1_1_Increment_Decrement

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"
  tools:context=".MainActivity">

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="You clicked the button 0 times"
     android:textSize="30dp"
     android:textColor="@color/colorRed"
     android:layout_marginTop="40dp"
     android:id="@+id/tv1"
      />
  <Button
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="+"
     android:layout_marginTop="30dp"
     android:layout_marginLeft="130dp"
     android:id="@+id/plus"/>
  <Button
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="-"
     android:layout_marginTop="30dp"
     android:layout_marginLeft="130dp"
     android:id="@+id/minus"/>

</LinearLayout>
```

Colors.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <color name="colorPrimary">#008577</color>
  <color name="colorPrimaryDark">#00574B</color>
  <color name="colorAccent">#D81B60</color>
  <color name="colorRed">#FF0000</color>
</resources>
```

MainActivity.java

```
package com.example.jevitha.myapplication;

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

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

  Button b1, b2;
  TextView t1;
  int count;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);

     b1=findViewById(R.id.plus);
     b2=findViewById(R.id.minus);
     t1=findViewById(R.id.tv1);

     b1.setOnClickListener(this);
```

```
        b2.setOnClickListener(this);

    }

    @Override
    public void onClick(View view) {
            if(view.getId()== R.id.plus)
                count++;
            else
            {
                if(view.getId() == R.id.minus)
                    count--;
            }
            // t1.setText(""+count);
            t1.setText(Integer.toString(count));
            // String.valueOf(count)
    }
}
```

1_ButtonClick_Option1
MainActivity.java

```
package com.example.jevitha.firstapp;
import android.support.v7.app.AppCompatActivity;
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 b1,b2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        b1 = findViewById(R.id.button1);
        b2 = findViewById(R.id.button2);

    /*  ---   Style 1   ---
    Making MainActivity class implement
                View.OnClickListener interface and override
         its onClick method
         */
            b1.setOnClickListener(this);
            b2.setOnClickListener(this);
    }

    @Override
    public void onClick(View view) {
        if(view.getId() == R.id.button1)
            Toast.makeText(this,"Button 1 Clicked", Toast.LENGTH_LONG).show();
        else
            Toast.makeText(this,"Button 2 Clicked", Toast.LENGTH_LONG).show();

    }
}
```

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"
    tools:context=".MainActivity">


    <Button
```

```
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button 2" />

  <Button
    android:id="@+id/button1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Button 1" />

</LinearLayout>
```

2_ButtonClick_AnonymousClass_Option2
MainActivity.java

```
package com.example.jevitha.secondapp;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

  Button b1,b2;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    b1 = findViewById(R.id.button1);
    b2 = findViewById(R.id.button2);

  /*  ---  Style 2  ---
      Using anonymous class. This *does not* require the
      MainActivity class to implement the View.OnClickListener interface

   */
    b1.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        Toast.makeText(MainActivity.this,"Button 1 clicked", Toast.LENGTH_LONG).show();
      }
    });



    b2.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View view) {
        Toast.makeText(getApplicationContext(),"Button 2 clicked", Toast.LENGTH_LONG).show();
      }
    });


  }

}
```

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

```
    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 2" />

    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Button 1" />

</LinearLayout>
```

3_Button_onClickAttribute_Option3

MainActivity.java

```
package com.example.jevitha.a1_button_toast;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main); // Linking XML file with the activity class
    }
    // This method is mapped to TextView through 'onClick' attribute in XML file
    // Textview need not do setOnClickListener if done through XML file
    public void onTextViewClicked(View view) {
            Toast.makeText(this,"TextView is clicked",Toast.LENGTH_LONG).show();
        }

}
```

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"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onTextViewClicked"
        android:text="ClickMe"     />

</LinearLayout>
```

4_ActivityLifecycle

No changes required in activity_main.xml file.

MainActivity.java

```
package com.example.jevitha.a2_activity_lifecycle;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
```

```
import android.widget.TextView;
import android.widget.Toast;


// Test cases - Find the difference in callbacks when -
// 1. device rotation,
// 2. back button pressed
// 3. Home button pressed
// and write the answers in your lab observation
public class MainActivity extends AppCompatActivity {

  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
// set the user interface layout for this activity
// layout file is defined in the project res/layout/main_activity.xml file
     setContentView(R.layout.activity_main);
    // Toast / log the current method name
Toast.makeText(this, "onCreate invoked",
          Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", "onCreate invoked");

  }

  protected void onStart() {
     super.onStart();
     Toast.makeText(this, " onStart invoked", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", " onStart invoked");
  }

  @Override
  protected void onResume() {
     super.onResume();
     Toast.makeText(this, " onResume invoked ", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", "   onResume invoked");
  }

  @Override
  protected void onPause() {
     super.onPause();
     Toast.makeText(this, " onPause invoked ", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", "    onPause invoked");
  }

  @Override
  protected void onStop() {
     super.onStop();
     Toast.makeText(this, " onStop invoked ", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", " onStop invoked");
  }

  @Override
  protected void onRestart() {
     super.onRestart();
     Toast.makeText(this, " onRestart invoked ", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", "   onRestart invoked");
  }

  @Override
  protected void onDestroy() {
     super.onDestroy();
     Toast.makeText(this, "onDestroy invoked ", Toast.LENGTH_SHORT).show();
     Log.d("MainActivity", " onDestroy invoked");

  }
}
```

5_SavedInstanceState

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"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="0"
        android:textAlignment="center"
        android:textColor="@color/colorPrimary" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="355dp"
        android:layout_height="116dp"
        android:text="0"
        android:textAlignment="center"
        android:textColor="@color/colorPrimary"
        android:textSize="50dp" />

    <Button
        android:id="@+id/button1"
        android:layout_marginTop="40dp"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Increment"
        android:textAlignment="center"
         />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Decrement"
        android:textAlignment="center"/>

</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a3_1_saveinstancestate;
import android.os.PersistableBundle;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;



// https://stackoverflow.com/questions/5179686/restoring-state-of-textview-after-screen-rotation
public class MainActivity extends AppCompatActivity implements View.OnClickListener{

    Button b1,b2;
    int i=0;
    TextView tv,tv1;

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

        tv = findViewById(R.id.textView);
        tv1 = findViewById(R.id.textView1);
        b1 = findViewById(R.id.button1);
        b1.setOnClickListener(this);

        b2 = findViewById(R.id.button2);
        b2.setOnClickListener(this);
```

```
    //Retrieve i value from savedInstanceState if available
    // and update the textview and toast.
    //1st run - execute the code as such
    //2nd run - comment out the entire if-else block below
    // and check the log.d messages
    //write your observations in lab notebook

    if (savedInstanceState != null) {

        i = savedInstanceState.getInt("count");
        //updating textview with the i value
        tv.setText(String.valueOf(i));

        Log.d("MainActivity", "OnCreate : i="+i);
        Toast.makeText(this, " onCreate i= "+i,
                Toast.LENGTH_SHORT).show();

    }
    else
    {
        Log.d("MainActivity", "OnCreate - no data");
        Toast.makeText(this, " onCreate   - no data",
                Toast.LENGTH_SHORT).show();
    }



}

@Override
public void onClick(View view) {
    // if button is clicked, increment counter,
    // update textview and toast
    if(view.getId()==b1.getId()) {
        i++;
        tv.setText(String.valueOf(i));
        tv1.setText(String.valueOf(i));
    }
    else
    {
        i--;
        tv.setText(String.valueOf(i));
        tv1.setText(String.valueOf(i));
    }
    Toast.makeText(this, "Hello Android :) clicked "+i,
            Toast.LENGTH_SHORT).show();
    Log.d("MainActivity","Button Clicked... ");

}

@Override
protected void onSaveInstanceState(Bundle outState) {
    super.onSaveInstanceState(outState);
    //saving i value in bundle parameter(outState) obtained.
    outState.putInt("count",i);
    Log.d("MainActivity", "OnSaveInstanceState : i="+i);
    Toast.makeText(this, "onSaveInstanceState i= "+i,
            Toast.LENGTH_SHORT).show();


}

@Override
protected void onRestoreInstanceState(Bundle savedInstanceState) {
    super.onRestoreInstanceState(savedInstanceState);
    if (savedInstanceState != null) {
        //retrieving i value from bundle parameter(savedInstanceState) obtained.
        i = savedInstanceState.getInt("count");
        //updating textview with the i value
        tv.setText(String.valueOf(i));

        Log.d("MainActivity", "OnRestoreInstanceState : i="+i);
        Toast.makeText(this, "onRestoreInstanceState i= "+i, Toast.LENGTH_SHORT).show();
```

```
        }
        else
        {
            Log.d("MainActivity", "OnRestoreInstanceState - no data");
            Toast.makeText(this, " onRestoreInstanceState   - no data", Toast.LENGTH_SHORT).show();
        }
    }

    @Override
    protected void onStart() {
        super.onStart();
        Log.d("MainActivity", "OnStart : i="+i);
        Toast.makeText(this, " OnStart   i= "+i, Toast.LENGTH_SHORT).show();

    }

    @Override
    protected void onPause() {
        super.onPause();
        Log.d("MainActivity", "OnPause : i="+i);
        Toast.makeText(this, "OnPause i= "+i, Toast.LENGTH_LONG).show();

    }

    @Override
    protected void onResume() {
        super.onResume();
        Log.d("MainActivity", "OnResume : i="+i);
        Toast.makeText(this, "OnResume i= "+i, Toast.LENGTH_LONG).show();

    }

    @Override
    protected void onStop() {
        super.onStop();
        Log.d("MainActivity", "OnStop : i="+i);
        Toast.makeText(this, "OnStop i= "+i, Toast.LENGTH_LONG).show();

    }

    @Override
    protected void onRestart() {
        super.onRestart();
        Log.d("MainActivity", "OnReStart : i="+i);
        Toast.makeText(this, "OnRestart i= "+i, Toast.LENGTH_LONG).show();

    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        Log.d("MainActivity", "OnDestroy : i="+i);
        Toast.makeText(this, "OnDestroy i="+i, Toast.LENGTH_LONG).show();

    }
}
```

6_EditText
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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">

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="14dp"
        android:layout_marginTop="18dp"
```

```
    android:textColor="@color/colorAccent"
    android:textSize="20dp"
    android:text="@string/textview_text" />

  <Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/textView1"
    android:layout_below="@+id/textView1"
    android:layout_marginTop="130dp"
    android:text="@string/button_text" />

  <EditText
    android:id="@+id/edittext"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:layout_alignLeft="@+id/button"
    android:layout_below="@+id/textView1"
    android:layout_marginTop="61dp"
    android:hint="@string/edit_hint"
    android:inputType="number" />


</RelativeLayout>
```

Strings.xml

```
<resources>
  <string name="app_name">4_0_EditText</string>
  <string name="textview_text">EditText Example</string>
  <string name="button_text">Click here to Toast</string>
  <string name="edit_hint">Enter your input here</string>
</resources>
```

MainActivity.java

```
package com.example.jevitha.a4_0_edittext;

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

public class MainActivity extends AppCompatActivity {
  EditText eText;
  Button btn;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    eText = (EditText) findViewById(R.id.edittext);
    btn = (Button) findViewById(R.id.button);
    btn.setOnClickListener(new View.OnClickListener() {
      public void onClick(View v) {
        String str = eText.getText().toString();
        Toast msg = Toast.makeText(getApplicationContext(),str,Toast.LENGTH_LONG);
        msg.show();
      }
    });

  }
}
```

7_EditText_Types

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
```

```
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="40dp"
    android:orientation="vertical"
    android:id="@+id/linearlayout"
    tools:context=".MainActivity">
    <EditText
        android:id="@+id/txtName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="25dp"
        android:ems="15"
        android:hint="Name"
        android:inputType="text"
        android:selectAllOnFocus="true" />
    <EditText
        android:id="@+id/txtPwd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Password 0 to 9"
        android:inputType="numberPassword" />
    <EditText
        android:id="@+id/txtEmai"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Email"
        android:inputType="textEmailAddress" />
    <EditText
        android:id="@+id/txtDate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/editText3"
        android:ems="10"
        android:hint="Date"
        android:inputType="date" />
    <EditText
        android:id="@+id/txtPhone"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Phone Number"
        android:inputType="phone"
        android:textColorHint="#FE8DAB"/>
    <Button
        android:id="@+id/btnSend"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="submit"
        android:textSize="16sp"
        android:textStyle="normal|bold" />
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/resultView"
        android:layout_marginTop="25dp"
        android:textSize="15dp"/>
</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a4_1_edittext_types;

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

public class MainActivity extends AppCompatActivity {

    Button btnSubmit;
```

```
  EditText name, password, email, dob, phoneno;
  TextView result;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     name=(EditText)findViewById(R.id.txtName);
     password = (EditText)findViewById(R.id.txtPwd);
     email = (EditText)findViewById(R.id.txtEmai);
     dob = (EditText)findViewById(R.id.txtDate);
     phoneno= (EditText)findViewById(R.id.txtPhone);
     btnSubmit = (Button)findViewById(R.id.btnSend);
     result = (TextView)findViewById(R.id.resultView);
     btnSubmit.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
           if (name.getText().toString().isEmpty() || password.getText().toString().isEmpty() ||
email.getText().toString().isEmpty() || dob.getText().toString().isEmpty()
                 || phoneno.getText().toString().isEmpty()) {
              result.setText("Please Fill All the Details");
           } else {
              result.setText("Name -   " + name.getText().toString() + " \n" + "Password -   " +
password.getText().toString()
                    + " \n" + "E-Mail -   " + email.getText().toString() + " \n" + "DOB -   " + dob.getText().toString()
                    + " \n" + "Contact -   " + phoneno.getText().toString());
           }
        }
     });
  }
}
```

8_Checkbox_Radiobutton_EditTextTextWatcher
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:paddingTop="10dp"
  android:paddingBottom="10dp"
  android:paddingLeft="10dp"
  android:paddingRight="10dp"
  tools:context=".MainActivity">

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="Enter Number: "
     android:textColor="@color/colorAccent"
     android:textAllCaps="true"
     android:id="@+id/t1"/>

  <EditText
     android:id="@+id/editText"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:inputType="number"
     android:maxLength="4"
     android:hint="Enter a Number here"
     />

  <TextView
     android:id="@+id/textView3"
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:layout_marginTop="10dp"
     android:text="Select the courses"
     android:gravity="right"
     android:textAllCaps="true"/>

  <CheckBox
```

```
    android:id="@+id/checkBox1"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:gravity="left"
    android:checked="true"
    android:text="Android" />

<CheckBox
    android:id="@+id/checkBox2"
    android:layout_width="116dp"
    android:layout_height="wrap_content"
    android:text="Cloud Computing" />


<RadioButton
    android:id="@+id/radioButton1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="left"
    android:text="Cryptography"
    android:layout_marginTop="20dp"
    android:checked="true"
    android:textSize="20dp" />


<RadioButton
    android:id="@+id/radioButton2"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:text="Web Development"
    android:layout_marginTop="10dp"

    android:textSize="20dp" />



<View
    android:layout_width="fill_parent"
    android:layout_height="1dp"
    android:layout_marginTop="20dp"
    android:background="#B8B894" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:layout_marginTop="30dp"
    android:gravity="center_horizontal"
    android:textSize="22dp"
    android:text="Radio button inside RadioGroup" />


<!--    Customized RadioButtons   -->


<RadioGroup
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/radioGroup">

    <RadioButton
        android:id="@+id/radioElective"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="   Elective"
        android:layout_marginTop="10dp"
        android:textSize="20dp" />

    <RadioButton
        android:id="@+id/radioCore"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="    Core"
        android:layout_marginTop="20dp"
```

```
        android:checked="false"
        android:textSize="20dp" />
    </RadioGroup>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Show Selected"
        android:id="@+id/button"
        android:onClick="onclickbuttonMethod"
        android:layout_gravity="right" />

</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a3_edittext_checkbox;


import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.text.Editable;

import android.text.TextWatcher;

import android.util.Log;
import android.view.View;
import android.view.Window;
import android.view.WindowManager;

import android.widget.Button;
import android.widget.CheckBox;

import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;

import android.widget.Toast;

public class MainActivity extends AppCompatActivity implements TextWatcher,
View.OnClickListener ,RadioGroup.OnCheckedChangeListener {

    EditText ed;
    CheckBox c1,c2;
    Button button;
    RadioButton subRadioButton;
    RadioGroup radioGroup;

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

        setContentView(R.layout.activity_main);

        // Make editText use TextWatcher interface to watch change made over EditText.
        // For doing this, EditText calls the addTextChangedListener() method.
        ed = (EditText) findViewById(R.id.editText);
        ed.addTextChangedListener(this);


        // checkbox uses setOnClickListener for notifying selection
        c1 = (CheckBox) findViewById(R.id.checkBox1);
        c2 = (CheckBox) findViewById(R.id.checkBox2);
        c1.setOnClickListener(this);
        c2.setOnClickListener(this);

        radioGroup=(RadioGroup)findViewById(R.id.radioGroup);
        radioGroup.setOnCheckedChangeListener(this);

    }
    //Textwatcher interface
    @Override
    public void beforeTextChanged(CharSequence s, int start, int count, int after) {
```

```
        Toast.makeText(getApplicationContext(), "before Textchanged : " + s.toString(),
Toast.LENGTH_SHORT).show();
        Log.d("BeforeChange", s.toString());
    }
    //Textwatcher interface
    @Override
    public void onTextChanged(CharSequence s, int start, int before, int count) {
        Toast.makeText(getApplicationContext(), "on Text changed :" + s.toString(), Toast.LENGTH_SHORT).show();
        Log.d("OnChange", s.toString());
    }
    //Textwatcher interface
    @Override
    public void afterTextChanged(Editable s) {
        Toast.makeText(getApplicationContext(), "After TextChanged : " + s.toString(),
Toast.LENGTH_SHORT).show();
        Log.d("AfterChange", s.toString());
        try {
            int no = Integer.parseInt(s.toString());
            if (no > 99) {
                s.replace(0, s.length(), "10");
                Toast.makeText(getApplicationContext(), " Enter a number < 99 ", Toast.LENGTH_SHORT).show();
                Log.d(" Enter a number < 99 ", s.toString());
            }
        } catch (NumberFormatException e) {
        }
    }


    // View.onClickListener interface
    @Override
    public void onClick(View v) {
        CheckBox t = (CheckBox) v;
        if (t.isChecked()) {
            Toast.makeText(getApplicationContext(), t.getText()+" is selected", Toast.LENGTH_SHORT).show();
           /* if(t.getId()==c1.getId()){
                c2.setChecked(false);
            }
            else
                c1.setChecked(false);*/
        }
    }

    // method mapped through onClick attribute in activity_main.xml
    public void onclickbuttonMethod(View view) {
        int selectedId = radioGroup.getCheckedRadioButtonId();
        subRadioButton = (RadioButton) findViewById(selectedId);
        if(selectedId == -1){
            Toast.makeText(MainActivity.this,"Nothing selected", Toast.LENGTH_SHORT).show();
        }
        else{
            Toast.makeText(MainActivity.this,subRadioButton.getText()+" is selected",
Toast.LENGTH_SHORT).show();
        }
    }

    //RadioGroup.OnCheckedChangeListener
    @Override
    public void onCheckedChanged(RadioGroup radioGroup1, int i) {
        //radioGroup1.getCheckedRadioButtonId();
        RadioButton rb = findViewById(i);
        Toast.makeText(MainActivity.this,rb.getText()+" is selected", Toast.LENGTH_SHORT).show();
    }
}
```

9_DynamicRadioButton

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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:paddingBottom="10dp"
    android:paddingLeft="10dp"
    android:paddingRight="10dp"
    android:paddingTop="10dp"
    android:id="@+id/relativeLayout"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/tv1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a4_1_dynamicradiobutton;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.RelativeLayout;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    RadioGroup rg;
    RelativeLayout rl;
    RadioButton rb1,rb2;

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

        rg = new RadioGroup(this);
        rl = (RelativeLayout) findViewById(R.id.relativeLayout);
        rb1 = new RadioButton(this);
        rb2 = new RadioButton(this);

        rb1.setText("Male");
        rb2.setText("Female");
        rg.addView(rb1);
        rg.addView(rb2);
        rg.setOrientation(RadioGroup.VERTICAL);

        RelativeLayout.LayoutParams params[] ={
                new RelativeLayout.LayoutParams
                (RelativeLayout.LayoutParams.MATCH_PARENT,
                        RelativeLayout.LayoutParams.MATCH_PARENT), // Layout params for radio group
                new RelativeLayout.LayoutParams
                        (RelativeLayout.LayoutParams.MATCH_PARENT,
                                RelativeLayout.LayoutParams.WRAP_CONTENT)}; // Layout params for button


        params[0].leftMargin =10;
        params[0].topMargin = 200;
        params[0].height = 200;
        rg.setLayoutParams(params[0]);
        rl.addView(rg);

        params[1].leftMargin =10;
        params[1].topMargin = 380;

        // Inserting   button programmatically
        Button b = new Button (this);
        b.setText("Test");
        b.setLayoutParams(params[1]);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
```

```
        public void onClick(View view) {
            Toast.makeText(getApplicationContext(),"Button clicked",Toast.LENGTH_SHORT).show();

        }
    });
    rl.addView(b);

    rg.setOnCheckedChangeListener(new RadioGroup.OnCheckedChangeListener() {
        @Override
        public void onCheckedChanged(RadioGroup group, int checkedId) {
            RadioButton radioButton = (RadioButton) findViewById(checkedId);
            Toast.makeText(getApplicationContext(),radioButton.getText(),Toast.LENGTH_SHORT).show();
        }
    });
  }
}
```

10_ListView
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"
  tools:context=".MainActivity">

  <ListView
    android:layout_width="wrap_content"
    android:layout_height="match_parent"
    android:id="@+id/listv">

  </ListView>



</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a8_listview;

import android.support.v7.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.TextView;
import android.widget.Toast;


public class MainActivity extends AppCompatActivity implements
    AdapterView.OnItemClickListener {

  ListView lv;
  String days[]={"Monday","Tuesday","Wednesday"};
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    lv=findViewById(R.id.listv);
    //android.R.layout.simple_list_item_1
    ArrayAdapter<String> ada=new ArrayAdapter<String>(this,
        android.R.layout.simple_list_item_1,
        days);
    lv.setAdapter(ada);
     lv.setOnItemClickListener(this);
  }

  @Override
  public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
```

```
        TextView txt = (TextView) view;
        Toast.makeText(getApplicationContext(), "You have selected : " + txt.getText(),
                Toast.LENGTH_SHORT).show();
    }
}
```

11_List_SubListView
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">


    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/listv"
        />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a8_1_listview_sublist;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ListView;
import android.widget.SimpleAdapter;
import android.widget.TextView;
import android.widget.Toast;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;
import java.util.Map;

public class MainActivity extends AppCompatActivity implements
        AdapterView.OnItemClickListener {

    ListView lv;
    String[] countries = {"India", "America", "China", "Japan"};
    String[] currencies = {"INR", "USD", "CNY", "JPY"};

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        lv=findViewById(R.id.listv);
        List<Map<String, String>> messages = new ArrayList<>();
        HashMap<String,String> content ;
        for(int i = 0 ; i < countries.length; i++) {
            content = new HashMap<String, String>();
            content.put("country", countries[i]);
            content.put("currency", currencies[i]);
            messages.add(content);
        }
        String[] entry = new String[] {"country", "currency"};
        SimpleAdapter adapter = new SimpleAdapter(this, messages,
                android.R.layout.simple_list_item_2,
                entry,
                new int[] {android.R.id.text1,
                        android.R.id.text2,
                });
        lv.setAdapter(adapter);

        lv.setOnItemClickListener(this);
    }
```

```
    @Override
    public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
        StringBuilder sb = new StringBuilder("");
        //By position in array
        sb.append(countries[position]+" : ");
        sb.append(currencies[position]+"'\n");
        Toast.makeText(getApplicationContext(), sb.toString(),
                Toast.LENGTH_SHORT).show();
    }
}
```

12_CustomListView
MainActivity.java

```
package com.example.jevitha.a5_edittext_listview;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.text.Editable;
import android.text.TextWatcher;
import android.util.Log;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.EditText;
import android.widget.ListView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    private ListView lv;
    private EditText editText;
    private ArrayAdapter<String> adapter;

    private String products[] = {"Apple", "Banana", "Pinapple", "Orange", "Papaya", "Melon",
            "Grapes", "Water Melon", "Lychee", "Guava", "Mango", "Kivi"};

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

        lv = (ListView) findViewById(R.id.listView);
        editText = (EditText) findViewById(R.id.editText);
        adapter = new ArrayAdapter<String>(this,R.layout.list_item, R.id.product_name,products);
        lv.setAdapter(adapter);

        editText.addTextChangedListener(new TextWatcher() {

            @Override
            public void onTextChanged(CharSequence cs, int arg1, int arg2, int arg3) {
                Log.d("Test","on text changed");
            }

            @Override
            public void beforeTextChanged(CharSequence arg0, int arg1, int arg2, int arg3) {
                Toast.makeText(getApplicationContext(), "before text change", Toast.LENGTH_LONG).show();
                Log.d("test","before text changed");
            }

            @Override
            public void afterTextChanged(Editable arg0) {
                Toast.makeText(getApplicationContext(), "after text change", Toast.LENGTH_LONG).show();
                Log.d("Test","after text changed");
                adapter.getFilter().filter(arg0);
            }
        });

        lv.setOnItemClickListener(new AdapterView.OnItemClickListener() {

            @Override
            public void onItemClick(AdapterView<?> adapterView, View view, int position, long l) {
```

```
            // TODO Auto-generated method stub
            String value=adapter.getItem(position);
            Toast.makeText(getApplicationContext(),value,Toast.LENGTH_SHORT).show();
            editText.setText(value);

        }
    });
  }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout 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">

  <EditText
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/editText"
     android:inputType="text"
     android:hint="Type a fruit name"
     android:maxLength="50"
     android:layout_marginLeft="10dp"
     />
  <ListView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/listView"
     android:layout_below="@id/editText"
     android:layout_marginLeft="10dp"
    />

</RelativeLayout>
```

List_item.xml

```
<?xml version="1.0" encoding="utf-8"?>

<LinearLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical">
<!-- dp /dip   - Density-independent Pixels - an abstract unit that is based on the physical density of the screen.
     These units are relative to a 160 dpi screen, so one dp is one pixel on a 160 dpi screen -->

     <TextView android:id="@+id/product_name"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:padding="10dp"
        android:textSize="16dp"
        android:textStyle="bold"
        android:textColor="@color/colorAccent"/>

</LinearLayout>
```

13_ExplicitIntent

Main_activity.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  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">
  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/mes"
     android:text="Hello World!"/>
  <EditText
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:id="@+id/name"
     android:layout_marginTop="100dp"
     />
  <EditText
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:id="@+id/pass"
     android:layout_marginTop="150dp"
     />
  <Button
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="login"
     android:layout_marginTop="200dp"
     android:onClick="Click"/>
</RelativeLayout>
```

Dimens.xml

```
<?xml version="1.0" encoding="utf-8"?>
<resources>
  <dimen name="activity_vertical_margin">10dp</dimen>
  <dimen name="activity_horizontal_margin">10dp</dimen>
</resources>
```

MainActivity.java

```
package com.example.jevitha.a15_intents;

import android.content.Intent;
import android.graphics.Color;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
  EditText uname,pword;
  TextView msg;
  Button b;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     uname=(EditText)findViewById(R.id.name);
     pword=(EditText)findViewById(R.id.pass);
     msg=(TextView)findViewById(R.id.mes);
  }
  @Override
  protected void onStart() {
     super.onStart();
     uname.setText("");
     pword.setText("");
     msg.setText("");
  }
  public void Click(View V)
  {
     String name1=uname.getText().toString().trim();
     String pwd1=pword.getText().toString().trim();
     if(name1.equals("admin")&&pwd1.equals("admin123"))
     {
        Intent i=new Intent(this,success.class);
        startActivity(i);
     }
     else{
```

```
            msg.setTextColor(Color.RED);
            msg.setText("ERROR");
        }

    }
}
```

Activity_success.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_success"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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=".success">
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/msg"/>
</RelativeLayout>
```

Success.java

```
package com.example.jevitha.a15_intents;

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

public class success extends AppCompatActivity {

    TextView t1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_success);
        t1=(TextView)findViewById(R.id.msg);
        t1.setText("Success");
    }
}
```

14_Explicit_Intent_WithData

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:id="@+id/mes"
        android:text="Hello World!"/>
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/name"
        android:layout_marginTop="100dp"
        />
    <EditText
        android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:id="@+id/pass"
        android:layout_marginTop="150dp"
        />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="login"
        android:layout_marginTop="200dp"
        android:onClick="Click"/>
</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a15_1_intent_with_data;

import android.content.Intent;
import android.graphics.Color;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
    EditText uname,pword;
    TextView msg;
    Button b;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        uname=(EditText)findViewById(R.id.name);
        pword=(EditText)findViewById(R.id.pass);
        msg=(TextView)findViewById(R.id.mes);
    }
    @Override
    protected void onStart() {
        super.onStart();
        uname.setText("");
        pword.setText("");
        msg.setText("");
    }
    public void Click(View V)
    {
        String name1=uname.getText().toString().trim();
        String pwd1=pword.getText().toString().trim();
        if(name1.equals("admin")&&pwd1.equals("admin123"))
        {
            Intent i=new Intent(this,success.class);
            i.putExtra("name",name1);
            i.putExtra("pwd",pwd1);
            startActivity(i);
        }
        else{
            msg.setTextColor(Color.RED);
            msg.setText("ERROR");
        }

    }
}
```

Activity_success.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_success"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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=".success">
```

```
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/msg"/>
</RelativeLayout>
```

Success.java

```
package com.example.jevitha.a15_1_intent_with_data;

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

public class success extends AppCompatActivity {

    TextView t1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_success);
        Bundle b=getIntent().getExtras();
        String name=b.getString("name");
        String pwd=b.getString("pwd");
        t1=(TextView)findViewById(R.id.msg);
        String test = "Welcome Username:   "+ name +
                " \n Password:     "+ pwd;
        t1.setText(test);

    }
}
```

15_ExplicitIntent_WithReturn

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        android:textSize="20dp"
        android:id="@+id/msg1"/>
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="100dp"
        android:text="go"
        android:onClick="pass"
        />
</RelativeLayout>
```

Success.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_success"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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=".success">
  <EditText
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:layout_marginTop="50dp"
     android:id="@+id/msg"
     android:hint="Enter a number"
     />
  <Button
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:onClick="passmsg"
     android:text="back"
     android:layout_marginTop="100dp"
     />
</RelativeLayout>
```

Dimens.xml

```
 <?xml version="1.0" encoding="utf-8"?>
<resources>
  <dimen name="activity_vertical_margin">10dp</dimen>
  <dimen name="activity_horizontal_margin">10dp</dimen>
</resources>
```

MainActivity.java

```
package com.example.jevitha.a15_2_intent_return_data_from_activity2;

import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
  TextView t1;
  final int MYREQUEST = 11;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     t1=(TextView) findViewById(R.id.msg1);
  }
  public void pass(View v)
  {
     Intent i=new Intent(this,success.class);
     i.putExtra("name","Welcome to the second screen");
     startActivityForResult(i,MYREQUEST);
  }
  @Override
  protected void onActivityResult(int requestCode, int resultCode, Intent data) {
     super.onActivityResult(requestCode, resultCode, data);
     if(requestCode==MYREQUEST)
     {
        if(resultCode == RESULT_OK) {
           String str = data.getStringExtra("msg");
           t1.setText("Received Ok : " + str);
        }
        else if(resultCode == RESULT_CANCELED){
           String str = data.getStringExtra("msg");
           t1.setText("Received Cancelled : "+str);
        }
        else {
           String str = data.getStringExtra("msg");
           str = str.concat(" Resultcode:   " + String.valueOf(resultCode));
           t1.setText("Received : " + str);
        }


     }
  }
```

```
}
```

Success.java

```
package com.example.jevitha.a15_2_intent_return_data_from_activity2;
import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
public class success extends AppCompatActivity {
  EditText t1;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_success);
    t1=(EditText)findViewById(R.id.msg);
    Bundle b=getIntent().getExtras();
    String name=b.getString("name");
    Toast.makeText(this,name,Toast.LENGTH_SHORT).show();
  }
  public void passmsg(View v)
  {
    String str=t1.getText().toString();
    Intent i=new Intent();
    i.putExtra("msg",str);
    // result code should be   RESULT_OK or
    // RESULT_CANCELLED depending on the usecase
    // generally any integer will work

    //setResult(RESULT_OK,i);

    if(Integer.valueOf(str) <= 10)
      setResult(RESULT_OK,i);
    else if (Integer.valueOf(str) > 11)
      setResult(RESULT_CANCELED,i);
    else
      setResult(111,i); // random result code
    finish();
  }
}
```

16_ImplicitIntent_Browse
activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/activity_main"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:paddingBottom="20dp"
android:paddingLeft="20dp"
android:paddingRight="20dp"
android:paddingTop="20dp"
tools:context=".MainActivity">

<TextView
  android:layout_width="match_parent"
  android:layout_height="wrap_content"
  android:text="Enter URL:"
  android:id="@+id/t1" />

<EditText
  android:layout_width="wrap_content"
  android:layout_height="wrap_content"
  android:inputType="textMultiLine"
  android:ems="10"
  android:id="@+id/e1"
  android:layout_below="@id/t1"
  android:layout_alignParentLeft="true"
  android:layout_alignParentStart="true" />
```

```
<Button
  android:text="Browse"
  android:layout_width="wrap_content"
  android:layout_height="wrap_content"
  android:id="@+id/browsebutton"
  android:layout_below="@+id/e1"
 />


</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a16_1_implicitintent_browse;


import android.content.Intent;
import android.net.Uri;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;


public class MainActivity extends AppCompatActivity implements View.OnClickListener {
  EditText e;
  Button browseButton;

  @Override
  protected void onCreate(Bundle savedInstanceState){
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     browseButton = (Button) findViewById(R.id.browsebutton);
     e = (EditText) findViewById(R.id.e1);
     browseButton.setOnClickListener(this);
  }

  public void onClick(View view) {
     String url;
     e = (EditText) findViewById(R.id.e1);
     url = e.getText().toString();
     Intent i;
     if (view.getId() == browseButton.getId()) {
        if(url.startsWith("http://"))
        i = new Intent(Intent.ACTION_VIEW,Uri.parse(url));
        else
           i = new Intent(Intent.ACTION_VIEW,Uri.parse("http://"+url));

        startActivity(i);
     }

  }
}
```

17_SMS

Create dimens.xml by clicking the auto suggest feature - use **10dp or 20dp**

Android_Manifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a16_6_sms">

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

  <application
     android:allowBackup="true"
     android:icon="@mipmap/ic_launcher"
     android:label="@string/app_name"
     android:roundIcon="@mipmap/ic_launcher_round"
     android:supportsRtl="true"
```

```
    android:theme="@style/AppTheme">
    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
    <activity android:name=".Main2Activity"></activity>
  </application>

</manifest>
```

activity_main.xml

```
<?xml version="1.0"encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/activity_main"
android:layout_width="match_parent"
android:layout_height="match_parent"
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">
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Hello World!"/>
<EditText
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/no"
android:layout_marginTop="50dp"/>
<EditText
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/msg"
android:layout_marginTop="100dp"/>
<Button
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/sms"
android:text="SMS"
android:layout_marginTop="150dp"/>
</RelativeLayout>
```

activity_main.java

```
package com.example.jevitha.mysmsapplication;
import android.app.PendingIntent;
import android.content.Intent;
import android.content.pm.ActivityInfo;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity implements View.OnClickListener{
EditText mobileno,message;
Button sendsms;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
//this.setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_LANDSCAPE);
mobileno=(EditText)findViewById(R.id.no);
message=(EditText)findViewById(R.id.msg);
sendsms=(Button)findViewById(R.id.sms);
```

```
sendsms.setOnClickListener(this);
}
@Override
public void onClick(View view) {
String no=mobileno.getText().toString();
String msg=message.getText().toString();
//Getting intent and PendingIntent instance
Intent intent=new Intent(getApplicationContext(),MainActivity.class);
PendingIntent pi=PendingIntent.getActivity(getApplicationContext(), 0, intent,0);
//Get the SmsManager instance and call the sendTextMessage method to send message
SmsManager sms=SmsManager.getDefault();


/*if (ContextCompat.checkSelfPermission(this,
      Manifest.permission.SEND_SMS)
      != PackageManager.PERMISSION_GRANTED) {
  // if (ActivityCompat.shouldShowRequestPermissionRationale(this,
    //         Manifest.permission.SEND_SMS)) {
      ActivityCompat.requestPermissions(this,
            new String[]{Manifest.permission.SEND_SMS},
            111);
   } else {
      // Permission already granted
  // }
}
*/

sms.sendTextMessage(no, null, msg, pi,null);
Toast.makeText(getApplicationContext(), "Message Sent successfully!",
Toast.LENGTH_LONG).show();
}
}
```

Activity2

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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=".Main2Activity">
   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Message Sent Successfully" />

</android.support.constraint.ConstraintLayout>


package com.example.jevitha.a16_6_sms;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

public class Main2Activity extends AppCompatActivity {

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

18_Dial_Call
AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
   package="com.example.jevitha.a16_2_dial_call">
```

```
  <application
     android:allowBackup="true"
     android:icon="@mipmap/ic_launcher"
     android:label="@string/app_name"
     android:roundIcon="@mipmap/ic_launcher_round"
     android:supportsRtl="true"
     android:theme="@style/AppTheme">
     <activity android:name=".MainActivity">
        <intent-filter>
           <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:paddingBottom="20dp"
  android:paddingLeft="20dp"
  android:paddingRight="20dp"
  android:paddingTop="20dp"
  tools:context=".MainActivity">

  <TextView
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="Enter Phone number:"
     android:id="@+id/t1" />

  <EditText
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:inputType="number"
     android:ems="10"
     android:id="@+id/e1"
     android:layout_below="@id/t1"
     android:layout_alignParentLeft="true"
     android:layout_alignParentStart="true" />

  <Button
     android:text="Dial"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/dialbutton"
     android:layout_below="@+id/e1"
     />

  <Button
     android:text="Call"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/callbutton"
     android:layout_toRightOf="@+id/dialbutton"
     android:layout_below="@+id/e1"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a16_2_dial_call;

import android.Manifest;
import android.content.Intent;
```

```
import android.content.pm.PackageManager;
import android.net.Uri;
import android.support.v4.app.ActivityCompat;
import android.support.v4.content.ContextCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;


public class MainActivity extends AppCompatActivity implements View.OnClickListener {
  EditText e;
  Button dialButton, callButton;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    dialButton = (Button) findViewById(R.id.dialbutton);
    callButton = (Button) findViewById(R.id.callbutton);
    e = (EditText) findViewById(R.id.e1);
    dialButton.setOnClickListener(this);
    callButton.setOnClickListener(this);
  }

  public void onClick(View view) {
    String phonenumber;
    e = (EditText) findViewById(R.id.e1);
    phonenumber = e.getText().toString();

    if (view.getId() == dialButton.getId()) {
      //Opens Dialer and user decides to call - so
// no permission required
      Intent i = new Intent(Intent.ACTION_DIAL,
          Uri.parse("tel:" + phonenumber));
      startActivity(i);

    }
    if (view.getId() == callButton.getId()) {
      Intent intent = new Intent(Intent.ACTION_CALL);
      //Another way to pass phone no
      intent.setData(Uri.parse("tel:" + phonenumber));

      // Since Call might incur charges hence it requires  //user to grant CALL Permission. The below if condition
//will be auto suggessted if not given.
      if (ActivityCompat.checkSelfPermission(this, Manifest.permission.CALL_PHONE)
          != PackageManager.PERMISSION_GRANTED) {

        // add the following line for runtime permission request
        ActivityCompat.requestPermissions(this,
            new String[]{Manifest.permission.CALL_PHONE},
            123);
        return;
      }
      startActivity(intent);

    }

  }
}
```

19_Implicit_Camera
To create drawable files :
Option 1 - Harddisk - copy image. Right click drawablle - paste.
Option 2 - Right click drawable -> New -> Vector asset - Choose the asset and customise → click next → click finish

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
```

```
<android.support.constraint.ConstraintLayout
  xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <Button
     android:id="@+id/button1"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_alignParentBottom="true"
     android:layout_centerHorizontal="true"
     android:text="Take a Photo">
  </Button>
  <ImageView
     android:id="@+id/imageView1"
     android:layout_width="fill_parent"
     android:layout_height="fill_parent"
     android:layout_above="@+id/button1"
     android:layout_alignParentTop="true"
     android:src="@drawable/a">
  </ImageView>
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a16_4_camera;
import android.content.Intent;
import android.graphics.Bitmap;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
  private static final int CAMERA_REQUEST = 18;
  ImageView imageView;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     imageView = (ImageView) this.findViewById(R.id.imageView1);
     Button photoButton = (Button) this.findViewById(R.id.button1);
     photoButton.setOnClickListener(this);
  }
  @Override
  public void onClick(View v) {
     Intent cameraIntent = new Intent(android.provider.MediaStore.ACTION_IMAGE_CAPTURE);
     startActivityForResult(cameraIntent,CAMERA_REQUEST);
  }
  @Override
  protected void onActivityResult(int requestCode, int resultCode, Intent data) {
     super.onActivityResult(requestCode, resultCode, data);
     if (requestCode == CAMERA_REQUEST) {
        Bitmap photo = (Bitmap) data.getExtras().get("data");
        imageView.setImageBitmap(photo);
        //Toast.makeText(this,String.valueOf(resultCode), Toast.LENGTH_SHORT).show();
     }
  }
}
```

20_Gallery
Manifest - include permission

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

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:paddingBottom="20dp"
  android:paddingLeft="20dp"
  android:paddingRight="20dp"
  android:paddingTop="20dp"
  tools:context=".MainActivity">
  <Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="open"
    android:id="@+id/open"/>
  <ImageView
    android:layout_width="300dp"
    android:layout_height="300dp"
    android:id="@+id/iv"
    android:layout_marginTop="150dp"/>
</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a16_3_implicitintent_gallery;

import android.content.Intent;
import android.graphics.Bitmap;
import android.net.Uri;
import android.provider.MediaStore;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.ImageView;
import android.widget.Toast;
import java.io.IOException;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
  Button bt;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    bt=(Button)findViewById(R.id.open);
    bt.setOnClickListener(this);
  }
  @Override
  public void onClick(View view) {
    Intent intent = new Intent();
    intent.setType("image/*");
    intent.setAction(Intent.ACTION_GET_CONTENT);
    //startActivityForResult(Intent.createChooser(intent, "Select Picture"),3);
    startActivityForResult(intent,3);
  }
  @Override
  protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    super.onActivityResult(requestCode, resultCode, data);

    if (requestCode == 3&& resultCode == RESULT_OK && data != null && data.getData() != null) {
      Uri uri = data.getData();
      try {
        Bitmap bitmap = MediaStore.Images.Media.getBitmap(getContentResolver(), uri);
        ImageView imageView = (ImageView) findViewById(R.id.iv);
        imageView.setImageBitmap(bitmap);
      } catch (IOException e) {
        e.printStackTrace();
      }
    }
  }
}
```

21_ScrollView
Horizontal Scroll View

```
<?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">
  <!-- https://developer.android.com/reference/android/widget/HorizontalScrollView -->
  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:textAppearance="?android:attr/textAppearanceSmall"
     android:text="Horizontal ScrollView Example"
     android:id="@+id/textView"
     android:layout_alignParentTop="true"
     android:layout_centerHorizontal="true" />

     <HorizontalScrollView
        android:layout_width="match_parent"
        android:layout_height="60dp"
        android:layout_marginTop="30dp"
        android:id="@+id/horizontalScrollView">
        <LinearLayout
           android:layout_width="wrap_content"
           android:layout_height="wrap_content"
           android:orientation="horizontal">
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button1"
              android:id="@+id/button1" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button2"
              android:id="@+id/button2" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button3"
              android:id="@+id/button3" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button4"
              android:id="@+id/button4" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button5"
              android:id="@+id/button5" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button6"
              android:id="@+id/button6" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button7"
              android:id="@+id/button7" />
           <Button
              android:layout_width="wrap_content"
              android:layout_height="wrap_content"
              android:text="New Button8"
              android:id="@+id/button8"/>
```

```
        </LinearLayout>
    </HorizontalScrollView>


</LinearLayout>
```

```
package com.example.jevitha.a13_scrollview;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    // uncomment this for horizontal scrollview
   //setContentView(R.layout.activity_main);
    //uncomment this for vertical scroll view
    setContentView(R.layout.vertical_scroll_view);

  }
}
```

Vertical scroll View

```
<?xml version="1.0" encoding="utf-8"?>
<android.widget.RelativeLayout 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">
  <TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textAppearance="?android:attr/textAppearanceMedium"
    android:text="Vertical ScrollView example"
    android:id="@+id/textView"
    android:layout_gravity="center_horizontal"
    android:layout_centerHorizontal="true"
    android:layout_alignParentTop="true" />

  <ScrollView android:layout_marginTop="30dp"
    android:layout_width="fill_parent"
    android:layout_height="wrap_content"
    android:id="@+id/scrollView">
    <LinearLayout
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"
      android:orientation="vertical" >
      <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button 1" />
      <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button 2" />
      <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button 3" />
      <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button 4" />
      <Button
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:text="Button 5" />
      <Button
```

```
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 6" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 7" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 8" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 9" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 10" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 11" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 12" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 13" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 14" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 15" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 16" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 17" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 18" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 19" />
        <Button
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:text="Button 20" />
    </LinearLayout>
  </ScrollView>
</android.widget.RelativeLayout>
```

22_DatePicker_TimePicker

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools" android:layout_width="match_parent"
  android:layout_height="match_parent" android:paddingLeft="@dimen/activity_horizontal_margin"
  android:paddingRight="@dimen/activity_horizontal_margin"
  android:paddingTop="@dimen/activity_vertical_margin"
  android:paddingBottom="@dimen/activity_vertical_margin" tools:context=".DateTimeActivity">

  <EditText
    android:layout_width="200dp"
    android:layout_height="wrap_content"
```

```
        android:id="@+id/in_date"
        android:layout_marginTop="82dp"
        android:layout_alignParentTop="true"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SELECT DATE"
        android:id="@+id/btn_date"
        android:layout_alignBottom="@+id/in_date"
        android:layout_toRightOf="@+id/in_date"
        android:layout_toEndOf="@+id/in_date" />

    <EditText
        android:layout_width="200dp"
        android:layout_height="wrap_content"
        android:id="@+id/in_time"
        android:layout_below="@+id/in_date"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SELECT TIME"
        android:id="@+id/btn_time"
        android:layout_below="@+id/btn_date"
        android:layout_alignLeft="@+id/btn_date"
        android:layout_alignStart="@+id/btn_date" />

</RelativeLayout>


package com.example.jevitha.a11_2_datetimepickerdialog;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.app.DatePickerDialog;
import android.app.TimePickerDialog;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.view.View;
import android.widget.Button;
import android.widget.DatePicker;
import android.widget.EditText;
import android.widget.TimePicker;

import java.util.Calendar;

public class DateTimeActivity extends AppCompatActivity implements
        View.OnClickListener,
        DatePickerDialog.OnDateSetListener,
        TimePickerDialog.OnTimeSetListener{

    Button btnDatePicker, btnTimePicker;
    EditText txtDate, txtTime;
    private int mYear, mMonth, mDay, mHour, mMinute;

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

        btnDatePicker=(Button)findViewById(R.id.btn_date);
        btnTimePicker=(Button)findViewById(R.id.btn_time);
        txtDate=(EditText)findViewById(R.id.in_date);
        txtTime=(EditText)findViewById(R.id.in_time);

        btnDatePicker.setOnClickListener(this);
        btnTimePicker.setOnClickListener(this);
```

```
    }

    @Override
    public void onClick(View v) {

        if (v == btnDatePicker) {

            // Get Current Date
            final Calendar c = Calendar.getInstance();
            mYear = c.get(Calendar.YEAR);
            mMonth = c.get(Calendar.MONTH);
            mDay = c.get(Calendar.DAY_OF_MONTH);


            DatePickerDialog datePickerDialog = new DatePickerDialog
                    (this, this, mYear, mMonth, mDay);
            datePickerDialog.show();
        }
        if (v == btnTimePicker) {

            // Get Current Time
            final Calendar c = Calendar.getInstance();
            mHour = c.get(Calendar.HOUR_OF_DAY);
            mMinute = c.get(Calendar.MINUTE);

            // Launch Time Picker Dialog
            TimePickerDialog timePickerDialog = new TimePickerDialog(this,
                    this, mHour, mMinute, false);
            timePickerDialog.show();
        }
    }

    @Override
    public void onDateSet(DatePicker datePicker, int dayOfMonth, int monthOfYear, int year) {
        txtDate.setText(dayOfMonth + "-" + (monthOfYear + 1)
                + "-" + year);
    }

    @Override
    public void onTimeSet(TimePicker timePicker, int hourOfDay, int minute) {
        txtTime.setText(hourOfDay + ":" + minute);
    }
}
```

23_Implicit_Bluetooth
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">
    <TextView android:text=""
        android:id="@+id/out"
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
    </TextView>
    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="8dp"
        android:layout_marginTop="8dp"
        android:text="TURN_ON"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.212"/>
    <Button
```

```
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginBottom="8dp"
    android:layout_marginTop="8dp"
    android:text="DISCOVERABLE"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/button3"
    app:layout_constraintVertical_bias="0.167"/>
  <Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="44dp"
    android:text="TURN_OFF"
    app:layout_constraintHorizontal_bias="0.501"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/button1"/>
</android.support.constraint.ConstraintLayout>

MainActivity.java
package com.example.jevitha.a16_5_bluetooth;
import android.bluetooth.BluetoothAdapter;
import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
  private static final int REQUEST_ENABLE_BT = 0;
  private static final int REQUEST_DISCOVERABLE_BT = 1;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    final TextView out=(TextView)findViewById(R.id.out);
    Button button1 = (Button) findViewById(R.id.button1);
    Button button2 = (Button) findViewById(R.id.button2);
    Button button3 = (Button) findViewById(R.id.button3);
    final BluetoothAdapter mBluetoothAdapter = BluetoothAdapter.getDefaultAdapter();


    if (mBluetoothAdapter == null) {
      out.append("device not supported");
    }
    button1.setOnClickListener(new View.OnClickListener() {
      public void onClick(View v) {
        if (mBluetoothAdapter == null) {
          out.setText("TURN ON :device not supported");
          return;
        }
        if (!mBluetoothAdapter.isEnabled()) {
          out.setText("TURNING ON BLUETOOTH");
          Intent enableBtIntent = new Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
          startActivityForResult(enableBtIntent, REQUEST_ENABLE_BT);
        }
      }
    });
    button2.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View arg0) {
        if (mBluetoothAdapter == null) {
          out.setText("DISCOVERABLE: device not supported");
          return;
        }
        if (!mBluetoothAdapter.isDiscovering()) {
          out.setText("MAKING YOUR DEVICE DISCOVERABLE");
          Toast.makeText(getApplicationContext(), "MAKING YOUR DEVICE DISCOVERABLE",
              Toast.LENGTH_LONG);
```

```
                Intent enableBtIntent = new Intent(BluetoothAdapter.ACTION_REQUEST_DISCOVERABLE);
                startActivityForResult(enableBtIntent, REQUEST_DISCOVERABLE_BT);
            }
        }
    });
    button3.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View arg0) {
            if (mBluetoothAdapter == null) {
                out.setText("TURN OFF: device not supported");
                return;
            }
            mBluetoothAdapter.disable();
            out.setText("TURN_OFF BLUETOOTH");
            Toast.makeText(getApplicationContext(), "TURNING_OFF BLUETOOTH", Toast.LENGTH_LONG);
        }
    });
  }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a16_5_bluetooth">

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

  <application
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">
    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

24_AutocompleteTextView
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

  <TextView
    android:id="@+id/textView"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Enter a Programming Language: "
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintHorizontal_bias="0.501"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintVertical_bias="0.221" />

  <AutoCompleteTextView
    android:id="@+id/autoCompleteTextView"
    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:layout_marginBottom="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        android:hint="C,C++,Java,.."
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.502"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView"
        app:layout_constraintVertical_bias="0.141" />

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a7_autocompletetextview;

import android.graphics.Color;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.MotionEvent;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.AutoCompleteTextView;

public class MainActivity extends AppCompatActivity {

  String[] language ={"C","C++","Java","Python","PHP","Kotlin","LISP","Prolog"};
  AutoCompleteTextView atv;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     //Try out android.R.layout.select_dialog_item,android.R.layout.simple_dropdown_item_1line,etc
     ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
           android.R.layout.simple_selectable_list_item,language);
     atv= (AutoCompleteTextView)findViewById(R.id.autoCompleteTextView);
     atv.setThreshold(1);
     atv.setAdapter(adapter);
     atv.setTextColor(Color.BLUE);


     atv.setOnTouchListener(new View.OnTouchListener(){
        @Override
        public boolean onTouch(View v, MotionEvent event){
           atv.showDropDown();
           return false;
        }
     });
  }

}
```

25_Spinner_ToggleButton

app→ res→ values → strings.xml

```
<resources>
  <string name="app_name">6_Spinner_ToggleButton</string>
  <string-array name="color">
     <item>Red</item>
     <item>Green</item>
     <item>Blue</item>
  </string-array>

</resources>
```

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:id="@+id/layout1"
  tools:context=".MainActivity">

  <TextView
     android:id="@+id/tv1"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="Hello World!"
     android:layout_marginBottom="10dp" />

  <Spinner
     android:id="@+id/spinner1"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginBottom="10dp"/>

  <ToggleButton
     android:id="@+id/toggleButton"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="Change Background"
     android:textOff="Change to GRAY"
     android:textOn="Change to WHITE"
     android:layout_marginBottom="10dp"/>

  <Spinner
     android:id="@+id/spinner2"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content" />

</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a6_spinner_togglebutton;

import android.graphics.Color;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.CheckedTextView;
import android.widget.CompoundButton;
import android.widget.LinearLayout;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;
import android.widget.ToggleButton;

public class MainActivity extends AppCompatActivity
     implements AdapterView.OnItemSelectedListener, CompoundButton.OnCheckedChangeListener {

  Spinner s1,s2;
  ToggleButton t;
  LinearLayout l;

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

     s1=(Spinner)findViewById(R.id.spinner1);                    //simple_list_item_checked
     ArrayAdapter
adap1=ArrayAdapter.createFromResource(this,R.array.color,android.R.layout.simple_list_item_activated_1);
     s1.setAdapter(adap1);
```

```
        s1.setOnItemSelectedListener(this);


        String days[]={"Sunday","Monday","Tuesday"};
        s2=(Spinner)findViewById(R.id.spinner2);
        ArrayAdapter<String> adap2=new
ArrayAdapter<String>(this,android.R.layout.simple_spinner_dropdown_item,days);
        s2.setAdapter(adap2);
        s2.setOnItemSelectedListener(this);

        //Use Toggle button with setOnCheckedChangeListener
        t=(ToggleButton)findViewById(R.id.toggleButton);
        l=(LinearLayout)findViewById(R.id.layout1);
        t.setOnCheckedChangeListener(this);
    }

    @Override
    public void onItemSelected(AdapterView<?> adapterView, View view, int i, long l) {

        if(adapterView.getId()==R.id.spinner1) {
            Log.d("MainActivity", "item selected");
            TextView txt = (TextView) view;
            //Checked Text view
            Log.d("spinner1",txt.getText().toString());
            Toast.makeText(getApplicationContext(), "You have selected " + txt.getText(),
Toast.LENGTH_SHORT).show();
        }
        else if(adapterView.getId()==R.id.spinner2)
        {
            CheckedTextView txt1 = (CheckedTextView) view;
            Toast.makeText(getApplicationContext(), "You have selected " + txt1.getText(),
Toast.LENGTH_SHORT).show();
            Log.d("spinner2",txt1.getText().toString());
        }

    }

    @Override
    public void onNothingSelected(AdapterView<?> adapterView) {
        Toast.makeText(getApplicationContext(), "No selection yet", Toast.LENGTH_SHORT).show();

    }
// Implementing listener For Toggle Button
    @Override
    public void onCheckedChanged(CompoundButton compoundButton, boolean isChecked) {

        // Change background color of layout if toggle button is clicked
        if(isChecked)
        {
            l.setBackgroundColor(Color.GRAY);
        }
        else
        {
            l.setBackgroundColor(Color.WHITE);
        }
    }

}
```

26_ImageView_ImageButton
app→ res→ drawable→ rightclick→ new → drawable resource file → Enter file name as “sample” → ok

Sample.xml

```
<?xml version="1.0" encoding="utf-8"?>
<!-- The order of the <item> elements is important because they are evaluated in order.
This is why the "normal" button image comes last, because it will only be applied after
android:state_pressed and android:state_focused have both evaluated false.-->
<selector xmlns:android="http://schemas.android.com/apk/res/android">
<item android:state_pressed="true"
  android:drawable="@drawable/button_pressed" /> <!-- pressed -->
<item android:state_focused="true"
```

```
  android:drawable="@drawable/button_focused" /> <!-- focused -->
<item android:drawable="@drawable/button_normal" /> <!-- default -->
</selector>
```

2. Download some images, copy the images in file system, right click drawable → paste

3. Create 3 new “Vector Asset” inside drawable folder with different colors and name them as button_pressed, button_focused, button_normal

Button_pressed.xml

```
<vector android:height="24dp" android:tint="#EA050F"
  android:viewportHeight="24.0" android:viewportWidth="24.0"
  android:width="24dp" xmlns:android="http://schemas.android.com/apk/res/android">
  <path android:fillColor="#FF000000" android:pathData="M6,18c0,0.55 0.45,1 1,1h1v3.5c0,0.83 0.67,1.5
1.5,1.5s1.5,-0.67 1.5,-1.5L11,19h2v3.5c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5L16,19h1c0.55,0 1,-0.45
1,-1L18,8L6,8v10zM3.5,8C2.67,8 2,8.67 2,9.5v7c0,0.83 0.67,1.5 1.5,1.5S5,17.33 5,16.5v-7C5,8.67 4.33,8
3.5,8zM20.5,8c-0.83,0 -1.5,0.67 -1.5,1.5v7c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5v-7c0,-0.83 -0.67,-1.5
-1.5,-1.5zM15.53,2.16l1.3,-1.3c0.2,-0.2 0.2,-0.51 0,-0.71 -0.2,-0.2 -0.51,-0.2 -0.71,0l-1.48,1.48C13.85,1.23 12.95,1
12,1c-0.96,0 -1.86,0.23 -2.66,0.63L7.85,0.15c-0.2,-0.2 -0.51,-0.2 -0.71,0 -0.2,0.2 -0.2,0.51
0,0.71l1.31,1.31C6.97,3.26 6,5.01 6,7h12c0,-1.99 -0.97,-3.75
-2.47,-4.84zM10,5L9,5L9,4h1v1zM15,5h-1L14,4h1v1z"/>
</vector>
```

Button_focused.xml

```
<vector android:height="24dp" android:tint="#3A2CEA"
  android:viewportHeight="24.0" android:viewportWidth="24.0"
  android:width="24dp" xmlns:android="http://schemas.android.com/apk/res/android">
  <path android:fillColor="#FF000000" android:pathData="M6,18c0,0.55 0.45,1 1,1h1v3.5c0,0.83 0.67,1.5
1.5,1.5s1.5,-0.67 1.5,-1.5L11,19h2v3.5c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5L16,19h1c0.55,0 1,-0.45
1,-1L18,8L6,8v10zM3.5,8C2.67,8 2,8.67 2,9.5v7c0,0.83 0.67,1.5 1.5,1.5S5,17.33 5,16.5v-7C5,8.67 4.33,8
3.5,8zM20.5,8c-0.83,0 -1.5,0.67 -1.5,1.5v7c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5v-7c0,-0.83 -0.67,-1.5
-1.5,-1.5zM15.53,2.16l1.3,-1.3c0.2,-0.2 0.2,-0.51 0,-0.71 -0.2,-0.2 -0.51,-0.2 -0.71,0l-1.48,1.48C13.85,1.23 12.95,1
12,1c-0.96,0 -1.86,0.23 -2.66,0.63L7.85,0.15c-0.2,-0.2 -0.51,-0.2 -0.71,0 -0.2,0.2 -0.2,0.51
0,0.71l1.31,1.31C6.97,3.26 6,5.01 6,7h12c0,-1.99 -0.97,-3.75
-2.47,-4.84zM10,5L9,5L9,4h1v1zM15,5h-1L14,4h1v1z"/>
</vector>
```

Button_normal.xml

```
<vector android:height="24dp" android:tint="#28EA2E"
  android:viewportHeight="24.0" android:viewportWidth="24.0"
  android:width="24dp" xmlns:android="http://schemas.android.com/apk/res/android">
  <path android:fillColor="#FF000000" android:pathData="M6,18c0,0.55 0.45,1 1,1h1v3.5c0,0.83 0.67,1.5
1.5,1.5s1.5,-0.67 1.5,-1.5L11,19h2v3.5c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5L16,19h1c0.55,0 1,-0.45
1,-1L18,8L6,8v10zM3.5,8C2.67,8 2,8.67 2,9.5v7c0,0.83 0.67,1.5 1.5,1.5S5,17.33 5,16.5v-7C5,8.67 4.33,8
3.5,8zM20.5,8c-0.83,0 -1.5,0.67 -1.5,1.5v7c0,0.83 0.67,1.5 1.5,1.5s1.5,-0.67 1.5,-1.5v-7c0,-0.83 -0.67,-1.5
-1.5,-1.5zM15.53,2.16l1.3,-1.3c0.2,-0.2 0.2,-0.51 0,-0.71 -0.2,-0.2 -0.51,-0.2 -0.71,0l-1.48,1.48C13.85,1.23 12.95,1
12,1c-0.96,0 -1.86,0.23 -2.66,0.63L7.85,0.15c-0.2,-0.2 -0.51,-0.2 -0.71,0 -0.2,0.2 -0.2,0.51
0,0.71l1.31,1.31C6.97,3.26 6,5.01 6,7h12c0,-1.99 -0.97,-3.75
-2.47,-4.84zM10,5L9,5L9,4h1v1zM15,5h-1L14,4h1v1z"/>
</vector>
```

Activity_main.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:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical"
  android:paddingBottom="@dimen/activity_vertical_margin"
  android:paddingRight="@dimen/activity_horizontal_margin"
  android:paddingTop="@dimen/activity_vertical_margin"
  android:scrollbars="vertical"
  tools:context=".MainActivity">

  <!-- Scroll view may have only one direct child placed within it.
    To add multiple views within the scroll view, make the direct child you add a view group,
    for example LinearLayout, and place additional views within that LinearLayout. -->
  <ScrollView
    android:layout_width="match_parent"
    android:layout_height="wrap_content">
    <LinearLayout
      android:layout_width="match_parent"
```

```
        android:layout_height="match_parent"
        android:orientation="vertical">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Image Button Demo: "
        android:textColor="@color/colorAccent"/>

    <ImageButton
        android:id="@+id/ib1"
        android:layout_width="200dp"
        android:layout_height="wrap_content"
        android:src="@drawable/android" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="15dp"
        android:text="Image Button with Varying images: "
        android:textColor="@color/colorAccent"/>

    <ImageButton
        android:id="@+id/ib2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:src="@drawable/sample" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="15dp"
        android:text="Image View: "
        android:textColor="@color/colorAccent"/>

    <ImageView
        android:id="@+id/iv1"
        android:layout_width="match_parent"
        android:layout_height="100dp"
        android:scaleType="fitStart"
        android:src="@drawable/androido"
        />

        <!-- try scaleType=fitcenter, fitStart, etc-->
    <ImageView
        android:id="@+id/iv2"
        android:layout_width="match_parent"
        android:layout_height="200dp"
        android:layout_marginTop="10dp"
        android:scaleType="fitXY"
        android:background="#000"
        />
    </LinearLayout>
  </ScrollView>
</LinearLayout>
```

Main_activity.java

```
package com.example.jevitha.a12_imageview_imagebutton;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.CheckBox;
import android.widget.EditText;
import android.widget.ImageButton;
import android.widget.ImageView;
import android.widget.ListView;
import android.widget.RadioButton;
import android.widget.TextView;
import android.widget.Toast;

//https://developer.android.com/reference/android/widget/ImageView.html
//https://developer.android.com/reference/android/widget/ImageButton

public class MainActivity extends AppCompatActivity implements View.OnClickListener {
```

```
    ImageButton b1;
    ImageView v1,v2;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1 = findViewById(R.id.ib1);
        v1 = findViewById(R.id.iv1);
        b1.setOnClickListener(this);
        v1.setOnClickListener(this);
        v2 =(ImageView) findViewById(R.id.iv2);
        v2.setOnClickListener(new View.OnClickListener(){
            @Override
            public void onClick(View view) {
                v2.setImageResource(R.drawable.android); //set the source in java class
            }
        });
    }


    @Override
    public void onClick(View view) {
      if(view.getId() == b1.getId())
          Toast.makeText(this,"ImageButton clicked", Toast.LENGTH_SHORT).show();
      else
          Toast.makeText(this,"ImageView clicked", Toast.LENGTH_SHORT).show();

    }
}
```

27_GridView
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:tools="http://schemas.android.com/tools"
    xmlns:android="http://schemas.android.com/apk/res/android"

    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <!-- Try giving absolute values here - 2, 3,etc for numColumns -->
    <GridView
        android:id="@+id/gridview1"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        android:columnWidth="80dp"
        android:gravity="center_horizontal"
        android:numColumns="auto_fit"
        android:stretchMode="columnWidth" >
    </GridView>


</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a9_gridview;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.GridView;
import android.widget.TextView;
import android.widget.Toast;


// https://developer.android.com/reference/android/widget/GridView
```

```
public class MainActivity extends AppCompatActivity implements AdapterView.OnItemClickListener {
  GridView gridView;

  static final String[] alphabets = new String[]{


        "A", "B", "C", "D", "E",
        "F", "G", "H", "I", "J",
        "K", "L", "M", "N", "O",
        "P", "Q", "R", "S", "T",
        "U", "V", "W", "X", "Y", "Z",
        "A", "B", "C", "D", "E",
        "F", "G", "H", "I", "J",
        "K", "L", "M", "N", "O",
        "P", "Q", "R", "S", "T",
        "U", "V", "W", "X", "Y", "Z"

  };


  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     gridView = (GridView) findViewById(R.id.gridview1);
     // Create adapter to set value for grid view
     ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
           android.R.layout.simple_list_item_1, alphabets);

     gridView.setAdapter(adapter);
     gridView.setOnItemClickListener(this);

 /*    Another coding style to set the listener

          gridView.setOnItemClickListener(new AdapterView.OnItemClickListener() {


       @Override
       public void onItemClick(AdapterView<?> parent, View v,
                       int position, long id) {


          Toast.makeText(getApplicationContext(),
                ((TextView) v).getText()   , Toast.LENGTH_SHORT).show();


       }
    });*/


  }

  @Override
  public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
     Toast.makeText(getApplicationContext(),
           ((TextView) view).getText()+" Pos: "+position, Toast.LENGTH_SHORT).show();

  }
}
```

28_AlertDialog
Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">

  <Button
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="Show Alert"
```

```
    android:onClick="clickme"/>


</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a10_alertdialog;

import android.content.DialogInterface;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;


public class MainActivity extends AppCompatActivity {

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
  }
  public void clickme(View v)
  {
    AlertDialog.Builder alertDialog = new AlertDialog.Builder(this);
    // Setting Dialog Title
    alertDialog.setTitle("Confirm Delete...");
    // Setting Dialog Message
    alertDialog.setMessage("Are you sure you want delete this?");
    // Setting Icon to Dialog
    alertDialog.setIcon(R.drawable.ic_launcher_background);
    // Setting Positive "Yes" Button
    alertDialog.setPositiveButton("yes", new DialogInterface.OnClickListener() {
      @Override
      public void onClick(DialogInterface dialog, int which) {
        Toast.makeText(getApplicationContext(), "You clicked on YES :    "+which,
Toast.LENGTH_SHORT).show();
      }
    });

    // Setting Negative "NO" Button
    alertDialog.setNegativeButton("NO", new DialogInterface.OnClickListener() {
      public void onClick(DialogInterface dialog, int which) {
        // Write your code here to invoke NO event
        Toast.makeText(getApplicationContext(), "You clicked on NO :    "+which,
Toast.LENGTH_SHORT).show();
        // dialog.cancel();
      }
    });
    // Setting Netural "Cancel" Button
    alertDialog.setNeutralButton("Cancel", new DialogInterface.OnClickListener() {
      public void onClick(DialogInterface dialog, int which) {
        // User pressed Cancel button. Write Logic Here
        Toast.makeText(getApplicationContext(), "You clicked on Cancel :    "+which,
            Toast.LENGTH_SHORT).show();
      }
    });
    // Showing Alert Message
    alertDialog.show();
  }
}
```

29_FragmentLifecycle

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android: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">
    <!-- Take a fragment in our activity -->
    <fragment
        android:id="@+id/test_fragment"
        class="com.example.jevitha.a18_3_fragment_lifecycle.testFragment"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:layout="@layout/fragment_test" />

</RelativeLayout>
```

fragment_test.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"
    tools:context=".testFragment">

    <!-- TODO: Update blank fragment layout -->
    <TextView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:text="@string/hello_blank_fragment" />

</FrameLayout>
```

MainActivity.java

```
package com.example.jevitha.a18_3_fragment_lifecycle;

import android.support.v7.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);
    }
}
```

TestFragment.java

```
package com.example.jevitha.a18_3_fragment_lifecycle;

import android.app.Activity;
import android.content.Context;
import android.net.Uri;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.util.Log;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Toast;


public class testFragment extends Fragment {

    private void printLog(String s) {
// display a message in Log File
        Log.d("LifeCycle:", s);
        //Toast the lifecycle
        Toast.makeText(getActivity(),"Fragment Lifecycle:"+s, Toast.LENGTH_SHORT).show();
    }

    @Override
    public void onActivityCreated(Bundle savedInstanceState) {
        super.onActivityCreated(savedInstanceState);
        printLog("onActivityCreated Called");
    }
```

```
    @Override
    public View onCreateView(LayoutInflater inflater, ViewGroup container, Bundle savedInstanceState) {

        View v = inflater.inflate(R.layout.fragment_test, container, false);
        printLog("onCreateView Called");

        return v;
    }

    @Override
    public void onViewCreated(View view, Bundle savedInstanceState) {
        super.onViewCreated(view, savedInstanceState);
        printLog("onViewCreated Called");

    }

    @Override
    public void onAttach(Activity activity) {
        super.onAttach(activity);
        printLog("onAttach Called");
    }

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        printLog("onCreate Called");
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        printLog("onDestroy Called");
    }

    @Override
    public void onDestroyView() {
        super.onDestroyView();
        printLog("onDestroyView Called");
    }

    @Override
    public void onDetach() {
        super.onDetach();
        printLog("onDetach Called");
    }

    @Override
    public void onPause() {
        super.onPause();
        printLog("onPause Called");
    }

    @Override
    public void onResume() {
        super.onResume();
        printLog("onResume Called");
    }

    @Override
    public void onStart() {
        super.onStart();
        printLog("onStart Called");
    }

    @Override
    public void onStop() {
        super.onStop();
        printLog("onStop Called");
    }
}
```

30_fragment_static_loading
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="horizontal"
  android:weightSum="1.0"
  tools:context=".MainActivity">

    <fragment
      android:layout_height="match_parent"
      android:layout_width="match_parent"
      class="com.example.jevitha.a18_1_fragments_staticloading.MenuFragment"
      android:id="@+id/fragment"
      android:layout_weight="0.5"/>
    <fragment
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      class="com.example.jevitha.a18_1_fragments_staticloading.TextFragment"
      android:id="@+id/fragment2"
      android:layout_weight="0.5"/>
  </LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a18_1_fragments_staticloading;

import android.support.v7.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);
  }
}
```

Fragment_menu.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:orientation="vertical"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MenuFragment">

  <ListView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:id="@+id/listview" />

</LinearLayout>
```

MenuFragment.java

```
package com.example.jevitha.a18_1_fragments_staticloading;

import android.content.Context;
import android.net.Uri;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;


/**
```

```
* A simple {@link Fragment} subclass.
* Activities that contain this fragment must implement the
* {@link MenuFragment.OnFragmentInteractionListener} interface
* to handle interaction events.
* Use the {@link MenuFragment#newInstance} factory method to
* create an instance of this fragment.
*/
public class MenuFragment extends Fragment   {
   String[] AndroidOS = new String[] { "Cupcake","Donut","Eclair","Froyo","Gingerbread","Honeycomb","Ice
Cream SandWich","Jelly Bean","KitKat" };
   String[] Version = new String[]{"1.5","1.6","2.0-2.1","2.2","2.3","3.0-3.2","4.0","4.1-4.3","4.4"};
   @Override

   public View onCreateView(LayoutInflater inflater,ViewGroup container, Bundle savedInstanceState) {
      View view =inflater.inflate(R.layout.fragment_menu, container, false);
      ArrayAdapter<String> adapter = new ArrayAdapter<String>(getActivity(),
            android.R.layout.simple_list_item_1, AndroidOS);
     ListView lv = view.findViewById(R.id.listview);
      lv.setAdapter(adapter);
lv.setOnItemClickListener(
            new AdapterView.OnItemClickListener()
            {
               @Override
               public void onItemClick(AdapterView<?> arg0, View view,
                              int position, long id) {
//                        TextFragment txt = (TextFragment)getFragmentManager().findFragmentById(R.id.fragment2);
//                        txt.change(AndroidOS[position],"Version : "+Version[position]);

                  Toast.makeText(getActivity(), "Clicked on OS:Version - "+ AndroidOS[position]+" :
"+Version[position],Toast.LENGTH_SHORT).show();

               }
            }
      );


      return view;

   }


}
```

Fragment_text.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:orientation="vertical"
   android:layout_width="match_parent"
   android:gravity="center"
   android:background="#5ba4e5"
   android:layout_height="match_parent"
   tools:context=".TextFragment">

   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:textSize="40px"
      android:textColor="#ffffff"
      android:text="Android OS"
      android:layout_gravity="center"
      android:id="@+id/AndroidOs"/>
   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      android:textColor="#ffffff"
      android:text="Android Version"
      android:textSize="30px"
      android:id="@+id/Version"/>

</LinearLayout>
```

TextFragment.java

```
package com.example.jevitha.a18_1_fragments_staticloading;

import android.content.Context;
import android.net.Uri;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;


/**
* A simple {@link Fragment} subclass.
* Activities that contain this fragment must implement the
* {@link TextFragment.OnFragmentInteractionListener} interface
* to handle interaction events.
* Use the {@link TextFragment#newInstance} factory method to
* create an instance of this fragment.
*/
public class TextFragment extends Fragment {

   TextView text,vers;
   @Override
   public View onCreateView(LayoutInflater inflater, ViewGroup container,
                            Bundle savedInstanceState) {
      // Inflate the layout for this fragment
    return inflater.inflate(R.layout.fragment_text, container, false);


   }

}
```

31_Fragment_dynamic_loading
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   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">
   <!-- display two Button's and a FrameLayout to replace the Fragment's   -->
   <Button
      android:id="@+id/firstFragment"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:background="@color/button_background_color"
      android:text="First Fragment"
      android:textColor="@color/white"
      android:textSize="20sp" />
   <Button
      android:id="@+id/secondFragment"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_marginTop="10dp"
      android:background="@color/button_background_color"
      android:text="Second Fragment"
      android:textColor="@color/white"
      android:textSize="20sp" />
   <!--
   Read these links :
    https://stackoverflow.com/questions/17495199/why-is-a-framelayout-used-for-fragments
```

```
    https://developer.android.com/reference/android/widget/FrameLayout

    FrameLayout is designed to block out an area on the screen to display a single item.
    Main purpose of frame layout is to block the area required to fit the largest child view.
    If you use a Frame Layout as Fragment Container you can ensure that you always have the space available
    to accommodate the largest fragment layout.-->
    <FrameLayout
        android:id="@+id/frameLayout"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginTop="10dp"
        android:background="@color/colorAccent"/>
</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a18_fragments_dynamicloading;

import android.app.Fragment;
import android.app.FragmentManager;
import android.app.FragmentTransaction;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {

    Button firstFragment, secondFragment;

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

        firstFragment = (Button) findViewById(R.id.firstFragment);
        secondFragment = (Button) findViewById(R.id.secondFragment);

        // perform setOnClickListener event on First Button
        firstFragment.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // load First Fragment
                loadFragment(new FirstFragment());
            }
        });
        // perform setOnClickListener event on Second Button
        secondFragment.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                // load Second Fragment
                loadFragment(new SecondFragment());
            }
        });
    }
    /*
     Details regarding Fragment Classes:
    android.app.Fragment : The base class for all fragment definitions
    android.app.FragmentManager : The class for interacting with fragment objects inside an activity
    android.app.FragmentTransaction : The class for performing an atomic set of fragment operations

    When using a compatibility package library provided by Google, the following classes are used for implementation.

    android.support.v4.app.FragmentActivity : The base class for all activities using compatibility-based fragment
    (and loader) features
    android.support.v4.app.Fragment
    android.support.v4.app.FragmentManager
    android.support.v4.app.FragmentTransaction
     */

    private void loadFragment(Fragment fragment) {
        // create a FragmentManager
        FragmentManager fm = getFragmentManager();
        // android.support.v4.app.FragmentManager fm=getSupportFragmentManager();
```

```
        // create a FragmentTransaction to begin the transaction and replace the Fragment
        FragmentTransaction fragmentTransaction =
                fm.beginTransaction();

        // replace the FrameLayout with new Fragment
        fragmentTransaction.replace(R.id.frameLayout, fragment);

        //fragmentTransaction.add(R.id.firstFragment,fragment);
        fragmentTransaction.commit(); // save the changes
    }
}
```

app→ right click → New → Fragment → Fragment(Blank)

Fragment_first.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@color/colorPrimary"
    tools:context=".FirstFragment">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="100dp"
        android:text="This is First Fragment"
        android:textColor="@color/black"
        android:textSize="25sp" />

    <Button
        android:id="@+id/firstButton"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:layout_marginLeft="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/green"
        android:text="First Fragment"
        android:textColor="@color/white"
        android:textSize="20sp"
        android:textStyle="bold" />


</RelativeLayout>
```

FirstFragment.java

```
package com.example.jevitha.a18_fragments_dynamicloading;

import android.os.Bundle;
import android.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.Toast;

public class FirstFragment extends Fragment {

    View view;
    Button firstButton;

/* Read this link for more info on inflator :
https://www.bignerdranch.com/blog/understanding-androids-layoutinflater-inflate/   */

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

```
    // perform setOnClickListener on first Button
    firstButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            // display a message by using a Toast
            Toast.makeText(getActivity(), "First Fragment", Toast.LENGTH_LONG).show();
        }
    });
    return view;

}

}
```

Fragment_second.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@color/blue"
    tools:context=".SecondFragment">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="100dp"
        android:text="This is Second Fragment"
        android:textColor="@color/black"
        android:textSize="25sp" />
    <Button
        android:id="@+id/secondButton"
        android:layout_width="fill_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:layout_marginLeft="20dp"
        android:layout_marginRight="20dp"
        android:background="@color/green"
        android:text="Second Fragment"
        android:textColor="@color/white"
        android:textSize="20sp"
        android:textStyle="bold" />


</RelativeLayout>
```

SecondFragment.java

```
package com.example.jevitha.a18_fragments_dynamicloading;


import android.os.Bundle;
import android.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.Toast;

public class SecondFragment extends Fragment {

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

    secondButton = (Button) view.findViewById(R.id.secondButton);
    // perform setOnClickListener on second Button
    secondButton.setOnClickListener(new View.OnClickListener() {
        @Override
```

```
        public void onClick(View v) {
            // display a message by using a Toast
            Toast.makeText(getActivity(), "Second Fragment", Toast.LENGTH_LONG).show();
        }
    });
    return view;

}
}
```

32_Fragment_Communication
Communicator.java

```
package com.example.jevitha.a18_3_fragment_communication_button_textview;

public interface Communicator {
    public void respond(String i);
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.widget.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"
    android:orientation="vertical">
    <fragment
        android:layout_width="match_parent"
        android:layout_height="250dp"
        android:id="@+id/fragment1"
        android:name="com.example.jevitha.a18_3_fragment_communication_button_textview.Fragment1">
    </fragment>
    <fragment
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/fragment2"
        android:name="com.example.jevitha.a18_3_fragment_communication_button_textview.Fragment2">
    </fragment>
</android.widget.LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a18_3_fragment_communication_button_textview;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity implements Communicator {

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

    @Override
    public void respond(String i) {
        android.support.v4.app.FragmentManager fm=
                getSupportFragmentManager();
        Fragment2 f2= (Fragment2)fm.
                findFragmentById(R.id.fragment2);
        f2.changedata(i);
    }

}
```

fragment_fragment1.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="@android:color/holo_blue_light"
   tools:context=".Fragment1">

   <Button
      android:id="@+id/btn"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_margin="40dp"
      android:layout_gravity="center_horizontal"
      android:text="counter" />

</FrameLayout>
```

Fragment1.java

```
package com.example.jevitha.a18_3_fragment_communication_button_textview;

import android.content.Context;
import android.net.Uri;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;


public class Fragment1 extends Fragment implements View.OnClickListener{
   int count=0;
   Button bt;
   Communicator comm;
 @Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
                         Bundle savedInstanceState) {
// Inflate the layout for this fragment
  // return inflater.inflate(R.layout.fragment_fragment1, container, false);
   View v = inflater.inflate(R.layout.fragment_fragment1, container, false);
   bt=(Button)v.findViewById(R.id.btn);
   bt.setOnClickListener(this);
   return v;
}


   @Override
   public void onClick(View v) {
      count++;
      if (comm == null)
      comm= (Communicator) getActivity();
      comm.respond("The button is clicked "+ count+" times");
   }


}
```

fragement_Fragment2.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="@android:color/holo_green_light"
   tools:context=".Fragment2">

   <TextView
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      android:gravity="center"
```

```
    android:textSize="20sp"
    android:textStyle="bold"
    android:textColor="@color/colorAccent"
    android:id="@+id/tv"
    android:text="Count" />

</FrameLayout>
```

Fragment2.java

```
package com.example.jevitha.a18_3_fragment_communication_button_textview;

import android.content.Context;
import android.net.Uri;
import android.os.Bundle;
import android.support.v4.app.Fragment;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.TextView;


public class Fragment2 extends Fragment {
  TextView txt;
  @Override
  public View onCreateView(LayoutInflater inflater, ViewGroup container,
                           Bundle savedInstanceState) {
    // Inflate the layout for this fragment
    return inflater.inflate(R.layout.fragment_fragment2, container, false);
  }
//    @Override
//    public void onActivityCreated( Bundle savedInstanceState) {
//        super.onActivityCreated(savedInstanceState);
//
//    }
  public void changedata(String i)
  {
    txt=(TextView)getActivity().findViewById(R.id.tv);
    txt.setText(i);
  }

}
```

33_OptionsMenu_ContextMenu
Right click res → New Android Resource Directory → Change type to “menu” This will automatically create the directory name → OK.

Right click on res → menu → New Android Resource files → top_menu.xml .
Repeat the same for context_menu.xml

```
package course.examples.UI.MenuExample;

import android.app.Activity;
import android.os.Bundle;
import android.view.ContextMenu;
import android.view.ContextMenu.ContextMenuInfo;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.view.View;
import android.widget.TextView;
import android.widget.Toast;

public class HelloAndroidWithMenuActivity extends Activity {
 public void onCreate(Bundle savedInstanceState) {
   super.onCreate(savedInstanceState);

   setContentView(R.layout.main);
   TextView tv = (TextView) findViewById(R.id.text_view);
   registerForContextMenu(tv);

 }

 @Override
```

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

 @Override
 public boolean onOptionsItemSelected(MenuItem item) {
    switch (item.getItemId()) {
    case R.id.help:
       Toast.makeText(getApplicationContext(), "you've been helped",
            Toast.LENGTH_SHORT).show();
       return true;
    case R.id.more_help:
       Toast.makeText(getApplicationContext(), "you've been helped more",
            Toast.LENGTH_SHORT).show();
       return true;
    case R.id.even_more_help:
       return true;
    default:
       return false;
    }
 }

 @Override
 public void onCreateContextMenu(ContextMenu menu, View v,
       ContextMenuInfo menuInfo) {
    super.onCreateContextMenu(menu, v, menuInfo);
    MenuInflater inflater = getMenuInflater();
    inflater.inflate(R.menu.context_menu, menu);

    /*menu.setHeaderTitle("Context Menu");
    menu.add(0, v.getId(), 0, "Upload");
    menu.add(0, v.getId(), 0, "Search");
    menu.add(0, v.getId(), 0, "Share");
    menu.add(0, v.getId(), 0, "Bookmark");*/
 }

 @Override
 public boolean onContextItemSelected(MenuItem item) {

    //Toast.makeText(this, "Selected Item: " +item.getTitle(), Toast.LENGTH_SHORT).show();
    switch (item.getItemId()) {
    case R.id.help_guide:
       Toast.makeText(getApplicationContext(), "ContextMenu Shown",
            Toast.LENGTH_SHORT).show();
       return true;
    default:
       return false;
    }

    //return true;
 }
}
```

Context_menu.xml

```
<menu xmlns:android="http://schemas.android.com/apk/res/android" >

   <item
      android:id="@+id/help_guide"
      android:title="@string/guide"/>

</menu>
```

Top_menu.xml

```
<menu xmlns:android="http://schemas.android.com/apk/res/android" >

   <item
```

```
    android:id="@+id/help"
    android:icon="@drawable/ic_menu_help"
    android:title="@string/help"/>
  <item
    android:id="@+id/more_help"
    android:icon="@drawable/ic_menu_help"
    android:title="@string/more_help"/>
  <item
    android:id="@+id/even_more_help"
    android:icon="@drawable/ic_menu_help"
    android:title="@string/even_more_help">
    <menu>
      <item
        android:id="@+id/give_up"
        android:title="@string/give_up"/>
    </menu>
  </item>

</menu>
```

34_SQLite

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  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">

  <EditText
    android:id="@+id/editRollno"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Rollno" />

  <EditText
    android:id="@+id/editName"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/editRollno"
    android:hint="Name" />

  <EditText
    android:id="@+id/editMarks"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/editName"
    android:hint ="marks" />

  <Button
    android:id="@+id/btnAdd"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/editMarks"
    android:layout_marginTop="10dp"
    android:text="Add" />

  <Button
    android:id="@+id/btnDelete"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btnAdd"
    android:layout_marginTop="15dp"
    android:text="Delete" />

  <Button
    android:id="@+id/btnModify"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btnDelete"
```

```
    android:layout_marginTop="20dp"
    android:text="modify" />

  <Button
    android:id="@+id/btnViewAll"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btnModify"
    android:layout_marginTop="25dp"
    android:text="viewall" />

  <Button
    android:id="@+id/btnView"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btnViewAll"
    android:layout_marginTop="30dp"
    android:text="view" />

  <Button
    android:id="@+id/btnShowInfo"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/btnView"
    android:layout_marginTop="35dp"
    android:text="showinfo" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a22_sqllitedatabase_connectivity;


import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

  EditText editRollno, editName, editMarks;
  Button btnAdd, btnDelete, btnModify, btnViewAll, btnShowInfo, btnView;
  SQLiteDatabase db;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    editRollno = (EditText) findViewById(R.id.editRollno);
    editName = (EditText) findViewById(R.id.editName);
    editMarks = (EditText) findViewById(R.id.editMarks);
    btnAdd = (Button) findViewById(R.id.btnAdd);
    btnDelete = (Button) findViewById(R.id.btnDelete);
    btnModify = (Button) findViewById(R.id.btnModify);
    btnView = (Button) findViewById(R.id.btnView);
    btnViewAll = (Button) findViewById(R.id.btnViewAll);
    btnShowInfo = (Button) findViewById(R.id.btnShowInfo);
    //Registering Event Handlers
    btnAdd.setOnClickListener(this);
    btnDelete.setOnClickListener(this);
    btnModify.setOnClickListener(this);
    btnView.setOnClickListener(this);
    btnViewAll.setOnClickListener(this);
    btnShowInfo.setOnClickListener(this);
    // Creating database and table
    db = openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE, null);
    db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno VARCHAR,name VARCHAR,marks
VARCHAR);");
  }
```

```
    @Override
    public void onClick(View view) {
        // Adding a record
        if (view == btnAdd) {
            // Checking empty fields
            if (editRollno.getText().toString().trim().length() == 0 || editName.getText().toString().trim().length() == 0 ||
                    editMarks.getText().toString().trim().length() == 0) {
                showMessage("Error", "Please enter all values");
                return;
            }
            // Inserting record
            db.execSQL("INSERT INTO student VALUES('" + editRollno.getText() + "','" + editName.getText() +
                    "','" + editMarks.getText() + "');");
            showMessage("Success", "Record added");
            clearText();
        }
        // Deleting a record
        if (view == btnDelete) {
            // Checking empty roll number
            if (editRollno.getText().toString().trim().length() == 0) {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            // Searching roll number
            Cursor c = db.rawQuery("SELECT * FROM student WHERE rollno='" + editRollno.getText() + "'", null);
            if (c.moveToFirst()) {
                // Deleting record if found
                showMessage("Success", "Record Deleted");
                db.execSQL("DELETE FROM student WHERE rollno='" + editRollno.getText() + "'");
            } else {
                showMessage("Error", "Invalid Rollno");
            }
            clearText();
        }
        // Modifying a record
        if (view == btnModify) {
            // Checking empty roll number
            if (editRollno.getText().toString().trim().length() == 0) {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            // Searching roll number
            Cursor c = db.rawQuery("SELECT * FROM student WHERE rollno='" + editRollno.getText() + "'", null);
            if (c.moveToFirst()) {
                // Modifying record if found
                db.execSQL("UPDATE student SET name='" + editName.getText() + "',marks='" + editMarks.getText()
+
                        "' WHERE rollno='" + editRollno.getText() + "'");
                showMessage("Success", "Record Modified");
            }
            else {
                showMessage("Error", "Invalid Rollno");
            }
            clearText();
        }
        // Viewing a record
        if (view == btnView) {
            // Checking empty roll number
            if (editRollno.getText().toString().trim().length() == 0) {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            // Searching roll number
            Cursor c = db.rawQuery("SELECT * FROM student WHERE rollno='" + editRollno.getText() + "'", null);
            if (c.moveToFirst()) {
                // Displaying record if found
                editName.setText(c.getString(1));
                editMarks.setText(c.getString(2));
            } else {
                showMessage("Error", "Invalid Rollno");
                clearText();
            }
        }
        // Viewing all records
```

```
        if (view == btnViewAll) {
            // Retrieving all records
            Cursor c = db.rawQuery("SELECT * FROM student", null);
            // Checking if no records found
            if (c.getCount() == 0) {
                showMessage("Error", "No records found");
                return;
            }
            // Appending records to a string buffer
            StringBuffer buffer = new StringBuffer();
            while (c.moveToNext())
            {
                buffer.append("Rollno: " + c.getString(0) + "\n");
                buffer.append("Name: " + c.getString(1) + "\n");
                buffer.append("Marks: " + c.getString(2) + "\n\n");
            }
            // Displaying all records
            showMessage("Student Details", buffer.toString());
        }
        // Displaying info
        if (view == btnShowInfo){
            showMessage("SQLite demo", "SQLite Connectivity");
        }
    }
    public void showMessage(String title, String message){
        AlertDialog.Builder builder = new AlertDialog.Builder(this);
        builder.setCancelable(true);
        builder.setTitle(title);
        builder.setMessage(message);
        builder.show();
    }
    public void clearText(){

        editRollno.setText("");
        editName.setText("");
        editMarks.setText("");
        editRollno.requestFocus();
    }
}
```

35_SharedPreference
Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/activity_main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    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">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="20dp"
        android:textColor="@color/colorPrimary"
        android:text="Shared Preferences Demo" />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/t1"
        android:inputType="text"
        android:hint="Enter Language preference (English / Indian Languages)"
        android:layout_marginTop="50dp"/>
    <EditText
```

```
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/t2"
      android:inputType="text"
      android:hint="Enter background color preference (Light / Dark)"
      android:layout_marginTop="100dp"/>
   <Button
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="submit"
      android:onClick="submit"
      android:layout_marginTop="150dp"/>

</RelativeLayout>
```

Activity_my.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:id="@+id/activity_my"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   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=".MyActivity">
   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/t1"
      android:layout_marginTop="50dp"/>
   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/t2"
      android:layout_marginTop="100dp"/>
   <Button
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:onClick="getval"
      android:text="GET"
      android:layout_marginTop="150dp"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a21_1_sharedpreferences;

import android.content.Context;
import android.content.Intent;
import android.content.SharedPreferences;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
   EditText t1,t2;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
   }
   public void submit(View v)
   {
      t1=(EditText)findViewById(R.id.t1);
      t2=(EditText)findViewById(R.id.t2);
      SharedPreferences sf=getSharedPreferences("myfile", Context.MODE_PRIVATE);
      SharedPreferences.Editor edit=sf.edit();
     edit.clear(); // remove existing entries
```

```
        edit.putString("language",t1.getText().toString());
        edit.putString("color",t2.getText().toString());
        edit.commit();
        Intent i=new Intent(this,MyActivity.class);
        startActivity(i);

    }
}
```

MyActivity.java

```
package com.example.jevitha.a21_1_sharedpreferences;

import android.content.Context;
import android.content.SharedPreferences;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;

public class MyActivity extends AppCompatActivity {
    EditText t1,t2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_my);
    }
    public void getval(View v)
    {
        t1=(EditText)findViewById(R.id.t1);
        t2=(EditText)findViewById(R.id.t2);
        SharedPreferences sf=getSharedPreferences("myfile", Context.MODE_PRIVATE);
        String p=sf.getString("language","NA");
        String q=sf.getString("color","NA"); //if key is not available - it shows NA
        t1.setText(p);
        t2.setText(q);

    }
}
```

36_ContentResolver

https://developer.android.com/guide/topics/providers/content-provider-basics

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

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

</android.support.constraint.ConstraintLayout>



</LinearLayout>
```

MainActivity.java

```
package com.example.jevitha.a27_contentprovider;

import android.app.ListActivity;
import android.content.ContentResolver;
import android.database.Cursor;
import android.provider.ContactsContract;
import android.os.Bundle;
import android.widget.ArrayAdapter;

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

public class MainActivity   extends ListActivity {
  @Override
  public void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);

    ContentResolver cr = getContentResolver();
    Cursor c = cr.query(ContactsContract.Contacts.CONTENT_URI,
        new String[] {ContactsContract.Contacts.DISPLAY_NAME},
        null, null, null);

    List<String> contacts = new ArrayList<String>();
    if (c.moveToFirst()) {
      do {
        contacts.add(c.getString(c.getColumnIndex(
            ContactsContract.Contacts.DISPLAY_NAME)));
      } while (c.moveToNext());
    }


ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
    android.R.layout.simple_list_item_1, contacts);


    setListAdapter(adapter);
  }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a27_contentprovider">

  <application
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">

    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

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

</manifest>
```

37_BroadcastReceiver
Android_Manifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a23_broadcastreceiver">
```

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

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">

        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

        <receiver
            android:name=".MyBroadcastReceiver"
            android:enabled="true"
            android:exported="true">
            <intent-filter>
                <action android:name="android.provider.Telephony.SMS_RECEIVED">
                </action>
            </intent-filter>
        </receiver>
    </application>

</manifest>
```

MyBroadcastReceiver.java

```
package com.example.jevitha.a23_broadcastreceiver;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.os.Build;
import android.os.Bundle;
import android.provider.Telephony;
import android.telephony.SmsMessage;
import android.util.Log;
import android.widget.TextView;
import android.widget.Toast;

public class MyBroadcastReceiver extends BroadcastReceiver {

    @Override
    public void onReceive(Context context, Intent intent) {
        Toast.makeText(context,"Msg from BroadcastReceiver - " +
                "SMS Received",Toast.LENGTH_LONG).show();

        Bundle bundle   = intent.getExtras();
        SmsMessage smsMessage;

        if (Build.VERSION.SDK_INT >= 19) { //KITKAT
            SmsMessage[] msgs = Telephony.Sms.Intents.getMessagesFromIntent(intent);
            smsMessage = msgs[0];
        } else {
            Object pdus[] = (Object[]) bundle.get("pdus");
            smsMessage = SmsMessage.createFromPdu((byte[]) pdus[0]);
        }
        String messageBody = smsMessage.getMessageBody();
        Toast.makeText(context, messageBody,Toast.LENGTH_LONG).show();
    }
}
```

MainActivity.java

```
package com.example.jevitha.a23_broadcastreceiver;
```

```
import android.support.v7.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);
  }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

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

</android.support.constraint.ConstraintLayout>
```

38_BroadcastReceiver_OTP

Android_Manifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a23_1_broadcastreceiver_otpreader">

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


  <application
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">
    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

    <receiver
      android:name=".MyOTPReceiver"
      android:enabled="true"
      android:exported="true"></receiver>
  </application>

</manifest>
```

MyOTPReceiver.java

```
package com.example.jevitha.a23_1_broadcastreceiver_otpreader;

import android.content.BroadcastReceiver;
```

```
import android.content.Context;
import android.content.Intent;
import android.os.Build;
import android.os.Bundle;
import android.provider.Telephony;
import android.telephony.SmsMessage;
import android.widget.Toast;

public class MyOTPReceiver extends BroadcastReceiver {


  private static SmsListener mListener;

  @Override
  public void onReceive(Context context, Intent intent) {
     Bundle bundle   = intent.getExtras();

     SmsMessage smsMessage;

     if (Build.VERSION.SDK_INT >= 19) { //KITKAT
        SmsMessage[] msgs = Telephony.Sms.Intents.getMessagesFromIntent(intent);
        smsMessage = msgs[0];
     } else {
        Object pdus[] = (Object[]) bundle.get("pdus");
        smsMessage = SmsMessage.createFromPdu((byte[]) pdus[0]);
     }
     String messageBody = smsMessage.getMessageBody();
     //Pass the message text to interface
     mListener.messageReceived(messageBody);

  }

  public static void bindListener(SmsListener listener) {
     mListener = listener;
  }
}
```

SMSListener.java

```
package com.example.jevitha.a23_1_broadcastreceiver_otpreader;

public interface SmsListener {
  public void messageReceived(String messageText);
}
```

MainActivity.java

```
package com.example.jevitha.a23_1_broadcastreceiver_otpreader;

import android.content.IntentFilter;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.widget.TextView;
import android.widget.Toast;

import java.util.regex.Matcher;
import java.util.regex.Pattern;

public class MainActivity extends AppCompatActivity implements SmsListener{

  private MyOTPReceiver broadcastReceiver;
  public static final String OTP_REGEX = "[0-9]{1,6}";

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

     broadcastReceiver = new MyOTPReceiver();
  }

  @Override
```

```
  public void messageReceived(String messageText) {

      //From the received text string you may do string operations to get the required OTP
      //It depends on your SMS format
      Log.e("Message",messageText);
      Toast.makeText(MainActivity.this,"Message: "+
            messageText,Toast.LENGTH_LONG).show();

      // If your OTP is six digits number, you may use the below code

      Pattern pattern = Pattern.compile(OTP_REGEX);
      Matcher matcher = pattern.matcher(messageText);
      String otp = "XXXXX";
      while (matcher.find())
      {
         otp = matcher.group();
      }

      Toast.makeText(MainActivity.this,"OTP: "+ otp ,Toast.LENGTH_LONG).show();
      TextView t = findViewById(R.id.tv);
      t.setText(otp);
  }

  @Override
  protected void onStart() {
      super.onStart();

      IntentFilter intentFilter=new IntentFilter
            ("android.provider.Telephony.SMS_RECEIVED");
      registerReceiver(broadcastReceiver,intentFilter);
  }
  @Override
  protected void onStop() {
      super.onStop();
      unregisterReceiver(broadcastReceiver);
  }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

  <TextView
      android:id="@+id/tv"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:text="Hello World!"
      android:textColor="@color/colorAccent"
      android:textSize="20dp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintLeft_toLeftOf="parent"
      app:layout_constraintRight_toRightOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />

</android.support.constraint.ConstraintLayout>
```

39_Sending_Receiving_Custom_Broadcast
Android_Manifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a23_2_broadcastreceiver_custombroadcast">

  <application
```

```
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">
    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

    <receiver
      android:name=".MyReceiver"
      android:enabled="true"
      android:exported="true">
    </receiver>
  </application>

</manifest>
```

MyReceiver.java

```
package com.example.jevitha.a23_2_broadcastreceiver_custombroadcast;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.widget.Toast;

public class MyReceiver extends BroadcastReceiver {

  //https://stackoverflow.com/questions/47260459/manifest-declared-broadcast-receiver-does-not-receive-custom-bro
adcast-on-androi
  @Override
  public void onReceive(Context context, Intent intent) {
    Toast.makeText(context, "Intent Detected.",
        Toast.LENGTH_LONG).show();
  }
}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

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

  <Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/button1"
    android:text="Broadcast Intent"
    android:onClick="broadcastIntent"
    android:layout_centerHorizontal="true" />


</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a23_2_broadcastreceiver_custombroadcast;

import android.content.Intent;
import android.content.IntentFilter;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;

public class MainActivity extends AppCompatActivity {

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

  @Override
  protected void onStart() {
     super.onStart();
    myReceiver = new MyReceiver();
    IntentFilter intentFilter = new IntentFilter
          ("com.example.jevitha.a23_2_broadcastreceiver_custombroadcast.CUSTOM_INTENT");
    registerReceiver(myReceiver,intentFilter);
  }

  public void broadcastIntent(View view){
     Intent intent = new Intent
           ("com.example.jevitha.a23_2_broadcastreceiver_custombroadcast." +
                 "CUSTOM_INTENT");
     //intent.setAction("com.example.jevitha.CUSTOM_INTENT");
     sendBroadcast(intent);
  }

  @Override
  protected void onStop() {
     super.onStop();
     unregisterReceiver(myReceiver);
  }
}
```

40_ContentResolver_PhoneNo

A listview with sublist containing name and contact number of the contacts from phone. On clicking an element, an intent call is placed to that number.

```
<?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:layout_width="match_parent"
     android:layout_height="match_parent"
     android:id="@+id/lv">

  </ListView>
</LinearLayout>
```

In manifest

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

```
package com.example.archana.a24_contentresolver_sublist;
```

```
import android.content.ContentResolver;
import android.content.Context;
import android.content.Intent;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.net.Uri;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.support.v7.app.AlertDialog;
import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ListView;
import android.widget.SimpleAdapter;
import android.widget.TextView;
import android.widget.Toast;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;
import java.util.Map;

public class MainActivity extends AppCompatActivity {
  ListView lv;


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

    lv = findViewById(R.id.lv);
    ContentResolver cr = getContentResolver();
    Cursor c = cr.query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI, null, null, null, null);
    List<Map<String, String>> list = new ArrayList<>();
    HashMap<String,String> map ;

    if (c.moveToFirst()) {
      do {
//                numbers.add(c.getString(c.getColumnIndex(ContactsContract.CommonDataKinds.Phone.NUMBER)))
;
//                contacts.add(c.getString((c.getColumnIndex(ContactsContract.CommonDataKinds.Phone.DISPLAY_
NAME))));
map = new HashMap<String, String>();
map.put("numbers", c.getString(c.getColumnIndex(ContactsContract.CommonDataKinds.Phone.NUMBER)));
map.put("contacts",
c.getString((c.getColumnIndex(ContactsContract.CommonDataKinds.Phone.DISPLAY_NAME))));
          list.add(map);

      } while (c.moveToNext());
    }
    String [] from = {"contacts", "numbers"};
    int [] to = {android.R.id.text1,
        android.R.id.text2};

    SimpleAdapter ad = new SimpleAdapter(this, list,android.R.layout.simple_list_item_2, from,to);
    lv.setAdapter(ad);

    lv.setOnItemClickListener(new AdapterView.OnItemClickListener() {
      @Override
      public void onItemClick(AdapterView<?> parent, View view, int position, long id) {
        TextView phonetv=view.findViewById(android.R.id.text2);
        //Toast.makeText(MainActivity.this, contactstv.getText().toString(), Toast.LENGTH_SHORT).show();
        Intent intent=new Intent(Intent.ACTION_DIAL, Uri.parse("tel:"+phonetv.getText().toString()));
        startActivity(intent);
      }
    });

  }
}
```

`

41_Notification

Add an image inside res → drawable → notif_icon.xml (using right click on project → new → vector assets) or copy paste an image

Activity_main.xml

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

  <Button
     android:id="@+id/btnShowNotification"
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginBottom="8dp"
     android:layout_marginEnd="8dp"
     android:layout_marginStart="8dp"
     android:layout_marginTop="8dp"
     android:text="Show Notification"
     app:layout_constraintBottom_toBottomOf="
parent"
     app:layout_constraintEnd_toEndOf="parent
"
     app:layout_constraintHorizontal_bias="0.33
4"
     app:layout_constraintLeft_toLeftOf="parent
"
```

```
      app:layout_constraintRight_toRightOf="par
ent"
      app:layout_constraintStart_toStartOf="pare
nt"
      app:layout_constraintTop_toTopOf="parent
"
      app:layout_constraintVertical_bias="0.158"
/>

   <Button
      android:id="@+id/btnClearNotification"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginBottom="8dp"
      android:layout_marginEnd="8dp"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:text="Clear Notification"
      app:layout_constraintBottom_toBottomOf="
parent"
      app:layout_constraintEnd_toEndOf="parent
"
      app:layout_constraintHorizontal_bias="0.33
8"
      app:layout_constraintStart_toStartOf="pare
nt"
      app:layout_constraintTop_toBottomOf="@+
id/btnShowNotification"
      app:layout_constraintVertical_bias="0.481"
/>

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a19_notification;

import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Context;
import android.content.Intent;
import android.net.Uri;
import android.os.Build;
import android.support.v4.app.NotificationCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends
AppCompatActivity {

   Button btnShow, btnClear;

   NotificationManager manager;

   Notification myNotification;

   int notifyID =1;

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

       btnShow = (Button)
findViewById(R.id.btnShowNotification);
```

```
        btnClear = (Button)
findViewById(R.id.btnClearNotification);
        manager = (NotificationManager)
getSystemService(NOTIFICATION_SERVICE);
        btnShow.setOnClickListener(new
View.OnClickListener() {

            @Override
            public void onClick(View arg0) {
               if (Build.VERSION.SDK_INT >=
Build.VERSION_CODES.O) {

                    String channel_Id =
"my_channel_01";// The id of the channel.
                    CharSequence channelName =
"NotifChannel";// The user-visible name of the
channel.
                    int channelImportance =
NotificationManager.IMPORTANCE_HIGH;

                     manager =
                           (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVI
CE);

                    // Create a notification and set the
notification channel.
                    NotificationChannel channel = new
NotificationChannel(channel_Id, channelName,
                           channelImportance);
                    manager.createNotificationChannel(ch
annel);

                    //Create the intent that'll fire when the
user taps the notification//
```

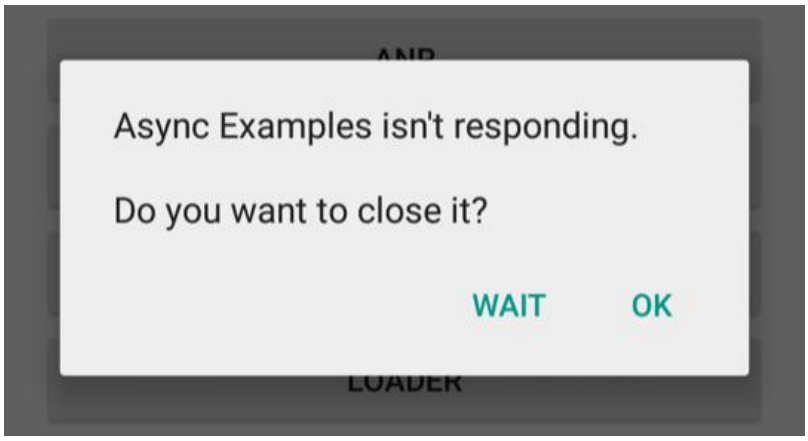
```
                Intent intent = new
Intent(Intent.ACTION_VIEW,
Uri.parse("https://www.google.com/"));
                //PendingIntent.FLAG_UPDATE_CURR
ENT - Flag indicating that if the described
PendingIntent already exists,
                // then keep it but replace its extra data
with what is in this new Intent.
                PendingIntent pendingIntent =
PendingIntent.getActivity(MainActivity.this, 1,
                        intent,
PendingIntent.FLAG_UPDATE_CURRENT);

                myNotification   = new
Notification.Builder(MainActivity.this,channel_Id)
                        .setContentTitle("New Message")
                        //.setAutoCancel(true)
                        .setOngoing(true)
                        .setContentText("Browse the
content")
                        .setSmallIcon(R.drawable.notif_ic
on)
                        .setContentIntent(pendingIntent)
                        .build();

                manager.notify(notifyID,
myNotification);
            }
            else{
                Intent intent = new
Intent(Intent.ACTION_VIEW,
Uri.parse("https://www.google.com/"));
```

```
                //PendingIntent.FLAG_UPDATE_CURR
ENT - Flag indicating that if the described
PendingIntent already exists,
                // then keep it but replace its extra data
with what is in this new Intent.
                PendingIntent pendingIntent =
PendingIntent.getActivity(MainActivity.this, 1,
                        intent,
PendingIntent.FLAG_UPDATE_CURRENT);

                Notification.Builder builder = new
Notification.Builder(MainActivity.this);
                builder.setAutoCancel(true);
                builder.setContentTitle("App
Notification");
                builder.setContentText("You have a
new message");
                builder.setSmallIcon(R.drawable.notif_i
con);
                builder.setContentIntent(pendingIntent);
                builder.setOngoing(true);
                builder.setSubText("This is
subtext...");    //API level 16
                //builder.setNumber(100);
                myNotification= builder.build();
                //   myNotication =
builder.getNotification();
                // myNotication.flags =
Notification.FLAG_AUTO_CANCEL;
                manager.notify(notifyID,myNotificatio
n);

            }
        }
```

```
        });

        btnClear.setOnClickListener(new
View.OnClickListener() {

            @Override
            public void onClick(View arg0) {
                manager.cancel(notifyID);
            }
        });

    }

}
```

42_AsyncTasks

https://developer.android.com/training/articles/perf-anr



In any situation in which your app performs a potentially lengthy operation, **you should not perform the work on the UI thread**, but instead create a worker thread and do most of the work there. This keeps the UI thread (which drives the user interface event loop) running and prevents the system from concluding that your code has frozen.

In Android, application responsiveness is monitored by the Activity Manager and Window Manager system services. Android will display the ANR dialog for a particular application when it detects one of the following conditions:

- No response to an input event (such as key press or screen touch events) within 5 seconds.

-
-

A BroadcastReceiver hasn't finished executing within 10 seconds.

-

https://developer.android.com/reference/android/os/AsyncTask

AsyncTask's generic types

The three types used by an asynchronous task are the following:

1.

Params, the type of the parameters sent to the task upon execution.

2.
3.

Progress, the type of the progress units published during the background computation.

4.
5.

Result, the type of the result of the background computation.

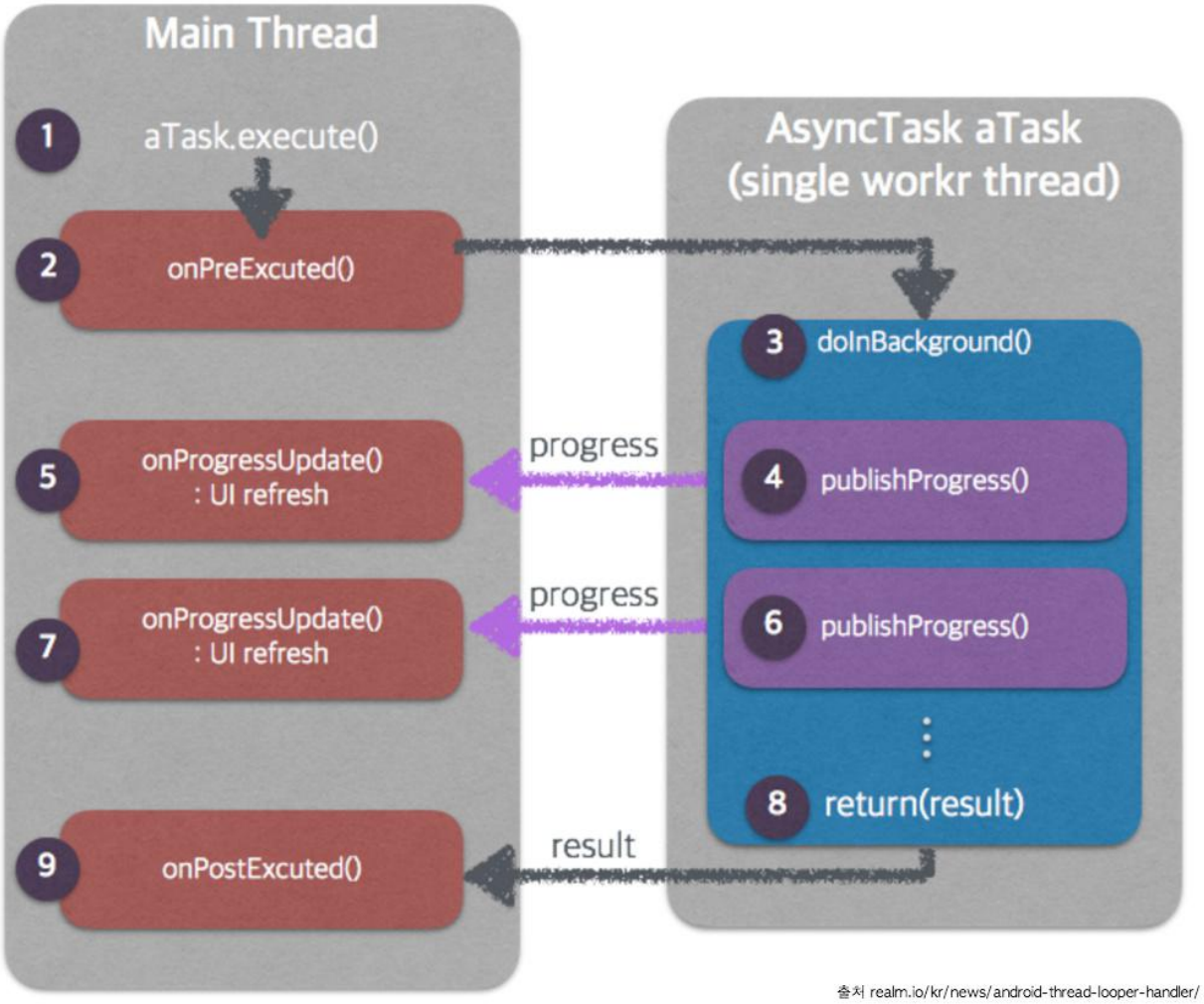
6.

Not all types are always used by an asynchronous task. To mark a type as unused, simply use the type Void:

private class MyTask extends AsyncTask<Void, Void, Void> { ... }

The 4 steps

http://cfile23.uf.tistory.com/image/2420B240577D4A720F8136



When an asynchronous task is executed, the task goes through 4 steps:

1.

onPreExecute(), invoked on the UI thread before the task is executed. This step is normally used to setup the task, for instance by showing a progress bar in the user interface.

2.
3.

doInBackground(Params...), invoked on the background thread immediately after onPreExecute() finishes executing. This step is used to perform background computation that can take a long time. The parameters of the asynchronous task are passed to this step. The result of the computation must be returned by this step and will be passed back to the last step. This step can also use publishProgress(Progress...) to publish one or more units of progress. These values are published on the UI thread, in the onProgressUpdate(Progress...) step.

4.
5.

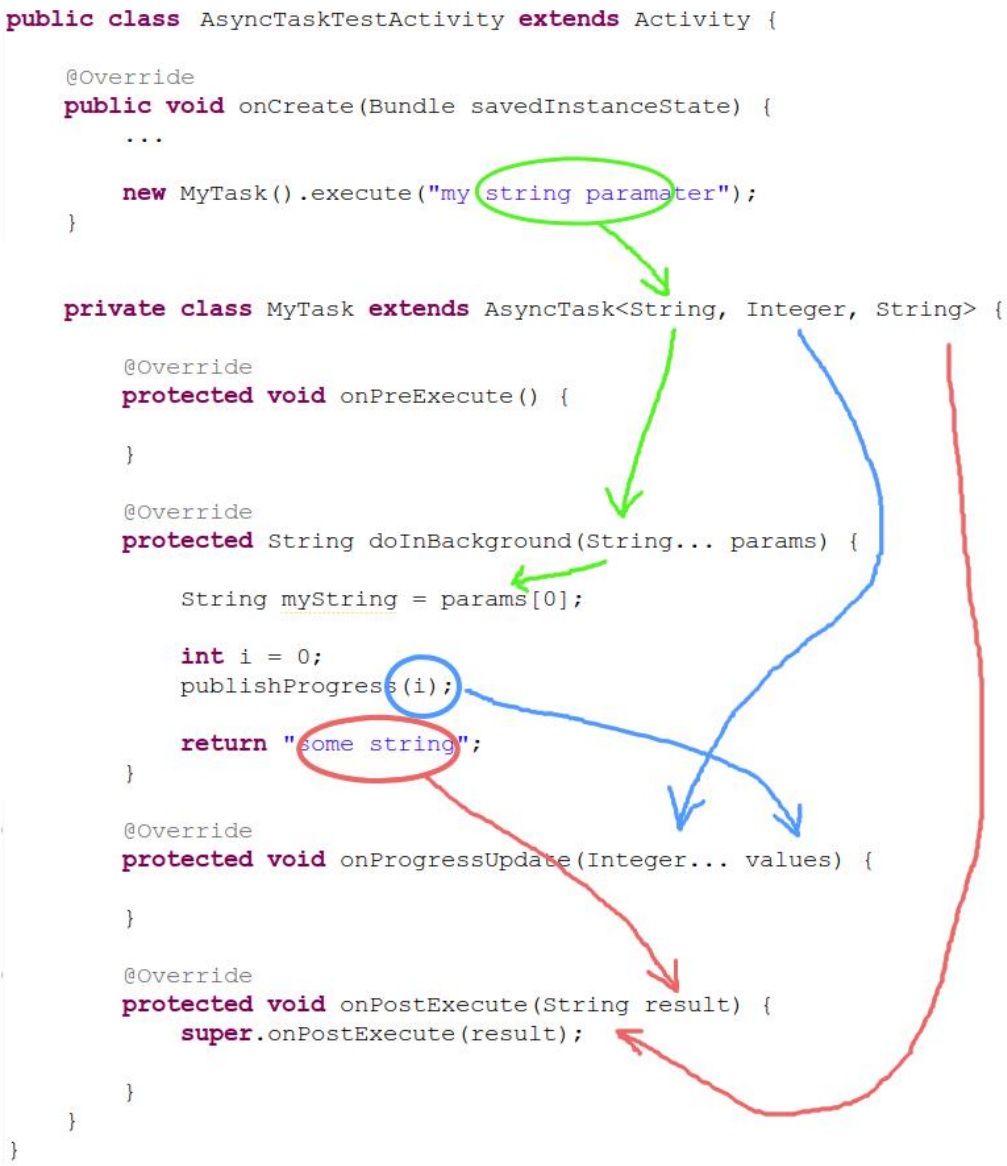
onProgressUpdate(Progress...), invoked on the UI thread after a call to publishProgress(Progress...). The timing of the execution is undefined. This method is used to display any form of progress in the user interface while the background computation is still executing. For instance, it can be used to animate a progress bar or show logs in a text field.

6.
7.

onPostExecute(Result), invoked on the UI thread after the background computation finishes. The result of the background computation is passed to this step as a parameter.

8.

https://i.stack.imgur.com/abwYS.png



```
public class AsyncTaskTestActivity extends Activity {

    @Override
    public void onCreate(Bundle savedInstanceState) {
        ...

        new MyTask().execute("my string paramater");
    }


    private class MyTask extends AsyncTask<String, Integer, String> {

        @Override
        protected void onPreExecute() {

        }

        @Override
        protected String doInBackground(String... params) {

            String myString = params[0];

            int i = 0;
            publishProgress(i);

            return "some string";
        }

        @Override
        protected void onProgressUpdate(Integer... values) {

        }

        @Override
        protected void onPostExecute(String result) {
            super.onPostExecute(result);

        }
    }
}
```

Activity_main.xml

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

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

    <TextView
        android:id="@+id/tv_time"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="10pt"
        android:textColor="#444444"
        android:layout_alignParentLeft="true"
        android:layout_marginRight="9dip"
        android:layout_marginTop="20dip"
        android:layout_marginLeft="10dip"
        android:text="Sleep time in Seconds:"/>
    <EditText
        android:id="@+id/in_time"
        android:layout_width="150dip"
        android:layout_height="wrap_content"
        android:background="@android:drawable/e
ditbox_background"
        android:layout_toRightOf="@id/tv_time"
        android:layout_alignTop="@id/tv_time"
        android:inputType="number"
        />
    <TextView
        android:id="@+id/tv_result"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textSize="20pt"
        android:textColor="@color/colorAccent"
        android:layout_below="@+id/in_time"
        android:layout_centerHorizontal="true" />
    <Button
        android:id="@+id/btn_run"
        android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:text="Run Async task"
        android:layout_below="@+id/tv_result"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="64dp" />

</RelativeLayout>
```

MainActivity.java

```
package com.example.jevitha.a20_async_tasks;

import android.widget.Toast;
import android.app.ProgressDialog;
import android.os.AsyncTask;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.util.Log;

public class MainActivity extends
AppCompatActivity {
   private Button button;
   private EditText time;
   private TextView finalResult;

   @Override
   protected void onCreate(Bundle
savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        time = (EditText) findViewById(R.id.in_time);
        button = (Button) findViewById(R.id.btn_run);
```

```
        finalResult = (TextView)
findViewById(R.id.tv_result);
        button.setOnClickListener(new
View.OnClickListener() {
            @Override
            public void onClick(View v) {
                AsyncTaskRunner runner = new
AsyncTaskRunner();
                String sleepTime =
time.getText().toString();
                runner.execute(sleepTime);
            }
        });
    }
    /*
    AsyncTask's generic types - The three types used
by an asynchronous task
    are the following:

    * Params, the type of the parameters sent to the
task upon execution.
    * Progress, the type of the progress units
published during the background computation.
    * Result, the type of the result of the background
computation.

     Not all types are always used by an
asynchronous task.
     To mark a type as unused, simply use the type
Void:

    private class MyTask extends
AsyncTask<Void, Void, Void> { ... }
To read:
```

```
https://cloud.netlifyusercontent.com/assets/344dbf88-fdf9-42bb-adb4-46f01eedd629/82d13600-091e-4e55-be73-607b0184df7f/asynctasks-in-android-app-development-large-preview-opt.png
https://i.stack.imgur.com/abwYS.png
http://cfile23.uf.tistory.com/image/2420B240577D4A720F8136
https://developer.android.com/training/articles/perf-anr
https://www.smashingmagazine.com/2017/03/simplify-android-networking-volley-http-library/
    */

   private class AsyncTaskRunner extends
AsyncTask<String, String, String> {

        private String resp;
        ProgressDialog progressDialog;

        @Override
        protected String doInBackground(String...
params) {
            // NO UI related stuff here
            Log.d("AsyncTask","doInBackground
called");
            try {
                int timeinsec =
Integer.parseInt(params[0]);
                int timeinms = timeinsec*1000;
```

```
            while(timeinsec>0) {
                publishProgress("Sleeping for " +
timeinsec +"   seconds"); // Calls
onProgressUpdate()
                Thread.sleep(1000);
                timeinsec--;

            }
            resp = "Slept for " + params[0] + "
seconds";
        } catch (InterruptedException e) {
            e.printStackTrace();
            resp = e.getMessage();
        } catch (Exception e) {
            e.printStackTrace();
            resp = e.getMessage();
        }
        return resp;
    }

    @Override
    protected void onPostExecute(String result) {
        Toast.makeText(MainActivity.this,
"onPostExecute called",
Toast.LENGTH_SHORT).show();
        Log.d("AsyncTask","onPostExecute
called");
        // execution of result of Long time consuming
operation
        progressDialog.dismiss();
        finalResult.setText(result);
    }
```

```
        @Override
        protected void onPreExecute() {
            Toast.makeText(MainActivity.this,
"onPreExecute called",
Toast.LENGTH_SHORT).show();
            Log.d("AsyncTask","onPreExecute
called");
            progressDialog =
ProgressDialog.show(MainActivity.this,
                    "ProgressDialog",
                    "Wait for "+time.getText().toString()+ "
seconds");
        }

        @Override
        protected void onProgressUpdate(String... text)
{
            Log.d("AsyncTask","onProgressUpdate
called");
            Toast.makeText(MainActivity.this,
"onProgressUpdate called",
Toast.LENGTH_SHORT).show();
            finalResult.setText(text[0]);
        }
    }
}
```

43_AsyncTask_FileDownload

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
```

```
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/btnProgressBar"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dip"
        android:text="Start Music" />

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a20_1_asynctask_filedownload;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import java.io.BufferedInputStream;
import java.io.File;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.net.URL;
import java.net.URLConnection;
import android.app.Activity;
import android.app.Dialog;
import android.app.ProgressDialog;
import android.media.AudioManager;
import android.media.MediaPlayer;
import android.media.MediaPlayer.OnCompletionListener;
import android.net.Uri;
import android.os.AsyncTask;
import android.os.Bundle;
import android.os.Environment;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends Activity {
    // Button to download and play Music
    private Button btnPlayMusic;
    // Media Player Object
    private MediaPlayer mPlayer;
    // Progress Dialog Object
    private ProgressDialog prgDialog;
    // Progress Dialog type (0 - for Horizontal progress bar)
    public static final int progress_bar_type = 0;
    // Music resource URL
```

```
    private static String file_url = "http://android.programmerguru.com/" +
            "wp-content/uploads/2014/01/jai_ho.mp3";
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // Show Download Music Button
        btnPlayMusic = (Button) findViewById(R.id.btnProgressBar);
        // Download Music Button click listener
        btnPlayMusic.setOnClickListener(new View.OnClickListener() {
            // When Download Music Button is clicked
            public void onClick(View v) {
                // Disable the button to avoid playing of song multiple times
                btnPlayMusic.setEnabled(false);
                // Downloaded Music File path in SD Card
Log.d("Music Location:",getExternalFilesDir(null)+"/jai_ho.mp3");
                File file = new File(getExternalFilesDir(null)
                        +"/jai_ho.mp3");
                // Check if the Music file already exists
                if (file.exists()) {
                    Toast.makeText(getApplicationContext(), "File already exist " +
                            "at "+getExternalFilesDir(null) +
                            " , playing Music", Toast.LENGTH_LONG).show();
                    // Play Music
                    playMusic();
                    // If the Music File doesn't exist in SD card (Not yet downloaded)
                } else {
                    Toast.makeText(getApplicationContext(), "File doesn't exist " +
                            "under SD Card, downloading Mp3 from Internet",
                            Toast.LENGTH_LONG).show();
                    // Trigger Async Task (onPreExecute method)
                    new DownloadMusicfromInternet().execute(file_url);
                }
            }
        });
    }
    // Show Dialog Box with Progress bar
    @Override
    protected Dialog onCreateDialog(int id) {
        switch (id) {
            case progress_bar_type:
                prgDialog = new ProgressDialog(this);
                prgDialog.setMessage("Downloading Mp3 file. Please wait...");
                prgDialog.setIndeterminate(false);
                prgDialog.setMax(100);
                prgDialog.setProgressStyle(ProgressDialog.STYLE_HORIZONTAL)
;
                prgDialog.setCancelable(false);
                prgDialog.show();
                return prgDialog;
```

```
            default:
                return null;
        }
    }
    // Async Task Class
    class DownloadMusicfromInternet extends AsyncTask<String, String,
String> {
        // Show Progress bar before downloading Music
        @Override
        protected void onPreExecute() {
            super.onPreExecute();
            // Shows Progress Bar Dialog and then call doInBackground method
            showDialog(progress_bar_type);
        }
        // Download Music File from Internet
        @Override
        protected String doInBackground(String... f_url) {
            int count;
            try {
                URL url = new URL(f_url[0]);
                URLConnection conection = url.openConnection();
                conection.connect();
                // Get Music file length
                int lenghtOfFile = conection.getContentLength();
                // input stream to read file - with 10k buffer
                InputStream input = new
BufferedInputStream(url.openStream(),10*1024);
                // Output stream to write file in SD card
                OutputStream output = new
FileOutputStream(getExternalFilesDir(null)
                        +"/jai_ho.mp3");
                byte data[] = new byte[1024];
                long total = 0;
                while ((count = input.read(data)) != -1) {
                    total += count;
                    // Publish the progress which triggers onProgressUpdate method
                    publishProgress("" + (int) ((total * 100) / lenghtOfFile));
                    // Write data to file
                    output.write(data, 0, count);
                }
                // Flush output
                output.flush();
                // Close streams
                output.close();
                input.close();
            } catch (Exception e) {
                Log.e("Error: ", e.getMessage());
            }
            return null;
        }
```

```
        // While Downloading Music File
        protected void onProgressUpdate(String... progress) {
            // Set progress percentage
            prgDialog.setProgress(Integer.parseInt(progress[0]));
        }
        // Once Music File is downloaded
        @Override
        protected void onPostExecute(String file_url) {
            // Dismiss the dialog after the Music file was downloaded
            dismissDialog(progress_bar_type);
            Toast.makeText(getApplicationContext(), "Download complete,
playing Music", Toast.LENGTH_LONG).show();
            // Play the music
            playMusic();
        }
    }

    // Play Music
    protected void playMusic(){
        // Read Mp3 file present under SD card

        Uri myUri1 = Uri.parse((getExternalFilesDir(null)
                +"/jai_ho.mp3"));
        mPlayer  = new MediaPlayer();
        mPlayer.setAudioStreamType(AudioManager.STREAM_MUSIC);
        try {
            mPlayer.setDataSource(getApplicationContext(), myUri1);
            mPlayer.prepare();
            // Start playing the Music file
            mPlayer.start();
            mPlayer.setOnCompletionListener(new OnCompletionListener() {
                public void onCompletion(MediaPlayer mp) {
                    // TODO Auto-generated method stub
                    // Once Music is completed playing, enable the button
                    btnPlayMusic.setEnabled(true);
                    Toast.makeText(getApplicationContext(), "Music completed
playing",Toast.LENGTH_LONG).show();
                }
            });
        } catch (IllegalArgumentException e) {
            Toast.makeText(getApplicationContext(), "You might not set the URI
correctly!",     Toast.LENGTH_LONG).show();
        } catch (SecurityException e) {
            Toast.makeText(getApplicationContext(),     "URI cannot be
accessed, permissed needed",     Toast.LENGTH_LONG).show();
        } catch (IllegalStateException e) {
            Toast.makeText(getApplicationContext(),     "Media Player is not in
correct state",     Toast.LENGTH_LONG).show();
        } catch (IOException e) {
```

```
            Toast.makeText(getApplicationContext(),      "IO Error
occured",      Toast.LENGTH_LONG).show();
            e.printStackTrace();
        }
    }
}
```

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jevitha.a20_1_asynctask_filedownload">

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

    <!-- Permission: Writing to SDCard -->
    <uses-permission
android:name="android.permission.WRITE_EXTERNAL_STORAGE" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:usesCleartextTraffic="true"
        android:theme="@style/AppTheme">

        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

44_Service_MusicPlayer

Right click app→ new → android resource directory → select resource type as raw

Copy paste the music file mp3 from your hard disk to raw folder.

For creating new service - use right click app → new → Service → Service.
Lifecycle:
https://o7planning.org/en/10421/cache/images/i/1172855.png

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/activity_main"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  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">

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/textview"
     android:text="Hello World!" />
  <Button
     android:layout_width="match_parent"
     android:layout_height="wrap_content"
     android:text="start"
     android:onClick="start"
     android:layout_marginTop="100dp"/>
  <Button
     android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:text="stop"
        android:onClick="stop"
        android:layout_marginTop="200dp"/>

</RelativeLayout>
```

MainActivity.java

```
package
com.example.jevitha.a24_services_musicplayer;

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

public class MainActivity extends
AppCompatActivity {

   TextView textView;

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

   }

   public void start(View v)
   {
      Intent i=new Intent(this,
            MyService.class);
      startService(i);
```

```
    }
    public void stop(View v)
    {
        Intent i=new Intent(this,MyService.class);
        stopService(i);
    }

}
```

MyService.java

```
package
com.example.jevitha.a24_services_musicplayer;

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

public class MyService extends Service {
    MediaPlayer myPlayer;

    public MyService() {
    }

    @Override
    public IBinder onBind(Intent intent) {
        Toast.makeText(this,"onBind",Toast.LENGTH
_SHORT).show();

        // TODO: Return the communication channel
to the service.
        throw new
UnsupportedOperationException("Not yet
implemented");
    }
```

```
  @Override
  public void onCreate() {
     super.onCreate();
     Toast.makeText(this,"onCreate",
           Toast.LENGTH_SHORT).show();

     myPlayer =
MediaPlayer.create(this,R.raw.yen);
     myPlayer.setLooping(false); // Set looping
  }

  @Override
  public int onStartCommand(Intent intent, int
flags,
                        int startId) {
     Toast.makeText(this,"onStartCommand",
           Toast.LENGTH_SHORT).show();
     myPlayer.start();
     return START_STICKY;
     /*
     START_STICKY : Using this return value, if the
OS kills our Service it will recreate it
                but the Intent that was sent to the
Service isn't redelivered.
                In this way the Service is always running
     START_NOT_STICKY: If the OS kills the
Service it won't recreate it until the client calls
                    explicitly onStart command
      START_REDELIVER_INTENT: It is similar to
the START_STICKY and in this case,
                  the Intent will be redelivered to the
service.
      */
```

```
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        Toast.makeText(this,"OnDestroy",
                Toast.LENGTH_SHORT).show();
        myPlayer.stop();
    }

}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jevitha.a24_services_musicplayer">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action
android:name="android.intent.action.MAIN" />
```

```
            <category
android:name="android.intent.category.LAUNC
HER" />
        </intent-filter>
    </activity>

    <service
        android:name=".MyService"
        android:enabled="true"
        android:exported="true"></service>
  </application>

</manifest>
```

45_BoundService_Lifecycle

Activity_main.xml

```
 <?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/ap
k/res/android"
  xmlns:tools="http://schemas.android.com/tool
s"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:background="#FFFFFF"
  android:paddingBottom="@dimen/activity_ver
tical_margin"
  android:paddingLeft="@dimen/activity_horizo
ntal_margin"
  android:paddingRight="@dimen/activity_horiz
ontal_margin"
  android:paddingTop="@dimen/activity_vertica
l_margin"
  tools:context=".MainActivity" >
```

```
    <Button
        android:id="@+id/btnStartService"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:text="Start Service" />

    <Button
        android:id="@+id/btnBindService"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/btnStartSer
vice"
        android:layout_below="@+id/btnStartServic
e"
        android:layout_marginTop="18dp"
        android:text="Bind Service" />

    <Button
        android:id="@+id/btnRequestService"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btnBindServic
e"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="18dp"
        android:text="Request Service" />

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

```
        android:layout_alignLeft="@+id/btnRequest
Service"
        android:layout_below="@+id/btnRequestSe
rvice"
        android:layout_centerVertical="true"
        android:layout_marginTop="18dp"
        android:text="Unbind Service" />

    <Button
        android:id="@+id/btnStopService"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/btnUnbindSer
vice"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="18dp"
        android:text="Stop Service" />


</RelativeLayout>
```

MainActivity.java

```
package
com.example.jevitha.a24_1_boundservice;

import android.content.ComponentName;
import android.content.Context;
import android.content.Intent;
import android.content.ServiceConnection;
import android.os.IBinder;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.Menu;
import android.view.MenuItem;
```

```
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends
AppCompatActivity implements
View.OnClickListener {

        private Button btnStartService;
        private Button btnStopService;
        private Button btnBindService;
        private Button btnUnbindService;
         private Button btnRequestService;


    private boolean isServiceBound = false;

        BoundService mBoundService;


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

            btnStartService =
(Button)findViewById(R.id.btnStartService);
            btnStartService.setOnClickListener(this);

            btnStopService =
(Button)findViewById(R.id.btnStopService);
            btnStopService.setOnClickListener(this);

            btnBindService =
(Button)findViewById(R.id.btnBindService);
            btnBindService.setOnClickListener(this);
```

```
        btnUnbindService =
(Button)findViewById(R.id.btnUnbindService);
        btnUnbindService.setOnClickListener(this);

        btnRequestService =
(Button)findViewById(R.id.btnRequestService);
        btnRequestService.setOnClickListener(this)
;

  }


    @Override
    public void onClick(View v) {
        switch (v.getId()) {
            case R.id.btnStartService:
                startService(new Intent(this,
BoundService.class));
                break;

            case R.id.btnStopService:
                stopService(new Intent(this,
BoundService.class));
                break;

            case R.id.btnBindService:
                bindService(new Intent(this,
BoundService.class),
                        mServiceConnection,
Context.BIND_AUTO_CREATE);
                isServiceBound = true;
                break;
            case R.id.btnRequestService:
                if(mBoundService!=null)
                mBoundService.service();
```

```
                break;
            case R.id.btnUnbindService:
                if(isServiceBound){
                    if(mServiceConnection != null){
                        unbindService(mServiceConnecti
on);
                    }
                    isServiceBound = false;
                }
                else{
                    Toast.makeText(this, "Service is
not bound.", Toast.LENGTH_SHORT).show();
                }
                break;

            default:
                break;
        }
    }

    // Code to manage Service lifecycle.
    private ServiceConnection
mServiceConnection = new ServiceConnection() {
        @Override
        public void
onServiceConnected(ComponentName comName,
IBinder service) {
            Log.d("BoundService","ServiceConnect
ion - onService Connected");

            BoundService.MyBinder myBinder =
(BoundService.MyBinder) service;
            mBoundService = myBinder.getService();
            isServiceBound = true;
```

```
        }

        @Override
        public void
onServiceDisconnected(ComponentName
comName) {
            Log.d("BoundService","ServiceConnect
ion - onService disConnected");


        }
    };
}
```

app→ right click → new → service → service

BoundService.java

```
package
com.example.jevitha.a24_1_boundservice;

import android.app.Service;
import android.content.Intent;
import android.os.Binder;
import android.os.IBinder;
import android.os.SystemClock;
import android.util.Log;
import android.widget.Chronometer;
import android.widget.Toast;

public class BoundService extends Service {
  private IBinder mBinder = new MyBinder();

  @Override
  public void onCreate() {
     Toast.makeText(getApplicationContext(), "I am
in on create method.",
Toast.LENGTH_SHORT).show();
     Log.d("BoundService","on Create");
```

```
        super.onCreate();
    }

    @Override
    public int onStartCommand(Intent intent, int flags,
int startId) {
        Toast.makeText(getApplicationContext(), "I am
in on start command method. " ,
Toast.LENGTH_SHORT).show();
        Log.d("BoundService","on Start
Command");
        return super.onStartCommand(intent, flags,
startId);
    }

    //This method returns an IBinder object that
defines the programming
    // interface that clients can use to interact with the
service.
    @Override
    public IBinder onBind(Intent intent) {
        Toast.makeText(getApplicationContext(), "I am
in on bind method. ",
Toast.LENGTH_SHORT).show();
        Log.d("BoundService","on Bind");
        return mBinder;
    }

    @Override
    public boolean onUnbind(Intent intent) {
        Toast.makeText(getApplicationContext(), "I am
in on unbind method. " ,
Toast.LENGTH_SHORT).show();
        Log.d("BoundService","on unbind");
        return true;
```

```
    }

    @Override
    public void onRebind(Intent intent) {
        Toast.makeText(getApplicationContext(), "I am
in on rebind method.",
Toast.LENGTH_SHORT).show();
        Log.d("BoundService","on rebind");
        super.onRebind(intent);
    }

    @Override
    public void onDestroy() {
        Toast.makeText(getApplicationContext(), "I am
in on destroy method.",
Toast.LENGTH_SHORT).show();
        Log.d("BoundService","on Destroy");
        super.onDestroy();
    }

    public void service(){
        Log.d("BoundService","servicing the
request");
        Toast.makeText(this,"BoundSampleService",
Toast.LENGTH_LONG).show();
    }


    public class MyBinder extends Binder {

        BoundService getService() {
            Log.d("BoundService","Binder-getService
");
            return BoundService.this;
        }
    }
```

}

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a24_1_boundservice">

  <application
    android:allowBackup="true"
    android:icon="@mipmap/ic_launcher"
    android:label="@string/app_name"
    android:roundIcon="@mipmap/ic_launcher_round"
    android:supportsRtl="true"
    android:theme="@style/AppTheme">
    <activity android:name=".MainActivity">
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />

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

    <service
      android:name=".BoundService"
      android:enabled="true"
      android:exported="true" />
  </application>
```

```
</manifest>
```

46_BoundService_MusicPlayer

1.

Create a ‘raw’ resource folder. Copy a mp3 file inside the raw folder.

2.

MainActivity.java

```
package com.example.jevitha.a24_2_service_musicplayer_bound;

import android.content.ComponentName;
import android.content.Context;
import android.content.Intent;
import android.content.ServiceConnection;
import android.os.IBinder;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity implements View.OnClickListener {

    private Button startServiceButton, stopServiceButton, fastBackward,
            fastForward;
    private Intent intent;
    private SimpleAudioService simpleAudioService;
    boolean serviceStarted = false;
```

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

        init();
    }

    /**
     * Instantiation of components
     */
    private void init() {
        startServiceButton = (Button)
findViewById(R.id.startServiceButton);
        stopServiceButton = (Button)
findViewById(R.id.stopServiceButton);
        fastBackward = (Button)
findViewById(R.id.fastBackward);
        fastForward = (Button)
findViewById(R.id.fastForward);

        startServiceButton.setOnClickListener(this);
        stopServiceButton.setOnClickListener(this);
        fastBackward.setOnClickListener(this);
        fastForward.setOnClickListener(this);
        intent = new Intent(this,
SimpleAudioService.class);
    }

    @Override
    public void onClick(View v) {

        switch (v.getId()) {
            /***
```

```
            * Open
            */
           case R.id.startServiceButton:
              startService(intent);
              /**
               * Call bindService() to start a bound
Service and to bind to the Service,
               *
               * intentService -   Intent to Service class
               *
               * serviceConnection - Interface for
monitoring the state of an application service.
               *
               * The third parameter is a flag indicating
options for the binding.
               * It should usually be
BIND_AUTO_CREATE in order to create the
service if it's not already alive.
               *   BIND_DEBUG_UNBIND -   include
debugging help for mismatched calls to unbind.
               *   BIND_NOT_FOREGROUND - don't
allow this binding to raise the target service's
process to the foreground scheduling priority.
               *   or 0 for none.
               */
              bindService(intent, serviceConnection,
Context.BIND_AUTO_CREATE);
              serviceStarted = true;
              break;
           /**
            * Close
            */
           case R.id.stopServiceButton:
```

```
            if (serviceStarted) {
                /*
                 * When a component has finished using the Service, they call unbindService() to unbind from it.
                 * When all components have unbound from the Service, it is destroyed.
                 */
                unbindService(serviceConnection);
                stopService(intent);
                serviceStarted = false;
            }
            break;
        /**
         * Rewind
         */
        case R.id.fastBackward:
            if (serviceStarted) {
                simpleAudioService.rewind();
            }
            break;
        /**
         * Fast forward
         */
        case R.id.fastForward:
            if (serviceStarted) {
                simpleAudioService.fastforward();
            }
            break;
        default:
            break;
    }
```

```
  }

  /**
   * ServiceConnection is an object of type
ServiceConnection,
   * which is an interface for service binding
   */
  private ServiceConnection serviceConnection =
new ServiceConnection() {
      /**
       * Click the open button, will call the
serviceConnection object's onServiceConnected
method.
       * Pass a IBinder object to the method
       * The IBinder object is of type
SimpleAudioServiceBinder - created in service
class.
       */
      @Override
      public void
onServiceConnected(ComponentName name,
                         IBinder sasBinder) {
          simpleAudioService =
((SimpleAudioService.
                  SimpleAudioServiceBinder)
sasBinder).getService();
      }

      /**
       * The method is used for service
disconnection .
       */
      @Override
```

```
        public void
onServiceDisconnected(ComponentName name) {
            simpleAudioService = null;
        }

    };

}
```

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical" >

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center_horizontal"
        android:text="MusicPlayer With
BoundService" />

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:layout_marginTop="50dp"
        android:layout_marginLeft="100dp">
```

```
    <Button
        android:id="@+id/startServiceButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Start" />

    <Button
        android:id="@+id/fastBackward"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Rewind" />

    <Button
        android:id="@+id/fastForward"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Fast forward" />

    <Button
        android:id="@+id/stopServiceButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Stop" />


  </LinearLayout>

</LinearLayout>
```

SimpleAudioService.java

```
package com.example.jevitha.a24_2_service_musicplayer_bound;
```

```
import android.app.Service;
import android.content.Intent;
import android.media.MediaPlayer;
import android.os.Binder;
import android.os.IBinder;
import android.util.Log;
import android.widget.Toast;

public class SimpleAudioService extends Service
{

   private String TAG = "MusicPlayer";
   private MediaPlayer player;
   private final IBinder sasBinder = new
SimpleAudioServiceBinder();
   /*
    * IBinder defines the interface that components
use to interact with the Service.
    * Get the interface IBinder by extending the
Binder class.
    * The client then uses this interface to access the
public methods in the Service.
    */
   public class SimpleAudioServiceBinder extends
Binder {
      SimpleAudioService getService() {
         return SimpleAudioService.this;
      }
   }

   /*
    * Implement onBind() which returns an IBinder.
    * These are the clients that can bind to a
Service:Activities , Services , Content Providers
```

```
    * You can't bind to a Service from:    Broadcast
Receivers
     */
    @Override
    public IBinder onBind(Intent intent) {
        Toast.makeText(this, "Service onBind()",
Toast.LENGTH_SHORT).show();
        Log.d("SERVICE","onBind");
        return sasBinder;
    }

    @Override
    public boolean onUnbind(Intent intent) {
        Toast.makeText(this, "Service onUnBind()",
Toast.LENGTH_SHORT).show();
        Log.d("SERVICE","onUnbind");
        return super.onUnbind(intent);
    }


    @Override
    public void onCreate() {
        super.onCreate();
        Toast.makeText(this, "Service onCreate()",
Toast.LENGTH_SHORT).show();
        Log.d("SERVICE","onCreate");
        player = MediaPlayer.create(this, R.raw.yen);
    }

    @Override
    public int onStartCommand(Intent intent, int flags,
int startId) {
        Toast.makeText(this, "Service
onStartCommand()",
Toast.LENGTH_SHORT).show();
```

```
        Log.d("SERVICE","onStartCommand");
        if (!player.isPlaying()) {
            player.start();
        }
        return super.onStartCommand(intent, flags,
startId);

    }
    /**
     * Call stopService to stop the service, will call
onDestroy () method.
     */
    @Override
    public void onDestroy() {
        super.onDestroy();
        Toast.makeText(this, "Service onDestroy()",
Toast.LENGTH_SHORT).show();
        Log.d("SERVICE","onDestroy");
        if (player.isPlaying()) {
            player.stop();
        }
        player.release();
    }

    /**
     * Service method: rewind
     */
    public void rewind() {
        if (player.isPlaying()) {
            player.seekTo(player.getCurrentPosition() -
2500);
            Toast.makeText(this, "Rewind to "+
player.getCurrentPosition() ,
Toast.LENGTH_SHORT).show();
```

```
        }
    }
    /**
     * Service: fast forward method
     */
    public void fastforward() {
        if (player.isPlaying()) {
            player.seekTo(player.getCurrentPosition() +
2500);
            Toast.makeText(this, "Forward to "+
player.getCurrentPosition() ,
Toast.LENGTH_SHORT).show();
        }
    }
}
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest
xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jevitha.a24_2_service_musicplayer_bound">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
```

```
        <intent-filter>
            <action
android:name="android.intent.action.MAIN" />

            <category
android:name="android.intent.category.LAUNC
HER" />
        </intent-filter>
    </activity>

    <service
        android:name=".SimpleAudioService"
        android:enabled="true"
        android:exported="true"></service>
  </application>

</manifest>
```

47_ForegroundService

Create an image file inside drawable named “ic_music”

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
xmlns:android="http://schemas.android.com/ap
k/res/android"
  xmlns:tools="http://schemas.android.com/tool
s"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity" >

  <TextView
    android:id="@+id/textView1"
    android:layout_width="wrap_content"
```

```
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="52dp"
        android:text="Foreground Music Service"
         />

    <Button
        android:id="@+id/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/textView1"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="26dp"
        android:text="Start Foreground Service" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/button1"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="35dp"
        android:text="Stop Foreground Service" />

</RelativeLayout>
```

MainActivity.java

```
package
com.example.jevitha.a24_4_foregroundservice_mu
sicplayer;

import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
```

```
import android.view.View;
import android.widget.Button;

public class MainActivity extends
AppCompatActivity implements
View.OnClickListener {

   @Override
   protected void onCreate(Bundle
savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      Button startButton = (Button)
findViewById(R.id.button1);
      Button stopButton = (Button)
findViewById(R.id.button2);

      startButton.setOnClickListener(this);
      stopButton.setOnClickListener(this);
   }

   @Override
   public void onClick(View v) {
      switch (v.getId()) {
         case R.id.button1:
            Intent startIntent = new
Intent(MainActivity.this,
                  ForegroundService.class);
            startIntent.setAction(Constants.ACTION.S
TARTFOREGROUND_ACTION);
            startService(startIntent);
            break;
         case R.id.button2:
            Intent stopIntent = new
Intent(MainActivity.this,
```

```
                    ForegroundService.class);
            stopIntent.setAction(Constants.ACTION.STOPFOREGROUND_ACTION);
            //stopService(stopIntent);
            startService(stopIntent);
            break;

        default:
            break;
    }

  }
}
```

ForegroundService.java

```
package com.example.jevitha.a24_4_foregroundservice_musicplayer;

import android.app.Notification;
import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.app.Service;
import android.content.Context;
import android.content.Intent;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.Color;
import android.os.Build;
import android.os.IBinder;
import android.support.v4.app.NotificationCompat;
import android.util.Log;

public class ForegroundService extends Service {
```

```
    public ForegroundService() {
    }
    private static final String LOG_TAG =
"ForegroundService";

    @Override
    public void onCreate() {

        super.onCreate();
        Log.i(LOG_TAG,"onCreate");
    }

    @Override
    public int onStartCommand(Intent intent, int flags,
int startId) {
        if
(intent.getAction().equals(Constants.ACTION.STAR
TFOREGROUND_ACTION)) {
            Log.i(LOG_TAG, "Received Start
Foreground Intent ");
            String channel_Id = "my_channel_01";//
The id of the channel.
            CharSequence channelName =
"NotifChannel";// The user-visible name of the
channel.
            int channelImportance =
NotificationManager.IMPORTANCE_HIGH;
            NotificationManager manager = null;
            NotificationChannel channel = null;
            if (Build.VERSION.SDK_INT >=
Build.VERSION_CODES.O) {

                manager =
```

```
                    (NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE);

            // Create a notification and set the
notification channel.
             channel = new
NotificationChannel(channel_Id, channelName,
                    channelImportance);
            channel.setDescription("Channel
description");
            channel.enableLights(true);
            channel.setLightColor(Color.BLUE);
            manager.createNotificationChannel(chann
el);

        }

        Intent notificationIntent = new Intent(this,
MainActivity.class);
        notificationIntent.setAction(Constants.ACTIO
N.MAIN_ACTION);
        notificationIntent.setFlags(Intent.FLAG_ACT
IVITY_NEW_TASK
                |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
        PendingIntent pendingIntent =
PendingIntent.getActivity(this,
                0, notificationIntent, 0);

        Intent previousIntent = new Intent(this,
ForegroundService.class);
        previousIntent.setAction(Constants.ACTION.
PREV_ACTION);
```

```
        PendingIntent ppreviousIntent =
PendingIntent.getService(this, 0,
                previousIntent, 0);

        Intent playIntent = new Intent(this,
ForegroundService.class);
        playIntent.setAction(Constants.ACTION.PLA
Y_ACTION);
        PendingIntent pplayIntent =
PendingIntent.getService(this, 0,
                playIntent, 0);

        Intent nextIntent = new Intent(this,
ForegroundService.class);
        nextIntent.setAction(Constants.ACTION.NEX
T_ACTION);
        PendingIntent pnextIntent =
PendingIntent.getService(this, 0,
                nextIntent, 0);

        Bitmap icon =
BitmapFactory.decodeResource(getResources(),
R.drawable.ic_music_1);

        Notification notification = new
NotificationCompat.Builder(this,channel_Id)
                .setContentTitle(" Music Player")
                .setTicker(" Music Player")
                .setContentText("My Music")
                // Show controls on lock screen even
when user hides sensitive content.
                .setVisibility(NotificationCompat.VISIBIL
ITY_PUBLIC)
                .setSmallIcon(R.drawable.ic_music)
                .setLargeIcon(
```

```
                        Bitmap.createScaledBitmap(icon,
128, 128, false))
                .setContentIntent(pendingIntent)
                .addAction(android.R.drawable.ic_medi
a_previous,
                        "Previous", ppreviousIntent)
                .addAction(android.R.drawable.ic_medi
a_play, "Play",
                        pplayIntent)
                .addAction(android.R.drawable.ic_medi
a_next, "Next",
                        pnextIntent)
                // Apply the media style template
                //.setStyle(new
android.support.v4.media.app.Notification.MediaSty
le()
                  //        .setShowActionsInCompactVie
w(1 /* #1: pause button */)
                    //      .setMediaSession(mediaSession.
getSessionToken()))
                .build();
        startForeground(Constants.NOTIFICATION_
ID.FOREGROUND_SERVICE,
                notification);
    } else if
(intent.getAction().equals(Constants.ACTION.PREV
_ACTION)) {
        Log.i(LOG_TAG, "Clicked Previous");
    } else if
(intent.getAction().equals(Constants.ACTION.PLAY
_ACTION)) {
        Log.i(LOG_TAG, "Clicked Play");
```

```
        } else if
(intent.getAction().equals(Constants.ACTION.NEXT
_ACTION)) {
            Log.i(LOG_TAG, "Clicked Next");
        } else if (intent.getAction().equals(
                Constants.ACTION.STOPFOREGROUND
_ACTION)) {
            Log.i(LOG_TAG, "Received Stop
Foreground Intent");
            stopForeground(true);
            stopSelf();
        }
        return START_STICKY;
    }

    @Override
    public void onDestroy() {
        super.onDestroy();
        Log.i(LOG_TAG, "In onDestroy");
    }

    @Override
    public IBinder onBind(Intent intent) {
        // Used only in case of bound services.
        return null;
    }
}
```

Constants.java

```
package
com.example.jevitha.a24_4_foregroundservice_mu
sicplayer;

public class Constants {
```

```
    public interface ACTION {
        public static String MAIN_ACTION =
"com.example.foregroundservice.action.main";
        public static String PREV_ACTION =
"com.example.foregroundservice.action.prev";
        public static String PLAY_ACTION =
"com.example.foregroundservice.action.play";
        public static String NEXT_ACTION =
"com.example.foregroundservice.action.next";
        public static String
STARTFOREGROUND_ACTION =
"com.example.foregroundservice." +
                "action.startforeground";
        public static String
STOPFOREGROUND_ACTION =
"com.example.foregroundservice." +
                "action.stopforeground";
    }

    public interface NOTIFICATION_ID {
        public static int FOREGROUND_SERVICE =
101;
    }
}
```

48_GPS

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jevitha.a26_2_gpsread">

    <uses-permission
android:name="android.permission.ACCESS_COARSE_LOCATION" />
    <uses-permission
android:name="android.permission.ACCESS_FINE_LOCATION" />
```

```
  <application
     android:allowBackup="true"
     android:icon="@mipmap/ic_launcher"
     android:label="@string/app_name"
     android:roundIcon="@mipmap/ic_launcher_round"
     android:supportsRtl="true"
     android:theme="@style/AppTheme">
     <activity android:name=".MainActivity">
        <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"?>
<android.support.constraint.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">

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:text="Hello World!"
     android:id="@+id/textview1"
     android:textSize="20dp"
     android:textColor="@color/colorAccent"
     app:layout_constraintBottom_toBottomOf="parent"
     app:layout_constraintLeft_toLeftOf="parent"
     app:layout_constraintRight_toRightOf="parent"
     app:layout_constraintTop_toTopOf="parent" />

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a26_2_gpsread;

import android.Manifest;
```

```
import android.annotation.SuppressLint;
import android.app.Activity;
import android.content.Context;
import android.content.pm.PackageManager;
import android.location.Criteria;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.support.v4.app.ActivityCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends Activity
      implements LocationListener {
  protected LocationManager locationManager;
  TextView txtLat;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_main);
     txtLat = (TextView) findViewById(R.id.textview1);

     locationManager = (LocationManager)
           getSystemService(Context.LOCATION_SERVICE);

//         if (ActivityCompat.checkSelfPermission
//                 (this, Manifest.permission.ACCESS_FINE_LOCATION)
//                 != PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission
//                 (this, Manifest.permission.ACCESS_COARSE_LOCATION) !=
//                 PackageManager.PERMISSION_GRANTED) {
//
//             return;
//         }


     if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
        // TODO: Consider calling
        //    ActivityCompat#requestPermissions
        // here to request the missing permissions, and then overriding
        //    public void onRequestPermissionsResult(int requestCode, String[]
permissions,
```

```
            //                                          int[] grantResults)
            // to handle the case where the user grants the permission. See the
documentation
            // for ActivityCompat#requestPermissions for more details.
            return;
        }
        locationManager.requestLocationUpdates(LocationManager.GPS_PRO
VIDER,
                1000, 0, this);

    }
    @Override
    public void onLocationChanged(Location location) {
        txtLat = (TextView) findViewById(R.id.textview1);

        txtLat.setText("Latitude:" + location.getLatitude() + ", Longitude:" +
                location.getLongitude());


    }

    @Override
    public void onProviderDisabled(String provider) {
        Log.d("Latitude",
                "disable");
    }

    @Override
    public void onProviderEnabled(String provider) {
        Log.d("Latitude",
                "enable");
    }

    @Override
    public void onStatusChanged(String provider, int status, Bundle extras) {
        Log.d("Latitude","status");
    }
}
```

49_GoogleMaps

Remember to register your app in the google console and get the api key.
Goto google_maps_api.xml in res → values and copy paste the url starting with *https://console.developers.google.com*
Given inside the comments in the file.

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.jevitha.a26_googlemap">
```

```
    <!--
         The ACCESS_COARSE/FINE_LOCATION permissions are not required
to use
         Google Maps Android API v2, but you must specify either coarse or fine
         location permissions for the 'MyLocation' functionality.
    -->
    <uses-permission
android:name="android.permission.ACCESS_FINE_LOCATION" />

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <!--
             The API key for Google Maps-based APIs is defined as a string
resource.
             (See the file "res/values/google_maps_api.xml").
             Note that the API key is linked to the encryption key used to sign the
APK.
             You need a different API key for each encryption key, including the
release key that is used to
             sign the APK for publishing.
             You can define the keys for the debug and release targets in
src/debug/ and src/release/.
        -->
        <meta-data
            android:name="com.google.android.geo.API_KEY"
            android:value="@string/google_maps_key" />

        <activity
            android:name=".MapsActivity"
            android:label="@string/title_activity_maps">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Activity_maps.xml

```
<?xml version="1.0" encoding="utf-8"?>
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:map="http://schemas.android.com/apk/res-auto"
```

```
  xmlns:tools="http://schemas.android.com/tools"
  android:id="@+id/map"
  android:name="com.google.android.gms.maps.SupportMapFragment"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MapsActivity" />
```

MapsActivity.java

```
package com.example.jevitha.a26_googlemap;

import android.support.v4.app.FragmentActivity;
import android.os.Bundle;

import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;

public class MapsActivity extends FragmentActivity implements
OnMapReadyCallback {

  private GoogleMap mMap;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
     super.onCreate(savedInstanceState);
     setContentView(R.layout.activity_maps);
     // Obtain the SupportMapFragment and get notified when the map is ready
to be used.
     SupportMapFragment mapFragment = (SupportMapFragment)
getSupportFragmentManager()
           .findFragmentById(R.id.map);
     mapFragment.getMapAsync(this);
  }


  /**
   * Manipulates the map once available.
   * This callback is triggered when the map is ready to be used.
   * This is where we can add markers or lines, add listeners or move the
camera. In this case,
   * we just add a marker near Amrita, Coimbatore.
   * If Google Play services is not installed on the device, the user will be
prompted to install
   * it inside the SupportMapFragment. This method will only be triggered once
the user has
   * installed Google Play services and returned to the app.
   */
  @Override
```

```
  public void onMapReady(GoogleMap googleMap) {
      mMap = googleMap;
      mMap.setMapType(GoogleMap.MAP_TYPE_SATELLITE);
      //mMap.setMapType(GoogleMap.MAP_TYPE_TERRAIN);
      // Add a marker in Amrita Coimbatore and move the camera
      LatLng amrita = new LatLng(10.9027, 76.9006);
      mMap.addMarker(new MarkerOptions().position(amrita).title("Marker at
Amrita Coimbatore"));
      mMap.moveCamera(CameraUpdateFactory.newLatLng(amrita));
      mMap.animateCamera(CameraUpdateFactory.zoomTo(10), 2000, null);
  }
}
```

50_GoogleMaps_GPS

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.example.jevitha.a26_1_googlemap_currentlocation">
  <!--
      The ACCESS_COARSE/FINE_LOCATION permissions are not required
to use
      Google Maps Android API v2, but you must specify either coarse or fine
      location permissions for the 'MyLocation' functionality.
  -->
  <uses-permission
android:name="android.permission.ACCESS_FINE_LOCATION" />
  <uses-permission
android:name="android.permission.ACCESS_COARSE_LOCATION"/>
  <uses-permission android:name="android.permission.INTERNET"/>
  <application
      android:allowBackup="true"
      android:icon="@mipmap/ic_launcher"
      android:label="@string/app_name"
      android:roundIcon="@mipmap/ic_launcher_round"
      android:supportsRtl="true"
      android:theme="@style/AppTheme">
      <!--
          The API key for Google Maps-based APIs is defined as a string
resource.
          (See the file "res/values/google_maps_api.xml").
          Note that the API key is linked to the encryption key used to sign the
APK.
          You need a different API key for each encryption key, including the
release key that is used to
          sign the APK for publishing.
          You can define the keys for the debug and release targets in
src/debug/ and src/release/.
```

```
        -->
        <meta-data
            android:name="com.google.android.geo.API_KEY"
            android:value="@string/google_maps_key" />

        <activity
            android:name=".MapsActivity"
            android:label="@string/title_activity_maps">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

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

</manifest>
```

Activity_maps.xml

```
<?xml version="1.0" encoding="utf-8"?>
<fragment xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:map="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/map"
    android:name="com.google.android.gms.maps.SupportMapFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MapsActivity" />
```

MapsActivity.java

```
package com.example.jevitha.a26_1_googlemap_currentlocation;

import android.Manifest;
import android.app.AlertDialog;
import android.content.Context;
import android.content.DialogInterface;
import android.content.pm.PackageManager;
import android.graphics.Color;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v4.app.FragmentActivity;
import android.os.Bundle;
import android.support.v4.content.ContextCompat;
import android.widget.Toast;
```

```
import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.BitmapDescriptorFactory;
import com.google.android.gms.maps.model.CircleOptions;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;

import java.util.ArrayList;

public class MapsActivity extends FragmentActivity implements
      OnMapReadyCallback,LocationListener {

   protected LocationManager locationManager;

   private GoogleMap mMap;
   private static final int LOCATION_PERMISSION_REQUEST_CODE = 1;


   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_maps);
      // Obtain the SupportMapFragment and get notified when the map is ready
to be used.
      SupportMapFragment mapFragment = (SupportMapFragment)
getSupportFragmentManager()
            .findFragmentById(R.id.map);
      mapFragment.getMapAsync(this);

      locationManager = (LocationManager)
getSystemService(Context.LOCATION_SERVICE);

      if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED &&
ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
PackageManager.PERMISSION_GRANTED) {
         return;
      }
      locationManager.requestLocationUpdates(LocationManager.GPS_PRO
VIDER, 1000, 0, this);

   }


   /**
    * Manipulates the map once available.
    * This callback is triggered when the map is ready to be used.
```

```
    * This is where we can add markers or lines, add listeners or move the
camera. In this case,
    * we just add a marker near Sydney, Australia.
    * If Google Play services is not installed on the device, the user will be
prompted to install
    * it inside the SupportMapFragment. This method will only be triggered once
the user has
    * installed Google Play services and returned to the app.
    */
   @Override
   public void onMapReady(GoogleMap googleMap) {

       mMap = googleMap;
       Toast.makeText(this, "OnMapReady", Toast.LENGTH_SHORT).show();

       LatLng home = new LatLng(11.0168, 76.9558);
       float zoomLevel = (float) 5.0;
       mMap.addMarker(new MarkerOptions().position(home).title("You are at
here!!!"));
       mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(home,
zoomLevel));

   }


   @Override
   public void onLocationChanged(Location location) {

       LatLng home = new LatLng(location.getLatitude(),
location.getLongitude());
       float zoomLevel = (float) 5.0;
       mMap.addMarker(new MarkerOptions().position(home).title("You are at
here now!!!"));
       mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(home,
zoomLevel));

   }

   @Override
   public void onStatusChanged(String s, int i, Bundle bundle) {

   }

   @Override
   public void onProviderEnabled(String s) {

   }

   @Override
   public void onProviderDisabled(String s) {

   }
```

}

51_TouchSensor

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:id="@+id/clayout"
  tools:context=".MainActivity">

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

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a25_touchsensor;
```

```
import android.support.constraint.ConstraintLayout;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.MotionEvent;
import android.view.View;

public class MainActivity extends
AppCompatActivity implements
        View.OnTouchListener{
   //private String TAG =
GestureActivity.class.getSimpleName();
   private String TAG = "message";
   float initialX, initialY;
   ConstraintLayout cl;
   @Override
   protected void onCreate(Bundle
savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        cl=findViewById(R.id.clayout);
        cl.setOnTouchListener(this);
   }
   @Override
   public boolean onTouch(View v, MotionEvent
event) {
        int action = event.getAction();
        if(action==MotionEvent.ACTION_DOWN)
        {
            initialX = event.getX();
            initialY = event.getY();
            Log.d(TAG, "initial "+initialX+""+initialY);
```

```
//
Toast.makeText(this,""+initialX+""+initialY,Toast.LE
NGTH_SHORT).show();
        }
        if(action==MotionEvent.ACTION_UP)
        {
            float finalX = event.getX();
            float finalY = event.getY();
            Log.d(TAG, "final"+finalX+""+finalY);
//
Toast.makeText(this,""+finalX+""+finalY,Toast.LEN
GTH_SHORT).show();
            if (initialX < finalX) {
                Log.d(TAG, "Left to Right swipe
performed");
            }
            if (initialX > finalX) {
                Log.d(TAG, "Right to Left swipe
performed");
            }
            if (initialY < finalY) {
                Log.d(TAG, "Up to Down swipe
performed");
            }
            if (initialY > finalY) {
                Log.d(TAG, "Down to Up swipe
performed");
            }
        }
        if(action==MotionEvent.ACTION_MOVE)
            Log.d(TAG, "Action was MOVE");
        if(action==MotionEvent.ACTION_CANCEL)
            Log.d(TAG,"Action was CANCEL");
```

```
        if(action==MotionEvent.ACTION_OUTSIDE)
            Log.d(TAG, "Movement occurred outside
bounds of current screen element");
// return super.onTouchEvent(event);
        return true;
    }
}
```

52_GestureDetector

activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.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">

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


</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a25_3_gesturedetector;

import android.support.v4.view.GestureDetectorCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.GestureDetector;
import android.view.MotionEvent;

public class MainActivity extends AppCompatActivity
        implements GestureDetector.OnGestureListener,
        GestureDetector.OnDoubleTapListener {
```

```
private static final String DEBUG_TAG = "Gestures";

//GestureDetectorCompat - Detects various gestures
// and events using the supplied MotionEvents.
private GestureDetectorCompat mDetector;


@Override
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Instantiate the gesture detector with the
    // application context and an implementation of
    // GestureDetector.OnGestureListener
    mDetector = new GestureDetectorCompat(this,this);
    // Set the gesture detector as the double tap listener.
    mDetector.setOnDoubleTapListener(this);

}

//To make it possible for your GestureDetector object to receive events,
// you override the View or Activity's onTouchEvent() method,
// and pass along all observed events to the detector instance.
@Override
public boolean onTouchEvent(MotionEvent event){
    this.mDetector.onTouchEvent(event);
    return super.onTouchEvent(event);
}


// Methods from GestureDetector.OnGestureListener
@Override
public boolean onDown(MotionEvent motionEvent) {
    Log.d(DEBUG_TAG,"onDown: " + motionEvent.toString());
    return false;
}

@Override
public void onShowPress(MotionEvent motionEvent) {
    Log.d(DEBUG_TAG, "onShowPress: " + motionEvent.toString());

}

@Override
public boolean onSingleTapUp(MotionEvent motionEvent) {
    Log.d(DEBUG_TAG, "onSingleTapUp: " + motionEvent.toString());
    return true;

}

@Override
```

```
    public boolean onScroll(MotionEvent motionEvent1, MotionEvent
motionEvent2, float v, float v1) {
        Log.d(DEBUG_TAG, "onScroll: " + motionEvent1.toString() +
motionEvent2.toString());
        return true;

    }

    @Override
    public void onLongPress(MotionEvent motionEvent) {
        Log.d(DEBUG_TAG, "onLongPress: " + motionEvent.toString());

    }

    @Override
    public boolean onFling(MotionEvent motionEvent1, MotionEvent
motionEvent2, float v, float v1) {
        Log.d(DEBUG_TAG, "onFling: " + motionEvent1.toString() +
motionEvent2.toString());
        return true;

    }

    //Methods from   GestureDetector.OnDoubleTapListener

    @Override
    public boolean onSingleTapConfirmed(MotionEvent motionEvent) {
        Log.d(DEBUG_TAG, "onSingleTapConfirmed: " +
motionEvent.toString());
        return true;

    }

    @Override
    public boolean onDoubleTap(MotionEvent motionEvent) {
        Log.d(DEBUG_TAG, "onDoubleTap: " + motionEvent.toString());
        return true;

    }

    @Override
    public boolean onDoubleTapEvent(MotionEvent motionEvent) {
        Log.d(DEBUG_TAG, "onDoubleTapEvent: " + motionEvent.toString());
        return true;

    }

  /*
    //To support only few gestures - extend from
GestureDetector.SimpleOnGestureListener
    // and override only required methods
```

```
  class MyGestureListener extends
GestureDetector.SimpleOnGestureListener {
      private static final String DEBUG_TAG = "Gestures";

      @Override
      public boolean onDown(MotionEvent event) {
         Log.d(DEBUG_TAG,"onDown: " + event.toString());
         return true;
      }

      @Override
      public boolean onFling(MotionEvent event1, MotionEvent event2,
                        float velocityX, float velocityY) {
         Log.d(DEBUG_TAG, "onFling: " + event1.toString() +
event2.toString());
         return true;
      }
   }

   */
}
```

53_SensorList

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:layout_margin="16dp"
   tools:context=".MainActivity">

  <ScrollView
      android:layout_width="match_parent"
      android:layout_height="match_parent"
```

```
    app:layout_constraintBottom_toBottomOf="
parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="pare
nt"
    >

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:id="@+id/sensor_list"
     android:text="Sensor List Placeholder"/>

 </ScrollView>

</android.support.constraint.ConstraintLayout>
```

MainActivity.java

```
package com.example.jevitha.a25_1_sensorlist;

import android.content.Context;
import android.hardware.Sensor;
import android.hardware.SensorManager;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.TextView;

import java.util.List;

public class MainActivity extends
AppCompatActivity {

  private SensorManager mSensorManager;

  @Override
```

```
  protected void onCreate(Bundle
savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      // The sensor manager is a system service that
lets you access the device sensors.

      mSensorManager = (SensorManager)
getSystemService
            (Context.SENSOR_SERVICE);

      //The Sensor.TYPE_ALL constant indicates all
the available sensors.
      List<Sensor>
sensorList   =   mSensorManager.
            getSensorList(Sensor.TYPE_ALL);

      StringBuilder sensorText = new StringBuilder();
      for (Sensor currentSensor : sensorList ) {
         sensorText.append(currentSensor.getName()
).append(
               System.getProperty("line.separator"));

         TextView sensorTextView = findViewById
               (R.id.sensor_list);
         sensorTextView.setText(sensorText);
      }
   }
}
```

54_Light_Proximity_TempSensor

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"
  tools:context=".MainActivity">

  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginTop="30dp"
     android:layout_marginLeft="20dp"
     android:textSize="30dp"
     android:textColor="@color/colorAccent"
     android:id="@+id/label_light"
     android:text="@string/label_light"
    />
  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginTop="20dp"
     android:layout_marginLeft="20dp"
     android:textSize="30dp"
     android:textColor="@color/colorAccent"
     android:id="@+id/label_proximity"
     android:text="@string/label_proximity"/>
  <TextView
     android:layout_width="wrap_content"
     android:layout_height="wrap_content"
     android:layout_marginTop="20dp"
     android:layout_marginLeft="20dp"
     android:textSize="30dp"
     android:textColor="@color/colorAccent"
     android:id="@+id/label_temp"
     android:text="@string/label_temp"/>


</LinearLayout>
```

Strings.xml

```
<resources>
  <string name="app_name">25_2_Light_ProximitySensor</string>
  <string name="error_no_sensor">No Sensor Available on
Device</string>
  <string name="label_light">Light Sensor: %1$.2f </string>
  <string name="label_proximity">Proximity Sensor: %1$.2f </string>
  <string name="label_temp">Temperature Sensor: %1$.2f </string>

</resources>
```

MainActivity.java

```
package com.example.jevitha.a25_2_light_proximitysensor;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.content.Context;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorManager;
import android.hardware.SensorEventListener;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.TextView;

/**
* SensorListeners demonstrates how to gain access to sensors (here, the light
* and proximity sensors), how to register sensor listeners, and how to
* handle sensor events.
*/
public class MainActivity extends AppCompatActivity implements
      SensorEventListener {
  // System sensor manager instance.
  private SensorManager mSensorManager;
  // Proximity and light sensors, as retrieved from the sensor manager.
  private Sensor mSensorProximity;
  private Sensor mSensorLight;
  private Sensor mSensorTemp;

  // TextViews to display current sensor values.
  private TextView mTextSensorLight;
  private TextView mTextSensorProximity;
  private TextView mTextSensorTemp;

  @Override
  protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
// Initialize all view variables.
      mTextSensorLight = (TextView) findViewById(R.id.label_light);
      mTextSensorTemp = (TextView) findViewById(R.id.label_temp);
      mTextSensorProximity = (TextView) findViewById
                        (R.id.label_proximity);
// Get an instance of the sensor manager.
      mSensorManager = (SensorManager)
            getSystemService(Context.SENSOR_SERVICE);
// Get light and proximity sensors from the sensor manager.
// The getDefaultSensor() method returns null if the sensor is not available on
the device.
      mSensorProximity = mSensorManager.getDefaultSensor
```

```
            (Sensor.TYPE_PROXIMITY);
        mSensorLight = mSensorManager.getDefaultSensor
            (Sensor.TYPE_LIGHT);
        mSensorTemp = mSensorManager.getDefaultSensor
            (Sensor.TYPE_AMBIENT_TEMPERATURE);
// Get the error message from string resources.
        String sensor_error =
getResources().getString(R.string.error_no_sensor);
// If either mSensorLight or mSensorProximity are null, those sensors are not
available in the device.   Set the text to the error message
        if (mSensorLight == null) {
            mTextSensorLight.setText(sensor_error);
        }
        if (mSensorProximity == null) {
            mTextSensorProximity.setText(sensor_error);
        }
        if (mSensorTemp == null) {
            mTextSensorTemp.setText(sensor_error);
        }
    }
    @Override
    protected void onStart() {
        super.onStart();
// Listeners for the sensors are registered in this callback and
// can be unregistered in onPause().
//
// Check to ensure sensors are available before registering listeners.
// Both listeners are registered with a "normal" amount of delay
// (SENSOR_DELAY_NORMAL)
        if (mSensorProximity != null) {
            mSensorManager.registerListener(this,
                    mSensorProximity,
                    SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (mSensorLight != null) {
            mSensorManager.registerListener(this, mSensorLight,
                    SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (mSensorTemp != null) {
            mSensorManager.registerListener(this, mSensorTemp,
                    SensorManager.SENSOR_DELAY_NORMAL);
        }
    }
    @Override
    protected void onStop() {
      super.onStop();
// Unregister all sensor listeners in this callback so they don't
// continue to use resources when the app is paused.
        mSensorManager.unregisterListener(this);
    }
```

```
    @Override
    public void onSensorChanged(SensorEvent sensorEvent) {
// The sensor type (as defined in the Sensor class).
        int sensorType = sensorEvent.sensor.getType();
// The new data value of the sensor.  Both the light and proximity
// sensors report one value at a time, which is always the first
// element in the values array.
        float currentValue = sensorEvent.values[0];
        switch (sensorType) {
// Event came from the light sensor.
            case Sensor.TYPE_LIGHT:
// Set the light sensor text view to the light sensor string
// from the resources, with the placeholder filled in.
                mTextSensorLight.setText(getResources().
                        getString(R.string.label_light,
                                currentValue));
                break;
            case Sensor.TYPE_PROXIMITY:
// Set the proximity sensor text view to the light sensor
// string from the resources, with the placeholder filled in.
                mTextSensorProximity.setText(getResources().
                        getString(R.string.label_proximity,
                                currentValue));
                break;
            case Sensor.TYPE_AMBIENT_TEMPERATURE:
// Set the proximity sensor text view to the light sensor
// string from the resources, with the placeholder filled in.
                mTextSensorTemp.setText(getResources().
                        getString(R.string.label_temp,
                                currentValue));
                break;
            default:
// do nothing
        }
    }
    /**
     * Abstract method in SensorEventListener.
     *Called if the sensor's accuracy changes, so your app can react to that
change.
     * Most sensors, including the light and proximity sensors, do not report
accuracy changes
     * In this app, you leave onAccuracyChanged() empty.
     */
    @Override
    public void onAccuracyChanged(Sensor sensor, int i) {
    }
}
```