PSG COLLEGE OF TECHNOLOGY, COIMBATORE - 641004

Department of Applied Mathematics and Computational Sciences

MSc SS/TCS - Semester 6

IoT Lab, Assignment 2

1. Android Platform:

Most Android-powered devices have built-in sensors that measure motion, orientation, and various environmental conditions. These sensors are capable of providing raw data with high precision and accuracy, and are useful if you want to monitor three-dimensional device movement or positioning, or you want to monitor changes in the ambient environment near a device. For example, a game might track readings from a device's gravity sensor to infer complex user gestures and motions, such as tilt, shake, rotation, or swing. Likewise, a weather application might use a device's temperature sensor and humidity sensor to calculate and report the dewpoint, or a travel application might use the geomagnetic field sensor and accelerometer to report a compass bearing.

The Android platform supports three broad categories of sensors:

* **Motion sensors**

These sensors measure acceleration forces and rotational forces along three axes. This category includes accelerometers, gravity sensors, gyroscopes, and rotational vector sensors.

* **Environmental sensors**

These sensors measure various environmental parameters, such as ambient air temperature and pressure, illumination, and humidity. This category includes barometers, photometers, and thermometers.

* **Position sensors**

These sensors measure the physical position of a device. This category includes orientation sensors and magnetometers.

### Users can access sensors available on the device and acquire raw sensor data by using the Android sensor framework. Sensor Framework

One can access these sensors and acquire raw sensor data by using the Android sensor framework. The sensor framework is part of the [android.hardware](https://developer.android.com/reference/android/hardware/package-summary) package that includes various classes and interfaces.

Lab Assignments:

Using the APIs(for Sensors and GPS) provided in the Android framework, develop the following applications:

1. IoT based Person/Wheelchair Fall detection
2. Design and Implement an end to end IoT based application that functions as 911 for stray animals. This application must connect animal lovers and caregivers across the country so that strays get the medical attention they need in real time. If an animal that requires medical attention is seen on the roads, this application must send the image and GPS location of the animal. This information goes to the Cloud database. Volunteers must receive alert messages once this information arrives. The mobile user also has **access to database of veterinarians, ambulances, NGOs and vet chemists** near their location. Provide a high level design document outlining the solution.

Links to Refer:

https://developer.android.com/studio

<https://developer.android.com/guide/topics/sensors/sensors_overview>

<https://appinventor.mit.edu/explore/ai2/android-wheres-my-car>

https://medium.com/@quicky316/install-flutter-sdk-on-windows-without-android-studio-102fdf567ce4