EAST WEST UNIVERSITY

Department of Computer Science & Engineering

Lab Report

Course Name: Internet of Things
Course Code: CSE 406
Section No: 01

Lab Exercise No: 02

Submitted To:

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Experiment Title: Water Level Detection using Arduino and Water Sensor with LED Indicators.

Objective:

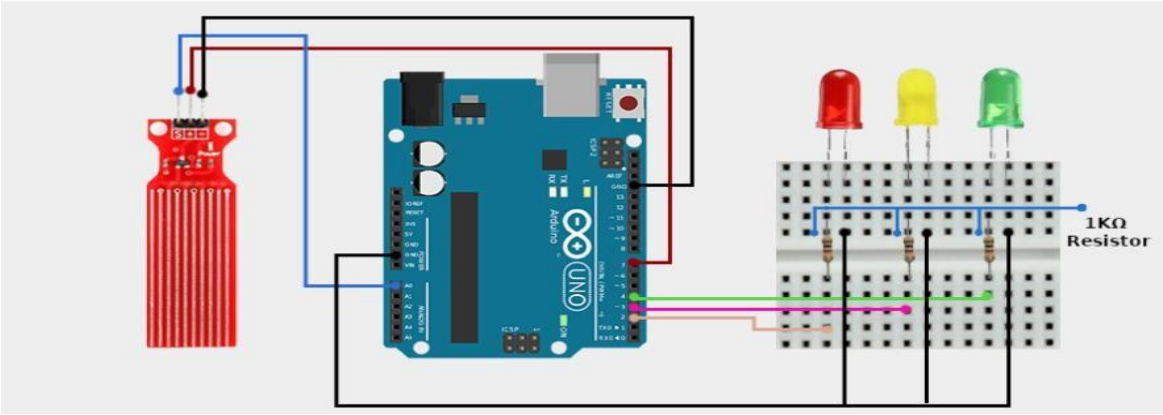
To design and implement a water level monitoring system using an Arduino Uno, water level sensor, and three LEDs to indicate different water levels:

- Red LED for High
- Yellow LED for Medium
- Green LED for Low

Components Used:

1. Arduino Uno
2. Water Level Sensor
3. Red LED
4. Yellow LED
5. Green LED
6. Resistors (1KΩ)
7. Jumper wires
8. Breadboard
9. USB cable and PC

Circuit Diagram:



Procedure:

1. Connect the water level sensor to the Arduino Uno as per the wiring table.
2. Connect the LEDs to pins 4, 5, and 6 using 1k resistors.
3. Upload the code to the Arduino Uno using the Arduino IDE.
4. Open the Serial Monitor at 9600 baud rates.
5. Gradually immerse the sensor in water and observe the changes in reading and level indication.

Working Principle:

The water sensor detects the water level by measuring the conductivity between its traces. It outputs an analog signal corresponding to the water level:

- Higher water = Higher analog value
- Lower water = Lower analog value

Based on the analog value from the sensor:

- If the value is =0 then the sensor is empty
- If the value is > 420, the Red LED lights up (High level)
- If the value is between 420 and 520, the Yellow LED lights up (Medium level)
- If the value is >0 and <= 420, the Green LED lights up (Low level)

Arduino Code: Internet_OF_Things/LAB-02/Jobayer_Water_level_LED.ino at main · JobayerFaisal/Internet_OF_Things

```
/* Change these values based on your calibration values */
int lowerThreshold = 420;
int upperThreshold = 520;


// Sensor pins
#define sensorPower 7
#define sensorPin A0

// Value for storing water level
```

```
int val = 0;

// Declare pins to which LEDs are connected
int redLED = 2;
int yellowLED = 3;
int greenLED = 4;

void setup() {
     Serial.begin(9600);
     pinMode(sensorPower, OUTPUT);
     digitalWrite(sensorPower, LOW);

     // Set LED pins as an OUTPUT
     pinMode(redLED, OUTPUT);
     pinMode(yellowLED, OUTPUT);
     pinMode(greenLED, OUTPUT);

     // Initially turn off all LEDs
     digitalWrite(redLED, LOW);
     digitalWrite(yellowLED, LOW);
     digitalWrite(greenLED, LOW);
}

void loop() {
     int level = readSensor();

     if (level == 0) {
          Serial.println("Water Level: Empty");
          digitalWrite(redLED, LOW);
          digitalWrite(yellowLED, LOW);
          digitalWrite(greenLED, LOW);
     }
     else if (level > 0 && level <= lowerThreshold) {
          Serial.println("Water Level: Low");
          digitalWrite(redLED, LOW );
          digitalWrite(yellowLED, LOW);
          digitalWrite(greenLED, HIGH);
     }
     else if (level > lowerThreshold && level <= upperThreshold)
{
          Serial.println("Water Level: Medium");
          digitalWrite(redLED, LOW);
          digitalWrite(yellowLED, HIGH);
          digitalWrite(greenLED, LOW);
     }
```

```
     else if (level > upperThreshold) {
          Serial.println("Water Level: High");
          digitalWrite(redLED, HIGH);
          digitalWrite(yellowLED, LOW);
          digitalWrite(greenLED, LOW);

     }
     delay(1000);
}

//This is a function used to get the reading
int readSensor() {
     digitalWrite(sensorPower, HIGH);
     delay(10);
     val = analogRead(sensorPin);
     digitalWrite(sensorPower, LOW);
     return val;
}
```

Observation:

Water Level (Analog Reading)	**LED On**	**Status**
level == 0	No	Empty
level > 0 && level <= 420	Green	Low
level > 420 && level <= 520	Yellow	Medium
level > 520	Red	High

Conclusion:

This experiment successfully demonstrated the detection of water levels using a water level sensor and Arduino Uno. The system reliably categorizes the water level into Low, Medium, and High, and can be extended for automated tank filling, irrigation systems, or alert-based systems.