Nitte Meenakshi Institute of Technology
(AN AUTONOMOUS INSTITUTION, AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM) , (A Unit of Nitte Education Trust, Mangalore)
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Department of Computer Science and Engineering

Date: 12-11-2017

ANDROID LABORATORY - PROGRAMS
Code: 14CSL77

PART – A

1. In this lab we will be learning how to use and extend the Android user interface library.
   a. Views, View Groups, Layouts, and Widgets are and how they relate to each other.
   b. How to declare and reference resources in code.
   c. How to navigate between multiple activities.
   d. How to share the data between the activities.
   e. Explore life-cycle methods of an activity.
   f. How to use Events and Event Listeners.
   g. How to create Toast Notifications.

2. You will expand on your knowledge of the Android user interface library.
   a. How to declare layouts statically as an xml resource.
   b. How to create custom Views from scratch to suit a specific need.
   c. How to create Options and Context Menus.
   d. How to use ListAdapter and ArrayAdapter to bind data source to a List View.
   e. How to create AlertDialog and progress Dialog in your activity.

3. You will be persisting data using an SQLite Database and preserving the state of an application during its lifecycle.
   a. How to save & restore data as Application Preferences (Shared Preference).
   b. How to save & restore data as Instance State.
   c. How to create and manage an SQLiteDatabase in Android.
   d. How to insert, update, remove, and retrieve data from an SQLite Database.
   e. Display data using RecyclerView.

4. Develop an app to capture a photo and store it into SDCard, extend this app to display all the photos capture in the grid view.
   a. How to use the Camera.
   b. How to write data to the SD card.

5. Create an application to demonstrate few key features of the Android framework. In particular, the application demonstrates how to send SMS text messages.
   a. How to send SMS text messages.
   b. How to dial using an in-built dialer
   c. How to send email.

6. Develop an app that include broadcast Receiver to receive the miss calls from the Known number and display it to the user using notification services. This same app should also fetch phone number from the inbuilt contacts using the concept of content provider.
    a. How to use broadcast receiver and notifications.
    b. How to use content providers.

7. Design an android app to fetch the JSON data from the internet and display the data using listView.
    a. Employee data is stored in the internet. (use Async Task)
    b. When app sends the request to the server, the server should provide data in json format.
    c. The client app should fetch this data and display using listview.

8. Develop an android app on Google Map, and should provide following functions.
    a. How to incorporate Google Maps into an application.
    b. How to register for and receive GPS location information.
    c. How to create Google Maps Overlays.
    d. Accept city name from user and marks it on map.
    e. Explore features like Zoom and map types.

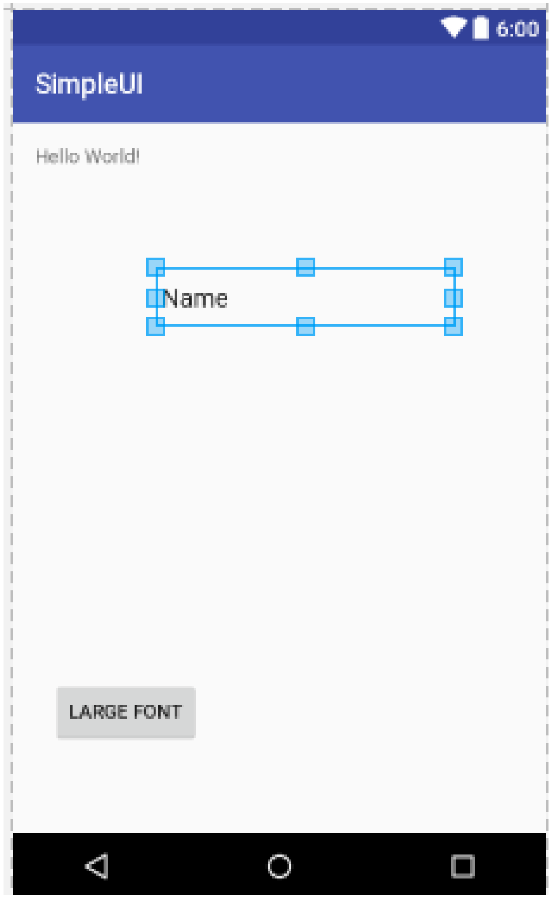
PART – B

Students should develop an innovative android app project on the societal sector,college activities,transportation, tourist system,medical application,online ticket booking and bill payment,banking sector,recruitment process, etc. Which includes the features that implemented above in Part- A.

Rubrics for the project includes :
Implementing the above features of Part-A in project -- 10 marks
Innovative features added to the project by your team -- 5 marks
Presenting the project explaining all features -- 5 marks

1. **In this lab we will be learning how to use and extend the Android user interface library.**
    a. **Views, View Groups, Layouts, and Widgets are and how they relate to each other.**
    b. **How to declare and reference resources in code.**
    c. **How to navigate between multiple activities.**
    d. **How to share the data between the activities.**
    e. **Explore life-cycle methods of an activity.**
    f. **How to use Events and Event Listeners.**
    g. **How to create Toast Notifications.**

Event Handling, Passing Data using Intent and Toast



MainActivity.java

```
et1= (EditText) findViewById(R.id.pt);
b1= (Button) findViewById(R.id.button2);
b1.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {

       Intent i1=new Intent(MainActivity.this,SecondAct.class);
       i1.putExtra(msg,et1.getText().toString());
       startActivity(i1);
    }
});
```

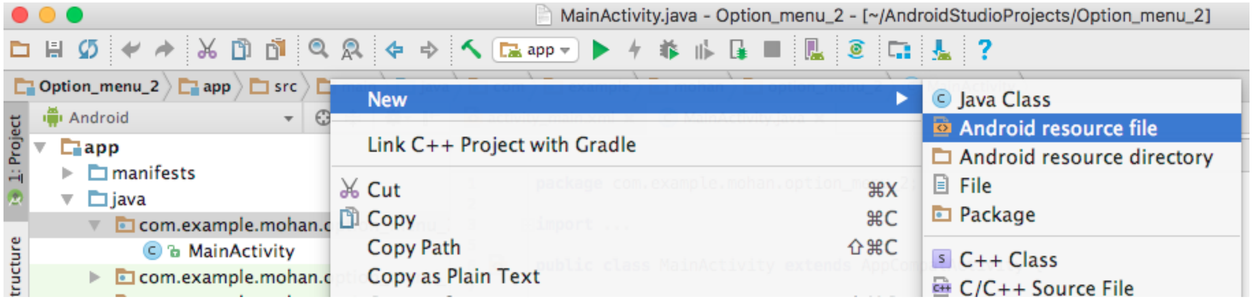
SecondActivity.java

```
    Intent i2=getIntent();
    Bundle b=i2.getExtras();
    Toast.makeText(this, "In Second Activity"+b.getString(MainActivity.msg), Toast.LENGTH_SHORT).show();
}
```

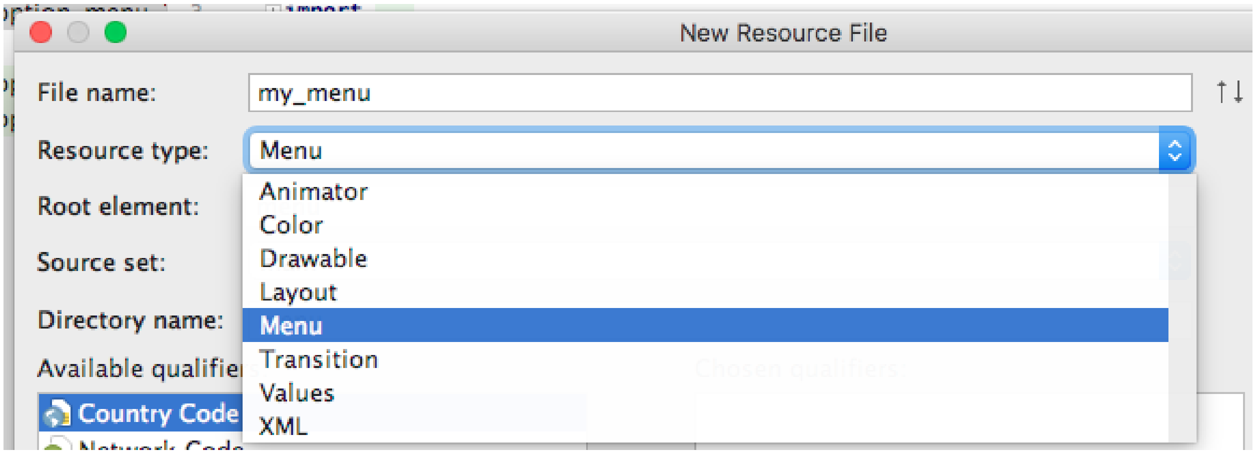
2. **You will expand on your knowledge of the Android user interface library.**
    - a. **How to declare layouts statically as an xml resource.**
    - b. **How to create custom Views from scratch to suit a specific need.**
    - c. **How to create Options and Context Menus.**
    - d. **How to use ListAdapter and ArrayAdapter to bind data source to a List View.**
    - e. **How to create AlertDialog and progress Dialog in your activity.**

Option Menu

Step 1:



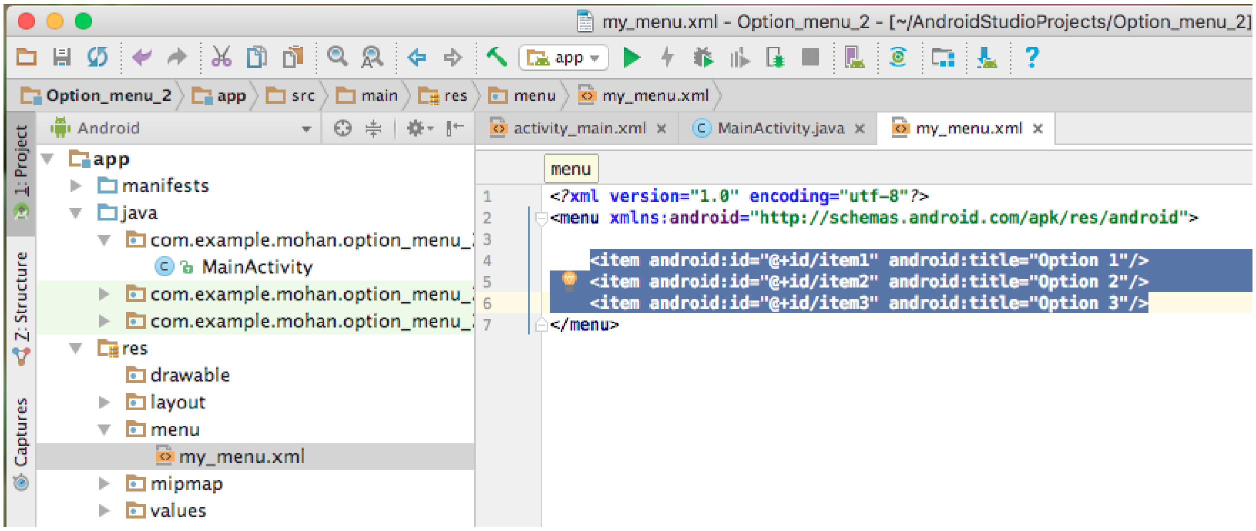
Step 2:


New Resource File

File name: my_menu

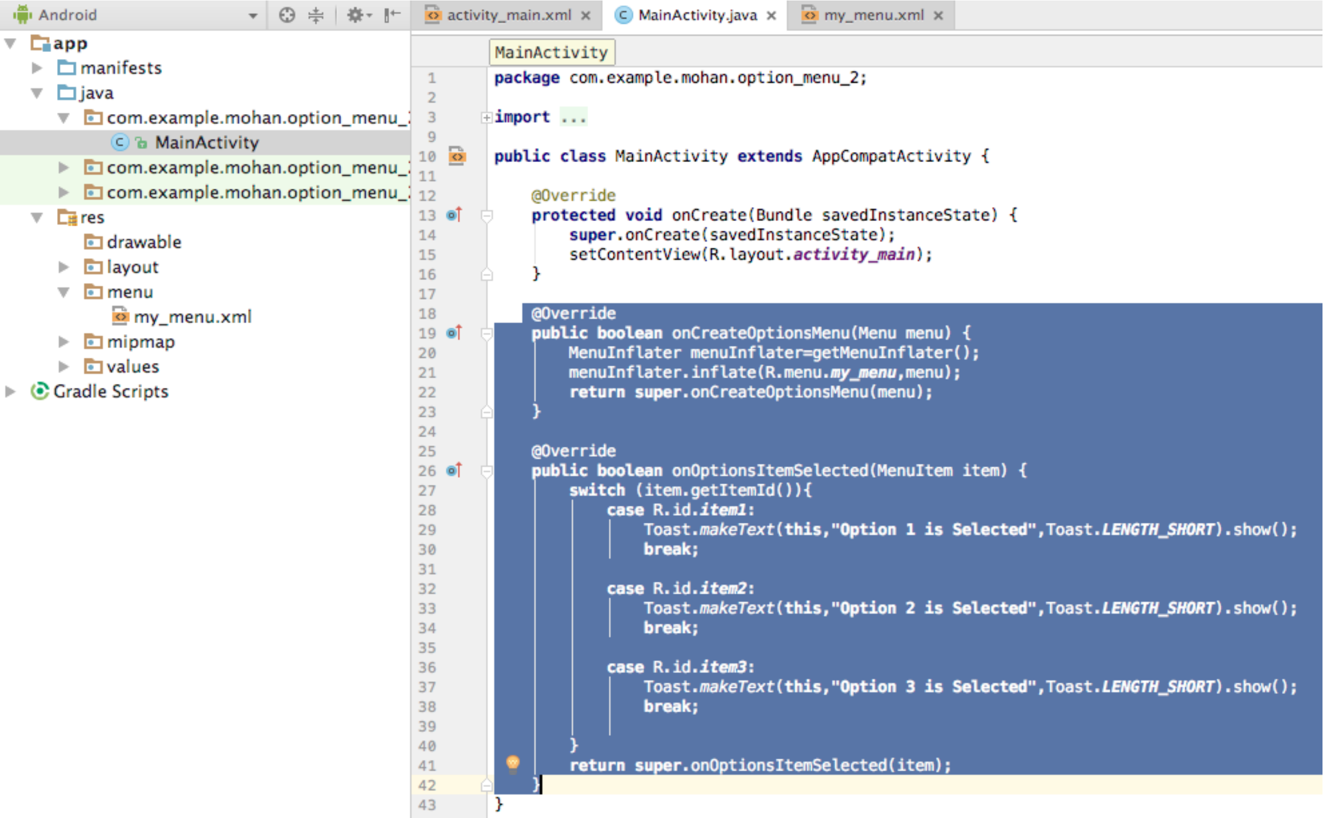
Resource type: Menu

Step 3:



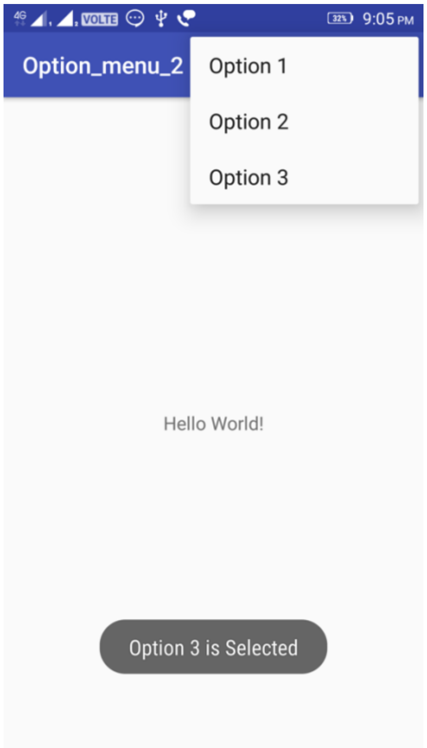
```xml
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">

    <item android:id="@+id/item1" android:title="Option 1"/>
    <item android:id="@+id/item2" android:title="Option 2"/>
    <item android:id="@+id/item3" android:title="Option 3"/>
</menu>
```

Step 4:



```java
package com.example.mohan.option_menu_2;

import ...

public class MainActivity extends AppCompatActivity {

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

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

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()){
            case R.id.item1:
                Toast.makeText(this,"Option 1 is Selected",Toast.LENGTH_SHORT).show();
                break;

            case R.id.item2:
                Toast.makeText(this,"Option 2 is Selected",Toast.LENGTH_SHORT).show();
                break;

            case R.id.item3:
                Toast.makeText(this,"Option 3 is Selected",Toast.LENGTH_SHORT).show();
                break;

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

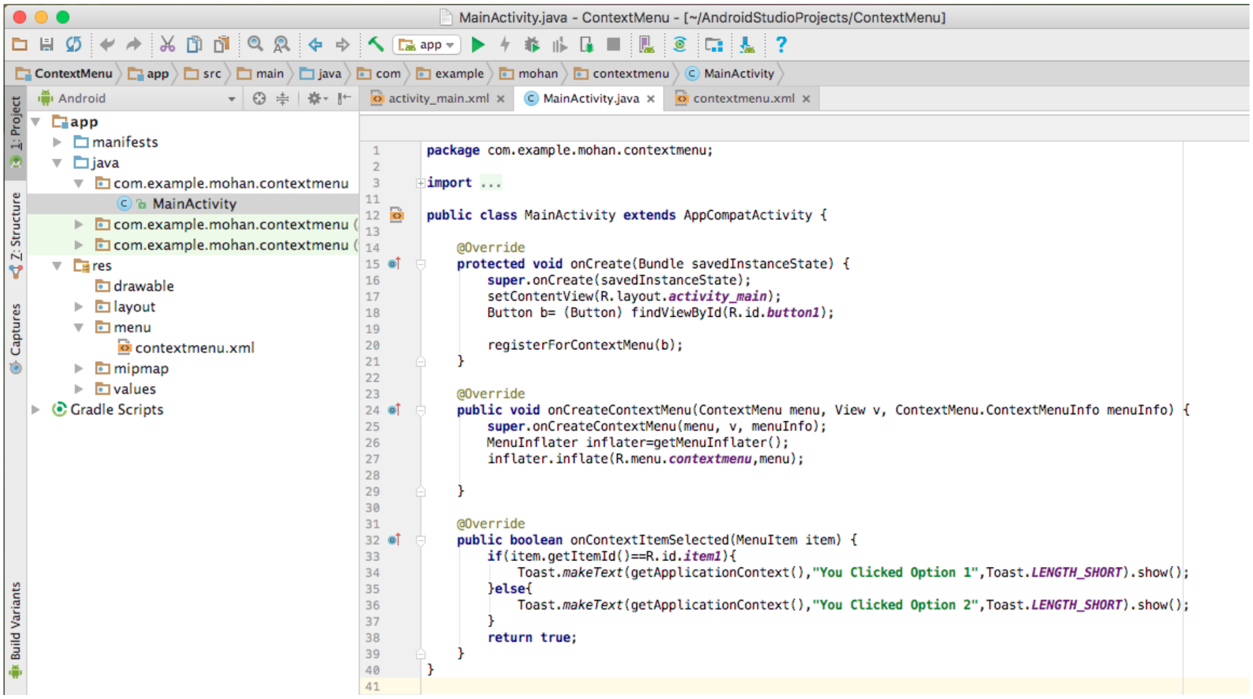
Step 5:



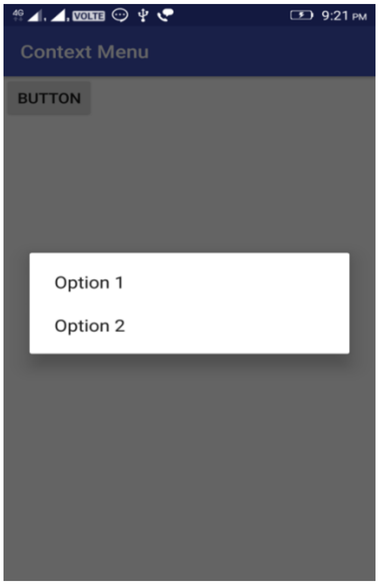
Hello World!

Option 3 is Selected

ContextMenu



```
package com.example.mohan.contextmenu;

import ...

public class MainActivity extends AppCompatActivity {

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

        registerForContextMenu(b);
    }

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

    }

    @Override
    public boolean onContextItemSelected(MenuItem item) {
        if(item.getItemId()==R.id.item1){
            Toast.makeText(getApplicationContext(),"You Clicked Option 1",Toast.LENGTH_SHORT).show();
        }else{
            Toast.makeText(getApplicationContext(),"You Clicked Option 2",Toast.LENGTH_SHORT).show();
        }
        return true;
    }
}
```



Program on AlertDialog

```
public class MainActivity extends AppCompatActivity {

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

public void onClickShowAlert(View view) {
        AlertDialog.Builder myAlertBuilder=new AlertDialog.Builder(MainActivity.this);
        myAlertBuilder.setTitle(R.string.alert_title);
        myAlertBuilder.setMessage(R.string.alert_message);
        myAlertBuilder.setPositiveButton(R.string.ok, new DialogInterface.OnClickListener() {
@Override
public void onClick(DialogInterface dialog, int which) {
               MainActivity.this.finish();
}
        });
        myAlertBuilder.setNegativeButton(R.string.cancel, new DialogInterface.OnClickListener() {
@Override
public void onClick(DialogInterface dialog, int which) {
dialog.cancel();
            }
        });
       AlertDialog alert=myAlertBuilder.create();
        alert.show();
    }
}
```

3. **You will be persisting data using an SQLite Database and preserving the state of an application during its lifecycle.**
    a. **How to save & restore data as Application Preferences (Shared Preference).**
    b. **How to save & restore data as Instance State.**
    c. **How to create and manage an SQLiteDatabase in Android.**
    d. **How to insert, update, remove, and retrieve data from an SQLite Database.**
    e. **Display data using RecyclerView.**

MainActivity.java

```
package com.example.mohan.dbapp;
import android.app.Notification;
import android.app.NotificationManager;
import android.app.PendingIntent;
import android.content.Intent;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import static android.os.Build.VERSION_CODES.M;

public class MainActivity extends AppCompatActivity {

    DatabaseHealper mDatabaseHealper;
private Button btnAdd, btnViewData;
private EditText editText;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

editText= (EditText) findViewById(R.id.editText);
btnAdd= (Button) findViewById(R.id.addbut);
btnViewData= (Button) findViewById(R.id.savebut);
mDatabaseHealper=new DatabaseHealper(this);

btnAdd.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
                String newEntry=editText.getText().toString();
if(editText.length() !=0){
                    AddData(newEntry);
editText.setText("");
                }else{
                    toastMessage("Enter Data");
                }
            }
        });


btnViewData.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
                Intent intent=new Intent(MainActivity.this,ListDataActivity.class);
                startActivity(intent);
            }
        });
    }

public void AddData(String newEntry){
boolean insertData=mDatabaseHealper.addData(newEntry);
if(insertData){
            toastMessage("Data Succesfully Inserted");
        }else{     toastMessage("Something Went Wrong"); }
    }

private void toastMessage(String message){
        Toast.makeText(this,message,Toast.LENGTH_SHORT).show();
    }
}
```

ListDataActivity.java

```
package com.example.mohan.dbapp;
import android.database.Cursor;
import android.os.Bundle;
import android.support.annotation.Nullable;
import android.support.v7.app.AppCompatActivity;
import android.util.Log;
import android.widget.ArrayAdapter;
import android.widget.ListAdapter;
import android.widget.ListView;
import android.widget.Toast;
import java.util.ArrayList;
import static android.icu.lang.UCharacter.GraphemeClusterBreak.L;

public class ListDataActivityextends AppCompatActivity {

private static final String TAG="ListDataActivity";

    DatabaseHealper mDatabaseHelper;
private ListView mlistView;

@Override
protected void onCreate(@Nullable Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
        setContentView(R.layout.list_layout);
mlistView= (ListView) findViewById(R.id.listView);
mDatabaseHelper=new DatabaseHealper(this);
        populateListView();
    }

private void populateListView() {
        Log.d(TAG,"Populate ListView: Displaying data in ListView");

        Cursor data=mDatabaseHelper.getData();
        ArrayList<String> listData=new ArrayList<>();
while(data.moveToNext()){
            listData.add(data.getString(1));
        }
        ListAdapter adapter=new ArrayAdapter<>(this,android.R.layout.simple_list_item_1,listData);
mlistView.setAdapter(adapter);
    }

private void toastMessage(String message){
        Toast.makeText(this,message,Toast.LENGTH_SHORT).show();
    }
}
```

DatabaseHealper.java

```
package com.example.mohan.dbapp;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import android.util.Log;
import static android.R.attr.publicKey;
import static android.R.attr.version;
public class DatabaseHealper extends SQLiteOpenHelper {
private static final String TAG="DatabaseHealper";
private static final String TABLE_NAME = "employees";
private static final String COL1="ID";
private static final String COL2="name";

public DatabaseHealper(Context context){ //}, String name, SQLiteDatabase.CursorFactory factory, int version) {
```

```
super(context, TABLE_NAME, null, 1);
    }

@Override
public void onCreate(SQLiteDatabase db) {
    String createTable = "CREATE TABLE "+TABLE_NAME +" (ID INTEGER PRIMARY KEY
AUTOINCREMENT,"+COL2+" TEXT)";
        db.execSQL(createTable);
    }

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

public boolean addData(String item){
        SQLiteDatabase db=this.getWritableDatabase();
        ContentValues contentValues=new ContentValues();
        contentValues.put(COL2,item);
        Log.d(TAG,"addData: Adding "+item+" to "+TABLE_NAME);
        Long result=db.insert(TABLE_NAME,null,contentValues);
if(result == -1) {
return false;
        }else{
return true;
        }
    }
public Cursor getData(){
        SQLiteDatabase db=this.getWritableDatabase();
        String query="SELECT * FROM "+TABLE_NAME;
        Cursor data=db.rawQuery(query,null);
return data;
    }

}
```

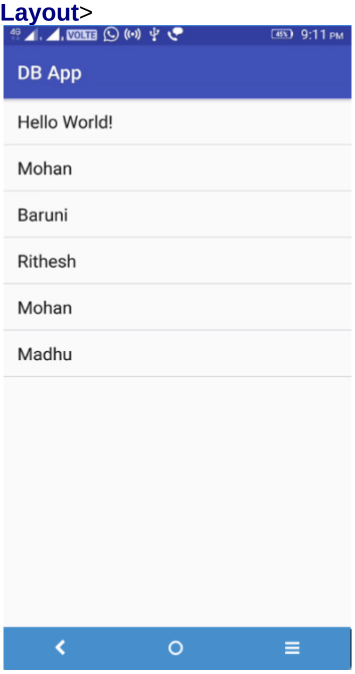
Activity_mail.xml

```
<?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="com.example.mohan.dbapp.MainActivity">

<RelativeLayout
android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_marginTop="34dp">

<Button
android:id="@+id/addbut"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="ADD"
tools:layout_editor_absoluteX="140dp"
tools:layout_editor_absoluteY="185dp" />

<Button
android:id="@+id/savebut"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignBottom="@+id/addbut"
android:layout_marginLeft="21dp"
android:layout_marginStart="21dp"
android:layout_toEndOf="@+id/addbut"
```

```
android:layout_toRightOf="@+id/addbut"
android:text="VIEW DATA" />
</RelativeLayout>

<EditText
android:id="@+id/editText"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_alignParentTop="true"
android:layout_marginLeft="17dp"
android:layout_marginStart="17dp"
android:ems="10"
android:inputType="textPersonName"
android:text="Name" />
</RelativeLayout>
```

list_layout.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/listView"
/>
</LinearLayout>
```



DB App

Hello World!

Mohan

Baruni

Rithesh

Mohan

Madhu

4. **Develop an app to capture a photo and store it into SDCard, extend this app to display all the photos capture in the grid view.**
    a. **How to use the Camera.**

b. How to write data to the SD card.

CustomAdapter

```
package nmit.mohan.com.camerasdcard;
import android.content.Intent;
import android.graphics.Bitmap;
import android.net.Uri;
import android.os.Environment;
import android.provider.MediaStore;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;a
import android.widget.ImageView;

import java.io.File;
import java.text.SimpleDateFormat;
import java.util.Date;

public class MainActivity extends AppCompatActivity {
final Integer CAMERA_REQUEST=1;
    ImageView imageView;
    Button take,view;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
imageView= (ImageView) findViewById(R.id.iv);
take= (Button) findViewById(R.id.takePic);
view= (Button) findViewById(R.id.viewPic);

take.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
                Intent intent=new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
                File pictureDirectory = Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_MOVIES);
                String PictureName=getPictureName();
                File imageFile=new File (pictureDirectory,PictureName);
                Uri pictureUri=Uri.fromFile(imageFile);
                intent.putExtra(MediaStore.EXTRA_OUTPUT,pictureUri);
                startActivityForResult(intent,CAMERA_REQUEST);
            }
        });
view.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
                Intent i=new Intent(MainActivity.this,Second.class);
                startActivity(i);
            }
        });
    }

private String getPictureName() {
        SimpleDateFormat sdf=new SimpleDateFormat("yyyyMMdd_HHmmss");
        String timestamp=sdf.format(new Date());
return "IMG"+timestamp+".jpg";
```

```
    }

@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
super.onActivityResult(requestCode, resultCode, data);
if(resultCode==RESULT_OK){
if(requestCode==CAMERA_REQUEST){
//              Bitmap img=(Bitmap) data.getExtras().get("data");
//              imageView.setImageBitmap(img);
}
        }
    }
}
```

ImageModel.java

```
package nmit.mohan.com.camerasdcard;
import android.net.Uri;

public class ImageModel {
private String name;
private Uri uri;
public String getName() {
return name;
    }

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

public Uri getUri() {
return uri;
    }

public void setUri(Uri uri) {
this.uri = uri;
    }
}
```

MainActivity.java

```
package nmit.mohan.com.camerasdcard;
import android.content.Intent;
import android.graphics.Bitmap;
import android.net.Uri;
import android.os.Environment;
import android.provider.MediaStore;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;a
import android.widget.ImageView;
import java.io.File;
import java.text.SimpleDateFormat;
import java.util.Date;

public class MainActivity extends AppCompatActivity {
final Integer CAMERA_REQUEST=1;
    ImageView imageView;
    Button take,view;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
imageView= (ImageView) findViewById(R.id.iv);
take= (Button) findViewById(R.id.takePic);
view= (Button) findViewById(R.id.viewPic);

take.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
        Intent intent=new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
        File pictureDirectory = Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_MOVIES);
        String PictureName=getPictureName();
        File imageFile=new File (pictureDirectory,PictureName);
        Uri pictureUri=Uri.fromFile(imageFile);
        intent.putExtra(MediaStore.EXTRA_OUTPUT,pictureUri);
        startActivityForResult(intent,CAMERA_REQUEST);
      }
    });
view.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
        Intent i=new Intent(MainActivity.this,Second.class);
        startActivity(i);
      }
    });
  }

private String getPictureName() {
    SimpleDateFormat sdf=new SimpleDateFormat("yyyyMMdd_HHmmss");
    String timestamp=sdf.format(new Date());
return "IMG"+timestamp+".jpg";
  }

@Override
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
super.onActivityResult(requestCode, resultCode, data);
if(resultCode==RESULT_OK){
if(requestCode==CAMERA_REQUEST){
//         Bitmap img=(Bitmap) data.getExtras().get("data");
//         imageView.setImageBitmap(img);
}
    }
  }
}
```

Second Activity.java

```
package nmit.mohan.com.camerasdcard;
import android.net.Uri;
import android.os.Environment;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.GridView;
import java.io.File;
import java.util.ArrayList;

public class Second extends AppCompatActivity {

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_second);
final GridView gv= (GridView) findViewById(R.id.gv);

    gv.setAdapter(new CustomAdapter(Second.this,getData()));
  }

private ArrayList<ImageModel> getData(){
    ArrayList<ImageModel> imgModel=new ArrayList<>();
    File DownloadFolder= Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_MOVIES);
    ImageModel im;
if(DownloadFolder.exists()){
      File []files=DownloadFolder.listFiles();

for (int i = 0; i < files.length; i++) {
        File file=files[i];
        im=new ImageModel();
        im.setName(file.getName());
        im.setUri(Uri.fromFile(file));
        imgModel.add(im);
      }
    }
return imgModel;
  }

}
```

activity_main.xml

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

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

<ImageView
android:layout_width="match_parent"
android:layout_height="451dp"
android:id="@+id/iv"/>
<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/takePic"
android:text="Take Pic"
/>
<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/viewPic"
android:text="Gallery"
/>
</LinearLayout>
```

activity_second.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="nmit.mohan.com.camerasdcard.Second">
```

```
<GridView
android:layout_width="match_parent"
android:layout_height="match_parent"
android:numColumns="2"
android:id="@+id/gv">
</GridView>
</RelativeLayout>
```

Itemlayout.xml

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

<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/itemtv"
android:text="some text"
/>

<ImageView
android:id="@+id/itemiv"
android:layout_width="135dp"
android:layout_height="160dp"
app:srcCompat="@drawable/cameraicon" />
</LinearLayout>
```

5. **Create an application to demonstrate few key features of the Android framework. In particular, the application demonstrates how to send SMS text messages.**
    a. **How to send SMS text messages.**
    b. **How to dial using an in-built dialer**
    c. **How to send email.**

MainActivity.java

```
package nmit.mohan.com.app_sms_email_phone;
import android.Manifest;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.net.Uri;
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.telephony.SmsManager;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
private static final int MY_PERMISSIONS_REQUEST_SEND_SMS = 0;
   Button sendBtn;
   Button btnSendEmail;
   Button btnPhone;
   String phoneNo;
   String message;

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

sendBtn = (Button) findViewById(R.id.btnSendSMS);

btnSendEmail = (Button) findViewById(R.id.btnSendEmail);
btnPhone = (Button) findViewById(R.id.btnDialPhone);

sendBtn.setOnClickListener(new View.OnClickListener() {
public void onClick(View view) {
        sendSMSMessage();
      }
    });

btnSendEmail.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
        sendEmail();
      }
    });

btnPhone.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
        PhoneDial();
      }
    });
  }

protected void sendEmail() {
    Intent emailIntent = new Intent(Intent.ACTION_SEND);
    emailIntent.setData(Uri.parse("mailto:"));
    emailIntent.setType("text/plain");
    emailIntent.putExtra(Intent.EXTRA_EMAIL, new String[]{"ba.mohan@gmail.com"});
    emailIntent.putExtra(Intent.EXTRA_SUBJECT, "subject Test");
    emailIntent.putExtra(Intent.EXTRA_TEXT, "Message Body Test");
    startActivity(emailIntent);
  }

protected void sendSMSMessage() {
    Intent sendIntent = new Intent(Intent.ACTION_VIEW);
    sendIntent.putExtra("sms_body", "default content");
    sendIntent.setType("vnd.android-dir/mms-sms");
    startActivity(sendIntent);
    Toast.makeText(getApplicationContext(), "SMS sent.",
        Toast.LENGTH_LONG).show();
  }

protected void PhoneDial() {
    Intent intent = new Intent(Intent.ACTION_DIAL);
    startActivity(intent);  }
  }
```

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="nmit.mohan.com.app_sms_email_phone.MainActivity">
<TextView
```

```
android:id="@+id/textView1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Sending SMS Example"
android:layout_alignParentTop="true"
android:layout_centerHorizontal="true"
android:textSize="30dp" />

<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Send Sms"
android:id="@+id/btnSendSMS"
android:layout_centerHorizontal="true"
android:layout_marginTop="48dp" />

<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Send Email"
android:id="@+id/btnSendEmail"
android:layout_below="@+id/btnSendSMS"
android:layout_centerHorizontal="true"
android:layout_marginTop="48dp" />

<Button
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Phone"
android:id="@+id/btnDialPhone"
android:layout_marginTop="54dp" />
</RelativeLayout>
```

6. **Develop an app that include broadcast Receiver to receive the miss calls from the Known number and display it to the user using notification services. This same app should also fetch phone number from the inbuilt contacts using the concept of content provider.**
   a. **How to use broadcast receiver and notifications.**
   b. **How to use content providers.**

App on Notification

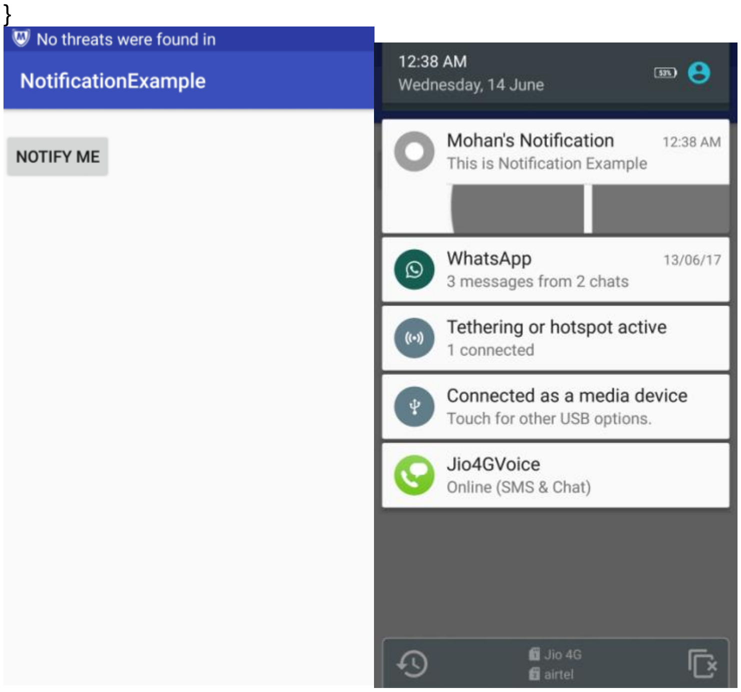
Activity_mail.xml

```
<Button
android:id="@+id/but1"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Notify Me"
tools:layout_editor_absoluteX="140dp"
tools:layout_editor_absoluteY="185dp"
android:layout_alignParentLeft="true"
android:layout_alignParentStart="true"
android:layout_marginTop="22dp" />
```

MainActivity.java

```
public class MainActivity extends AppCompatActivity {

   Button but;
@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
but=(Button) findViewById(R.id.but1);
but.setOnClickListener(new View.OnClickListener() {
```

```
@Override
public void onClick(View v) {
            Intent int1=new Intent();
            PendingIntent pi1=PendingIntent.getActivity(MainActivity.this,0,int1,0);
            Notification not1=new Notification.Builder(MainActivity.this)
                  .setTicker("Ticker Title")
                  .setContentTitle("Mohan\'s Notification")
                  .setContentText("This is Notification Example")
                  .setSmallIcon(R.drawable.icon)
                  .addAction(R.drawable.red_button,"Action 1",pi1)
                  .addAction(R.drawable.green_ball,"Action 2",pi1)
                  .setContentIntent(pi1).getNotification();
            not1.flags=Notification.FLAG_AUTO_CANCEL;
            NotificationManager nm= (NotificationManager) getSystemService(NOTIFICATION_SERVICE);
            nm.notify(0,not1);
         }
      });
   }
}
```



Mohan's Notification 12:38 AM
This is Notification Example

WhatsApp 13/06/17
3 messages from 2 chats

Tethering or hotspot active
1 connected

Connected as a media device
Touch for other USB options.

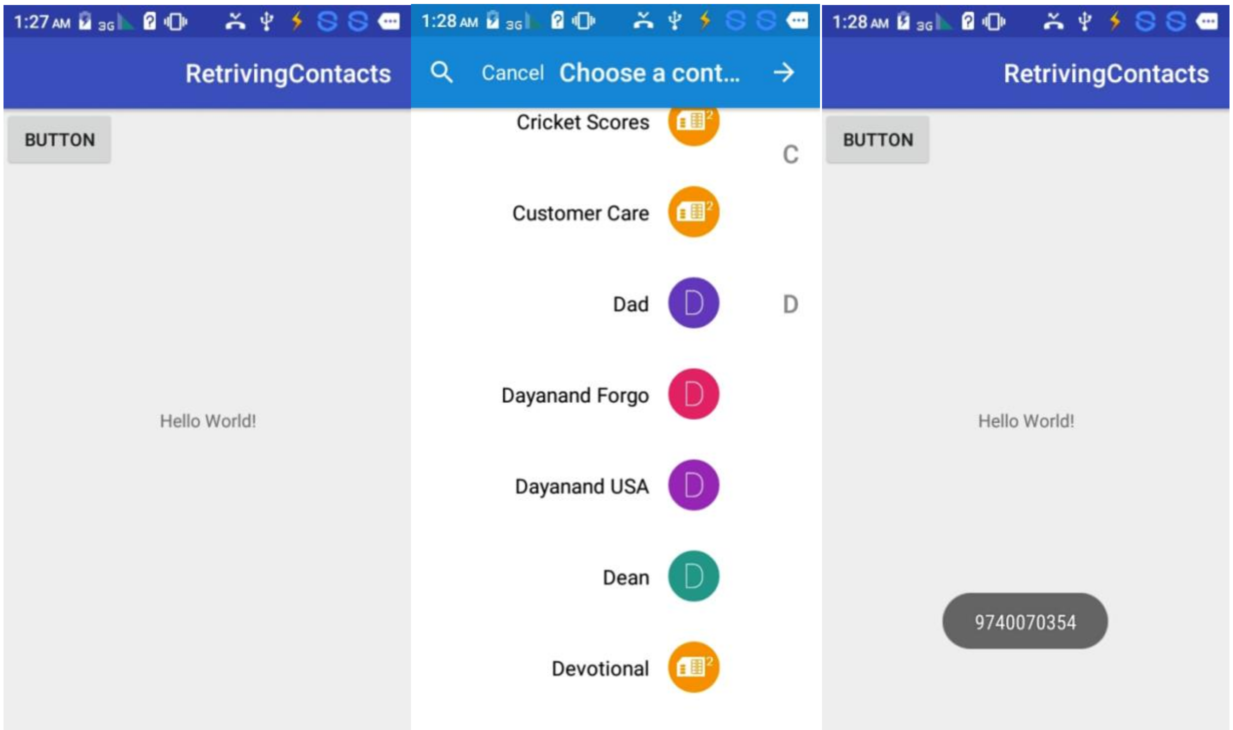
Jio4GVoice
Online (SMS & Chat)

Read Number from Contacts

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

```
package com.example.mohan.retrivingcontacts;
import android.app.Activity;
import android.content.Intent;
import android.database.Cursor;
import android.net.Uri;
import android.provider.ContactsContract;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

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

```
        Button button = (Button)findViewById(R.id.button);
        button.setOnClickListener(new View.OnClickListener()
        {
@Override
public void onClick(View v)
            {
Intent intent = new Intent(Intent.ACTION_PICK, ContactsContract.Contacts.CONTENT_URI);startActivityForResult(intent, 1);
            }
        });
    }

@Override public void onActivityResult(int reqCode, int resultCode, Intent data){ super.onActivityResult(reqCode, resultCode, data);
switch(reqCode)
        {
case (1):
if (resultCode == Activity.RESULT_OK)
                {
                    Uri contactData = data.getData();
                    Cursor c = managedQuery(contactData, null, null, null, null);
if (c.moveToFirst())
                    {
String id = c.getString(c.getColumnIndexOrThrow(ContactsContract.Contacts._ID));
String hasPhone =c.getString(c.getColumnIndex(ContactsContract.Contacts.HAS_PHONE_NUMBER));

if (hasPhone.equalsIgnoreCase("1"))
                        {
                            Cursor phones = getContentResolver().query(ContactsContract.CommonDataKinds.Phone.CONTENT_URI,null,ContactsContract.CommonDataKinds.Phone.CONTACT_ID +" = "+ id,null, null);
                            phones.moveToFirst();
String cNumber = phones.getString(phones.getColumnIndex(ContactsContract.CommonDataKinds.Phone.NUMBER));
Toast.makeText(getApplicationContext(), cNumber, Toast.LENGTH_SHORT).show();
//setCn(cNumber);
}
                    }
                }
        }
    }

}
```



7.Design an android app to fetch the JSON data from the internet and display the data using listView.

c. **Employee data is stored in the internet. (use Async Task)**

d. **When app sends the request to the server, the server should provide data in json format.**

e. **The client app should fetch this data and display using listview.**

https://api.androidhive.info/contacts/

```
{
    "contacts": [
        {
                "id": "c200",
                "name": "Ravi Tamada",
                "email": "ravi@gmail.com",
                "address": "xx-xx-xxxx,x - street, x - country",
                "gender" : "male",
                "phone": {
                    "mobile": "+91 0000000000",
                    "home": "00 000000",
                    "office": "00 000000"
                }
        },
```

Main_Activity.java

```java
public class MainActivity extends AppCompatActivity {
   Button b;
   ListView lv;
   ArrayList<HashMap<String, String>>contactList;

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

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

contactList = new ArrayList<>();
lv= (ListView) findViewById(R.id.list);
b= (Button) findViewById(R.id.fetch);
b.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
        String strUrl = "https://api.androidhive.info/contacts/";
new UrlHandler().execute(strUrl);
      }
    });
  }

public class UrlHandler extends AsyncTask<String, Integer, String> {
@Override
protected void onPostExecute(String s) {
super.onPostExecute(s);
      ListAdapter adapter = new SimpleAdapter(MainActivity.this, contactList,
          R.layout.list_item, new String[]{ "id","name","email"},
new int[]{R.id.cid,R.id.cname, R.id.cemail});
lv.setAdapter(adapter);
    }

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

      String json_response = null;
try {
        URL url = new URL(params[0]);
        HttpURLConnection connection = (HttpURLConnection) url.openConnection();
        connection.setRequestMethod("GET");
        connection.connect();
        InputStream in = new BufferedInputStream(connection.getInputStream());
        json_response = convertStreamToString(in);

if (json_response != null) {
try {
            JSONObject jsonObj = new JSONObject(json_response);

// Getting JSON Array node
JSONArray contacts = jsonObj.getJSONArray("contacts");

// looping through All Contacts
for (int i = 0; i < contacts.length(); i++) {
              JSONObject c = contacts.getJSONObject(i);
              String id = c.getString("id");
              String name = c.getString("name");
              String email = c.getString("email");

// tmp hash map for single contact
HashMap<String, String> contact = new HashMap<>();

// adding each child node to HashMap key => value
contact.put("id", id);
              contact.put("name", name);
              contact.put("email", email);
// adding contact to contact list
contactList.add(contact);
            }
          } catch (JSONException e) {
            Log.e("error", "Json parsing error: " + e.getMessage());
          }
        } else {
          Log.e("error", "Couldn't get json from server.");
        }
      } catch (MalformedURLException e) {
        e.printStackTrace();
      } catch (IOException e) {
        e.printStackTrace();
      }
return null;
    }
private String convertStreamToString(InputStream is) {
      BufferedReader reader = new BufferedReader(new InputStreamReader(is));
      StringBuilder sb = new StringBuilder();

      String line;
try {
while ((line = reader.readLine()) != null) {
          sb.append(line).append('\n');
        }
      } catch (IOException e) {
        e.printStackTrace();
      }
return sb.toString();
    }
  }
}
```

activity_main.xml

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

<Button
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:text="Fetch Data"
android:id="@+id/fetch"
/>

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

```
android:id="@+id/list"
></ListView>
</LinearLayout>
```

list_item.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:id="@+id/cid"
/>
<TextView
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/cname"
/>
<TextView
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/cemail"
/>
</LinearLayout>
```

Android_Mainfest.xml

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

8.Develop an android app on Google Map, and should provide following functions.

a. **How to incorporate Google Maps into an application.**
b. **How to register for and receive GPS location information.**
c. **How to create Google Maps Overlays.**
d. **Accept city name from user and marks it on map.**
e. **Explore features like Zoom and map types.**

MapsActivity.java

```
package com.example.mohan.demomaps;
import android.Manifest;
import android.content.pm.PackageManager;
import android.location.Address;
import android.location.Geocoder;
import android.support.v4.app.ActivityCompat;
import android.support.v4.app.FragmentActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
import com.google.android.gms.maps.CameraUpdateFactory;
import com.google.android.gms.maps.GoogleMap;
import com.google.android.gms.maps.OnMapReadyCallback;
import com.google.android.gms.maps.SupportMapFragment;
import com.google.android.gms.maps.model.LatLng;
import com.google.android.gms.maps.model.MarkerOptions;
import java.io.IOException;
import java.util.List;
```

```
public class MapsActivity extends FragmentActivity implements OnMapReadyCallback {
private GoogleMap mMap;
private TextView tv;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_maps);
// Obtain the SupportMapFragment and get notified when the map is ready to be used.
SupportMapFragment mapFragment = (SupportMapFragment) getSupportFragmentManager()
        .findFragmentById(R.id.map);
    mapFragment.getMapAsync(this);
  }

@Override
public void onMapReady(GoogleMap googleMap) {
mMap = googleMap;
// Add a marker in Sydney and move the camera
LatLng sydney = new LatLng(-35, 121.5);
mMap.addMarker(new MarkerOptions().position(sydney).title("Marker"));
mMap.moveCamera(CameraUpdateFactory.newLatLng(sydney));
  }

public void setmMap(GoogleMap mMap) {
this.mMap = mMap;    }

public void onSearch(View view) {
    List<Address> addressList=null;
    EditText et_location= (EditText) findViewById(R.id.et1);
    String location=et_location.getText().toString();
if(location!=null || location.equals("")){
      Geocoder geocoder=new Geocoder(this);
try {
        addressList= geocoder.getFromLocationName(location,1);
      } catch (IOException e) {    e.printStackTrace();     }

      Address address=addressList.get(0);
      LatLng latLng=new LatLng(address.getLatitude(),address.getLongitude());
mMap.addMarker(new MarkerOptions().position(latLng).title(location));
mMap.animateCamera(CameraUpdateFactory.newLatLng(latLng ));
    }
  }

public void onType(View view) {
if(mMap.getMapType()== GoogleMap.MAP_TYPE_NORMAL){
mMap.setMapType(GoogleMap.MAP_TYPE_SATELLITE);
    }else{mMap.setMapType(GoogleMap.MAP_TYPE_NORMAL);       }
  }

public void onZoom(View view) {
if(view.getId()==R.id.zoomin){
mMap.animateCamera(CameraUpdateFactory.zoomIn());
    }if(view.getId()==R.id.zoomout){mMap.animateCamera(CameraUpdateFactory.zoomOut());
    }
  }
}
```

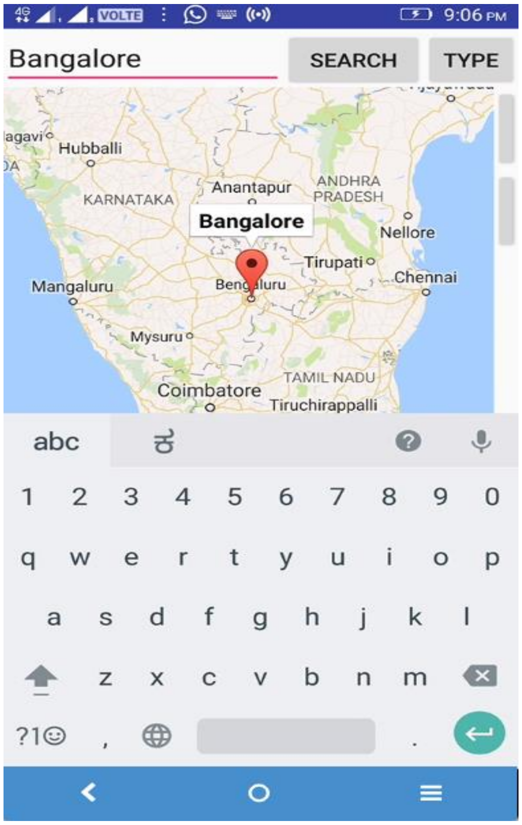
Activity_maps.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
android:layout_width="match_parent"
android:orientation="vertical"
android:layout_height="400dp">
<LinearLayout
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:orientation="horizontal"
android:id="@+id/ll1">

<EditText
android:id="@+id/et1"
android:layout_width="196dp"
android:layout_height="wrap_content" />

<Button
android:id="@+id/searchbut"
android:layout_width="98dp"
android:layout_height="wrap_content"
android:onClick="onSearch"
android:text="Search" />

<Button
android:id="@+id/typebut"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="onType"
android:text="Type" />

</LinearLayout>
<LinearLayout
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:orientation="horizontal"
android:layout_below="@id/ll1"
android:id="@+id/linearLayout"
android:layout_alignParentBottom="true">

<fragment xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/map" android:layout_below="@id/ll1"
android:name="com.google.android.gms.maps.SupportMapFragment"
android:layout_width="343dp"
android:layout_height="match_parent"
tools:context="com.example.mohan.demomaps.MapsActivity" />

<LinearLayout
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:orientation="vertical">

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

```
android:layout_height="69dp"
android:onClick="onZoom"
android:text="+" />

<Button
android:id="@+id/zoomout"
android:layout_width="wrap_content"
android:layout_height="68dp"
android:onClick="onZoom"
android:text="-" />
</LinearLayout>
</LinearLayout>
</RelativeLayout>
```

AndroidMainfest.xml

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

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

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

<!-- The API key for Google Maps-based APIs is defined as a string resource.          (See the file
"res/values/google_maps_api.xml"). Note that the API key is linked to the encryption key used to sign the APK. You need
a different API key for each encryption key, including the release key that is used to sign the APK for publishing.
You can define the keys for the debug and release targets in src/debug/ and src/release/.
       -->
<meta-data
android:name="com.google.android.geo.API_KEY"
android:value="@string/google_maps_key" />
<activity
android:name=".MapsActivity"
android:label="@string/title_activity_maps">
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>
</application>
</manifest>
```



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