Documentation for Task 1:

1st project:

Aim:
To turn a bulb on by motion detection if the ambient light around is not enough.

Apparatus required:
Arduino Uno R3, Breadboard, PIR sensor, Ambient light sensor, 5V relay, Bulb, Jumper cables, 10k ohm resistor

Link for simulation:

Application:
Lighting of common areas such as hallways and restrooms.

Motivation for the project:
I noticed that the lights in our campus restrooms and hallways even switch on during the day time where there is an abundance of sunlight. This made me think of a way to overcome this issue and hence I came up with this circuit.

2nd project:

Aim:
To make an alarm ring/LED to glow when the moisture level in the soil or the surrounding temperature do not satisfy the given parameters.

Apparatus required:
Arduino Uno R3, Breadboard, Soil Moisture Sensor, Temperature Sensor, 16*2 LCD display, Potentiometer, LED, 1k ohm resistors(2), 100 ohm resistor, and jumper cables.

Link for simulation:

Application:
In plant monitoring systems

Motivation for the project:
Often watering of plants is done at a wrong time leading to ineffective usage and wastage of water. This made me think of a way to overcome this issue and hence I came up with this circuit.

3rd Project:

Aim:
To measure height and weight of any object.

Apparatus required:
Arduino Uno R3, Breadboard, Force sensor, Ultrasonic sensor, LCD 16*2(I2C), 10k ohm resistor, jumper cables.

Video link for simulation:

Application:
Measuring BMI, or determining the height and weight of objects.