MOBILE APPLICATION DEVELOPMENT LABORATORY

PRACTICAL REPORT FILE

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF TECHNOLOGY

INFORMATION TECHNOLOGY

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1 Android User Interface Design: Implement Your Name in Android Studio.

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activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http:/
    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">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="KHUSHPREET SINGH MANKOO"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.helloworld;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

OUTPUT:-

Figure 1: Output for Your Name

2 Write your name and Button Eg. Your Name Welcome ! and round shape button named Go

activity_main.xml

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="KHUSHPREET SINGH MANKOO"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />


    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="179dp"
        android:background="@drawable/round_btn"
        android:text="Round Button"
        android:textColor="#000"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

round_btn.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
<solid android:color="#fff"/>
    <corners
        android:topRightRadius="45dp"
        android:topLeftRadius="45dp"
        android:bottomLeftRadius="45dp"
        android:bottomRightRadius="45dp"
        />
</shape>
```

MainActivity.java

```java
package com.example.roundedbutton;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

OUTPUT:-

Figure 2: Output for Our name with round shape button

3   Change the Icon of your APK file in Android Studio.

```
AndroidManifest.xml

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    package="com.example.helloworld">

    <application
        android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.HELLOWORLD"
        tools:targetApi="31">
        <activity
         android:name=".MainActivity"
         android:exported="true">
         <intent-filter>
          <action android:name="android.intent.action.MAIN" />

          <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```
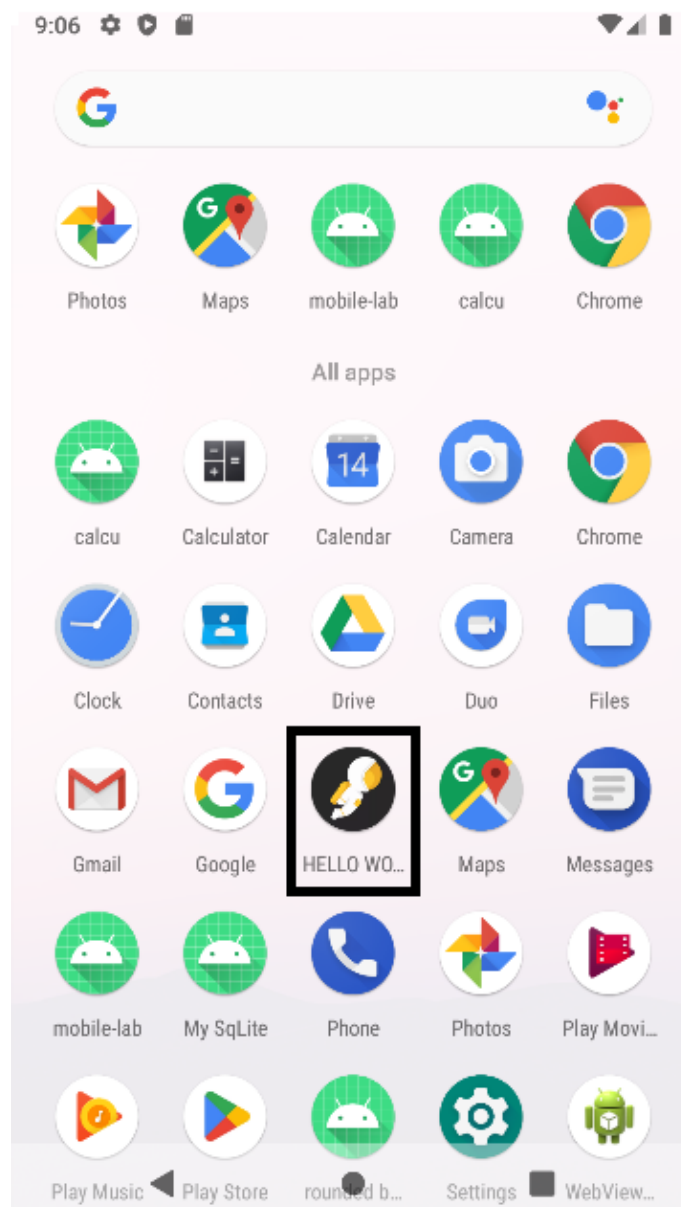
OUTPUT:-

Figure 3: Output for APK Icon change

4 Android User Interface Design: To implement basic calculator in android studio.

activity_main.xml

```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:layout_marginTop="0dp"
    android:layout_marginRight="0dp"
    android:background="@color/purple_200"
    android:backgroundTint="@color/purple_200"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/ed1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:hint="Enter 1st Number"
        android:inputType="numberSigned"
        android:minHeight="48dp"
        android:textColorHint="#311B92" />

    <EditText
        android:id="@+id/ed2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:hint="Enter 2nd Number"
        android:inputType="numberSigned"
        android:minHeight="48dp"
        android:textColorHint="#311B92" />

    <Button
```

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```xml
        android:id="@+id/ad"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/design_default_color_background"
        android:text="addition"
        android:textColor="#757575" />

    <Button
        android:id="@+id/sub"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/white"
        android:backgroundTint="@color/white"
        android:text="subtraction"
        android:textColor="#757575" />

    <Button
        android:id="@+id/mul"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:text="multiplication" />

    <Button
        android:id="@+id/div"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:text="Division" />

    <Button
        android:id="@+id/Page"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
```

```
            android:layout_marginRight="20dp"
            android:text="Next" />

        <TextView
            android:id="@+id/ans"
            android:layout_width="382dp"
            android:layout_height="45dp"
            android:layout_marginLeft="20dp"
            android:layout_marginTop="20dp"
            android:layout_marginRight="20dp"
            android:hint="Answer" />

        <ImageView
            android:id="@+id/imageView2"
            android:layout_width="257dp"
            android:layout_height="115dp"
            android:layout_gravity="center|top"
            android:visibility="visible"
            app:srcCompat="@drawable/calculator_icon" />

</LinearLayout>
```

```java
MainActivity.java

package com.example.calcu;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    EditText ed1,ed2;
    Button ad,sub,mul,div, Page;
    TextView ans;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ed1=findViewById(R.id.ed1);
```

```java
ed2=findViewById(R.id.ed2);
ad=findViewById(R.id.ad);
sub=findViewById(R.id.sub);
mul=findViewById(R.id.mul);
div=findViewById(R.id.div);
ans=findViewById(R.id.ans);
Page=findViewById(R.id.Page);

ad.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view) {
        int f, s, a;
        f = Integer.parseInt(ed1.getText().toString());
        s = Integer.parseInt(ed2.getText().toString());
        a = f + s;
        ans.setText("result = "+a);
    }}
    );
sub.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
        a=f-s;
        ans.setText("result = "+a);
    }
});

mul.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
        a=f*s;
        ans.setText("result = "+a);
    }
});

div.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
```

```java
                a=f/s;
                ans.setText("result = "+a);
            }
        });
        Page.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent i = new Intent(MainActivity.this,MainActivity2.cl
                startActivity(i);


            }
        });


    }
}
```

OUTPUT:-

Figure 4: Output for calculator

5 Android User Interface Design: To implement different type of layouts like relative, grid, linear and table.

activity_main.xml

```xml
<!-- Parent Layout -->
<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:background="@color/whiteColor"
android:orientation="vertical"
android:paddingBottom="@dimen/activity_vertical_margin"
android:paddingLeft="@dimen/activity_horizontal_margin"
android:paddingRight="@dimen/activity_horizontal_margin"
android:paddingTop="@dimen/activity_vertical_margin"
tools:context=".MainActivity">
<!-- first Child Layout -->

<!-- create a Linear Layout with horizontal orientation and weightSum pr
<LinearLayout
android:id="@+id/firstLayout"
android:layout_width="match_parent"
android:layout_height="50dp"
android:layout_marginTop="20dp"
android:orientation="horizontal"
android:weightSum="2">

<!-- place one TextView and one EditText inside layout using weight prop

<TextView
android:layout_width="0dp"
android:layout_height="50dp"
android:layout_marginRight="10dp"
android:layout_weight="0.6"
android:gravity="center_vertical"
android:paddingLeft="10dp"
android:text="User Name"
android:textColor="@color/blackColor" />

<EditText
android:id="@+id/firstName"
android:layout_width="0dp"
android:layout_height="50dp"
android:layout_marginLeft="10dp"
```

```xml
    android:layout_weight="1.4"
    android:background="@color/editTextBack"
    android:hint="User Name"
    android:imeOptions="actionNext"
    android:paddingLeft="10dp"
    android:singleLine="true"
    android:textColor="@color/blackColor" />
</LinearLayout>
<!-- create a Linear Layout with horizontal orientation and weightSum pr
<!-- second Child Layout -->

<LinearLayout
    android:id="@+id/secondLayout"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="20dp"
    android:orientation="horizontal"
    android:weightSum="2">

<!-- place one TextView and one EditText inside layout using weight prop

<TextView
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_marginRight="10dp"
    android:layout_weight="0.6"
    android:gravity="center_vertical"
    android:paddingLeft="10dp"
    android:text="Phone No."
    android:textColor="@color/blackColor" />

<EditText
    android:id="@+id/lastName"
    android:layout_width="0dp"
    android:layout_height="50dp"
    android:layout_marginLeft="10dp"
    android:layout_weight="1.4"
    android:background="@color/editTextBack"
    android:hint="Phone No."
    android:imeOptions="actionNext"
    android:paddingLeft="10dp"
    android:singleLine="true"
    android:textColor="@color/blackColor" />
</LinearLayout>
<!-- create a Linear Layout with horizontal orientation and weightSum pr
<!-- third Child Layout -->
```

```xml
<LinearLayout
android:id="@+id/thirdLayout"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="20dp"
android:orientation="horizontal"
android:weightSum="2">

<!-- place one TextView and one EditText inside layout using weight prop

<TextView
android:layout_width="0dp"
android:layout_height="50dp"
android:layout_marginRight="10dp"
android:layout_weight="0.6"
android:gravity="center_vertical"
android:paddingLeft="10dp"
android:text="Email Id"
android:textColor="@color/blackColor" />

<EditText
android:id="@+id/address"
android:layout_width="0dp"
android:layout_height="50dp"
android:layout_marginLeft="10dp"
android:layout_weight="1.4"
android:background="@color/editTextBack"
android:hint="Email Id"
android:imeOptions="actionNext"
android:paddingLeft="10dp"
android:singleLine="true"
android:textColor="@color/blackColor" />
</LinearLayout>
<!-- fourth Child Layout -->

<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="20dp"
android:orientation="horizontal"
android:weightSum="2">

<Button
android:layout_width="0dp"
android:layout_height="wrap_content"
```

```xml
android:layout_marginRight="10dp"
android:layout_weight="1"
android:background="@color/greenColor"
android:text="Cancel"
android:textColor="@color/whiteColor" />

<Button
android:layout_width="0dp"
android:layout_height="wrap_content"
android:layout_marginLeft="10dp"
android:layout_weight="1"
android:background="@color/greenColor"
android:text="Submit"
android:textColor="@color/whiteColor" />
</LinearLayout>
</LinearLayout>
```

MainActivity.java

```java
package com.example.nestedlayout;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;

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) {

        getMenuInflater().inflate(R.menu.menu_main, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {

        int id = item.getItemId();
```

```java
        if (id == R.id.action_settings) {
            return true;
        }

        return super.onOptionsItemSelected(item);
    }
}
```

Open res -> values-> colors.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
<!-- define colors used in our xml file-->
<color name="whiteColor">#fff</color>
<color name="blackColor">#000</color>
<color name="editTextBack">#f2f2f2</color>
<color name="greenColor">#0f0</color>
</resources>
```

OUTPUT:-

Figure 5: Nested Layouts

6 Create an Apk File with page of intent in an application.

activity_main.xml

```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:layout_marginTop="10dp"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="match_parent"
        android:layout_height="107dp"
        app:srcCompat="@drawable/spotify2" />

    <Button
        android:id="@+id/button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="50dp"
        android:text="Sign in with E-Mail" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="

    <Button
        android:id="@+id/button2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginRight="50dp"
        android:text="SIGN IN WITH FACEBOOK" />

    <EditText
        android:id="@+id/editTextTextEmailAddress"
        android:layout_width="match_parent"
```

```xml
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:minHeight="48dp"
        android:text="E-Mail" />

    <EditText
        android:id="@+id/editTextTextEmailAddress2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:minHeight="48dp"
        android:text="Confirm E-Mail" />

    <EditText
        android:id="@+id/editTextNumberPassword"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="numberPassword"
        android:minHeight="48dp"
        android:text="Password" />

    <EditText
        android:id="@+id/editTextTextPersonName3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textPersonName"
        android:minHeight="48dp"
        android:text="what should we call you ?" />

    <LinearLayout
        android:layout_width="match_parent"
```

```
            android:layout_height="79dp"
            android:orientation="horizontal"></LinearLayout>

</LinearLayout>
```

MainActivity.java

```java
package com.example.mobile_lab;

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

        button.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent i= new Intent(MainActivity.this,MainActivity2.cla
                startActivity(i);
            }
        });
    }
}
```

---

activity_main2.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http:/
    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"
```

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```xml
        tools:context=".MainActivity2">

    <TextView
        android:id="@+id/textView"
        android:layout_width="149dp"
        android:layout_height="74dp"
        android:layout_marginStart="16dp"
        android:layout_marginTop="26dp"
        android:text="Welcome!
"
        android:textSize="34sp"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity2.java
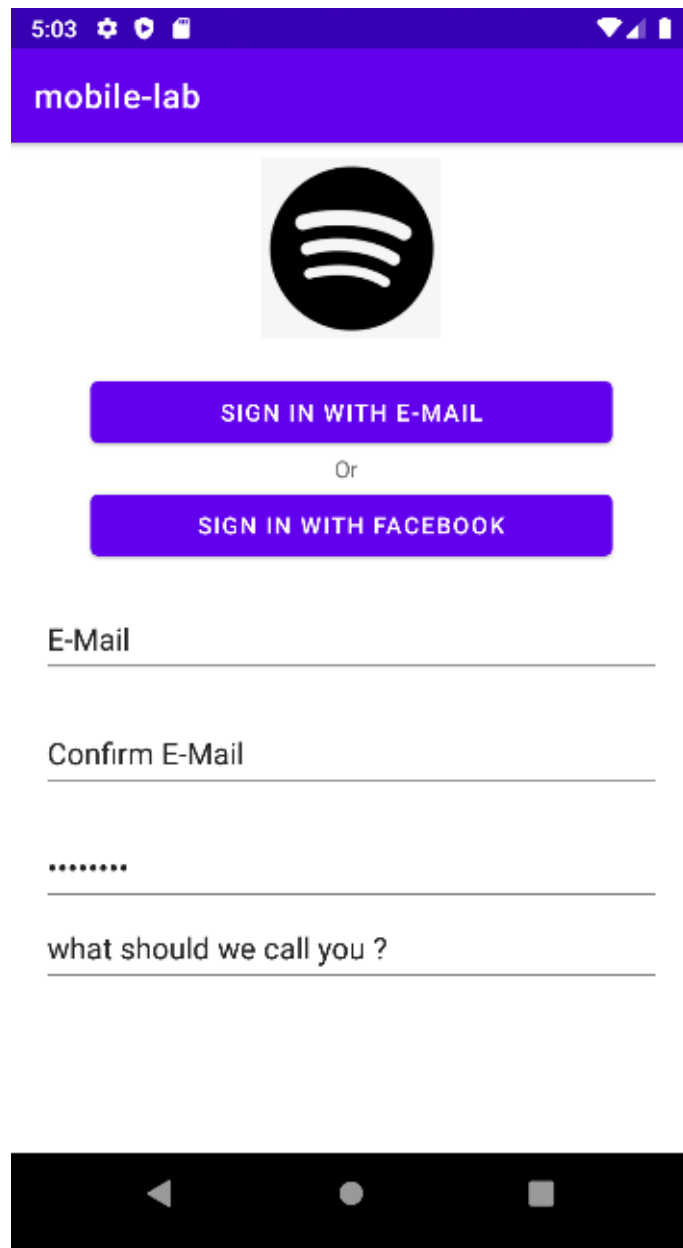
```java
package com.example.mobile_lab;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

public class MainActivity2 extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
    }
}
```

OUTPUT:-

Figure 6.1: intent main output
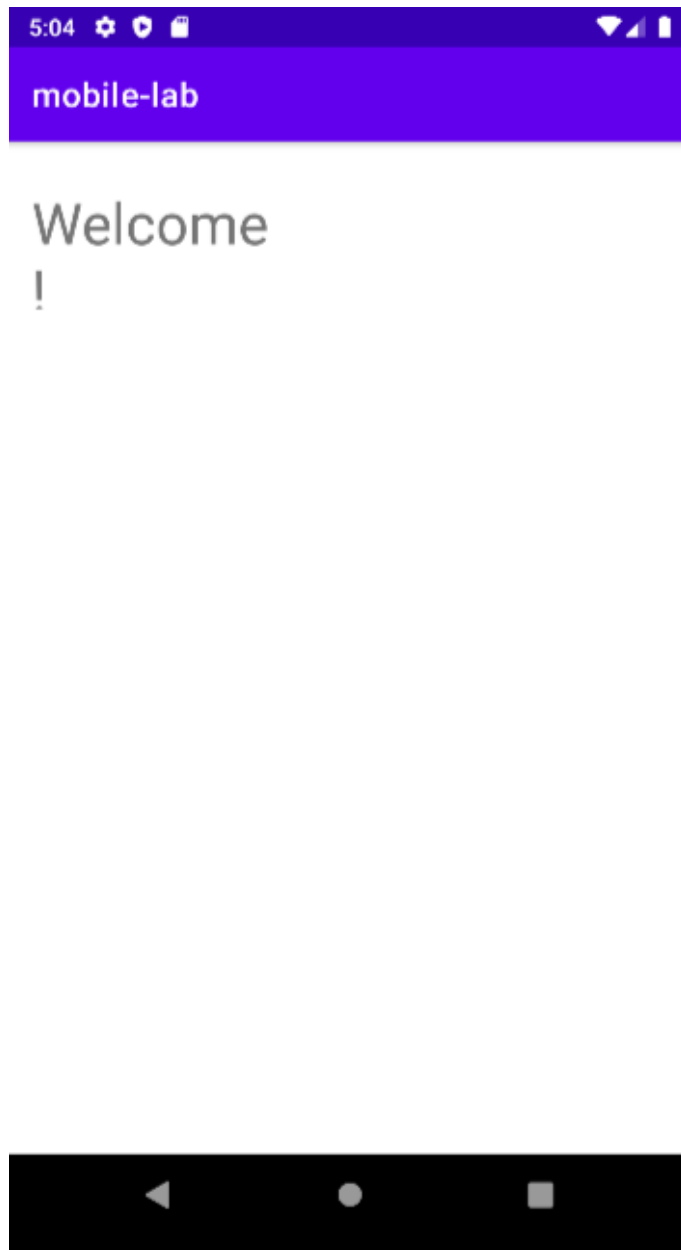
Figure 6.2: intent inner output

7   Create an Apk file with page of fragment in an application

activity_main.xml

```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:layout_marginTop="0dp"
    android:layout_marginRight="0dp"
    android:background="@color/purple_200"
    android:backgroundTint="@color/purple_200"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/ed1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:hint="Enter 1st Number"
        android:inputType="numberSigned"
        android:minHeight="48dp"
        android:textColorHint="#311B92" />

    <EditText
        android:id="@+id/ed2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:hint="Enter 2nd Number"
        android:inputType="numberSigned"
        android:minHeight="48dp"
        android:textColorHint="#311B92" />

    <Button
        android:id="@+id/ad"
        android:layout_width="match_parent"
```

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```xml
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/design_default_color_background"
        android:text="addition"
        android:textColor="#757575" />

    <Button
        android:id="@+id/sub"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/white"
        android:backgroundTint="@color/white"
        android:text="subtraction"
        android:textColor="#757575" />

    <Button
        android:id="@+id/mul"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:text="multiplication" />

    <Button
        android:id="@+id/div"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:text="Division" />

    <Button
        android:id="@+id/Page"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:text="Next" />
```

```xml
    <TextView
        android:id="@+id/ans"
        android:layout_width="382dp"
        android:layout_height="45dp"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:hint="Answer" />

    <ImageView
        android:id="@+id/imageView2"
        android:layout_width="257dp"
        android:layout_height="115dp"
        android:layout_gravity="center|top"
        android:visibility="visible"
        app:srcCompat="@drawable/calculator_icon" />

</LinearLayout>
```

MainActivity.java

```java
package com.example.calcu;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    EditText ed1,ed2;
    Button ad,sub,mul,div, Page;
    TextView ans;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ed1=findViewById(R.id.ed1);
```

```
ed2=findViewById(R.id.ed2);
ad=findViewById(R.id.ad);
sub=findViewById(R.id.sub);
mul=findViewById(R.id.mul);
div=findViewById(R.id.div);
ans=findViewById(R.id.ans);
Page=findViewById(R.id.Page);

ad.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view) {
        int f, s, a;
        f = Integer.parseInt(ed1.getText().toString());
        s = Integer.parseInt(ed2.getText().toString());
        a = f + s;
        ans.setText("result = "+a);
    }}
    );
sub.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
        a=f-s;
        ans.setText("result = "+a);
    }
});

mul.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
        a=f*s;
        ans.setText("result = "+a);
    }
});

div.setOnClickListener(new View.OnClickListener(){
    @Override
    public void onClick(View view){
        int f,s,a;
        f=Integer.parseInt(ed1.getText().toString());
        s=Integer.parseInt(ed2.getText().toString());
```

```
                a=f/s;
                ans.setText("result = "+a);
            }
        });
        Page.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Intent i = new Intent(MainActivity.this,MainActivity2.cl
                startActivity(i);


            }
        });


    }
}
```

_____

activity_main.xml

```xml
<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:orientation="vertical"
    android:background="#ff5678"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity2">

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

        <Button
            android:id="@+id/red"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="Red" />

        <Button
            android:id="@+id/yellow"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1"
            android:text="yellow" />
```

```
        </LinearLayout>

        <LinearLayout
            android:id="@+id/layout"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="horizontal"></LinearLayout>
</LinearLayout>
```

```
MainActivity2.java

package com.example.calcu;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentTransaction;

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

public class MainActivity2 extends AppCompatActivity {

    Button btnred, btnyellow;
    LinearLayout layout;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);

        btnred = findViewById(R.id.red);
        btnyellow= findViewById(R.id.yellow);
        layout=findViewById(R.id.layout);

        btnred.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                red_fragment firstfragment = new red_fragment();
                FragmentTransaction transaction = getSupportFragmentMana
                transaction.replace(R.id.layout, firstfragment);
                transaction.commit();
```

```
            }
        });

        btnyellow.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                yellow_fragment2 secondfragment = new yellow_fragment2()
                FragmentTransaction transaction = getSupportFragmentMana
                transaction.replace(R.id.layout, secondfragment);
                transaction.commit();
            }
        });




    }
}
```

---

red_fragment.java

```
package com.example.calcu;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.Fragment;
import androidx.fragment.app.FragmentTransaction;

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

public class MainActivity2 extends AppCompatActivity {

    Button btnred, btnyellow;
    LinearLayout layout;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);

        btnred = findViewById(R.id.red);
        btnyellow= findViewById(R.id.yellow);
```

```java
        layout=findViewById(R.id.layout);

        btnred.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                red_fragment firstfragment = new red_fragment();
                FragmentTransaction transaction = getSupportFragmentMana
                transaction.replace(R.id.layout, firstfragment);
                transaction.commit();
            }
        });

        btnyellow.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                yellow_fragment2 secondfragment = new yellow_fragment2()
                FragmentTransaction transaction = getSupportFragmentMana
                transaction.replace(R.id.layout, secondfragment);
                transaction.commit();
            }
        });




    }
}
```

```java
yellow_fragment2.java

package com.example.calcu;

import android.os.Bundle;

import androidx.fragment.app.Fragment;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;


public class yellow_fragment2 extends Fragment {
```

```
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup containe
                             Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        return inflater.inflate(R.layout.fragment_yellow_fragment2, cont
    }
}
```

---

fragment_red_fragment.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout 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="#ff0000"
    tools:context=".red_fragment">


    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="160dp"
        android:layout_gravity="center"
        android:gravity="center"
        android:text="Red"
        android:textSize="32dp" />
</FrameLayout>
```

---

fragment_yellow_fragment.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout 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="#807e11"
    tools:context=".yellow_fragment2">


    <TextView
```

```
            android:id="@+id/textView2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="yellow"
            android:textSize="32dp"
            android:layout_gravity="center"
            android:gravity="center"
            />
</FrameLayout>
```
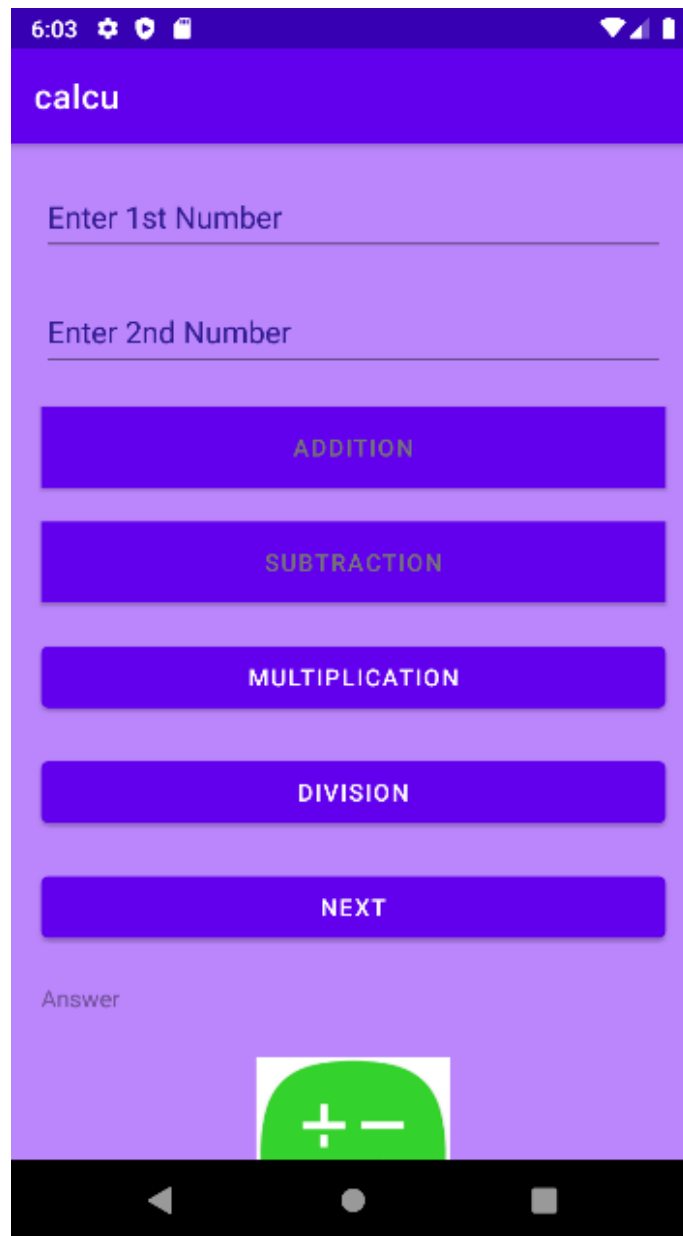
OUTPUT:-

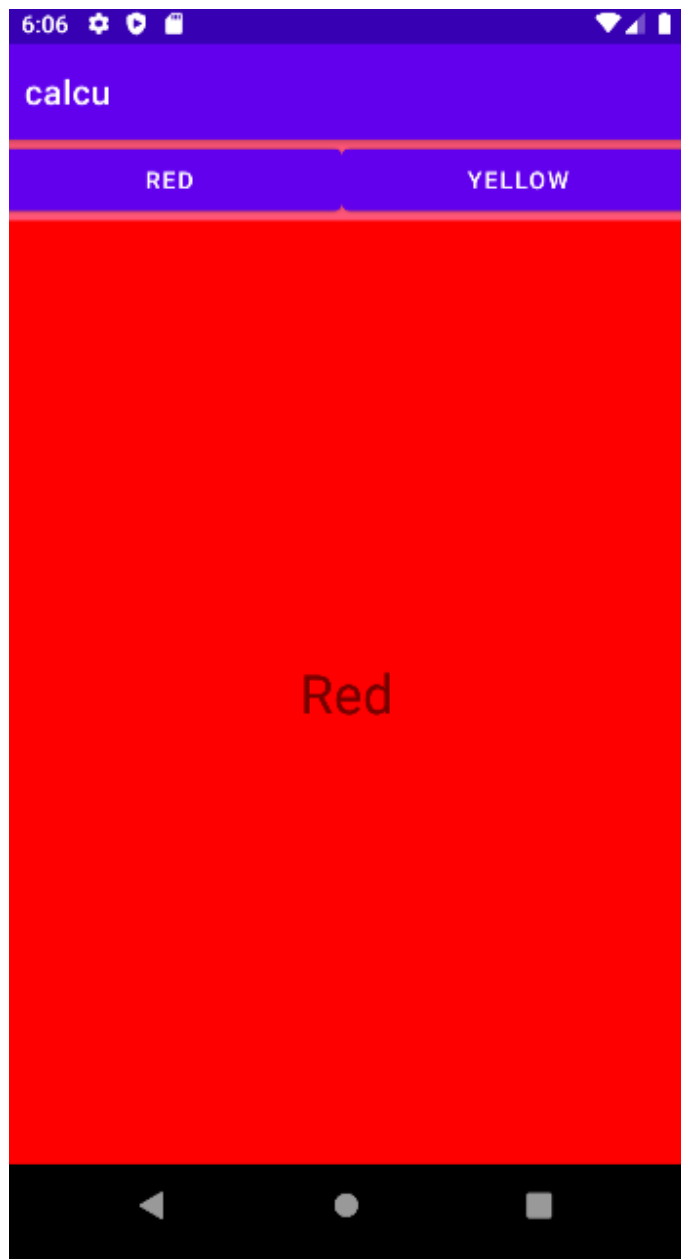Figure 7.1: Front interface

Figure 7.2: intent inner output

Figure 7.3: Red Fragment

Figure 7.4: yellow Fragment

8 Persistent Data Storage: To perform database connectivity of android app using SQLite.

activity_main.java

```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:layout_marginTop="10dp"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/b1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="50dp"
        android:text="Insert" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Or" />

    <Button
        android:id="@+id/b2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginRight="50dp"
        android:text="DELETE" />

    <EditText
        android:id="@+id/et1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
```

```xml
        android:ems="10"
        android:inputType="textEmailAddress"
        android:minHeight="48dp"
        android:text="Name" />

    <EditText
        android:id="@+id/et2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:minHeight="48dp"
        android:text="Username" />

    <EditText
        android:id="@+id/et3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="numberPassword"
        android:minHeight="48dp"
        android:text="Password" />

</LinearLayout>
```

```java
MainActivity.java

package com.example.mysqlite;

import androidx.appcompat.app.AppCompatActivity;

import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
```

```java
public class MainActivity extends AppCompatActivity {
    EditText et1,et2,et3;
    Button b1,b2,b3,b4;
    database g;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        et1=findViewById(R.id.et1);
        et2=findViewById(R.id.et2);
        et3=findViewById(R.id.et3);
        b1=findViewById(R.id.b1);
        b2=findViewById(R.id.b2);
        database g = new database(this);
        // SQLiteDatabase db = g.getReadableDatabase();
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String name1=et1.getText().toString();
                String username1=et2.getText().toString();
                String password1=et3.getText().toString();
                if(name1.equals("")|| username1.equals("")|| password1.e
                {
                    Toast.makeText(MainActivity.this, "Enter all the fie
                }
                else
                {
                    Boolean i =g.insert_data(name1,username1,password1);
                    if (i==true){
                        Toast.makeText(MainActivity.this,"Successful",To
                    }
                    else
                    {
                        Toast.makeText(MainActivity.this,"Not Successful
                    }

                }
                et1.setText("");
            }
        });
    }
}
```

---

database.java

```java
package com.example.mysqlite;

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

import androidx.annotation.Nullable;



public class database extends SQLiteOpenHelper {
    private static final String dbname="signup.db";
    public database(@Nullable Context context) {
        super(context, dbname, null, 1);
    }

    @Override
    public void onCreate(SQLiteDatabase sqLiteDatabase) {
        String q="create table users(id integer primary key autoincremen
        sqLiteDatabase.execSQL(q);
    }

    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1)
        sqLiteDatabase.execSQL("drop table if exists users");
        onCreate(sqLiteDatabase);

    }
    public boolean insert_data(String name,String username,String passwo
    {
        SQLiteDatabase db=this.getWritableDatabase();
        ContentValues c=new ContentValues();
        c.put("name",name);
        c.put("username",username);
        c.put("password",password);
        long r=db.insert("users",null,c);
        if (r==-1) return false;
        else
            return true;
    }
}
```
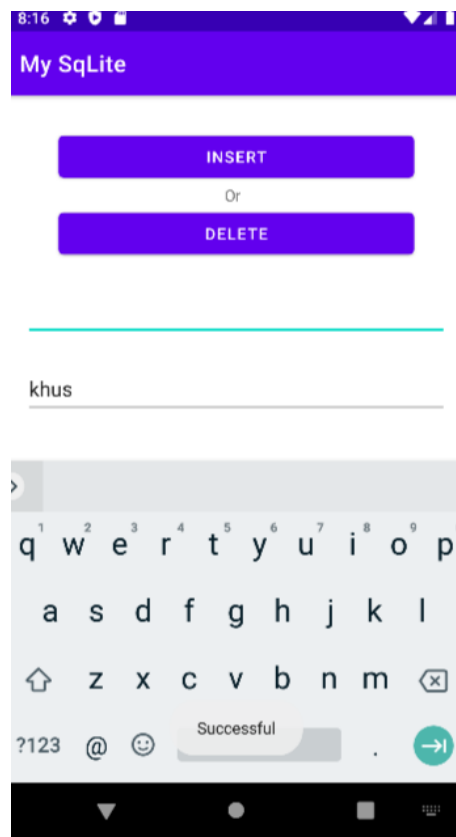
OUTPUT:-

Figure 8:- Sign In Form

9 Demonstration on Services

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
<?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:background="@android:color/holo_blue_light"
 android:gravity="center"
 android:orientation="vertical"
 tools:context=".MainActivity">
<Button
 android:id="@+id/btnstart"
 android:layout_width="wrap_content"
 android:layout_height="wrap_content"
 android:layout_margin="20dp"
 android:background="@color/purple_500"
 android:gravity="center"
 android:padding="20dp"
 android:text="Start service"
 android:textSize="20dp" />
<Button
  android:id="@+id/btnstop"
  android:layout_width="wrap_content"
  android:layout_height="wrap_content"
  android:layout_margin="20dp"
  android:background="@color/purple_500"
  android:gravity="center"
  android:padding="20dp"
  android:text="Stop service"
  android:textSize="20dp" />
</LinearLayout>

</LinearLayout>
```

MainActivity.java

```java
package com.example.service;
```

```java
import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;

public class MainActivity extends AppCompatActivity {

    Button btnstart,btnstop;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    btnstart=findViewById(R.id.btnstart);
    btnstop=findViewById(R.id.btnstop);
    btnstart.setOnClickListener(this);
    btnstop.setOnClickListener(this);
}
@Override
public void onClick(View view) {
   if(view==btnstart){
     startService(new Intent(this,Musicservice.class));
    }else if(view==btnstop){
     stopService(new Intent(this,Musicservice.class));
    }
}
}
```

MusicService.java

```java
package com.example.service;

import android.app.Service;
import android.content.Intent;
import android.media.MediaPlayer;
import android.os.IBinder;
import android.provider.Settings;
import android.support.annotation.Nullable;
public class Musicservice extends Service {
private MediaPlayer mp;
@Nullable
@Override
public IBinder onBind(Intent intent) {
  return null;
}
```

```java
@Override
public int onStartCommand(Intent intent, int flags, int startId) {
  mp=MediaPlayer.create(this, Settings.System.DEFAULT_RINGTONE_URI);
  mp.setLooping(true);
  mp.start();
  return START_STICKY;
}
@Override
public void onDestroy() {
  mp.stop();
  super.onDestroy();
}
}
```

OUTPUT:-

Figure 9:- Service Example

10   Demonstration on Android Security and Debugging

activity_main.java

```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:layout_marginTop="10dp"
    android:orientation="vertical"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/b1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="50dp"
        android:text="Insert" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Or" />

    <Button
        android:id="@+id/b2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginRight="50dp"
        android:text="DELETE" />

    <EditText
        android:id="@+id/et1"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textEmailAddress"
```

```
            android:minHeight="48dp"
            android:text="Name" />

    <EditText
        android:id="@+id/et2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:minHeight="48dp"
        android:text="Username" />

    <EditText
        android:id="@+id/et3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginRight="20dp"
        android:ems="10"
        android:inputType="numberPassword"
        android:minHeight="48dp"
        android:text="Password" />

</LinearLayout>
```

MainActivity.java

```java
package com.example.mysqlite;

import androidx.appcompat.app.AppCompatActivity;

import android.database.sqlite.SQLiteDatabase;
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 et1,et2,et3;
    Button b1,b2,b3,b4;
```

```java
    database g;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        et1=findViewById(R.id.et1);
        et2=findViewById(R.id.et2);
        et3=findViewById(R.id.et3);
        b1=findViewById(R.id.b1);
        b2=findViewById(R.id.b2);
        database g = new database(this);
      // SQLiteDatabase db = g.getReadableDatabase();
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String name1=et1.getText().toString();
                String username1=et2.getText().toString();
                String password1=et3.getText().toString();
                if(name1.equals("")|| username1.equals("")|| password1.e
                {
                    Toast.makeText(MainActivity.this, "Enter all the fie
                }
                else
                {
                    Boolean i =g.insert_data(name1,username1,password1);
                    if (i==true){
                        Toast.makeText(MainActivity.this,"Successful",To
                    }
                    else
                    {
                        Toast.makeText(MainActivity.this,"Not Successful
                    }

                }
                et1.setText("");
            }
        });
    }
}
```

_____

database.java

package com.example.mysqlite;

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

import androidx.annotation.Nullable;



public class database extends SQLiteOpenHelper {
    private static final String dbname="signup.db";
    public database(@Nullable Context context) {
        super(context, dbname, null, 1);
    }

    @Override
    public void onCreate(SQLiteDatabase sqLiteDatabase) {
        String q="create table users(id integer primary key autoincremen
        sqLiteDatabase.execSQL(q);
    }

    @Override
    public void onUpgrade(SQLiteDatabase sqLiteDatabase, int i, int i1)
        sqLiteDatabase.execSQL("drop table if exists users");
        onCreate(sqLiteDatabase);

    }
    public boolean insert_data(String name,String username,String passwo
    {
        SQLiteDatabase db=this.getWritableDatabase();
        ContentValues c=new ContentValues();
        c.put("name",name);
        c.put("username",username);
        c.put("password",password);
        long r=db.insert("users",null,c);
        if (r==-1) return false;
        else
            return true;
    }
}
```

OUTPUT:-

Figure 10:- Toast Message Successful

Figure 10:- Toast Message Not Successful