

1. build.gradle (:app)

```
plugins {  
    id 'com.android.application'  
    id 'kotlin-android'  
}  
  
android {  
    compileSdkVersion 30  
  
    defaultConfig {  
        applicationId "com.example.firstcalculator"  
        minSdkVersion 19  
        targetSdkVersion 30  
        versionCode 1  
        versionName "1.0"  
  
        testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"  
    }  
  
    buildTypes {  
        release {  
            minifyEnabled false  
            proguardFiles getDefaultProguardFile('proguard-android-optimize.txt'), 'proguard-rules.pro'  
        }  
    }  
    compileOptions {  
        sourceCompatibility JavaVersion.VERSION_1_8  
        targetCompatibility JavaVersion.VERSION_1_8  
    }  
    kotlinOptions {  
        jvmTarget = '1.8'  
    }  
}  
  
dependencies {  
  
    implementation "org.jetbrains.kotlin:kotlin-stdlib:$kotlin_version"  
    implementation 'androidx.core:core-ktx:1.3.1'  
    implementation 'androidx.appcompat:appcompat:1.2.0'  
    implementation 'com.google.android.material:material:1.2.1'  
    implementation 'androidx.constraintlayout:constraintlayout:2.0.1'  
    implementation 'net.objecthunter:exp4j:0.4.8'  
    testImplementation 'junit:junit:4.+'  
    androidTestImplementation 'androidx.test.ext:junit:1.1.2'  
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.3.0'  
}
```

2. button.xml

```
<?xml version="1.0" encoding="utf-8"?>
<selector xmlns:android="http://schemas.android.com/apk/res/android">
  <item android:state_pressed="true">
    <shape>
      <gradient android:angle="90" android:endColor="#FFFFFF"
android:startColor="#9EB8FF" android:type="linear"/>
      <padding android:bottom="0dp" android:left="0dp" android:right="0dp" android:top="0dp"/>
      <size android:width="60dp" android:height="60dp"/>
      <stroke android:width="1dp" android:color="#ff3da6ef"/>
    </shape>
  </item>
  <item>
    <shape>
      <gradient android:angle="90" android:endColor="#FFFFFF"
android:startColor="#ffd9d9d9" android:type="linear"/>
      <padding android:bottom="0dp" android:left="0dp" android:right="0dp" android:top="0dp"/>
      <size android:width="60dp" android:height="60dp"/>
      <stroke android:width="0.5dp" android:color="#ffcecece"/>
    </shape>
  </item>
</selector>
```

3. MainActivity.kt

```
package com.example.firstcalculator

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle
import android.view.View
import android.widget.Button
import android.widget.TextView
import net.objecthunter.exp4j.ExpressionBuilder

class MainActivity : AppCompatActivity() {

    // TextView used to display the input and output
    lateinit var txtInput: TextView

    // Represent whether the lastly pressed key is numeric or not
    var lastNumeric: Boolean = false

    // Represent that current state is in error or not
    var stateError: Boolean = false

    // If true, do not allow to add another DOT
    var lastDot: Boolean = false

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
        txtInput = findViewById(R.id.txtInput)
    }

    /**
     * Append the Button.text to the TextView
     */
    fun onDigit(view: View) {
        if (stateError) {
            // If current state is Error, replace the error message
            txtInput.text = (view as Button).text
            stateError = false
        } else {
            // If not, already there is a valid expression so append to it
            txtInput.append((view as Button).text)
        }
        // Set the flag
        lastNumeric = true
    }
}
```

```

/**
 * Append . to the TextView
 */
fun onDecimalPoint(view: View) {
    if (lastNumeric && !stateError && !lastDot) {
        txtInput.append(".")
        lastNumeric = false
        lastDot = true
    }
}

/**
 * Append +,-,*,/ operators to the TextView
 */
fun onOperator(view: View) {
    if (lastNumeric && !stateError) {
        txtInput.append((view as Button).text)
        lastNumeric = false
        lastDot = false // Reset the DOT flag
    }
}

/**
 * Clear the TextView
 */
fun onClear(view: View) {
    this.txtInput.text = ""
    lastNumeric = false
    stateError = false
    lastDot = false
}

/**
 * Calculate the output using Exp4j
 */
fun onEqual(view: View) {
    // If the current state is error, nothing to do.
    // If the last input is a number only, solution can be found.
    if (lastNumeric && !stateError) {
        // Read the expression
        val txt = txtInput.text.toString()
        // Create an Expression (A class from exp4j library)
        val expression = ExpressionBuilder(txt).build()
        try {
            // Calculate the result and display
            val result = expression.evaluate()
            txtInput.text = result.toString()
            lastDot = true // Result contains a dot
        } catch (ex: ArithmeticException) {
            // Display an error message
            txtInput.text = "Error"
            stateError = true
            lastNumeric = false
        }
    }
}
}

```

4. activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/
    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:paddingTop="8dp"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:textSize="48sp"
        android:background="#efefef"
        android:id="@+id/txtInput"
        android:gravity="right|center_vertical"
        android:maxLength="12"
        android:layout_marginLeft="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        app:layout_constraintTop_toTopOf="parent"
        android:layout_marginRight="8dp"/>

    <TableLayout
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_marginTop="8dp"
        app:layout_goneMarginTop="8dp"
        android:layout_marginLeft="8dp"
        android:layout_marginBottom="8dp"
        android:layout_marginRight="8dp"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/txtInput"
        android:gravity="fill">

        <TableRow
            android:layout_width="match_parent"
            android:layout_height="0dp"
            android:layout_weight="1"
            android:gravity="center">

            <Button
                android:text="7"
                android:background="@drawable/button"
                android:layout_width="0dp"
                android:layout_weight="1"
                android:layout_height="match_parent"
                android:onClick="onDigit"
                android:id="@+id/btnSeven"/>
```

```
<Button
    android:text="8"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnEight"/>
```

```
<Button
    android:text="9"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnNine"/>
```

```
<Button
    android:text="/"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onOperator"
    android:id="@+id/btnDivide"/>
```

```
</TableRow>
```

```
<TableRow
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1"
    android:gravity="center">
```

```
<Button
    android:text="4"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnFour"/>
```

```
<Button
    android:text="5"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnFive"/>
```

```
<Button
    android:text="6"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnSix"/>
```

```
<Button
    android:text="*"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onOperator"
    android:id="@+id/btnMultiply"/>
</TableRow>
```

```
<TableRow
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1"
    android:gravity="center">
```

```
<Button
    android:text="1"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnOne"/>
```

```
<Button
    android:text="2"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnTwo"/>
```

```
<Button
    android:text="3"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onDigit"
    android:id="@+id/btnThree"/>
```

```
<Button
    android:text="-"
    android:background="@drawable/button"
    android:layout_width="0dp"
    android:layout_weight="1"
    android:layout_height="match_parent"
    android:onClick="onOperator"
    android:id="@+id/btnSubtract"/>
</TableRow>
```

```

<TableRow
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1"
    android:gravity="center">

    <Button
        android:text="."
        android:background="@drawable/button"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="match_parent"
        android:onClick="onDecimalPoint"
        android:id="@+id/btnDecimal"/>

    <Button
        android:text="0"
        android:background="@drawable/button"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="match_parent"
        android:onClick="onDigit"
        android:id="@+id/btnZero"/>

    <Button
        android:text="CLR"
        android:background="@drawable/button"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="match_parent"
        android:onClick="onClear"
        android:id="@+id/btnClear"/>

    <Button
        android:text="+"
        android:background="@drawable/button"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="match_parent"
        android:onClick="onOperator"
        android:id="@+id/btnAdd"/>
</TableRow>

<TableRow
    android:layout_width="match_parent"
    android:layout_height="0dp"
    android:layout_weight="1">

    <Button
        android:text="="
        android:background="@drawable/button"
        android:layout_width="0dp"
        android:layout_weight="1"
        android:layout_height="match_parent"
        android:onClick="onEqual"
        android:id="@+id/btnEqual"/>
</TableRow>
</TableLayout>
</androidx.constraintlayout.widget.ConstraintLayout>

```


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