ANDROID

What is Android :

Android is a Platform for mobile, tablet, TV's, desktop, wearable devices and automobiles.

Android platform consists 3 components.

- Operating System
- Middleware
- KeyApps

Android Features :

- Android is Open Source.
- Application framework is providing infrastructures for application developer.
- DVM is optimized for mobile devices to work on low power, low memory and low RAM it is a customized JVM.
- SQLite Database is used to maintain structured data.
- Open GLES native library is used to display graphics.
- Android supports GPS and different media formats.
- Android Studio provides rich development environment.
- Android is a product from OHA [Open Handset Alliance] which is lead by Google.
- Android plays a keyrole in IOT [Internet of Things : Machine - Machine communication].

Android Components :

- Activity
- Service
- Broadcast Receiver
- Content Provider

Activity :

A single screen in the application with UI components, user will communicate with the device through Activity.

Service :

A long running background process without any user interaction.
e.g. : Alarm , Media Player , FM Player

Broadcast Receiver :

Broadcast Receivers are registered for System announcements.
e.g. : Headset plugin , charger connected / disconnected , making / receiving call..

Content Provider :

Content Provider is used to share the data between multiple applications [in Android one of the security feature is we can't access the other applications data into our application directly, but if the application is providing content provider then we can access the data into our application in Android following builtin applications are providing content provider. Contacts , Callog , Media , Setting , Calendar]

Advanced Components :

- WebService [SOAP & REST]
- XML
- JSON
- GSON
- Retrofit

- Google Maps
- Google Places
- Firebase [auth,db,storage,cloud messaging,admob]
- Google Cloud Messaging [push notifications]
- Material Design Concepts

- Graphics Programming
- Graphics Programming with Cocos-2D

Manifest.xml :

Manifest.xml provides complete description [activities , services , permissions , icon , initial screen …] about the application.

Android platform before installing the application and before start the application it reads manifest.xml

R.java :

- R is termed as resource.
- R.java is an abstraction between the java file and different resources which are placed in 'res' folder.
- for every resource(file) in res folder it will create a static integer field in R.java , with the help of integer field we can access the resource into Activity(java file).
- Android Studio automatically will generate R.java.

.apk :

- apk termed as Android Application Package.
- it is the installation file in Android platform.
- apk consist .dex, res, assets, libs and Manifest.xml.

XML :

- XML is termed as extensible markup language.
- HTML is termed hyper text markup language.
- enclosing the data with in tags is called as Markup Language.

sample xml :

```
<students>
    <student>
      <id>123</id>
      <name>Mahesh</name>
      <gender>Male</gender>
    </student>
</students>
```

Advantages :

- XML is interoperable [platform independent , technology independent].
- XML is used to share the data between multiple technologies.
- XML is used as textual data base.
- XML is used as deployment descriptor [web.xml , manifest.xml , web-config.xml, plist.xml..].

Rules :

- should be properly nested.
- every xml file should have only one root element.
- xml tag name shouldn't contain spaces , should start with number and special characters except (_).

Custom Rules :

- DTD [Document Type Definition]
- XSD [XML Schema Definition]

UI Group :

- UI group is used to specify how to arrange the UI components.

LinearLayout :

By using Linear Layout we can present the UI components in a vertical or horizontal format one after another.

syntax :

```
<LinearLayout
      xmlns:android="xsd_location | xsd_url"
      android:layout_width="match_parent"
android:layout_height="match_parent"
      android:orientation="vertical | horizontal">

                              // UI components

 </LinearLayout>
```

for every UI component and UI group we have to specify width and height, following are the possible parameters to specify width and height.

- match_parent [>= 2.2]
- fill_parent [< 2.2]
- wrap_content
- px [pixel]
- dp [density pixel]
  [sp : scaled pixel]

Steps to crete an Activity :

Create a class as a child of android.app.Activity [why?]

Activity Life Cycle :

Activity is having 4 states.

- Activity Doesn't exist
- Foreground
- Pause
- Background

following are the major methods in Activity class.

- onCreate()
- onStart()
- onResume()
- onPause()
- onStop()
- onRestart()
- onDestroy()

to maintain the Activity Life cycle , our Activity class should be should be a subtype of android.app.Activity.

same like main() method in C/C++/Java in Android Activity onCreate() method will be invoke first so provide the implementation/ovveride for onCreate() method.

Bundle is used to get the state of an Activity.
We designed the UI in XML, we have to set the XML to java , use the following method in java (inside onCreae() method) to set the xml file.

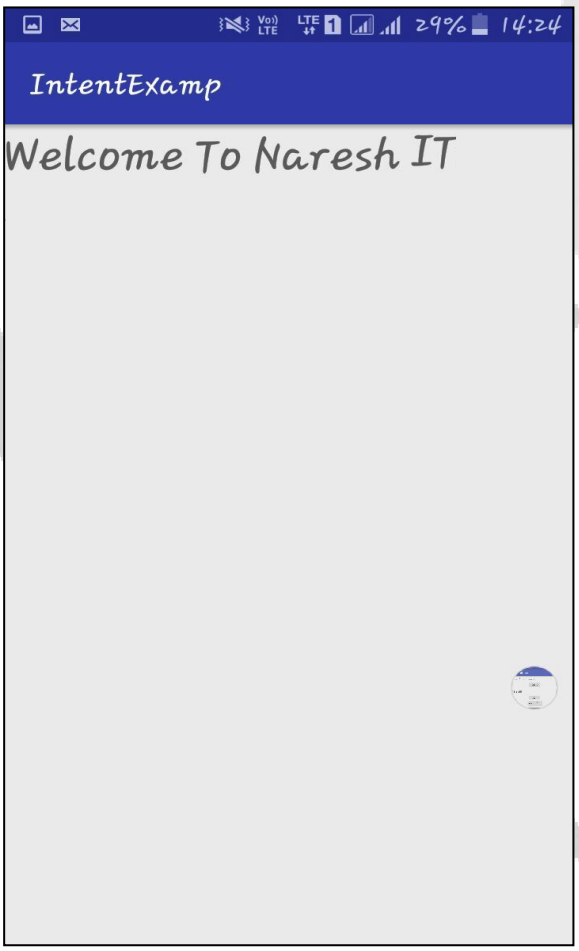
```
setContentView(R.layout.file_name);
```

activity_main.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"
   >
   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Welcome 2 NIT"
      android:textSize="40sp"/>
</LinearLayout>
```

MainActivity.java

```
package  cubexsoft.helloworld;

import android.os.Bundle;
import android.support.annotation.Nullable;

public class MainActivity extends android.app.Activity
{
   @Override
   protected void onCreate(@Nullable Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);

      setContentView(R.layout.activity_main);
   }
}
```



- button is having a click event , we can configure the click event in 2 ways.
  - XML
  - Java

XML :

- use the following to configure the configure the click event using XML.
  android:onClick="method_name"
- if we click the button it will invoke the specified method in java, if the method is not available it will throw MethodNotFoundException.

eg : *xml: android:onClick="getText"*
java: public void getText(View v)
{
…….;
}

- to get the UI component into java we have to configure an id for the UI component , use the following attribute to set the id.
  android:id="@+id/id_name"

- use the following method in java to get the UI component from XML.
  findViewById(R.id.id_name);

Configure the click event using Java :

- to configure the click event using java, get the UI component from XML to java.
  Button b=(Button)findViewById(R.id.b1);

- configure the following listener in java to configure the click event.

```
b.setOnClickListener(new View.OnClickListener()
    {
        public void onClick(View v) {
       // ……….
     }
     });
```

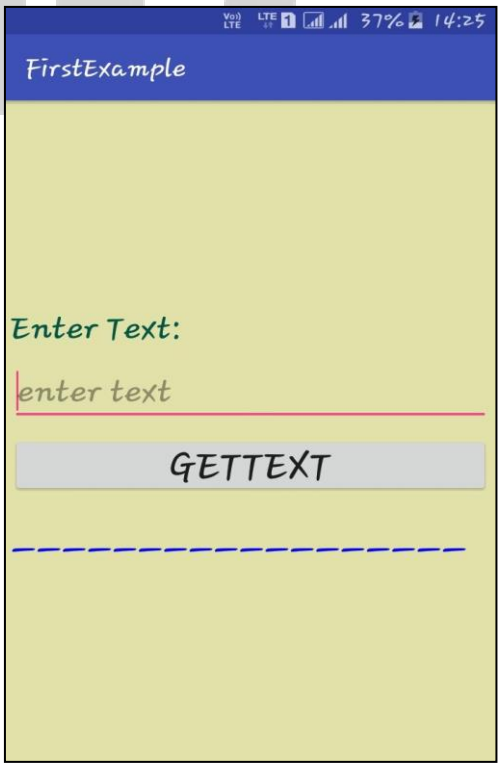
activity_main.xml

```
<?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"
  >
   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Enter Text :"
      android:textSize="40sp"
      />
   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/et1"
      />
   <Button
      android:id="@+id/b1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="GetText"
```

```
        android:textSize="40sp"/>
    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="_____________________"
        android:textSize="40sp"
        android:id="@+id/tv1"
        />
</LinearLayout>
```

MainActivity.java

```
package cubexsoft.firstex;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends android.app.Activity
{
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button b=(Button)findViewById(R.id.b1);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                EditText et1=(EditText)findViewById(R.id.et1);
                TextView tv1=(TextView)findViewById(R.id.tv1);
                tv1.setText(et1.getText());
            }
        });
    }
```



AutoCompleteTextView :

- ACTV is one of the UI component in Android which is used to provide an auto completion support to the user it is a subtype of EditText component.

xml :

```
<AutoCompleteTextView
        android:id="@+id/actv"
        ……. />
```

Java :

```
AutoCompleteTextView actv=(AutoCompleteTextView);
findViewById(R.id.actv);
```

To provide auto completion support we have to configure the values, in android there are 2 ways to configure the values

- XML
- Java

XML :

```
res >> values >> strings.xml
    <string-array name="array_name">
            <item>value1</item>
            <item>value2</item>
            …….
    </string-array>
```

use the following code in java to get these configured values.

```
String[] values=getResources().getStringArray(R.array.array_name);
```

Java :

```
String[] values=new String[]{"value1","value2",….};
    (or)
ArrayList<String> list=new ArrayList<String>();
list.add(value1);
list.add(value2);
list.add(value3);
……..
```

to present the values we have to create an adapter, in android there are 3 types of adapters

- Array Adapter
- Custom Adapter
- Cursor Adapter

ArrayAdapter :

syntax :

```
ArrayAdapter<String> adapter=new ArrayAdapter<String>
                    (context, xml_file,values);
actv.setAdapter(adapter);
actv.setThreshold(int);
```

code sample :

```
String[] values=getResources().getStringArray(R.array.countries);
ArrayAdapter<String> adapter=new ArrayAdapter<String>(MainActivity.this,
```

```
            android.R.layout.simple_spinner_dropdown_item,values);
AutoCompleteTextView actv=(AutoCompleteTextView)findViewById(R.id.actv);
actv.setAdapter(adapter);
actv.setThreshold(1);
```

- to achieve I18N we shouldn't hardcode the value , we have to configure the value in the strings.xml with the following attribute.

```
<string name="ecn">Enter Country Name : </string>
```

- use the following attribute to get the value from strings.xml

```
android:text="@string/ecn"
```

activtity_main.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">
   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="@string/ecn"
      android:textSize="40sp"
      />
   <AutoCompleteTextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/actv"
      />
</LinearLayout>
```

MainActivity.java

```
package cubexsoft.actvex;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.widget.ArrayAdapter;
import android.widget.AutoCompleteTextView;
public class MainActivity extends android.app.Activity
{
   @Override
   protected void onCreate(@Nullable Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
     String[] values=getResources().getStringArray(R.array.countries);
      ArrayAdapter<String> adapter=new ArrayAdapter<String>(MainActivity.this,
                        android.R.layout.simple_spinner_dropdown_item,values);
      AutoCompleteTextView actv=(AutoCompleteTextView)findViewById(R.id.actv);
      actv.setAdapter(adapter);
      actv.setThreshold(1);
   }
}
```

strings.xml

```
<resources>
   <string name="app_name">ACTVEx</string>
   <string-array name="countries">
      <item>Australia</item>
```

```
        <item>America</item>
        <item>Afganisthan</item>
        <item>India</item>
        <item>Ireland</item>
        <item>Indonasia</item>
    </string-array>
    <string name="ecn">Enter Country Name : </string>
</resources>
```

Spinner :

- Spinner is one of the UI component in Android which is used to display the list of configured values in a dropdown menu.

syntax :

xml :

```
<Spinner
    android:id="@+id/sp1"
…….../>
```

java :

Spinner sp1=(Spinner)findViewById(R.id.sp1);

same like ACTV , to present the values we have to configure the values in XML / Java.

- if the values configured in XML use the following attribute to set the values.

android:entries="@array/array_name"

- if the values are configured in java we have to create an adapter to set the values.

ArrayAdapter<String> adapter=new ArrayAdapter<String>

```
                    (context,xml_file,values);
    sp1.setAdapter(adapter);
```

- Spinner is having item selected event to get this event configure the following listener.

```
        sp1.setOnItemSelectedListener(new OnItemSelectListener(){
                                    public void onItemSelected(){…..}
    public void onNothingSelected(){…}
                    });
```

Toast :

- Toast is one of the notification method in Android which is used to display text on the screen for few seconds.

syntax :

```
Toast.makeText(context,message,duration).show();
```

example :

```
Toast.makeText(MainActivity.this,sp1.getSelectedItem().toString(),
                                                Toast.LENGTH_LONG).show();
```

activity_main.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"
   >
   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Select Country :"
      android:textSize="30sp"
      />
   <Spinner
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/sp1"
      android:entries="@array/countries"
      ></Spinner>

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Select Gender"
      android:textSize="30sp"
      />

   <Spinner
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/sp2"
      ></Spinner>
```

```
</LinearLayout>
```

MainActivity.java

```
package cubexsoft.spinnertest;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.Toast;
import java.lang.reflect.Array;
import java.util.ArrayList;
public class MainActivity extends android.app.Activity
{
   @Override
   protected void onCreate(@Nullable Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      final Spinner sp1=(Spinner)findViewById(R.id.sp1);
      sp1.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
         @Override
         public void onItemSelected(AdapterView<?> parent, View view, int position, long id) {
           if(position>0) {
              Toast.makeText(MainActivity.this, sp1.getSelectedItem().toString(),
                    Toast.LENGTH_LONG).show();
           }
         }

         @Override
         public void onNothingSelected(AdapterView<?> parent) {

         }
      });

      Spinner sp2=(Spinner)findViewById(R.id.sp2);
      ArrayList<String> list=new ArrayList<>();
      list.add("Select");
      list.add("Male");
      list.add("FeMale");
      ArrayAdapter<String> adapter=new ArrayAdapter<String>
            (MainActivity.this,android.R.layout.simple_spinner_dropdown_item,list);
      sp2.setAdapter(adapter);

   }
}
```

strings.xml

```
<resources>
   <string name="app_name">SpinnerTest</string>
   <string-array name="countries">
      <item>---select---</item>
      <item>India</item>
      <item>Australia</item>
      <item>Afganisthan</item>
```

```
        <item>China</item>
        <item>Bangladesh</item>
        <item>Srilanka</item>
    </string-array>
</resources>
```

ListView :

- ListView is used to display the list of configured values.

xml:

```
<ListView
    android:id="@+id/lview1"
    ……../>
```

java :

```
ListView lview=(ListView)findViewById(R.id.lview1);
```

same like ACTV and Spinner for presenting the value we have to configure the values in XML / Java , if the values are configure in XML by using android:entries="@array/array_name" attribute we can set the values, if the values are configured in java create an adapter to set the values.

internal storage path :

String path="/storage/sdcard0/"

(or)

"/storage/emulated/0/"

external storage path :

String path="/storage/sdcard1/"

(or)

"/storage/extSdCard/"

```
ListView lview=(ListView)findViewById(R.id.lview1);
String path="/storage/emulated/0/";
File f=new File(path);   String[] files=f.list();
ArrayAdapter<String>  adapter=new ArrayAdapter<String>
          (MainActivity.this,android.R.layout.simple_spinner_item,files);
lview.setAdapter(adapter);
```

- if we are accessing the device storage information we have to add the following permissions in Manifest.xml.

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

How to enable Runtime permissions :

- check the permission status.

```
int status= ContextCompat.checkSelfPermission(MainActivity.this,
                  Manifest.permission.READ_EXTERNAL_STORAGE);
```

- if the permission is granted we can read the data, if the permission is not granted request the user to grant the permission.

```
if(status== PackageManager.PERMISSION_GRANTED){
      readFiles();
}else{
      ActivityCompat.requestPermissions(MainActivity.this, new
         String[]{Manifest.permission.READ_EXTERNAL_STORAGE},123);       }
```

- get the permission status granted or not , by adding the following method in Activity class, if user is granted the permission we can read the data.

```
@Override   public void onRequestPermissionsResult(int requestCode, @NonNull String[]
permissions, @NonNull int[] grantResults) {
super.onRequestPermissionsResult(requestCode, permissions, grantResults);
if(grantResults[0]==PackageManager.PERMISSION_GRANTED){
            readFiles();
   }else{
     Toast.makeText(MainActivity.this,"User is Not Intrested to Read...",
           Toast.LENGTH_LONG).show();
      }
}
```

- by using ArrayAdapter<String> we can present only String type of data, to present your own UI on individual item use Custom Adapter.

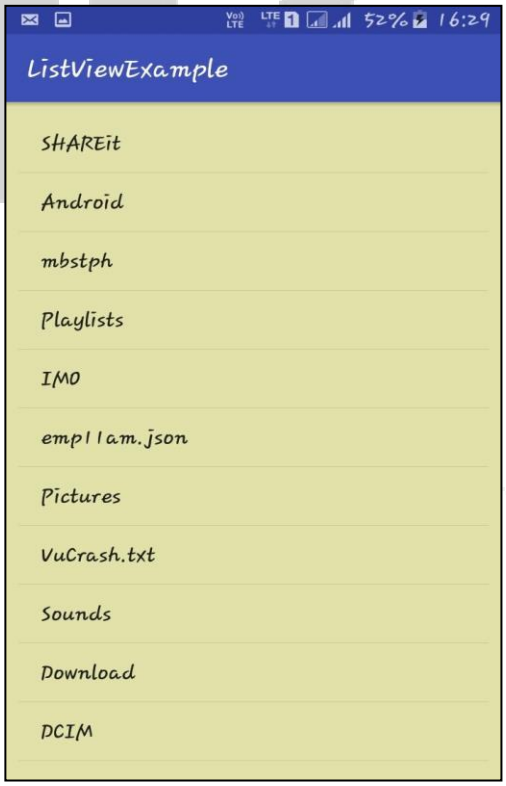
activity_main.xml

```
<?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"
   >
   <ListView
      android:layout_width="match_parent"
```

```
        android:layout_height="match_parent"
        android:id="@+id/lview1"
        ></ListView>
</LinearLayout>
```

MainActivity.java

```
package cubexsoft.listviewtest;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.Toast;
import java.io.File;

public class MainActivity extends AppCompatActivity {

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

        ListView lview=(ListView)findViewById(R.id.lview1);
        String path="/storage/emulated/0/";
        File f=new File(path);
        String[] files=f.list();

        ArrayAdapter<String> adapter=new ArrayAdapter<String>
                (MainActivity.this,android.R.layout.simple_spinner_item,files);
        lview.setAdapter(adapter);
    }
}
```



Steps to create Custom Adapter :

- create a class as a child of android.widget.BaseAdapter.
- it is an abstract class having following abstract methods.
  - getCount()
  - getItem()
  - getItemId()
  - getView()
- **LayoutInflater :** Layout Inflater class is used to UI xml to View object.

```
LayoutInflater inflater=LayoutInflater.from(activity_object);
    View v=inflater.inflate(R.layout.xml_file,view_group);
```

- use the following code to set the custom adapter to the UI component.

```
    ui_comp.setAdapter(new CustomAdapterClass());
```

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

indiview.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="horizontal"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   >
   <ImageView
      android:layout_width="0dp"
      android:layout_height="100dp"
      android:layout_weight="0.2"
      android:id="@+id/iview1"
      android:src="@mipmap/ic_launcher"
      />
   <LinearLayout
      android:layout_width="0dp"
      android:layout_height="100dp"
      android:layout_weight="0.6"
      android:orientation="vertical"
      >
       <TextView
          android:layout_width="match_parent"
          android:layout_height="0dp"
          android:layout_weight="0.5"
          android:text="File Name"
          android:id="@+id/name"
          android:textSize="20sp"
          android:textColor="#FF0000"
          android:textStyle="bold"
          android:gravity="center"
          />

      <TextView
         android:layout_width="match_parent"
         android:layout_height="0dp"
         android:layout_weight="0.5"
         android:text="File Size"
         android:id="@+id/size"
         android:textSize="20sp"
         android:textStyle="bold"
         android:textColor="#0000FF"
         android:gravity="center"
         />

   </LinearLayout>

   <Button
      android:layout_width="0dp"
      android:layout_height="50dp"
      android:layout_weight="0.2"
      android:text="Del"
      android:textSize="15sp"
      android:id="@+id/b1"
      />
</LinearLayout>
```

MainActivity.java

```
package cubexsoft.listviewcustom;

import android.Manifest;
import android.content.pm.PackageManager;
import android.support.annotation.NonNull;
import android.support.v4.app.ActivityCompat;
import android.support.v4.content.ContextCompat;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import java.io.File;

public class MainActivity extends AppCompatActivity {

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

        int status= ContextCompat.checkSelfPermission(MainActivity.this,
                Manifest.permission.READ_EXTERNAL_STORAGE);

        if(status== PackageManager.PERMISSION_GRANTED){
            readFiles();
        }else{
            ActivityCompat.requestPermissions(MainActivity.this,
                 new String[]{Manifest.permission.READ_EXTERNAL_STORAGE},123);
        }
    }

    public void readFiles(){
        String path="/storage/emulated/0/WhatsApp/Media/WhatsApp Images/";
        File f=new File(path);
        String[] files=f.list();

   /*     ArrayAdapter<String> adapter=new ArrayAdapter<String>
                (MainActivity.this,android.R.layout.simple_spinner_item,files); */

        ListView lview=(ListView)findViewById(R.id.lview);
        lview.setAdapter(new MyAdapter(MainActivity.this,files));
    }

    @Override
    public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,
@NonNull int[] grantResults) {
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);

        if(grantResults[0]==PackageManager.PERMISSION_GRANTED){
            readFiles();
        }
    }
}
```

MyAdapter.java

```
package cubexsoft.listviewcustom;

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

/**
 * Created by maheshthippala on 16/06/17.
 */

public class MyAdapter extends BaseAdapter {

    MainActivity mainActivity;
    String[] files;

    public MyAdapter(MainActivity mainActivity, String[] files) {
        this.mainActivity=mainActivity;
        this.files=files;
    }


    @Override
    public int getCount() {

        return files.length;
    }

    @Override
    public Object getItem(int position) {
        return null;
    }

    @Override
    public long getItemId(int position) {
        return 0;
    }

    @Override
    public View getView(int position, View convertView, ViewGroup parent) {

        LayoutInflater inflater=LayoutInflater.from(mainActivity);

        View v=inflater.inflate(R.layout.indiview,null);

        return v;
    }
}
```

Intents :

- Intents is used to provide a communication between Activity - Activity , Activity - Service , Activity - Broadcast Receiver.

with respect to Activity there are 2 types of intents.

- Implicit Intents
- Explicit Intents

Implicit Intents :

- Implicit Intents is used to call builtin Activities [e.g.: Camera, dialer , browser,caller …]

syntax :

```
Intent i=new Intent();
i.setAction(Intent.ACTION_NAME);
startActivity(i);
```

Explicit Intents :

- Explicit Intents is used to call user defined Activities.

syntax :

```
Intent i=new Intent(context, class_name);
startActivity(i);
```

by using explicit intents we can invoke other applications activity from our application.

Intent i=getPackageManager().getLaunchIntentForPackage("package_name");
startActivity(i);

following are the major methods in Intent class

setAction() setComponent()
setData() putExtra()
setType() getExtra()

```
public void dial(View v){
	Intent i=new Intent();
	i.setAction(Intent.ACTION_DIAL);
	EditText et1=(EditText)findViewById(R.id.et1);
	i.setData(Uri.parse("tel:"+et1.getText().toString()));
	startActivity(i);
}
```

- every user defined Activity should be configured in Manifest.xml with the following tag inside <application> tag.

```
<activity android:name="package_name.activity_class_name"/>
```

- which activity you want to display as a initial Activity in the application for that Activity configure the following tag inside <activity> tag.

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

public void next(View v){
	Intent i=new Intent(MainActivity.this,WelcomeActivity.class);
	EditText et2=(EditText)findViewById(R.id.et2);
	i.putExtra("uname",et2.getText().toString());
	startActivity(i);
}
```

In Welcome Activity onCreate() method :

```
String name=getIntent().getStringExtra("uname");
	TextView tv1=(TextView)findViewById(R.id.tv1);	tv1.setText(tv1.getText()+name);
```

activity_main.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"
   >

   <EditText
      android:id="@+id/et1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Enter Number :"
      android:inputType="phone"
```

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

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="DIAL"
        android:textSize="20sp"
        android:onClick="dial"
        />

    <EditText
        android:id="@+id/et2"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Name :"
        android:inputType="text"
        android:textSize="25sp"
        />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="NEXT"
        android:textSize="20sp"
        android:onClick="next"
        />
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="WhatsApp"
        android:textSize="20sp"
        android:onClick="whatsApp"
        />

</LinearLayout>
```

welcome.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Welcome 2 NareshIT"
        android:textSize="50sp"
        android:id="@+id/tv1"
        />

</LinearLayout>
```

MainActivity.java

```
package cubexsoft.intentstest;

import android.content.ComponentName;
```

```
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.EditText;

public class MainActivity extends AppCompatActivity {

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

    public void dial(View v){
/*      Intent i=new Intent();
        i.setAction(Intent.ACTION_DIAL);
        EditText et1=(EditText)findViewById(R.id.et1);
        i.setData(Uri.parse("tel:"+et1.getText().toString()));
        startActivity(i); */

        Intent i=new Intent();
        i.setAction(Intent.ACTION_GET_CONTENT);
        i.setType("image/*");
        startActivity(i);

    }

    public void next(View v){

        Intent i=new Intent();
        i.setComponent(new ComponentName(MainActivity.this,WelcomeActivity.class));
        EditText et2=(EditText)findViewById(R.id.et2);
        i.putExtra("uname",et2.getText().toString());
        startActivity(i);
    }

    public void whatsApp(View v){
        Intent i=getPackageManager().
        getLaunchIntentForPackage("com.surpax.ledflashlight.panel");
        startActivity(i);

    }

}
```

WelcomeActivity.java

```
package cubexsoft.intentstest;

import android.app.Activity;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.widget.TextView;
import org.w3c.dom.Text;

/**
 * Created by maheshthippala on 19/06/17.
```

```
 */

public class WelcomeActivity extends Activity {

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

       String name=getIntent().getStringExtra("uname");
        TextView tv1=(TextView)findViewById(R.id.tv1);
        tv1.setText(tv1.getText()+name);
    }
}
```

Storage Methods :

- Shared Preferences
- SQLite Database
- Files[XML / JSON]

Shared Preferences :

- SharedPreferences is used to maintain the data in a key,value pair.
- SharedPreferences interface is used to manage SPF.
- getSharedPreferences(spf_name,Mode) method is used to get the object of SharedPrefences.

```
SharedPreferences spf=getSharedPreferences(spf_name,mode);
```

- if the SPF is not available with the specified name then it will create a new SharedPreferenes, it the SPF is already available with the specified name then it will open the data from existing SPF.

- following are the possible parameters to specify mode.

```
Context.MODE_PRIVATE
Context.MODE_WORLD_READABLE
Context.MODE_WORLD_WRITABLE
```

- by using above object (spf) we can create SPF and we can read the data from SPF, to write the data into SPF additionally we have to create an object for SharedPreferences.Editor.

```
SharedPreferences.Editor spe=spf.edit();
```

- spe.putXXX("key",value) method is used to insert the data.
// XXX - data type
- spf.getXXX("key","default_value") method is used to read the data, if the value is available with the specified key then it will return the actual value otherwise it will return the default value.

- spe.commit() method is used to commit the data in SPF.
- spe.clear() method is used to remove the data from SPF.

- internally SPF will maintain the data in a XML file, we can explore the XML file by using Android Device Monitor [ADM].

ADM >> file_explorer >> data >> data >> pkg_name >>
shared_preferences >> file_name.xml

- by using ADM we can explore only virtual device [AVD] data.

- by using SPF we can maintain huge amount of data but for every value we have to specify a unique key its difficult to remember the keys thats why SPF is preferred to maintain limited data (e.g. : pattern lock , keep me sign , highscore) to maintain huge amount of data Android is preferred SQLite Database.

activity_main.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"
   >

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/let1"
      android:hint="Enter User Name"
      />

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
```

```
        android:id="@+id/let2"
        android:hint="Enter Password"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="LOGIN"
        android:onClick="login"
        android:textSize="20sp"
        />

    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Register"
        android:onClick="register"
        android:textSize="20sp"
        />

</LinearLayout>
```

register.xml

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

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ret1"
        android:hint="Enter Uname"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ret2"
        android:hint="Enter Pass"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ret3"
        android:hint="Enter Mobile No"
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/ret4"
        android:hint="Enter Email"
        />
```

```
    <Button
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Register"
        android:onClick="register"
        />

</LinearLayout>
```

welcome.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Welcome 2 NIT"
        android:textSize="50sp"
        />

</LinearLayout>
```

MainActivity.java

```
package nareshit.spftest;

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;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {


    EditText et1,et2;

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

        et1=(EditText)findViewById(R.id.let1);
        et2=(EditText)findViewById(R.id.let2);
    }

        public void login(View v){
            SharedPreferences spf=getSharedPreferences("myprfs",
                                        Context.MODE_PRIVATE);
```

```
            String name=spf.getString("uname","no value");
            String pass=spf.getString("pass","no value");
            if(et1.getText().toString().equals(name) &&
                    et2.getText().toString().equals(pass)){
        Intent i=new Intent(MainActivity.this,WelcomeActivity.class);
               startActivity(i);
            }else {
               Toast.makeText(MainActivity.this,"Invalid User",
                                                Toast.LENGTH_LONG).show();
            }
        }

        public void register(View v){

            Intent i=new Intent(MainActivity.this,RegistrationActivity.class);
            startActivity(i);

        }
}
```

RegistrationActivity.java

```
package nareshit.spftest;

import android.app.Activity;
import android.content.Context;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.View;
import android.widget.EditText;

/**
 * Created by maheshthippala on 20/06/17.
 */

public class RegistrationActivity extends Activity {

    EditText et1,et2,et3,et4;

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

        setContentView(R.layout.register);

        et1=(EditText)findViewById(R.id.ret1);
        et2=(EditText)findViewById(R.id.ret2);
        et3=(EditText)findViewById(R.id.ret3);
        et4=(EditText)findViewById(R.id.ret4);
    }


    public void register(View v){
        SharedPreferences spf=getSharedPreferences("myprfs",
                                                Context.MODE_PRIVATE);
        SharedPreferences.Editor spe=spf.edit();
        spe.putString("uname",et1.getText().toString());
```

```
        spe.putString("pass",et2.getText().toString());
        spe.putString("mno",et3.getText().toString());
        spe.putString("email",et4.getText().toString());
        spe.commit();

        finish();
    }

}
```

WelcomeActivity.java

```
package nareshit.spftest;

import android.app.Activity;
import android.os.Bundle;
import android.support.annotation.Nullable;

/**
 * Created by maheshthippala on 20/06/17.
 */

public class WelcomeActivity extends Activity {

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

        setContentView(R.layout.welcome);
    }
}
```

SQLite Database :

- SQLite Database is used to maintain structured data in Android.
- SQLiteDatabase class is used to manage SQLite database.
- openOrCreateDatabase(db_name,mode,cursor_factory) method is used to get the object for SQLiteDatabase.

```
SQLiteDatabase dBase=openOrCreateDatabase(db_name,
                                          mode,cursor_factory);
```

- SQLiteDB is providing builtin methods to perform CRUD operations.

```
                insert()
                query()     // read
        update()
                delete()
```

- apart from builtin methods we can execute nativeSQL statements by using following methods.

```
                - execSQL(sql_query)   //  I  U  D  C
                - rawQuery(sql_query)  //  R
```

- we can explore the SQLite the DB file using ADM.
  ADM >> file_explorer >> data >> data >> pkg_name >>
  database >> file_name.db
- to open the SQLite db file we use SQLite browser.

Caused by: android.database.sqlite.SQLiteException: table employee already exists (code 1): , while compiling: create table employee(id number,name varchar(50),desig varchar(50),dept varchar(50))

Read :

```
public void read(View v){
/*query(String table, String[] columns, String selection,      String[] selectionArgs, String groupBy, String having, String orderBy)*/
    Cursor c=dBase.query("employee",null,null,null,null,null,null);
    while(c.moveToNext())   {
            int id=c.getInt(0);
            String name=c.getString(1);
            String desig=c.getString(2);
            String dept=c.getString(3);
        Toast.makeText(MainActivity.this,id+"\n"+name+"\n"+desig+"\n"+dept,
            Toast.LENGTH_LONG).show();
        }
 }
```

Update :

```
public void update(View v){
    /*String table,ContentValues values,String whereClause, String[] whereArgs*/
    ContentValues cv=new ContentValues();
    cv.put("name",et2.getText().toString());
    cv.put("desig",et3.getText().toString());
    int count=dBase.update("employee",cv,"id=? and dept=?",
          new String[]{et1.getText().toString(),et4.getText().toString()});
    if(count>0){
        Toast.makeText(MainActivity.this,"Record is updated..",
                                        Toast.LENGTH_LONG).show();
 et1.setText(""); et2.setText(""); et3.setText("");et4.setText("");      }else{
        Toast.makeText(MainActivity.this,"Failed to
                                update..",Toast.LENGTH_LONG).show();      }
```

```
    }
```

Delete :

```
    int count=dBase.delete("employee","id=?",
                        new String[]{et1.getText().toString()});
```

activity_main.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"
   >

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="ID"
      android:id="@+id/et1" />

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="NAME"
      android:id="@+id/et2" />

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Desig"
      android:id="@+id/et3" />

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Dept"
      android:id="@+id/et4" />

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

      <Button
         android:layout_width="0dp"
         android:layout_height="wrap_content"
         android:text="INSERT"
         android:onClick="insert"
         android:layout_weight="0.5"
         />


      <Button
```

```
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:text="READ"
        android:onClick="read"
        android:layout_weight="0.5"
        />


    </LinearLayout>


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

       <Button
          android:layout_width="0dp"
          android:layout_height="wrap_content"
          android:text="UPDATE"
          android:onClick="update"
          android:layout_weight="0.5"
          />


       <Button
          android:layout_width="0dp"
          android:layout_height="wrap_content"
          android:text="DELETE"
          android:onClick="delete"
          android:layout_weight="0.5"
          />


    </LinearLayout>

</LinearLayout>
```

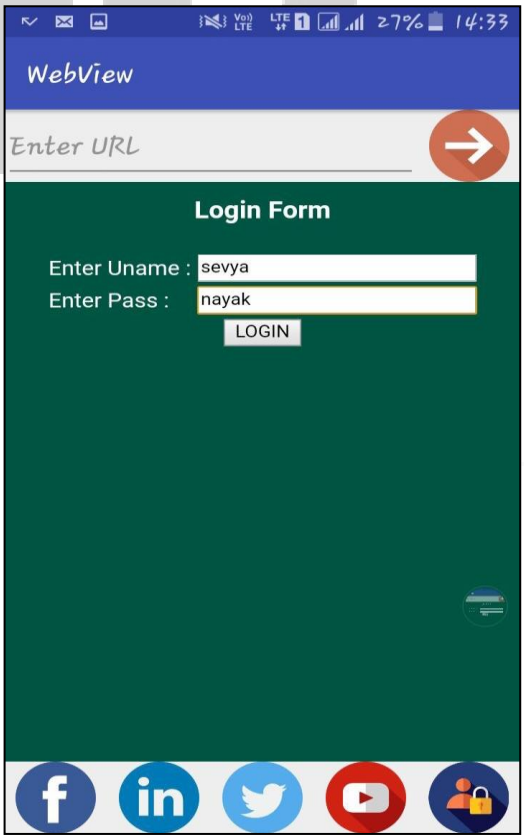
MainActivity.java

```
package nareshit.sqlitedbtest;

import android.app.Activity;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
public class MainActivity extends Activity {
    EditText et1,et2,et3,et4;
    SQLiteDatabase dBase;

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

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

        et1=(EditText)findViewById(R.id.et1);
        et2=(EditText)findViewById(R.id.et2);
        et3=(EditText)findViewById(R.id.et3);
        et4=(EditText)findViewById(R.id.et4);

        dBase=openOrCreateDatabase("mydb",
                    Context.MODE_PRIVATE,null);
    dBase.execSQL("create table if not exists employee(id number," +
          "name varchar(50),desig varchar(50),dept varchar(50))");
     }

     public void insert(View v){
        ContentValues cv=new ContentValues();
        cv.put("id",et1.getText().toString());
        cv.put("name",et2.getText().toString());
        cv.put("desig",et3.getText().toString());
        cv.put("dept",et4.getText().toString());
        long status=dBase.insert("employee",null,cv);
        if(status!=-1){
           Toast.makeText(MainActivity.this,"Data Inserted",
                          Toast.LENGTH_LONG).show();
           et1.setText(""); et2.setText("");et3.setText("");et4.setText("");
        }else{
           Toast.makeText(MainActivity.this,"Failed to Insert",
                 Toast.LENGTH_LONG).show();
        }
     }


     public void read(View v){

        /*query(String table, String[] columns, String selection,
        String[] selectionArgs, String groupBy, String having,
              String orderBy)*/
    Cursor c=dBase.query("employee",null,"id=? and dept=?",
        new String[]{et1.getText().toString(),et4.getText().toString()},
          null,null,null);

     while(c.moveToNext())
     {
        int id=c.getInt(0);
        String name=c.getString(1);
        String desig=c.getString(2);
        String dept=c.getString(3);

        et1.setText(String.valueOf(id));
        et2.setText(name);
        et3.setText(desig);
        et4.setText(dept);
     }
     }

     public void update(View v){
   /*   String table, ContentValues values, String whereClause,
                                    String[] whereArgs */
```

```
    ContentValues cv=new ContentValues();
     cv.put("name",et2.getText().toString());
     cv.put("desig",et3.getText().toString());
     int count=dBase.update("employee",cv,"id=? and dept=?",
        new String[]{et1.getText().toString(),et4.getText().toString()});

      if(count>0){
         Toast.makeText(MainActivity.this,"Record is updated..",Toast.LENGTH_LONG).show();

      et1.setText(""); et2.setText(""); et3.setText("");et4.setText("");
      }else{
         Toast.makeText(MainActivity.this,"Failed to update..",Toast.LENGTH_LONG).show();
      }
   }

   public void delete(View v){
        /*
     int count=dBase.delete("employee","id=?",
                        new String[]{et1.getText().toString()});
      if(count>0){
         Toast.makeText(MainActivity.this,"Record is deleted..",Toast.LENGTH_LONG).show();

         et1.setText(""); et2.setText(""); et3.setText("");et4.setText("");
      }else{
         Toast.makeText(MainActivity.this,"Failed to delete..",Toast.LENGTH_LONG).show();
      } */
     dBase.execSQL(
        "delete from employee where id="+et1.getText().toString());
   }

}
```

WebView :



- WebView is one of the UI component in Android which is used to display webpages in android application.

xml:

```
<WebView
    android:id="@+id/wview"
    android:layout_width="match_parent"
    android:layout_height="match_parent"/>
```

java :

```
WebView wview=(WebView)findViewById(R.id.wview);
```

- by using Webview we can perform the following operations.

  - call browser
  - integrate browser in our application
  - display .html files
  - we can provide communication between HTML UI components and Android Activity.

- wview.loadUrl("url_address"); method is used to display webpages in android application.

- to access internet in the application add the following statement in manifest.xml.

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

- to integrate the browser in our application set the following method to web view component.

```
wview.setWebViewClient(new WebViewClient());
```

- following are the major methods in web view client class.

```
onPageStarted();
shouldOverrideUrlLoading();
onPageFinished();
```

```
final ProgressDialog pDialog=new ProgressDialog(MainActivity.this);
pDialog.setTitle("Message");
pDialog.setMessage("Please wait ... page is loading ..");      wview.setWebViewClient(new
WebViewClient(){
 @Override
      public void onPageStarted() {
          pDialog.show();
         }
       @Override
       public void onPageFinished() {
            pDialog.dismiss();
          } });
      }
```

- by default webview will not enable javascript to enable javascript set the following method to webview component.

```
wview.getSettings().setJavaScriptEnable(true);
```

- set the following method to webview to enable zoom controls.

wview.getSettings().setBuiltinZoomControls(true);

display .html files :

- place the .html file in assets folder.
- use the following code to display .html file.

wview.loadUrl("file:///android_asset/file_name.html");

Communication between HTML UI to Android Activity:

- by using JavaScriptInterface we can provide the communication between HTML UI and Android Activity.

wview.addJavaScriptInterface(activity_name,"interface_name");

- in the above method by using the second parameter (interface_name) we can communicate with the specified activity methods from Javascript.

- which method we want to call from javascript add the following annotation on top of the Method.

@JavaScriptInterface

activity_main.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"
   >

   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.1"
      android:orientation="horizontal"
      >

      <EditText
         android:layout_width="0dp"
         android:layout_height="match_parent"
         android:layout_weight="0.8"
         android:id="@+id/et1"
         android:hint="Enter URL"
         />

      <ImageView
         android:layout_width="0dp"
         android:layout_height="match_parent"
         android:layout_weight="0.2"
         android:src="@drawable/search"
         android:onClick="test"
         android:id="@+id/srch" />
```

```
    </LinearLayout>

    <WebView
       android:layout_width="match_parent"
       android:layout_height="0dp"
       android:layout_weight="0.8"
       android:id="@+id/wview1"
       ></WebView>

    <LinearLayout
       android:layout_width="match_parent"
       android:layout_height="0dp"
       android:layout_weight="0.1"
       android:orientation="horizontal"
       >
       <ImageView
          android:layout_width="0dp"
          android:layout_height="match_parent"
          android:layout_weight="0.25"
          android:src="@drawable/facebook"
          android:onClick="test"
          android:id="@+id/fb"
          />

       <ImageView
          android:layout_width="0dp"
          android:layout_height="match_parent"
          android:layout_weight="0.25"
          android:src="@drawable/gplus"
          android:onClick="test"
          android:id="@+id/google"
          />

       <ImageView
          android:layout_width="0dp"
          android:layout_height="match_parent"
          android:layout_weight="0.25"
          android:src="@drawable/youtube"
          android:onClick="test"
          android:id="@+id/you"
          />

       <ImageView
          android:layout_width="0dp"
          android:layout_height="match_parent"
          android:layout_weight="0.25"
          android:src="@drawable/html"
          android:onClick="test"
          android:id="@+id/html"
          />
    </LinearLayout>

</LinearLayout>
```

MainActivity.java

```
package nareshit.webviewex;

import android.app.ProgressDialog;
import android.graphics.Bitmap;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.webkit.JavascriptInterface;
import android.webkit.WebView;
import android.webkit.WebViewClient;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

   WebView wview;

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

      wview=(WebView)findViewById(R.id.wview1);
      wview.getSettings().setJavaScriptEnabled(true);
      wview.getSettings().setBuiltInZoomControls(true);
     wview.addJavascriptInterface(MainActivity.this,"myinterface");

      final ProgressDialog pDialog=new ProgressDialog(MainActivity.this);
      pDialog.setTitle("Message");
      pDialog.setMessage("Please wait ... page is loading ..");

      wview.setWebViewClient(new WebViewClient(){
         @Override
         public void onPageStarted(WebView view, String url, Bitmap favicon) {
            super.onPageStarted(view, url, favicon);
           pDialog.show();
         }
         @Override
         public boolean shouldOverrideUrlLoading(WebView view, String url) {
            return super.shouldOverrideUrlLoading(view, url);
         }
         @Override
         public void onPageFinished(WebView view, String url) {
            super.onPageFinished(view, url);
            pDialog.dismiss();
         }
      });
   }

   @JavascriptInterface
   public void showMsg(String name,String pass)
   {
      Toast.makeText(MainActivity.this, name+"\n"+pass,
            Toast.LENGTH_LONG).show();
   }

   public void test(View v){
```

```
        switch (v.getId())
        {
           case R.id.srch:
              EditText et1=(EditText)findViewById(R.id.et1);
              wview.loadUrl(et1.getText().toString());
              break;
           case R.id.fb:
              wview.loadUrl("http://www.facebook.com");

              break;
           case R.id.google:
              wview.loadUrl("http://www.google.com");

              break;
           case R.id.you:
              wview.loadUrl("http://www.youtube.com");
              break;
           case R.id.html:

              wview.loadUrl("file:///android_asset/login.html");

              break;

        }
     }
}
```

Assets/login.html

```
<html>
   <head>
      <script language="JavaScript">
        function login()
         {
       var uname=document.getElementById("uname").value;
       var pass=document.getElementById("pass").value;
        myinterface.showMsg(uname,pass);
        }
      </script>
   </head>


   <body bgcolor="#054" text="white">

   <center>

      <table>
          <tr><td colspan="2" align="center"> <h3>Login Form </h3></td> </tr>
         <tr><td>Enter Uname :</td><td><input type="text" id="uname"></td></tr>
         <tr><td>Enter Pass :</td><td><input type="text" id="pass"></td></tr>
         <tr><td colspan="2" align="center"><input type="button" value="LOGIN"
onclick="login()"></td></tr>
      </table>
   </center>

   </body>

</html>
```

fragments :

- fragment is one the UI component in Android.

xml :

```
<fragment
android:id="@+id/frag1"
…… />
```

- Fragment is called as subtype of an Activity.
- same like Activity every fragment is having its own life cycle and its own UI.

Steps to create a Fragment :

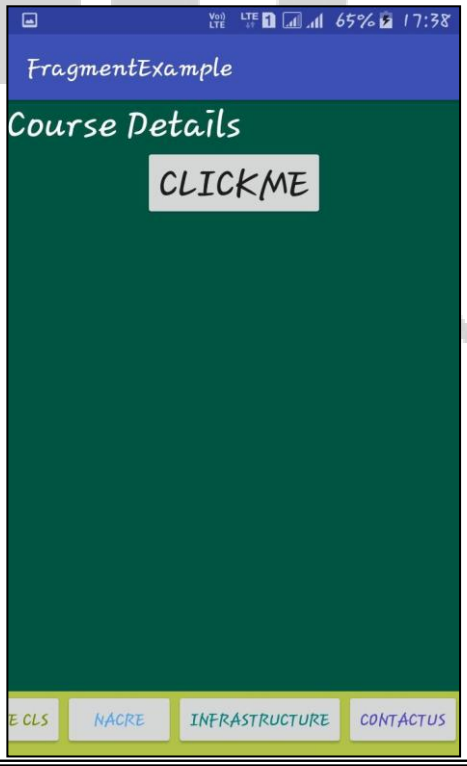
- create a class as a child of android.app.Fragment.
- same like Activity onCreate() method in fragment onCreateView() method will be invoke first so provide the implementation for onCreateView() method.

```
public View onCreateView(LayoutInflater li,ViewGroup vg,Bundle b)
{
    View v=li.inflate(R.layout.xml_file,vg,false);
        // logic to get the UI components from fragment.
    return v;
}
```

- we will manage fragments from Activity, use the following to code manage fragments.

```
FragmentManager fManager=getFragmentManager();
FragmentTransaction tx=fManager.beginTransaction();
tx.add/replace/remove(fragment_id,fragment_class_object);
tx.commit();
```

- in a single class we can create number of fragments.
- fragments concept is introduced from Android 3.0, so the minimum version to use fragments is Android 3.o.



activity_main.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"
   >

   <FrameLayout
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.9"
      android:id="@+id/f1"
      ></FrameLayout>

      <HorizontalScrollView
         android:layout_width="match_parent"
         android:layout_height="0dp"
         android:layout_weight="0.1">

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

               <Button
                  android:layout_width="wrap_content"
                  android:layout_height="wrap_content"
                  android:text="Courses"
                  android:onClick="nit"
                  android:id="@+id/b1"
                  />

               <Button
                  android:layout_width="wrap_content"
                  android:layout_height="wrap_content"
                  android:text="FacultyInfo"
                  android:onClick="nit"
                  android:id="@+id/b2"
                  />

               <Button
                  android:layout_width="wrap_content"
                  android:layout_height="wrap_content"
                  android:text="Placeements"
                  android:onClick="nit"
                  android:id="@+id/b3"
                  />
               <Button
                  android:layout_width="wrap_content"
                  android:layout_height="wrap_content"
                  android:text="Materials"
                  android:onClick="nit"
                  android:id="@+id/b4"
                  />
               <Button
```

```
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Online Cls"
                />

            <Button
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Nacre"
                />
            <Button
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="Infrastructure"
                />

            <Button
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="ContactUs"
                />
        </LinearLayout>
    </HorizontalScrollView>

</LinearLayout>
```

courses.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:background="#FF0000"
   >

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Course Details"
      android:textSize="70sp"
      android:textColor="#FFFFFF"
      />

   <Button
      android:id="@+id/b1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="ClickMe"
      android:layout_gravity="center"
      android:textSize="30sp"
      />

</LinearLayout>
```

faculties.xml

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

```
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:background="#00FF00"
   >

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Faculty Details"
      android:textSize="70sp"
      android:textColor="#FFFFFF"
      />

</LinearLayout>
```

materials.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:background="#054"
   >


   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Material Details"
      android:textSize="70sp"
      android:textColor="#FFFFFF"
      />

</LinearLayout>
```

placements.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:background="#0000FF"
   >

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Placement Details"
      android:textSize="70sp"
      android:textColor="#FFFFFF"
      />
</LinearLayout>
```

MainActivity.java

```
package nareshit.fragmentstest;

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

public class MainActivity extends AppCompatActivity {

    FragmentManager fManager;
    FragmentTransaction tx;

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

        fManager=getFragmentManager();
        tx=fManager.beginTransaction();
        tx.add(R.id.f1,new CourseFragment());
        tx.commit();
    }

    public void nit(View v){

        switch (v.getId()){
            case R.id.b1:
                tx=fManager.beginTransaction();
                tx.replace(R.id.f1,new CourseFragment());
                tx.commit();
                break;
            case R.id.b2:
                tx=fManager.beginTransaction();
                tx.replace(R.id.f1,new FacultyFragment());
                tx.commit();
                break;


            case R.id.b3:
                tx=fManager.beginTransaction();
                tx.replace(R.id.f1,new PlacementsFragment());
                tx.commit();
                break;
            case R.id.b4:
                tx=fManager.beginTransaction();
                tx.replace(R.id.f1,new MaterialsFragment());
                tx.commit();
                break;

        }

    }
```

```
}
```

CoursesFragment.java

```
package nareshit.fragmentstest;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.Toast;

/**
 * Created by maheshthippala on 24/06/17.
 */

public class CourseFragment extends android.app.Fragment {

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

        View v=inflater.inflate(R.layout.courses,container,false);

        Button b1=(Button)v.findViewById(R.id.b1);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                Toast.makeText(getActivity(),"Dont click me",
                        Toast.LENGTH_LONG).show();

            }
        });

        return v;
    }
}
```

FacultyFragment.java

```
package nareshit.fragmentstest;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

/**
 * Created by maheshthippala on 24/06/17.
 */

public class FacultyFragment extends android.app.Fragment {
```

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

        View v=inflater.inflate(R.layout.faculties,container,false);

        return v;
    }
}
```

MaterialsFragment.java

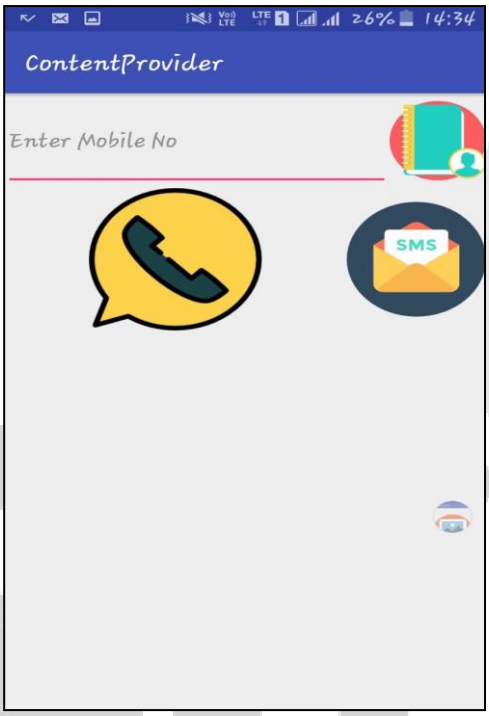
```
package nareshit.fragmentstest;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

/**
 * Created by maheshthippala on 24/06/17.
 */

public class MaterialsFragment extends android.app.Fragment {

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

        View v=inflater.inflate(R.layout.materials,container,false);

        return v;
    }
}
```

PlacementsFragment.java

```
package nareshit.fragmentstest;

import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

/**
 * Created by maheshthippala on 24/06/17.
 */

public class PlacementsFragment extends android.app.Fragment {

    @Nullable
    @Override
```

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

        View v=inflater.inflate(R.layout.placements,container,false);

        return v;
    }
}
```

Android Telephony :



- SMS
- Call
- Email
    - Builtin Activity
    - JavaMail API

SMS :

- android.telephony.SmsManager class is used to text messages in Android.

```
SmsManager sManager=SmsManager.getDefault();
sManager.sendTextMessage(rec_num,src_num,text,sent_intent,
                                                    deliver_intent);
```

permission :

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

Call :

for making calls Android is providing a builtin Activity use implicit intents to call builtin Activity.

```
                Intent i=new Intent();
                i.setAction(Intent.ACTION_CALL);
                i.setData(Uri.parse("tel:"+number));
                startActivity(i);
```

permission :

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

E-Mail :

for sending an Email Android is providing a builtin Activity use implicit intents to call builtin Activity.

```
                Intent i=new Intent();
                i.setAction(Intent.ACTION_SEND);
                i.putExtra(Intent.EXTRA_EMAIL, new String[]{m1,m2..});
                i.putExtra(Intent.EXTRA_SUBJECT,"subject here");
                i.putExtra(Intent.EXTRA_TEXT,"text here");
                i.putExtra(Intent.EXTRA_STREAM,uri_object);
                i.setType("message/rfc822");    // enable MIME
      startActivity(i.createChooser(intent_object,"message"));
```

permission :

```
                INTERNET
```

Attachment Functionality :

```
                Intent i=new Intent();
                i.setAction(Intent.ACTION_GET_CONTENT);
                i.setType("*/*");
                startActivityForResult(i,request_code(int));
```

in the above method if we specify the second parameter (request code) >= 0 after the next Activity is completed it will invoke onActivityResult() method in the current Activity class.

```
public void onActivityResult(int reqcode,int rescode,Intent i)
{
   Uri selected_path=i.getData();
}

public void sendSMS(View v){
Intent sent_int=new Intent(MainActivity.this,Sent.class);
Intent del_int=new Intent(MainActivity.this,Deliver.class);
 /* Pending Intent : Pending Intent is a subtype of Intent which is called by later */
  PendingIntent pIntent_sent=PendingIntent.getActivity(MainActivity.this,
                                                        0,sent_int,0);
  PendingIntent pIntent_del=PendingIntent.getActivity(MainActivity.this,
                                                      0,del_int,0);
/*   SmsManager sManager=SmsManager.getDefault();
    sManager.sendTextMessage(et1.getText().toString(),
            null,et2.getText().toString(),pIntent_sent,pIntent_del); */

StringTokenizer tokenizer=new StringTokenizer (et1.getText().toString(),",");
while(tokenizer.hasMoreTokens()) {
            SmsManager sManager = SmsManager.getDefault();
         sManager.sendTextMessage(tokenizer.nextToken(),null,
                    et2.getText().toString(), pIntent_sent, pIntent_del);
      } }
```

- by using builtin Activity we can't send an email in the background user has to select any one of the email application [Gmail,E-Mail…] for sending an email to send an email in the background with out any user interaction use Java Mail API.

Java Mail API :

- add the following .jar files as a modules, and add these modules as a dependency modules.

- activation.jar
- additional.jar
- mail.jar

- copy the following .java files into project src folder.
  - GmailSender.java
  - JSSEProvider.java
  - LongOperation.java

- configure the sender credentials in LongOperation.java.
- use the following code in Activity to configure receiver credentials to send an email.

```
LongOperation lop=new LongOperation(to,sub,msg);
lop.execute();
```

- LongOpertion.java is an AsyncTask[?] class.

activity_main.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">

   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/et1"
      android:hint="Enter Mobile No"
      />
   <EditText
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/et2"
      android:hint="Enter Message "
      />

   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      >
      <Button
         android:layout_width="0dp"
         android:layout_height="wrap_content"
         android:layout_weight="0.5"
```

```
            android:text="SendSMS"
            android:onClick="sendSMS"
            />
        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="CALL"
            android:onClick="call"
            />
    </LinearLayout>
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/et3"
        android:hint="Enter Email "
        />
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/et4"
        android:hint="Enter Subject "
        />

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id="@+id/et5"
        android:hint="Enter Text "
        />
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Attach"
        android:onClick="attach"
        android:layout_gravity="right"
        />
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        >
        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="SendMail"
            android:onClick="sendMail"
            />

        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="JavaMail"
            android:onClick="javaMail"
            />
</LinearLayout>
```

deliver.xml

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


    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Message DELIVERED"
        android:textSize="50sp"
        />

</LinearLayout>

</LinearLayout>
```

sent.xml

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


    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Message SENT"
        android:textSize="50sp"
        />

</LinearLayout>
```

MainActivity.java

```
package nareshit.telephonytest;

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

import java.util.StringTokenizer;

public class MainActivity extends AppCompatActivity {

    EditText et1,et2,et3,et4,et5;

    Uri u;
```

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

        et1=(EditText)findViewById(R.id.et1);
        et2=(EditText)findViewById(R.id.et2);
        et3=(EditText)findViewById(R.id.et3);
        et4=(EditText)findViewById(R.id.et4);
        et5=(EditText)findViewById(R.id.et5);

    }

    public void sendSMS(View v){

        Intent sent_int=new Intent(MainActivity.this,Sent.class);
        Intent del_int=new Intent(MainActivity.this,Deliver.class);

        PendingIntent pIntent_sent=PendingIntent.getActivity(MainActivity.this,
                        0,sent_int,0);

        PendingIntent pIntent_del=PendingIntent.getActivity(MainActivity.this,
                0,del_int,0);

StringTokenizer tokenizer=new StringTokenizer
                                        (et1.getText().toString(),",");
while(tokenizer.hasMoreTokens()) {
    SmsManager sManager = SmsManager.getDefault();
    sManager.sendTextMessage(tokenizer.nextToken(),
            null, et2.getText().toString(), pIntent_sent, pIntent_del);
}
    }
    public void call(View v){
        Intent i=new Intent();
        i.setAction(Intent.ACTION_CALL);
        i.setData(Uri.parse("tel:"+et1.getText().toString()));
        startActivity(i);
    }
    public void sendMail(View v){
        Intent i=new Intent();
        i.setAction(Intent.ACTION_SEND);
        i.putExtra(Intent.EXTRA_EMAIL, new String[]{et3.getText().toString()});
        i.putExtra(Intent.EXTRA_SUBJECT,et4.getText().toString());
        i.putExtra(Intent.EXTRA_TEXT,et5.getText().toString());
        i.putExtra(Intent.EXTRA_STREAM,u);
        i.setType("message/rfc822");    // enable MIME
        startActivity(i.createChooser(i,"Select Any Email Client"));

    }

    public void javaMail(View v){

            LongOperation lop=new LongOperation(
                 et3.getText().toString(),et4.getText().toString(),et5.getText().toString());
            lop.execute();
    }
```

```
    public void attach(View v){
            Intent i=new Intent();
            i.setAction(Intent.ACTION_GET_CONTENT);
            i.setType("*/*");
            startActivityForResult(i,123);
    }

    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
        u=data.getData();
    }
}
```

Deliver.java

```
package nareshit.telephonytest;

import android.app.Activity;
import android.os.Bundle;
import android.support.annotation.Nullable;

/**
 * Created by maheshthippala on 25/06/17.
 */

public class Deliver extends Activity {
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.deliver);
    }
}
```

Sent.java

```
package nareshit.telephonytest;

import android.app.Activity;
import android.os.Bundle;
import android.support.annotation.Nullable;

/**
 * Created by maheshthippala on 25/06/17.
 */

public class Sent extends Activity {
    @Override
    protected void onCreate(@Nullable Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        setContentView(R.layout.sent);
    }
}
```

GMailSender.java

```
package nareshit.telephonytest;

import java.io.ByteArrayInputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.OutputStream;
import java.security.Security;
import java.util.Properties;
import javax.activation.DataHandler;
import javax.activation.DataSource;
import javax.mail.Message;
import javax.mail.PasswordAuthentication;
import javax.mail.Session;
import javax.mail.Transport;
import javax.mail.internet.InternetAddress;
import javax.mail.internet.MimeMessage;

public class GMailSender extends javax.mail.Authenticator {
   private String mailhost = "smtp.gmail.com";
   private String user;
   private String password;
   private Session session;

   static {
      Security.addProvider(new JSSEProvider());
   }

   public GMailSender(String user, String password) {
      this.user = user;
      this.password = password;

      Properties props = new Properties();
      props.setProperty("mail.transport.protocol", "smtp");
      props.setProperty("mail.host", mailhost);
      props.put("mail.smtp.auth", "true");
      props.put("mail.smtp.port", "465");
      props.put("mail.smtp.socketFactory.port", "465");
      props.put("mail.smtp.socketFactory.class",
            "javax.net.ssl.SSLSocketFactory");
      props.put("mail.smtp.socketFactory.fallback", "false");
      props.setProperty("mail.smtp.quitwait", "false");

      session = Session.getDefaultInstance(props, this);
   }

   protected PasswordAuthentication getPasswordAuthentication() {
      return new PasswordAuthentication(user, password);
   }

   public synchronized void sendMail(String subject, String body, String sender, String
recipients) throws Exception {

      MimeMessage message = new MimeMessage(session);
      DataHandler handler = new DataHandler(new ByteArrayDataSource(body.getBytes(),
"text/plain"));
      message.setSender(new InternetAddress(sender));
      message.setSubject(subject);
```

```
        message.setDataHandler(handler);
        if (recipients.indexOf(',') > 0)
            message.setRecipients(Message.RecipientType.TO, InternetAddress.parse(recipients));
        else
            message.setRecipient(Message.RecipientType.TO, new InternetAddress(recipients));
        Transport.send(message);

    }

    public class ByteArrayDataSource implements DataSource {
        private byte[] data;
        private String type;

        public ByteArrayDataSource(byte[] data, String type) {
            super();
            this.data = data;
            this.type = type;
        }

        public ByteArrayDataSource(byte[] data) {
            super();
            this.data = data;
        }

        public void setType(String type) {
            this.type = type;
        }

        public String getContentType() {
            if (type == null)
                return "application/octet-stream";
            else
                return type;
        }

        public InputStream getInputStream() throws IOException {
            return new ByteArrayInputStream(data);
        }

        public String getName() {
            return "ByteArrayDataSource";
        }

        public OutputStream getOutputStream() throws IOException {
            throw new IOException("Not Supported");
        }
    }
}
```

JSSEProvider.java

```
package nareshit.telephonytest;
import java.security.AccessController;
import java.security.Provider;

public final class JSSEProvider extends Provider {
```

```
        private static final long serialVersionUID = 1L;

        public JSSEProvider() {
      super("HarmonyJSSE", 1.0, "Harmony JSSE Provider");
      AccessController.doPrivileged(new java.security.PrivilegedAction<Void>() {
         public Void run() {
            put("SSLContext.TLS",
                  "org.apache.harmony.xnet.provider.jsse.SSLContextImpl");
            put("Alg.Alias.SSLContext.TLSv1", "TLS");
            put("KeyManagerFactory.X509",
                  "org.apache.harmony.xnet.provider.jsse.KeyManagerFactoryImpl");
            put("TrustManagerFactory.X509",
                  "org.apache.harmony.xnet.provider.jsse.TrustManagerFactoryImpl");
            return null;
         }
      });
   }
}
```

LongOperation.java

```
package nareshit.telephonytest;

import android.media.MediaPlayer;
import android.os.AsyncTask;
import android.util.Log;

public class LongOperation extends AsyncTask<Void, Void, String> {

        String to,sub,msg ;


        public LongOperation(String to, String sub, String msg) {

                                        this.to=to;
                                        this.sub=sub;
                                        this.msg=msg;

        }




        @Override
        protected String doInBackground(Void... params) {
                try{
                GMailSender sender = new
GMailSender("mahesh.choutkuri@gmail.com","XXXXXXXX");
      sender.sendMail(sub,msg,to,to);
                }
                catch(Exception e){Log.e("error",e.getMessage(),e);return "Email Not Sent";}
                return "Email Sent";
        }


        @Override
        protected void onPostExecute(String result)
        {
```

```
        }
        @Override
        protected void onPreExecute()
        {
        }

        @Override
        protected void onProgressUpdate(Void... values)
        {
        }
}
```

AsyncTask :

- in Android every Activity is running on a Thread called as ActivityThread / UIThread.
- from Android 3.0 if any logic is taking time to process the Activity thread will not wait to complete the process [it will skip the process].
- to execute the long operations [network calls] we have to create a separate thread [we can't communicate with Activity UI components from a separate Thread] or execute the current Activity Thread in the background by using AsyncTask.

Steps to work with Asynctask :

- create a class as a child of android.os.AsyncTask.

e.g. : class MyTask extends android.os.AsyncTask
{
}

- it is an abstract class having an abstract method called doInBackground() so provide the implementation for doInBackground() method.

- following are the major methods in AsyncTask.

- onPreExecute()
- doInBackground()
- onPostExecute()

- execute the AsyncTask from Activity by using the following code.

```
AsynTaskName task=new AsyncTaskName();
task.execute();
```

- if we are executing an AsyncTask from Activity add the following code in Activity onCreate() method.

```
StrictMode.ThreadPolicy policy=
        new StrictMode.ThreadPolicy.Builder().permitAll().build();
StrictMode.setThreadPolicy(policy);
android.os.NetworkOnMainThreadException
```

activity_main.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"
    >

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="GET IMAGE"
        android:onClick="getImage"
        android:textSize="25sp"
        android:layout_gravity="center"
        />

    <ImageView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/iview1"
        android:src="@mipmap/ic_launcher"
        />

</LinearLayout>
```

MainActivity.java

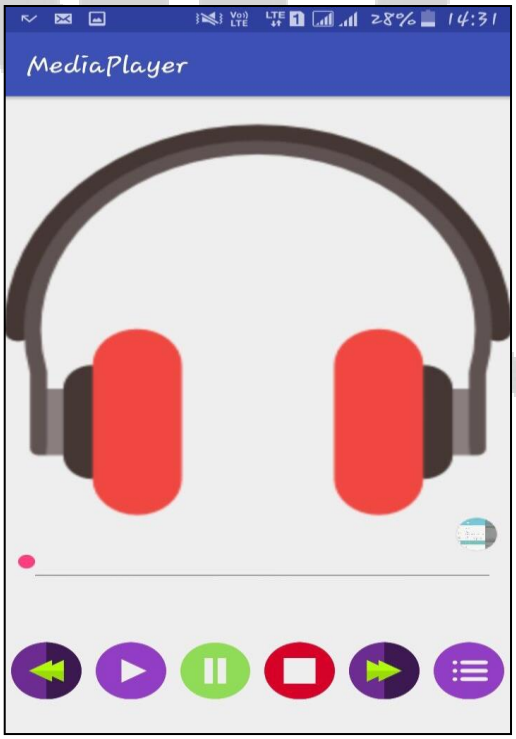
```
package nareshit.asyctasktest;

import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.os.AsyncTask;
import android.os.StrictMode;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageView;

import java.io.InputStream;
import java.net.URL;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        StrictMode.ThreadPolicy policy=new
                StrictMode.ThreadPolicy.Builder().permitAll().build();
        StrictMode.setThreadPolicy(policy);
    }
    public void getImage(View v){
        MyTask task=new MyTask();
        task.execute();
    }

    class MyTask extends AsyncTask
    {
        URL u=null;
        InputStream isr=null;

        @Override
```

```
        protected Object doInBackground(Object[] params) {
            try{
                u=new URL("http://media5.starkinsider.com/wordpress/wp-
content/uploads/2015/06/Google-Android-Winning.jpg?x28372");
                isr=u.openStream();
            }catch (Exception ie){
                ie.printStackTrace();
            }
            return null;
        }
        @Override
        protected void onPostExecute(Object o) {
            super.onPostExecute(o);

            Bitmap bmp= BitmapFactory.decodeStream(isr);
            ImageView iview=(ImageView)findViewById(R.id.iview1);
            iview.setImageBitmap(bmp);
        }
    }


}
```

Android Media :

- Media Player
- Video View
- Audio Recording
- Video Recording
- Camera & Gallery

Media Player :



- android.media.MediaPlayer class is used to play audio files in Android.
- we can play the audio file from 3 different sources

- apk
- storage
- network

apk :

res >> raw >> audio_file.mp3

```
MediaPlayer mPlayer=MediaPlayer.create(context,R.raw.file_name);
```

storage | network :

```
MediaPlayer mPlayer=new MediaPlayer();
mPlayer.setDataSource(file_path | network_url);
        (or)
mPlayer.setDataSource(context,uri_obj);
mPlayer.prepare();
```

following are the major methods in MediaPlayer class

start()	seekTo(int)
stop()	getDuration()
pause()	getCurrentPosition()

Handler :

frequently if we want to perform any operation for a specific time interval use Handler.

```
Handler handler=new Handler();
handler.postDelayed(new Runnable(){
        public void run(){
                // logic
        }
},time_internal(milli_seconds));
```

activity_main.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">

   <ImageView
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.7"
      android:src="@drawable/logo"
      />
   <SeekBar
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.1"
      android:id="@+id/sbar1"
      />
   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.2"
      android:orientation="horizontal"
```

```
>
<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/backward"
   android:onClick="media"
   android:id="@+id/backward"
   android:padding="5dp"
   />
<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/play"
   android:onClick="media"
   android:id="@+id/play"
   android:padding="5dp"/>

<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/pause"
   android:onClick="media"
   android:id="@+id/pause"
   android:padding="5dp"

   />

<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/stop"
   android:onClick="media"
   android:id="@+id/stop"
   android:padding="5dp"

   />

<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/fast_forward"
   android:onClick="media"
   android:id="@+id/forward"
   android:padding="5dp"

   />

<ImageView
   android:layout_width="0dp"
   android:layout_height="match_parent"
   android:layout_weight="0.16"
   android:src="@drawable/music"
   android:onClick="media"
```

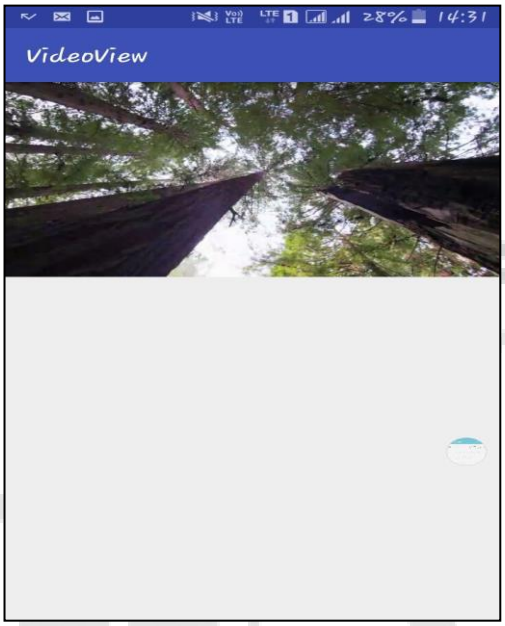
```
        android:id="@+id/list"
        android:padding="5dp"

        />
    </LinearLayout>

</LinearLayout>
```

MainActivity.java

```
package nareshit.mymediaplayer;

import android.content.Intent;
import android.media.MediaPlayer;
import android.net.Uri;
import android.os.Handler;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.SeekBar;

public class MainActivity extends AppCompatActivity {

    MediaPlayer mPlayer;
    Uri u;

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

    public void init()
    {
        // mPlayer=MediaPlayer.create(MainActivity.this,R.raw.dj);
try {
    mPlayer = new MediaPlayer();
    mPlayer.setDataSource(MainActivity.this, u);
    mPlayer.prepare();
}catch (Exception e){
    e.printStackTrace();
}
        final SeekBar sBar=(SeekBar)findViewById(R.id.sbar1);
        sBar.setMax(mPlayer.getDuration());
        sBar.setOnSeekBarChangeListener(new SeekBar.OnSeekBarChangeListener() {
            @Override
            public void onProgressChanged(SeekBar seekBar, int progress, boolean fromUser) {
                mPlayer.seekTo(progress);
            }

            @Override
            public void onStartTrackingTouch(SeekBar seekBar) {

            }

            @Override
```

```
            public void onStopTrackingTouch(SeekBar seekBar) {

            }
        });

        final Handler handler=new Handler();
        handler.postDelayed(new Runnable() {
            @Override
            public void run() {
                sBar.setProgress(mPlayer.getCurrentPosition());
               handler.postDelayed(this,5000);
            }
        },5000);

    }

    public void media(View v){

        switch (v.getId()) {
            case R.id.backward:
                mPlayer.seekTo(mPlayer.getCurrentPosition()-
                        mPlayer.getDuration()/10);

                break;

            case R.id.play:
                    mPlayer.start();
                break;

            case R.id.pause:
                    mPlayer.pause();
                break;

            case R.id.stop:
                    mPlayer.stop();
                    init();
                break;

            case R.id.forward:
                mPlayer.seekTo(mPlayer.getCurrentPosition()+
                                    mPlayer.getDuration()/10);
                break;
            case R.id.list:

                Intent i=new Intent();
                i.setAction(Intent.ACTION_GET_CONTENT);
                i.setType("audio/*");
                startActivityForResult(i,111);
                break;
        }
    }
    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
        u=data.getData();
        init();
    }
}
```

Video View :



VideoView is one of the UI component in Android which is used to play the video files.

xml :

```
<VideoView
    android:id="@+id/vview1"
    ..... />
```

Java :

```
VideoView vview=(VideoView)findViewById(R.id.vview1);
vview.setVideoPath(file_path|network_url);
vview.start();
```

to provide pause,play,forward,backward and seeker functionality set the following object to video view component.

```
vview.setMediaController(new MediaController(context));
```

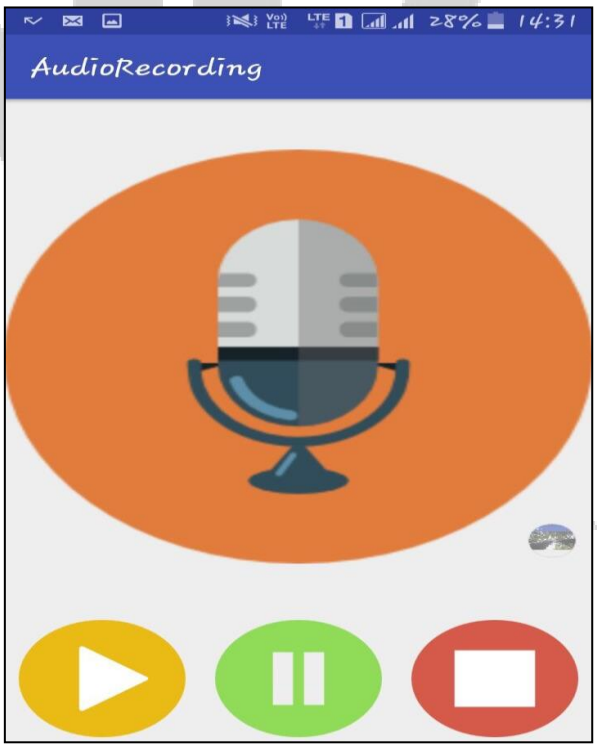
activity_main.xml

```
<?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">

   <VideoView
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      android:id="@+id/vview1"
      />

</LinearLayout>
```

MainActivity.java

```
package nareshit.videoviewtest;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.MediaController;
import android.widget.VideoView;

public class MainActivity extends AppCompatActivity {

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


        VideoView vview=(VideoView)findViewById(R.id.vview1);
        vview.setVideoPath("/storage/extSdCard/Videos/VID-20170506-WA0000.mp4");
        vview.start();

        vview.setMediaController(new MediaController(MainActivity.this));

    }
}
```

Audio Recording :



- android.media.MediaRecorder class is used to record audio and video in Android.
  MediaRecorder recorder=new MediaRecorder();

- to record audio we have to specify the following properties.

```
recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
recorder.setOutputFormat(MediaRecorder.OutputFormat.AMR_NB);
recorder.setAudioEncoder(MediaRecorder.AudioEncoder. AMR_NB);
recorder.setOutputFile("file_location/filename.amr");
recorder.prepare();
recorder.start();
```

permissions :

RECORD_AUDIO
WRITE_EXTERNAL_STORAGE

Note :

Android is nor providing any builtin support to pause record an audio, to provide pause functionality maintain the temp files when user selects pause combine all the temp files into a single file when user selects stop.

```
recorder.setMaxDuration(10000);
recorder.setMaxFileSize(10*1024);
recorder.setOnInfoListener(new MediaRecorder.OnInfoListener() {       @Override
 public void onInfo(MediaRecorder mr, int what, int extra) {

      if(what==MediaRecorder.MEDIA_RECORDER_INFO_MAX_DURATION_REACHED){
 recorder.stop();
   Toast.makeText(MainActivity.this,"MAX DURATION
                                    REACHED",Toast.LENGTH_LONG).show();
}else if(what==MediaRecorder.MEDIA_RECORDER_INFO_MAX_FILESIZE_REACHED)
{
 recorder.stop();
Toast.makeText(MainActivity.this,"MAX FILESIZE
                        REACHED",Toast.LENGTH_LONG).show();
        }
 }
});
```

activity_main.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"
   >

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

      <Button
         android:layout_width="0dp"
         android:layout_weight="0.5"
         android:layout_height="wrap_content"
         android:text="START"
         android:onClick="start"
         />
```

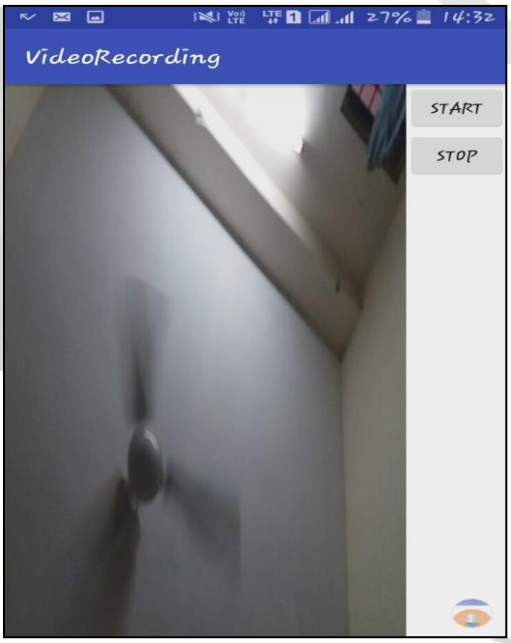
```
        <Button
            android:layout_width="0dp"
            android:layout_weight="0.5"
            android:layout_height="wrap_content"
            android:text="STOP"
            android:onClick="stop"
            />


    </LinearLayout>


</LinearLayout>
```

MainActivity.java

```
package nareshit.audiorecordingex;

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

public class MainActivity extends AppCompatActivity {

    MediaRecorder recorder;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
        public void init()
        {       try {
            recorder = new MediaRecorder();
            recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
            recorder.setOutputFormat(MediaRecorder.OutputFormat.AMR_NB);
            recorder.setAudioEncoder(MediaRecorder.AudioEncoder.AMR_NB);

recorder.setOutputFile("/storage/emulated/0/and11am"+System.currentTimeMillis()+".amr");
            recorder.setMaxDuration(10000);
            recorder.setMaxFileSize(10*1024);
            recorder.setOnInfoListener(new MediaRecorder.OnInfoListener() {
                @Override
                public void onInfo(MediaRecorder mr, int what, int extra) {
                    if(what==MediaRecorder.MEDIA_RECORDER_INFO_MAX_DURATION_REACHED){
                        recorder.stop();
                        Toast.makeText(MainActivity.this,"MAX DURATION
REACHED",Toast.LENGTH_LONG).show();
                    }else
if(what==MediaRecorder.MEDIA_RECORDER_INFO_MAX_FILESIZE_REACHED)
                    {
                        recorder.stop();
                        Toast.makeText(MainActivity.this,"MAX FILESIZE
REACHED",Toast.LENGTH_LONG).show();

                    }
```

```
            }
        });


            recorder.prepare();
            recorder.start();
        }catch (Exception e){
            e.printStackTrace();
        }

        }

    public void start(View v){
            init();
    }

    public void stop(View v){
            recorder.stop();
    }



}
```

Video Recording :



- android.media.MediaRecorder class is used to record video in Android.

```
MediaRecorder recorder=new MediaRecorder();
```

- to record video we have to specify the following properties.

```
recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
recorder.setVideoSource(MediaRecorder.VideoSource.CAMERA);

CamcorderProfile profile=CamcorderProfile.get
                                    (CamcorderProfile.QUALITY_HIGH);
recorder.setProfile(profile);
```

recorder.setOutputFile("file_location/file_name.mp4");

by using above properties we can record a video but while we are recording the video we have to show the video preview to the user to show th video preview we use an advanced UI component called SurfaceView.

xml :

```
<SurfaceView
    android:id="@+id/sview"
    …….. />
```

java :

```
SurfaceView sview=(SurfaceView)findViewById(R.id.sview);
```

directly we can't perform any operations on SurfaceView to manage SurfaceView we have to crete an object for SurfaceHolder.

```
SurfaceHolder sHolder=sview.getHolder();
recorder.setPreviewDisplay(sHolder.getSurface());
recorder.prepare();
recorder.start();
```

permissions :

```
RECORD_AUDIO
CAMERA
WRITE_EXTERNAL_STORAGE
```

activity_main.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="horizontal">

   <SurfaceView
      android:layout_width="0dp"
      android:layout_height="match_parent"
      android:layout_weight="0.8"
      android:id="@+id/sview1"
      />

   <LinearLayout
      android:layout_width="0dp"
      android:layout_height="match_parent"
      android:layout_weight="0.2"
      android:orientation="vertical"
      >

      <Button
         android:layout_width="match_parent"
         android:layout_height="wrap_content"
         android:text="START"
         android:onClick="start"
         />
```

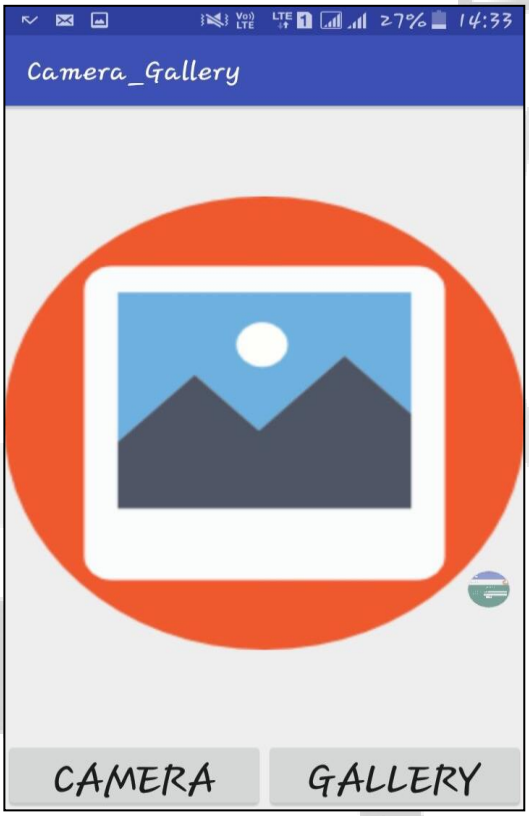
```
        <Button
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="STOP"
            android:onClick="stop" />
    </LinearLayout>

</LinearLayout>
```

MainActivity.java

```
package nareshit.videorecordingtest;

import android.media.CamcorderProfile;
import android.media.MediaRecorder;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.SurfaceHolder;
import android.view.SurfaceView;
import android.view.View;

public class MainActivity extends AppCompatActivity {

    MediaRecorder recorder;

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

    public void init()
    {
        try {
            recorder = new MediaRecorder();
            recorder.setAudioSource(MediaRecorder.AudioSource.MIC);
            recorder.setVideoSource(MediaRecorder.VideoSource.CAMERA);

            CamcorderProfile profile = CamcorderProfile.get
                    (CamcorderProfile.QUALITY_HIGH);
            recorder.setProfile(profile);
            recorder.setOutputFile("/storage/emulated/0/and11am" + System.currentTimeMillis()
+ ".mp4");

            SurfaceView sview = (SurfaceView) findViewById(R.id.sview1);
            SurfaceHolder sHolder = sview.getHolder();
            recorder.setPreviewDisplay(sHolder.getSurface());
            recorder.prepare();
            recorder.start();
        }catch (Exception e){
            e.printStackTrace();
        }
    }


    public void start(View v){
            init();
    }
```

```
    public void stop(View v){
          recorder.stop();
    }

}
```

Camera & Gallery :



Camera :

android is providing a builtin activity for camera ,use implicit intents to call builtin Activity.

```
Intent i=new Intent("android.media.action.IMAGE_CAPTURE");
startActivityForResult(i,123[req_code]);
```

Gallery :

gallery is one of the builtin Activity in Android use implicit intents to call builtin Activity.

```
Intent i=new Intent();
i.setAction(Intent.ACTION_GET_CONTENT);
i.setType("image/*");
startActivityForResult(i,124[req_code]);
```

after image is captured by using camera | image is selected by using Gallery it will invoke onActivityResult() method in the current Activity class

```
        public void onActivityResult(int req_code,int res_code,Intent i)
                {
                        if(req_code==123 && res_code==Activity.RESUT_OK)
                        {

                        }else if(req_code==124 && res_code==Activity.RESULT_OK)
                        {
                                        Uri u=i.getData();
                                        iview.setImageUri(u);
                        }
                }
permissions :
                        CAMERA
                        WRITE_EXTRA_STORAGE
```

activity_main.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">

   <ImageView
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.9"
      android:id="@+id/iview1"
      android:src="@mipmap/ic_launcher"
      />
   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="0dp"
      android:layout_weight="0.1"
      android:orientation="horizontal"
      >

      <Button
         android:layout_width="0dp"
         android:layout_height="match_parent"
         android:layout_weight="0.5"
         android:text="CAMERA"
         android:onClick="camera"
         />
      <Button
         android:layout_width="0dp"
         android:layout_height="match_parent"
         android:layout_weight="0.5"
         android:text="GALLERY"
         android:onClick="gallery"
         />


   </LinearLayout>

</LinearLayout>
```

MainActivity.java

```
package nareshit.cam_galtest;

import android.app.Activity;
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.ImageView;

public class MainActivity extends AppCompatActivity {

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

    public void camera(View v){
        Intent i=new Intent("android.media.action.IMAGE_CAPTURE");
        startActivityForResult(i,123);
    }

    public void gallery(View v){
        Intent i=new Intent();
        i.setAction(Intent.ACTION_GET_CONTENT);
        i.setType("image/*");
        startActivityForResult(i,124);
    }

    @Override
    protected void onActivityResult(int requestCode, int resultCode, Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
        ImageView iview=(ImageView)findViewById(R.id.iview1);
        if(requestCode==123 && resultCode== Activity.RESULT_OK)
        {
             Bitmap bmp=(Bitmap)data.getExtras().get("data");
           iview.setImageBitmap(bmp);
        }else if(requestCode==124 && resultCode==Activity.RESULT_OK){
           iview.setImageURI(data.getData());
        }

    }
}
```

Service :

- Service is used to perform long operations in the background with out any user interaction.

e.g. : Media Player , FM Player , Alarm Service.

Steps to Create Service :

- create a class as a child of android.app.Service.
- it is an abstract class having an abstract method called onBind() so provide the implementation for onBind() method.
- following are the major methods in Service class
  - onCreate()
  - onStartCommand()
  - onDestroy()
- if we start a service if the service is not available in a stack it will invoke onCreate() and onStartCommand() methods.
- if we start a service if the service is already available in a stack it will invoke only onStartCommand() method.
- if we stop a service it will invoke onDestroy() method.
- Service doesn't contain any UI, we will manage service Activity by using Intents.

```
Intent i=new Intent(context,Service_classname.class);
startService(i);
stopService(i);
```

- same like Activity every Service class should be configured in Manifest.xml with the following tag inside <application> tag.

```
<service android:name="package_name.class_name"/>
```

activity_main.xml

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

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="START"
      android:onClick="start"
      android:layout_alignParentBottom="true"
      android:layout_alignParentLeft="true"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="STOP"
      android:onClick="stop"
      android:layout_alignParentBottom="true"
      android:layout_alignParentRight="true"
      />


</RelativeLayout>
```

MainActivity.java

```
package nareshit.servicetest;

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

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

public class MainActivity extends AppCompatActivity {

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

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

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


}
```

MyService.java

```
package nareshit.servicetest;

import android.app.Service;
import android.content.Intent;
import android.media.MediaPlayer;
import android.os.IBinder;
import android.support.annotation.IntDef;
import android.support.annotation.Nullable;

/**
 * Created by maheshthippala on 01/07/17.
 */

public class MyService extends android.app.Service {

    MediaPlayer mPlayer;

    @Nullable
    @Override
    public IBinder onBind(Intent intent) {
        return null;
    }

    @Override
    public void onCreate() {
        super.onCreate();
        mPlayer=MediaPlayer.create(MyService.this,R.raw.dj);
    }

    @Override
    public int onStartCommand(Intent intent, int flags, int startId) {
        mPlayer.start();
```

```
        return super.onStartCommand(intent, flags, startId);
    }

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

Broadcast Receiver :

- Broadcast Receivers are registered for System annoucements.

eg :

headset plugin , charger connected / disconnected , screen ON/OFF, making/receiving call , sending/receiving SMS, Battery low , phone restarted …..

Steps to work with Broadcast Receiver :

- create a class as a child BroadcastReceiver.
- it is an abstract class having an abstract method called onReceive() so provide the implementation for onReceive() method.
- from Activity class for which event you want to get the broadcast announcements configure the events by using IntentFilter[group of intents is called as IntentFilter].

```
IntentFilter filter=new IntentFilter();
filter.addAction(Intent.ACTION_NAME);
…….
registerReceiver(new BroadcastReceiverClass(),filter);
```

- if any one of the configured events are happened it will invoke onReceive() method in the broadcast receiver class.

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="nareshit.brtest.MainActivity">

    <TextView
        android:textSize="50sp"
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="TextView"
        tools:layout_editor_absoluteX="99dp"
        tools:layout_editor_absoluteY="176dp" />
</android.support.constraint.ConstraintLayout>
```

MainActivity.java

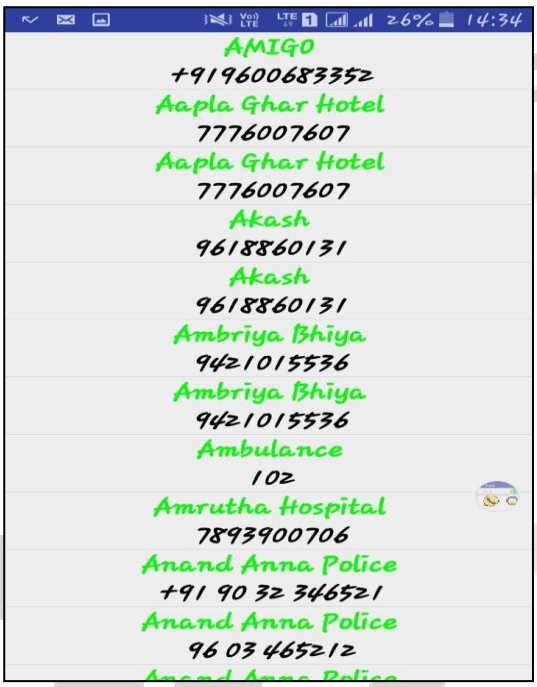
```
package nareshit.brtest;

import android.content.Intent;
import android.content.IntentFilter;
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);

        IntentFilter filter=new IntentFilter();
        filter.addAction(Intent.ACTION_HEADSET_PLUG);
        filter.addAction(Intent.ACTION_POWER_CONNECTED);
        filter.addAction(Intent.ACTION_POWER_DISCONNECTED);
        filter.addAction(Intent.ACTION_SCREEN_ON);
        filter.addAction(Intent.ACTION_SCREEN_OFF);
        filter.addAction(Intent.ACTION_AIRPLANE_MODE_CHANGED);

        registerReceiver(new MyReceiver(),filter);

    }
}
```

MyReceiver.java

```
package nareshit.brtest;

import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.support.v4.app.INotificationSideChannel;
import android.widget.TextView;

/**
 * Created by maheshthippala on 01/07/17 */

public class MyReceiver extends BroadcastReceiver {

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

        MainActivity mActivity=(MainActivity) context;

        TextView tv=(TextView)mActivity.findViewById(R.id.textView);

            if(intent.getAction().equals(Intent.ACTION_POWER_CONNECTED)){
                tv.setText("Power Connected");
            }else  if(intent.getAction().equals(Intent.ACTION_POWER_DISCONNECTED)){
                tv.setText("Power DisConnected");
            }else  if(intent.getAction().equals(Intent.ACTION_SCREEN_ON)){
                tv.setText("Screen ON");
            }else  if(intent.getAction().equals(Intent.ACTION_SCREEN_OFF)){
                tv.setText("Screen OFF");
```

```
        }else  if(intent.getAction().equals(Intent.ACTION_AIRPLANE_MODE_CHANGED)){
            tv.setText("Airplane mode changed");
        }else  if(intent.getAction().equals(Intent.ACTION_HEADSET_PLUG)){
            tv.setText("HeadSet Plugin");
        }
    }
}
```

Content Provider :



- Content Provider is used to share the data between multiple applications [in android one of the security feature is we can't access the other applications data into our application directly , but if the application is providing content provider then we can access the data into our application, in Android following builtin applications are providing ContentProvider.

e.g.: contacts, call log , media , Settings , Calendar]

Steps to work with Content Provider :

- to get any content provider into Activity we have to get an object for ContentResolver, use the following method to get the object for ContentResolver.

```
ContentResolver resolver=getContentResolver();
```

- resolver.query(CP_URI,…..) method is used to get the data from a specific content provider, return type of this method is Cursor.

```
Cursor c=resolver.query(CP_URI,……);
```

- if the data is available in a Cursor for presenting the data Android is providing an adapter called SimpleCursorAdapter

```
SimpleCursorAdapter adapter=new SimpleCursorAdapter
                        (context,xml_file,cursor_object,from,to);
```

from - String[] - DB column names

to - int[] - id's of the UI components

- ui.setAdapter(adapter) method is used to set the custom adapter to the UI component.

activity_main.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">

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

      <EditText
         android:layout_width="0dp"
         android:layout_height="wrap_content"
         android:layout_weight="0.8"
         android:id="@+id/et1"
         android:hint="Enter Mobile No : "
         />

         <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.2"
            android:text="Contcats"
            android:onClick="contacts"
            />

   </LinearLayout>
</LinearLayout>
```

indiview.xml

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


   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Name"
      android:textSize="20sp"
      android:textColor="#FF0000"
      android:textStyle="bold"
      android:gravity="center"
      android:id="@+id/tv1"
      />
   <TextView
```

```
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Number"
        android:textSize="20sp"
        android:textColor="#0000FF"
        android:textStyle="bold|italic"
        android:gravity="center"
        android:id="@+id/tv2" />
</LinearLayout>
```

loc.xml

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

    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/lview1"
        >

    </ListView>
</LinearLayout>
```

MainActivity.java

```
package nareshit.cptest;

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

public class MainActivity extends AppCompatActivity {

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

    public void contacts(View v){

        Intent i=new Intent(MainActivity.this,ListOfContacts.class);
        startActivity(i);
    }

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

        EditText et1=(EditText)findViewById(R.id.et1);
        et1.setText(ApplicationConstants.mno);

    }
}
```

ListOfContacts.java

```
package nareshit.cptest;

import android.app.Activity;
import android.content.ContentResolver;
import android.database.Cursor;
import android.os.Bundle;
import android.provider.ContactsContract;
import android.support.annotation.Nullable;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ListView;
import android.widget.SimpleCursorAdapter;
import android.widget.TextView;
import android.widget.Toast;

/**
 * Created by maheshthippala on 03/07/17.
 */

public class ListOfContacts extends Activity {

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

        ListView lview=(ListView)findViewById(R.id.lview1);

        ContentResolver resolver=getContentResolver();
        /* uri, String[] projection,
        @Nullable String selection, @Nullable String[] selectionArgs,
        @Nullable String sortOrder */
      Cursor c=resolver.query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI,
              null,null,null,
             ContactsContract.CommonDataKinds.Phone.DISPLAY_NAME);

      String[] from=new String[]{
         ContactsContract.CommonDataKinds.Phone.DISPLAY_NAME,
          ContactsContract.CommonDataKinds.Phone.NUMBER};

        int[] to=new int[]{R.id.tv1,R.id.tv2};

        SimpleCursorAdapter adapter=new SimpleCursorAdapter(
              ListOfContacts.this,R.layout.indiview,c,from,to,0);
        lview.setAdapter(adapter);

        lview.setOnItemClickListener(new AdapterView.OnItemClickListener() {
            @Override
            public void onItemClick(AdapterView<?> parent, View view, int position, long id) {

                TextView tv2=(TextView) view.findViewById(R.id.tv2);

                Toast.makeText(ListOfContacts.this,tv2.getText().toString(),
                        Toast.LENGTH_LONG).show();
```

```
            ApplicationConstants.mno=tv2.getText().toString();

            finish();
        }
    });

  }
}
```

AppConstants.java

```
package nareshit.cptest;

/**
 * Created by maheshthippala on 03/07/17.
 */

public class ApplicationConstants {

   static String mno="";

}
```

Builtin Services :

- Location Service
- Notification Service
- Sensor Service
- Wifi
- Bluetooth
- Vibrator

getSystemService(Context.SERVICE_NAME) method is used to get the builtin services into application.

Location Service :

getSystemService(Context.LOCATION_SERVICE) method is used to get the builtin location service into application, application framework is providing a class called LocationManager to manage location service.

```
LocationManager lManager=(LocationManager)
                        getSystemService(Context.LOCATION_SERVICE);
```

- lManager.getLastKnownLocation(LocationManager.PROVIDER) method is used to get the last updated location.

- to get the current location configure the following listener to the location manager.

```
lManager.requestLocationUpdates(PROVIDER,min_time,
                        min_dist,new LocationListener(){
        public void onLocationChanged(Location l){
            double lati=l.getLatitude();
            double longi=l.getLongitude();
            lManager.removeUpdates(this); // stop getting location updates
            }
        });
```

permission :
- ACCESS_FINE_LOCATION
- ACCESS_COARSE_LOCATION

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="nareshit.locationtest.MainActivity">

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Latitude :"
      android:textSize="25sp"
      tools:layout_editor_absoluteX="150dp"
      tools:layout_editor_absoluteY="132dp"
      android:layout_above="@+id/textView2"
      android:layout_centerHorizontal="true"
      android:layout_marginBottom="84dp" />

   <TextView
      android:id="@+id/textView2"
      android:layout_width="wrap_content"
      android:textSize="25sp"
      android:layout_height="wrap_content"
      android:text="Longitude :"
      tools:layout_editor_absoluteX="150dp"
      tools:layout_editor_absoluteY="215dp"
      android:layout_alignParentBottom="true"
      android:layout_centerHorizontal="true"
```

```
        android:layout_marginBottom="176dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentTop="true"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="27dp"
        android:onClick="notify"
        android:text="Notify" />
</RelativeLayout>
```

MainActivity.java

```
package nareshit.locationtest;

import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Context;
import android.content.Intent;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.app.NotificationCompat;
import android.view.View;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    TextView tv1;
    TextView tv2;

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

        tv1=(TextView)findViewById(R.id.textView);
        tv2=(TextView)findViewById(R.id.textView2);

     final LocationManager lManager=(LocationManager)
                    getSystemService(Context.LOCATION_SERVICE);

    lManager.getLastKnownLocation(LocationManager.NETWORK_PROVIDER);

    lManager.requestLocationUpdates(LocationManager.NETWORK_PROVIDER,
            1000, 1, new LocationListener() {
                @Override
                public void onLocationChanged(Location location) {

                  double lati=location.getLatitude();
                   double longi=location.getLongitude();
```

```
                tv1.setText("Latitude :"+lati);
                tv2.setText("Longitude :"+longi);

              //   lManager.removeUpdates(this);
            }

            @Override
            public void onStatusChanged(String provider, int status, Bundle extras) {

            }

            @Override
            public void onProviderEnabled(String provider) {

            }

            @Override
            public void onProviderDisabled(String provider) {

            }
        });
    }

    public void notify(View v){

   NotificationManager nManager=(NotificationManager)
                    getSystemService(Context.NOTIFICATION_SERVICE);

        NotificationCompat.Builder builder=
              new NotificationCompat.Builder(MainActivity.this);
        builder.setSmallIcon(R.drawable.logo);
        builder.setTicker("Message from NIT");

        Bitmap bmp= BitmapFactory.
                decodeResource(getResources(),R.drawable.logo);
        builder.setLargeIcon(bmp);
        builder.setContentTitle("Welcome 2 NIT");
        builder.setContentText("welcome to Naresh IT, Android 11 AM ");

        Intent i=new Intent(MainActivity.this,MainActivity.class);
        PendingIntent pIntent=PendingIntent.getActivity(MainActivity.this,
                                                        0,i,0);
        builder.setContentIntent(pIntent);
        builder.setAutoCancel(true);

        nManager.notify((int)System.currentTimeMillis(),builder.build());
    }


}
```

Notification Service :

- every Android device will have a notification bar, we can display notifications on Notification bar using Notification Service.

- getSystemService(Context.NOTIFICATION_SERVICE) method is used to get the builtin notification service into Activity application framework is providing a class called NotificationManager to manage Notification Service.

```
NotificationManager nManager=(NotificationManager)
                        getSystemService(Context.NOTFICATION_SERVICE);
```

- use the following code to display notification on Notification bar.

```
  NotificationManager nManager=(NotificationManager)
                        getSystemService(Context.NOTIFICATION_SERVICE);
NotificationCompat.Builder builder=new
                                    NotificationCompat.Builder(MainActivity.this);
builder.setSmallIcon(R.drawable.logo);
builder.setTicker("Message from NIT");

Bitmap bmp= BitmapFactory. decodeResource(getResources(),R.drawable.logo);
builder.setLargeIcon(bmp);
builder.setContentTitle("Welcome 2 NIT");
builder.setContentText("welcome to Naresh IT, Android 11 AM ");
Intent i=new Intent(MainActivity.this,MainActivity.class);
PendingIntent pIntent=PendingIntent.getActivity(MainActivity.this,0,i,0);
builder.setContentIntent(pIntent);
builder.setAutoCancel(true);
nManager.notify((int)System.currentTimeMillis(),builder.build());
```

```
public void notify(View v){

  NotificationManager nManager=(NotificationManager)
                  getSystemService(Context.NOTIFICATION_SERVICE);

     NotificationCompat.Builder builder=
           new NotificationCompat.Builder(MainActivity.this);
     builder.setSmallIcon(R.drawable.logo);
     builder.setTicker("Message from NIT");

     Bitmap bmp= BitmapFactory.
              decodeResource(getResources(),R.drawable.logo);
     builder.setLargeIcon(bmp);
     builder.setContentTitle("Welcome 2 NIT");
     builder.setContentText("welcome to Naresh IT, Android 11 AM ");

     Intent i=new Intent(MainActivity.this,MainActivity.class);
     PendingIntent pIntent=PendingIntent.getActivity(MainActivity.this,
                                                          0,i,0);
     builder.setContentIntent(pIntent);
     builder.setAutoCancel(true);

     nManager.notify((int)System.currentTimeMillis(),builder.build());
  }
```

Sensor Service :

- based on device capability Android supports different type of Sensors like ACCESSLORY, PROXIMITY , ORIENTATION, GYROSCOPE and GRAVITY.
- to manage SensorService application framework is providing a class called SensorManager to manage SensorService.

```
SensorManager sManager=(SensorManager)getSystemService
                                              (Context.SENSOR_SERVICE);
```

- to get the sensor events configure the following listener.

```
                  sManager.registerListener(new SensorListener(){
                                    onSensorChanged() {   };
                                    onAccuracyChanged() {  };
                        }, SENSOR_TYPE );
```

activity_main.xml :

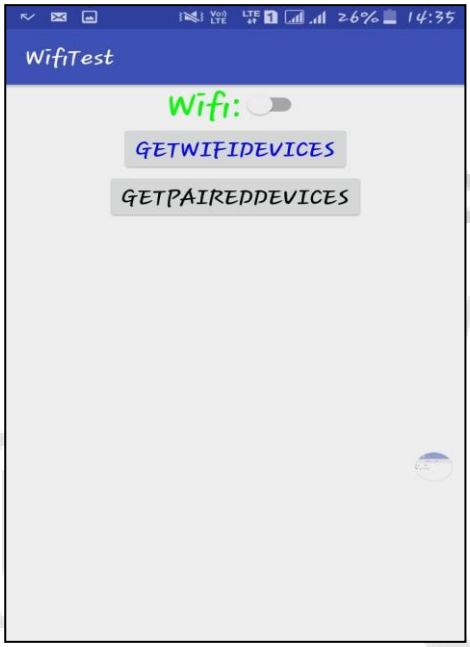
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical">

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="X Value :"
      android:textSize="35sp"
```

```
        android:id="@+id/tv1"
        />

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Y Value :"
        android:textSize="35sp"
        android:id="@+id/tv2"
        />

</LinearLayout>
```

MainActivity.java

```
package nareshit.sensortest;

import android.content.Context;
import android.hardware.SensorListener;
import android.hardware.SensorManager;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.TextClock;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    TextView tv1,tv2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        tv1=(TextView)findViewById(R.id.tv1);
        tv2=(TextView)findViewById(R.id.tv2);

        SensorManager sManager=(SensorManager)
                        getSystemService(Context.SENSOR_SERVICE);
        sManager.registerListener(new SensorListener() {
            @Override
            public void onSensorChanged(int sensor, float[] values) {
                  tv1.setText("X Value :"+values[0]);
                  tv2.setText("Y Value :"+values[1]);
            }
            @Override
            public void onAccuracyChanged(int sensor, int accuracy) {
            }
        },SensorManager.SENSOR_ACCELEROMETER);
    }


}
```

Wifi Service :



- getSystemService(Context.WIFI_SERVICE) method is used to get the builtin wifi service into Activity, application framework is proving a class called WifiManager to manage wifi service.

```
WifiManager wManager=(WifiManager)getSystemService(Context.WIFI_SERVICE);
```

- wManager.getWifiState() method is used to get the wifi state, return type of this method is int(0 - disabled , 1-disabling , 2-enabled , 3 - enabling).

-wManager.setWifiEnable(boolean) method is used to change the wifi state.

- wManager.getScanResults() method is used to get the list of available wifi devices, return type of this method is List<ScanResult>.

```
List<ScanResult> results=wManager.getScanResults();
for(ScanResult result:results)
        {
Toast.makeText(context, result.SSID+"\n"+result.frequency,
                                                LENGTH_LONG).show();
        }
```

- wManager.getConfiguredNetworks() method is used to get the list of paired wifi devices, return type of this method is List<WifiConfiguration>.

```
List<WifiConfiguration> list=wManager.getConfiguredNetworks();

for(WifiConfiguration config:list)
        {
            Toast.makeText(context,  config.SSID+"\n"+config.STATUS,
                                                LENGTH_LONG).show();
        }
```

permissions :
ACCESS_WIFI_STATE
CHANGE_WIFI_STATE

activity_main.xml

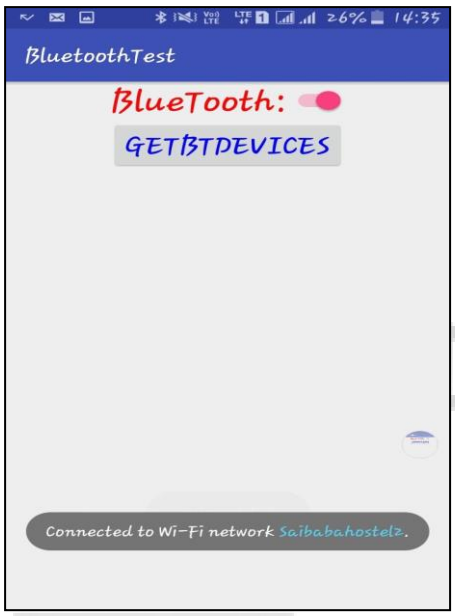
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical"
   >

   <Switch
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Wifi :"
      android:textSize="30sp"
      android:id="@+id/s1"
      android:layout_gravity="center"
      />


   <Button
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="GetWifiDevices"
      android:onClick="getWifiDevices"
      />

   <Button
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="PairedWifiDevices"
      android:onClick="pairedWifiDevices"
      />
</LinearLayout>
```

MainActivity.java

```
package nareshit.wifitest;

import android.content.Context;
import android.net.wifi.ScanResult;
import android.net.wifi.WifiConfiguration;
import android.net.wifi.WifiManager;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.CompoundButton;
import android.widget.Switch;
import android.widget.Toast;

import java.util.List;

public class MainActivity extends AppCompatActivity {
```

```
    WifiManager wManager;
       Switch s;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
       super.onCreate(savedInstanceState);
       setContentView(R.layout.activity_main);
       s=(Switch)findViewById(R.id.s1);
       wManager=(WifiManager)
                    getSystemService(Context.WIFI_SERVICE);
       int wifi_state=wManager.getWifiState();
       if(wifi_state==0 || wifi_state==1){
          s.setChecked(false);
       }else if(wifi_state==2 || wifi_state==3){
          s.setChecked(true);
       }
       s.setOnCheckedChangeListener(new CompoundButton.OnCheckedChangeListener() {
          @Override
          public void onCheckedChanged(CompoundButton buttonView, boolean isChecked) {
             wManager.setWifiEnabled(isChecked);
          }
       });

    }

    public void getWifiDevices(View v){

       List<ScanResult> results=wManager.getScanResults();

       for(ScanResult result:results){
          Toast.makeText(MainActivity.this,
                   result.SSID+"\n"+result.frequency,
                   Toast.LENGTH_LONG).show();
       }

    }

    public void pairedWifiDevices(View v){
       List<WifiConfiguration> results=wManager.getConfiguredNetworks();

       for(WifiConfiguration result:results){
          Toast.makeText(MainActivity.this,
                result.SSID+"\n"+result.status,
                Toast.LENGTH_LONG).show();
       }
    }
}
```

Bluetooth :



- In android there are different approaches to manage Bluetooth service, one of the best approach is manage BT service using BluetoothAdapter.

BluetoothAdapter bAdapter=BluetoothAdapter.getDefault();

- bAdapter.isEnabled() method is used to get the BT state.
- bAdapter.enable() / disable() methods is used to change the BT state.
- to get the list of available BT devices we have to configure a Broadcast Receiver.

```
bAdapter.startDiscovery();
IntentFilter filter=new IntentFilter();
filter.addAction(BluetoothDevice.ACTION_FOUND);
registerReceiver(new BroadcastReceiver(){
public void onReceive(Context c,Intent i)
{
BluetoothDevice device=i.getParcableExtra(BluetoothDevice.EXTRA_DEVICE);
Toast.makeText(context,device.getName()+"\n"+device.getAddress(),
                                                    LENGTH_LONG).show();
}},filter);
```

permission :

BLUETOOTH
BLUETOOTH_ADMIN

activity_main.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">
   <Switch
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Bluetooth :"
      android:id="@+id/s1"
      android:textSize="20sp"
```

```
        android:layout_gravity="center"
        />
<Button
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="GetBTDevices"
    android:onClick="getBTDevices"
    />
    <ListView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/lview1"
        ></ListView>


</LinearLayout>
```

MainActivity.java

```
package nareshit.bttest;

import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.os.Vibrator;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.CompoundButton;
import android.widget.ListView;
import android.widget.Switch;
import android.widget.Toast;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    BluetoothAdapter bAdapter;
    Switch s1;
    ListView lview;
    ArrayList<String> list;
    ArrayAdapter<String> adapter;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        s1=(Switch)findViewById(R.id.s1);
        lview=(ListView)findViewById(R.id.lview1);
        list=new ArrayList<>();
        adapter=new ArrayAdapter<String>(MainActivity.this,
            android.R.layout.simple_list_item_single_choice,list);
        lview.setAdapter(adapter);

        bAdapter=BluetoothAdapter.getDefaultAdapter();
```

```
        s1.setChecked(bAdapter.isEnabled());
        s1.setOnCheckedChangeListener(new CompoundButton.OnCheckedChangeListener() {
           @Override
           public void onCheckedChanged(CompoundButton buttonView, boolean isChecked) {
                 if(isChecked){
                    bAdapter.enable();
                 }else{
                    bAdapter.disable();
                 }
           }
        });
    }

    public void getBTDevices(View v){

        bAdapter.startDiscovery();
        IntentFilter filter=new IntentFilter();
        filter.addAction(BluetoothDevice.ACTION_FOUND);
        registerReceiver(new BroadcastReceiver() {
           @Override
           public void onReceive(Context context, Intent intent) {
            BluetoothDevice device=
                  intent.getParcelableExtra(BluetoothDevice.EXTRA_DEVICE);
              Toast.makeText(MainActivity.this, device.getName()+"\n"+
                            device.getAddress(),Toast.LENGTH_LONG).show();
              list.add(device.getName()+"\n"+device.getAddress());
              adapter.notifyDataSetChanged();
              Vibrator vib=(Vibrator)
                                  getSystemService(Context.VIBRATOR_SERVICE);
              vib.vibrate(5000);
           }
        }, filter);
    }

}
```

Vibrator :

```
        Vibrator v=(Vibrator)getSystemService(Context.VIBRATOR_SERVICE);
        v.vibrate(milli_seconds);
```

permission :

VIBRATE

Dialogs:

- Custom
- Alert
- Date Picker
- Time Picker
- Progress Dialog
- Indeterminent
- Determinant
- DialogFragment

Custom :

- by using custom dialog we can create our UI, display the UI on dialog.

syntax :

```
Dialog d=new Dialog(context);
d.setContentView(R.layour.xml_file);
d.show();
```

to get the UI components from dialog xml, use dialog object before findViewById() method.

eg :

```
Button b=(Button)d.findViewById(R.id.id_name);
```

if the UI component is available on dialog xml we can't configure the events using XML.

Alert Dialog :

- AlertDialog is one of the builtin dialog with few builtin functionalities like title, message,icon,max we can create 3 possible buttons.

```
AlertDialog.Builder builder=new AlertDialog.Builder(context);
builder.setTitle("title_here");
builder.setMessage("message_here");
builder.setIcon(R.drawable.image_name);
builder.setPositiveButton(text,listener);
builder.setNegativeButton(text,listener);
builder.setNeutralButton(text,listener);
builder.show();
```

if we click any alert dialog button it will invoke the following listener.

```
DialogInterface.OnClickListener listener =
                                                        new
DialogInterface.OnClickListener()
{
        public void onClick(DialogInterface d,int which)
        {
    // which(2nd parameter) will tell u the button type
        }
};
```

DatePickerDialog :

- DPD is a subtype of dialog to get date as input from the user.

```
DatePickerDialog dpd=new DatePickerDialog(context,listener,

default_year,default_month,default_day);
dpd.show();
```

- if we select the date it will invoke the following listener.

```
DatePickerDialog.OnDateSetListener listener=
                                    new DatePickerDialog.OnDateSetListener()
{
public void onDateSet(Dialog d,int year,int month,day)
{
    //method will call when  user select date…
}
}
```

TimePickerDialog :

- TPD is a subtype of Dialog class used to get time as input from the user.

```
TimePickerDialog tpd=new TimePickerDialog(context,listener,

hour,minute,24_hrs_format(boolean));
tpd.show();
```

if we change the time it will invoke the following listener.

```
TimePickerDialog.OnTimeSetListener listener=
                                new TimePickerDialog.OnTimeSetListener()
{
        public void onTimeSet(Dialog d,int hour,int minute)
            {
                    //  when time is changed…
            }
}
```

ProgressDialog :

- in Android there are 2 types of progress dialogs
  - Indeterminent [we can't estimate duration]
  - Determinant [we can estimate duration]

syntax :

```
ProgressDialog pDialog=new ProgressDialog(context);
pDialog.setTitle("title_here");
pDialog.setMessage("message_here");
pDialog.setProgressStyle(ProgressDialog.STYLE_SPINNER);
                                    // indeterminent
pDilog.setProgressStyle(ProgressDialog.STYLE_HORIZONTAL);
                                                        // determinant
pDialog.setIcon(R.drawable.image_name);
pDialog.show();
```

Dialog Fragment :

- DialogFragment is used to display the fragment on a dialog.
- to create a dialog fragment create a class as a child of DialogFragment.
- use the following code in Activity to display dialog fragment.

```
FragmentManager fManager=getFragmentManager();
MyFragment frag=new MyFragment();
frag.show(fManager,"");
```

activity_main.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">

   <Button
      android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      android:onClick="custom"
      android:text="CUSTOM" />

   <Button
      android:id="@+id/button2"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_gravity="center"
      android:onClick="alert"
      android:text="ALERT" />

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

      <TextView
         android:layout_width="0dp"
         android:layout_height="wrap_content"
         android:text="Date :"
         android:textSize="25sp"
```

```
        android:layout_weight="0.4"
        />
    <EditText
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="0.4"
        android:id="@+id/date_"
        android:editable="false"
        />
    <Button
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="0.2"
        android:text="DPD"
        android:onClick="dpd"
        />

</LinearLayout>

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

    <TextView
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:text="Time :"
        android:textSize="25sp"
        android:layout_weight="0.4"
        />
    <EditText
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="0.4"
        android:id="@+id/time_"
        android:editable="false"
        />
    <Button
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="0.2"
        android:text="TPD"
        android:onClick="tpd"
        />

</LinearLayout>

<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:onClick="indeterminent"
    android:text="Indeterminent" />

<Button
```

```
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:onClick="determinent"
        android:text="Determinent" />

    <Button
        android:id="@+id/button5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="center"
        android:onClick="dialogFragment"
        android:text="DialogFragment" />

</LinearLayout>
```

dialog_view.xml

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

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Are u sure want to Exit?"
        android:textSize="20sp"
        />

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

        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="YES"
            android:id="@+id/yes"
            />

        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="NO"
            android:id="@+id/no"
            />

    </LinearLayout>
</LinearLayout>
```

myfrag.xml

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:background="#054"
   >

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Sample Fragment"
      android:textSize="50sp"
      android:textColor="#FFFFFF"
      />

</LinearLayout>
```

MainActivity.java

```
package nareshit.dialogstest;

import android.app.DatePickerDialog;
import android.app.Dialog;
import android.app.FragmentManager;
import android.app.FragmentTransaction;
import android.app.ProgressDialog;
import android.app.TimePickerDialog;
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.Button;
import android.widget.DatePicker;
import android.widget.EditText;
import android.widget.ImageView;
import android.widget.TimePicker;

public class MainActivity extends AppCompatActivity {

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

   public void custom(View v){
     final Dialog d=new Dialog(MainActivity.this);
      d.setTitle("Message");
      d.setContentView(R.layout.dialog_view);
      d.show();
      Button yes_btn=(Button)d.findViewById(R.id.yes);
      Button no_btn=(Button)d.findViewById(R.id.no);
      yes_btn.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
```

```
            d.dismiss();
            finish();
        }
    });
    no_btn.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            d.dismiss();
        }
    });
}

public void alert(View v){
    AlertDialog.Builder builder=new
                                AlertDialog.Builder(MainActivity.this);
    builder.setTitle("Message");
    builder.setMessage("Are u sure want to exit? ");
    builder.setIcon(R.mipmap.ic_launcher);
    DialogInterface.OnClickListener listener=new DialogInterface.OnClickListener() {
        @Override
        public void onClick(DialogInterface dialog, int which) {
            if(which==dialog.BUTTON_POSITIVE)
            {
                dialog.dismiss();
                finish();
            }else if(which==dialog.BUTTON_NEGATIVE){
                dialog.dismiss();
            }
        }
    };
    builder.setPositiveButton("Yes",listener);
    builder.setNegativeButton("No",listener);
    builder.show();
}

public void dpd(View v){
    DatePickerDialog.OnDateSetListener listener=
            new DatePickerDialog.OnDateSetListener() {
                @Override
                public void onDateSet(DatePicker view, int year, int monthOfYear, int
dayOfMonth) {

                    EditText et1=(EditText)findViewById(R.id.date_);
                    et1.setText(dayOfMonth+"-"+monthOfYear+"-"+year);
                }
            };
    DatePickerDialog dpd=new DatePickerDialog(MainActivity.this,
                listener,2017,6,9);
    dpd.show();
}

public void tpd(View v){

    TimePickerDialog.OnTimeSetListener listener=new
            TimePickerDialog.OnTimeSetListener() {
        @Override
        public void onTimeSet(TimePicker view, int hourOfDay, int minute) {
```

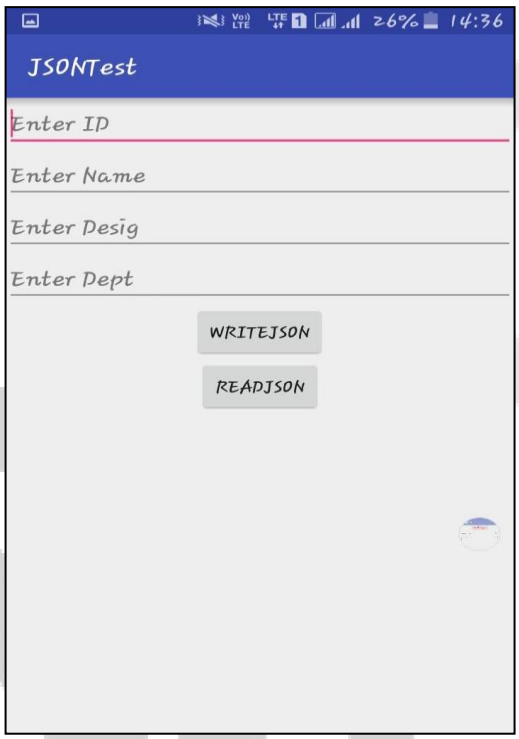
```
                EditText time=(EditText)findViewById(R.id.time_);
                if(hourOfDay<12) {
                   time.setText(hourOfDay + ":" + minute+" AM");
                }else{
                   time.setText((hourOfDay-12) + ":" + minute+" PM");
                }
             }
          };


      TimePickerDialog tpd=new TimePickerDialog(MainActivity.this,
              listener,9,42,false);
      tpd.show();
   }

   public void indeterminent(View v){
      ProgressDialog pDialog=new ProgressDialog(MainActivity.this);
      pDialog.setTitle("Message");
      pDialog.setMessage("Please wait page is loading....");
      pDialog.setIcon(R.mipmap.ic_launcher);
      pDialog.setProgressStyle(ProgressDialog.STYLE_SPINNER);
      pDialog.show();
   }
   public void determinent(View v){
      ProgressDialog pDialog=new ProgressDialog(MainActivity.this);
      pDialog.setTitle("Message");
      pDialog.setMessage("Please wait page is loading....");
      pDialog.setIcon(R.mipmap.ic_launcher);
      pDialog.setProgressStyle(ProgressDialog.STYLE_HORIZONTAL);
      pDialog.show();
   }

   public void dialogFragment(View v){
      FragmentManager fManager=getFragmentManager();
      MyFragment frag=new MyFragment();
      frag.show(fManager,"");
   }
}
```

MyFragment.java

```
package nareshit.dialogstest;

import android.app.DialogFragment;
import android.app.Fragment;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

/**
 * Created by maheshthippala on 09/07/17.
 */

public class MyFragment extends DialogFragment {

   @Nullable
```

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

        View v=inflater.inflate(R.layout.myfrag,container,false);

        getDialog().setTitle("Dialog Fragment");

        return v;
    }
}
```

JSON:



- JSON is termed as Java Script Object Notation.
    - it is a light weight data format than XML.
    - JSON will maintain the data by using key,value pairs.
    - the entire JSON data will be represent by using the following characters.
        - JSONObject {
        - JSONArray [
    - Android is providing builtin API for JSON parsing but it is not recommended, we use a 3rd party API called GSON for doing the JSON parsing.

- Steps to work with GSON :
    - add GSON library as a dependency library file
      (right click app >> open module settings >> dependency >> + >> library dependency >> search gson)
    - create equivalent POJO classes for JSON format.

activity_mian.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">

 <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter ID"
    android:id="@+id/et1"
    />

 <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Name"
    android:id="@+id/et2"
    />


 <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Desig"
    android:id="@+id/et3"
    />


 <EditText
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Enter Dept"
    android:id="@+id/et4"
    />

 <Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="WriteJSON"
    android:onClick="writejson"
    android:layout_gravity="center"
    />
 <Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="ReadJSON"
    android:onClick="readjson"
    android:layout_gravity="center"
    />
```

```
</LinearLayout>
```

MainActivity.java

```
package nareshit.jsontest;

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

import com.google.gson.Gson;

import java.io.File;
import java.io.FileReader;
import java.io.FileWriter;
import java.lang.reflect.Array;
import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

    EditText et1,et2,et3,et4;

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

        et1=(EditText)findViewById(R.id.et1);
        et2=(EditText)findViewById(R.id.et2);
        et3=(EditText)findViewById(R.id.et3);
        et4=(EditText)findViewById(R.id.et4);
    }
        public void writejson(View v){
            try {
                Employee e = new Employee();
                e.setId(Integer.parseInt(et1.getText().toString()));
                e.setName(et2.getText().toString());
                e.setDesig(et3.getText().toString());
                e.setDept(et4.getText().toString());
                Employees es=null;
                ArrayList<Employee> emps=null;
                File f=new File("/storage/emulated/0/and11am.json");
                if(f.exists()){
                    Gson g = new Gson();
                    FileReader reader = new FileReader("/storage/emulated/0/and11am.json");
                    es = g.fromJson(reader, Employees.class);
                    emps=es.getEmps();
                }else{
                    es= new Employees();
                    emps = new ArrayList<>();
                }
                emps.add(e);

                es.setEmps(emps);

                Gson g = new Gson();
```

```
            String json_response=g.toJson(es);

            FileWriter writer = new FileWriter("/storage/emulated/0/and11am.json");
            writer.write(json_response);
            writer.flush();
            writer.close();

         }catch(Exception e){
            e.printStackTrace();
         }
      }

   public void readjson(View v){
      try {
         Gson g = new Gson();
         FileReader reader = new FileReader("/storage/emulated/0/and11am.json");
         Employees emps = g.fromJson(reader, Employees.class);
         ArrayList<Employee> list = emps.getEmps();
         for (Employee e : list) {
            Toast.makeText(MainActivity.this,
                  e.getId() + "\n" + e.getName() + "\n" +
                        e.getDesig() + "\n" + e.getDept(),
                  Toast.LENGTH_LONG).show();
         }
      }catch (Exception e){
         e.printStackTrace();
      }
   }

}
```

Employee.java

```
package nareshit.jsontest;

import com.google.gson.annotations.SerializedName;

/**
 * Created by maheshthippala on 10/07/17.
 */
public class Employee {
   @SerializedName("id")
   private int id;
   @SerializedName("name")
   private String name;
   @SerializedName("desig")
   private String desig;
   @SerializedName("dept")
   private String  dept;

   public int getId() {
      return id;
   }

   public void setId(int id) {
      this.id = id;
   }
```

```
    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getDesig() {
        return desig;
    }

    public void setDesig(String desig) {
        this.desig = desig;
    }

    public String getDept() {
        return dept;
    }

    public void setDept(String dept) {
        this.dept = dept;
    }
}
```

Employees.java

```
package nareshit.jsontest;

import com.google.gson.annotations.SerializedName;

import java.util.ArrayList;

/**
 * Created by maheshthippala on 10/07/17.
 */

public class Employees {
    @SerializedName("employees")
    private ArrayList<Employee> emps;

    public ArrayList<Employee> getEmps() {
        return emps;
    }

    public void setEmps(ArrayList<Employee> emps) {
        this.emps = emps;
    }
}
```

XML PULL PARSER:

activity_main.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">

    <Button
       android:layout_width="wrap_content"
       android:layout_height="wrap_content"
       android:text="ReadXML"
       android:onClick="readXML"
       android:layout_gravity="center"
       />

    <ListView
       android:layout_width="match_parent"
       android:layout_height="match_parent"
       android:id="@+id/lview1"
       ></ListView>

</LinearLayout>
```

indiview.xml

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

    <LinearLayout
       android:layout_width="match_parent"
       android:layout_height="wrap_content"
       android:orientation="horizontal"
       >
       <TextView
          android:layout_width="0dp"
          android:layout_weight="0.8"
          android:layout_height="wrap_content"
          android:text="Name"
          android:id="@+id/name"
          android:textColor="#FF0000"
          android:textSize="25sp"
          android:gravity="left"
          />
       <CheckBox
          android:layout_width="0dp"
          android:layout_height="wrap_content"
          android:layout_weight="0.2"
          android:text="Del"
          android:id="@+id/cb"
          android:gravity="right"
          />

    </LinearLayout>

    <LinearLayout

       android:layout_width="match_parent"
```

```
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        >
        <TextView
           android:layout_width="0dp"
           android:layout_weight="0.5"
           android:layout_height="wrap_content"
           android:text="ID"
           android:id="@+id/id_"
           android:textColor="#0000FF"
           android:textSize="25sp"
           android:gravity="left"
           />

        <TextView
           android:layout_width="0dp"
           android:layout_weight="0.5"
           android:layout_height="wrap_content"
           android:text="Course"
           android:id="@+id/course"
           android:textColor="#054"
           android:textSize="25sp"
           />


    </LinearLayout>

</LinearLayout>
```

Indiview_.xml

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

   <LinearLayout
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:orientation="horizontal"
      >
      <TextView
         android:layout_width="0dp"
         android:layout_weight="0.8"
         android:layout_height="wrap_content"
         android:text="Name"
         android:id="@+id/name"
         android:textColor="#FF0000"
         android:textSize="25sp"
         android:gravity="left"
         />
      <CheckBox
         android:layout_width="0dp"
         android:layout_height="wrap_content"
         android:layout_weight="0.2"
         android:text="Del"
```

```
        android:id="@+id/cb"
        android:gravity="right"
        />

    </LinearLayout>

    <LinearLayout
       android:layout_width="match_parent"
       android:layout_height="wrap_content"
       android:orientation="horizontal"
       >
       <TextView
          android:layout_width="0dp"
          android:layout_weight="0.5"
          android:layout_height="wrap_content"
          android:text="ID"
          android:id="@+id/test_id"
          android:textColor="#0000FF"
          android:textSize="25sp"
          android:gravity="left"
          />

       <TextView
          android:layout_width="0dp"
          android:layout_weight="0.5"
          android:layout_height="wrap_content"
          android:text="Course"
          android:id="@+id/course"
          android:textColor="#054"
          android:textSize="25sp"
          />


    </LinearLayout>


</LinearLayout>
```

MainActivity.java

```
package nareshit.xmlpullparsertest;

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

import org.xmlpull.v1.XmlPullParser;
import org.xmlpull.v1.XmlPullParserFactory;

import java.util.ArrayList;

public class MainActivity extends AppCompatActivity {

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

```
}

public void readXML(View v){
   try {
      XmlPullParserFactory factory = XmlPullParserFactory.newInstance();
      XmlPullParser parser = factory.newPullParser();
      parser.setInput(getAssets().open("students.xml"), null);
      int i=parser.getEventType();
      Student s = null;
      boolean isId=false;
      boolean isName=false;
      boolean isCourse=false;
      ArrayList<Student> students=new ArrayList<>();
      Students s1=new Students();
      while(i!=parser.END_DOCUMENT){
         if(i==parser.START_TAG){
            if(parser.getName().equals("student")){
               s=new Student();
            }
            if(parser.getName().equals("id")){
               isId=true;
            }
            if(parser.getName().equals("name")){
               isName=true;
            }
            if(parser.getName().equals("course")){
               isCourse=true;
            }
         }
         if(i==parser.TEXT){
            if(isId){
               s.setId(Integer.parseInt(parser.getText()));
            }
            if(isName){
               s.setName(parser.getText());
            }
            if(isCourse){
               s.setCourse(parser.getText());
            }
         }
         if(i==parser.END_TAG){
            if(parser.getName().equals("student")){
               students.add(s);
            }
            if(parser.getName().equals("id")){
               isId=false;
            }
            if(parser.getName().equals("name")){
               isName=false;
            }
            if(parser.getName().equals("course")){
               isCourse=false;
            }
            if(parser.getName().equals("students")){
               s1.setStudents(students);
            }
         }
         parser.next();
```

```
            i=parser.getEventType();
        } // while

        if(i==parser.END_DOCUMENT)
        {
            ListView listView=(ListView)findViewById(R.id.lview1);
            listView.setAdapter(new MyAdapter(MainActivity.this,
                                                    s1.getStudents()));
        }

      }catch(Exception e){
          e.printStackTrace();
      }
   }
}
```

MyAdapter.java

```
package nareshit.xmlpullparsertest;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.BaseAdapter;
import android.widget.CheckBox;
import android.widget.CompoundButton;
import android.widget.TextView;
import java.util.ArrayList;

/**
 * Created by maheshthippala on 08/07/17.
 */

public class MyAdapter extends BaseAdapter {
    MainActivity mActivity;
    ArrayList<Student> students;

   public MyAdapter(MainActivity mActivity,
                            ArrayList<Student> students)
   {
        this.mActivity=mActivity;
        this.students=students;
   }

   @Override
   public int getCount() {
      return students.size();
   }

   @Override
   public Object getItem(int position) {
      return null;
   }

   @Override
   public long getItemId(int position) {
      return 0;
   }

   @Override
```

```
    public View getView(final int position, View convertView, ViewGroup parent) {

        LayoutInflater inflater=LayoutInflater.from(mActivity);

        View v=inflater.inflate(R.layout.indiview_,null);

        TextView name=(TextView)v.findViewById(R.id.name);
        TextView id=(TextView)v.findViewById(R.id.test_id);
        TextView course=(TextView)v.findViewById(R.id.course);
        CheckBox cb=(CheckBox) v.findViewById(R.id.cb);

        Student s=students.get(position);

        name.setText(s.getName());
        id.setText(String.valueOf(s.getId()));
        course.setText(s.getCourse());

        cb.setOnCheckedChangeListener(new CompoundButton.OnCheckedChangeListener() {
            @Override
            public void onCheckedChanged(CompoundButton buttonView, boolean isChecked) {
                if(isChecked){
                    students.remove(position);
                    MyAdapter.this.notifyDataSetChanged();
                }
            }
        });


        return v;
    }
}
```

Student.java

```
package nareshit.xmlpullparsertest;

/**
 * Created by maheshthippala on 08/07/17.
 */

public class Student {

    private  int id;
    private String name;
    private String course;

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }
```

```
    public void setName(String name) {
        this.name = name;
    }

    public String getCourse() {
        return course;
    }

    public void setCourse(String course) {
        this.course = course;
    }
}
```

Students.java

```
package nareshit.xmlpullparsertest;

import java.util.ArrayList;

/**
 * Created by maheshthippala on 08/07/17.
 */

public class Students {

    private ArrayList<Student> students;

    public ArrayList<Student> getStudents() {
        return students;
    }

    public void setStudents(ArrayList<Student> students) {
        this.students = students;
    }
}
```

assets/students.xml

```
<students>
    <student>
        <id>123</id>
        <name>Mahesh</name>
        <course>Java</course>
    </student>
    <student>
        <id>124</id>
        <name>Rajesh</name>
        <course>Android</course>
    </student>
    <student>
        <id>125</id>
        <name>Shiva</name>
        <course>iOS</course>
    </student>
</students>
```

SAX-PARSER

activity_main.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">

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="READ SAX"
      android:onClick="saxparser"
      />
<ListView
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:id="@+id/lview"
   ></ListView>

</LinearLayout>
```

MainActivity.java

```
package nareshit.xmlreadtest;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.ListView;

import org.xml.sax.Attributes;
import org.xml.sax.SAXException;
import org.xml.sax.helpers.DefaultHandler;

import java.util.ArrayList;

import javax.xml.parsers.SAXParser;
import javax.xml.parsers.SAXParserFactory;

public class MainActivity extends AppCompatActivity {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
   }
   public void saxparser(View v){
   try {
      SAXParserFactory factory = SAXParserFactory.newInstance();
      SAXParser parser = factory.newSAXParser();
      parser.parse(getAssets().open("employees.xml"),
                              new DefaultHandler(){
                                 Employee e;
                                 boolean isId;
                                 boolean isName;
```

```
                boolean isDesig;
                ArrayList<Employee> emps=new ArrayList<Employee>();
                Employees es;
                @Override
                public void startElement(String uri, String localName, String
qName, Attributes attributes) throws SAXException {
                    super.startElement(uri, localName, qName, attributes);
                    if(qName.equals("employee")){
                        e=new Employee();
                    }
                    if(qName.equals("id")){
                        isId=true;
                    }
                    if(qName.equals("name")){
                        isName=true;
                    }
                    if(qName.equals("desig")){
                        isDesig=true;
                    }

                }

                @Override
                public void characters(char[] ch, int start, int length) throws
SAXException {
                    super.characters(ch, start, length);
                        if(isId){
            e.setId(Integer.parseInt(new String(ch,start,length)));
                        }
                        if(isName){
                            e.setName(new String(ch,start,length));
                        }
                        if(isDesig){
                            e.setDesig(new String(ch,start,length) );
                        }
                }
                @Override
                public void endElement(String uri, String localName, String
qName) throws SAXException {
                    super.endElement(uri, localName, qName);
                    if(qName.equals("id")){
                        isId=false;
                    }
                    if(qName.equals("name")){
                        isName=false;
                    }

                    if(qName.equals("desig")){
                        isDesig=false;
                    }

                    if(qName.equals("employee")){
                        emps.add(e);
                    }

                    if(qName.equals("employees")){

                        es=new Employees();
```

```
                                es.setEmps(emps);
                            }
                        }

                        @Override
                        public void endDocument() throws SAXException {
                            super.endDocument();

                            ArrayList<Employee> list=es.getEmps();
                            ArrayList<String> temp_list=new ArrayList<String>();
                            for(Employee e:list){
                                temp_list.add(e.toString());
                            }
                            ListView lview=(ListView)findViewById(R.id.lview);
                            ArrayAdapter<String> adapter=new ArrayAdapter<String>
                                    (MainActivity.this,
                                    android.R.layout.simple_list_item_single_choice,
                                        temp_list);
                            lview.setAdapter(adapter);
                        }
                    });

        }catch (Exception e){
            e.printStackTrace();
        }
        }

}
```

Employee.java

```
package nareshit.xmlreadtest;

/**
 * Created by maheshthippala on 07/07/17.
 */

public class Employee {

    private int id;
    private String name;
    private String desig;

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }
```

```
    public String getDesig() {
        return desig;
    }

    public void setDesig(String desig) {
        this.desig = desig;
    }

    @Override
    public String toString() {
        return "Id:"+id+"\n"+"Name :"+name+"\n"+"Desig:"+desig;
    }
}
```

Employees.java

```
package nareshit.xmlreadtest;

import java.util.ArrayList;

/**
 * Created by maheshthippala on 07/07/17.
 */

public class Employees {

    private ArrayList<Employee> emps;

    public ArrayList<Employee> getEmps() {
        return emps;
    }

    public void setEmps(ArrayList<Employee> emps) {
        this.emps = emps;
    }
}
```

Assets/employees.xml

```
<employees>
    <employee>
        <id>123</id>
        <name>Mahesh</name>
        <desig>Tech Lead</desig>
    </employee>
    <employee>
        <id>124</id>
        <name>Rajesh</name>
        <desig>Sr SE</desig>
    </employee>
    <employee>
        <id>125</id>
        <name>Shiva</name>
        <desig>Tester</desig>
    </employee>
</employees>
```

Retrofit:

Steps to work with Retrofit :

- add the following libraries as a dependency libraries to your project.

right click app >> module settings >> dependencies >> + >>
library dependency.

- retrofit
- gson
- retrofit-gson converter

- based on the response, create the equivalent POJO classes by using GSON.

- create an interface(end-point), crete an abstract method with return type of Call<POJO_Class>.

eg :

```
public Call<Deals> getDeals(String city_id);
```

- initialise the retrofit object in Activity.

```
Retrofit r=new Retrofit.Builder().
addConverterFactory(GsonConverterFactory.create()).
                    baseUrl("Your-webservice-base-url/").build();
```

- create an implementation class for an interface.

```
DealsInterface di=r.create(DealsInterface.class);
```

- by using interface reference call the abstract method of interface.

```
Call<Deals> deals=di.getDeals(String.valueOf(sp1.getSelectedItemId()));
```

- configure the suburl on top of interface with the following annotation.

@GET("sub_utl")
or
@POST("sub_url"

-use the following code to call the REST url by using Retrofit.

```
deals.enqueue(new Callback<Deals>() {     @Override     public void
onResponse(Call<Deals> call, Response<Deals> response) {       Deals
re_deals=response.body();       ArrayList<Deal> list=re_deals.getDeals();       for (Deal
d:list)       {

Toast.makeText(MainActivity.this,d.getName(+"\n"+d.getOriginal_price()+ "\n"+d.getOffer_
price()+"\n"+d.getAddress(),Toast.LENGTH_LONG).show();       }    }     @Override
public void onFailure(Call<Deals> call, Throwable t) {     } });
```

activity_main.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">

   <TextView
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Select City :"
      android:textSize="25sp"
      />

   <Spinner
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:id="@+id/sp1"
      android:entries="@array/cities"
      ></Spinner>

   <Button
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="GetDeals"
   android:onClick="getDeals"
      android:layout_gravity="center"
   />

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


</LinearLayout>
```

app/build.gradle

```
apply plugin: 'com.android.application'

android {
    compileSdkVersion 23
    buildToolsVersion "25.0.0"
    defaultConfig {
        applicationId "nareshit.resttest"
        minSdkVersion 14
        targetSdkVersion 23
        versionCode 1
        versionName "1.0"
        testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
        }
    }
}

dependencies {
    compile fileTree(include: ['*.jar'], dir: 'libs')
    androidTestCompile('com.android.support.test.espresso:espresso-core:2.2.2', {
        exclude group: 'com.android.support', module: 'support-annotations'
    })
    compile 'com.android.support:appcompat-v7:23.4.0'
    compile 'com.android.support.constraint:constraint-layout:1.0.0-beta5'
    testCompile 'junit:junit:4.12'
    compile 'com.google.code.gson:gson:2.8.1'
    compile 'com.squareup.retrofit2:retrofit:2.3.0'
    compile 'com.squareup.retrofit2:converter-gson:2.3.0'
}
```

MainActivity.java

```
package nareshit.resttest;

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

import java.util.ArrayList;

import retrofit2.Call;
import retrofit2.Callback;
import retrofit2.Response;
import retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory;

public class MainActivity extends AppCompatActivity {

    Spinner sp1;
    ListView lview;
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        sp1=(Spinner)findViewById(R.id.sp1);
        lview=(ListView)findViewById(R.id.lview);
    }

    public void getDeals(View v){
        Retrofit r=new Retrofit.Builder().
                addConverterFactory(GsonConverterFactory.create()).
                baseUrl("Your REST Service Here").
                build();
        DealsInterface di=r.create(DealsInterface.class);
        Call<Deals> deals=di.getDeals();
        deals.enqueue(new Callback<Deals>() {
            @Override
            public void onResponse(Call<Deals> call, Response<Deals> response) {
              Deals re_deals=response.body();
              ArrayList<Deal> list=re_deals.getDeals();
                for (Deal d:list)
                {
                    Toast.makeText(MainActivity.this,
                            d.getName()+"\n"+d.getOriginal_price()+
                    "\n"+d.getOffer_price()+"\n"+d.getAddress(),
                            Toast.LENGTH_LONG).show();
                }
            }
            @Override
            public void onFailure(Call<Deals> call, Throwable t) {

            }
        });

    }
}
```

DealsInterface.java

```
package nareshit.resttest;

import retrofit2.Call;
import retrofit2.http.GET;

/**
 * Created by maheshthippala on 13/07/17.
 */

public interface DealsInterface {

    @GET("YOUR_WEBSERVICE_SUB_URL_HERE")
    Call<Deals> getDeals();

}
```

Deal.java

```
package nareshit.resttest;

import com.google.gson.annotations.SerializedName;
```

```
/**
 * Created by maheshthippala on 13/07/17.
 */

public class Deal {
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public String getOriginal_price() {
        return original_price;
    }
    public void setOriginal_price(String original_price) {
        this.original_price = original_price;
    }
    public String getOffer_price() {
        return offer_price;
    }
    public void setOffer_price(String offer_price) {
        this.offer_price = offer_price;
    }
    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }
    @SerializedName("name")
    private String name;
    @SerializedName("original_price")
    private String original_price;
    @SerializedName("offer_price")
    private String offer_price;
    @SerializedName("address")
    private String address;
}
```

Deals.java

```
package nareshit.resttest;

import com.google.gson.annotations.SerializedName;

import java.util.ArrayList;

/**
 * Created by maheshthippala on 13/07/17.
 */
public class Deals {

    @SerializedName("today_deals")
    private ArrayList<Deal> deals;
    public ArrayList<Deal> getDeals() {
        return deals;
```

```
    }

    public void setDeals(ArrayList<Deal> deals) {
        this.deals = deals;
    }
}
```

Google Maps :

- create a project , add google-play-services:maps as a library project.
- create a fragment UI component in Activity xml with the following name.

```
<fragment
        android:name="com.google.android.gms.maps.SupportMapFragment"
……./>
```

-use the following code in Activity to get the SupportMapFragment into Activity.

```
SupportMapFragment frag=(SupportMapFragment)
        getSupportFragmentManager().findFragmentById(R.id.XXX);
```

- get the GoogleMap object from SupportMapFragment.

```
frag.getMapAsync(new OnMapReadyCallback() {

@Override
  public void onMapReady(GoogleMap googleMap) {

  } });
```

- to work with any Google-API we have to get an API key from Google, go through the following URL to get an API key.

http://code.google.com/apis/console

AIzaSyAOeIcUosQIJD-FuZNCU0TkA-oQNWSfeZg

- configure the API in manifest.xml with the following tag inside <application> tag.

```
<meta-data
                android:name=“”
                android:value=“AIzaSyAOeIcUosQIJD-FuZNCU0TkA-oQNWSfeZg”/>
```

- set the following method to GoogleMap to change the Map style.

```
gMap.setMapType(GoogleMap.MAP_TYPE_SATELLITE);
```

- use the following code to place a marker (location) on a Map.

```
        MarkerOptions opt1=new MarkerOptions();

        opt1.position(new LatLng(lati,longi));

        opt1.icon(BitmapDescriptorFactory.fromResource(R.drawable.cab2));
```

```
            gMap.addMarker(opt1);
```

MainActivity.java :

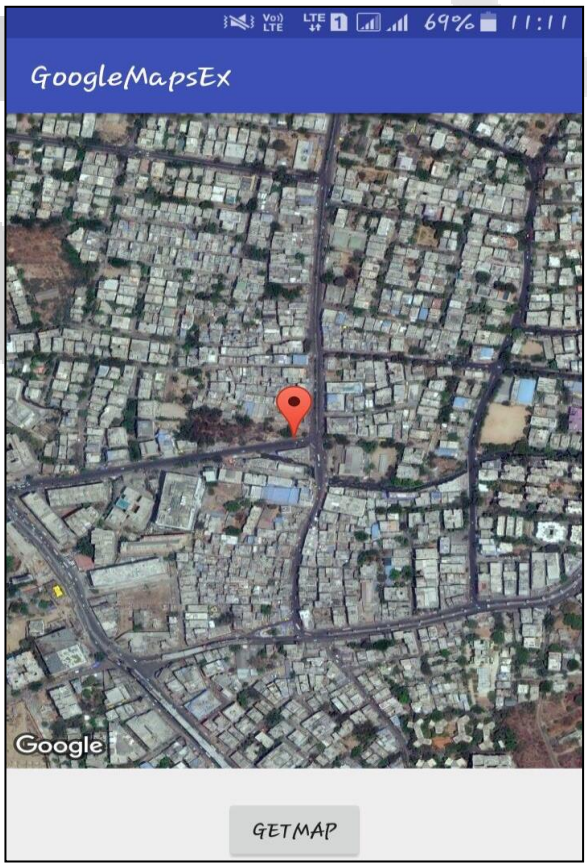
```
package cubexsoft.googlemapstest;

import android.content.Context;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.TextView;

import com.google.android.gms.maps.CameraUpdate;
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.BitmapDescriptor;
import com.google.android.gms.maps.model.BitmapDescriptorFactory;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;

public class MainActivity extends AppCompatActivity {

    SupportMapFragment frag;
    GoogleMap gMap;

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

        frag=(SupportMapFragment)getSupportFragmentManager().
                                findFragmentById(R.id.fragment);

        frag.getMapAsync(new OnMapReadyCallback() {
            @Override
            public void onMapReady(GoogleMap googleMap) {
                gMap=googleMap;
            }
        });

    }

    public void getLocation(View v){

     final LocationManager
lManager=(LocationManager)getSystemService(Context.LOCATION_SERVICE);

    lManager.getLastKnownLocation(LocationManager.NETWORK_PROVIDER);
```

```
    lManager.requestLocationUpdates(LocationManager.NETWORK_PROVIDER, 1000, 1,
            new LocationListener() {
                @Override
                public void onLocationChanged(Location location) {

                  double lati= location.getLatitude();
                  double longi= location.getLongitude();

                   MarkerOptions opt1=new MarkerOptions();
                   opt1.position(new LatLng(lati,longi));

                   opt1.icon(BitmapDescriptorFactory.fromResource(R.drawable.cab2));

                   gMap.addMarker(opt1);

                   opt1.title("NareshIT @ BlockIII");

                   gMap.animateCamera(CameraUpdateFactory.
                          newLatLngZoom(new LatLng(lati,longi),16f));

                //    gMap.setMapType(GoogleMap.MAP_TYPE_SATELLITE);


                   lManager.removeUpdates(this);
                }

                @Override
                public void onStatusChanged(String s, int i, Bundle bundle) {

                }

                @Override
                public void onProviderEnabled(String s) {

                }

                @Override
                public void onProviderDisabled(String s) {

                }
            });

    }

}
```

activity_main.xml :

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
     android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

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

```
        android:layout_height="0dp"
        android:layout_weight="0.9"
        android:orientation="vertical"
        >


        <fragment
            android:id="@+id/fragment"
            android:name="com.google.android.gms.maps.SupportMapFragment"
            android:layout_width="match_parent"
            android:layout_height="match_parent" />
    </LinearLayout>

    <Button
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="0.1"
        android:text="GetLocation"
        android:onClick="getLocation"

        />

</LinearLayout>
```



Firebase Auth :

MainActivity.java

```
package com.example.bablookumarsah.firebaseauthtest;

import android.content.Intent;
import android.support.annotation.NonNull;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

import com.google.android.gms.tasks.OnCompleteListener;
import com.google.android.gms.tasks.Task;
import com.google.firebase.auth.AuthResult;
import com.google.firebase.auth.FirebaseAuth;
import com.google.firebase.auth.FirebaseUser;

public class MainActivity extends AppCompatActivity {

    EditText et1,et2;
    private FirebaseAuth mAuth;
    private FirebaseAuth.AuthStateListener mAuthListener;

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

        et1 = (EditText)findViewById(R.id.et1);
        et2 = (EditText)findViewById(R.id.et2);

        mAuth = FirebaseAuth.getInstance();

        mAuthListener = new FirebaseAuth.AuthStateListener() {
            @Override
            public void onAuthStateChanged(@NonNull FirebaseAuth firebaseAuth) {
                FirebaseUser user = firebaseAuth.getCurrentUser();
                if (user != null) {
                    // User is signed in

                    ApplicationConstants.name=user.getEmail();

                    startActivity(new Intent(MainActivity.this,
                                    WelcomeActivity.class));

                } else {
                    // User is signed out
                    Toast.makeText(MainActivity.this,
                      "Not Registered",Toast.LENGTH_LONG).show();
                }
            }
```

```
        };
        mAuth.addAuthStateListener(mAuthListener);

    }

    public void signin (View v){
        mAuth.signInWithEmailAndPassword(et1.getText().toString(), et2.getText().toString())
                .addOnCompleteListener(this, new OnCompleteListener<AuthResult>() {
                    @Override
                    public void onComplete(@NonNull Task<AuthResult> task) {

                    }
                });


    }
    public void register (View v){

mAuth.createUserWithEmailAndPassword(et1.getText().toString(),et2.getText().toString())
                .addOnCompleteListener(this, new OnCompleteListener<AuthResult>() {
                    @Override
                    public void onComplete(@NonNull Task<AuthResult> task) {


                    }
                });


    }
}
```

WelcomeActivity.java

```
package com.example.bablookumarsah.firebaseauthtest;

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

import com.google.firebase.auth.FirebaseAuth;

public class WelcomeActivity extends AppCompatActivity {

    private FirebaseAuth mAuth;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_welcome);
        mAuth = FirebaseAuth.getInstance();

        TextView tv1=(TextView)findViewById(R.id.tv1);
        tv1.setText("Welcome : "+ApplicationConstants.name);

    }

    public void signout (View v){
```

```
        mAuth.signOut();
        finish();

    }
}
```

Application Constants :

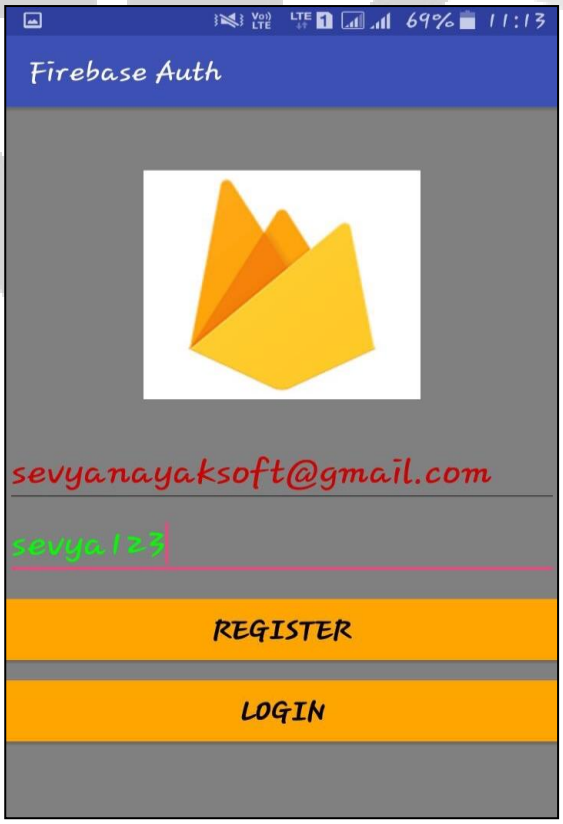
```
package com.example.bablookumarsah.firebaseauthtest;


public class ApplicationConstants {

    static  String name;

}
```

Activity_main.xml

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Username"
        android:textSize="30sp"
        android:id="@+id/et1"/>
    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Password"
        android:textSize="30sp"
        android:id="@+id/et2"/>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:orientation="horizontal">
        <Button
            android:layout_width="0dp"
            android:layout_weight="0.5"
            android:layout_height="wrap_content"
            android:text="Sign In"
            android:onClick="signin"/>
        <Button
            android:layout_width="0dp"
            android:layout_weight="0.5"
            android:layout_height="wrap_content"
            android:text="Register"
            android:onClick="register"/>
        </LinearLayout>

    </LinearLayout>
```

Activity_welcome :

```
<LinearLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   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="Gaurav Swarankar jee"
      android:textSize="50sp"
      android:id="@+id/tv1"
      />

   <Button
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Sign Out"
      android:onClick="signout"
      android:layout_gravity="right"/>

</LinearLayout>
```



Firebase Database and Storage:

MainActivity.java :

```
package com.example.bablookumarsah.fbdbtest;

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

import com.google.android.gms.tasks.OnFailureListener;
import com.google.android.gms.tasks.OnSuccessListener;
import com.google.firebase.database.DataSnapshot;
import com.google.firebase.database.DatabaseError;
import com.google.firebase.database.DatabaseReference;
import com.google.firebase.database.FirebaseDatabase;
import com.google.firebase.database.ValueEventListener;
import com.google.firebase.storage.FirebaseStorage;
import com.google.firebase.storage.StorageReference;
import com.google.firebase.storage.UploadTask;

import java.io.File;
import java.util.Iterator;

public class MainActivity extends AppCompatActivity {

    EditText et1,et2,et3,et4;
    private StorageReference mStorageRef;

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

        et1=(EditText)findViewById(R.id.et1);
        et2=(EditText)findViewById(R.id.et2);
        et3=(EditText)findViewById(R.id.et3);
        et4=(EditText)findViewById(R.id.et4);

        mStorageRef = FirebaseStorage.getInstance().getReference();
    }


    public void insert(View v){
        FirebaseDatabase database = FirebaseDatabase.getInstance();
        DatabaseReference myRef = database.getReference("employees");
        DatabaseReference child_emps=myRef.push();
        child_emps.child("id").setValue(et1.getText().toString());
        child_emps.child("name").setValue(et2.getText().toString());
        child_emps.child("desig").setValue(et3.getText().toString());
```

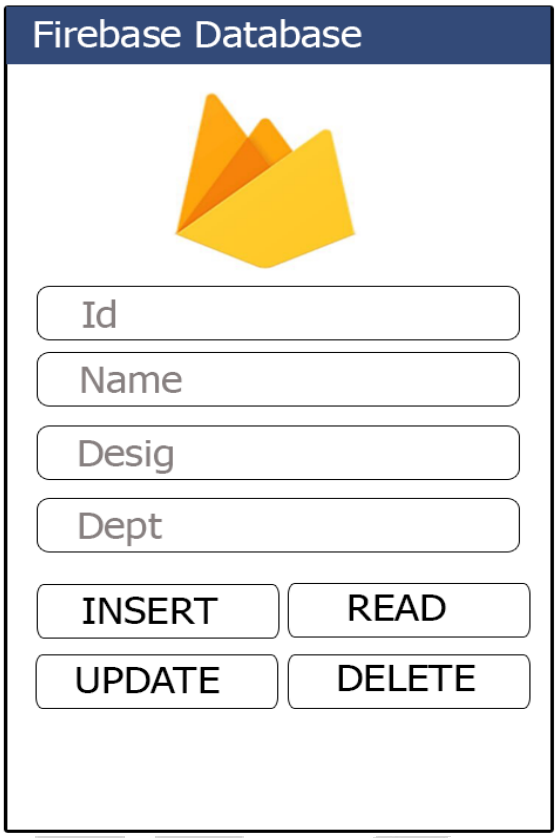
```
    child_emps.child("dept").setValue(et4.getText().toString());
}

public void read(View v){
    FirebaseDatabase database = FirebaseDatabase.getInstance();
    DatabaseReference myRef = database.getReference("employees");

    myRef.addValueEventListener(new ValueEventListener() {
        @Override
        public void onDataChange(DataSnapshot dataSnapshot) {
        Iterable<DataSnapshot> childs_emps=dataSnapshot.getChildren();
        Iterator<DataSnapshot> it=childs_emps.iterator();
         while(it.hasNext()) {
               DataSnapshot snap=it.next();
               StringBuilder builder=new StringBuilder();
               Iterable<DataSnapshot> it_childs=snap.getChildren();
               Iterator<DataSnapshot> it_indi_rec=it_childs.iterator();
               while(it_indi_rec.hasNext()) {
                  DataSnapshot snp=it_indi_rec.next();
                  builder.append(snp.getValue()+"\n");
               }
            Toast.makeText(MainActivity.this,builder.toString(),
                                  Toast.LENGTH_LONG).show();
          }
        }

        @Override
        public void onCancelled(DatabaseError databaseError) {
        }
    });
}

public void upload(View v){
    Intent i=new Intent();
    i.setAction(Intent.ACTION_GET_CONTENT);
    i.setType("*/*");
    startActivityForResult(i,123);
}

@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    super.onActivityResult(requestCode, resultCode, data);
    Uri u=data.getData();
    File f=new File(u.getPath());
    StorageReference riversRef = mStorageRef.child("files/"+f.getName());

    riversRef.putFile(u)
          .addOnSuccessListener(new OnSuccessListener<UploadTask.TaskSnapshot>() {
              @Override
              public void onSuccess(UploadTask.TaskSnapshot taskSnapshot) {
                 //Uri downloadUrl = taskSnapshot.getDownloadUrl();
              }
          })
          .addOnFailureListener(new OnFailureListener() {
              @Override
              public void onFailure(@NonNull Exception exception) {
              }
         });
```

```
    }
}
```

Activity_main.xml :

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical">

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Eid"
        android:id="@+id/et1"/>

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Name"
        android:id="@+id/et2"/>

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Desig"
        android:id="@+id/et3"/>

    <EditText
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter Dept"
        android:id="@+id/et4"/>

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

        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="INSERT"
            android:onClick="insert"/>

        <Button
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="0.5"
            android:text="READ"
            android:onClick="read"/>
    </LinearLayout>

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Upload"
        android:onClick="upload"
```

```
        android:layout_gravity="right"/>
</LinearLayout>
```



Material Design :

RecyclerView & CardView

Steps to work with RecyclerView :

- create a project , add RecyclerView and CardView as a dependency libraries.
- in Activity xml create a RecyclerView UI component.

<android.support.v7.widget.RecyclerView android:layout_width="match_parent" android:layout_height="match_parent" android:id="@+id/rview" />

- get the RecyclerView component from XML to Activity.

```
RecyclerView rview=(RecyclerView)findViewById(R.id.rview);
```

- RecyclerView will act as a ListView, Gallery and GridView , specify in which format we wants to present the data.

LinearLayoutManager lManager=new LinearLayoutManager (MainActivity.this,LinearLayoutManager.VERTICAL,false); rview.setLayoutManager(lManager);

- in which format we want to display the individual UI, crete an XML file with CardView.

- create a View holder class, create a class as a child of RecyclerView.ViewHolder.

- create a class as a child of RecyclerView.Adapter<ViewHolder_class_obj>
- it is an abstract class having following abstract methods.

public MyHolder onCreateViewHolder(ViewGroup parent, int viewType) public void onBindViewHolder(MyHolder holder, int position) public int getItemCount()

- use the following code to set recycler view adapter to recycler view UI component.

```
rview.setAdapter(new MyAdapter(MainActivity.this,files));
```

MainActivity.java :

```
package cubexsoft.recyclerviewex;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.support.v7.widget.GridLayoutManager;
import android.support.v7.widget.LinearLayoutManager;
import android.support.v7.widget.RecyclerView;

public class MainActivity extends AppCompatActivity {

    static  MainActivity mActivity;

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

        mActivity=this;

        RecyclerView rview=(RecyclerView)findViewById(R.id.rview1);

       /* LinearLayoutManager lManager=new LinearLayoutManager(this,
              LinearLayoutManager.HORIZONTAL,false); */

        GridLayoutManager gManger=new GridLayoutManager(this,2);

        rview.setLayoutManager(gManger);

        rview.setAdapter(new MyAdapter());
    }
}
```

MyAdapter.java

```
package cubexsoft.recyclerviewex;

import android.support.v7.widget.RecyclerView;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
```

```
import java.io.File;


public class MyAdapter extends RecyclerView.Adapter<MyHolder> {

    String path="/storage/emulated/0/WhatsApp/Media/WhatsApp Video/";
    File f=new File(path);
    String[] files=f.list();

    @Override
    public MyHolder onCreateViewHolder(ViewGroup parent, int viewType) {
        LayoutInflater inflater=LayoutInflater.from(MainActivity.mActivity);
        View v=inflater.inflate(R.layout.indiview,parent,false);
        MyHolder holder=new MyHolder(v);
        return holder;
    }

    @Override
    public void onBindViewHolder(final MyHolder holder, int position) {

        String video_path=path+files[position];

        File f_new=new File(video_path);

        if(f_new.isFile()){
            holder.vview.setVideoPath(video_path);
            holder.play.setOnClickListener(new View.OnClickListener() {
                @Override
                public void onClick(View v) {
                    holder.vview.start();
                }
            });

            holder.pause.setOnClickListener(new View.OnClickListener() {
                @Override
                public void onClick(View v) {
                    holder.vview.pause();
                }
            });
        }
    }

    @Override
    public int getItemCount() {
        return files.length;
    }
}
```

MyHolder.java

```
package cubexsoft.recyclerviewex;

import android.support.v7.widget.RecyclerView;
import android.view.View;
import android.widget.ImageView;
import android.widget.VideoView;

public class MyHolder extends RecyclerView.ViewHolder {
    VideoView vview;
    ImageView play;
    ImageView pause;
    public MyHolder(View itemView) {
        super(itemView);
        vview=(VideoView)itemView.findViewById(R.id.vview1);
        play=(ImageView)itemView.findViewById(R.id.b1);
        pause=(ImageView)itemView.findViewById(R.id.b2);
    }
}
```

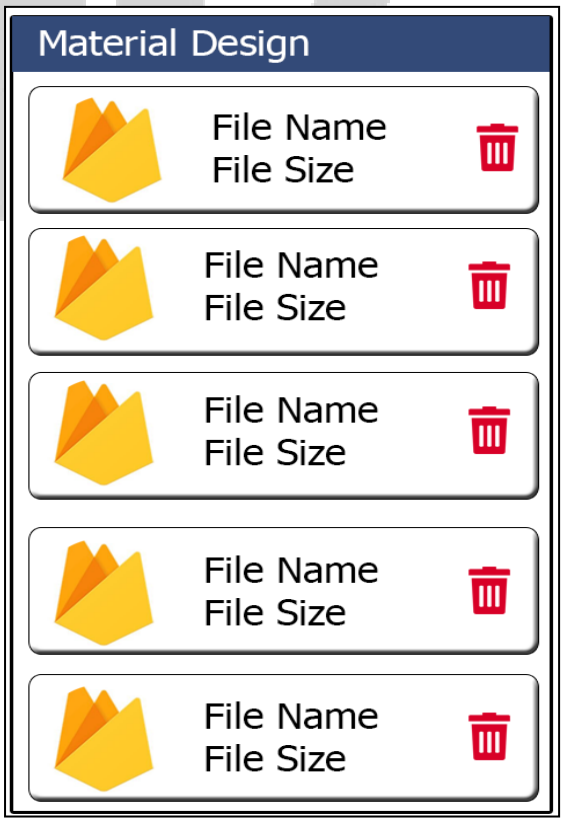
Activity_main.xml :

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
   android:orientation="vertical">
    <android.support.v7.widget.RecyclerView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/rview1">
</android.support.v7.widget.RecyclerView>
</LinearLayout>
```

Indiview.xml :

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:orientation="vertical"
    android:layout_width="150dp"
    android:layout_height="150dp">

    <android.support.v7.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="150dp"
        app:cardCornerRadius="10dp"
        android:elevation="5dp"
        android:layout_margin="5dp">

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

```
        android:orientation="horizontal">

        <VideoView
            android:layout_width="0dp"
            android:layout_height="match_parent"
            android:layout_weight="0.9"
            android:id="@+id/vview1"/>
        <LinearLayout
            android:layout_width="0dp"
            android:layout_height="match_parent"
            android:layout_weight="0.1"
            android:orientation="vertical">
        <ImageView
                android:layout_width="match_parent"
                android:layout_height="0dp"
                android:layout_weight="0.5"
                android:src="@drawable/play"
                android:id="@+id/b1"/>
            <ImageView
                android:layout_width="match_parent"
                android:layout_height="0dp"
                android:layout_weight="0.5"
                android:src="@drawable/pause"
                android:id="@+id/b2" />
        </LinearLayout>
      </LinearLayout>
   </android.support.v7.widget.CardView>
</LinearLayout>
```



Google Places :

MainActivity.java:

```
package nareshit.googleplacestest;

import android.content.Context;
import android.location.Location;
import android.location.LocationListener;
import android.location.LocationManager;
import android.os.Bundle;
import android.support.design.widget.FloatingActionButton;
import android.support.design.widget.Snackbar;
import android.support.v7.widget.LinearLayoutManager;
import android.support.v7.widget.RecyclerView;
import android.view.View;
import android.support.design.widget.NavigationView;
import android.support.v4.view.GravityCompat;
import android.support.v4.widget.DrawerLayout;
import android.support.v7.app.ActionBarDrawerToggle;
import android.support.v7.app.AppCompatActivity;
import android.support.v7.widget.Toolbar;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.TextView;

import java.util.ArrayList;

import retrofit2.Call;
import retrofit2.Callback;
import retrofit2.Response;
import retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory;

public class MainActivity extends AppCompatActivity
        implements NavigationView.OnNavigationItemSelectedListener {


    LocationManager lManager;
    double lati;
    double longi;

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

        lManager=(LocationManager)getSystemService(Context.LOCATION_SERVICE);
        lManager.getLastKnownLocation(LocationManager.NETWORK_PROVIDER);
        lManager.requestLocationUpdates(LocationManager.NETWORK_PROVIDER,
                1000, 1, new LocationListener() {
```

```
                @Override
                public void onLocationChanged(Location location) {
                    lati=location.getLatitude();
                    longi=location.getLongitude();

                    TextView tv1=(TextView)findViewById(R.id.lati);
                    TextView tv2=(TextView)findViewById(R.id.longi);

                    tv1.setText("Lati :"+lati);
                    tv2.setText("Longi:"+longi);

                    lManager.removeUpdates(this);
                }

                @Override
                public void onStatusChanged(String s, int i, Bundle bundle) {

                }

                @Override
                public void onProviderEnabled(String s) {

                }

                @Override
                public void onProviderDisabled(String s) {

                }
            });

        Toolbar toolbar = (Toolbar) findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);

        FloatingActionButton fab = (FloatingActionButton) findViewById(R.id.fab);
        fab.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Snackbar.make(view, "Replace with your own action",
Snackbar.LENGTH_LONG)
                        .setAction("Action", null).show();
            }
        });

        DrawerLayout drawer = (DrawerLayout) findViewById(R.id.drawer_layout);
        ActionBarDrawerToggle toggle = new ActionBarDrawerToggle(
                this, drawer, toolbar, R.string.navigation_drawer_open,
R.string.navigation_drawer_close);
        drawer.setDrawerListener(toggle);
        toggle.syncState();

        NavigationView navigationView = (NavigationView) findViewById(R.id.nav_view);
        navigationView.setNavigationItemSelectedListener(this);
```

```
}

@Override
public void onBackPressed() {
    DrawerLayout drawer = (DrawerLayout) findViewById(R.id.drawer_layout);
    if (drawer.isDrawerOpen(GravityCompat.START)) {
        drawer.closeDrawer(GravityCompat.START);
    } else {
        super.onBackPressed();
    }
}

@Override
public boolean onCreateOptionsMenu(Menu menu) {
    // Inflate the menu; this adds items to the action bar if it is present.
    getMenuInflater().inflate(R.menu.main, menu);
    return true;
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    // Handle action bar item clicks here. The action bar will
    // automatically handle clicks on the Home/Up button, so long
    // as you specify a parent activity in AndroidManifest.xml.
    int id = item.getItemId();

    //noinspection SimplifiableIfStatement
    if (id == R.id.action_settings) {
        return true;
    }

    return super.onOptionsItemSelected(item);
}

@SuppressWarnings("StatementWithEmptyBody")
@Override
public boolean onNavigationItemSelected(MenuItem item) {
    // Handle navigation view item clicks here.

    callRetrofit(item.getTitle().toString());

    DrawerLayout drawer = (DrawerLayout) findViewById(R.id.drawer_layout);
    drawer.closeDrawer(GravityCompat.START);
    return true;
}

public void callRetrofit(String type)
{

    Retrofit r=new Retrofit.Builder().
            addConverterFactory(GsonConverterFactory.create()).
            baseUrl("https://maps.googleapis.com").build();
    PlacesInterface pi=r.create(PlacesInterface.class);
```

```
        Call<Results> call=pi.getPlaces(type);
        call.enqueue(new Callback<Results>() {
            @Override
            public void onResponse(Call<Results> call, Response<Results> response) {
                Results r=response.body();
                ArrayList<Result> results=r.getResults();

                RecyclerView rview=(RecyclerView)
                        findViewById(R.id.rview1);

                LinearLayoutManager lManager=new
                        LinearLayoutManager(MainActivity.this,
                        LinearLayoutManager.VERTICAL,false);
                rview.setLayoutManager(lManager);

                rview.setAdapter(new MyAdapter(MainActivity.this,results));
            }

            @Override
            public void onFailure(Call<Results> call, Throwable t) {

            }
        });
    }
}
```

MyAdapter.java :

```
package nareshit.googleplacestest;

import android.support.v7.widget.RecyclerView;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;

import java.util.ArrayList;

/**
 * Created by maheshthippala on 21/07/17.
 */

public class MyAdapter extends RecyclerView.Adapter<MyHolder> {

    MainActivity mActivity;
    ArrayList<Result> results;

    public MyAdapter(MainActivity mActivity, ArrayList<Result> results)
    {
        this.mActivity=mActivity;
        this.results=results;
    }

    @Override
```

```
    public MyHolder onCreateViewHolder(ViewGroup parent, int viewType) {
      LayoutInflater inflater=LayoutInflater.from(mActivity);
        View v=inflater.inflate(R.layout.indiview,parent,false);
        MyHolder holder=new MyHolder(v);
        return holder;
    }
    @Override
    public void onBindViewHolder(MyHolder holder, int position) {
        holder.tv1.setText(results.get(position).getName());
        holder.tv2.setText(results.get(position).getAddress());
    }

    @Override
    public int getItemCount() {
        return results.size();
    }
}
```

MyHolder.java

```
package nareshit.googleplacestest;

import android.support.v7.widget.RecyclerView;
import android.view.View;
import android.widget.TextView;

/**
 * Created by maheshthippala on 21/07/17.
 */

public class MyHolder extends RecyclerView.ViewHolder {

    TextView tv1;
    TextView tv2;

    public MyHolder(View itemView) {
        super(itemView);
        tv1=(TextView)itemView.findViewById(R.id.name);
        tv2=(TextView)itemView.findViewById(R.id.address);
    }
}
```

PlacesInterface.java

```
package nareshit.googleplacestest;

import retrofit2.Call;
import retrofit2.http.GET;
import retrofit2.http.Query;

/**
 * Created by maheshthippala on 21/07/17.
 */
```

```
public interface PlacesInterface {

  //
@GET("/maps/api/place/nearbysearch/json?location=17.4372665,78.4480046&radius
=500&type=atm&key=AIzaSyADrp7f9s3ZjRmxhmIY1azcOsXNdXbuOiY")

@GET("/maps/api/place/nearbysearch/json?location=17.4372665,78.4480046&radius
=500&key=AIzaSyADrp7f9s3ZjRmxhmIY1azcOsXNdXbuOiY")
   Call<Results> getPlaces(@Query("type") String type);
}
```

Result.java :

```
package nareshit.googleplacestest;

import com.google.gson.annotations.SerializedName;

public class Result {

   @SerializedName("name")
   private String name;

   @SerializedName("vicinity")
   private String address;

   public String getName() {
      return name;
   }

   public void setName(String name) {
      this.name = name;
   }

   public String getAddress() {
      return address;
   }

   public void setAddress(String address) {
      this.address = address;
   }
}
```

Results.java :

```
package nareshit.googleplacestest;

import com.google.gson.annotations.SerializedName;

import java.util.ArrayList;
```

```
public class Results {

   @SerializedName("results")
   private ArrayList<Result> results;

   public ArrayList<Result> getResults() {
      return results;
   }

   public void setResults(ArrayList<Result> results) {
      this.results = results;
   }
}
```

activity_main.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<android.support.v4.widget.DrawerLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:id="@+id/drawer_layout"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:fitsSystemWindows="true"
   tools:openDrawer="start">

   <include
      layout="@layout/app_bar_main"
      android:layout_width="match_parent"
      android:layout_height="match_parent" />

   <android.support.design.widget.NavigationView
      android:id="@+id/nav_view"
      android:layout_width="wrap_content"
      android:layout_height="match_parent"
      android:layout_gravity="start"
      android:fitsSystemWindows="true"
      app:headerLayout="@layout/nav_header_main"
      app:menu="@menu/activity_main_drawer" />

</android.support.v4.widget.DrawerLayout>
```

content_main.xml :

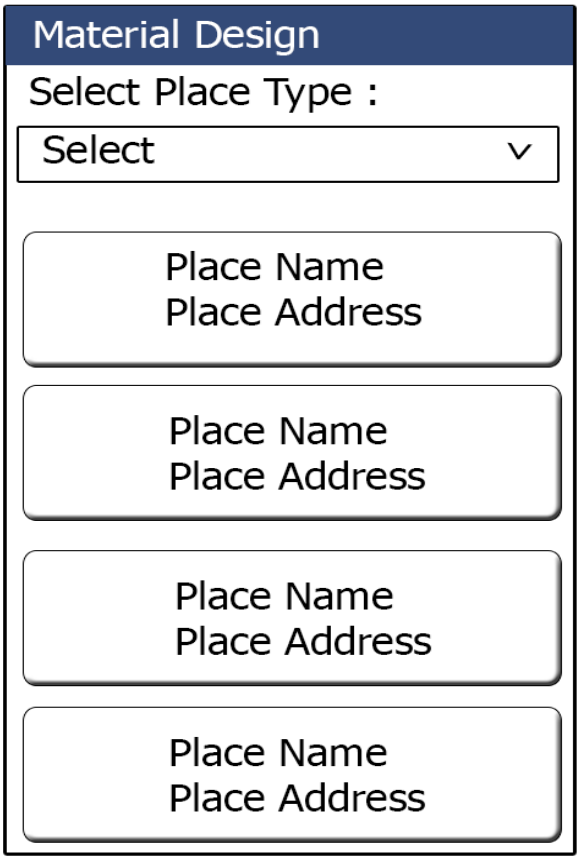
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
   android:layout_marginTop="60dp"
   xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:orientation="vertical">
```

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

       <TextView
          android:layout_width="0dp"
          android:layout_height="wrap_content"
          android:text="Latitude"
          android:id="@+id/lati"
          android:layout_weight="0.5"
          android:textSize="20sp"
          />
       <TextView
          android:layout_width="0dp"
          android:layout_height="wrap_content"
          android:text="Longitude"
          android:id="@+id/longi"
          android:layout_weight="0.5"
          android:textSize="20sp"
          />

    </LinearLayout>

   <android.support.v7.widget.RecyclerView
       android:layout_width="match_parent"
       android:layout_height="match_parent"
       android:id="@+id/rview1"
       ></android.support.v7.widget.RecyclerView>

</LinearLayout>
```

indiview.xml :

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="wrap_content">

    <android.support.v7.widget.CardView
       android:layout_width="match_parent"
       android:layout_height="wrap_content"
       app:cardCornerRadius="15dp"
       android:layout_margin="10dp">

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

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

```
            android:layout_height="wrap_content"
            android:text="Name"
             android:textSize="20sp"
            android:textStyle="bold"
            android:id="@+id/name"
            android:layout_gravity="center"
            android:textColor="#054"
            />
          <TextView
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:text="Address"
            android:textSize="20sp"
            android:textStyle="bold"
            android:id="@+id/address"
            android:layout_gravity="center"
            android:textColor="#0000FF"/>
      </LinearLayout>
    </android.support.v7.widget.CardView>
</LinearLayout>
```



Graphics Programmming :

MainActivity.java :

```
package cubexsoft.graphicstest;

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(new MyView(this));
    }
}
```

MyView.java :

```
package cubexsoft.graphicstest;

import android.content.Context;
import android.graphics.Bitmap;
import android.graphics.BitmapFactory;
import android.graphics.Canvas;
import android.graphics.Color;
import android.graphics.Paint;
import android.os.Handler;
import android.view.SurfaceHolder;
import android.view.SurfaceView;


public class MyView extends SurfaceView {
    SurfaceHolder sHolder;

    Handler handler=new Handler();
    int xpos=50;

    public MyView(Context context) {
        super(context);

        sHolder=getHolder();

        sHolder.addCallback(new SurfaceHolder.Callback() {
            @Override
            public void surfaceCreated(SurfaceHolder holder) {

             /*   handler.postDelayed(new Runnable() {
                    @Override
                    public void run() {
```

```
                Canvas c=sHolder.lockCanvas();
                myDraw(c);
                sHolder.unlockCanvasAndPost(c);

                xpos=xpos+5;
                handler.postDelayed(this,500);
            }
        },500); */

        Canvas c=sHolder.lockCanvas();
        myDraw(c);
        sHolder.unlockCanvasAndPost(c);
    }

    @Override
    public void surfaceChanged(SurfaceHolder holder, int format, int width, int
height) {

    }

    @Override
    public void surfaceDestroyed(SurfaceHolder holder) {

    }
  });
}

public void myDraw(Canvas c){

    c.drawColor(Color.BLACK);

    Paint p=new Paint();
    p.setColor(Color.RED);
    p.setStyle(Paint.Style.FILL);

    c.drawCircle(200,200,50,p);

    p.setColor(Color.YELLOW);
    c.drawRect(200,300,500,600,p);

    p.setStyle(Paint.Style.STROKE);
    p.setColor(Color.CYAN);
    p.setTextSize(50);

    c.drawText("Mahesh@NareshIT",200,650,p);

    Bitmap bmp= BitmapFactory.decodeResource(getResources(),
                            R.drawable.cyclist);

    c.drawBitmap(bmp,xpos,700,null);
}
}
```

GraphicsProgramming with Cocos-2D :

SimpleGame.java :

```
package com.tutorials.cocos2dsimplegame;

import org.cocos2d.layers.CCScene;
import org.cocos2d.nodes.CCDirector;
import org.cocos2d.opengl.CCGLSurfaceView;
import org.cocos2d.types.ccColor4B;

import android.app.Activity;
import android.os.Bundle;
import android.view.Window;
import android.view.WindowManager;

public class SimpleGame extends Activity
{
protected CCGLSurfaceView _glSurfaceView;

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

		requestWindowFeature(Window.FEATURE_NO_TITLE);
		getWindow().setFlags(WindowManager.LayoutParams.FLAG_FULLSCREEN,
WindowManager.LayoutParams.FLAG_FULLSCREEN);

	getWindow().setFlags(WindowManager.LayoutParams.FLAG_KEEP_SCREEN_ON,
WindowManager.LayoutParams.FLAG_KEEP_SCREEN_ON);

		_glSurfaceView = new CCGLSurfaceView(this);

		setContentView(_glSurfaceView);
	}

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

		CCDirector.sharedDirector().attachInView(_glSurfaceView);


	CCDirector.sharedDirector().setDeviceOrientation(CCDirector.kCCDeviceOrientati
onLandscapeLeft);

		CCDirector.sharedDirector().setDisplayFPS(false);

		CCDirector.sharedDirector().setAnimationInterval(1.0f / 60.0f);
```

```
                /*
            CCScene scene = GameLayer.scene();
            CCDirector.sharedDirector().runWithScene(scene);
            */

            CCScene scene=CCScene.node();
            //scene.addChild(new NareshITLayer());
                scene.addChild(new FingerPaint());
            CCDirector.sharedDirector().runWithScene(scene);

        }

        @Override
        public void onPause()
        {
            super.onPause();

            CCDirector.sharedDirector().pause();
        }

        @Override
        public void onResume()
        {
            super.onResume();

            CCDirector.sharedDirector().resume();
        }

        @Override
        public void onStop()
        {
            super.onStop();

            CCDirector.sharedDirector().end();
        }
}
```

NareshITLayer.java :

```
package com.tutorials.cocos2dsimplegame;

import org.cocos2d.actions.base.CCRepeatForever;
import org.cocos2d.actions.camera.CCOrbitCamera;
import org.cocos2d.actions.interval.CCAnimate;
import org.cocos2d.actions.interval.CCJumpTo;
import org.cocos2d.actions.interval.CCMoveTo;
import org.cocos2d.actions.interval.CCRotateBy;
import org.cocos2d.actions.interval.CCScaleTo;
import org.cocos2d.actions.interval.CCSequence;
import org.cocos2d.layers.CCLayer;
import org.cocos2d.menus.CCMenu;
import org.cocos2d.menus.CCMenuItem;
```

```
import org.cocos2d.menus.CCMenuItemImage;
import org.cocos2d.nodes.CCAnimation;
import org.cocos2d.nodes.CCDirector;
import org.cocos2d.nodes.CCLabel;
import org.cocos2d.nodes.CCSprite;
import org.cocos2d.types.CGPoint;
import org.cocos2d.types.CGSize;
import org.cocos2d.utils.CCFormatter;

/**
 * Created by maheshthippala on 19/03/17.
 */

public class NareshITLayer extends CCLayer {

    CGSize s;

    @Override
    public void onEnter() {
        super.onEnter();

        s= CCDirector.sharedDirector().winSize();

        CCMenuItem item= CCMenuItemImage.item("aboutus.png",
                              "aboutus1.png",this,"aboutus");
        item.setPosition(s.width-s.width/4,s.height-s.height/4);
        addChild(item);

        CCMenuItem item1= CCMenuItemImage.item("gallery.png",
              "gallery1.png",this,"gallery");
        item1.setPosition(s.width-s.width/4,s.height-s.height/2);
        addChild(item1);

        CCMenu menu=CCMenu.menu(item,item1);
        menu.setPosition(0,0);
        addChild(menu);


    /*
        CCSprite sprite=CCSprite.sprite("man1.png");
        sprite.setPosition(s.width/4,s.height/4);
        sprite.setScale(2);
        addChild(sprite);


        CCAnimation animation=CCAnimation.animation("cycle",0.2f);

        animation.addFrame(CCFormatter.format("man1.png"));
        animation.addFrame(CCFormatter.format("man2.png"));
        animation.addFrame(CCFormatter.format("man3.png"));
        animation.addFrame(CCFormatter.format("man4.png"));
        animation.addFrame(CCFormatter.format("man5.png"));
```

```
        CCAnimate animate=CCAnimate.action(animation);
        CCRepeatForever ever=CCRepeatForever.action(animate);
        sprite.runAction(ever);

        CCMoveTo mto=CCMoveTo.action(20f,
                CGPoint.ccp(s.width-s.width/4,s.height/4));
        sprite.runAction(mto);

        CCRotateBy rby=CCRotateBy.action(20f,4*360);
        sprite.runAction(rby);


        CCJumpTo jto=CCJumpTo.action(20f,
              CGPoint.ccp(s.width-s.width/4,s.height/4),150,4);
        sprite.runAction(jto);

        CCScaleTo sto=CCScaleTo.action(5f,3);
       // sprite.runAction(sto);

        CCScaleTo sto1=CCScaleTo.action(5f,1);

        CCSequence seq=CCSequence.actions(sto,sto1);
//        sprite.runAction(seq);

        CCRepeatForever ever=CCRepeatForever.action(seq);
        sprite.runAction(ever);


        CCLabel label=CCLabel.makeLabel("Welcome 2 NareshIT",null,50);
        label.setPosition(s.width/2,s.height/2);
        addChild(label);


        CCOrbitCamera camera=CCOrbitCamera.action(20f,4,0,0,360,0,0);
        sprite.runAction(camera);

    */

    }

    public void aboutus(Object o){
          System.out.println("----- About Us ---------");
    }

    public void gallery(Object o){
       System.out.println("----- Gallery ---------");

    }
    public void aboutus(){
       System.out.println("----- About Us ---------");
    }

    public void gallery(){
```

```
        System.out.println("----- Gallery ---------");

    }

    @Override
    public void onExit() {
        super.onExit();
    }
}
```

PaintLayer.java :

```
package com.tutorials.cocos2dsimplegame;

import android.view.MotionEvent;

import org.cocos2d.layers.CCLayer;
import org.cocos2d.nodes.CCDirector;
import org.cocos2d.nodes.CCSprite;
import org.cocos2d.types.CGPoint;


public class PaintLayer extends CCLayer {

    @Override
    public void onEnter() {
        super.onEnter();
        this.setIsTouchEnabled(true);
     }

    @Override
    public void onExit() {
        super.onExit();
    }

    @Override
    public boolean ccTouchesMoved(MotionEvent event) {

        CCSprite sp1=CCSprite.sprite("r1.png");
        CGPoint point= CCDirector.sharedDirector().
                convertToGL(CGPoint.ccp(event.getX(),event.getY()));
        sp1.setPosition(point.x,point.y);
        addChild(sp1);

        return super.ccTouchesMoved(event);
    }

}
```