

## activity\_main.xml

```
<?xml version="1.0"
encoding="utf-8"?>
<androidx.constraintlayout.w
idget.ConstraintLayout
xmlns:android="http://schema
s.android.com/apk/res/androi
d"

xmlns:app="http://schemas.an
droid.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/textView2"

android:layout_width="0dp"

android:layout_height="53dp"

android:layout_marginStart="
23dp"

android:layout_marginTop="60
dp"

android:layout_marginEnd="23
dp"

android:layout_marginBottom=
"56dp"

android:text="Welcome To
GPM"
```

```
android:textColor="#0F9D58"

android:textSize="28dp"

android:textStyle="bold"

app:layout_constraintBottom_
toBottomOf="@+id/textView5"

app:layout_constraintEnd_toE
ndOf="parent"

app:layout_constraintStart_t
oStartOf="parent"

app:layout_constraintTop_toT
opOf="parent" />

    <TextView

android:id="@+id/textView5"

android:layout_width="wrap_c
ontent"

android:layout_height="wrap_
content"

android:layout_marginBottom=
"9dp"

android:text="Gyroscope    :"

android:textColor="#000000"

android:textSize="18dp"

android:textStyle="bold"

app:layout_constraintBottom_
toTopOf="@+id/textView4"

app:layout_constraintEnd_toE
ndOf="@+id/textView4" />

    <TextView

android:id="@+id/textView8"
```

```

android:layout_width="38dp"

android:layout_height="19dp"
android:layout_marginTop="20dp"
android:layout_marginEnd="55dp"
    android:text="RES"

android:textColor="#000000"
android:textSize="18dp"
android:textStyle="bold"

app:layout_constraintEnd_toEndOf="parent"

app:layout_constraintTop_toBottomOf="@+id/textView6" />

    <TextView
android:id="@+id/textView6"

android:layout_width="wrap_content"

android:layout_height="wrap_content"

android:layout_marginTop="9dp"
    android:text="RES"

android:textColor="#000000"

android:textSize="18dp"

android:textStyle="bold"

app:layout_constraintStart_toStartOf="@+id/textView3"

app:layout_constraintTop_toBottomOf="@+id/textView3" />

```

```

    <TextView
android:id="@+id/textView7"

android:layout_width="wrap_content"

android:layout_height="wrap_content"

android:layout_marginTop="14dp"

android:text="Orientation"
:"

android:textColor="#000000"

android:textSize="18dp"

android:textStyle="bold"

app:layout_constraintEnd_toEndOf="@+id/textView4"

app:layout_constraintTop_toBottomOf="@+id/textView4" />

    <TextView
android:id="@+id/textView3"

android:layout_width="wrap_content"

android:layout_height="wrap_content"

android:layout_marginTop="32dp"

    android:text="RES"

```

```

    android:textColor="#000000"

    android:textSize="18dp"

    android:textStyle="bold"

    app:layout_constraintEnd_toEndOf="@+id/textView8"

    app:layout_constraintStart_toStartOf="@+id/textView8"

    app:layout_constraintTop_toBottomOf="@+id/textView2" />

    <TextView

    android:id="@+id/textView4"

    android:layout_width="wrap_content"

    android:layout_height="wrap_content"

    android:layout_marginStart="14dp"

    android:layout_marginTop="178dp"

        android:text="
Accelerometer  :"

    android:textColor="#000000"

    android:textSize="18dp"

    android:textStyle="bold"

    app:layout_constraintStart_toStartOf="parent"

    app:layout_constraintTop_toTopOf="parent" />

    <LinearLayout

    android:id="@+id/linear"

    android:layout_width="287dp"

```

```

    android:layout_height="318dp"

    android:layout_marginStart="1dp"

    android:layout_marginTop="42dp"

    android:layout_marginEnd="1dp"

    android:layout_marginBottom="1dp"

    android:orientation="horizontal"

    app:layout_constraintBottom_toBottomOf="parent"

    app:layout_constraintEnd_toEndOf="parent"

    app:layout_constraintStart_toStartOf="parent"

    app:layout_constraintTop_toBottomOf="@+id/textView8"></LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

```

# MainActivity.java

```
package
com.example.pract_11;

import
android.annotation.SuppressL
int;
import
android.content.Context;
import
android.graphics.Color;
import android.os.Bundle;
import android.view.Display;
import
android.view.WindowManager;
import
android.widget.LinearLayout;
import
android.widget.TextView;
import android.widget.Toast;

import
androidx.appcompat.app.AppCo
mpatActivity;

public class MainActivity
extends AppCompatActivity {

    TextView t1, t2, t3;
    LinearLayout l1;
    private Accelerometer
accelerometer;
    private Gyroscope
gyroscope;

    @SuppressWarnings("MissingInflat
edId")
    @Override
    protected void
onCreate(Bundle
savedInstanceState) {

    super.onCreate(savedInstanceState);

    setContentView(R.layout.acti
vity_main);
```

```
        t1 =
findViewById(R.id.textView3)
;
        t2 =
findViewById(R.id.textView6)
;
        t3 =
findViewById(R.id.textView8)
;
        l1 =
findViewById(R.id.linear);

        t1.setText("");
        t2.setText("");
        t3.setText("");
        accelerometer = new
Accelerometer(MainActivity.t
his);
        gyroscope = new
Gyroscope(MainActivity.this)
;

accelerometer.setListener(ne
w Accelerometer.Listener() {
    @Override
    public void
onTranslation(float tx,
float ty, float ts) {
        if (tx > 1.0f) {

l1.setBackgroundColor(Color.
RED);

        t2.setText("On flat-
surface");

        }
        else if (tx
< -1.0f) {

l1.setBackgroundColor(Color.
BLUE);

        t2.setText("in hand");
        }
    }
});
```

```

gyroscope.addListener(new
Gyroscope.Listener() {
    @Override
    public void
onRotation(float rx, float
ry, float rz) {
        if (rz >
1.0f) {
11.setBackgroundColor(Color.
GREEN);

t1.setText("roated at
right");

        }

        else if (rz
< -1.0f) {

11.setBackgroundColor(Color.
YELLOW);

t1.setText("roated at
left");

        }

    }
});

Display display =
((WindowManager) getSystemService(Context.WINDOW_SERVICE)
).getDefaultDisplay();
int rotation =
display.getRotation();

if(rotation == 0){

t3.setText("Portraite");
}else{

t3.setText("Landscape");
}

}

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

```

```

accelerometer.register();

gyroscope.register();
}

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

accelerometer.unregister();

gyroscope.unregister();
}
}

```

## Gyroscope.java

```
package
com.example.pract_11;

import
android.content.Context;
import
android.hardware.Sensor;
import
android.hardware.SensorEvent
;
import
android.hardware.SensorEvent
Listener;
import
android.hardware.SensorManag
er;

public class Gyroscope {
    public interface
    Listener {
        void
        onRotation(float tx, float
        ty, float ts);
    }

    private Listener
    listener;

    public void
    setListener(Listener) {
        listener = l;
    }

    private SensorManager
    sensorManager;
    private Sensor sensor;
    private
    SensorEventListener
    sensorEventListener;

    // create constructor
    with context as argument
    Gyroscope(Context
    context) {

        sensorManager =
        (SensorManager)
        context.getSystemService(Con
```

```
text.SENSOR_SERVICE);

        sensor =
        sensorManager.getDefaultSens
        or(Sensor.TYPE_GYROSCOPE);
        sensorEventListener
        = new SensorEventListener()
        {
            @Override
            public void
            onSensorChanged(SensorEvent
            sensorEvent) {
                if (listener
                != null) {
                    listener.onRotation(sensorEv
                    ent.values[0],
                    sensorEvent.values[1],
                    sensorEvent.values[2]);
                }
            }
            @Override
            public void
            onAccuracyChanged(Sensor
            sensor, int i) {
                }
            };
        }

        public void register() {
            sensorManager.registerListen
            er(sensorEventListener,
            sensor,
            SensorManager.SENSOR_DELAY_N
            ORMAL);
        }
        public void unregister()
        {
            sensorManager.unregisterList
            ener(sensorEventListener);
        }
    }
}
```

## Accelerometer.java

```
package
com.example.pract_11;

import
android.content.Context;
import
android.hardware.Sensor;
import
android.hardware.SensorEvent
;
import
android.hardware.SensorEvent
Listener;
import
android.hardware.SensorManag
er;

public class Accelerometer {

    public interface
Listener {
        void
onTranslation(float tx,
float ty, float ts);
    }

    private Listener
listener;

    public void
setListener(Listener l) {
        listener = l;
    }

    private SensorManager
sensorManager;
    private Sensor sensor;
    private
SensorEventListener
sensorEventListener;
    Accelerometer(Context
context) {
        sensorManager =
(SensorManager)
context.getSystemService(Con
text.SENSOR_SERVICE);
        sensor =
sensorManager.getDefaultSens
```

```
or(Sensor.TYPE_LINEAR_ACCELE
RATION);

        sensorEventListener
= new SensorEventListener()
{
            @Override
            public void
onSensorChanged(SensorEvent
sensorEvent) {
                if (listener
!= null) {

listener.onTranslation(senso
rEvent.values[0],
sensorEvent.values[1],
sensorEvent.values[2]);
                }
            }
            @Override
            public void
onAccuracyChanged(Sensor
sensor, int i) {

            }
        };

        public void register() {

sensorManager.registerListen
er(sensorEventListener,
sensor,
SensorManager.SENSOR_DELAY_N
ORMAL);
        }

        public void unregister()
{

sensorManager.unregisterList
ener(sensorEventListener);
        }
    }
}
```

# OUTPUT

