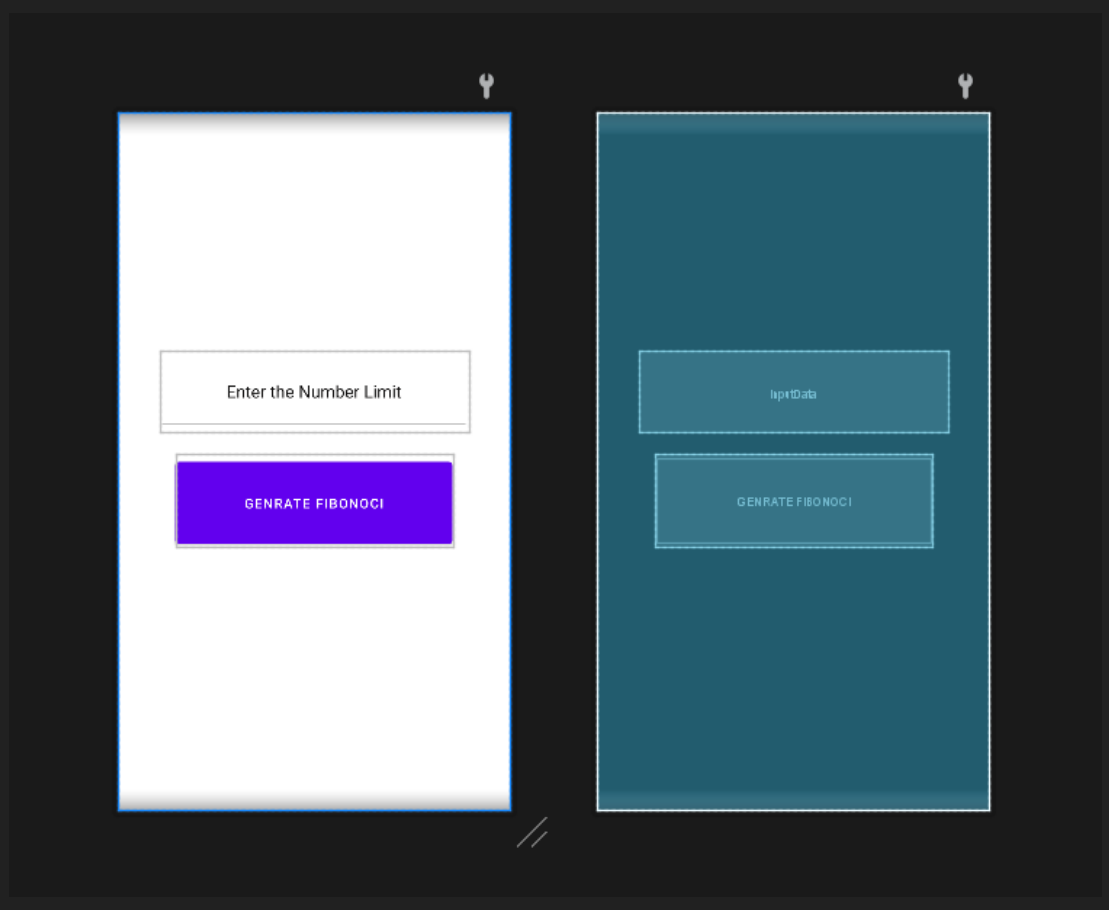
1. Android App to demonstrate Basic Controls, taking user input, Event Handling, Intent and List View by generating Fibonacci series.

activity_main.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"
    android:gravity="center"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/InputData"
        android:layout_width="326dp"
        android:layout_height="85dp"
        android:inputType="number"
        tools:layout_editor_absoluteX="37dp"
        tools:layout_editor_absoluteY="268dp"
        android:hint="Enter the Number Limit"
        android:textAlignment="center"
        android:textColor="#0E0D0D"
        android:textColorHint="#0E0D0D"
        />

    <Button
        android:id="@+id/fiboButton"
        android:layout_width="291dp"
        android:layout_height="98dp"
        android:layout_margin="25dp"
        android:text="Genrate Fibonoci"
        />

</LinearLayout>
```

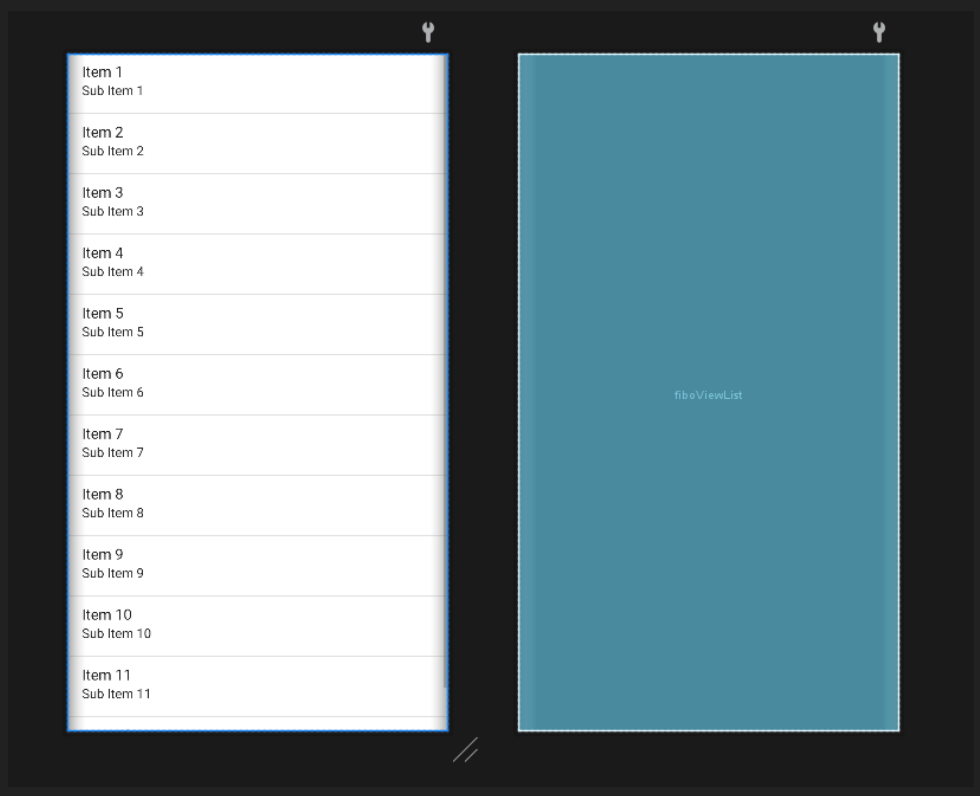


MainActivity.java

```java
package com.example.a01_fibonoci;

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;

public class MainActivity extends AppCompatActivity {
    EditText inputText;
    Button fiboButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        inputText = findViewById(R.id.InputData);
        fiboButton = findViewById(R.id.fiboButton);

        fiboButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int numberLimit = Integer.parseInt(inputText.getText().toString());

                Intent nextPage = new Intent(MainActivity.this,Second.class);
                nextPage.putExtra("limitFibo",numberLimit);
                startActivity(nextPage);
            }
        });
    }
}
```

activity_second.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"
    tools:context=".Second">

    <ListView
        android:id="@+id/fiboViewList"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        />
</LinearLayout>
```




```java
package com.example.a01_fibonoci;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;

import java.util.ArrayList;
import java.util.List;

public class Second extends AppCompatActivity {

    int[] fiboSeries;

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

        int fiboLimit = getIntent().getIntExtra("limitFibo", 1);
        fiboSeries = new int[fiboLimit];
        fiboSeries[0] = 0;
        fiboSeries[1] = 1;
        for (int i = 2; i < fiboLimit; i++) {
            fiboSeries[i] = fiboSeries[i - 1] + fiboSeries[i - 2];
        }

        List<Integer> fiboNumbers = new ArrayList<>();
        for (int i = 0; i < fiboLimit; i++) {
            fiboNumbers.add(fiboSeries[i]);
        }

        ListView listView = findViewById(R.id.fiboViewList);
        ArrayAdapter<Integer> adapter = new ArrayAdapter<Integer>(this,
android.R.layout.simple_list_item_1, fiboNumbers);
        listView.setAdapter(adapter);
    }
}
```

2. Android App to demonstrate Fragments using a Simple Calculator.

activity_main.xml

```
<?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">

    <RelativeLayout
        android:id="@+id/FrameLayout"
        android:layout_width="410dp"
        android:layout_height="433dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.006" />

    <Button
        android:id="@+id/add"
        android:layout_width="140dp"
        android:layout_height="66dp"
        android:layout_marginStart="28dp"
        android:text="ADD"
        android:textSize="25dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.723" />

    <Button
        android:id="@+id/subBtn"
        android:layout_width="158dp"
        android:layout_height="63dp"
        android:layout_marginBottom="16dp"
        android:text="SUB"
        android:textSize="25dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.845"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.737" />

    <Button
        android:id="@+id/mulBtn"
        android:layout_width="158dp"
        android:layout_height="63dp"
        android:text="Mul"
        android:textSize="25dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.11"
        app:layout_constraintStart_toStartOf="parent"
```

```
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.889" />

    <Button
        android:id="@+id/div"
        android:layout_width="158dp"
        android:layout_height="63dp"
        android:text="Div"
        android:textSize="25dp"

        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.845"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.857" />

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


```
package com.example.a02_fragment_calculator;

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

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

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    Button Add, sub, multiply, divBtn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

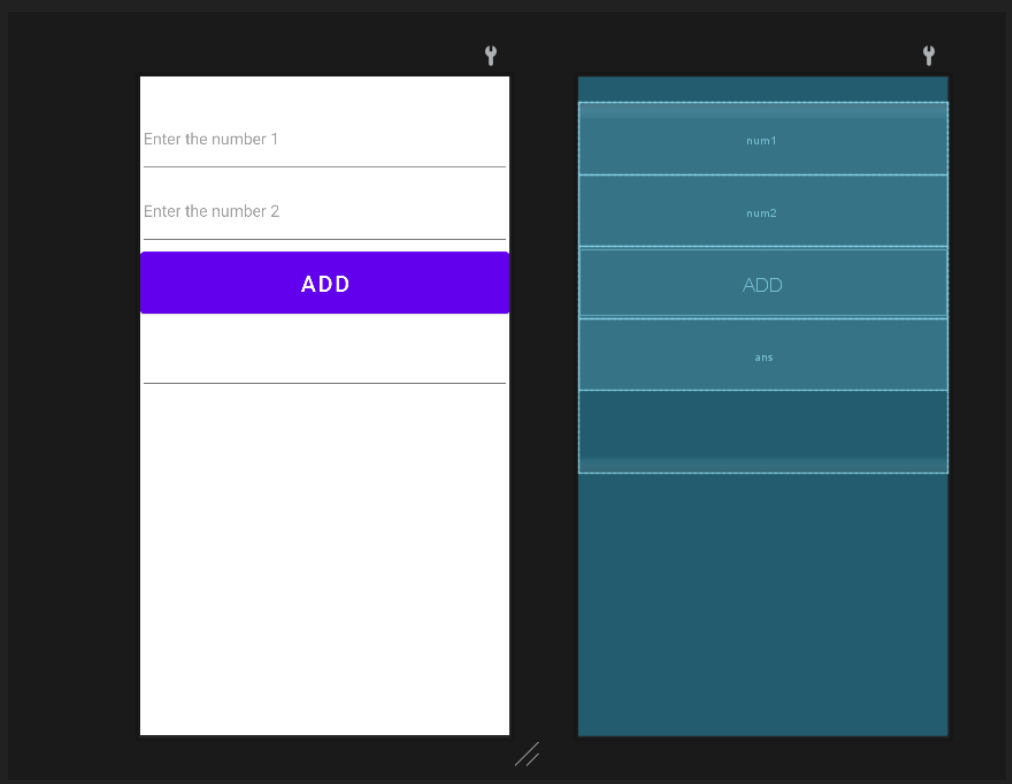
```
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        Add = findViewById(R.id.add);
        sub = findViewById(R.id.subBtn);
        multiply = findViewById(R.id.mulBtn);
        divBtn = findViewById(R.id.div);

        Add.setOnClickListener(this);
        sub.setOnClickListener(this);
        multiply.setOnClickListener(this);
        divBtn.setOnClickListener(this);
    }

    private void TransformFragment(Fragment Fragment) {
        FragmentManager fragmentManager = getSupportFragmentManager();
        FragmentTransaction fragmentTransaction = fragmentManager.beginTransaction();
        fragmentTransaction.replace(R.id.FrameLayout, Fragment).commit();
    }
```

```
    @Override
    public void onClick(View v) {
        if (v == multiply)
            TransformFragment(new Mul());
        else if (v == divBtn)
            TransformFragment(new Div());
        else if (v == Add)
            TransformFragment(new Addition());
        else if (v == sub)
            TransformFragment(new Sub());
    }
}
```

fragment_addition.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="411dp"
    android:orientation="vertical"
    android:layout_marginTop="29dp"
    tools:context=".Addition">

    <EditText
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:id="@+id/num1"
        android:hint="Enter the number 1"/>

    <EditText
        android:id="@+id/num2"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="Enter the number 2" />

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

```
        android:layout_height="80dp"
        android:text="ADD"
        android:textAlignment="center"
        android:textSize="25dp"
        />

    <EditText
        android:id="@+id/ans"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        />

</LinearLayout>
```



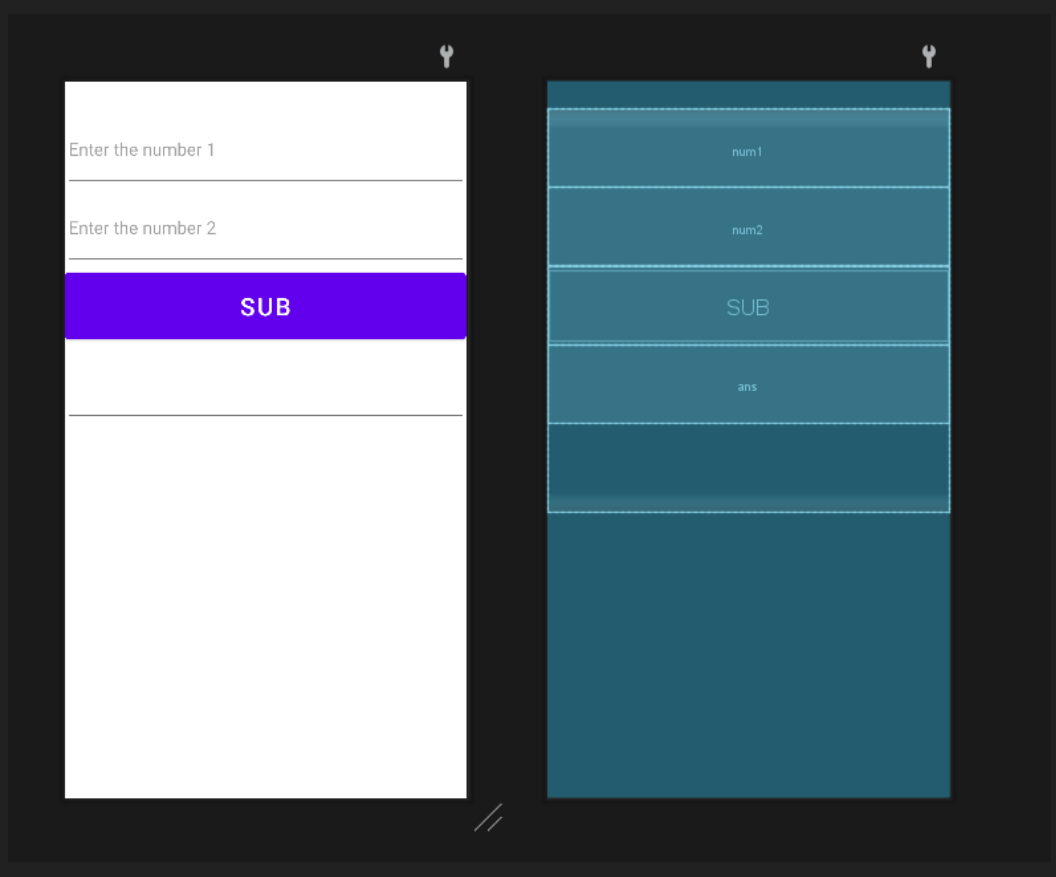
Addition.java

```
package com.example.a02_fragment_calculator;

import android.os.Bundle;

import androidx.fragment.app.Fragment;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;

public class Addition extends Fragment {

    View view;

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        view = inflater.inflate(R.layout.fragment_addition, container, false);

        EditText num1,num2,res;
        Button add;

        num1 = view.findViewById(R.id.num1);
        num2 =view.findViewById(R.id.num2);
```

```
        res = view.findViewById(R.id.ans);

        add = view.findViewById(R.id.addNum);

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

                int numb1 = Integer.parseInt(num1.getText().toString());
                int numb2 = Integer.parseInt(num2.getText().toString());
                res.setText(" " + (numb1 + numb2));
            }
        });
        return view;
    }
}
```

fragment_sub.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="411dp"
    android:orientation="vertical"
    android:layout_marginTop="29dp"
    tools:context=".Sub">

    <EditText
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:id="@+id/num1"
        android:hint="Enter the number 1"/>

    <EditText
        android:id="@+id/num2"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="Enter the number 2" />

    <Button
        android:id="@+id/subNumber"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:text="Sub"
        android:textAlignment="center"
        android:textSize="25dp"
        />

    <EditText
        android:id="@+id/ans"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        />

</LinearLayout>
```



```java
package com.example.a02_fragment_calculator;

import android.os.Bundle;

import androidx.fragment.app.Fragment;

import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.EditText;


public class Sub extends Fragment {

   View view;

    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container,
                             Bundle savedInstanceState) {
        // Inflate the layout for this fragment
        view = inflater.inflate(R.layout.fragment_sub, container, false);

        EditText num1,num2,res;
        Button add;

        num1 = view.findViewById(R.id.num1);
        num2 =view.findViewById(R.id.num2);
        res = view.findViewById(R.id.ans);

        add = view.findViewById(R.id.subNumber);

        add.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int numb1 =Integer.parseInt(num1.getText().toString());
                int numb2 =Integer.parseInt(num2.getText().toString());
                res.setText(" "+(numb1-numb2) );
            }
        });

        return view;
    }
}
```

3. Android App to demonstrate Services using a Simple Audio Player.

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.a03_music_player">

    <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.03_music_player"
        tools:targetApi="31">

----------------------------------------------------
        <service
            android:name=".MyMusic"
            android:enabled="true"
            android:exported="true"></service>
----------------------------------------------------

        <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>
```

activity_main.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"
android:gravity="center"
tools:context=".MainActivity">

<Button
    android:layout_width="250dp"
    android:layout_height="80dp"
    android:text="Start"
    android:id="@+id/startMusic"
    />

<Button
    android:layout_width="250dp"
    android:layout_height="80dp"
    android:layout_margin="50dp"
    android:text="STOP"
    android:id="@+id/stopMusic"/>
```

```
    </LinearLayout>
```

MainActivity.java

```
package com.example.a03_music_player;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
    Button startMusic,stopMusic;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        startMusic = findViewById(R.id.startMusic);
        stopMusic = findViewById(R.id.stopMusic);

        startMusic.setOnClickListener(this);
        stopMusic.setOnClickListener(this);

    }

    @Override
    public void onClick(View v) {
        if(v == startMusic){
            Toast.makeText(this, "Music Started", Toast.LENGTH_LONG).show();
            startService(new Intent(this,MyMusic.class));
        }
        else{
            Toast.makeText(this, "Music Stoped", Toast.LENGTH_LONG).show();
            stopService(new Intent(this,MyMusic.class));
        }
    }
}
```

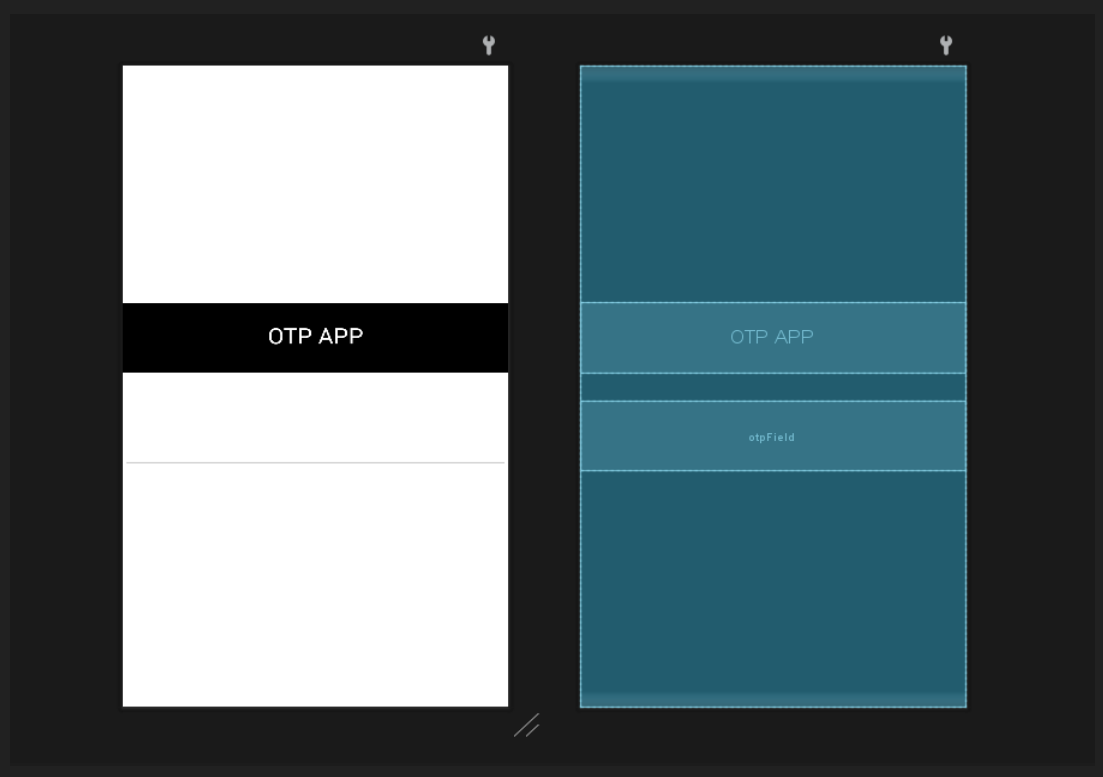
Mymusic.java (Service)

```
package com.example.a03_music_player;

import android.app.Service;
import android.content.Intent;
import android.media.MediaPlayer;
import android.os.IBinder;

public class MyMusic extends Service {
    MediaPlayer mediaPlayer;
    public MyMusic() {
    }

    @Override
    public void onCreate() {
        super.onCreate();
//     mediaPlayer = MediaPlayer.create(this,R.raw.music);
```

```
//        if don't have music audio then choose the default ringtone

        mediaPlayer =MediaPlayer.create(this, Settings.System.DEFAULT_RINGTONE_URI);

        mediaPlayer.setLooping(true);
        mediaPlayer.start();
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        mediaPlayer.stop();
    }

    @Override
    public IBinder onBind(Intent intent) {
        // TODO: Return the communication channel to the service.
        throw new UnsupportedOperationException("Not yet implemented");
    }
}
```

4. Android App to demonstrate Permissions and Broadcast Receivers using OTP and usage of Telephony to trigger an SMS.

```
<?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"
    android:gravity="center"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:text="OTP APP"
        android:textAlignment="center"
        android:background="@color/black"
        android:textColor="@color/white"
        android:textSize="25dp"
        android:padding="20sp"/>

    <EditText
        android:textAlignment="center"
        android:id="@+id/otpField"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:layout_marginTop="30dp"
        android:inputType="number"
        android:padding="25dp" />

</LinearLayout>
```



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.a04_broadcast_otp_sms">

-----------------------------------------------------------------------

    <uses-permission android:name="android.permission.RECEIVE_SMS" />
    <uses-permission android:name="android.permission.READ_SMS" />

-------------------------------------------------------------------------

    <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.04_broadcast_OTP_SMS"
tools:targetApi="31">
<receiver
    android:name=".smsReceiver"
    android:enabled="true"
    android:exported="true">

    <intent-filter>
        <action android:name="android.provider.Telephony.SMS_RECEIVED"/>
    </intent-filter>

</receiver>

<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>
```

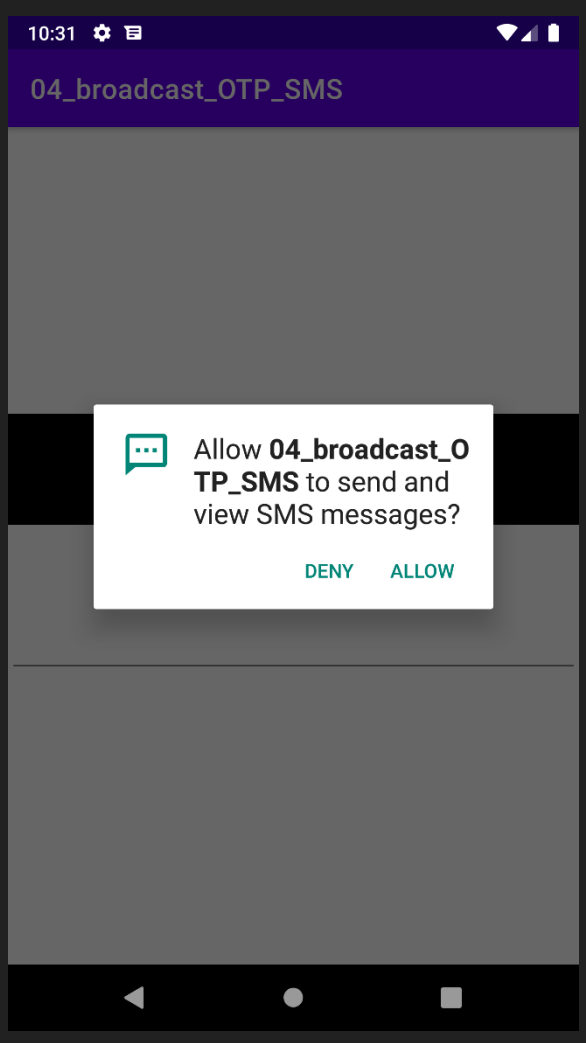
MainActivity.java

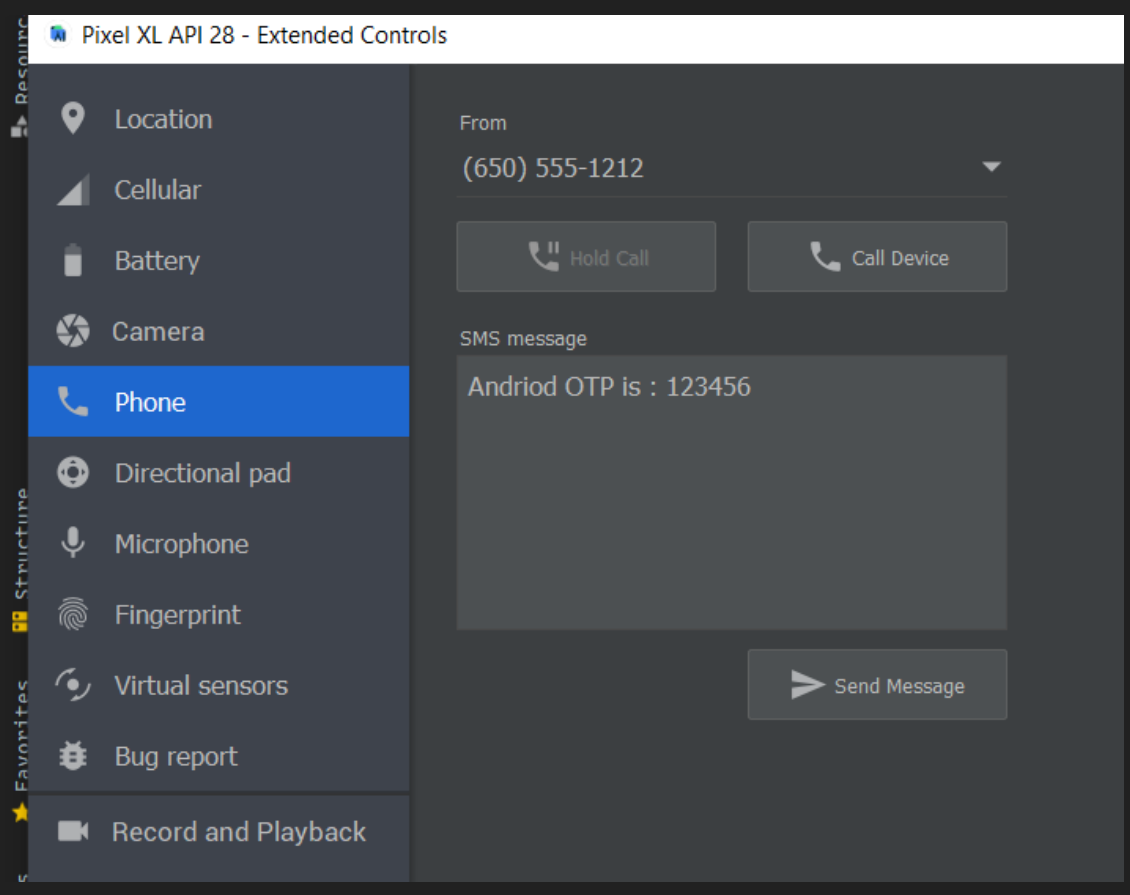
```
package com.example.a04_broadcast_otp_sms;

import androidx.appcompat.app.AppCompatActivity;

import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Build;
import android.os.Bundle;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
    smsReceiver smsReceiver;
    EditText otpView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        smsReceiver = new smsReceiver();

        otpView = findViewById(R.id.otpField);

        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            if (checkSelfPermission(Manifest.permission.RECEIVE_SMS) !=
PackageManager.PERMISSION_GRANTED) {
                requestPermissions(new String[]{Manifest.permission.RECEIVE_SMS,
Manifest.permission.READ_SMS}, 0);
            }
        }

        smsReceiver.setOTPEdit(otpView);
    }
}
```

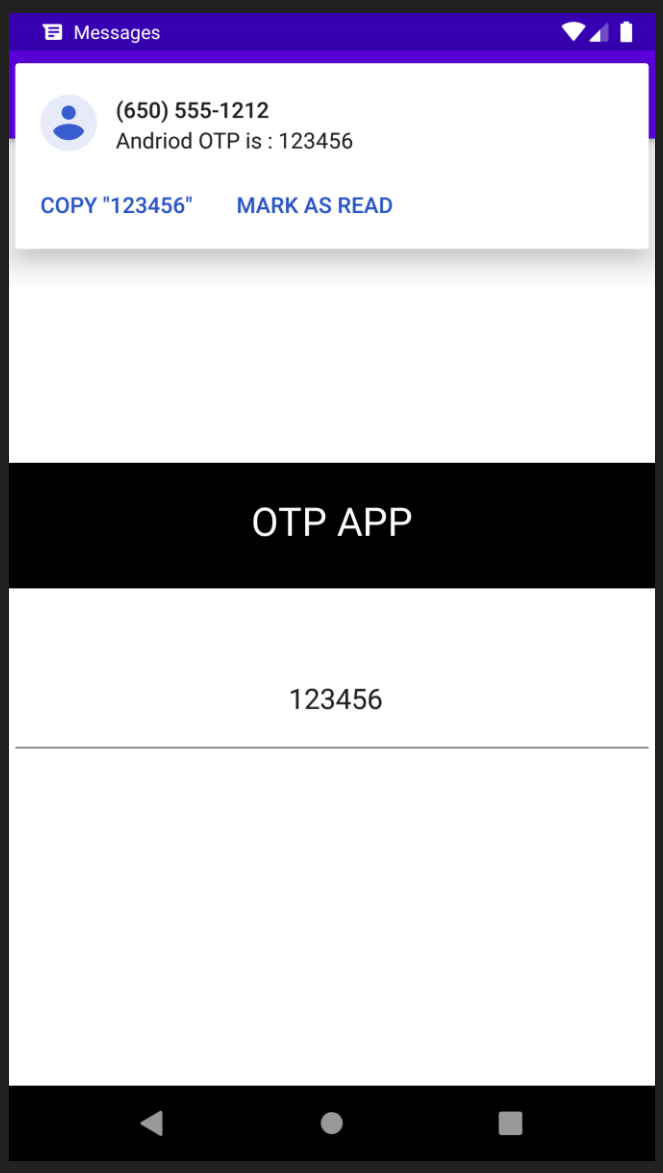
---

smsReceiver.java

```java
package com.example.a04_broadcast_otp_sms;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.provider.Telephony;
import android.telephony.SmsMessage;
import android.widget.EditText;
import android.widget.Toast;

public class smsReceiver extends BroadcastReceiver {
    private static EditText editOTP;

    @Override
    public void onReceive(Context context, Intent intent) {

        SmsMessage[] messages = Telephony.Sms.Intents.getMessagesFromIntent(intent);
        for(SmsMessage smsMessage:messages){
            String smsText = smsMessage.getMessageBody();
            String getOtp = smsText.split(":")[1];
            editOTP.setText(getOtp);
        }
    }

    public void setOTPEdit(EditText otpView) {
        smsReceiver.editOTP = otpView;
    }
}
```

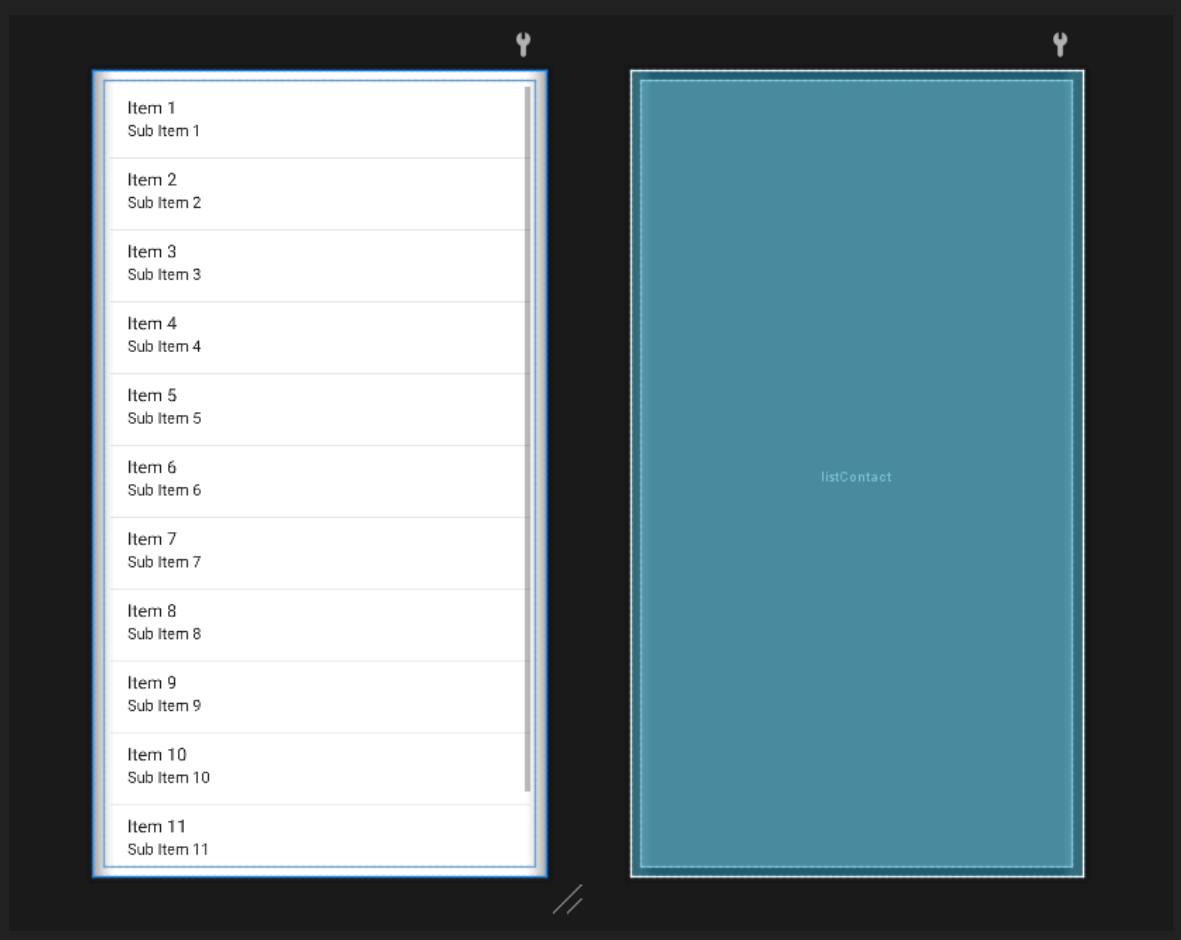





Messages
(650) 555-1212
Andriod OTP is : 123456
COPY "123456"
MARK AS READ
OTP APP
123456

5. Android App to demonstrate Content Providers Consumption using Contacts and the usage of, Menus.

```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"

    tools:context=".MainActivity">

    <ListView
    android:id="@+id/listContact"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_margin="10dp"
    android:padding="5dp"/>

</LinearLayout>
```

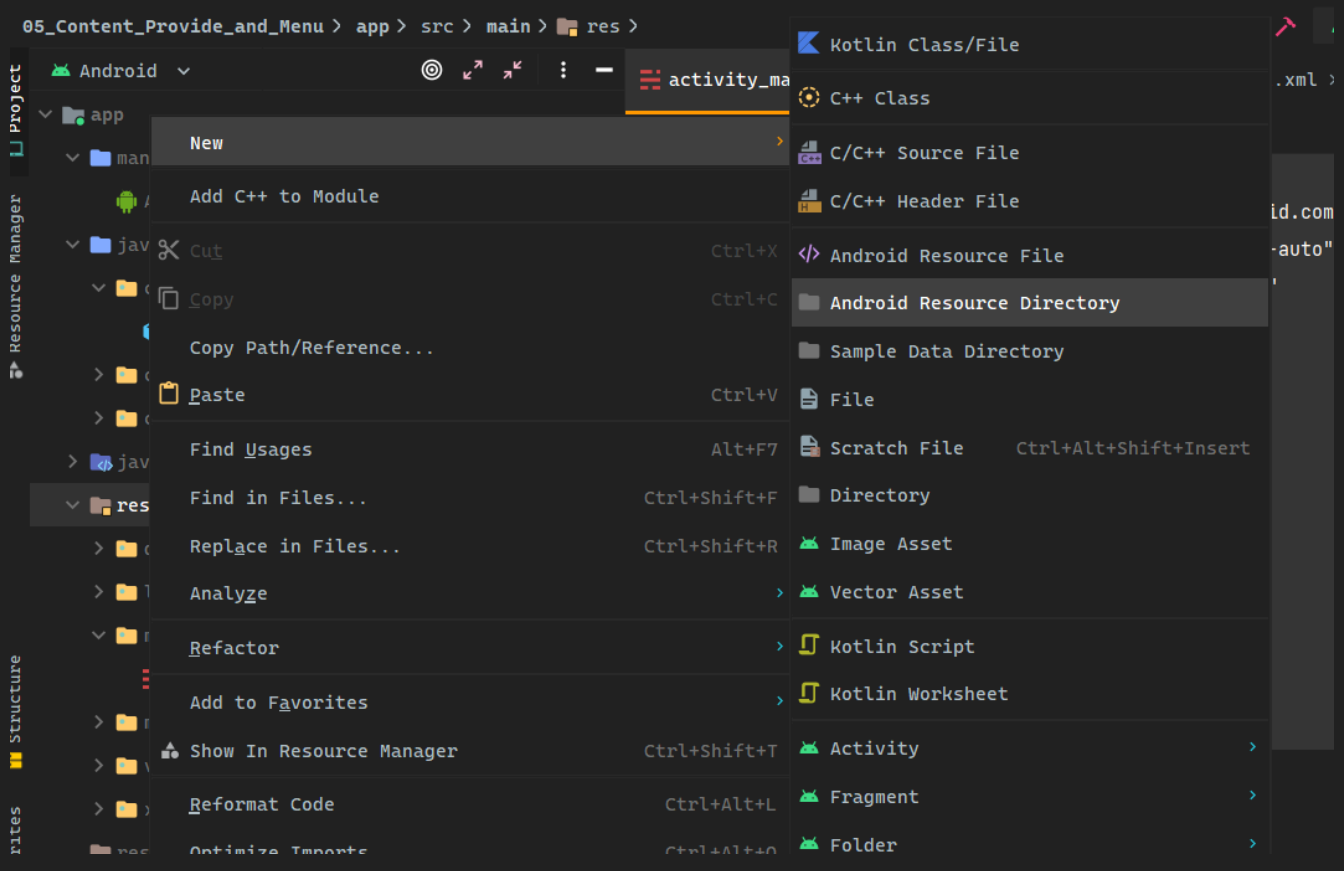


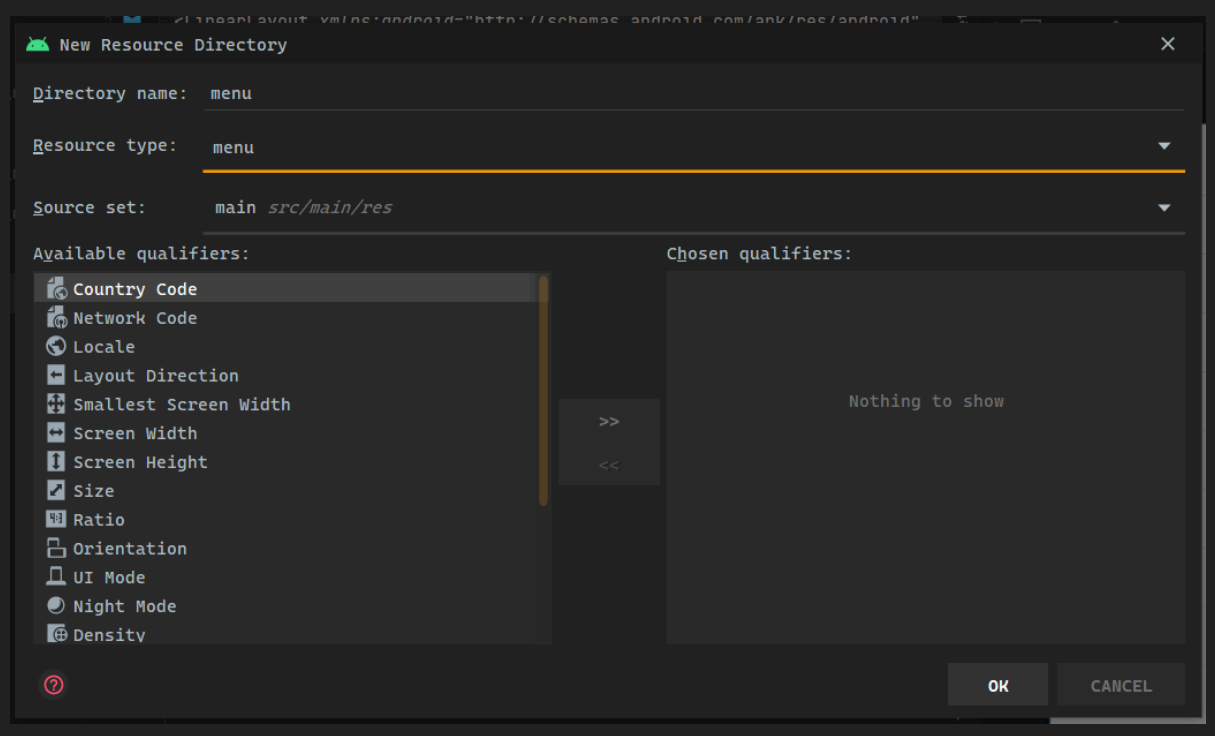

```java
package com.example.a05_content_provide_and_menu;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import android.Manifest;
import android.content.pm.PackageManager;
import android.database.Cursor;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    String contactName, contactNumber;
    ArrayList<String> contacts;
    Cursor cursor;

    ListView contactListview;
```

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

        if (checkSelfPermission(Manifest.permission.READ_CONTACTS) !=
PackageManager.PERMISSION_GRANTED) {
            requestPermissions(new String[]{Manifest.permission.READ_CONTACTS}, 0);
            Toast.makeText(MainActivity.this, "Permision Granted", Toast.LENGTH_LONG).show();
        }
        contactListview = findViewById(R.id.listContact);

    }

    @Override
    protected void onResume() {
        super.onResume();
        display_Contact();
    }

//Step 2 : Adding Menu to app

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

    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        switch (item.getItemId()){
            case R.id.item1:
                Toast.makeText(this, "Item 1 is selected", Toast.LENGTH_LONG).show();
                break;
            case R.id.item2:
                Toast.makeText(this, "Item 2 is Selected", Toast.LENGTH_LONG).show();
                break;
        }
        return super.onOptionsItemSelected(item);
    }

Step 2 : Adding Menu to app ends here


    public void display_Contact() {
        contacts = new ArrayList<String>();
        cursor = getContentResolver().query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI, null,
null, null, null);

        if (cursor.getCount() > 0) {
            while (cursor.moveToNext()) {
                contactName =
cursor.getString(cursor.getColumnIndexOrThrow(ContactsContract.CommonDataKinds.Phone.DISPLAY_NAME));
                contactNumber =
cursor.getString(cursor.getColumnIndexOrThrow(ContactsContract.CommonDataKinds.Phone.NUMBER));

                String contactDetails = contactName + " \t " + contactNumber;
                contacts.add(contactDetails);
            }
        }
        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
android.R.layout.simple_list_item_1, contacts);
        contactListview.setAdapter(adapter);
    }
}
```

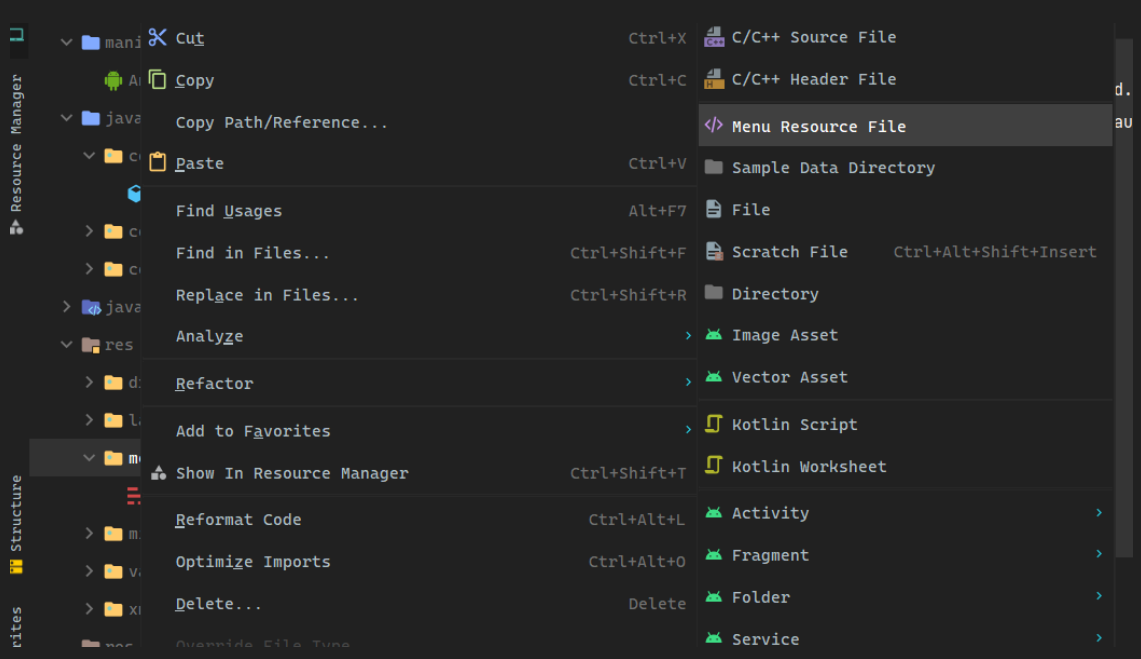
Step2: ADDING MENU TO APP

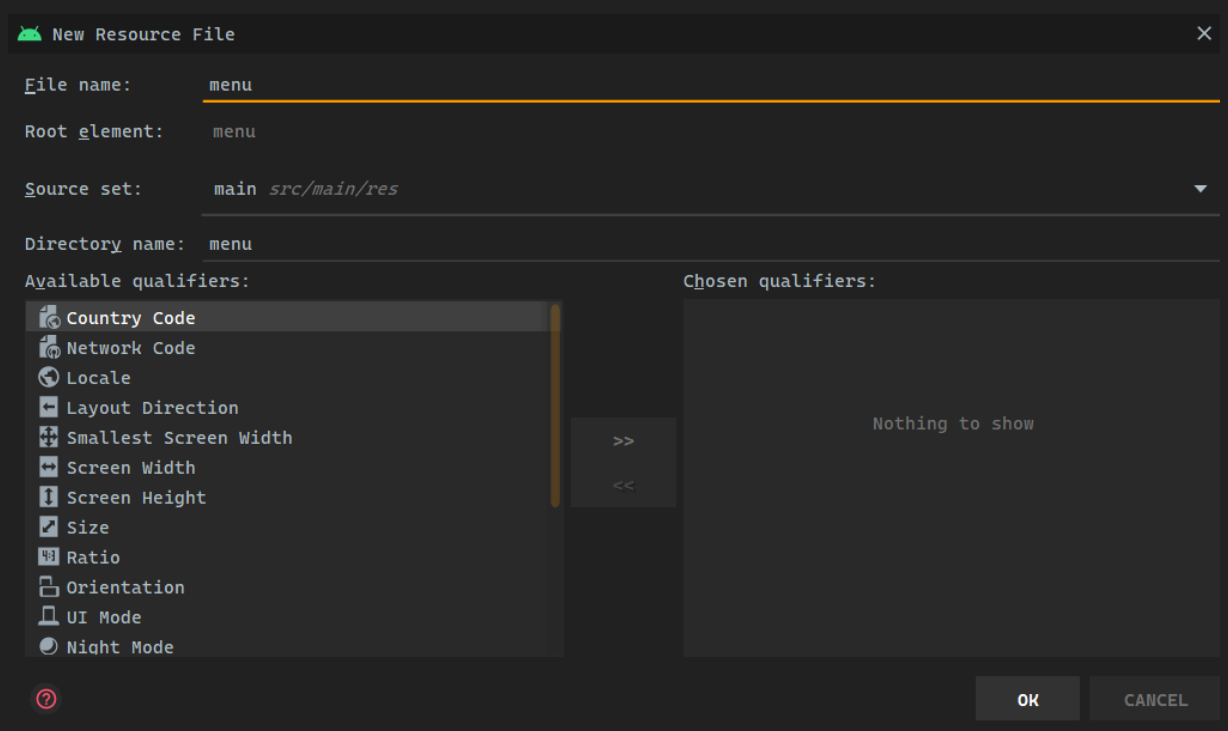
Step1: Create Resource Directory





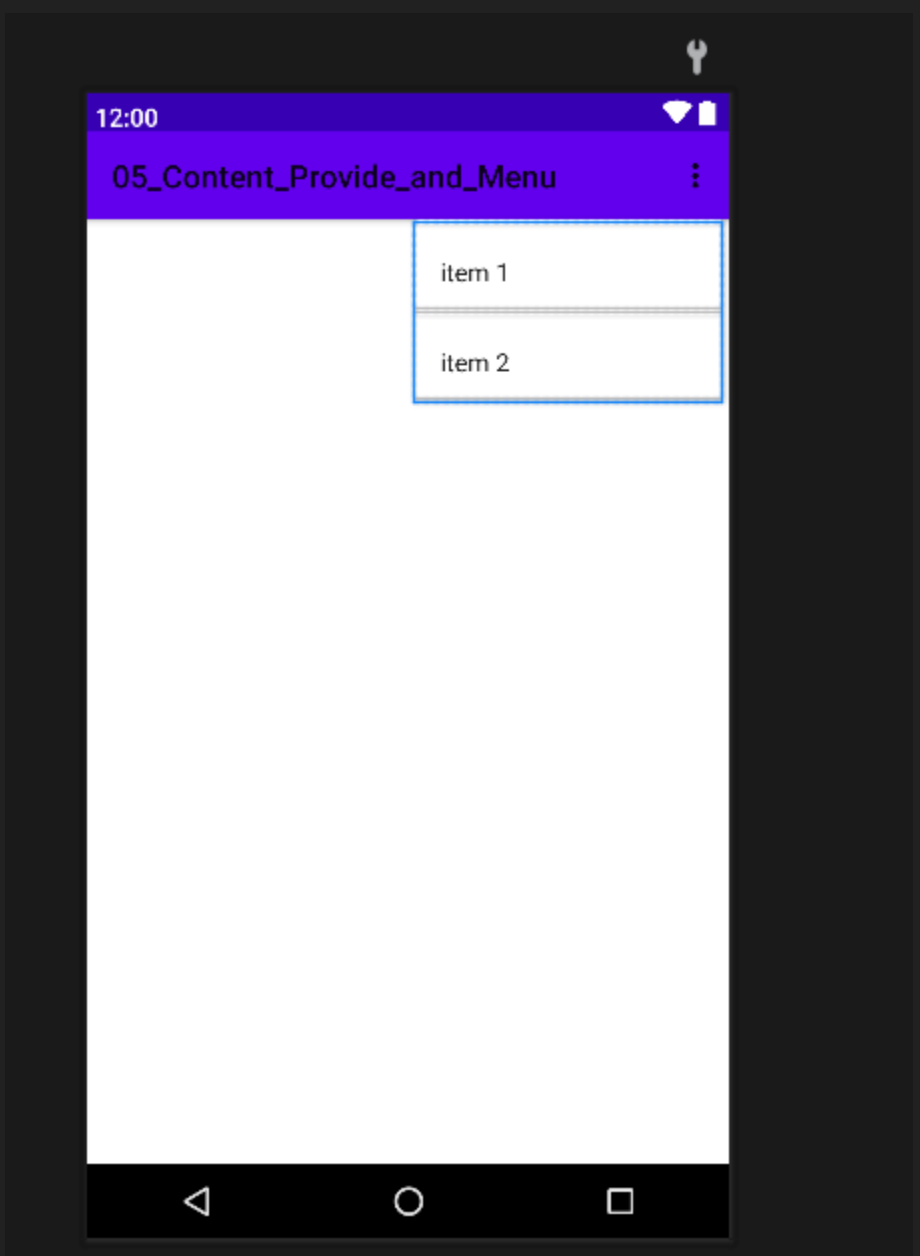
Create Menu Resource File




New Resource File
File name: menu
Root element: menu
Source set: main src/main/res
Directory name: menu
Available qualifiers:
Country Code
Network Code
Locale
Layout Direction
Smallest Screen Width
Screen Width
Screen Height
Size
Ratio
Orientation
UI Mode
Night Mode
>>
<<
Chosen qualifiers:
Nothing to show
OK
CANCEL

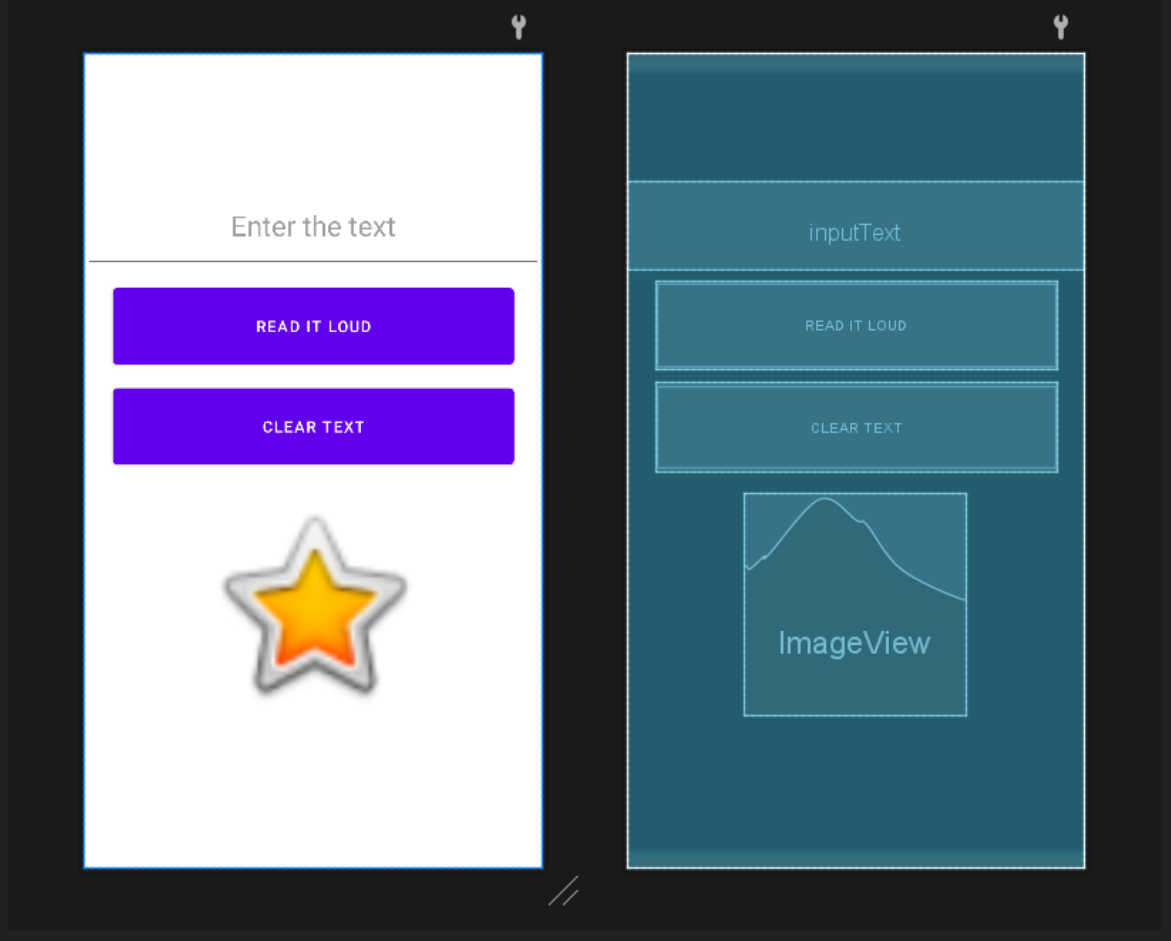
menu.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/item1"
        android:title="item 1" />

    <item
        android:id="@+id/item2"
        android:title="item 2"/>

</menu>
```



6 Android App to demonstrate Text to Speech, Google Speech Recognizer Intent using a Voice Notepad.

```
<?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"
    android:gravity="center"
    tools:context=".MainActivity">

    <EditText
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="Enter the text"
        android:textSize="25dp"
        android:textAlignment="center"
        android:id="@+id/inputText"/>

    <Button
        android:id="@+id/btnSpeak"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:layout_marginTop="10dp"
        android:layout_marginLeft="25dp"
        android:layout_marginRight="25dp"
        android:text="Read it Loud"/>

    <Button
        android:id="@+id/clearBtn"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:layout_marginTop="10dp"
        android:layout_marginLeft="25dp"
        android:layout_marginRight="25dp"
        android:text="Clear text"/>

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:layout_margin="20dp"
        app:srcCompat="@android:drawable/btn_star_big_on" />

</LinearLayout>
```

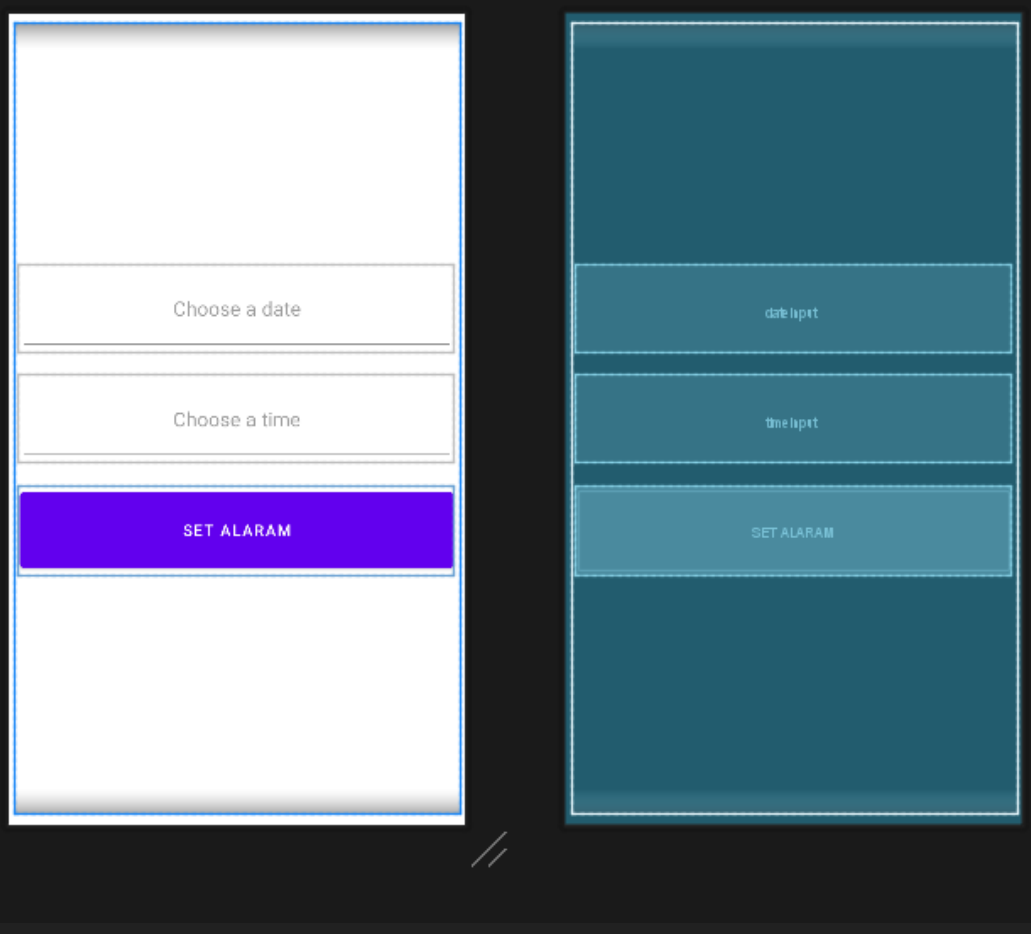

Enter the text
READ IT LOUD
CLEAR TEXT
inputText
READ IT LOUD
CLEAR TEXT
ImageView

```java
package com.example.a06_text_to_speech;

import androidx.annotation.Nullable;
import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.speech.RecognizerIntent;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageView;

import java.util.ArrayList;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {

    private static final int RECOGNIZER_RESULT = 1;
    EditText inputText;
    Button readLoud, clearText;
    TextToSpeech textToSpeech;



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

        inputText = findViewById(R.id.inputText);
        readLoud = findViewById(R.id.btnSpeak);
        clearText = findViewById(R.id.clearBtn);

        imageView = findViewById(R.id.imageView);

        textToSpeech = new TextToSpeech(this, new TextToSpeech.OnInitListener() {
            @Override
            public void onInit(int status) {
                if(status == TextToSpeech.SUCCESS){
                    textToSpeech.setLanguage(Locale.ENGLISH);
                }
            }
        });

        readLoud.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String text = inputText.getText().toString();
                textToSpeech.speak(text,TextToSpeech.QUEUE_FLUSH,null);
            }
        });

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

//        Image View using Google reconizer

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

```
            Intent intent = new Intent(RecognizerIntent.ACTION_RECOGNIZE_SPEECH);
            intent.putExtra(RecognizerIntent.EXTRA_LANGUAGE,Locale.ENGLISH);
            intent.putExtra(RecognizerIntent.EXTRA_PROMPT," Speak Now ");
            startActivityForResult(intent,RECOGNIZER_RESULT);
        }
    });
}

@Override
protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
    super.onActivityResult(requestCode, resultCode, data);

    if(data != null && resultCode == RESULT_OK){
        /*
  ArrayList<String> matches = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS);
  String speechText = matches.get(0);
  inputText.setText("");
  inputText.setText(speechText);
  */

        //            or

        String speechText = data.getStringArrayListExtra(RecognizerIntent.EXTRA_RESULTS).get(0);
            inputText.setText("");
            inputText.setText(speechText);
        }
    }
}
```

8. Android App to demonstrate System Services using Date, Time Pickers and setting an Alarm, with Notification, Ringtone and Vibration.

```
<?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_marginStart="5dp"
    android:layout_marginLeft="5dp"
    android:layout_marginTop="10dp"
    android:layout_marginEnd="5dp"
    android:layout_marginRight="5dp"
    android:layout_marginBottom="10dp"
    android:focusable="false"
    android:gravity="center"
    android:orientation="vertical"
    tools:context=".MainActivity">

  <EditText
      android:id="@+id/dateInput"
      android:layout_width="match_parent"
      android:layout_height="80dp"
      android:layout_marginStart="5dp"
      android:layout_marginLeft="5dp"
      android:layout_marginTop="10dp"
      android:layout_marginEnd="5dp"
      android:layout_marginRight="5dp"
      android:layout_marginBottom="10dp"
      android:focusable="false"
      android:hint="Choose a date"
      android:inputType="date"
      android:textAlignment="center" />

    <EditText
      android:id="@+id/timeInput"
      android:layout_width="match_parent"
      android:layout_height="80dp"
      android:layout_marginStart="5dp"
      android:layout_marginLeft="5dp"
      android:layout_marginTop="10dp"
      android:layout_marginEnd="5dp"
      android:layout_marginRight="5dp"
      android:layout_marginBottom="10dp"
      android:focusable="false"
      android:hint="Choose a time"
      android:inputType="time"
      android:textAlignment="center" />

  <Button
      android:id="@+id/alramBtn"
      android:layout_width="match_parent"
      android:layout_height="80dp"
      android:layout_marginStart="5dp"
      android:layout_marginLeft="5dp"
      android:layout_marginTop="10dp"
      android:layout_marginEnd="5dp"
      android:layout_marginRight="5dp"
      android:layout_marginBottom="10dp"

      android:text="Set Alaram" />

</LinearLayout>
```



AndroidManifest.xml

```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.a07_alram_menu">

    <uses-permission android:name="android.permission.VIBRATE" />

    <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.07_alram_menu"
        tools:targetApi="31">
        <receiver
            android:name=".alaramReceiver"
            android:enabled="true"
            android:exported="true"></receiver>

        <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>
```

MainActivity.java

```java
package com.example.a07_alram_menu;

import androidx.appcompat.app.AppCompatActivity;

import android.app.AlarmManager;
import android.app.DatePickerDialog;
import android.app.PendingIntent;
import android.app.TimePickerDialog;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.DatePicker;
import android.widget.EditText;
import android.widget.TimePicker;
import android.widget.Toast;

import java.text.SimpleDateFormat;
import java.util.Calendar;

public class MainActivity extends AppCompatActivity {

    EditText dateText, timeText;
    Button alarmButton;

    DatePickerDialog datePickerDialog;
    TimePickerDialog timePickerDialog;

    Calendar calendar, calendarAlram;

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

        dateText = findViewById(R.id.dateInput);
        timeText = findViewById(R.id.timeInput);
        alarmButton = findViewById(R.id.alramBtn);

        calendar = Calendar.getInstance();
        calendarAlram = Calendar.getInstance();

        dateText.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int year = calendar.get(Calendar.YEAR);
                int month = calendar.get(Calendar.MONTH);
                int day = calendar.get(Calendar.DAY_OF_MONTH);

                datePickerDialog = new DatePickerDialog(MainActivity.this, new
DatePickerDialog.OnDateSetListener() {
                    @Override
                    public void onDateSet(DatePicker view, int year, int month, int dayOfMonth) {
                        calendarAlram.set(Calendar.DAY_OF_MONTH, dayOfMonth);
                        calendarAlram.set(Calendar.MONTH, month);
                        calendarAlram.set(Calendar.YEAR, year);

                        SimpleDateFormat dateFormat = new SimpleDateFormat("dd-MM-yyyy");
                        dateText.setText(dateFormat.format(calendarAlram.getTime()));
                    }
                }, year, month, day);
                datePickerDialog.show();
            }
        });

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

```
            @Override
            public void onClick(View v) {
                int hour = calendar.get(Calendar.HOUR_OF_DAY);
                int min = calendar.get(Calendar.MINUTE);

                timePickerDialog = new TimePickerDialog(MainActivity.this, new
TimePickerDialog.OnTimeSetListener() {
                    @Override
                    public void onTimeSet(TimePicker view, int hourOfDay, int minute) {
                        calendarAlram.set(Calendar.HOUR_OF_DAY,hourOfDay);
                        calendarAlram.set(Calendar.MINUTE,minute);

                        SimpleDateFormat timeFormat = new SimpleDateFormat("hh:mm aa");

                        timeText.setText(timeFormat.format(calendarAlram.getTime()));
                    }
                }, hour, min, false);
                timePickerDialog.show();
            }
        });

        alarmButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(MainActivity.this,alaramReceiver.class);
                PendingIntent pendingIntent =
PendingIntent.getBroadcast(MainActivity.this,123,intent,PendingIntent.FLAG_UPDATE_CURRENT);

                AlarmManager alarmManager = (AlarmManager) getSystemService(ALARM_SERVICE);

alarmManager.set(AlarmManager.RTC_WAKEUP,calendarAlram.getTimeInMillis(),pendingIntent);
                Toast.makeText(MainActivity.this,"Alarm set
"+calendarAlram.getTime().toString(),Toast.LENGTH_LONG).show();
            }
        });
    }

}
```

alaramReceiver.java

```
package com.example.a07_alram_menu;

import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.media.MediaPlayer;
import android.media.RingtoneManager;
import android.net.Uri;
import android.os.Build;
import android.os.VibrationEffect;
import android.os.Vibrator;
import android.provider.Settings;
import android.widget.Toast;

import androidx.core.app.NotificationCompat;

public class alaramReceiver extends BroadcastReceiver {
    Vibrator vibrator;
    NotificationManager notificationManager;

    @Override
    public void onReceive(Context context, Intent intent) {
```

```
        Toast.makeText(context, "Alarm is Set up", Toast.LENGTH_LONG).show();

//        Vibration
        vibrator = (Vibrator) context.getSystemService(Context.VIBRATOR_SERVICE);
        if(Build.VERSION.SDK_INT >= Build.VERSION_CODES.O)
            vibrator.vibrate(VibrationEffect.createOneShot(2000, VibrationEffect.DEFAULT_AMPLITUDE));
        else{
            vibrator.vibrate(5000);
        }

//        RingTone play
        Uri ringtoneUri = RingtoneManager.getDefaultUri(RingtoneManager.TYPE_ALARM);
        MediaPlayer mp = MediaPlayer.create(context, ringtoneUri);
        mp.start();

//        Notification
        notificationManager = (NotificationManager)
context.getSystemService(Context.NOTIFICATION_SERVICE);
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            NotificationChannel channel = new NotificationChannel("MYChannel", "Reminders",
NotificationManager.IMPORTANCE_HIGH);
            notificationManager.createNotificationChannel(channel);
        }
        Intent i = new Intent(Intent.ACTION_VIEW);
        i.setData(Uri.parse("www.google.com"));
        PendingIntent pendingIntent = PendingIntent.getActivity(context, 123, i, 0);

        NotificationCompat.Builder builder = new NotificationCompat.Builder(context, "MYChannel");
        builder.setSmallIcon(android.R.drawable.alert_dark_frame)
                .setContentTitle("My notification")
                .setContentText("Alram Notification")
                .setPriority(NotificationCompat.PRIORITY_HIGH)
                .setAutoCancel(true)
                .setContentIntent(pendingIntent)
                .setDefaults(Notification.DEFAULT_VIBRATE)
                .setSound(ringtoneUri);


        notificationManager.notify(546, builder.build());
//        throw new UnsupportedOperationException("Not yet implemented");
    }
}
```

9. Android App to find the Location of the Phone using GPS

Incomplete

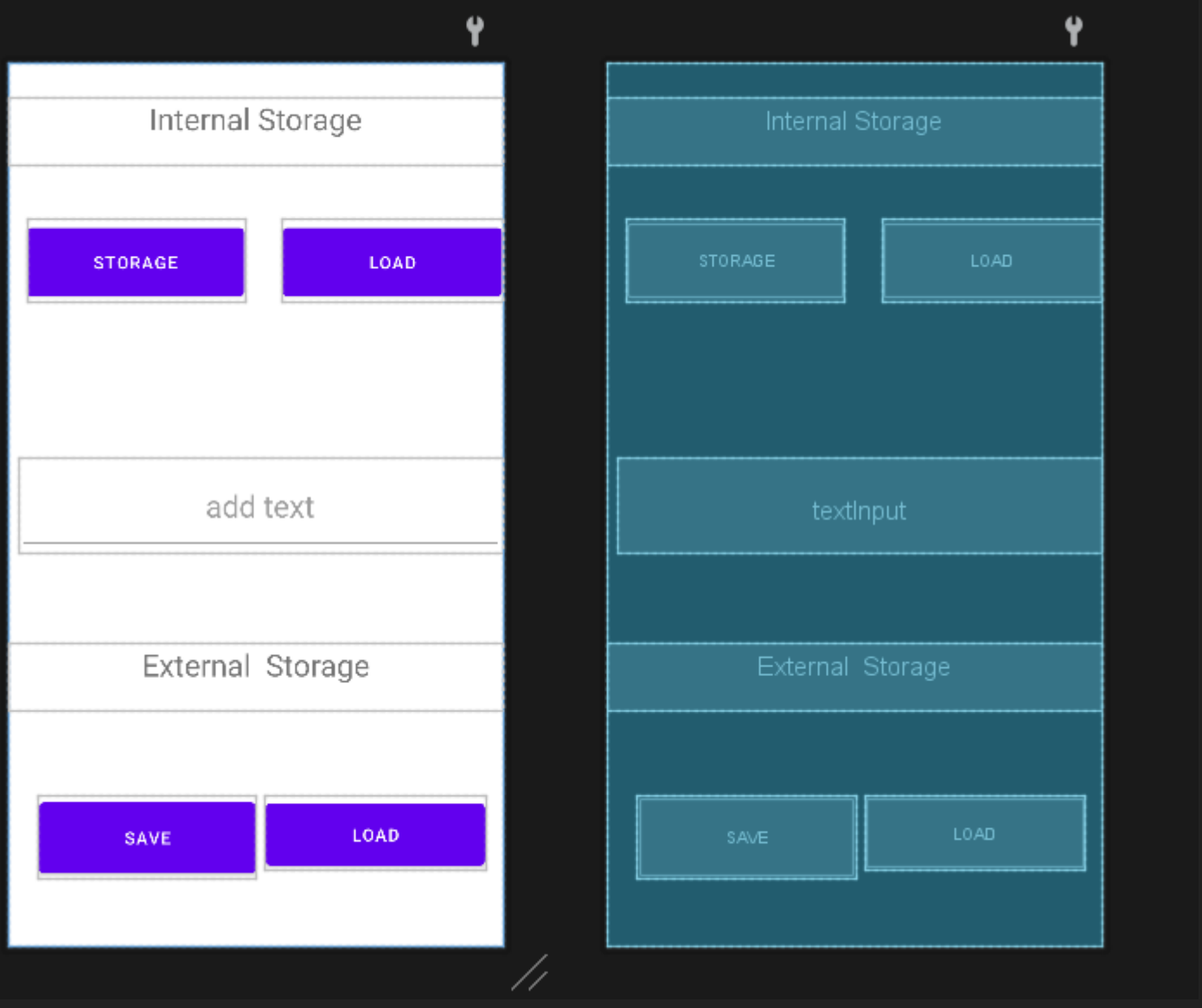
9 Android App to demonstrate Drawer View, Images, audio, video and using the Camera of the Phone

Incomplete

10. Android App to demonstrate the usage of Internal & External Storage of the Phone.

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">


    <Button
        android:id="@+id/exLoad"
        android:layout_width="182dp"
        android:layout_height="63dp"
        android:text="Load"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.933"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.907" />

    <Button
        android:id="@+id/exStore"
        android:layout_width="180dp"
        android:layout_height="70dp"
        android:text="Save"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.112"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.916" />

    <Button
        android:id="@+id/InterStore"
        android:layout_width="180dp"
        android:layout_height="68dp"
        android:text="Storage"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.069"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.196" />

    <Button
        android:id="@+id/interLoad"
        android:layout_width="182dp"
        android:layout_height="68dp"
        android:layout_marginStart="228dp"
        android:text="Load"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.196" />
```

```
    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="56dp"
        android:text="External  Storage"
        android:textAlignment="center"
        android:textSize="25dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.711"
        tools:layout_editor_absoluteX="0dp" />

    <EditText
        android:id="@+id/textInput"
        android:layout_width="402dp"
        android:layout_height="79dp"
        android:textAlignment="center"
        android:textSize="25dp"
        android:hint="add text"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        tools:layout_editor_absoluteX="9dp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="match_parent"
        android:layout_height="56dp"
        android:text="Internal Storage"
        android:textAlignment="center"
        android:textSize="25dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.042"
        tools:layout_editor_absoluteX="16dp" />

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


Internal Storage
STORAGE
LOAD
add text
External Storage
SAVE
LOAD
Internal Storage
STORAGE
LOAD
textInput
External Storage
SAVE
LOAD

```java
package com.example.a10_internal_and_extenal;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

import android.Manifest;
import android.content.Context;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStreamReader;

public class MainActivity extends AppCompatActivity {
    Button internalSave, internalLoad, externalSave, externalLoad;
    EditText inputText;

    String INTERNAL_FILE = "Internal.txt";

    String EXTERNAL_FILE = "External.txt";
    String FILE_PATH = "Mydir";



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

        inputText = findViewById(R.id.textInput);

        internalSave = findViewById(R.id.InterStore);
        internalLoad = findViewById(R.id.interLoad);

        externalLoad = findViewById(R.id.exLoad);
        externalSave = findViewById(R.id.exStore);

//        Internal Storage location
//        /data/data/com.example.a10_internal_and_extenal/files/Internal.txt
        internalSave.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String text = inputText.getText().toString();
                try {
                    FileOutputStream fileOutputStream = openFileOutput(INTERNAL_FILE, MODE_PRIVATE);
                    fileOutputStream.write(text.getBytes());
                    inputText.getText().clear();
                    Toast.makeText(MainActivity.this, "Saved", Toast.LENGTH_LONG).show();
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
        });

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

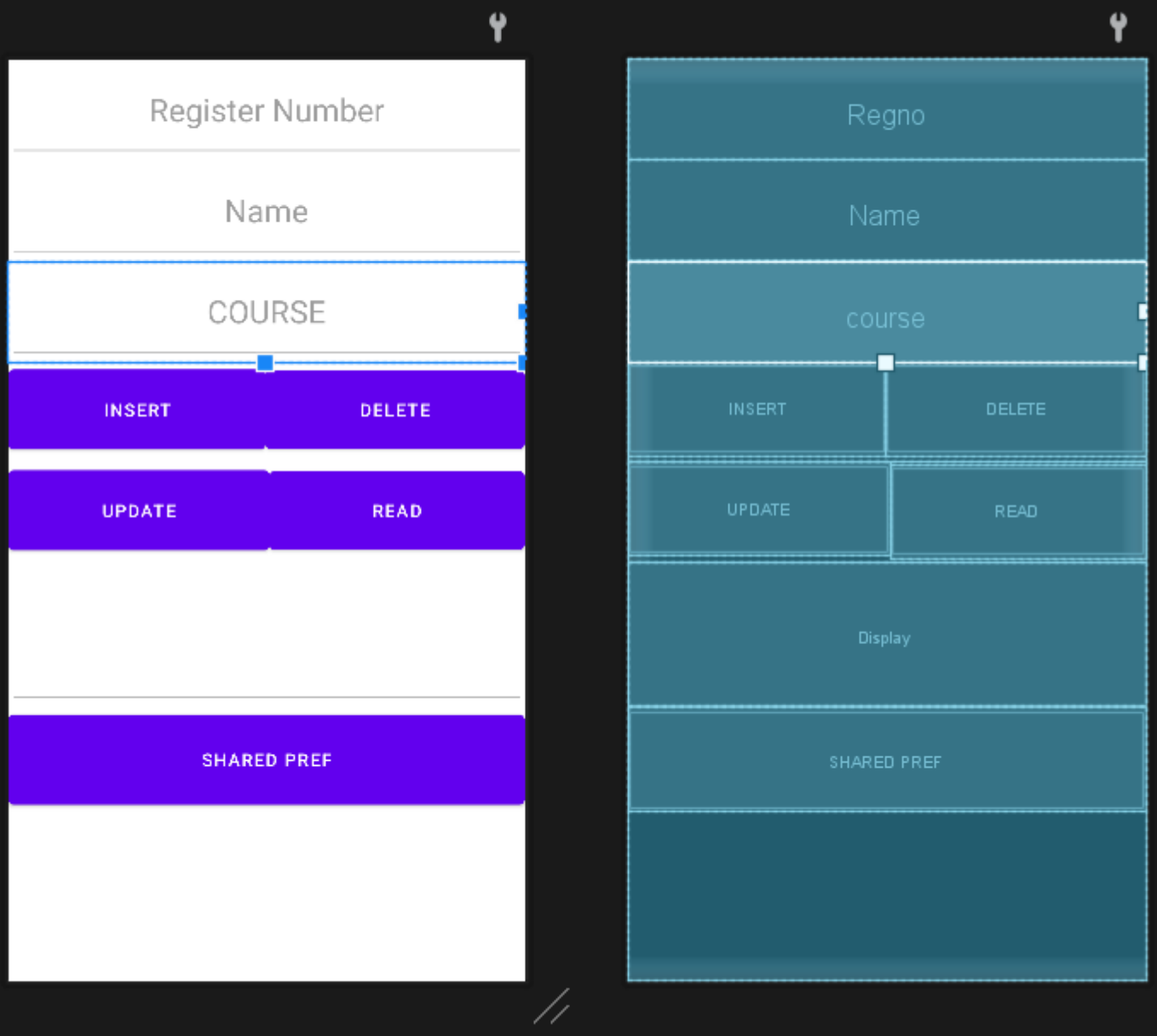
```
            try {
                FileInputStream fileInputStream = openFileInput(INTERNAL_FILE);
                InputStreamReader inputStreamReader = new InputStreamReader(fileInputStream);
                BufferedReader bufferedReader = new BufferedReader(inputStreamReader);
                String text = "";
                StringBuilder builderText = new StringBuilder();
                while ((text = bufferedReader.readLine()) != null) {
                    builderText.append(text);
                }
                inputText.setText(builderText.toString());
            } catch (FileNotFoundException e) {
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
            }
        }
    });

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

            if (checkSelfPermission(Manifest.permission.WRITE_EXTERNAL_STORAGE) !=
PackageManager.PERMISSION_GRANTED) {
                requestPermissions(new String[]{Manifest.permission.WRITE_EXTERNAL_STORAGE,
Manifest.permission.READ_EXTERNAL_STORAGE}, 123);
            }

            File file = new File(getExternalFilesDir(FILE_PATH), EXTERNAL_FILE);

            String text = inputText.getText().toString();
            FileOutputStream fileOutputStream = null;
            try {
                fileOutputStream = new FileOutputStream(file);
                fileOutputStream.write(text.getBytes());
                inputText.getText().clear();
                Toast.makeText(MainActivity.this, "Saved", Toast.LENGTH_LONG).show();
            } catch (FileNotFoundException e) {
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
            }
        }
    });

    externalLoad.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            if (ContextCompat.checkSelfPermission(MainActivity.this,
(Manifest.permission.READ_EXTERNAL_STORAGE)) != PackageManager.PERMISSION_GRANTED) {
                ActivityCompat.requestPermissions(MainActivity.this, new
String[]{Manifest.permission.READ_EXTERNAL_STORAGE,Manifest.permission.WRITE_EXTERNAL_STORAGE,}, 0);
            }
            File file = new File(getExternalFilesDir(FILE_PATH), EXTERNAL_FILE);

            FileInputStream fileInputStream = null;
            try {
                fileInputStream = new FileInputStream(file);
                InputStreamReader inputStreamReader = new InputStreamReader(fileInputStream);
                BufferedReader bufferedReader = new BufferedReader(inputStreamReader);
                String text = "";
                StringBuilder builderText = new StringBuilder();
                while ((text = bufferedReader.readLine()) != null) {
                    builderText.append(text);
                }
                inputText.setText(builderText.toString());
            } catch (FileNotFoundException e) {
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
```

```
                }
            }
        });
    }
}
```

11 Android App to demonstrate the use of Shared Preferences & SQLite by performing CRUD operations.

```
<?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/Regno"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="Register Number"
        android:textAlignment="center"
        android:textSize="25dp"/>

    <EditText
        android:id="@+id/Name"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="Name"
        android:textAlignment="center"
        android:textSize="25dp"/>

    <EditText
        android:id="@+id/course"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:hint="COURSE"
        android:textAlignment="center"
        android:textSize="25dp"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:orientation="horizontal">

        <Button
            android:id="@+id/Insert"
            android:layout_width="wrap_content"
            android:layout_height="75dp"
            android:layout_weight="1"
            android:text="Insert" />

        <Button
            android:id="@+id/DELETE"
            android:layout_width="wrap_content"
            android:layout_height="74dp"
            android:layout_weight="1"
            android:text="DELETE" />
    </LinearLayout>
```

```
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="80dp"
    android:orientation="horizontal">

    <Button
        android:id="@+id/UPDATE"
        android:layout_width="wrap_content"
        android:layout_height="75dp"
        android:layout_weight="1"
        android:text="UPDATE" />

    <Button
        android:id="@+id/READ"
        android:layout_width="wrap_content"
        android:layout_height="74dp"
        android:layout_weight="1"
        android:text="READ" />

    </LinearLayout>

    <EditText
        android:id="@+id/Display"
        android:layout_width="match_parent"
        android:layout_height="114dp"
        android:ems="10"
        android:gravity="start|top"
        android:inputType="textMultiLine" />

    <Button
        android:id="@+id/SharedPref"
        android:layout_width="match_parent"
        android:layout_height="83dp"
        android:text="SHARED Pref" />


</LinearLayout>
```


Register Number
Name
COURSE
INSERT
DELETE
UPDATE
READ
SHARED PREF
Regno
Name
course
INSERT
DELETE
UPDATE
READ
Display
SHARED PREF

MainActivity.java

```java
package com.example.a11_shared_sqlite;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.content.SharedPreferences;
import android.database.Cursor;
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 {

    Button PrefanceButton;
    SharedPreferences sharedPreferences;
    public static final String SHARED_PREF_NAME = "My_Pref";
    public static final String KEY_REG_NO = "REG_NO";
    public static final String KEY_NAME = "name";


    Button insert, delete, update, read;
    EditText regno, name, course;

    EditText multi;

    dbHelper dbHelper;

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

        dbHelper = new dbHelper(this);

        regno = findViewById(R.id.Regno);
        name = findViewById(R.id.Name);
        course = findViewById(R.id.course);

        multi = findViewById(R.id.Display);

        insert = findViewById(R.id.Insert);
        delete = findViewById(R.id.DELETE);
        update = findViewById(R.id.UPDATE);
        read = findViewById(R.id.READ);

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

                Boolean data = dbHelper.insert(regno.getText().toString(),
name.getText().toString(), course.getText().toString());
                if (data) {
                    Toast.makeText(MainActivity.this, "Inserted",
Toast.LENGTH_SHORT).show();
                }
```

```
            }
        });

        delete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                int num = Integer.parseInt(regno.getText().toString());
                dbHelper.Delete(num);
            }
        });

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

                long result = dbHelper.Update(regno.getText().toString(),
name.getText().toString(), course.getText().toString());

                if (result == -1) {
                    Toast.makeText(MainActivity.this, "Not Updated",
Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(MainActivity.this, "Updated",
Toast.LENGTH_SHORT).show();
                }
            }
        });

        read.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Cursor cursor = dbHelper.fetch();
                String result = " ";
                if (cursor.moveToFirst()) {
                    do {
                        String RegNum =
cursor.getString(cursor.getColumnIndexOrThrow("RegisterNumber"));
                        String name =
cursor.getString(cursor.getColumnIndexOrThrow("Username"));
                        String course =
cursor.getString(cursor.getColumnIndexOrThrow("Course"));
                        String answer = RegNum + " " + name + " " + course + "\n";
                        result = result + " " + answer;
                    } while (cursor.moveToNext());
                }
                multi.setText(result);
            }
        });

//        Shared Pref Logic
        PrefanceButton = findViewById(R.id.SharedPref);

        sharedPreferences = getSharedPreferences(SHARED_PREF_NAME,MODE_PRIVATE);

        PrefanceButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String studentRegno = regno.getText().toString();
                String studentName = name.getText().toString();
```

```
                SharedPreferences.Editor editor = sharedPreferences.edit();
                editor.putString(KEY_REG_NO,studentRegno);
                editor.putString(KEY_NAME,studentName);
                editor.commit();
                editor.apply();
                Intent intent = new Intent(MainActivity.this,Second.class);
                startActivity(intent);
            }
        });

    }
}
```

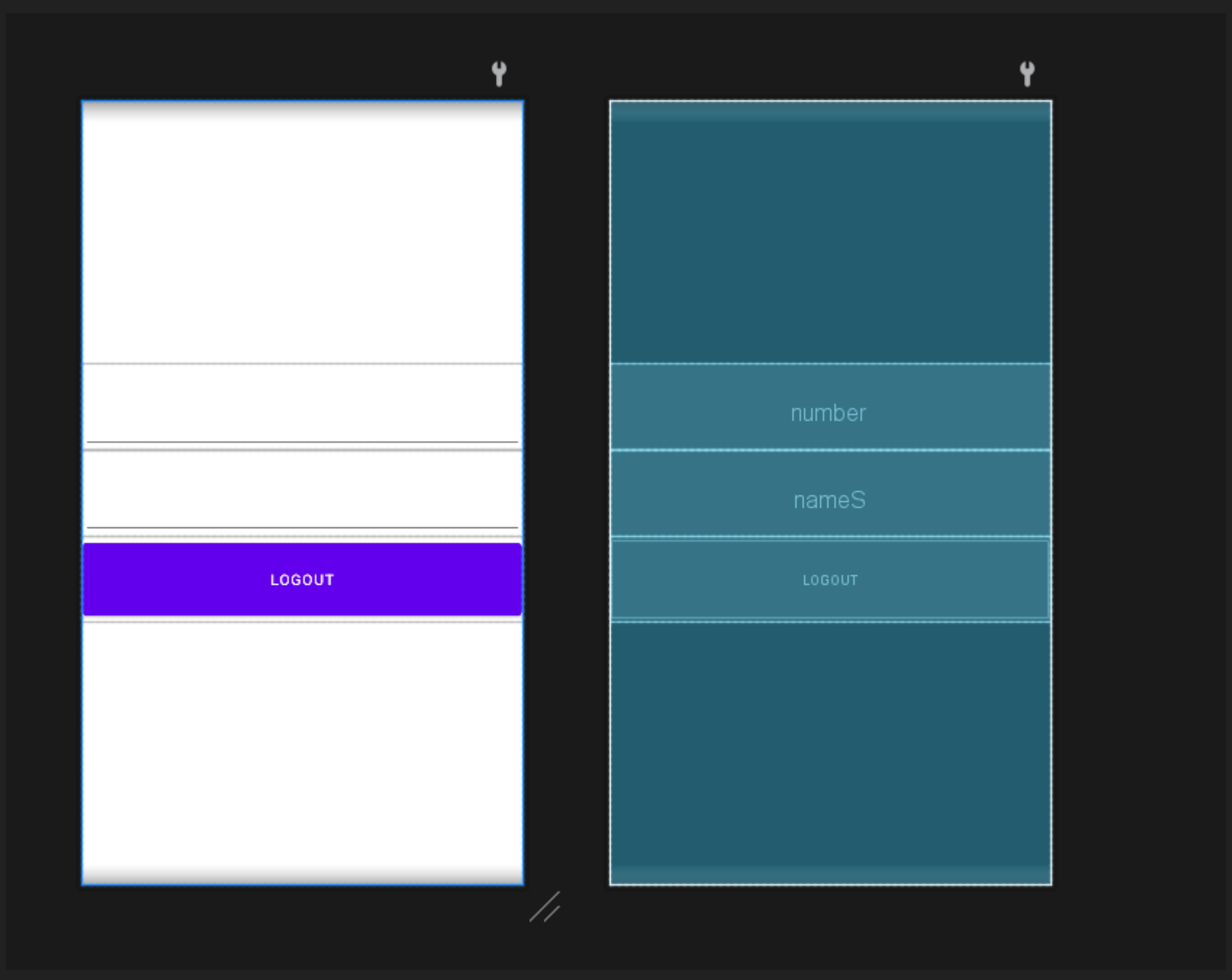
dbHelper.java

```
package com.example.a11_shared_sqlite;

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

import androidx.annotation.Nullable;

public class dbHelper extends SQLiteOpenHelper {

    public static final String DATABASE = "STUDENT.DB";
    public static final int VERSION = 5;

    public dbHelper(@Nullable Context context) {
        super(context, DATABASE, null, VERSION);
    }

    @Override
    public void onCreate(SQLiteDatabase db) {
        String query = "create table Std (RegisterNumber text  ," +
                "Username text , " +
                " Course text) ";
        db.execSQL(query);

    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
        db.execSQL("drop table if exists Std");
        onCreate(db);
    }

    public boolean insert(String regNo,String userName,String course){
        ContentValues contentValues = new ContentValues();
        SQLiteDatabase db = getWritableDatabase();
        contentValues.put("RegisterNumber", regNo);
        contentValues.put("Username", userName);
        contentValues.put("Course", course);

        long r = db.insert("Std", null, contentValues);
        if (r == -1) {
            return false;
        } else {
            return true;
        }
    }

    public long Update(String regNo, String userName, String course) {
        ContentValues contentValues = new ContentValues();
        SQLiteDatabase db = getWritableDatabase();
        contentValues.put("RegisterNumber", regNo);
//        contentValues.put("Username", userName);
        contentValues.put("Course", course);
        int result = db.update("Std", contentValues, "RegisterNumber=" + regNo,null);
```

```
        return  result;
    }

    public Cursor fetch(){

        SQLiteDatabase db = getWritableDatabase();
        String colums[] = new String[]{"RegisterNumber","Username","Course"};
        Cursor cursor = db.query("std",colums,null,null,null,null,null);
        if (cursor != null){
            cursor.moveToFirst();
        }
        return cursor;
    }

    public void Delete(long _id){
        SQLiteDatabase db = getWritableDatabase();
        db.delete("std","RegisterNumber = " +_id,null);
    }


}
```

activity_second.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:gravity="center"
    android:orientation="vertical"
    tools:context=".Second">

    <EditText
        android:id="@+id/number"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:textAlignment="center"
        android:textSize="25dp"/>
    <EditText
        android:id="@+id/nameS"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:textAlignment="center"
        android:textSize="25dp"/>

    <Button
        android:id="@+id/logout"
        android:layout_width="match_parent"
        android:layout_height="80dp"
        android:text="Logout"/>

</LinearLayout>
```

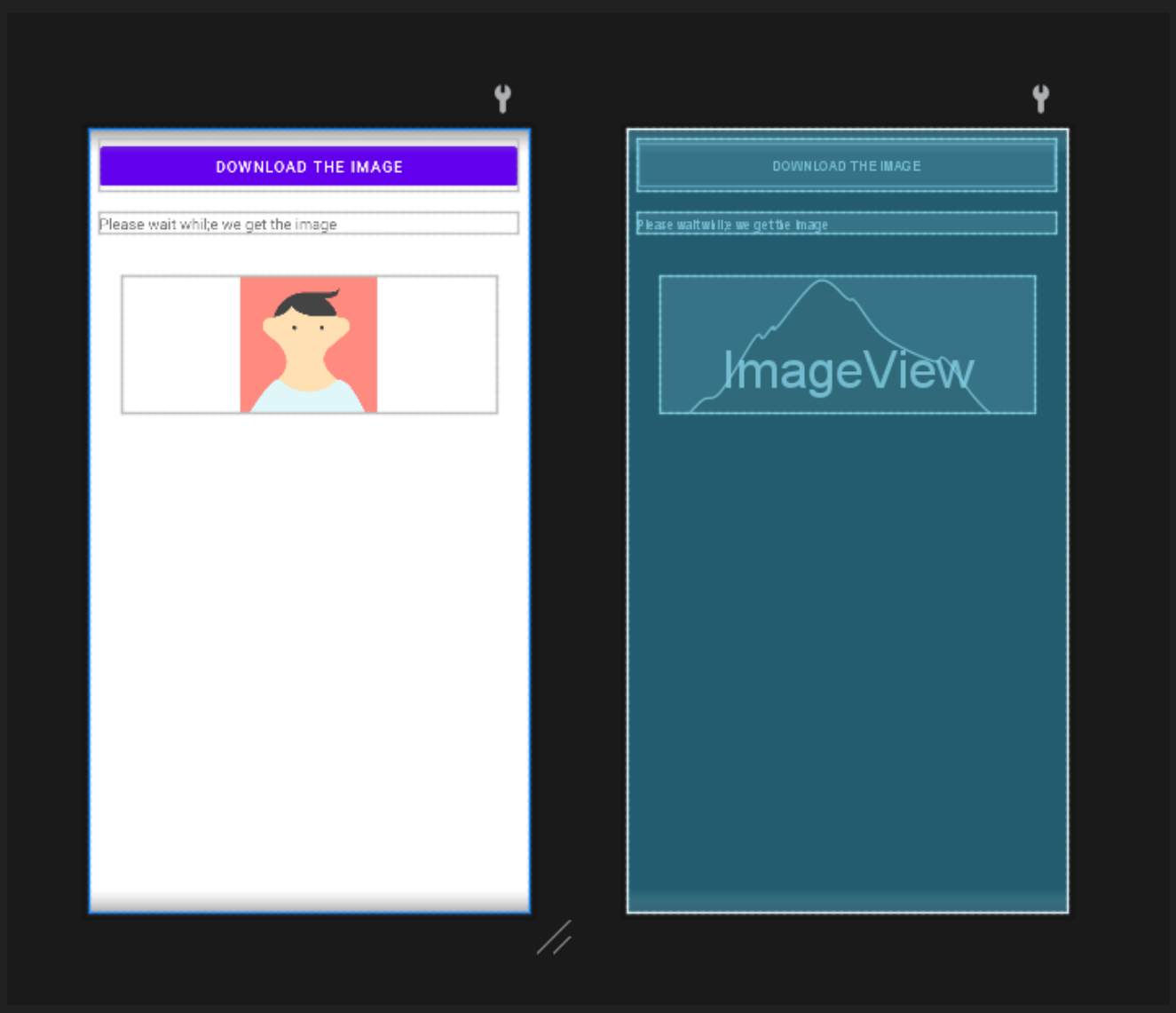


Second.java

```java
package com.example.a11_shared_sqlite;

import androidx.appcompat.app.AppCompatActivity;

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

public class Second extends AppCompatActivity {
    EditText regno, name;
    Button logout;

    SharedPreferences sharedPreferences;
    public static final String SHARED_PREF_NAME = "My_Pref";
    public static final String KEY_REG_NO = "REG_NO";
    public static final String KEY_NAME = "name";

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

        regno = findViewById(R.id.number);
        name = findViewById(R.id.nameS);
        logout = findViewById(R.id.logout);

        sharedPreferences = getSharedPreferences(SHARED_PREF_NAME, MODE_PRIVATE);

        String strRegno = sharedPreferences.getString(KEY_REG_NO, null);
        String strName = sharedPreferences.getString(KEY_NAME, null);

        name.setText(strName);
        regno.setText(strRegno);

        logout.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                SharedPreferences.Editor editor = sharedPreferences.edit();
                editor.clear();
                editor.commit();
                Intent intent = new Intent(Second.this, MainActivity.class);
                startActivity(intent);
            }
        });
    }
}
```

12 Android App to demonstrate the concept of Background Threads.

```
<?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">

    <Button
        android:id="@+id/btnDownload"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"

        android:text="Download the image" />

    <TextView
        android:id="@+id/tvProgress"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:text="Please wait whil;e we get the image" />

    <ImageView
        android:id="@+id/image_logo"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="30dp"
        tools:srcCompat="@tools:sample/avatars" />

</LinearLayout>
```



```java
package com.example.a12_backgroun_thread;

import androidx.appcompat.app.AppCompatActivity;

import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.AsyncTask;
import android.os.Bundle;
import android.speech.tts.TextToSpeech;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.TextView;

import java.io.IOException;
import java.io.InputStream;
import java.net.HttpURLConnection;
import java.net.MalformedURLException;
import java.net.URL;
import java.nio.channels.AsynchronousChannelGroup;

public class MainActivity extends AppCompatActivity {
    TextView progressBar;
    ImageView imageView;
    Button DownLoadBtn;

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

        progressBar = findViewById(R.id.tvProgress);
        imageView = findViewById(R.id.image_logo);
        DownLoadBtn = findViewById(R.id.btnDownload);

        progressBar.setVisibility(View.INVISIBLE);

        DownLoadBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                downloadImageClass imageClass = new downloadImageClass();
                imageClass.execute("https://sac-aimit.in/alogo.png");
            }
        });
    }

    class downloadImageClass extends AsyncTask<String, Integer, Bitmap> {

        @Override
        protected void onPreExecute() {
            super.onPreExecute();
            progressBar.setVisibility(View.VISIBLE);
        }

        @Override
        protected void onPostExecute(Bitmap bitmap) {
            super.onPostExecute(bitmap);
            imageView.setImageBitmap(bitmap);
            progressBar.setVisibility(View.INVISIBLE);
        }

        @Override
        protected void onProgressUpdate(Integer... values) {
            super.onProgressUpdate(values);
            progressBar.setText("Download" + values[0] + "%");
        }

        @Override
        protected Bitmap doInBackground(String... strings) {
            Bitmap bmp = null;
```

```
            try {
                URL imageURL = new URL(strings[0]);
                publishProgress(25);

                HttpURLConnection connection = (HttpURLConnection) imageURL.openConnection();
                publishProgress(50);

                InputStream inputStream = connection.getInputStream();
                publishProgress(75);

                bmp = BitmapFactory.decodeStream(inputStream);
                publishProgress(100);
            } catch (MalformedURLException e) {
                e.printStackTrace();
            } catch (IOException e) {
                e.printStackTrace();
            }
            return bmp;
        }
    }
}
```