UNIVERSITI MALAYSIA TERENGGANU

CSM3123 – NATIVE MOBILE PROGRAMMING

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 6

SEMESTER I 2024/2025

Prepared for:

DR. RABIEI B MAMAT

Prepared by:

MARLIANTI BT MUF PIARLIS (S66353)

MainActivity

```
package com.example.sensorexperimentapp;

import android.os.Bundle;

import androidx.activity.EdgeToEdge;
import android.hardware.Sensor;
import android.hardware.SensorManager;
import android.os.Bundle;
import android.widget.Button;
import android.widget.TextView;

import java.util.List;
import androidx.appcompat.app.AppCompatActivity;


public class MainActivity extends AppCompatActivity {
    private SensorManager sensorManager;
    private TextView sensorListTextView;

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

        Button detecSensorButton = findViewById(R.id.detectSensorButton);
        sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);

        detecSensorButton.setOnClickListener(v ->
listAvailableSensors());
    }
    private void listAvailableSensors(){
        List<Sensor> sensorList =
sensorManager.getSensorList(Sensor.TYPE_ALL);
        StringBuilder sensorInfo = new StringBuilder("Available
Sensor:\n");
        for (Sensor sensor : sensorList){

sensorInfo.append(sensor.getName()).append(sensor.getType()).append(")\n"
);
        }
        sensorListTextView.setText(sensorInfo.toString());
    }
}
```

Activity_main

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    android:orientation="vertical">

    <Button
        android:id="@+id/detectSensorButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
```

```
        android:text="Detect Available Sensors"
        />

    <TextView
        android:id="@+id/sensorListTextView"
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:paddingTop="16dp"
        android:text="Sensors will be listed here"
        />


</LinearLayout>
```

MainActivity

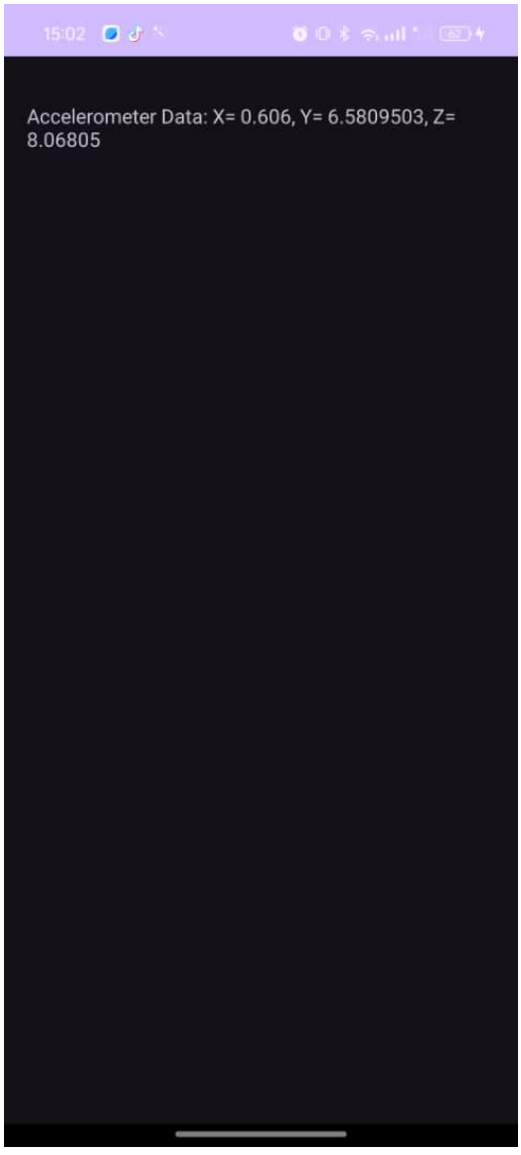
```
package com.example.sensorexperimentapp;

import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;
import android.os.Bundle;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity implements
SensorEventListener {
    private Sensor accelerometer, proximitySensor, lightSensor;
    private SensorManager sensorManager;
    private TextView accelerometerData, proximityData, lightData;

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


        sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);


        accelerometer =
sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER);
        proximitySensor =
sensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY);
        lightSensor = sensorManager.getDefaultSensor(Sensor.TYPE_LIGHT);


        accelerometerData = findViewById(R.id.accerometerData);
        proximityData = findViewById(R.id.proximityData);
        lightData = findViewById(R.id.lightData);


        if (accelerometer != null) {
            sensorManager.registerListener(this, accelerometer,
SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (proximitySensor != null) {
            sensorManager.registerListener(this, proximitySensor,
SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (lightSensor != null) {
            sensorManager.registerListener(this, lightSensor,
SensorManager.SENSOR_DELAY_NORMAL);
        }
    }

    @Override
    public void onSensorChanged(SensorEvent event) {
        if (event.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
            float x = event.values[0];
            float y = event.values[1];
            float z = event.values[2];
```

```
            accelerometerData.setText("Accelerometer Data: X= " + x + ",
Y= " + y + ", Z= " + z);
        } else if (event.sensor.getType() == Sensor.TYPE_PROXIMITY) {
            proximityData.setText("Proximity Data: " + event.values[0]);
        } else if (event.sensor.getType() == Sensor.TYPE_LIGHT) {
            lightData.setText("Light Data: " + event.values[0]);
        }
    }

    @Override
    public void onAccuracyChanged(Sensor sensor, int accuracy) {
        // No action needed
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        // Unregister sensor listeners to avoid memory leaks
        sensorManager.unregisterListener(this);
    }
}
```

Activity_main

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    android:orientation="vertical">

    <!--<Button
        android:id="@+id/detectSensorButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Detect Available Sensors"
        />

    <TextView
        android:id="@+id/sensorListTextView"
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:paddingTop="16dp"
        android:text="Sensors will be listed here"
        />-->

    <TextView
        android:layout_height="match_parent"
        android:layout_width="match_parent"
        android:id="@+id/accerometerData"
        android:text="Accelerometer Data: "
        android:paddingTop="16dp"
        />

    <TextView
        android:layout_height="match_parent"
        android:layout_width="match_parent"
        android:id="@+id/proximityData"
        android:text="Proximity Data: "
```

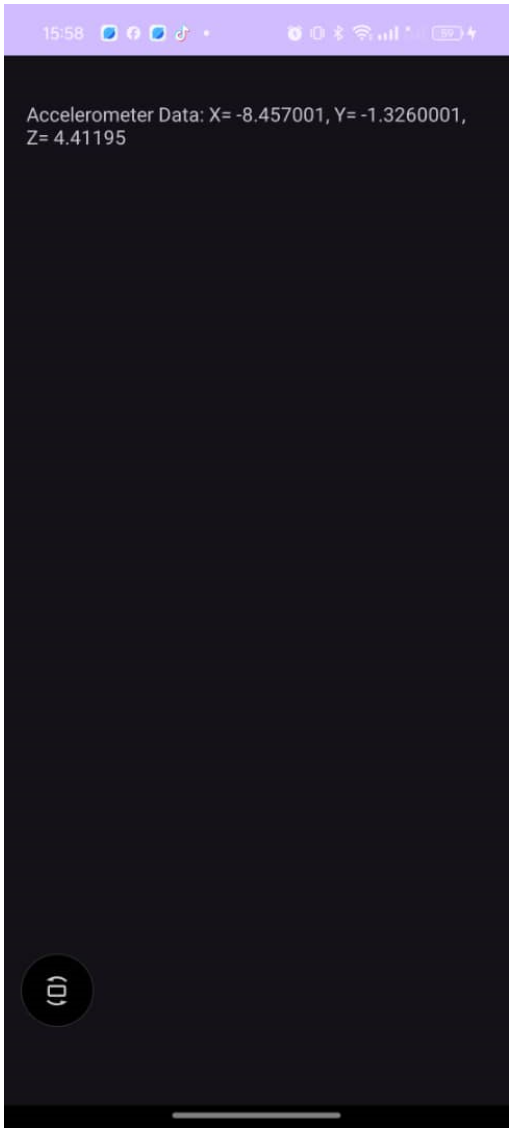
```
        android:paddingTop="16dp"
        />

    <TextView
        android:layout_height="match_parent"
        android:layout_width="match_parent"
        android:id="@+id/lightData"
        android:text="Proximity Data: "
        android:paddingTop="16dp"
        />

</LinearLayout>
```



mainActivity

```
package com.example.sensorexperimentapp;

import android.annotation.SuppressLint;
import android.hardware.Sensor;
import android.hardware.SensorEvent;
import android.hardware.SensorEventListener;
import android.hardware.SensorManager;
import android.os.Bundle;

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity implements
SensorEventListener {
    private Sensor accelerometer, proximitySensor, lightSensor;
    private Sensor rotationVectorSensor;
    private TextView orientationData;
    private SensorManager sensorManager;
    private TextView accelerometerData, proximityData, lightData;


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


        sensorManager = (SensorManager) getSystemService(SENSOR_SERVICE);
        rotationVectorSensor =
sensorManager.getDefaultSensor(Sensor.TYPE_ROTATION_VECTOR);
        sensorManager.registerListener(this,
rotationVectorSensor,SensorManager.SENSOR_DELAY_NORMAL);

        accelerometer =
sensorManager.getDefaultSensor(Sensor.TYPE_ACCELEROMETER);
        proximitySensor =
sensorManager.getDefaultSensor(Sensor.TYPE_PROXIMITY);
        lightSensor = sensorManager.getDefaultSensor(Sensor.TYPE_LIGHT);


        accelerometerData = findViewById(R.id.accerometerData);
        proximityData = findViewById(R.id.proximityData);
        lightData = findViewById(R.id.lightData);
        orientationData = findViewById(R.id.orientationData);


        if (accelerometer != null) {
            sensorManager.registerListener(this, accelerometer,
SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (proximitySensor != null) {
            sensorManager.registerListener(this, proximitySensor,
SensorManager.SENSOR_DELAY_NORMAL);
        }
        if (lightSensor != null) {
            sensorManager.registerListener(this, lightSensor,
SensorManager.SENSOR_DELAY_NORMAL);
        }
```

```
    }

    @Override
    public void onSensorChanged(SensorEvent event) {
        if (event.sensor.getType() == Sensor.TYPE_ACCELEROMETER) {
            float x = event.values[0];
            float y = event.values[1];
            float z = event.values[2];

            accelerometerData.setText("Accelerometer Data: X= " + x + ",
Y= " + y + ", Z= " + z);
        } else if (event.sensor.getType() == Sensor.TYPE_PROXIMITY) {
            proximityData.setText("Proximity Data: " + event.values[0]);
        } else if (event.sensor.getType() == Sensor.TYPE_LIGHT) {
            lightData.setText("Light Data: " + event.values[0]);
        }

        if(event.sensor.getType() == Sensor.TYPE_ROTATION_VECTOR){
            float[] rotationMatrix = new float [9];
            SensorManager.getOrientation(rotationMatrix, event.values);

            float[] orientation = new float[3];
            SensorManager.getOrientation(rotationMatrix, orientation);

            orientationData.setText("Orientation: "+
                    "Azimuth=" + Math.toDegrees(orientation[0])+
                    ", Pith=" + Math.toDegrees(orientation[1])+
                    ", Roll=" + Math.toDegrees(orientation[2]));

        }
    }

    @Override
    public void onAccuracyChanged(Sensor sensor, int accuracy) {
        // No action needed
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        // Unregister sensor listeners to avoid memory leaks
        sensorManager.unregisterListener(this);
    }
}
```



When I rotate the phone

GITHUB LINK: https://github.com/Marlianti01/NATIVE-PROGRAMMING.git