SCMS SCHOOL OF ENGINEERING & TECHNOLOGY

VIDHYA NAGAR, KARUKUTTY, ERNAKULAM – 683582
(AN ISO 9001:2000 CERTIFIED INSTITUTION)

.....

LABORATORY RECORD

Name:..... Roll No. .....

Semester & Branch:..... Year: .....

University Examination Reg.No.....of year.....Month.....

Certified that this is a bonafide record of work done by Mr/Ms. .....

In the. .....laboratory of SCMS SCHOOL OF ENGINEERING AND TECHNOLOGY.

Place : Karukutty
Date: .....

Faculty in charge

Internal Examiner

External Examiner

INDEX

PROGRAM 1 (CO1)

AIM: Design a login Form with username and password using Linear Layout and toast valid credentials.

XML

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:context=".MainActivity">


    <EditText
        android:id="@+id/username"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="Username" />

    <EditText
        android:id="@+id/password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:hint="password" />

    <Button
        android:id="@+id/login"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Click" />
    </LinearLayout>
```

Java

```
package com.example.myapplication1;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
    EditText username;
    EditText password;
    Button b;
    String name="admin";
    String ps="1234";

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        username=findViewById(R.id.username);
        password=findViewById(R.id.password);
        b=findViewById(R.id.logig);
        b.setOnClickListener((new View.OnClickListener() {

            @Override

            public void onClick(View v) {
                String inname = username.getText().toString();
                String inpass = password.getText().toString();
                if(inname.isEmpty() || inpass.isEmpty())
                {
                  Toast.makeText(MainActivity.this, "fields are empty",
Toast.LENGTH_SHORT).show();
                }
                else
                {
 if(inname.equals(name) && inpass.equals(ps))
{
Toast.makeText(MainActivity.this,"success",Toast.LENGTH_SHORT).show();

                    }
                 else
                {

                        Toast.makeText(MainActivity.this,"login
failed",Toast.LENGTH_SHORT).show();
}
}
}

        }));

    }

}
```

OUTPUT

Result: Program to design login Form with username and password using Linear Layout and toast valid credentials is successfully executed and output verified

PROGRAM 2 (CO1)

AIM: Write a program that demonstrates Activity Lifecycle

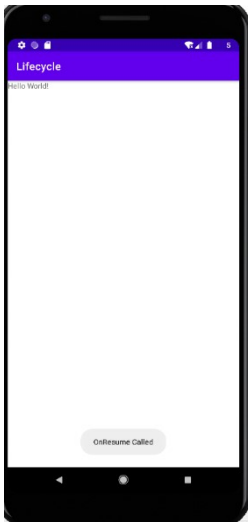
XML

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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:orientation="vertical"
    tools:layout_editor_absoluteX="1dp"
    tools:layout_editor_absoluteY="1dp"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</LinearLayout>
```

JAVA

```
package com.example.lifecycle;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast.makeText(MainActivity.this,"OnCreate
Called",Toast.LENGTH_LONG).show();
    }
    @Override
    protected void onStart(){
        super.onStart();
        Toast.makeText(MainActivity.this,"OnStart
Called",Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onRestart(){
        super.onRestart();
        Toast.makeText(MainActivity.this,"OnRestart
Called",Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onResume(){
        super.onResume();
        Toast.makeText(MainActivity.this,"OnResume
Called",Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onPause(){
        super.onPause();
        Toast.makeText(MainActivity.this,"OnPause
Called",Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onStop(){
        super.onStop();
        Toast.makeText(MainActivity.this,"OnStop
Called",Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onDestroy(){
        super.onDestroy();
        Toast.makeText(MainActivity.this,"OnDestroy
Called",Toast.LENGTH_SHORT).show();
    }
}
```

OUTPUT



RESULT: Program to demonstrate Activity Lifecycle is successfully executed and output verified

PROGRAM 3 (CO1)

AIM: Implementing basic arithmetic operations of simple calculator

XML

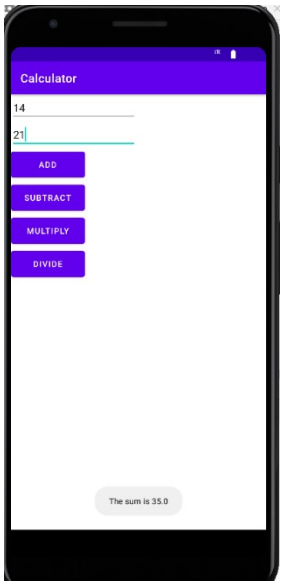
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:layout_editor_absoluteX="1dp"
    tools:layout_editor_absoluteY="272dp"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/n1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"/>

    <EditText
        android:id="@+id/n2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"/>

    <Button
        android:id="@+id/add"
        android:layout_width="125dp"
        android:layout_height="56dp"
        android:text="ADD" />

    <Button
        android:id="@+id/subtract"
        android:layout_width="125dp"
        android:layout_height="56dp"
        android:text="SUBTRACT" />

    <Button
        android:id="@+id/multiply"
        android:layout_width="125dp"
        android:layout_height="56dp"
        android:text="MULTIPLY" />

    <Button
        android:id="@+id/divide"
        android:layout_width="125dp"
        android:layout_height="56dp"
        android:text="DIVIDE" />

</LinearLayout>
```

JAVA

```
package com.example.calculator;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText number1;
    EditText number2;
    Button b1;
    Button b2;
    Button b3;
    Button b4;
    float sol=0;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        number1=findViewById(R.id.n1);
        number2=findViewById(R.id.n2);
        b1=findViewById(R.id.add);
        b2=findViewById(R.id.subtract);
        b3=findViewById(R.id.multiply);
        b4=findViewById(R.id.divide);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                float a = Float.parseFloat(number1.getText().toString());
                float b = Float.parseFloat(number2.getText().toString());
                sol=a+b;
                Toast.makeText(MainActivity.this,"The sum is " +sol
,Toast.LENGTH_SHORT).show();
            }
        });
        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                float a = Float.parseFloat(number1.getText().toString());
                float b = Float.parseFloat(number2.getText().toString());
                sol=a-b;
                Toast.makeText(MainActivity.this,"The difference is "
+sol,Toast.LENGTH_SHORT).show();
            }
        });
        b3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                float a =Float.parseFloat(number1.getText().toString());
                float b =Float.parseFloat(number2.getText().toString());
                sol=a*b;
                Toast.makeText(MainActivity.this,"The product is "
+sol,Toast.LENGTH_SHORT).show();
            }
        });
```

```
        b4.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                float a = Float.parseFloat(number1.getText().toString());
                float b = Float.parseFloat(number2.getText().toString());
                sol=a/b;
                Toast.makeText(MainActivity.this,"The division is "
+sol,Toast.LENGTH_SHORT).show();

            }
        });
    }
}
```

OUTPUT



RESULT: Program to implement basic arithmetic operations of simple calculator is successfully executed and output verified

PROGRAM 4 (CO1)

AIM: Implement validations on various UI controls

XML

```
<?xml version="1.0" encoding="utf-8"?>
<GridLayout 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:id="@+id/Phone"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@color/purple_200"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="1dp"
    tools:layout_editor_absoluteY="1dp">

    <TextView
        android:id="@+id/Name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="0"
        android:layout_column="0"
        android:text="Name"/>

    <EditText
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="0"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPersonName"/>

    <TextView
        android:id="@+id/Age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="1"
        android:layout_column="0"
        android:text="Age" />

    <EditText
        android:id="@+id/age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="1"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPersonName"/>

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="2"
        android:layout_column="0"
```

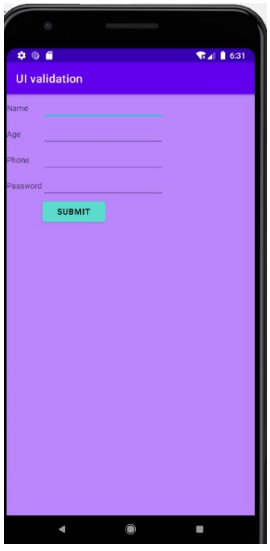
```
        android:text="Phone" />

    <EditText
        android:id="@+id/phone"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="2"
        android:layout_column="1"
        android:ems="10"
        android:inputType="phone" />

    <TextView
        android:id="@+id/Password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="3"
        android:layout_column="0"
        android:text="Password" />

    <EditText
        android:id="@+id/pass"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="3"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/button"
        android:layout_width="110dp"
        android:layout_height="wrap_content"
        android:layout_row="4"
        android:layout_column="1"
        android:backgroundTint="#5BDCCD"
        android:text="Submit"
        android:textColor="@color/black" />

</GridLayout>
```

JAVA

```
package com.example.uivalidation;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.util.jar.Attributes;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity {
    EditText username;
    EditText age;
    EditText phone;
    EditText pass;
    Button b1;
    Pattern USERNAME_PATTERN=Pattern.compile("^[A-Za-z]\\w{5,30}$");
//Alphabets 6-30 letters
    Pattern PASSWORD_PATTERN =Pattern.compile("^" +
            "(?=.*[@#$%^&+=])" +     // at least 1 special character
            "(?=\\S+$)" +            // no white spaces
            ".{4,}" +                // at least 4 characters
            "$");
    Pattern AGE_PATTERN= Pattern.compile("^" +

            "(?=\\S+$)" +                  // no white spaces
            "[0-9]{1,2}" +                // 2 numbers
            "$");
    Pattern PHONE_PATTERN=Pattern.compile("^(0|91)?[7-9][0-9]{9}$");
//Begins with 0 or 91,then 7 or 8 or 9,then contains 9 digits

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

        username=findViewById(R.id.name);
        age=findViewById(R.id.age);
        phone=findViewById(R.id.phone);
        pass=findViewById(R.id.pass);
        b1=findViewById(R.id.button);

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String inpName=username.getText().toString();
                String inpAge=age.getText().toString();
                String inpPh=phone.getText().toString();
                String inpPass=pass.getText().toString();


                if(inpName.isEmpty()){
                    Toast.makeText(MainActivity.this,  "Name Field is
Empty", Toast.LENGTH_SHORT).show();
```

```
                }
                if(inpAge.isEmpty()){
                    Toast.makeText(MainActivity.this,  "Age field is
Empty", Toast.LENGTH_SHORT).show();
                }
                if(inpPh.isEmpty()){
                    Toast.makeText(MainActivity.this,  "Phone field is
Empty", Toast.LENGTH_SHORT).show();
                }
                if(inpPass.isEmpty()){
                    Toast.makeText(MainActivity.this,  "Pass field is
Empty", Toast.LENGTH_SHORT).show();
                }
                if (!USERNAME_PATTERN.matcher(inpName).matches()){
                    username.setError("Enter alphabets [6-30 characters]");
                }
                if (!AGE_PATTERN.matcher(inpAge).matches()) {
                    age.setError("Incorrect Age");
                }
                if (!PHONE_PATTERN.matcher(inpPh).matches()){
                    phone.setError("Contains only 10 digits");
                }
                if (!PASSWORD_PATTERN.matcher(inpPass).matches()){
                    pass.setError("Password is too weak");
                }
                else{
                        Toast.makeText(MainActivity.this, "Success",
Toast.LENGTH_SHORT).show();

                    }
                }
        });

    }
}
```

OUTPUT



RESULT : Program to implement validations on various UI controls successfully executed and output verified

PROGRAM 5 (C02)

AIM : Design a registration activity and store registration details in local memory of phone using SharedPreferences

XML

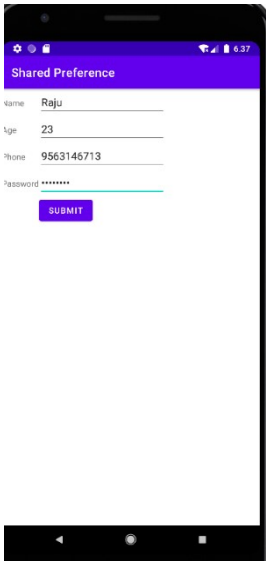
```
<?xml version="1.0" encoding="utf-8"?>
<GridLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/Phone"
    android:layout_width="409dp"
    android:layout_height="729dp"
    android:orientation="vertical"
    tools:context=".MainActivity"
    tools:layout_editor_absoluteX="1dp"
    tools:layout_editor_absoluteY="1dp">

    <TextView
        android:id="@+id/Name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="0"
        android:layout_column="0"
        android:text="Name" />

    <EditText
        android:id="@+id/name"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="0"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPersonName"/>

    <TextView
        android:id="@+id/Age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="1"
        android:layout_column="0"
        android:text="Age" />

    <EditText
        android:id="@+id/age"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="1"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPersonName"/>

    <TextView
        android:id="@+id/textView4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="2"
        android:layout_column="0"
```

```
        android:text="Phone" />

    <EditText
        android:id="@+id/phone"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="2"
        android:layout_column="1"
        android:ems="10"
        android:inputType="phone" />

    <TextView
        android:id="@+id/Password"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="3"
        android:layout_column="0"
        android:text="Password" />

    <EditText
        android:id="@+id/pass"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="3"
        android:layout_column="1"
        android:ems="10"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_row="4"
        android:layout_column="1"
        android:text="Submit" />

</GridLayout>
```

JAVA

```
package com.example.sharedpreference;

import android.os.Bundle;
import android.content.SharedPreferences;
import android.widget.EditText;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    EditText name,pass,phn,age;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        name=(EditText)findViewById(R.id.name);
        pass=(EditText)findViewById(R.id.pass);
        phn=(EditText)findViewById(R.id.phone);
        age=(EditText)findViewById(R.id.age);

    }
    public void onResume() {
        super.onResume();

        SharedPreferences sh=getSharedPreferences("sp", MODE_PRIVATE);

        String s1 = sh.getString("name", "");
        String s2 = sh.getString("pass", "");
        int ph = sh.getInt("phone", 0);
        int a = sh.getInt("age", 0);

        name.setText(s1);
        pass.setText(s2);
        phn.setText(String.valueOf(ph));
        age.setText(String.valueOf(a));

    }
    public void onPause() {


        super.onPause();

        SharedPreferences sharedPreferences = getSharedPreferences("sp",
MODE_PRIVATE);
        SharedPreferences.Editor sp = sharedPreferences.edit();

        sp.putString("name", name.getText().toString());
        sp.putString("pass", pass.getText().toString());
        sp.putInt("age", Integer.parseInt(age.getText().toString()));
        sp.putInt("phone", Integer.parseInt(phn.getText().toString()));
        sp.commit();
        sp.apply();
    }

}
```

OUTPUT



RESULT : Program to store registration using SharedPreference successfully executed and output verified

PROGRAM 6 (CO2)

AIM : Design a simple calculator using GridLayout

XML

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout 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="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/edittext"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        android:text=" " />

    <GridLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="130dp"
        android:columnCount="3"
        android:rowCount="5">

        <Button
            android:id="@+id/button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_rowWeight="1"
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="1"
            android:textSize="34sp"
            app:iconPadding="5dp" />

        <Button
            android:id="@+id/button4"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_rowWeight="1"
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="2"
            android:textSize="36sp" />

        <Button
            android:id="@+id/button5"
            android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="3"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="4"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="5"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button8"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="6"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button9"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="7"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button10"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="8"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button11"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="9"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button12"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="+"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button13"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="0"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button14"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
        android:layout_columnWeight="1"
        android:layout_gravity="fill"
        android:layout_margin="5sp"
        android:background="#03A9F4"
        android:text="-"
        android:textSize="36sp" />

    <Button
        android:id="@+id/button15"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_rowWeight="1"
```

```
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="*"
            android:textSize="36sp" />

        <Button
            android:id="@+id/button16"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_rowWeight="1"
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="/"
            android:textSize="36sp" />

        <Button
            android:id="@+id/button17"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_rowWeight="1"
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="="
            android:textSize="36sp" />

        <Button
            android:id="@+id/button18"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_rowWeight="1"
            android:layout_columnWeight="1"
            android:layout_gravity="fill"
            android:layout_margin="5sp"
            android:background="#03A9F4"
            android:text="AC"
            android:textSize="36sp" />

    </GridLayout>

</LinearLayout>
```

JAVA

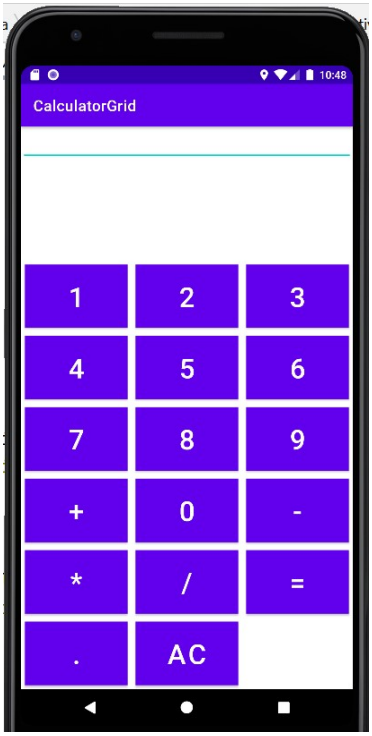
```
package com.example.calculator;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;


public class MainActivity extends AppCompatActivity {
    EditText editText;
    Button b1, b2, b3, b4, b5, b6, b7, b8, b9, b0, plus, sub, mul, div,
equal, ac;
    float value1, value2;
    boolean Addition, Subtraction, Multiplication, Division;


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

        editText = findViewById(R.id.edittext);
        b1 = findViewById(R.id.button);
        b2 = findViewById(R.id.button4);
        b3 = findViewById(R.id.button5);
        b4 = findViewById(R.id.button6);
        b5 = findViewById(R.id.button7);
        b6 = findViewById(R.id.button8);
        b7 = findViewById(R.id.button9);
        b8 = findViewById(R.id.button10);
        b9 = findViewById(R.id.button11);
        b0 = findViewById(R.id.button13);
        plus = findViewById(R.id.button12);
        sub = findViewById(R.id.button14);
        mul = findViewById(R.id.button15);
        div = findViewById(R.id.button16);
        equal = findViewById(R.id.button17);
        ac = findViewById(R.id.button18);


        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                editText.setText(editText.getText() + "1");

            }
        });


        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                editText.setText(editText.getText() + "2");

            }
        });
```

```
b3.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "3");

    }
});

b4.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "4");

    }
});

b5.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "5");

    }
});

b6.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "6");

    }
});

b7.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "7");

    }
});

b8.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "8");

    }
});

b9.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "9");

    }
});

b0.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        editText.setText(editText.getText() + "0");
```

```
    }
});

plus.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        if (editText == null) {
            editText.setText("");
        } else {
            value1 = Float.parseFloat(editText.getText() + "");
            Addition = true;
            editText.setText(null);
        }

    }
});

sub.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        value1 = Float.parseFloat(editText.getText() + "");
        Subtraction = true;
        editText.setText(null);
    }
});


mul.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        value1 = Float.parseFloat(editText.getText() + "");
        Multiplication = true;
        editText.setText(null);
    }
});

div.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        value1 = Float.parseFloat(editText.getText() + "");
        Division = true;
        editText.setText(null);
    }
});

equal.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        value2 = Float.parseFloat(editText.getText() + "");

        if (Addition == true) {
            editText.setText(value1 + value2 + "");
            Addition = false;
        }

        if (Subtraction == true) {
            editText.setText(value1 - value2 + "");
            Subtraction = false;
        }

        if (Multiplication == true) {
```

```
                    editText.setText(value1 * value2 + "");
                    Multiplication = false;
                }

                if (Division == true) {
                    editText.setText(value1 / value2 + "");
                    Division = false;
                }

            }
        });
        ac.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                editText.setText("");
            }
        });


    }
}
```

OUTPUT



RESULT : Program to design simple calculator using GridLayout successfully executed and output verified

PROGRAM 7 (CO3)

AIM : Implement Intent to navigate between multiple activities

XML

MainActivity

```
<?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"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/button2"
        android:layout_width="160dp"
        android:layout_height="59dp"
        android:text="Go"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <LinearLayout
        android:id="@+id/linearLayout"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical"
        tools:layout_editor_absoluteX="28dp"
        tools:layout_editor_absoluteY="184dp">

        <TextView
            android:id="@+id/textView3"
            android:layout_width="match_parent"
            android:layout_height="336dp"
            android:gravity="center"
            android:text="First Page"
            android:textAlignment="center"

android:textAppearance="@style/TextAppearance.AppCompat.Display1" />
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

XML

Home

```
<?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"
    tools:context=".Home">

    <Button
        android:id="@+id/button"
        android:layout_width="170dp"
        android:layout_height="62dp"
        android:text="Go Back"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
        app:layout_constraintBottom_toBottomOf="@+id/linearLayout2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <LinearLayout
        android:id="@+id/linearLayout2"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="vertical">

        <TextView
            android:id="@+id/textView"
            android:layout_width="match_parent"
            android:layout_height="341dp"
            android:gravity="center"
            android:text="Second Page"
            android:textAlignment="center"

android:textAppearance="@style/TextAppearance.AppCompat.Display1" />
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

JAVA

MainActivity

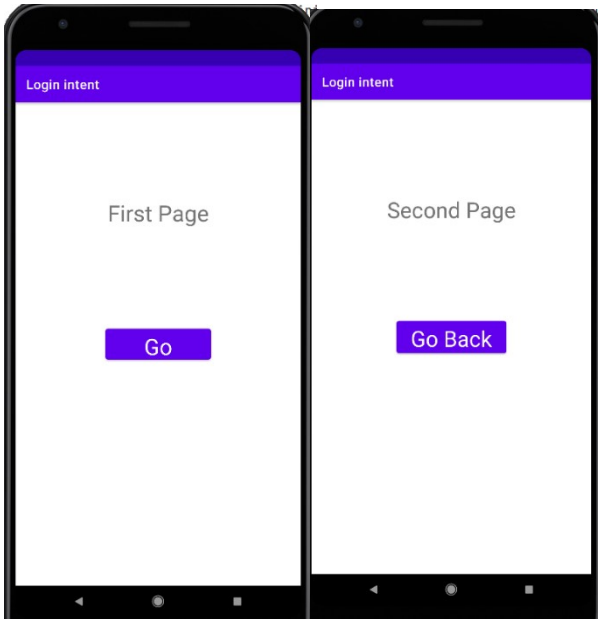
```
package com.example.loginintent;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;


public class MainActivity extends AppCompatActivity {
    Button b1;

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

        b1 =findViewById(R.id.button2);

        //implement Onclick event for Explicit Intent

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                Intent intent = new  Intent(getApplicationContext(),
Home.class);
                startActivity(intent);


            }
        });
    }
}
```

Home

```
package com.example.loginintent;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class Home extends AppCompatActivity {

    Button b1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_home);

        b1 = findViewById(R.id.button);

        //implement Onclick event for Explicit Intent

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                Intent intent = new Intent(getApplicationContext(),
MainActivity.class);
                startActivity(intent);


            }
        });

    }

}
```

OUTPUT



RESULT : Program to implement Intent to navigate between multiple activities successfully executed and output verified

PROGRAM 8 (CO3)

AIM : Implement Options menu to navigate to activities

XML

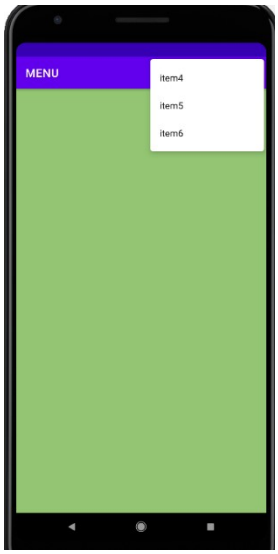
```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto">
    <item android:id="@+id/item1"
        android:title="item1"
        android:icon="@drawable/ic_icon1"
        app:showAsAction="always" />
    <item android:id="@+id/item2"
        android:title="item2"
        android:icon="@drawable/ic_icon2"
        app:showAsAction="always" />
    <item android:id="@+id/item3"
        android:title="item3"
        android:icon="@drawable/ic_icon3"
        app:showAsAction="always" />
    <item android:id="@+id/item4"
        android:title="item4"
        app:showAsAction="never" />
    <item android:id="@+id/item5"
        android:title="item5"
        app:showAsAction="never" />
    <item android:id="@+id/item6"
        android:title="item6"
        app:showAsAction="never" />
</menu>
```

JAVA

```
package com.example.menu;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.view.ContextMenu;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.widget.PopupMenu;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

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

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        MenuInflater inflater = getMenuInflater();
        inflater.inflate(R.menu.menu_file, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
            case R.id.item1:
                Intent i=new
Intent(getApplicationContext(),MainActivity2.class);
                startActivity(i);
                return true;
            case R.id.item2:
                Intent i2=new
Intent(getApplicationContext(),MainActivity3.class);
                startActivity(i2);
                return true;
            case R.id.item3:
                Intent i3=new
Intent(getApplicationContext(),MainActivity4.class);
                startActivity(i3);
                return true;
            case R.id.item4:
                Toast.makeText(MainActivity.this, "Item4 Selected",
Toast.LENGTH_SHORT).show();
            case R.id.item5:
                Toast.makeText(MainActivity.this, "Item5 Selected",
Toast.LENGTH_SHORT).show();
            case R.id.item6:
                Toast.makeText(MainActivity.this, "Item6 Selected",
Toast.LENGTH_SHORT).show();
            default:
                return super.onOptionsItemSelected(item);
        }
```

```
        }
}
```

OUTPUT



RESULT : Program to implement options menu to navigate to activities successfully executed and output verified

PROGRAM 9 (CO5)

AIM: Create database using SQLite and perform insert operation.

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="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">


    <EditText
        android:id="@+id/idEdtCourseName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:hint="Enter course Name" />

    <EditText
        android:id="@+id/idEdtCourseTracks"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:hint="Enter Course Tracks" />
    <EditText
        android:id="@+id/idEdtCourseDuration"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:hint="Enter Course Duration" />

    <EditText
        android:id="@+id/idEdtCourseDescription"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:hint="Enter Course Description" />
    <Button
        android:id="@+id/idBtnAddCourse"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:text="Add Course"
        android:textAllCaps="false" />

</LinearLayout>
```

Java

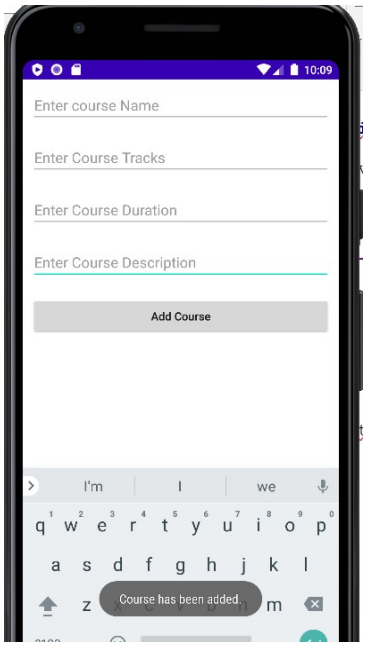
```
package com.example.sqllite;

import android.os.Bundle;
import android.app.Activity;
```

```
import android.view.Menu;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends Activity {

    private EditText courseNameEdt, courseTracksEdt, courseDurationEdt,
courseDescriptionEdt;
    private Button addCourseBtn;
    private DBHandler dbHandler;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        courseNameEdt = (EditText)findViewById(R.id.idEdtCourseName);
        courseTracksEdt = (EditText)findViewById(R.id.idEdtCourseTracks);
        courseDurationEdt =
(EditText)findViewById(R.id.idEdtCourseDuration);
        courseDescriptionEdt =(EditText)
findViewById(R.id.idEdtCourseDescription);
        addCourseBtn = (Button)findViewById(R.id.idBtnAddCourse);

                dbHandler = new DBHandler(MainActivity.this);
        addCourseBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                // below line is to get data from all edit text fields.
                String courseName = courseNameEdt.getText().toString();
                String courseTracks = courseTracksEdt.getText().toString();
                String courseDuration =
courseDurationEdt.getText().toString();
                String courseDescription =
courseDescriptionEdt.getText().toString();


                if (courseName.isEmpty() && courseTracks.isEmpty() &&
courseDuration.isEmpty() && courseDescription.isEmpty()) {
                    Toast.makeText(MainActivity.this, "Please enter all the
data..", Toast.LENGTH_SHORT).show();
                    return;
                }
                dbHandler.addNewCourse(courseName, courseDuration,
courseDescription, courseTracks);

                Toast.makeText(MainActivity.this, "Course has been added.",
Toast.LENGTH_SHORT).show();
                courseNameEdt.setText("");
                courseDurationEdt.setText("");
                courseTracksEdt.setText("");
                courseDescriptionEdt.setText("");
            }
        });
    }
}
```

```
package com.example.sqllite;


import android.content.ContentValues;
import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

public class DBHandler extends SQLiteOpenHelper {


    private static final String DB_NAME = "coursedb";
    private static final int DB_VERSION = 1;


    private static final String TABLE_NAME = "mycourses";
    private static final String ID_COL = "id";


    private static final String NAME_COL = "name";


    private static final String DURATION_COL = "duration";


    private static final String DESCRIPTION_COL = "description";


    private static final String TRACKS_COL = "tracks";


    public DBHandler(Context context) {
        super(context, DB_NAME, null, DB_VERSION);
    }


    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "CREATE TABLE " + TABLE_NAME + " ("
                + ID_COL + " INTEGER PRIMARY KEY AUTOINCREMENT, "
                + NAME_COL + " TEXT,"
                + DURATION_COL + " TEXT,"
                + DESCRIPTION_COL + " TEXT,"
                + TRACKS_COL + " TEXT)";

                db.execSQL(query);
    }


    public void addNewCourse(String courseName, String courseDuration,
String courseDescription, String courseTracks) {


        SQLiteDatabase db = this.getWritableDatabase();

                ContentValues values = new ContentValues();

                values.put(NAME_COL, courseName);
        values.put(DURATION_COL, courseDuration);
        values.put(DESCRIPTION_COL, courseDescription);
```

```
        values.put(TRACKS_COL, courseTracks);

                db.insert(TABLE_NAME, null, values);

        db.close();
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {

        db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
        onCreate(db);
    }
}
```

OUTPUT



RESULT: Program to create database using SQLite and perform insert operation is successfully executed and output verified.

Program 10 (CO5)

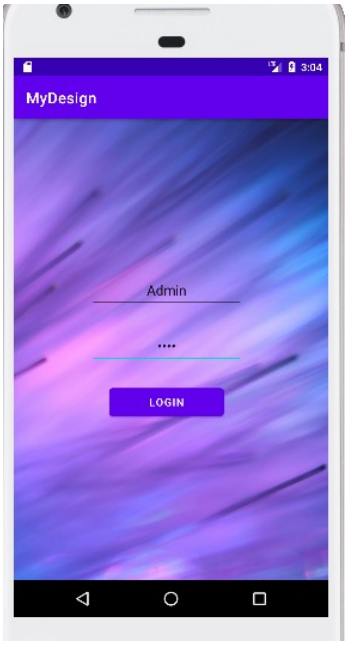
AIM: Program to implement UI design using manifest code .

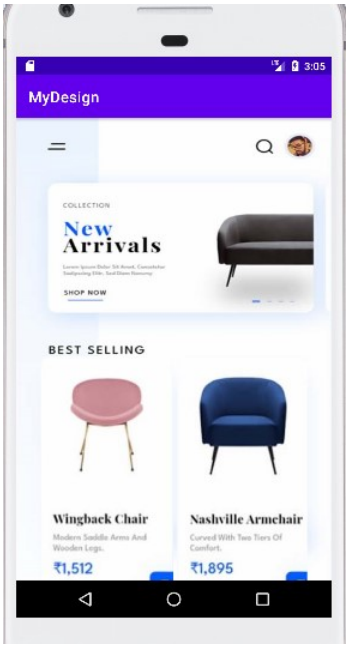
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.appcompat.widget.LinearLayoutCompat
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:scaleType="fitCenter"
    android:background="@drawable/login"

    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="409dp"
        android:layout_height="729dp"
        android:orientation="vertical"
        tools:layout_editor_absoluteX="1dp"
        tools:layout_editor_absoluteY="1dp">

        <EditText
            android:id="@+id/uname"
            android:layout_width="200dp"
            android:layout_height="wrap_content"
            android:layout_marginLeft="100dp"
            android:layout_marginTop="200dp"
            android:ems="10"
            android:hint="Username"
            android:inputType="textPersonName"
            android:minHeight="48dp"
            android:textAlignment="center" />

        <EditText
            android:id="@+id/pass"
            android:layout_width="200dp"
            android:layout_height="wrap_content"
            android:layout_marginLeft="100dp"
            android:layout_marginTop="25dp"
            android:ems="10"
            android:hint="Password"
            android:inputType="textPassword"
            android:minHeight="48dp"
            android:textAlignment="center" />

        <Button
            android:id="@+id/button"
            android:layout_width="150dp"
            android:layout_marginTop="25dp"
            android:layout_marginLeft="125dp"
            android:layout_height="wrap_content"
            android:text="Login" />
    </LinearLayout>
</androidx.appcompat.widget.LinearLayoutCompat>


<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
```

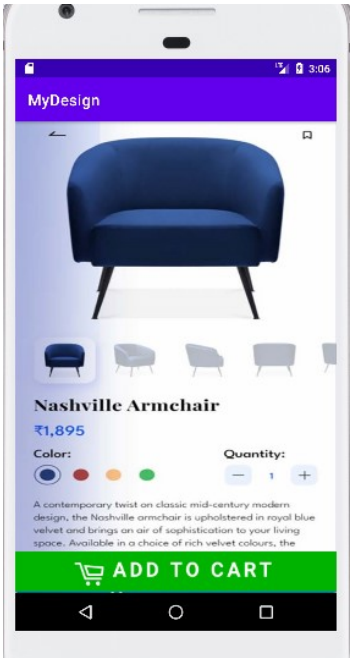
```
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:scaleType="fitCenter"
    android:background="@drawable/ec1"
    tools:context=".MainActivity2">

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

        <ImageButton
            android:id="@+id/imageButton"
            android:layout_width="231dp"
            android:layout_height="320dp"
            android:layout_marginLeft="32dp"
            android:layout_marginTop="305dp"
            android:layout_marginBottom="10dp"
            android:layout_weight="1"
            android:padding="0dp"
            android:scaleType="fitCenter"

            app:srcCompat="@drawable/ec5"
            tools:ignore="SpeakableTextPresentCheck" />

        <ImageButton
            android:id="@+id/imageButton2"
            android:layout_width="231dp"
            android:layout_height="320dp"
            android:layout_marginLeft="3dp"
            android:layout_marginTop="305dp"
            android:layout_marginBottom="10dp"
            android:layout_marginRight="30dp"
            android:layout_weight="1"
            android:padding="2dp"
            android:scaleType="fitCenter"
            app:srcCompat="@drawable/ec4"
            tools:ignore="SpeakableTextPresentCheck" />
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>


<?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:scaleType="fitCenter"
    android:background="@drawable/ec2"
    tools:context=".MainActivity3">

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

```
        <ImageButton
            android:id="@+id/imageButton4"
            android:layout_width="match_parent"
            android:layout_height="51dp"
            android:layout_marginTop="550dp"
            app:srcCompat="@drawable/add"
            tools:ignore="SpeakableTextPresentCheck" />
    </LinearLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

OUTPUT







RESULT: Program to implement UI design using manifest code is successfully executed and output verified.

GitHub Link:- https://github.com/adithyan739/Android-Lab