```
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"</pre>
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"</pre>
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>
```

```
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
  }
}
```

}

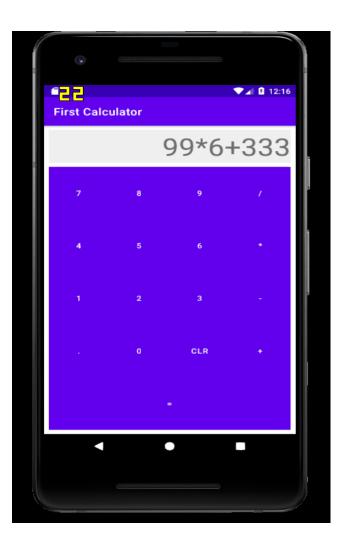
## 4. activity\_main.xml

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