CODTECH Task 4 – Code Refactoring Comparison

# 🔴 BEFORE: Original Code (MainActivity.java)

// Old MainActivity.java (simplified example)  
@Override  
protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.activity\_main);  
  
 button0 = findViewById(R.id.button0);  
 button1 = findViewById(R.id.button1);  
 // ... other buttons  
  
 button1.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 result = resultTextView.getText().toString();  
 result = result + "1";  
 resultTextView.setText(result);  
 }  
 });  
  
 buttonAdd.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 tmp = resultTextView.getText().toString();  
 onClearButtonClicked();  
 operator = "+";  
 }  
 });  
  
 // Equal logic (uses int only)  
 buttonEqual.setOnClickListener(new View.OnClickListener() {  
 @Override  
 public void onClick(View v) {  
 int res = 0;  
 int number = Integer.valueOf(tmp);  
 int number2 = Integer.valueOf(resultTextView.getText().toString());  
 switch (operator) {  
 case "+": res = number + number2; break;  
 case "-": res = number - number2; break;  
 case "X": res = number \* number2; break;  
 case "/": res = number / number2; break;  
 }  
 result = String.valueOf(res);  
 resultTextView.setText(result);  
 }  
 });  
}

# ✅ AFTER: Refactored and Improved Code (MainActivity.java)

// Refactored MainActivity.java (highlighted parts)  
@Override  
protected void onCreate(Bundle savedInstanceState) {  
 super.onCreate(savedInstanceState);  
 setContentView(R.layout.activity\_main);  
 linkUIComponents();  
 setNumberButtonListeners();  
 setOperatorButtonListeners();  
}  
  
// Handles number and decimal input  
private void setNumberButtonListeners() {  
 View.OnClickListener numberListener = view -> {  
 Button b = (Button) view;  
 currentInput += b.getText().toString();  
 resultTextView.setText(currentInput);  
 };  
 button0.setOnClickListener(numberListener);  
 button1.setOnClickListener(numberListener);  
 // ... dot button for decimal input  
}  
  
// Handles operator logic  
private void setOperatorButtonListeners() {  
 buttonAdd.setOnClickListener(v -> operatorClicked("+"));  
 buttonEqual.setOnClickListener(v -> equalClicked());  
}  
  
// Uses double instead of int, supports decimals and divide-by-zero  
private void equalClicked() {  
 try {  
 double num1 = Double.parseDouble(firstNumber);  
 double num2 = Double.parseDouble(currentInput);  
 double result = 0;  
 switch (selectedOperator) {  
 case "+": result = num1 + num2; break;  
 case "-": result = num1 - num2; break;  
 case "\*": result = num1 \* num2; break;  
 case "/":  
 if (num2 == 0) {  
 resultTextView.setText("Divide by 0 Error");  
 return;  
 }  
 result = num1 / num2;  
 break;  
 }  
 resultTextView.setText(String.valueOf(result));  
 historyTextView.append(firstNumber + " " + selectedOperator + " " + currentInput + " = " + result + "  
");  
 currentInput = String.valueOf(result);  
 } catch (Exception e) {  
 resultTextView.setText("Error");  
 }  
}

# 📄 Layout Comparison – activity\_main.xml

## 🔴 BEFORE: Original activity\_main.xml

<TableLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical">  
  
 <TextView  
 android:id="@+id/text\_view\_result"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="60sp"  
 android:textAlignment="viewEnd" />  
  
 <TableRow>  
 <Button android:id="@+id/button1" android:text="1" android:layout\_weight="1" />  
 <Button android:id="@+id/button2" android:text="2" android:layout\_weight="1" />  
 <Button android:id="@+id/button3" android:text="3" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonAdd" android:text="+" android:layout\_weight="1" />  
 </TableRow>  
  
 <!-- other rows skipped -->  
  
 <TableRow>  
 <Button android:id="@+id/buttonClear" android:text="CLEAR" android:layout\_weight="1" />  
 <Button android:id="@+id/button0" android:text="0" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonEqual" android:text="=" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonDiv" android:text="/" android:layout\_weight="1" />  
 </TableRow>  
</TableLayout>

## ✅ AFTER: Updated activity\_main.xml

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"  
 android:layout\_width="match\_parent"  
 android:layout\_height="match\_parent"  
 android:orientation="vertical"  
 android:padding="12dp">  
  
 <TextView  
 android:id="@+id/text\_view\_result"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="48sp"  
 android:textAlignment="viewEnd"  
 android:background="#F0F0F0" />  
  
 <ScrollView  
 android:layout\_width="match\_parent"  
 android:layout\_height="150dp"  
 android:background="#DDDDDD">  
  
 <TextView  
 android:id="@+id/historyTextView"  
 android:layout\_width="match\_parent"  
 android:layout\_height="wrap\_content"  
 android:textSize="16sp"  
 android:textColor="#444444" />  
 </ScrollView>  
  
 <TableLayout android:layout\_width="match\_parent" android:layout\_height="wrap\_content">  
  
 <TableRow>  
 <Button android:id="@+id/button1" android:text="1" android:layout\_weight="1" />  
 <Button android:id="@+id/button2" android:text="2" android:layout\_weight="1" />  
 <Button android:id="@+id/button3" android:text="3" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonAdd" android:text="+" android:layout\_weight="1" />  
 </TableRow>  
  
 <!-- Added dot button -->  
 <TableRow>  
 <Button android:id="@+id/buttonDot" android:text="." android:layout\_weight="1" />  
 <Button android:id="@+id/button0" android:text="0" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonEqual" android:text="=" android:layout\_weight="1" />  
 <Button android:id="@+id/buttonDiv" android:text="/" android:layout\_weight="1" />  
 </TableRow>  
  
 <TableRow>  
 <Button android:id="@+id/buttonClear" android:text="CLEAR" android:layout\_span="4" />  
 </TableRow>  
 </TableLayout>  
</LinearLayout>