**PART – A**

**Experiment-No:2**

Develop an Android application using controls like Button,TextView,EditText for designing a calculator having basic functionality like Addition,Substraction,Multiplication,and Division

**Components Used:**

* Text View: To display Numbers and Result.
* Buttons: To interact with User for Arithmetic operations.
* Linear Layout: To hold Buttons in correct orientation.

**XML Code:**

<?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:layout\_marginLeft="0dp"  
 android:layout\_marginRight="0dp"  
 android:background="@color/black"  
 tools:context=".MainActivity">  
  
 <TextView  
 android:id="@+id/res"  
 android:layout\_width="408dp"  
 android:layout\_height="73dp"  
 android:layout\_marginTop="56dp"  
 android:textAlignment="viewEnd"  
 android:textColor="#ffffff"  
 android:textSize="50sp"  
 app:layout\_constraintBottom\_toTopOf="@+id/linearLayout"  
 app:layout\_constraintEnd\_toEndOf="parent"  
 app:layout\_constraintHorizontal\_bias="1.0"  
 app:layout\_constraintStart\_toStartOf="parent"  
 app:layout\_constraintTop\_toTopOf="parent" />  
  
 <LinearLayout  
 android:id="@+id/linearLayout"  
 android:layout\_width="match\_parent"  
 android:layout\_height="80dp"  
 app:layout\_constraintBottom\_toTopOf="@+id/linearLayout2"  
 app:layout\_constraintTop\_toBottomOf="@+id/res"  
 tools:layout\_editor\_absoluteX="0dp">  
  
 <Button  
 android:id="@+id/clr"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="C"  
 android:textSize="30sp"  
 app:backgroundTint="#C0C0C0" />  
  
 <Button  
 android:id="@+id/not"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="~"  
 android:textSize="30sp"  
 app:backgroundTint="#C0C0C0" />  
  
 <Button  
 android:id="@+id/mod"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="%"  
 android:textSize="30sp"  
 app:backgroundTint="#C0C0C0" />  
  
 <Button  
 android:id="@+id/divide"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="÷"  
 android:textSize="30sp"  
 app:backgroundTint="#FFD700" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:id="@+id/linearLayout2"  
 android:layout\_width="match\_parent"  
 android:layout\_height="80dp"  
 app:layout\_constraintBottom\_toTopOf="@+id/linearLayout3"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout"  
 tools:layout\_editor\_absoluteX="1dp">  
  
 <Button  
 android:id="@+id/seven"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="7"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/eight"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="8"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/nine"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="9"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/mult"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="X"  
 android:textSize="30sp"  
 app:backgroundTint="#FFD700" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:id="@+id/linearLayout3"  
 android:layout\_width="match\_parent"  
 android:layout\_height="80dp"  
 android:orientation="horizontal"  
 app:layout\_constraintBottom\_toTopOf="@+id/linearLayout4"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout2"  
 tools:layout\_editor\_absoluteX="1dp">  
  
 <Button  
 android:id="@+id/four"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="4"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/five"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="5"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/six"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="6"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/min"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="-"  
 android:textSize="30sp"  
 app:backgroundTint="#FFD700" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:id="@+id/linearLayout4"  
 android:layout\_width="match\_parent"  
 android:layout\_height="80dp"  
 android:orientation="horizontal"  
 app:layout\_constraintBottom\_toTopOf="@+id/linearLayout6"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout3"  
 tools:layout\_editor\_absoluteX="-34dp">  
  
 <Button  
 android:id="@+id/one"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="1"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/two"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="2"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/three"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="3"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/plus"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="+"  
 android:textSize="30sp"  
 app:backgroundTint="#FFD700" />  
 </LinearLayout>  
  
 <LinearLayout  
 android:id="@+id/linearLayout6"  
 android:layout\_width="match\_parent"  
 android:layout\_height="80dp"  
 android:orientation="horizontal"  
 app:layout\_constraintBottom\_toBottomOf="parent"  
 app:layout\_constraintTop\_toBottomOf="@+id/linearLayout4"  
 tools:layout\_editor\_absoluteX="1dp">  
  
 <Button  
 android:id="@+id/zero"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="0"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/dot"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="."  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/exp"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="^"  
 android:textSize="30sp"  
 app:backgroundTint="#696969" />  
  
 <Button  
 android:id="@+id/eqs"  
 android:layout\_width="wrap\_content"  
 android:layout\_height="wrap\_content"  
 android:layout\_marginLeft="10dp"  
 android:layout\_marginRight="10dp"  
 android:layout\_weight="1"  
 android:background="@drawable/rounded\_button"  
 android:text="="  
 android:textSize="30sp"  
 app:backgroundTint="#FFD700" />  
 </LinearLayout>  
  
</androidx.constraintlayout.widget.ConstraintLayout>

**Java Code:**

*package* com.keshavrkaranth.caluclator;  
  
*import* android.os.Bundle;  
*import* android.view.View;  
*import* android.widget.Button;  
*import* android.widget.TextView;  
  
  
  
*import* androidx.appcompat.app.AppCompatActivity;  
  
  
*public class* MainActivity *extends* AppCompatActivity {  
 Button b0,b1,b2,b3,b4,b5,b6,b7,b8,b9,dot;  
 Button B\_add, B\_subtract, B\_multiply, B\_divide, B\_exp, B\_not, B\_mod, B\_clear, B\_eqs;  
 *double* num1=0,num2=0,res=0;  
 TextView txt;  
 *boolean* add,sub,mul,div,exp,mod;  
  
 *@Override  
 protected void* onCreate(Bundle savedInstanceState) {  
 *super*.onCreate(savedInstanceState);  
 setContentView(R.layout.activity\_main);  
 b0=(Button) findViewById(R.id.zero);  
 b1=(Button) findViewById(R.id.one);  
 b2=(Button) findViewById(R.id.two);  
 b3=(Button) findViewById(R.id.three);  
 b4=(Button) findViewById(R.id.four);  
 b5=(Button) findViewById(R.id.five);  
 b6=(Button) findViewById(R.id.six);  
 b7=(Button) findViewById(R.id.seven);  
 b8=(Button) findViewById(R.id.eight);  
 b9=(Button) findViewById(R.id.nine);  
 B\_clear =(Button) findViewById(R.id.clr);  
 dot = (Button) findViewById(R.id.dot);  
 txt = findViewById(R.id.res);  
 B\_add = findViewById(R.id.plus);  
 B\_subtract = findViewById(R.id.min);  
 B\_multiply = findViewById(R.id.mult);  
 B\_divide = findViewById(R.id.divide);  
 B\_mod = findViewById(R.id.mod);  
 B\_exp = findViewById(R.id.exp);  
 B\_not = findViewById(R.id.not);  
 B\_eqs = findViewById(R.id.eqs);  
  
 add = *false*;  
 sub = *false* ;  
 mul = *false*;  
 div = *false*;  
 exp = *false*;  
 mod = *false*;  
 b0.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"0");  
 }  
 });  
 b1.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"1");  
 }  
 });  
 b2.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"2");  
 }  
 });  
 b3.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"3");  
 }  
 });  
 b4.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"4");  
 }  
 });  
 b5.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"5");  
 }  
 });  
 b6.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"6");  
 }  
 });  
 b7.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"7");  
 }  
 });  
 b8.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"8");  
 }  
 });  
 b9.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString()+"9");  
 }  
 });  
 B\_clear.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText("");  
 }  
 });  
 dot.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 txt.setText(txt.getText().toString() + ".");  
  
 }  
 });  
 B\_not.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 Double num = Double.parseDouble(txt.getText().toString())\*-1;  
 txt.setText(num.toString());  
 }  
 });  
 B\_add.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 add=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
 }  
 }  
 });  
 B\_subtract.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 sub=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
 }  
 }  
 });  
 B\_multiply.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 mul=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
  
 }  
 }  
 });  
 B\_divide.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 div=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
 }  
 }  
 });  
 B\_mod.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 mod=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
  
 }  
 }  
 });  
 B\_exp.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }*else* {  
 exp=*true*;  
 num1 = Double.parseDouble(txt.getText().toString());  
 txt.setText("");  
  
 }  
 }  
 });  
  
  
 B\_eqs.setOnClickListener(*new* View.OnClickListener() {  
 *@Override  
 public void* onClick(View view) {  
  
 *if*(txt.getText().toString()==""){  
 txt.setText("");  
 }  
 *else* {  
 num2 = Double.parseDouble(txt.getText().toString());  
 System.out.println(num2);  
 *if*(add==*true*){  
 res = num1+num2;  
 txt.setText(Double.toString(res));  
 add=*false*;  
 }*else if*(sub==*true*){  
 res = num1-num2;  
 txt.setText(Double.toString(res));  
 sub=*false*;  
 }*else if*(mul==*true*){  
 System.out.println("mul");  
 res = num1\*num2;  
 txt.setText(Double.toString(res));  
 mul=*false*;  
 }*else if*(div==*true*){  
 *if*(num2==0){  
 txt.setText("Error");  
 }  
 *else* {  
 res = num1/num2;  
 txt.setText(Double.toString(res));  
 div=*false*;  
 }  
  
 }*else if*(mod==*true*){  
 *if*(num2==0){  
 txt.setText("Error");  
 }  
 *else* {  
 res = num1%num2;  
 txt.setText(Double.toString(res));  
 mod=*false*;  
 }  
 }*else if*(exp==*true*){  
 *if*(num2==0){  
 txt.setText("Error");  
 }  
 *else* {  
 res = Math.pow(num1,num2);  
 txt.setText(Double.toString(res));  
 exp=*false*;  
 }  
  
 }  
 }  
 }  
 });  
  
  
  
  
 }  
}

**Sample Output:**

