



Lahore Garrison University

# Calculator Application

using Java (Android Studio)

Laiba Riaz

Mobile Application Development

Sir. Wahid Qayyum



Paper Due Date

April 29, 2024

## (CalculatorApplication\_Design)



## (CalculatorApplication/activity\_main.xml)

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
<!-- solution textView-->
<TextView
    android:id="@+id/solution_textView"
```

```

    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:textSize="40sp"
    android:textAlignment="textEnd"
    android:layout_above="@id/result_textView"
    android:layout_margin="15dp"
    android:textColor="@color/black"/>
<!-- Result textview-->
<TextView
    android:id="@+id/result_textView"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="0"
    android:textSize="60sp"
    android:textAlignment="textEnd"
    android:layout_above="@id/buttons_layout"
    android:layout_margin="15dp"
    android:textColor="@color/black"/>
<!-- Buttons layout-->
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    android:layout_alignParentBottom="true"
    android:layout_gravity="center"
    android:background="@color/material_dynamic_neutral90"
    android:id="@+id/buttons_layout">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:orientation="horizontal">
        <com.google.android.material.button.MaterialButton
            android:id="@+id/button_c"
            android:layout_width="70dp"
            android:layout_height="70dp"
            app:cornerRadius="40dp"
            style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
            android:text="C"
            android:textSize="30sp"
            android:textColor="@color/white"
            android:layout_margin="10dp"
            android:backgroundTint="@color/material_dynamic_neutral60"/>
        <com.google.android.material.button.MaterialButton
            android:id="@+id/button_OpenBracket"
            android:layout_width="70dp"
            android:layout_height="70dp"
            app:cornerRadius="40dp"
            style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"

```

```

        android:text="("
        android:textSize="30sp"
        android:textColor="@color/white"
        android:layout_margin="10dp"
        android:backgroundTint="@color/material_dynamic_neutral40" />
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_CloseBracket"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text=")"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_neutral40"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_divide"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="/"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_primary40"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="horizontal">
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_7"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="7"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_neutral0"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_8"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"

```

```

        style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
        android:text="8"
        android:textSize="30sp"
        android:textColor="@color/white"
        android:layout_margin="10dp"
        android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_9"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="9"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_multiply"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="*"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_primary40"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="horizontal">
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_4"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="4"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_5"
    android:layout_width="70dp"
    android:layout_height="70dp"

```

```

        app:cornerRadius="40dp"
        style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
        android:text="5"
        android:textSize="30sp"
        android:textColor="@color/white"
        android:layout_margin="10dp"
        android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_6"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="6"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_add"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="+"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_primary40" />
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="horizontal">
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_1"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="1"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_2"
    android:layout_width="70dp"

```

```

        android:layout_height="70dp"
        app:cornerRadius="40dp"
        style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
        android:text="2"
        android:textSize="30sp"
        android:textColor="@color/white"
        android:layout_margin="10dp"
        android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_3"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="3"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black" />
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_subtract"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="-"
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_primary40"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="center"
    android:orientation="horizontal">
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_AC"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="AC"
    android:textSize="19sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/material_dynamic_neutral60"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_0"

```

```

        android:layout_width="70dp"
        android:layout_height="70dp"
        app:cornerRadius="40dp"
        style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
        android:text="0"
        android:textSize="30sp"
        android:textColor="@color/white"
        android:layout_margin="10dp"
        android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_point"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="40dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="."
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@color/black"/>
<com.google.android.material.button.MaterialButton
    android:id="@+id/button_equal"
    android:layout_width="70dp"
    android:layout_height="70dp"
    app:cornerRadius="20dp"
    style="@style/Widget.MaterialComponents.ExtendedFloatingActionButton"
    android:text="="
    android:textSize="30sp"
    android:textColor="@color/white"
    android:layout_margin="10dp"
    android:backgroundTint="@android:color/holo_orange_dark"/>
</LinearLayout>
</LinearLayout>
</RelativeLayout>

```

## (CalculatorApplication/MainActivity.java)

```

package com.example.calculatorapplication;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
import com.google.android.material.button.MaterialButton;
import org.mozilla.javascript.Context; // imported rom build.gradle to calculate result
import org.mozilla.javascript.Scriptable; // imported rom build.gradle to calculate result
public class MainActivity extends AppCompatActivity implements View.OnClickListener{
    // variable creation

```



```

TextView Result_Textview,Solution_Textview;
MaterialButton ButtonAC,ButtonPoint,ButtonC,ButtonOpenBracket,ButtonCloseBracket;
MaterialButton ButtonDivide, ButtonMultiply, ButtonAdd, ButtonSubtract, ButtonEqual;
MaterialButton Button0,Button1,Button2,Button3,Button4,Button5,Button6,Button7, Button8, Button9;
// to assign id to textview and buttons from xml
@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    Result_Textview= findViewById(R.id.result_textView);
    Solution_Textview= findViewById(R.id.solution_textView);
    // getting button id by calling function
    getId(ButtonC,R.id.button_c);
    getId(ButtonAC,R.id.button_AC);
    getId(ButtonPoint,R.id.button_point);
    getId(ButtonOpenBracket,R.id.button_OpenBracket);
    getId(ButtonCloseBracket,R.id.button_CloseBracket);
    getId(ButtonDivide,R.id.button_divide);
    getId(ButtonMultiply,R.id.button_multiply);
    getId(ButtonAdd,R.id.button_add);
    getId(ButtonSubtract,R.id.button_subtract);
    getId(ButtonEqual,R.id.button_equal);
    getId(Button0,R.id.button_0);
    getId(Button1,R.id.button_1);
    getId(Button2,R.id.button_2);
    getId(Button3,R.id.button_3);
    getId(Button4,R.id.button_4);
    getId(Button5,R.id.button_5);
    getId(Button6,R.id.button_6);
    getId(Button7,R.id.button_7);
    getId(Button8,R.id.button_8);
    getId(Button9,R.id.button_9);
}
// function to get buttons id
void getId(MaterialButton btn,int id)
{
    btn=findViewById(id);
    btn.setOnClickListener(this); }
@Override
public void onClick(View view){
    MaterialButton button= (MaterialButton) view;
    String ButtonText= button.getText().toString();
    String dataToCalculate= Solution_Textview.getText().toString();
    // AC,=, and C features
    if(ButtonText.equals("AC")){
        Solution_Textview.setText("");
        Result_Textview.setText("0");
        return; }
    if(ButtonText.equals("=")){
        Solution_Textview.setText(Result_Textview.getText());
        return; }
    if(ButtonText.equals("C")){
        dataToCalculate=dataToCalculate.substring(0,dataToCalculate.length()-1);
    }
}

```

```

}else{
    dataToCalculate= dataToCalculate+ButtonText; }
// Showing result in Soutlion textview
Solution_Textview.setText(dataToCalculate);
String finalResult = CalculatedResult(dataToCalculate);
if(!finalResult.equals("ERROR")){
    Result_Textview.setText(finalResult);
}
}
// calculated results by library added in build.gradle
String CalculatedResult(String data){
    try {
        Context context=Context.enter();
        context.setOptimizationLevel(-1);
        Scriptable scriptable = context.initStandardObjects();
        String finalResult= context.evaluateString(scriptable,data,
            "javascript", 1,null).toString();
        // removing unrequired .0 from calculated results
        if(finalResult.endsWith(".0")){
            finalResult= finalResult.replace(".0",""); }
        return finalResult;
    }catch (Exception e){
        return "ERROR"; } } }

```

### (CalculatorApplication/AndroidManifest.xml)

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportRtl="true"
        android:theme="@style/Theme.CalculatorApplication"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity"
            android:exported="true">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>
</manifest>

```