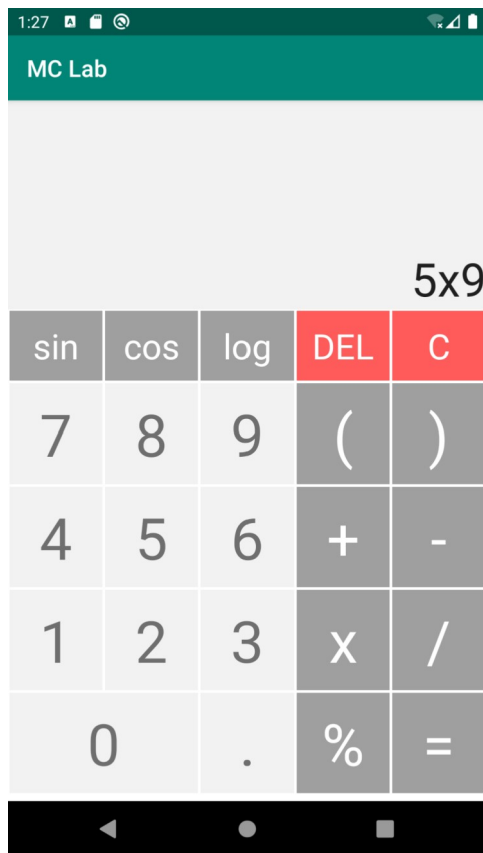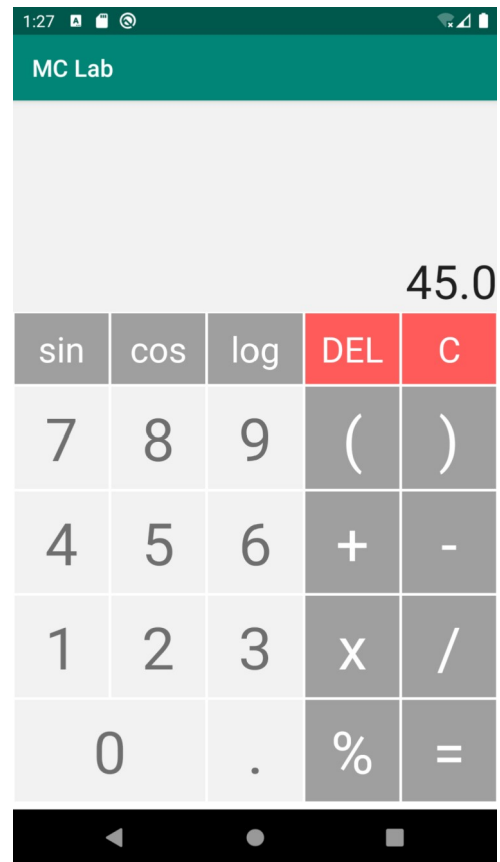# Ex3 Calculator Application

Question:

Create a simple calculator application
a. Use Grid Layout
b. Display all Digits, Decimal Point, Basic 5 operations (+, -, *, /, %) , =, Del
c. +, -, *, /, % (on press, perform the corresponding operations)
d. = (On press, display the answer).
e. Del (On press Del, Delete a character)
f. Also provision for basic trigonometric, logarithmic operations

Input:

Output:

//ex3.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#ffffff"
    tools:context="cocomo.lab.ex3_main">

    <EditText
        android:id="@+id/et_input"
        android:layout_width="match_parent"
        android:layout_height="180dp"
        android:background="#F3F2F2"
        android:textSize="40dp"
        android:gravity="right|bottom"/>

    <GridLayout
        android:layout_below="@+id/et_input"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:columnCount="5"
        android:rowCount="5"
        android:orientation="vertical">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:orientation="horizontal">

            <TextView
                android:id="@+id/tv_sin"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_margin="1dp"
                android:background="#60000000"
                android:textColor="#ffffff"
                android:text="sin"
                android:layout_gravity="center"
                android:gravity="center"
                android:textSize="30dp"
                android:padding="10dp"
                android:layout_weight="1"/>
            <TextView
                android:id="@+id/tv_cos"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_margin="1dp"
                android:background="#60000000"
                android:textColor="#ffffff"
```

```xml
        android:text="cos"
        android:layout_gravity="center"
        android:gravity="center"
        android:textSize="30dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_log"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#60000000"
        android:textColor="#ffffff"
        android:text="log"
        android:layout_gravity="center"
        android:gravity="center"
        android:textSize="30dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_del"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="#A4FF0000"
        android:textColor="#ffffff"
        android:layout_margin="1dp"
        android:text="DEL"
        android:layout_gravity="center"
        android:gravity="center"
        android:textSize="30dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_c"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:background="#A4FF0000"
        android:textColor="#ffffff"
        android:layout_margin="1dp"
        android:text="C"
        android:gravity="center"
        android:textSize="30dp"
        android:padding="10dp"
        android:layout_weight="1"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">

    <TextView
        android:id="@+id/tv_7"
```

```xml
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="1dp"
    android:background="#F3F2F2"
    android:text="7"
    android:gravity="center"
    android:textSize="50dp"
    android:padding="10dp"
    android:layout_weight="1"/>
<TextView
    android:id="@+id/tv_8"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="1dp"
    android:background="#F3F2F2"
    android:text="8"
    android:gravity="center"
    android:textSize="50dp"
    android:padding="10dp"
    android:layout_weight="1"/>
<TextView
    android:id="@+id/tv_9"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="1dp"
    android:background="#F3F2F2"
    android:text="9"
    android:gravity="center"
    android:textSize="50dp"
    android:padding="10dp"
    android:layout_weight="1"/>
<TextView
    android:id="@+id/tv_open"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="1dp"
    android:background="#60000000"
    android:textColor="#ffffff"
    android:text="("
    android:gravity="center"
    android:textSize="50dp"
    android:padding="10dp"
    android:layout_weight="1"/>
<TextView
    android:id="@+id/tv_close"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="1dp"
    android:background="#60000000"
    android:textColor="#ffffff"
    android:text=")"
    android:gravity="center"
```

```
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal">

    <TextView
        android:id="@+id/tv_4"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#F3F2F2"
        android:text="4"
        android:gravity="center"
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_5"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#F3F2F2"
        android:text="5"
        android:gravity="center"
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_6"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#F3F2F2"
        android:text="6"
        android:gravity="center"
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_plus"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#60000000"
        android:textColor="#ffffff"
        android:text="+"
        android:gravity="center"
        android:textSize="50dp"
```

```xml
            android:padding="10dp"
            android:layout_weight="1"/>
        <TextView
            android:id="@+id/tv_minus"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#60000000"
            android:textColor="#ffffff"
            android:text="-"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="1"/>
    </LinearLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <TextView
            android:id="@+id/tv_1"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#F3F2F2"
            android:text="1"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="1"/>
        <TextView
            android:id="@+id/tv_2"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#F3F2F2"
            android:text="2"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="1"/>
        <TextView
            android:id="@+id/tv_3"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#F3F2F2"
            android:text="3"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
```

```xml
            android:layout_weight="1"/>
        <TextView
            android:id="@+id/tv_mul"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#60000000"
            android:textColor="#ffffff"
            android:text="x"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="1"/>
        <TextView
            android:id="@+id/tv_div"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#60000000"
            android:textColor="#ffffff"
            android:text="/"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="1"/>
    </LinearLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <TextView
            android:id="@+id/tv_0"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#F3F2F2"
            android:text="0"
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
            android:layout_weight="0.75"/>
        <TextView
            android:id="@+id/tv_dot"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="1dp"
            android:background="#F3F2F2"
            android:text="."
            android:gravity="center"
            android:textSize="50dp"
            android:padding="10dp"
```

```xml
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_percent"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#60000000"
        android:textColor="#ffffff"
        android:text="%"
        android:gravity="center"
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    <TextView
        android:id="@+id/tv_equal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="1dp"
        android:background="#60000000"
        android:textColor="#ffffff"
        android:text="="
        android:gravity="center"
        android:textSize="50dp"
        android:padding="10dp"
        android:layout_weight="1"/>
    </LinearLayout>

    </GridLayout>

</RelativeLayout>
```

//**ex3_main.java**

package cocomo.lab;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;

import java.util.ArrayList;
import java.util.Stack;

public class ex3_main extends AppCompatActivity implements View.OnClickListener{

    EditText et_input;
    Stack<String> input;
    ArrayList<String> post_input;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.ex3_main);

        et_input=findViewById(R.id.et_input);
        input=new Stack<String>();
        post_input=new ArrayList<String>();

        String
ops[]={"c","del","dot","plus","minus","mul","div","percent","open","close","equal","sin","cos","log
"};

        for(int i=0;i<10;i++){
            int id=getResources().getIdentifier("tv_"+Integer.toString(i),"id",getPackageName());
            findViewById(id).setOnClickListener(this);
        }
        for(int i=0;i<14;i++){
            int id=getResources().getIdentifier("tv_"+ops[i],"id",getPackageName());
            findViewById(id).setOnClickListener(this);
        }
    }

    @Override
    public void onClick(View v) {
        switch (v.getId()){
            case R.id.tv_c:
                et_input.setText("");
                break;
            case R.id.tv_del:
                String val=et_input.getEditableText().toString();
                et_input.setText(val.substring(0,val.length()-1));
                break;

```java
            case R.id.tv_equal:
                String ip=et_input.getEditableText().toString();
                if(!ip.startsWith("sin") && !ip.startsWith("cos") && !ip.startsWith("log")) {
                    postFix(ip);
                    calc();
                    et_input.setText(input.peek());
                }
                else
                    trig_calc(ip);
                break;
            default:
                TextView tv_num=(TextView)v;
                et_input.setText(et_input.getEditableText().toString() + tv_num.getText());
                break;
        }
        et_input.setSelection(et_input.getEditableText().length());
    }

    private void postFix(String ip){
        makeEmpty();
        post_input.clear();

        ip = ip.replaceAll("[+|-|x|/|(|)]", ",$0,");
        ip = ip.replaceAll(",,", ",");

        String sep[]=ip.split(",");
        for(int i=0;i<sep.length;i++){
            if(sep[i].equals("x") || sep[i].equals("(") || sep[i].equals("+") || sep[i].equals("-") ||
sep[i].equals("/") || sep[i].equals("%"))
                input.push(sep[i]);
            else if(sep[i].equals(")")){
                while(!input.peek().equals("("))
                    post_input.add(input.pop());
                input.pop();
            }
            else
                post_input.add(sep[i]);
        }
        while(!input.isEmpty())
            post_input.add(input.pop());
    }

    private void calc(){
        makeEmpty();

        for(String num:post_input){
            if(num.equals("x") || num.equals("+") || num.equals("-") || num.equals("/") ||
num.equals("%")){
                String va1_a=input.pop();
                String va1_b=input.pop();

                float a,b;
```

```java
            try {
                a = Integer.parseInt(va1_a);
            }
            catch (Exception e){
                a = Float.parseFloat(va1_a);
            }

            try {
                b = Integer.parseInt(va1_b);
            }
            catch (Exception e){
                b = Float.parseFloat(va1_b);
            }

            switch (num){
                case "+":
                    input.push(Float.toString(b+a));
                    break;
                case "-":
                    input.push(Float.toString(b-a));
                    break;
                case "x":
                    input.push(Float.toString(b*a));
                    break;
                case "/":
                    input.push(Float.toString(b/a));
                    break;
                case "%":
                    input.push(Float.toString(b%a));
                    break;
            }
        }
        else
            input.push(num);
    }
}
private void trig_calc(String ip){
    Double val = Double.parseDouble(ip.substring(3));
    if(ip.startsWith("sin"))
        et_input.setText(Double.toString(Math.sin(Math.toRadians(val))));
    else if(ip.startsWith("cos"))
        et_input.setText(Double.toString(Math.cos(Math.toRadians(val))));
    else if(ip.startsWith("log"))
        et_input.setText(Double.toString(Math.log(val)));
}

private void makeEmpty(){
    while (!input.isEmpty())
        input.pop();
}
```

}