

## 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:**