QUE 1. Write a program to change the background color when device is shuffed.

ActivityMain.xml

```
<?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"
   tools:context=".MainActivity">
   <TextView
      android:id="@+id/tv"
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      android:layout_x="0dp"
      android:layout_y="0dp"
      android:text="Shake to switch color" />
</AbsoluteLayout>
```

MainActivity.java

```
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;
   public void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      view = findViewById(R.id.tv);
      view.setBackgroundColor(Color.GREEN);

      sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
      lastUpdate = System.currentTimeMillis();
   }
   //overriding two methods of SensorEventListener
   @Override
   public void onAccuracyChanged(Sensor sensor, int accuracy) {}
   @Override
   public void onSensorChanged(SensorEvent event) {
      if (event.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
```

```
        getAccelerometer(event);
      }

   }
   private void getAccelerometer(SensorEvent event) {
      float[] values = event.values;
      // Movement
      float x = values[0];
      float y = values[1];
      float z = values[2];
      float accelationSquareRoot = (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.GREEN);
         } else {
            view.setBackgroundColor(Color.RED);
         }
         isColor = !isColor; } }
   protected void onResume() {
      super.onResume();
      // register this class as a listener for the orientation and
      // accelerometer sensors

sensorManager.registerListener(this,sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROM
ETER),
            SensorManager.SENSOR_DELAY_NORMAL);
   }

   @Override
   protected void onPause() {
      // unregister listener
      super.onPause();
      sensorManager.unregisterListener(this);
   }
}
```

QUE2. Write a program to display the list of sensors supported by the mobile device.

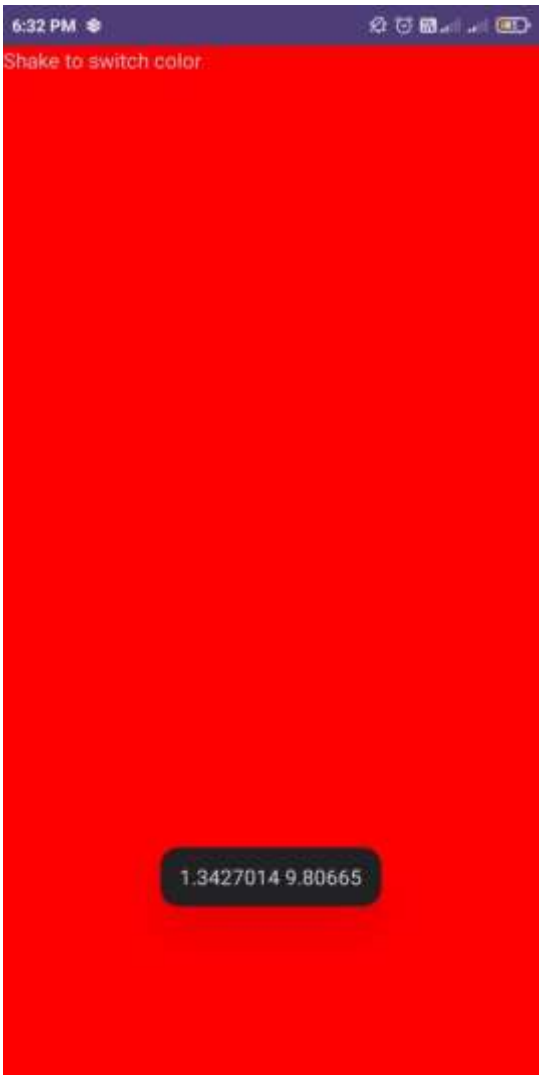
ActivityMain.xml

```
<?xml version="1.0" encoding="utf-8"?>
<ScrollView xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity"
   android:padding="10dp">

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

</ScrollView>
```

MainActivity.java

```
package com.example.all_sensors;
import android.hardware.Sensor;
import android.hardware.SensorManager;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.TextView;
import java.util.List;
public class MainActivity extends AppCompatActivity {
   TextView tv;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      tv = findViewById(R.id.tv);
      String sensorInfo = "";
      SensorManager sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
      List<Sensor> sensorList = sensorManager.getSensorList(Sensor.TYPE_ALL);
      for(Sensor s : sensorList) {
         sensorInfo += s.getName() + "\n\n";
      }
      tv.setText(sensorInfo);
   }
}
```

QUE 1 : Output



Que 2 Output