentView(R.layout.activity\_main); // Set the layout for this activity

        // Initialize UI elements by finding their IDs from the layout

        cmEditText = findViewById(R.id.cmEditText);

        convertButton = findViewById(R.id.convertButton);

        inchesResultTextView = findViewById(R.id.inchesResultTextView);

        // Set an OnClickListener for the convert button

        convertButton.setOnClickListener(**new** View.OnClickListener() {

            @*Override*

            public *void* onClick(*View* view) {

                convertCentimetersToInches(); // Call the conversion method

            }

        });

    }

    /\*\*

     \* This method handles the conversion from centimeters to inches.

     \*/

    private *void* convertCentimetersToInches() {

        // Get the input text from the EditText

*String* cmString = cmEditText.getText().toString();

        // Check if the input string is empty

        if (cmString.isEmpty()) {

            // Show a Toast message if the input is empty

            Toast.makeText(*this*, "Please enter a value in Centimeters", Toast.LENGTH\_SHORT).show();

            inchesResultTextView.setText("Result: "); // Clear previous result

            return; // Exit the method

        }

        try {

            // Parse the input string to a double

*double* centimeters = Double.parseDouble(cmString);

            // Perform the conversion (1 inch = 2.54 cm)

*double* inches = centimeters / 2.54;

            // Format the inches value to two decimal places

            // This makes the output cleaner and more readable

*DecimalFormat* df = **new** DecimalFormat("#.##");

*String* formattedInches = df.format(inches);

            // Display the result in the TextView

            inchesResultTextView.setText("Result: " + formattedInches + " inches");

        } catch (*NumberFormatException* *e*) {

            // Handle cases where the user inputs non-numeric data

            Toast.makeText(*this*, "Invalid input. Please enter a valid number.", Toast.LENGTH\_LONG).show();

            inchesResultTextView.setText("Result: "); // Clear previous result

            e.printStackTrace(); // Print the stack trace for debugging

        }

    }

}