Assignment #1

Note: Submit your schematics, code and the screen prints of the executed code as a single pdf file with the student ID as file name. Max.Marks for this assignment 4*5=20Marks

1) Perform the following instructions on your mobile/emulator.

- Create an app that lists the available device sensors.
- Run the app on a device and on the emulator to view sensors.
- Create a second app that gets data from the light and proximity sensors, and displays that data.
- Interact with the device and note the changes in sensor data.
- Run the app in the emulator and learn about the emulator's virtual sensors.

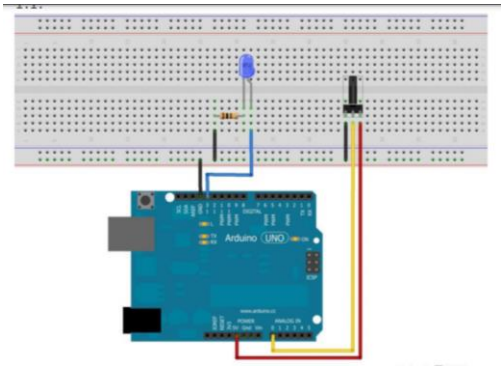
Note: Any OS can be considered.

Refer to the Demo given during the interaction. Sample class is shown below:

```
public class MainActivity extends Activity {
   SensorManager sm = null;
   TextView textView1 = null;
   List list;

   SensorEventListener sel = new SensorEventListener(){
      public void onAccuracyChanged(Sensor sensor, int accuracy) {}
      public void onSensorChanged(SensorEvent event) {
         float[] values = event.values;
         textView1.setText("x: "+values[0]+"\ny: "+values[1]+"\nz: "+values[2]);
      }   };

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

      /* Get a SensorManager instance */
      sm = (SensorManager)getSystemService(SENSOR_SERVICE);

      textView1 = (TextView)findViewById(R.id.textView1);

      list = sm.getSensorList(Sensor.TYPE_ACCELEROMETER);
      if(list.size()>0){
         sm.registerListener(sel, (Sensor) list.get(0),
SensorManager.SENSOR_DELAY_NORMAL);
      }else{
```

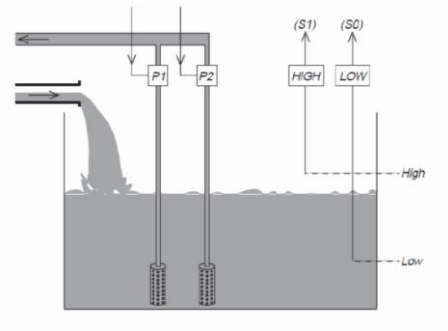
```
        Toast.makeText(getBaseContext(), "Error: No Accelerometer.",
Toast.LENGTH_LONG).show();
    }   }

  @Override
  protected void onStop() {
    if(list.size()>0){
      sm.unregisterListener(sel);
    }
    super.onStop();
  } }
```

2) A) Using fritzing circuit, connect a led and a potentiometer to execute the following tasks
B)Using UnoArduino Simulator, perform the following exercises:
1)Use the variable voltage
2)Read analog value from the variable voltage
3)and DIM LED based on the analog values



3) Consider a system to maintain the water level in a sump between the levels high and low. Two transducers (HIGH and LOW) are used to monitor the level. The water is pumped out by two pumps:
Assume appropriate conditions on how water should be maintained and write the program using the simulator.

The following system can be controlled by an Arduino microcontroller (using a simulator). The pumps can be mimicked by LEDs.Switches can be represented by Low and High transducers. The program should inspect the input switches at regular intervales and take appropriate action.



4)Using Arduino simulator perform the following instructions:

a) Reads an analog input on pin 0, converts it to voltage, and prints the result to the serial monitor. Graphical representation is available using serial plotter (Tools > Serial Plotter menu). Attach the center pin of a potentiometer to pin A0, and the outside pins to +5V and ground. Also prepare a sketch using fritzing.

b) Instead of converting to a voltage value, can you change the conversion factor to return a range from 0 to 100?

c) Simulate the above code to apply on a Servo Motor functioning on the UnoArdsimulator.

5)Using Wyliodrin studio and Raspberry Pi simulator, build your own applications based on the LEDs, and buttons and submit the codes accordingly