

## 1. Write a program to create a hello world activity using all lifecycles methods to display messages using Log.d

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

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:tools="http://schemas.android.com/tools"

android:layout_width="match_parent"

android:layout_height="match_parent"

android:background="@color/teal_200"

tools:context=".MainActivity">

<TextView

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:text="Hello World!"

    android:textSize="25sp"

    android:textColor="@color/black"

    app:layout_constraintBottom_toBottomOf="parent"

    app:layout_constraintEnd_toEndOf="parent"

    app:layout_constraintStart_toStartOf="parent"

    app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>

package com.example.activitydemo;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;

import android.util.Log;

public class MainActivity extends AppCompatActivity {

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        Log.d("message", "onCreate Event");

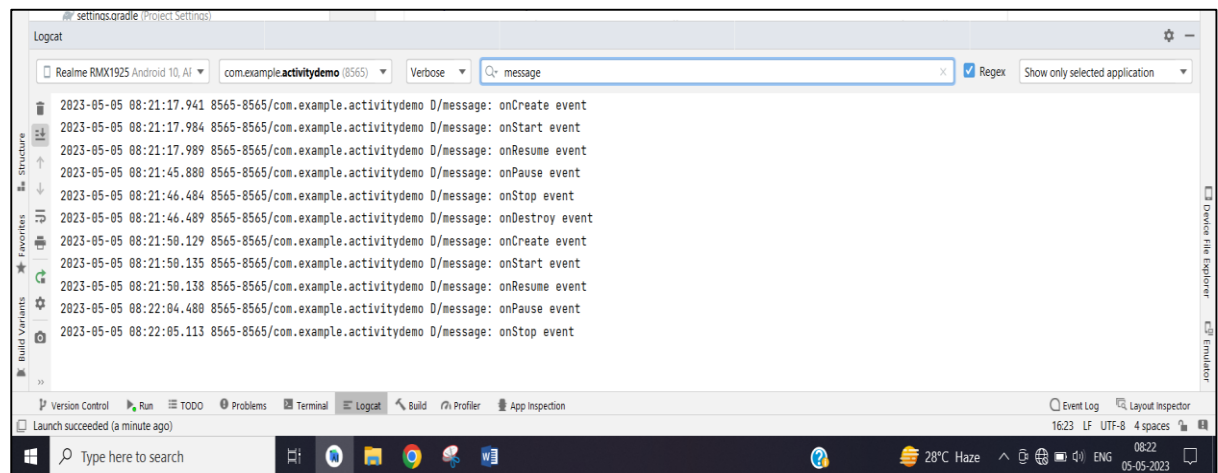
    }

}
```

```

protected void onStart() {
    super.onStart();
    Log.d("message","onStart Event"); }
protected void onResume() {
    super.onResume();
    Log.d("message","onResume Event");}
protected void onPause() {
    super.onPause();
    Log.d("message","onPause Event");}
protected void onStop() {
    super.onStop();
    Log.d("message","onStop Event");}
protected void onRestart(){
    super.onRestart();
    Log.d("message","onRestart Event");}
protected void onDestroy() {
    super.onDestroy();
    Log.d("message","onDestroy Event");}
}

```



1. Write a program to create a text field and a button "Navigate". When you enter [www.google.com](http://www.google.com) and press navigate button it should open google app

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

    <EditText
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:hint="enter URL"
        android:layout_marginLeft="80dp"
        android:textSize="25sp"
        android:id="@+id/t1"
        android:layout_marginTop="200dp"
    ></EditText>

    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:text="Navigate"
        android:textSize="25sp"
        android:backgroundTint="@color/black"
        android:layout_marginTop="100dp"
        android:onClick="call"
        android:layout_marginLeft="80dp"></Button>

</LinearLayout>

package com.example.googlenavigation;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
    EditText t1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        t1=findViewById(R.id.t1);
    }
}
```

```

        public void call(View view) {
            Intent i1=new Intent(Intent.ACTION_VIEW, Uri.parse(t1.getText().toString()));
            startActivity(i1);
        }
    }
}

```

## 2. Write a program to create button “Start Dialer”. When u click on this button it should open the phone dialer

```

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

```

```

    <EditText
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:hint="enter phone"
        android:layout_marginTop="200dp"
        android:layout_marginLeft="80dp"
        android:id="@+id/t1"
    ></EditText>

```

```

    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:text="Call"
        android:textSize="25sp"
        android:backgroundTint="@color/black"
        android:layout_marginTop="100dp"
        android:layout_marginLeft="80dp"
        android:onClick="call"
    ></Button>

```

```

</LinearLayout>
package com.example.intentdailer;

```

```

import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

```

```

public class MainActivity extends AppCompatActivity {
    EditText t1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

    }

    public void call(View view) {
        t1=findViewById(R.id.t1);
        Toast.makeText(this, "clicked", Toast.LENGTH_SHORT).show();
        Uri uri= Uri.parse("tel:" + t1.getText().toString());
        Intent i1=new Intent(Intent.ACTION_DIAL,uri);
        try{
            startActivity(i1);

        }
        catch (SecurityException s){
            Toast.makeText(this, "error", Toast.LENGTH_SHORT).show();
        }
    }
}

```

**3. Write a program to create two screens. First screen will take one number input from user. After click on factorial button, second screen will open and it should display factorial of the same number. Also specify which type of intent you will use in this case**

In this case we will use explicit intent to jump from one activity to another activity and pass information among them

```

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

    <EditText
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginLeft="80dp"
        android:layout_marginTop="100dp"
        android:hint="enter a number"
        android:id="@+id/e1"
        android:textSize="25sp"
    ></EditText>

    <Button

```

```

        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginLeft="80dp"
        android:text="Factorial"
        android:textSize="25sp"
        android:onClick="show"
        android:id="@+id/b1"
        android:backgroundTint="@color/black"
        android:layout_marginTop="100dp"></Button>

</LinearLayout>
package com.example.intentfactorial;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    private EditText e1;
    private Bundle bundle;
    private Button b1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        e1 = findViewById(R.id.e1);
        b1=findViewById(R.id.b1);
        bundle = new Bundle();
    }

    public void show(View view) {
        switch(view.getId())
        {
            case R.id.b1:
                int val=Integer.parseInt(e1.getText().toString());
                bundle.putInt("nval",val);
                Intent intent=new Intent(this,MainActivity2.class);
                intent.putExtras(bundle);
                startActivity(intent);
                break;
        }
    }
}

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

```

```

xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity2">

<TextView
    android:layout_width="200dp"
    android:layout_height="50dp"
    android:textSize="25sp"
    android:layout_marginLeft="80dp"
    android:layout_marginTop="300dp"
    android:id="@+id/t1"></TextView>

</LinearLayout>
package com.example.intentfactorial;

import androidx.appcompat.app.AppCompatActivity;

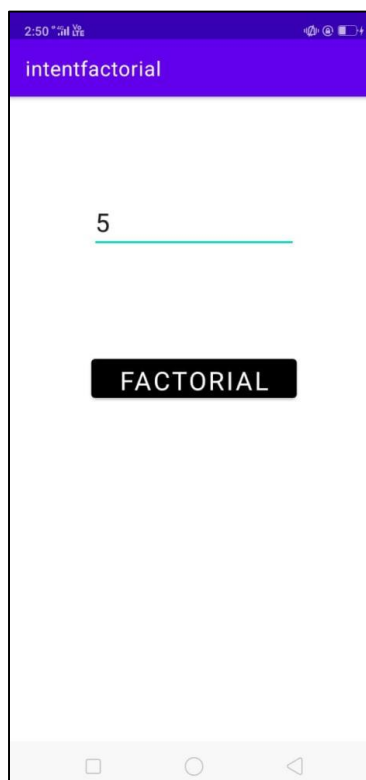
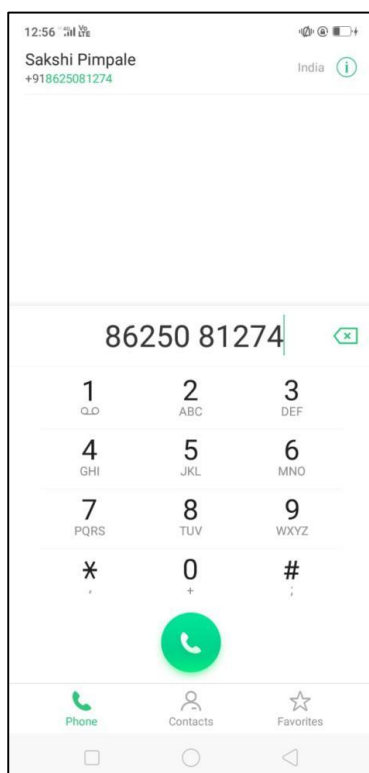
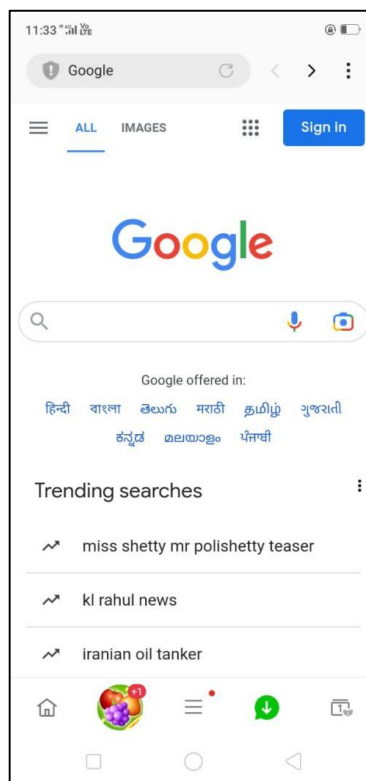
import android.content.Intent;
import android.os.Bundle;
import android.widget.TextView;

public class MainActivity2 extends AppCompatActivity {
    TextView t1;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
        t1=findViewById(R.id.t1);
        Intent intent=getIntent();
        Bundle bundle=intent.getExtras();
        int val=bundle.getInt("nval");
        int fact=1;
        for(int i=1 ; i<=val ; i++){
            fact=(fact*i);

        }
        String txt=Integer.toString(fact);
        t1.setText("Factorial : " +txt);
    }
}

```





## 1. Write a program to create your own content provider to insert and access data in android application

```
<?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="Name"
        android:layout_marginLeft="100dp"
        android:layout_marginTop="100dp"/>
    <EditText
        android:id="@+id/txtName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="100dp"
        android:ems="10"/>
    <Button
        android:id="@+id/btnAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onClickAddDetails"
        android:layout_marginLeft="100dp"
        android:text="Add User"/>
    <Button
        android:id="@+id/btnRetrieve"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:onClick="onClickShowDetails"
        android:layout_marginLeft="100dp"
        android:text="Show Users"/>
    <TextView android:id="@+id/res"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="100dp"
        android:clickable="false"
        android:ems="10"/>
</LinearLayout>
```

```
package com.example.contentprovider;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.net.Uri;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.MotionEvent;
import android.view.View;
import android.view.inputmethod.InputMethodManager;
```

```

import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
    @Override
    public boolean onTouchEvent(MotionEvent event) {
        InputMethodManager imm = (InputMethodManager)
getSystemService(Context.INPUT_METHOD_SERVICE);
        imm.hideSoftInputFromWindow(getCurrentFocus().getWindowToken(), 0);
        return true;
    }
    public void onClickAddDetails(View view) {
        ContentValues values = new ContentValues();
        values.put(UsersProvider.name, ((EditText)
findViewById(R.id.txtName)).getText().toString());
        getContentResolver().insert(UsersProvider.CONTENT_URI, values);
        Toast.makeText(getBaseContext(), "New Record Inserted",
Toast.LENGTH_LONG).show();
    }

    public void onClickShowDetails(View view) {
        // Retrieve employee records
        TextView resultView = (TextView) findViewById(R.id.res);
        Cursor cursor =
getContentResolver().query(Uri.parse("content://com.example.contentprovider.UsersProvider
/users"), null, null, null, null);
        if (cursor.moveToFirst()) {
            StringBuilder strBuild = new StringBuilder();
            while (!cursor.isAfterLast()) {
                strBuild.append("\n" + cursor.getString(cursor.getColumnIndexOrThrow("id")) + "-"
+ cursor.getString(cursor.getColumnIndexOrThrow("name")));
                cursor.moveToNext();
            }
            resultView.setText(strBuild);
        } else {
            resultView.setText("No Records Found");
        }
    }
}

```

```

<provider
    android:authorities="com.example.contentprovider.UsersProvider"
    android:name=".UsersProvider">
</provider>

```

Java2 Code –

```

package com.example.contentprovider;
import android.content.ContentProvider;

```

```

import android.content.ContentUris;
import android.content.ContentValues;
import android.content.Context;
import android.content.UriMatcher;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteException;
import android.database.sqlite.SQLiteOpenHelper;
import android.database.sqlite.SQLiteQueryBuilder;
import android.net.Uri;
import java.util.HashMap;

public class UsersProvider extends ContentProvider {
    static final String PROVIDER_NAME = "com.example.contentprovider.UsersProvider";
    static final String URL = "content://" + PROVIDER_NAME + "/users";
    static final Uri CONTENT_URI = Uri.parse(URL);
    static final String id = "id";
    static final String name = "name";
    static final int uriCode = 1;
    static final UriMatcher uriMatcher;
    private static HashMap<String, String> values;
    static {
        uriMatcher = new UriMatcher(UriMatcher.NO_MATCH);
        uriMatcher.addURI(PROVIDER_NAME, "users", uriCode);
        uriMatcher.addURI(PROVIDER_NAME, "users/*", uriCode);
    }
    @Override
    public String getType(Uri uri) {
        switch (uriMatcher.match(uri)) {
            case uriCode:
                return "vnd.android.cursor.dir/users";
            default:
                throw new IllegalArgumentException("Unsupported URI: " + uri);
        }
    }
    @Override
    public boolean onCreate() {
        Context context = getContext();
        DatabaseHelper dbHelper = new DatabaseHelper(context);
        db = dbHelper.getWritableDatabase();
        if (db != null) {
            return true;
        }
        return false;
    }
    @Override
    public Cursor query(Uri uri, String[] projection, String selection, String[] selectionArgs,
String sortOrder) {
        SQLiteQueryBuilder qb = new SQLiteQueryBuilder();

        qb.setTables(TABLE_NAME);
        switch (uriMatcher.match(uri)) {
            case uriCode:
                qb.setProjectionMap(values);
                break;
            default:

```

```

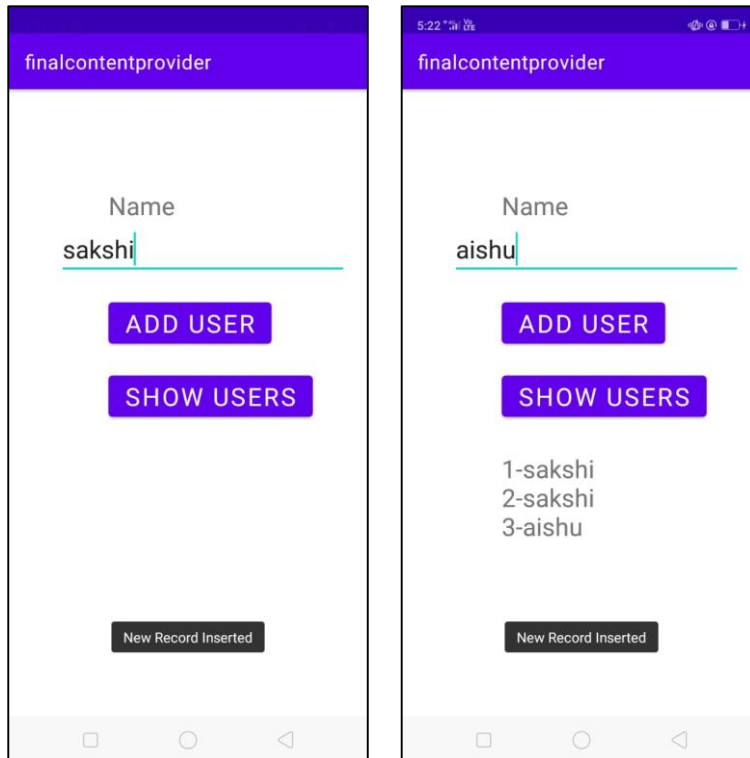
        throw new IllegalArgumentException("Unknown URI " + uri);
    }
    if (sortOrder == null || sortOrder == "") {
        sortOrder = id;
    }
    Cursor c = qb.query(db, projection, selection, selectionArgs, null, null, sortOrder);
    c.setNotificationUri(getContext().getContentResolver(), uri);
    return c;
}
@Override
public Uri insert(Uri uri, ContentValues values) {
    long rowID = db.insert(TABLE_NAME, "", values);
    if (rowID > 0) {
        Uri _uri = ContentUris.withAppendedId(CONTENT_URI, rowID);
        getContext().getContentResolver().notifyChange(_uri, null);
        return _uri;
    }
    throw new SQLException("Failed to add a record into " + uri);
}
@Override
public int update(Uri uri, ContentValues values, String selection, String[] selectionArgs) {
    int count = 0;
    switch (uriMatcher.match(uri)) {
        case uriCode:
            count = db.update(TABLE_NAME, values, selection, selectionArgs);
            break;
        default:
            throw new IllegalArgumentException("Unknown URI " + uri);
    }
    getContext().getContentResolver().notifyChange(uri, null);
    return count;
}
@Override
public int delete(Uri uri, String selection, String[] selectionArgs) {
    int count = 0;
    switch (uriMatcher.match(uri)) {
        case uriCode:
            count = db.delete(TABLE_NAME, selection, selectionArgs);
            break;
        default:
            throw new IllegalArgumentException("Unknown URI " + uri);
    }
    getContext().getContentResolver().notifyChange(uri, null);
    return count;
}
private SQLiteDatabase db;
static final String DATABASE_NAME = "EmpDB";
static final String TABLE_NAME = "Employees";
static final int DATABASE_VERSION = 1;
static final String CREATE_DB_TABLE = "CREATE TABLE " + TABLE_NAME + "
(id INTEGER PRIMARY KEY AUTOINCREMENT, " + " name TEXT NOT NULL);";
private static class DatabaseHelper extends SQLiteOpenHelper {
    DatabaseHelper(Context context) {
        super(context, DATABASE_NAME, null, DATABASE_VERSION);
    }
}

```

```

@Override
public void onCreate(SQLiteDatabase db) {
    db.execSQL(CREATE_DB_TABLE);
}
@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
    db.execSQL("DROP TABLE IF EXISTS " + TABLE_NAME);
    onCreate(db);
}
}
}

```



## 1. Write a program to start a Wi-Fi using service

Permissions to be included in AndroidManifest.xml

```
<uses-permission android:name="android.permission.ACCESS_WIFI_STATE"/>
<uses-permission android:name="android.permission.INTERNET"/>
<uses-permission android:name="android.permission.CHANGE_WIFI_STATE"/>
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:text="START WIFI"
        android:textSize="20sp"
        android:layout_gravity="center"
        android:layout_marginTop="200dp"
        android:id="@+id/b1"
        android:backgroundTint="@color/black"></Button>
</LinearLayout>
```

```
package com.example.wifi;
import androidx.appcompat.app.AppCompatActivity;
import android.net.wifi.WifiManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
```

```

WifiManager wm;

Button b1;

@Override

protected void onCreate(Bundle savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.activity_main);


    b1=findViewById(R.id.b1);

    b1.setOnClickListener(new View.OnClickListener() {

        @Override

        public void onClick(View view) {

            wm=(WifiManager) getApplicationContext().getSystemService(WIFI_SERVICE);

            wm.setWifiEnabled(true);

            Toast.makeText(getApplicationContext(),"WiFi
Enabled",Toast.LENGTH_LONG).show();

        }

    });

}

}

```

## 2. Write a program to display following output

```

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

    <TextView
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginTop="100dp"
        android:layout_marginLeft="60dp"></TextView>

    <Button
        android:layout_width="250dp"
        android:layout_height="50dp"
        android:text="Start Service"
        android:layout_marginLeft="60dp"

```

```

        android:layout_marginTop="50dp"
        android:backgroundTint="@color/black"
        android:id="@+id/b1"
        android:onClick="b1"
        android:textSize="25sp"></Button>
<Button
    android:layout_width="250dp"
    android:layout_height="50dp"
    android:text="Stop Service"
    android:layout_marginLeft="60dp"
    android:layout_marginTop="50dp"
    android:backgroundTint="@color/black"
    android:id="@+id/b2"
    android:onClick="b2"
    android:textSize="25sp"></Button>

</LinearLayout>

package com.example.wifiservice;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
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 b1(View view) {
        startService(new Intent(this, NewService.class));
    }

    public void b2(View view) {
        stopService(new Intent(this, NewService.class));
    }
}

package com.example.wifiservice;

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

import androidx.annotation.Nullable;

```



```

import java.security.Provider;
import java.util.List;
import java.util.Map;

public class NewService extends Service {
    private MediaPlayer player;
    @Override

    public int onStartCommand(Intent intent,int flags,int startId){
        player=MediaPlayer.create(this,R.raw.wave);
        player.setLooping(true);
        player.start();
        Toast.makeText(this, "service started", Toast.LENGTH_SHORT).show();
        return START_STICKY;
    }
    @Override
    public void onDestroy(){
        super.onDestroy();
        player.stop();
        Toast.makeText(this, "service stopped", Toast.LENGTH_SHORT).show();
    }

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

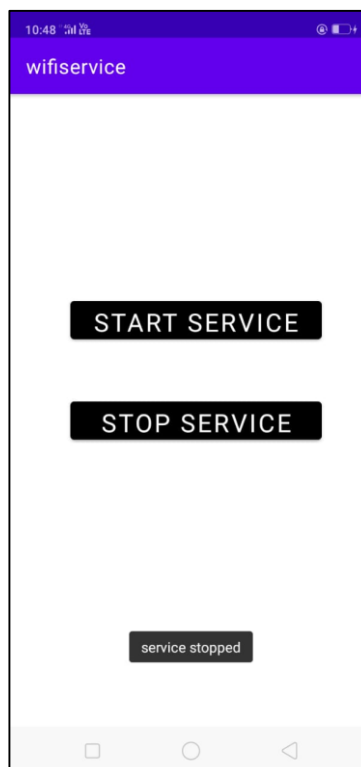
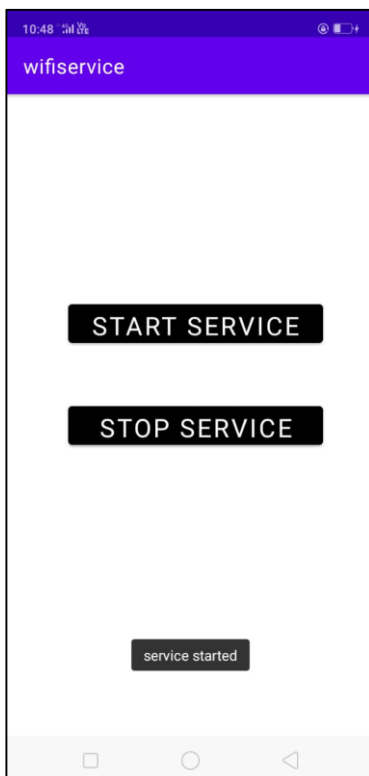
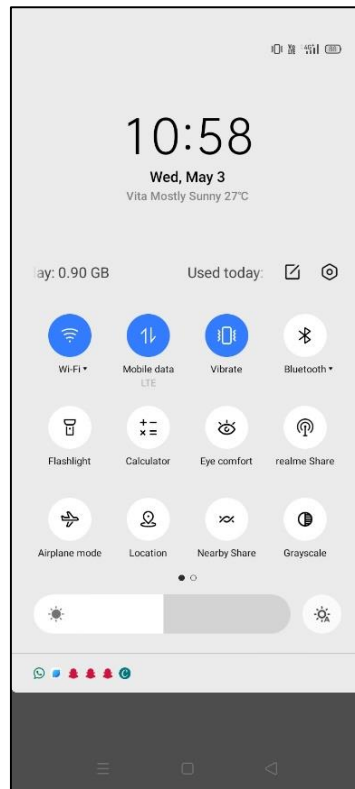
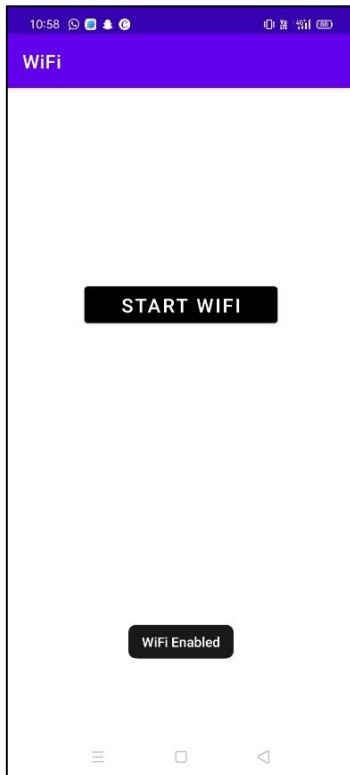
```

.Manifest file

```

<service android:name=".NewService"/>

```



## 1. Write a program to demonstrate all the system broadcast messages

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="#F6D4D4"
    tools:context=".MainActivity">
</LinearLayout>
```

```
package com.example.broadcastexample;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.content.IntentFilter;
import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    MyReceiver mr;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        IntentFilter if1=new IntentFilter();
        if1.addAction(Intent.ACTION_POWER_CONNECTED);
        if1.addAction(Intent.ACTION_POWER_DISCONNECTED);
        if1.addAction(Intent.ACTION_BATTERY_CHANGED);
        if1.addAction(Intent.ACTION_BATTERY_LOW);
        if1.addAction(Intent.ACTION_BATTERY_OKAY);
        if1.addAction(Intent.ACTION_CALL);
        if1.addAction(Intent.ACTION_BUG_REPORT);
```

```

        mr=new MyReceiver();
        registerReceiver(mr,if1);
        Toast.makeText(this,"ITS WORKING",Toast.LENGTH_SHORT).show();
    }

    public void onStop() {
        super.onStop();
        unregisterReceiver(mr); }
    }

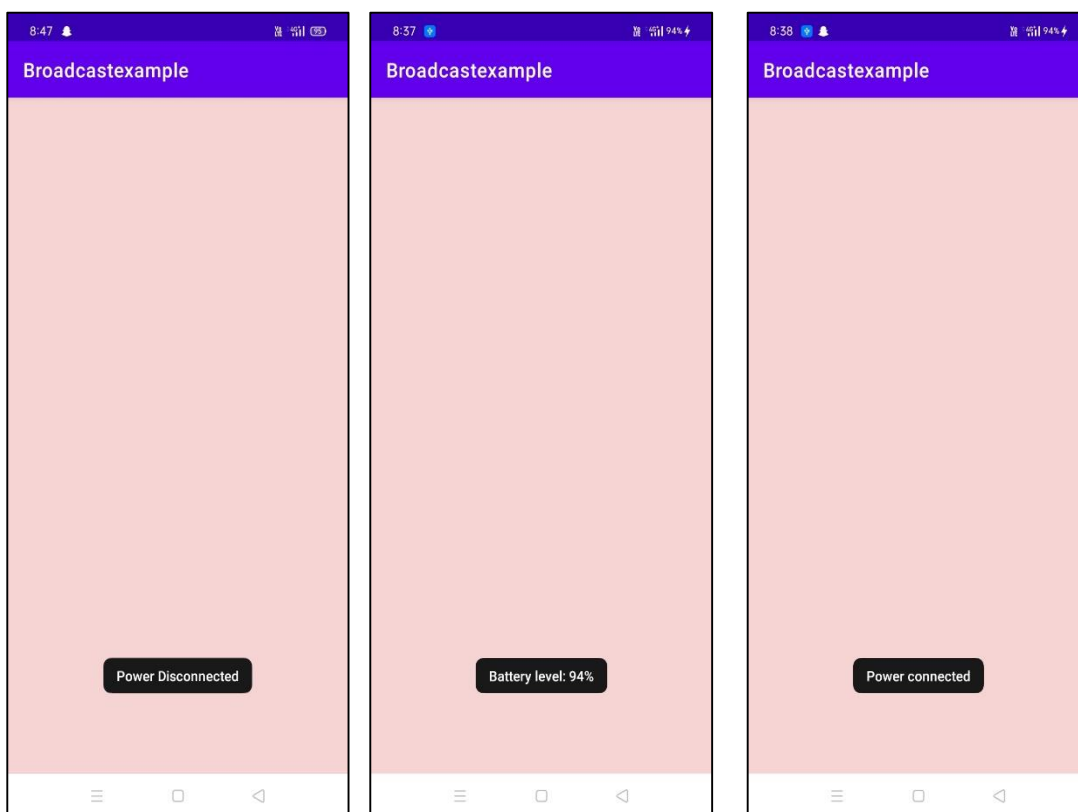
package com.example.broadcastexample;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.util.Log;
import android.widget.Toast;
public class MyReceiver extends BroadcastReceiver {
    @Override
    public void onReceive(Context context, Intent intent) {
        String action=intent.getAction();
        if(action.equals(Intent.ACTION_BATTERY_LOW))
        {
            int level=intent.getIntExtra("level",0);
            Toast.makeText(context,"Battery level: "+level+"%",Toast.LENGTH_SHORT).show();
        }
        if(action.equals(Intent.ACTION_BATTERY_CHANGED))
        {
            int level=intent.getIntExtra("level",0);
            Toast.makeText(context,"Battery level: "+level+"%",Toast.LENGTH_SHORT).show();
        }
        if(action.equals(Intent.ACTION_BATTERY_OKAY))
        {
            int level=intent.getIntExtra("level",0);
            Toast.makeText(context,"Battery level: "+level+"%",Toast.LENGTH_SHORT).show();
        }
    }
}

```

```

        if(action.equals(Intent.ACTION_POWER_CONNECTED))
        {
            Toast.makeText(context,"Power connected",Toast.LENGTH_SHORT).show();
        }
        if(action.equals(Intent.ACTION_POWER_DISCONNECTED))
        {
            Toast.makeText(context,"Power Disconnected",Toast.LENGTH_SHORT).show();
        }
        if(action.equals(Intent.ACTION_CALL))
        {
            Toast.makeText(context,"CALL RECEIVED",Toast.LENGTH_SHORT).show();
        }
        if(action.equals(Intent.ACTION_BUG_REPORT))
        {
            Toast.makeText(context,"RECEIVED BUG REPORT",Toast.LENGTH_SHORT).show();
        }
    }
}

```



## 1. Write a program to changes the background color when device is Shuffled

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

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:textSize="25sp"
        android:text="" />

</RelativeLayout>

package com.example.sensorshuffled;

import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity;
import android.graphics.Color;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;

public class MainActivity extends Activity implements SensorEventListener {
    private SensorManager sensorManager;
    private boolean isColor = false;
    private View view;
    private long lastUpdate;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        view = findViewById(R.id.textView);
        view.setBackgroundColor(Color.BLUE);
        sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
        lastUpdate = System.currentTimeMillis();
    }

    @Override
    public void onSensorChanged(SensorEvent event) {
        if (event.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
            getAccelerometer(event);
        }
    }
}
```

```

@Override
public void onAccuracyChanged(Sensor sensor, int i) {}
private void getAccelerometer(SensorEvent event) {
    float[] values = event.values;
    // Movement
    float x = values[0];
    float y = values[1];
    float z = values[2];

    float accelerationSquareRoot = (x * x + y * y + z * z)
        / (SensorManager.GRAVITY_EARTH * SensorManager.GRAVITY_EARTH);

    long actualTime = System.currentTimeMillis();
    Toast.makeText(getApplicationContext(),String.valueOf(accelationSquareRoot)+" "+
        SensorManager.GRAVITY_EARTH, Toast.LENGTH_SHORT).show();

    if (accelationSquareRoot >= 2) //it will be executed if you shuffle
    {

        if (actualTime - lastUpdate < 200) {
            return;
        }
        lastUpdate = actualTime;//updating lastUpdate for next shuffle
        if (isColor) {
            view.setBackgroundColor(Color.YELLOW);

        } else {
            view.setBackgroundColor(Color.RED);
        }
        isColor = !isColor;
    }
}
protected void onResume() {
    super.onResume();

    sensorManager.registerListener(this,sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER),
        SensorManager.SENSOR_DELAY_NORMAL);
}
protected void onPause() {
    super.onPause();
    sensorManager.unregisterListener(this);
}
}

```

## 2. Write a program to display the list of sensors supported by the mobile devices

```

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

```

```

        android:orientation="vertical"
        tools:context=".MainActivity">
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="LIST OF ALL SENSORS"
    android:textSize="25sp"
    android:textColor="@color/black"
    android:layout_gravity="center"
    android:layout_marginTop="40dp"></TextView>
<ScrollView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:layout_marginTop="40dp">
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/t1"
            android:textColor="@color/black"></TextView>
        </LinearLayout>
    </ScrollView>

</LinearLayout>

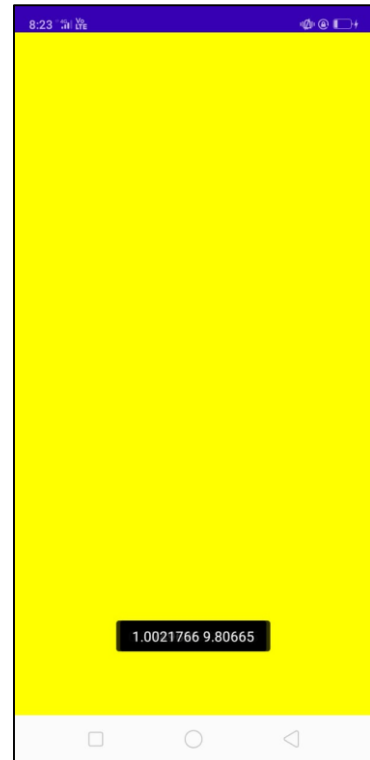
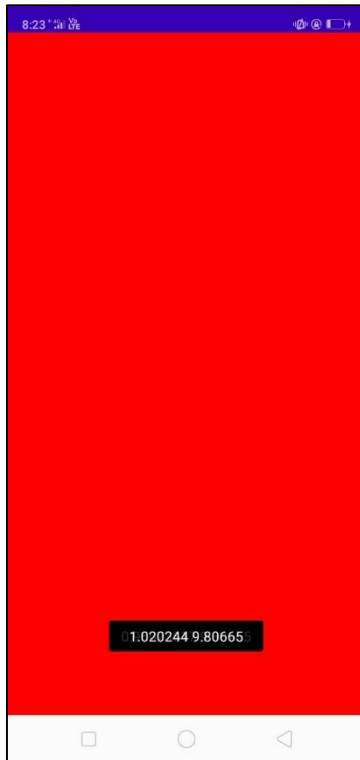
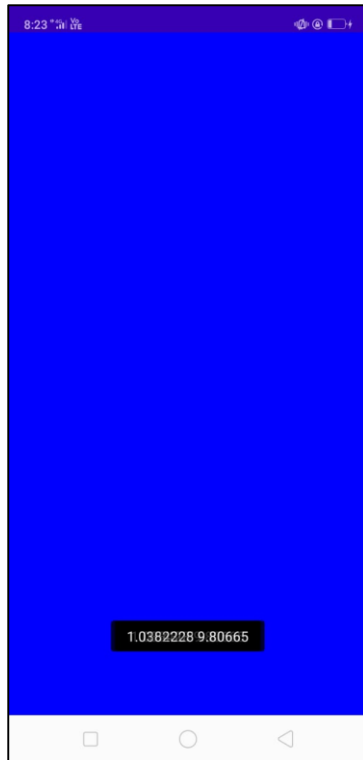
package com.example.allsensorsdemo;

import androidx.appcompat.app.AppCompatActivity;
import android.hardware.Sensor;
import android.hardware.SensorManager;
import android.os.Bundle;
import android.widget.TextView;
import java.util.List;

public class MainActivity extends AppCompatActivity {
    SensorManager sm;
    TextView t1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        sm=(SensorManager) getSystemService(SENSOR_SERVICE);
        List<Sensor> deviceSensors=sm.getSensorList(Sensor.TYPE_ALL);
        t1=findViewById(R.id.t1);
        for (Sensor sensors:deviceSensors)
        {
            t1.append(sensors.toString()+"\n\n");
        }
    }
}

```





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allsensorsdemo

### LIST OF ALL SENSORS

{Sensor name="icm4x6xx Accelerometer Non-wakeup", vendor="TDK-Invensense", version=293, type=1, maxRange=156.9064, resolution=0.0047884034, power=0.24, minDelay=5000}

{Sensor name="ak0991x Magnetometer Non-wakeup", vendor="akm", version=131130, type=2, maxRange=4912.0, resolution=0.15, power=1.1, minDelay=10000}

{Sensor name="Rotation Vector Non-wakeup", vendor="qualcomm", version=1, type=3, maxRange=1.0, resolution=0.01, power=1.415, minDelay=5000}

{Sensor name="icm4x6xx Gyroscope Non-wakeup", vendor="TDK-Invensense", version=293, type=4, maxRange=34.905556, resolution=0.001065233, power=0.57, minDelay=5000}

{Sensor name="tsl2540 Ambient Light Sensor Non-wakeup", vendor="ams AG", version=256, type=5, maxRange=1.0, resolution=0.01, power=0.08, minDelay=0}

{Sensor name="tsl2540 Ambient Light Sensor Wakeup", vendor="ams AG", version=256, type=5, maxRange=1.0, resolution=0.01, power=0.08, minDelay=0}

{Sensor name="stk\_stk3x3x Proximity Sensor Non-wakeup", vendor="sensortek", version=317, type=8, maxRange=5.0, resolution=0.0, power=0.1, minDelay=0}

{Sensor name="stk\_stk3x3x Proximity Sensor Wakeup", vendor="sensortek", version=317, type=8, maxRange=5.0, resolution=0.0, power=0.1, minDelay=0}

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allsensorsdemo

### LIST OF ALL SENSORS

{Sensor name="gravity Non-wakeup", vendor="qualcomm", version=1, type=9, maxRange=156.99008, resolution=0.01, power=0.515, minDelay=5000}

{Sensor name="linear\_acceleration", vendor="qualcomm", version=1, type=10, maxRange=156.99008, resolution=0.01, power=0.515, minDelay=5000}

{Sensor name="Rotation Vector Non-wakeup", vendor="qualcomm", version=1, type=11, maxRange=1.0, resolution=0.01, power=1.415, minDelay=5000}

{Sensor name="ak0991x Magnetometer-Uncalibrated Non-wakeup", vendor="akm", version=131130, type=14, maxRange=4912.0, resolution=0.15, power=1.1, minDelay=10000}

{Sensor name="Game Rotation Vector Non-wakeup", vendor="qualcomm", version=1, type=15, maxRange=1.0, resolution=0.01, power=0.515, minDelay=5000}

{Sensor name="icm4x6xx Gyroscope-Uncalibrated Non-wakeup", vendor="TDK-Invensense", version=293, type=16, maxRange=34.905556, resolution=0.001065233, power=0.57, minDelay=5000}

{Sensor name="sns\_smd Wakeup", vendor="qualcomm", version=1, type=17, maxRange=1.0, resolution=1.0, power=0.025, minDelay=-1}

{Sensor name="icm4x6xx Non-wakeup", vendor="TDK-Invensense", version=293, type=19, maxRange=1.0, resolution=0.01, power=0.001, minDelay=0}

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allsensorsdemo

### LIST OF ALL SENSORS

{Sensor name="icm4x6xx Non-wakeup", vendor="TDK-Invensense", version=293, type=19, maxRange=1.0, resolution=0.01, power=0.05, minDelay=0}

{Sensor name="sns\_geomag\_rv Non-wakeup", vendor="qualcomm", version=1, type=20, maxRange=1.0, resolution=0.01, power=1.05, minDelay=10000}

{Sensor name="pick\_up\_motion Wakeup", vendor="oppo", version=1, type=22, maxRange=1.0, resolution=0.01, power=0.001, minDelay=0}

{Sensor name="Device Orientation Non-wakeup", vendor="qualcomm", version=1, type=27, maxRange=1.0, resolution=1.0, power=0.025, minDelay=0}

{Sensor name="stationary\_detect", vendor="qualcomm", version=1, type=29, maxRange=1.0, resolution=1.0, power=0.025, minDelay=-1}

{Sensor name="motion\_detect", vendor="qualcomm", version=1, type=30, maxRange=1.0, resolution=1.0, power=0.025, minDelay=-1}

{Sensor name="icm4x6xx Accelerometer-Uncalibrated Non-wakeup", vendor="TDK-Invensense", version=293, type=35, maxRange=156.9064, resolution=0.0047884034, power=0.24, minDelay=5000}

{Sensor name="sensor\_logger Non-wakeup", vendor="oppo", version=1, type=33171024, maxRange=1.0, resolution=0.01, power=0.001, minDelay=0}

## 1. Write a program to capture image and display it using imageview.

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

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"

    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <ImageView

        android:layout_width="match_parent"
        android:layout_height="400dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.495"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.167"
        android:id="@+id/im1"></ImageView>

    <ImageButton

        android:layout_width="100dp"
        android:layout_height="100dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/im1"
        app:layout_constraintVertical_bias="0.196"
        android:src="@drawable/cam"
        android:onClick="show"></ImageButton>

</androidx.constraintlayout.widget.ConstraintLayout>

package com.example.cameraexample;

import androidx.annotation.Nullable;

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

```

import android.content.Intent;
import android.graphics.Bitmap;
import android.os.Bundle;
import android.provider.MediaStore;
import android.view.View;
import android.widget.ImageView;

public class MainActivity extends AppCompatActivity {
    ImageView im1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        im1=findViewById(R.id.im1);
    }
    public void show(View view) {
        Intent intent=new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
        startActivityForResult(intent,1);
    }
    @Override
    protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
        Bitmap b1=(Bitmap)data.getExtras().get("data");
        im1.setImageBitmap(b1);
    }
}

```

## 2. Write a program to record a video using various camera methods

```

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

```

```

<ImageButton
    android:layout_width="100dp"
    android:layout_height="100dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/im1"
    app:layout_constraintVertical_bias="0.196"
    android:src="@drawable/cam"
    android:onClick="show"></ImageButton>
</androidx.constraintlayout.widget.ConstraintLayout>

package com.example.cameraexample;

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

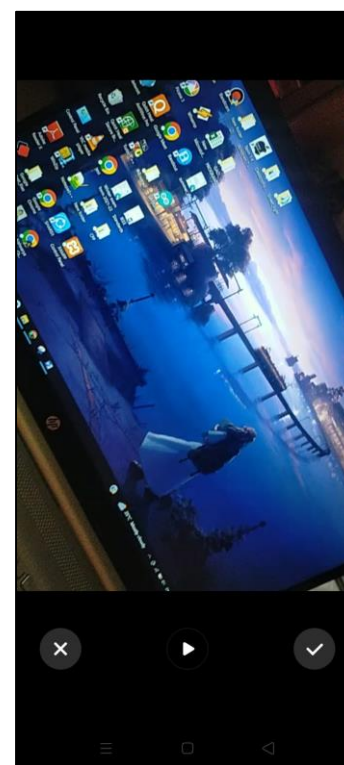
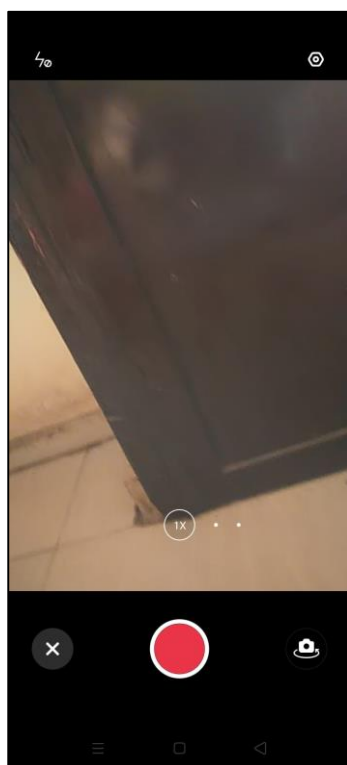
import android.content.Intent;
import android.graphics.Bitmap;
import android.os.Bundle;
import android.provider.MediaStore;
import android.view.View;
import android.widget.ImageView;
import android.widget.Toast;

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

    public void show(View view) {
        Intent intent=new Intent(MediaStore.ACTION_VIDEO_CAPTURE);
        startActivityForResult(intent,101);
    }

    @Override
    protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {
        super.onActivityResult(requestCode, resultCode, data);
        if (requestCode == 101) {
            if (resultCode == RESULT_OK) {
                Toast.makeText(this, "Video saved to:\n" + data.getData(),
                Toast.LENGTH_LONG).show();
            }
            else if (resultCode == RESULT_CANCELED) {
                Toast.makeText(this, "Video recording cancelled.", Toast.LENGTH_LONG).show();
            }
            else {
                Toast.makeText(this, "Failed to record video", Toast.LENGTH_LONG).show();
            }
        }
    }
}

```



# 1. Write a program to turn on, get visible, list devices and turn off Bluetooth with the help of following GUI

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="200dp"
        android:layout_height="60dp"
        android:text="Bluetooth"
        android:textColor="@color/black"
        android:textSize="25sp"
        android:layout_marginTop="40dp"></TextView>
    <Button
        android:layout_width="150dp"
        android:layout_height="50dp"
        android:layout_marginTop="30dp"
        android:text="TURN ON"
        android:textSize="20sp"
        android:backgroundTint="@color/black"
        android:id="@+id/b1"></Button>
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginTop="20dp"
        android:text="GET VISIBLE"
        android:textSize="20sp"
        android:backgroundTint="@color/black"
        android:id="@+id/b2"></Button>
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginTop="20dp"
        android:text="LIST DEVICES"
        android:textSize="20sp"
        android:backgroundTint="@color/black"
        android:id="@+id/b3"></Button>
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginTop="20dp"
        android:text="TURN OFF"
        android:textSize="20sp"
        android:backgroundTint="@color/black"
        android:id="@+id/b4"></Button>
```

```

<ScrollView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_gravity="center"
    android:layout_marginTop="20dp">
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="300dp"
            android:layout_height="wrap_content"
            android:id="@+id/t1"
            android:textColor="@color/black"></TextView>
    </LinearLayout>
</ScrollView>
</LinearLayout>

```

```
package com.example.bluetoothdemo;
```

```

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import android.bluetooth.BluetoothAdapter;
import android.bluetooth.BluetoothDevice;
import android.content.Intent;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import java.util.Set;

```

```

public class MainActivity extends AppCompatActivity {
    BluetoothAdapter ba;
    Button b1, b2, b3, b4;
    TextView t1;
    String Dn;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ba = BluetoothAdapter.getDefaultAdapter();
        t1 = findViewById(R.id.t1);
        b1 = findViewById(R.id.b1);

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                if (!ba.isEnabled()) {

```

```

        if (ActivityCompat.checkSelfPermission(getApplicationContext(),
android.Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            ba.enable();
            Toast.makeText(getApplicationContext(), "Bluetooth Enabled",
Toast.LENGTH_LONG).show();
        }
    } else {
        Toast.makeText(getApplicationContext(), "Bluetooth Already Enabled",
Toast.LENGTH_LONG).show();
    }
}
});
b2 = findViewById(R.id.b2);
b2.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {

        if (ActivityCompat.checkSelfPermission(getApplicationContext(),
android.Manifest.permission.BLUETOOTH_ADVERTISE) !=
PackageManager.PERMISSION_GRANTED) {
            Intent i = new
Intent(BluetoothAdapter.ACTION_REQUEST_DISCOVERABLE);
            i.putExtra(BluetoothAdapter.EXTRA_DISCOVERABLE_DURATION, 300);
            startActivity(i);
        }

    }
});
b3=findViewById(R.id.b3);
b3.setOnClickListener(new View.OnClickListener()
{
    @Override
    public void onClick(View view)
    {
        if (ActivityCompat.checkSelfPermission(getApplicationContext(),
android.Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            Set<BluetoothDevice> pd = ba.getBondedDevices();
            for (BluetoothDevice device : pd) {
                Dn = device.getName();
                t1.append("\n" + Dn);
            }
        }
    }
});
b4=findViewById(R.id.b4);
b4.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {

```



```

        if (ActivityCompat.checkSelfPermission(getApplicationContext(),
android.Manifest.permission.BLUETOOTH_CONNECT) !=
PackageManager.PERMISSION_GRANTED) {
            ba.disable();
            Toast.makeText(getApplicationContext(), "Bluetooth Disabled",
Toast.LENGTH_LONG).show();
        }
    }
});
}
}

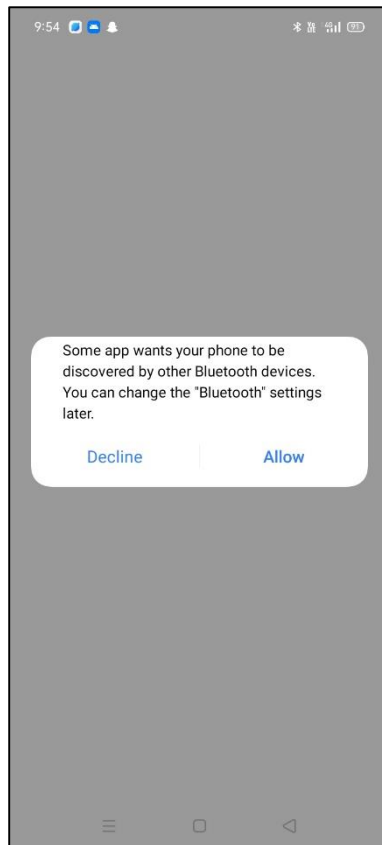
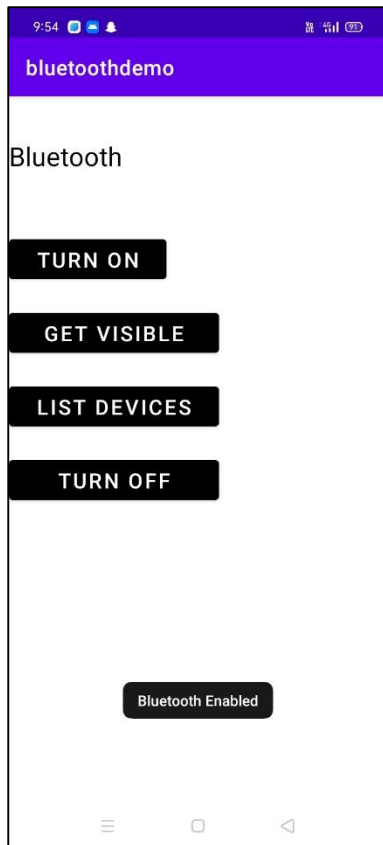
```

AndroidManifest.xml

```

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

```



**1. Write a program to rotate the image in clockwise/anticlockwise,  
Zoom in/Zoom out, Fade in/fade out by using the following GUI**

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

    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="400dp"
        android:id="@+id/imageView"
        android:src="@drawable/img"/>

    <Button
        android:layout_width="300dp"
        android:layout_height="70dp"
        android:text="Clockwise/Anticlockwise"
        android:textSize="20sp"
        android:backgroundTint="@color/black"
        android:id="@+id/button"
        android:layout_marginLeft="30dp"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="220dp"
        android:onClick="rotate"/>

    <Button
        android:id="@+id/zoomInButton"
        android:layout_width="300dp"
        android:layout_height="60dp"
        android:onClick="zoom"
        android:text="Zoomin/out"
        android:backgroundTint="@color/black"
        android:textSize="30sp"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="150dp"
        android:layout_marginLeft="30dp"
        android:textStyle="bold"/>

    <Button
        android:layout_width="300dp"
        android:layout_height="50dp"
        android:layout_marginLeft="30dp"
        android:layout_alignParentBottom="true"
        android:layout_marginBottom="80dp"
        android:text="fadeIn/out"
        android:onClick="fade"
        android:backgroundTint="@color/black"
        android:textSize="25sp"></Button>

</RelativeLayout>
```

MainActivity.java

```
package com.example.animationpr;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.view.animation.Animation;
import android.view.animation.AnimationUtils;
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 rotate(View view){
        ImageView image = (ImageView)findViewById(R.id.imageView);
        Animation animation = AnimationUtils.loadAnimation(getApplicationContext(),
            R.anim.rotate);
        image.startAnimation(animation);
    }
    public void zoom(View view) {

        ImageView image = (ImageView)findViewById(R.id.imageView);
        Animation animation = AnimationUtils.loadAnimation(getApplicationContext(),
            R.anim.zoom_in);
        image.startAnimation(animation);

    }

    public void fade(View view) {

        ImageView image = (ImageView)findViewById(R.id.imageView);
        Animation animation = AnimationUtils.loadAnimation(getApplicationContext(),
            R.anim.fade);
        image.startAnimation(animation);

    }
}
```

Rotate.xml

```
<?xml version="1.0" encoding="utf-8"?>
<set xmlns:android="http://schemas.android.com/apk/res/android">
    <rotate xmlns:android="http://schemas.android.com/apk/res/android"
        android:fromDegrees="0"
        android:toDegrees="360"
        android:pivotX="50%"
        android:pivotY="50%"
        android:duration="5000" >
    </rotate>
```

```

<rotate xmlns:android="http://schemas.android.com/apk/res/android"
    android:startOffset="5000"
    android:fromDegrees="360"
    android:toDegrees="0"
    android:pivotX="50%"
    android:pivotY="50%"
    android:duration="5000" >
</rotate>
</set>.

```

#### Fade.xml

```

<?xml version="1.0" encoding="utf-8"?>
<set xmlns:android="http://schemas.android.com/apk/res/android"
    android:interpolator="@android:anim/linear_interpolator">
    <alpha
        android:duration="2000"
        android:fromAlpha="0.1"
        android:toAlpha="1.0">
    </alpha>

    <alpha
        android:duration="2000"
        android:fromAlpha="1.0"
        android:toAlpha="0.1" >
    </alpha>
</set>

```

#### Zoom in.xml

```

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

    <scale
        xmlns:android="http://schemas.android.com/apk/res/android"
        android:duration="1000"
        android:fromXScale="2"
        android:fromYScale="2"
        android:pivotX="50%"
        android:pivotY="50%"
        android:toXScale="4"
        android:toYScale="4" >
    </scale>

    <scale
        android:duration="2500"
        android:fromXScale="1.0"
        android:fromYScale="1.0"
        android:pivotX="50%"
        android:pivotY="50%"
        android:toXScale=".2"
        android:toYScale=".2" />
</set>

```



## 1. Write a program to insert data in SQLite database using AsyncTask

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">
    <EditText
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:hint="Enter Roll No"
        android:textSize="25sp"
        android:layout_marginLeft="70dp"
        android:id="@+id/t1"
        android:layout_marginTop="100dp"></EditText>
    <EditText
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:hint="Enter Name"
        android:textSize="25sp"
        android:layout_marginLeft="70dp"
        android:id="@+id/t2"
        android:layout_marginTop="50dp"></EditText>
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:backgroundTint="@color/black"
        android:layout_marginTop="50dp"
        android:layout_marginLeft="70dp"
        android:id="@+id/b1"
        android:onClick="save"
        android:text="submit"
        android:textSize="25sp"></Button>
```

```

<Button
    android:layout_width="200dp"
    android:layout_height="50dp"
    android:backgroundTint="@color/black"
    android:layout_marginTop="50dp"
    android:layout_marginLeft="70dp"
    android:id="@+id/b2"
    android:text="Display"
    android:onClick="display"
    android:textSize="25sp"></Button>
</LinearLayout>

package com.example.asynctask;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
import android.database.Cursor;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText t1,t2;
    Database db;
    AsyncTask async;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        t1=findViewById(R.id.t1);
        t2=findViewById(R.id.t2);
        db=new Database(this);
        async=new AsyncTask(this);

    }

```



```

public void save(View view) {
    if((t1.getText().toString().equals("") && (t2.getText().toString().equals(""))){
        Toast.makeText(this, "Enter Credentials", Toast.LENGTH_SHORT).show();
    }
    else{
        async.execute(t1.getText().toString(),t2.getText().toString());
        t1.setText("");
        t2.setText("");
    }
}

public void display(View view) {
    Cursor cu=db.getData();
    if(cu.getCount()==0){
        Toast.makeText(this, "No record found", Toast.LENGTH_SHORT).show();
    }
    else{
        StringBuffer sb=new StringBuffer();
        while(cu.moveToNext()){
            sb.append("Roll No:" +cu.getString(0)+"\n");
            sb.append("Name:" +cu.getString(1)+"\n");
        }
        AlertDialog.Builder al=new AlertDialog.Builder(this);
        al.setTitle("Result");
        al.setMessage(sb.toString());
        al.show();
    }
}

package com.example.asynctask;

import android.content.Context;
import android.os.AsyncTask;
import android.widget.Toast;

import androidx.appcompat.app.AlertDialog;

```

```

public class asyncTask extends AsyncTask<String,Void,Long> {
    Context context;
    Database db;
    AlertDialog.Builder al;
    asyncTask(Context c){
        context=c;
        db=new Database(context);
    }
    @Override
    protected void onPreExecute(){
        super.onPreExecute();
        al=new AlertDialog.Builder(context);
    }
    @Override
    protected Long doInBackground(String... strings) {
        String t1=strings[0];
        String t2=strings[1];
        long result=db.insert(t1,t2);
        return result;
    }
    @Override
    protected void onProgressUpdate(Void... values){
        super.onProgressUpdate(values);
    }
    @Override
    protected void onPostExecute(Long aLong){
        super.onPostExecute(aLong);
        Toast.makeText(context, "Value Inserted", Toast.LENGTH_SHORT).show();
    }
}

package com.example.asyncTask;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;

```

```

import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;

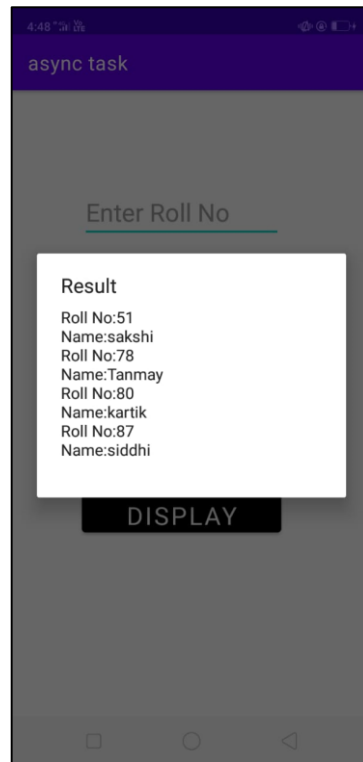
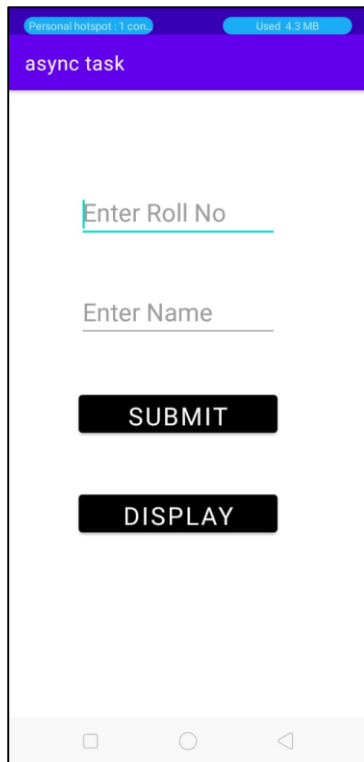
public class Database extends SQLiteOpenHelper {
    public Database(Context context) {
        super(context, "std.db", null, 1);
    }
    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL("create table std(Roll Text,Name Text);");
    }
    public long insert(String t1,String t2){
        SQLiteDatabase sd=this.getWritableDatabase();
        ContentValues ctx=new ContentValues();
        ctx.put("Roll",t1);
        ctx.put("Name",t2);
        long result=sd.insert("std",null,ctx);
        return result;
    }

    public Cursor getData(){
        SQLiteDatabase db=this.getWritableDatabase();
        Cursor cu=db.rawQuery("Select * from std",null);
        return cu;
    }

    @Override
    public void onUpgrade(SQLiteDatabase db, int i, int i1) {

    }
}

```



## 1. Write a program to create the login form and display login successful/unsuccessful toast message

```
<?xml version="1.0" encoding="utf-8"?>
<AbsoluteLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#79A6CA"
    tools:context=".MainActivity">
    <ImageView
        android:layout_width="300dp"
        android:layout_height="200dp"
        android:layout_x="40dp"
        android:layout_y="20dp"
        android:src="@drawable/logo" ></ImageView>
    <TextView
        android:layout_width="300dp"
        android:layout_height="60dp"
        android:layout_x="40dp"
        android:layout_y="230dp"
        android:text="ADMIN LOGIN"
        android:textSize="30sp"
        android:textColor="@color/black"
        android:textAlignment="center"></TextView>
    <EditText
        android:layout_width="300dp"
        android:layout_height="60dp"
        android:layout_x="40dp"
        android:layout_y="300dp"
        android:hint="Enter Username"
        android:backgroundTint="#DF2517"
        android:id="@+id/t1"> </EditText>
    <EditText
        android:layout_width="300dp"
        android:layout_height="60dp"
```

```

        android:layout_x="40dp"
        android:layout_y="380dp"
        android:hint="Enter Password"
        android:backgroundTint="#DF2517"
        android:id="@+id/t2"
        android:inputType="numberPassword"> </EditText>
<Button
    android:layout_width="150dp"
    android:layout_height="60dp"
    android:layout_x="120dp"
    android:layout_y="460dp"
    android:text="LOGIN"
    android:backgroundTint="@color/black"
    android:onClick="next"></Button>
</AbsoluteLayout>

```

```

package com.example.friendscorner;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText t1,t2;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

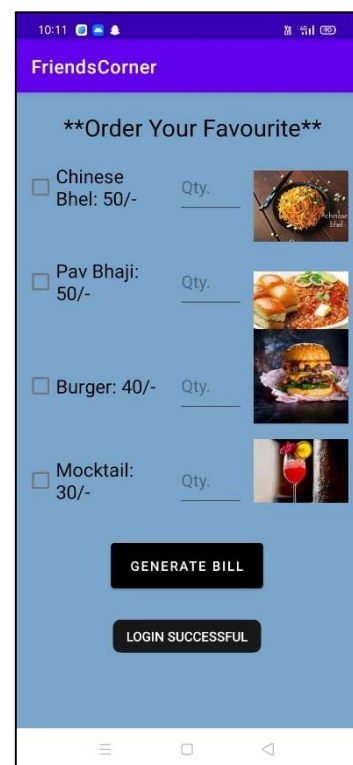
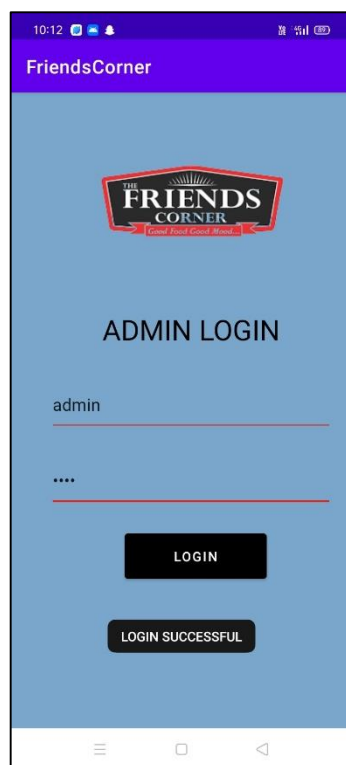
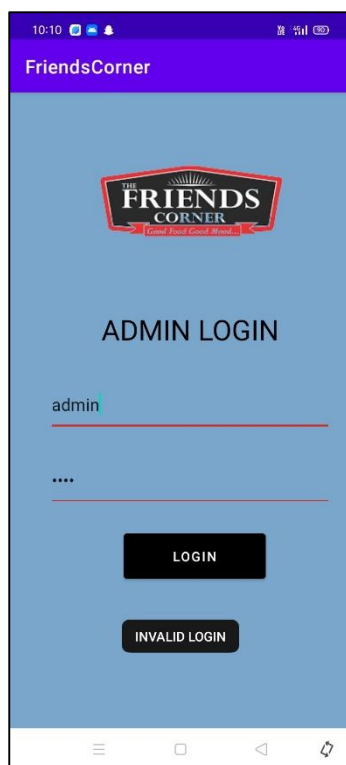
    public void next(View view) {
        t1=findViewById(R.id.t1);
        t2=findViewById(R.id.t2);
        String user=t1.getText().toString();
        String password=t2.getText().toString();
    }
}

```

```

if(user.equals("admin") && password.equals("1234"))
{
    Toast.makeText(getApplicationContext(),"LOGIN
SUCCESSFUL",Toast.LENGTH_LONG).show();
    Intent i1 = new Intent(getApplicationContext(), FriendsCorner2.class);
    startActivity(i1);
}
else
{
    Toast.makeText(getApplicationContext(),"INVALID
LOGIN",Toast.LENGTH_LONG).show();
}
}
}

```



- 1. Write a program to create the login form with necessary validations like length of username and password, empty text fields, count of unsuccessful login attempts. Display the login successful /UnSuccessful toast message**

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <EditText
        android:layout_width="300dp"
        android:layout_height="50dp"
        android:id="@+id/editText"
        android:hint="Enter Name"
        android:focusable="true"
        android:textSize="25sp"
        android:layout_marginTop="46dp"
        android:layout_alignParentLeft="true"
        android:layout_marginLeft="40dp"
        android:layout_marginBottom="50dp"
        android:background="#92CFEC"/>

    <EditText
        android:layout_width="300dp"
        android:layout_height="50dp"
        android:inputType="textPassword"
        android:ems="10"
        android:id="@+id/editText2"
        android:layout_below="@+id/editText"
        android:layout_alignParentLeft="true"
        android:textSize="25sp"
        android:layout_marginBottom="20dp"
        android:layout_marginLeft="40dp"
        android:background="#92CFEC"
        android:hint="Password" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Attempts Left:"
        android:id="@+id/textView2"
        android:layout_below="@+id/editText2"
        android:layout_alignParentLeft="true"
        android:layout_alignParentStart="true"
        android:textSize="25dp" />

    <TextView
        android:layout_width="100dp"
        android:layout_height="50dp"
        android:text="New Text"
```



```

        android:id="@+id/textView3"
        android:layout_alignTop="@+id/textView2"
        android:layout_alignParentRight="true"
        android:layout_alignParentEnd="true"
        android:layout_alignBottom="@+id/textView2"
        android:layout_toEndOf="@+id/textview"
        android:textSize="25dp"
    />
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="login"
    android:id="@+id/button"
    android:layout_marginBottom="280dp"
    android:layout_alignParentBottom="true"
    android:layout_marginRight="120dp"
    android:layout_alignParentRight="true"
    android:backgroundTint="@color/black"
    android:onClick="login"
    android:textSize="25sp"
/>
</RelativeLayout>
package com.example.loginpr;

import androidx.appcompat.app.AppCompatActivity;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    Button b1;
    EditText ed1,ed2;

    TextView tx1;
    int counter = 3;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        b1 = (Button)findViewById(R.id.button);
        ed1 = (EditText)findViewById(R.id.editText);
        ed2 = (EditText)findViewById(R.id.editText2);

        tx1 = (TextView)findViewById(R.id.textView3);
        tx1.setVisibility(View.GONE);
    }
    public void login(View view){
        if(ed1.getText().toString().equals("admin") &&

```

```

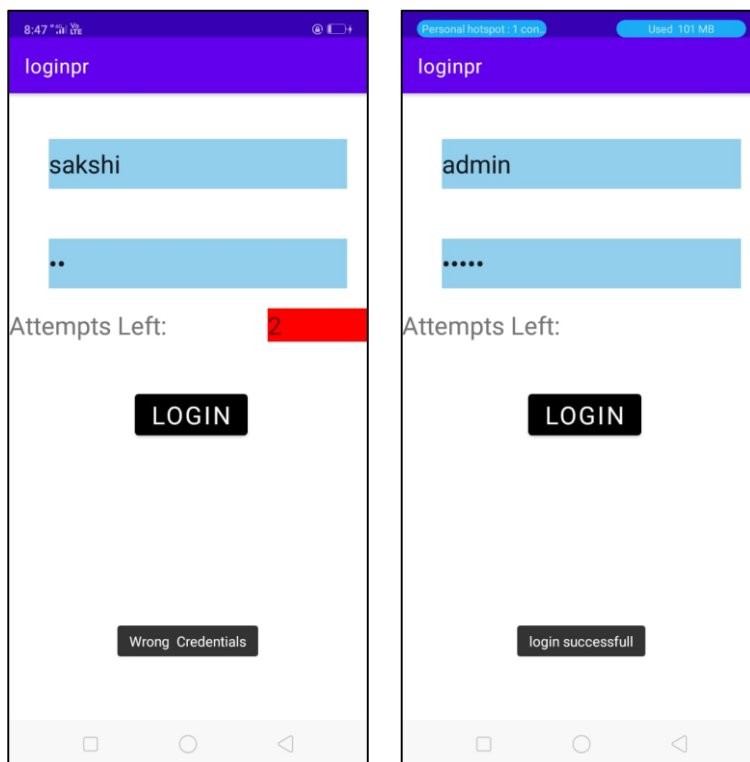
        ed2.getText().toString().equals("admin")) {
            Toast.makeText(getApplicationContext(),
                "login successfull",Toast.LENGTH_SHORT).show();
        }else{

            Toast.makeText(getApplicationContext(), "Wrong
            Credentials",Toast.LENGTH_SHORT).show();

            tx1.setVisibility(View.VISIBLE);
            tx1.setBackgroundColor(Color.RED);
            counter--;
            tx1.setText(Integer.toString(counter));

            if (counter == 0) {
                b1.setEnabled(false);
            }
        }
    }
}

```



## 1. Write a program to send and receive SMS, make use of following GUI

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".MainActivity">
    <ImageView
        android:layout_width="150dp"
        android:layout_height="150dp"
        android:layout_gravity="center"
        android:layout_marginTop="30dp"
        android:src="@drawable/logo"></ImageView>
    <EditText
        android:layout_width="250dp"
        android:layout_height="50dp"
        android:layout_gravity="center"
        android:layout_marginTop="30dp"
        android:background="@drawable/s1"
        android:drawableLeft="@drawable/p1"
        android:hint="ENTER PHONE NUMBER"
        android:textColor="@color/black"
        android:fontFamily="@font/alkatra"
        android:id="@+id/t1"
        android:textColorHint="@color/black"></EditText>
    <EditText
        android:layout_width="250dp"
        android:layout_height="50dp"
        android:layout_gravity="center"
        android:layout_marginTop="40dp"
        android:background="@drawable/s1"
        android:drawableLeft="@drawable/m1"
        android:hint="ENTER MESSAGE"
        android:textColor="@color/black"
        android:fontFamily="@font/alkatra"
        android:id="@+id/t2"
        android:textColorHint="@color/black"></EditText>
    <Button
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_gravity="center"
        android:layout_marginTop="60dp"
        android:backgroundTint="#1483DC"
        android:background="@drawable/s1"
        android:text="SEND"
        android:textColor="#F8F3F3"
        android:textSize="25sp"
        android:fontFamily="@font/alkatra"
        android:onClick="sendsms"></Button>
    <Button
        android:layout_width="200dp"
```

```

        android:layout_height="50dp"
        android:layout_gravity="center"
        android:layout_marginTop="20dp"
        android:backgroundTint="#1483DC"
        android:background="@drawable/s1"
        android:text="RECEIVE"
        android:textColor="#F8F3F3"
        android:textSize="25sp"
        android:fontFamily="@font/alkatra"
        android:onClick="receivesms"></Button> </LinearLayout>

```

```
package com.example.sms;
```

```

import androidx.appcompat.app.AppCompatActivity;
import android.content.IntentFilter;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;

```

```

public class MainActivity extends AppCompatActivity {
    EditText t1,t2;
    MyReceiver mr;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        t1=findViewById(R.id.t1);
        t2=findViewById(R.id.t2);
    }

    public void sendsms(View view) {
        String pno=t1.getText().toString();
        String msg=t2.getText().toString();
        SmsManager sm=SmsManager.getDefault();
        sm.sendTextMessage(pno,null,msg,null,null);
        Toast.makeText(getApplicationContext(),"Message
sent",Toast.LENGTH_LONG).show();
    }

    public void receivesms(View view) {
        mr=new MyReceiver();
        IntentFilter if1=new IntentFilter("android.provider.Telephony.SMS_RECEIVED");
        registerReceiver(mr,if1);
    }
    public void onPause()
    {
        super.onPause();
        unregisterReceiver(mr);
    }
}
package com.example.sms;

```

```
import android.content.BroadcastReceiver;
```

```

import android.content.Context;
import android.content.Intent;
import android.os.Bundle;
import android.telephony.SmsMessage;
import android.widget.Toast;

public class MyReceiver extends BroadcastReceiver {
    @Override
    public void onReceive(Context context, Intent intent) {
        Bundle bundle=intent.getExtras();
        Object messages[]=(Object[]) bundle.get("pdus");
        SmsMessage smsMessage[]=new SmsMessage[messages.length];
        for(int i=0;i<messages.length;i++)
        {
            smsMessage [i]=SmsMessage.createFromPdu((byte[])messages[i]);
        }
        Toast.makeText(context,"Received
SMS:\n"+smsMessage[0].getMessageBody(),Toast.LENGTH_LONG).show();
    }
}

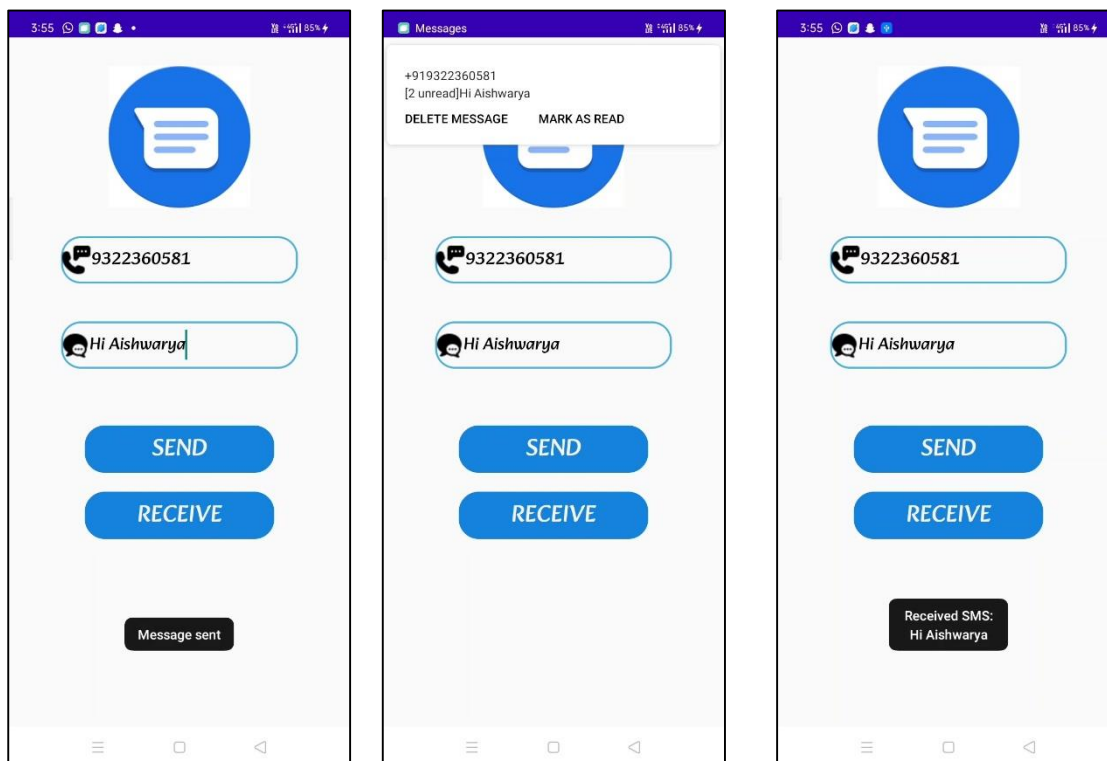
```

Include following code in AndroidManifest.xml

```

<uses-permission android:name="android.permission.SEND_SMS"/> >
<uses-permission android:name="android.permission.RECEIVE_SMS"/>
<receiver android:name="MyReceiver"
    android:permission="android.permission.BROADCAST_SMS"></receiver>
</application>

```



## 1. Write a program to send an email

```
package com.example.email;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;

import android.os.Bundle;

import android.view.View;

import android.widget.EditText;


public class MainActivity extends AppCompatActivity {

    EditText t1,t2,t3;

    @Override

    protected void onCreate(Bundle savedInstanceState) {

        super.onCreate(savedInstanceState);

        setContentView(R.layout.activity_main);

        t1=findViewById(R.id.t1);

        t2=findViewById(R.id.t2);

        t3=findViewById(R.id.t3);

    }

    public void sendmail(View view) {

        String email=t1.getText().toString();

        String sub=t2.getText().toString();

        String msg=t3.getText().toString();

        Intent i1=new Intent(Intent.ACTION_SEND);

        i1.setType("mime/rfc822");

        i1.putExtra(Intent.EXTRA_EMAIL,new String[]{email});

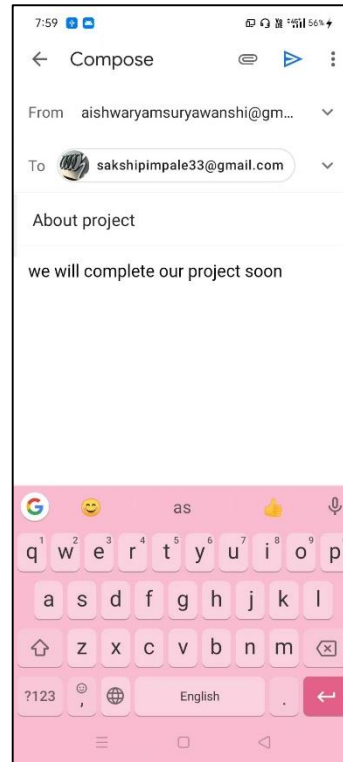
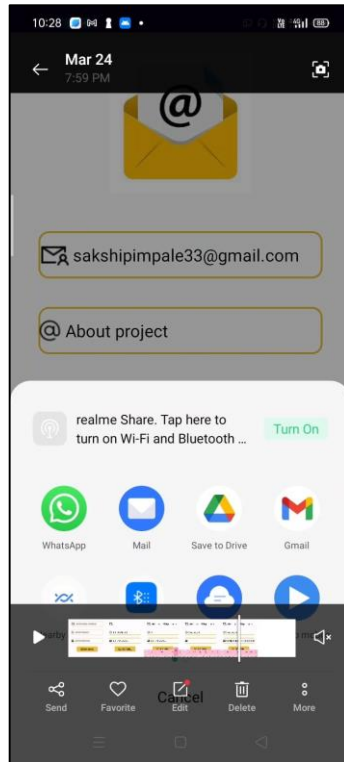
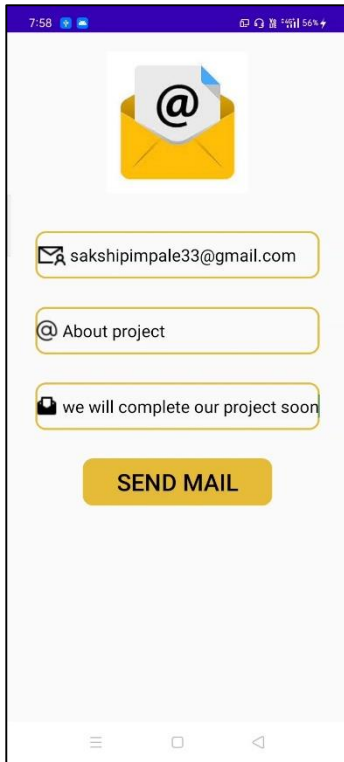
        i1.putExtra(Intent.EXTRA_SUBJECT,sub);

        i1.putExtra(Intent.EXTRA_TEXT,msg);

        startActivity(Intent.createChooser(i1,"Send Email"));

    }

}
```



## 1. Write a program to locate user's current location

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#5EE5F6"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginLeft="100dp"
        android:layout_marginTop="10dp"
        android:text="USERS LOCATION"
        android:textColor="#DF1258"
        android:textSize="20sp"></TextView>
    <TextView
        android:layout_width="100dp"
        android:layout_height="30dp"
        android:layout_alignParentLeft="true"
        android:textSize="20sp"
        android:layout_marginLeft="10dp"
        android:textColor="@color/black"
        android:text="LATITUDE"
        android:layout_marginTop="60dp"></TextView>
    <TextView
        android:layout_width="200dp"
        android:layout_height="30dp"
        android:layout_alignParentRight="true"
        android:textSize="20sp"
        android:layout_marginLeft="10dp"
        android:textColor="@color/black"
        android:layout_marginTop="60dp"
        android:id="@+id/latitude"></TextView>
```



```

<TextView
    android:layout_width="150dp"
    android:layout_height="30dp"
    android:layout_alignParentLeft="true"
    android:textSize="20sp"
    android:layout_marginLeft="10dp"
    android:textColor="@color/black"
    android:text="LONGITUDE"
    android:layout_marginTop="130dp" ></TextView>
<TextView
    android:layout_width="200dp"
    android:layout_height="30dp"
    android:layout_alignParentRight="true"
    android:textSize="20sp"
    android:layout_marginLeft="10dp"
    android:textColor="@color/black"
    android:layout_marginTop="130dp"
    android:id="@+id/longitude"></TextView>
<TextView
    android:layout_width="150dp"
    android:layout_height="30dp"
    android:layout_alignParentLeft="true"
    android:layout_marginLeft="10dp"
    android:layout_marginTop="200dp"
    android:text="ADDRESS"
    android:textColor="@color/black"
    android:textSize="20sp"></TextView>
<ScrollView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentRight="true"
    android:layout_marginLeft="10dp"
    android:layout_marginTop="200dp">
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

```

```

        <TextView
            android:id="@+id/address"
            android:layout_width="200dp"
            android:layout_height="30dp"

            android:textColor="@color/black"
            android:textSize="20sp"></TextView>
    </LinearLayout>
</ScrollView>
<TextView
    android:layout_width="150dp"
    android:layout_height="30dp"
    android:layout_alignParentLeft="true"
    android:textSize="20sp"
    android:layout_marginLeft="10dp"
    android:textColor="@color/black"
    android:text="CITY"
    android:layout_marginTop="250dp"
    ></TextView>
<TextView
    android:layout_width="200dp"
    android:layout_height="30dp"
    android:layout_alignParentRight="true"
    android:textSize="20sp"
    android:layout_marginLeft="10dp"
    android:textColor="@color/black"
    android:layout_marginTop="250dp"
    android:id="@+id/city"></TextView>
<TextView
    android:layout_width="150dp"
    android:layout_height="30dp"
    android:layout_alignParentLeft="true"
    android:layout_marginLeft="10dp"
    android:layout_marginTop="310dp"
    android:text="COUNTRY"
    android:textColor="@color/black"
    android:textSize="20sp"></TextView>

```

```

<TextView
    android:layout_width="200dp"
    android:layout_height="30dp"
    android:layout_alignParentRight="true"
    android:textSize="20sp"
    android:layout_marginLeft="10dp"
    android:textColor="@color/black"
    android:layout_marginTop="310dp"
    android:id="@+id/country"></TextView>

<Button
    android:layout_width="200dp"
    android:layout_height="40dp"
    android:text="GET LOCATION"
    android:backgroundTint="@color/black"
    android:layout_marginTop="360dp"
    android:gravity="center"
    android:id="@+id/getLocation"
    android:layout_marginLeft="50dp"></Button>
</RelativeLayout>

```

```

package com.example.userlocation;

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

import android.content.pm.PackageManager;
import android.location.Address;
import android.location.Geocoder;
import android.location.Location;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

```

```

import android.widget.Toast;

import com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationServices;
import com.google.android.gms.tasks.OnSuccessListener;

import java.io.IOException;
import java.util.List;
import java.util.Locale;

public class MainActivity extends AppCompatActivity {
    FusedLocationProviderClient fusedLocationProviderClient;
    TextView latitude,longitude,address,city,country;
    Button getLocation;
    private final static int REQUEST_CODE = 100;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        latitude = findViewById(R.id.latitude);
        longitude = findViewById(R.id.longitude);
        address = findViewById(R.id.address);
        city = findViewById(R.id.city);
        country = findViewById(R.id.country);
        getLocation = findViewById(R.id.getLocation);
        fusedLocationProviderClient = LocationServices.getFusedLocationProviderClient(this);
        getLocation.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {

                getLastLocation();

            }
        });
    }
}

```

```

private void getLastLocation(){

    if (ContextCompat.checkSelfPermission(this,
    android.Manifest.permission.ACCESS_FINE_LOCATION) ==
    PackageManager.PERMISSION_GRANTED){

        fusedLocationProviderClient.getLastLocation()
        .addOnSuccessListener(new OnSuccessListener<Location>() {
            @Override
            public void onSuccess(Location location) {

                if (location != null){
                    try {
                        Geocoder geocoder = new Geocoder(MainActivity.this,
                        Locale.getDefault());

                        List<Address> addresses =
                        geocoder.getFromLocation(location.getLatitude(), location.getLongitude(), 1);
                        latitude.setText(" "+addresses.get(0).getLatitude());
                        longitude.setText(""+addresses.get(0).getLongitude());
                        address.setText(""+addresses.get(0).getSubLocality());
                        city.setText(""+addresses.get(0).getLocality());
                        country.setText(""+addresses.get(0).getCountryName());
                    } catch (IOException e) {
                        e.printStackTrace();
                    }

                }

            }
        });
    }else {
        askPermission();
    }
}

```

```

    }

    private void askPermission() {

        ActivityCompat.requestPermissions(MainActivity.this,new
String[] { android.Manifest.permission.ACCESS_FINE_LOCATION },REQUEST_CODE);

    }

    @Override
    public void onRequestPermissionsResult(int requestCode, @NonNull
@org.jetbrains.annotations.NotNull String[] permissions, @NonNull
@org.jetbrains.annotations.NotNull int[] grantResults) {

        if (requestCode == REQUEST_CODE){

            if (grantResults.length > 0 && grantResults[0] ==
PackageManager.PERMISSION_GRANTED){

                getLastLocation();

            }else {

                Toast.makeText(MainActivity.this,"Please provide the required
permission",Toast.LENGTH_SHORT).show();

            }
        }
        super.onRequestPermissionsResult(requestCode, permissions, grantResults);
    }
}

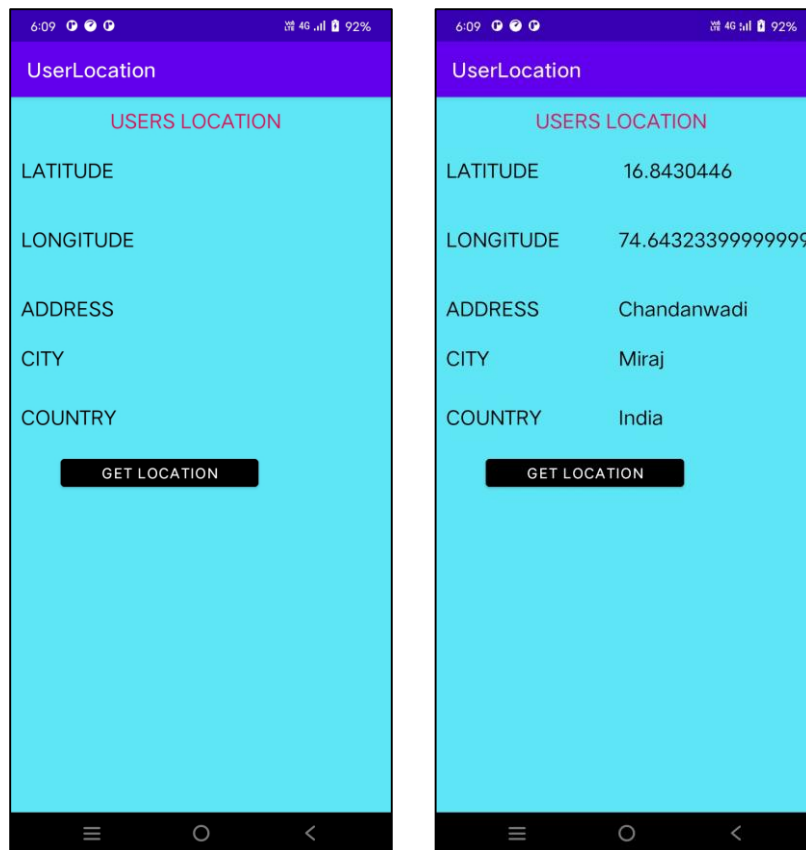
```

Permissions included in AndroidManifest.xml

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

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

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



**1. Write a program to draw a route between two locations**