This is an android application which contains two basic files XML file represents the user interface (UI) and JAVA file defines basic operations of the application (Calculator).This application performs some operations like addition, subtraction, multiplication, division, square root, logarithm and sin etc. The below code is xml code which show the graphical user interface like:

Fig: Screenshot of UI

main_activity.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:background="#fff"
    android:orientation="vertical"
    tools:context="com.example.oliullah.calculator.MainActivity">
```

Here “EditText” will take numbers as input from buttons:

```
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="30sp"
    android:id="@+id/edit1"/>
```

“TextView” will show the calculated result:

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="16dp"
    android:text="0"
    android:textSize="45sp"
    android:id="@+id/show"/>
```

These buttons represent four columns and five rows which are linearly related:

```
<LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:gravity="bottom"
    android:orientation="vertical">

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

This “Button” clears the “EditText” field:

```
<Button
        android:id="@+id/btn_delete"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="C"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
```

This “Button” performs “sin” operation:

```
<Button
        android:id="@+id/btn_sin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="sin"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
```

This “Button” performs “sqrt” operation:

```
 <Button
        android:id="@+id/btn_sqrt"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_marginRight="2dp"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="sqrt"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
```

This “Button” performs “$\log_{10}$” operation:

```
      <Button
        android:id="@+id/btn_log"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="log"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
    </LinearLayout>
```

```
<LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="3dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/btn_seven"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:background="#ddd"
            android:minHeight="80dp"
            android:text="7"
            android:textColor="#333"
            android:textSize="25sp" />

        <Button
            android:id="@+id/btn_eight"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginLeft="2dp"
            android:layout_weight="1"
            android:background="#ddd"
            android:minHeight="80dp"
            android:text="8"
            android:textColor="#333"
```

```
        android:textSize="25sp" />

    <Button
        android:id="@+id/btn_nine"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_marginRight="2dp"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="9"
        android:textColor="#333"
        android:textSize="25sp" />

    <Button
        android:id="@+id/btn_multiple"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="X"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
</LinearLayout>
```

This portion represents ‘1’,’2’,’3’,’4’,’5’,’6’,’7’,’8’,’9’,’+’,’-‘,’*’ and ‘/’:

```
<LinearLayout
   android:layout_width="match_parent"
   android:layout_height="wrap_content"
   android:layout_marginTop="2dp"
   android:orientation="horizontal">
   <Button
      android:id="@+id/btn_four"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_weight="1"
      android:background="#ddd"
      android:minHeight="80dp"
      android:text="4"
      android:textColor="#333"
      android:textSize="25sp" />
   <Button
      android:id="@+id/btn_five"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginLeft="2dp"
      android:layout_weight="1"
      android:background="#ddd"
      android:minHeight="80dp"
      android:text="5"
      android:textColor="#333"
      android:textSize="25sp" />
```

```
    <Button
        android:id="@+id/btn_six"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_marginRight="2dp"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="6"
        android:textColor="#333"
        android:textSize="25sp" />

    <Button
        android:id="@+id/btn_minus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="-"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="2dp"
    android:orientation="horizontal">

    <Button
        android:id="@+id/btn_one"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="1"
        android:textColor="#333"
        android:textSize="25sp" />

    <Button
        android:id="@+id/btn_two"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="2"
```

```
        android:textColor="#333"
        android:textSize="25sp" />
    <Button
        android:id="@+id/btn_three"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_marginRight="2dp"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="3"
        android:textColor="#333"
        android:textSize="25sp" />

    <Button
        android:id="@+id/btn_plus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ccc"
        android:minHeight="80dp"
        android:text="+"
        android:textColor="@color/colorPrimaryDark"
        android:textSize="30sp"
        android:textStyle="bold" />
</LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="2dp"
    android:orientation="horizontal">

    <Button
        android:id="@+id/btn_dot"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="."
        android:textColor="#333"
        android:textSize="25sp" />
    <Button
        android:id="@+id/btn_zero"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="2dp"
        android:layout_weight="1"
        android:background="#ddd"
        android:minHeight="80dp"
        android:text="0"
        android:textColor="#333"
        android:textSize="25sp" />
```

```
        <Button
            android:id="@+id/btn_divide"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:background="#ddd"
            android:minHeight="80dp"
            android:text="/"
            android:textColor="#333"
            android:textSize="25sp" />
```

This “Button” shows the arithmetic operation’s result:

```
        <Button
            android:id="@+id/btn_equal"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:background="#666"
            android:minHeight="80dp"
            android:text="="
            android:textColor="#fff"
            android:textSize="30sp"
            android:textStyle="bold" />
    </LinearLayout>
  </LinearLayout>
</LinearLayout>
```

MainActivity.java

Our calculator has two values, mvOne and mvTwo. These values hold the numbers to be operated on. Both values are of type double, so they can hold numbers with and without decimals.

```
package com.example.oliullah.calculator;


import android.support.v7.app.AppCompatActivity;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;
```

Creating different objects and declaring variables:

```
public class MainActivity extends AppCompatActivity {

Button b1,b2,b3,b4,b5,b6,b7,b8,b9,b10,b11,b12,b13,b14,b15,b16,b17,b18,b19,b20;
   EditText input;
   TextView result;
   float mvOne, mvTwo;
   boolean Addition,Subtract,Mul,Div,Log,Sin;
   String l;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      b1=(Button) findViewById(R.id.btn_delete);
      b2=(Button) findViewById(R.id.btn_sin);
      b3=(Button) findViewById(R.id.btn_sqrt);
      b4=(Button) findViewById(R.id.btn_log);
```

```
b5=(Button) findViewById(R.id.btn_seven);
b6=(Button) findViewById(R.id.btn_eight);
b7=(Button) findViewById(R.id.btn_nine);
b8=(Button) findViewById(R.id.btn_multiple);
b9=(Button) findViewById(R.id.btn_four);
b10=(Button) findViewById(R.id.btn_five);
b11=(Button) findViewById(R.id.btn_six);
b12=(Button) findViewById(R.id.btn_minus);
b13=(Button) findViewById(R.id.btn_one);
b14=(Button) findViewById(R.id.btn_two);
b15=(Button) findViewById(R.id.btn_three);
b16=(Button) findViewById(R.id.btn_plus);
b17=(Button) findViewById(R.id.btn_dot);
b18=(Button) findViewById(R.id.btn_zero);
b19=(Button) findViewById(R.id.btn_divide);
b20=(Button) findViewById(R.id.btn_equal);
input=(EditText) findViewById(R.id.edit1);
result=(TextView) findViewById(R.id.show);
```

Whenever the user clicks a number (or dot), we simply want to add that number to the editText. The code sample below shows how we accomplish this for number one (1).

```
b13.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"1");
   }
});

b14.setOnClickListener(new View.OnClickListener(){
```

```
    @Override
    public void onClick(View v){
        input.setText(input.getText()+"2");
    }
});

b15.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        input.setText(input.getText()+"3");
    }
});

b9.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        input.setText(input.getText()+"4");
    }
});

b10.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        input.setText(input.getText()+"5");
    }
});
```

```
b11.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"6");
   }
});

b5.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"7");
   }
});

b6.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"8");
   }
});

b7.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"9");
   }
});
```

```
b18.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      input.setText(input.getText()+"0");
   }
});
```

The below portion of the code check whether mvOne null or number. If the mvOne is number then corresponding operation is set as true:

```
b16.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      if (input==null){
         input.setText("");
      }
      else{
         mvOne=Float.parseFloat(input.getText()+"");
         Addition=true;
         input.setText(null);
      }
   }
});

b12.setOnClickListener(new View.OnClickListener(){
   @Override
   public void onClick(View v){
      mvOne=Float.parseFloat(input.getText()+"");
```

```
        Subtract=true;
      input.setText(null);
    }
});

b8.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        mvOne=Float.parseFloat(input.getText()+"");
        Mul=true;
        input.setText(null);
    }
});

b19.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        mvOne=Float.parseFloat(input.getText()+"");
        Div=true;
        input.setText(null);
    }
});

b4.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        Log=true;
```

```
        l=input.getText()+"";
        input.setText(l);
    }
});
b2.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        Sin=true;
        l=input.getText()+"";
        input.setText(l);
    }
});
```

This portion performs square root operation on mvOne:

```
b3.setOnClickListener(new View.OnClickListener(){
    @Override
    public  void onClick(View v){
        mvOne=Float.parseFloat(input.getText()+"");
        result.setText(mvOne*mvOne+"");
    }
});
```

This portion performs arithmetic operations on mvOne and mvTwo:

```
b20.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View v){
        mvTwo=Float.parseFloat(input.getText()+"");
```

Addition operation on two numbers:

```
if(Addition==true){
   result.setText(mvOne+mvTwo+"");
   Addition=false;
}
```

Subtraction operation on two numbers:

```
if(Subtract==true){
   result.setText(mvOne-mvTwo+"");
   Subtract=false;
}
```

Multiplication operation on two numbers:

```
if(Mul==true){
   result.setText(mvOne*mvTwo+"");
   Mul=false;
}
```

Division operation on two numbers:

```
if(Div==true){
   result.setText(mvOne/mvTwo+"");
   Div=false;
}
```

Logarithm (10 based**) operation on two numbers:**

```
if(Log==true){
   result.setText(Math.log10(mvTwo)+"");
   Log=false;
}
```

“SIN” operation on a number:

```
if(Sin==true){
                result.setText(Math.sin(mvTwo)+"");
                Sin=false;
            }
        }
    });
```

This portion clears the input and result area of the application:

```
    b1.setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View v){
            input.setText(null);
            result.setText(null);
        }
    });


    b17.setOnClickListener(new View.OnClickListener(){
        @Override
        public void onClick(View v){
            input.setText(input.getText()+".");
        }
    });
  }
}
```

Now if we run the application to perform addition on two numbers then the app show the result like this: