East West University

Department of CSE

Course Title: Internet of Things

Course code: CSE406

Section: 01

Lab report: 02

Submitted by:
Sheikh sazzaduzzaman
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Submitted to:
Dr. Raihan Ul Islam
Associate Professor
Department of CSE

Introduction : In this lab we worked with an analog water level sensor and three LEDs red, yellow, and green to visually indicate water levels in a container. The aim of this project was to understand how to read analog sensor values using an Arduino, process them, and trigger different outputs based on sensor thresholds.

Code :

```
const int sensorPin = A0;
const int redLED = 2;
const int yellowLED = 3;
const int greenLED = 4;

void setup() {
  pinMode(redLED, OUTPUT);
  pinMode(yellowLED, OUTPUT);
  pinMode(greenLED, OUTPUT);
  Serial.begin(9600);
}

void loop() {
  int sensorValue = analogRead(sensorPin);
  Serial.println(sensorValue);


  if (sensorValue < 300) {

    digitalWrite(redLED, LOW);
    digitalWrite(yellowLED, LOW);
    digitalWrite(greenLED, HIGH);
  } else if (sensorValue < 600) {

    digitalWrite(redLED, LOW);
    digitalWrite(yellowLED, HIGH);
    digitalWrite(greenLED, LOW);
  } else {

    digitalWrite(redLED, HIGH);
    digitalWrite(yellowLED, LOW);
    digitalWrite(greenLED, LOW);
  }

  delay(500);
}
```

Explaination :

This Arduino program reads analog values from a water level sensor connected to analog pin A0. It uses three LEDs to indicate the current water level:

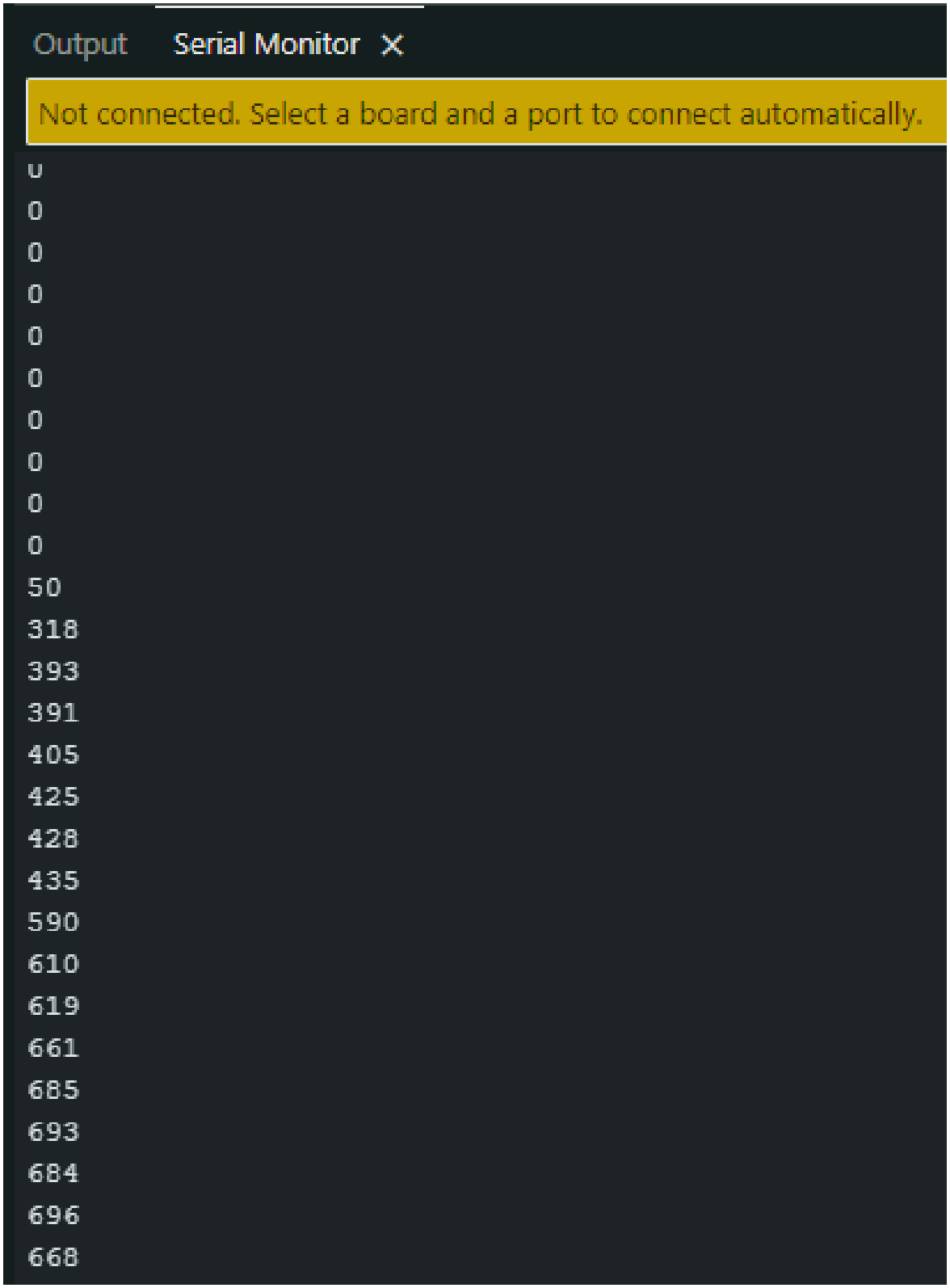
- **Green LED**: Lights up when water level is low (sensor value < 300).
- **Yellow LED**: Indicates medium water level (sensor value between 300 and 600).
- **Red LED**: Lights up when water level is high (sensor value > 600).

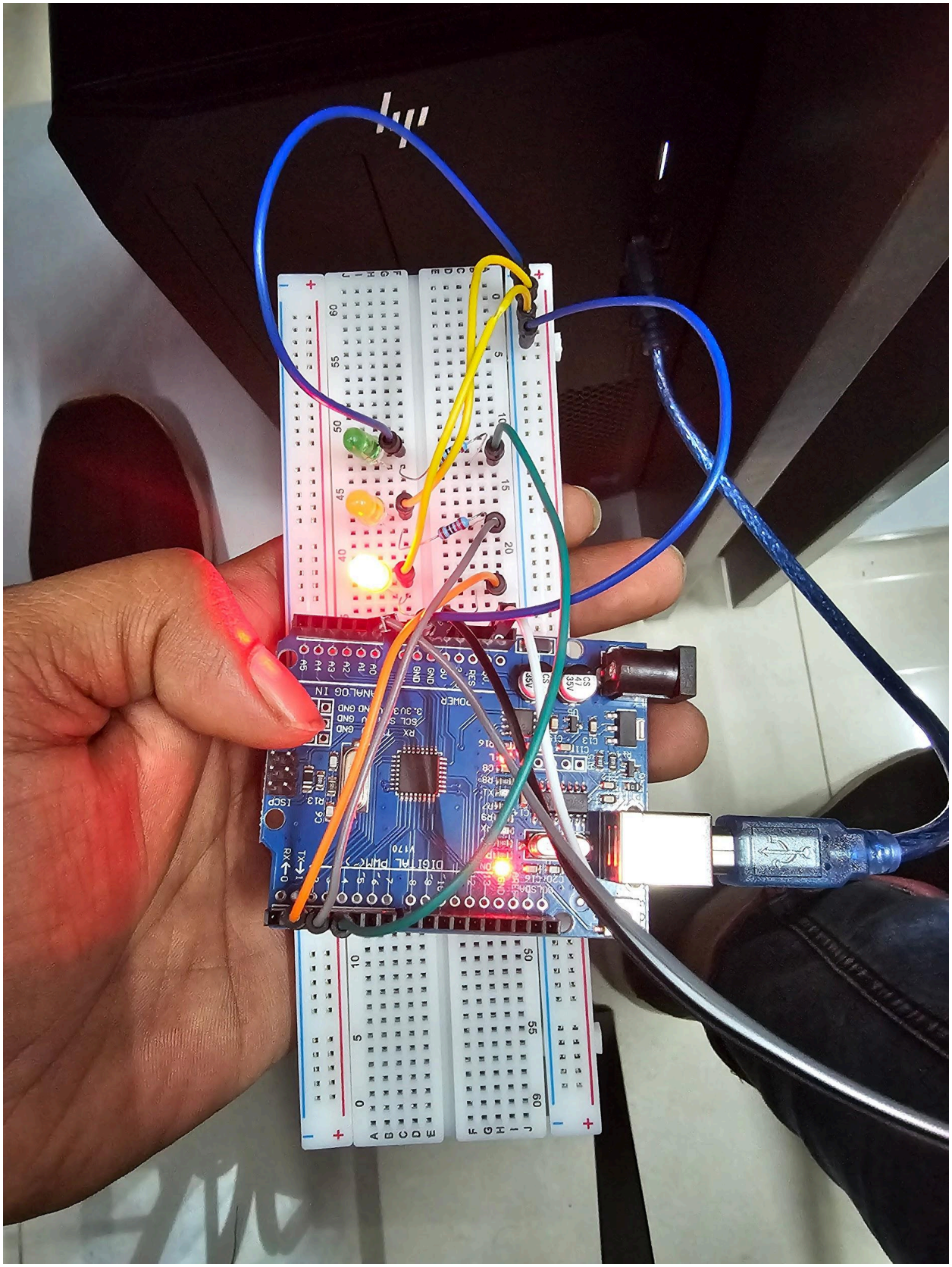
The analogRead() function reads the sensor value, which is then compared to threshold values to decide which LED to turn on. The thresholds can be adjusted based on calibration readings from the Serial Monitor.

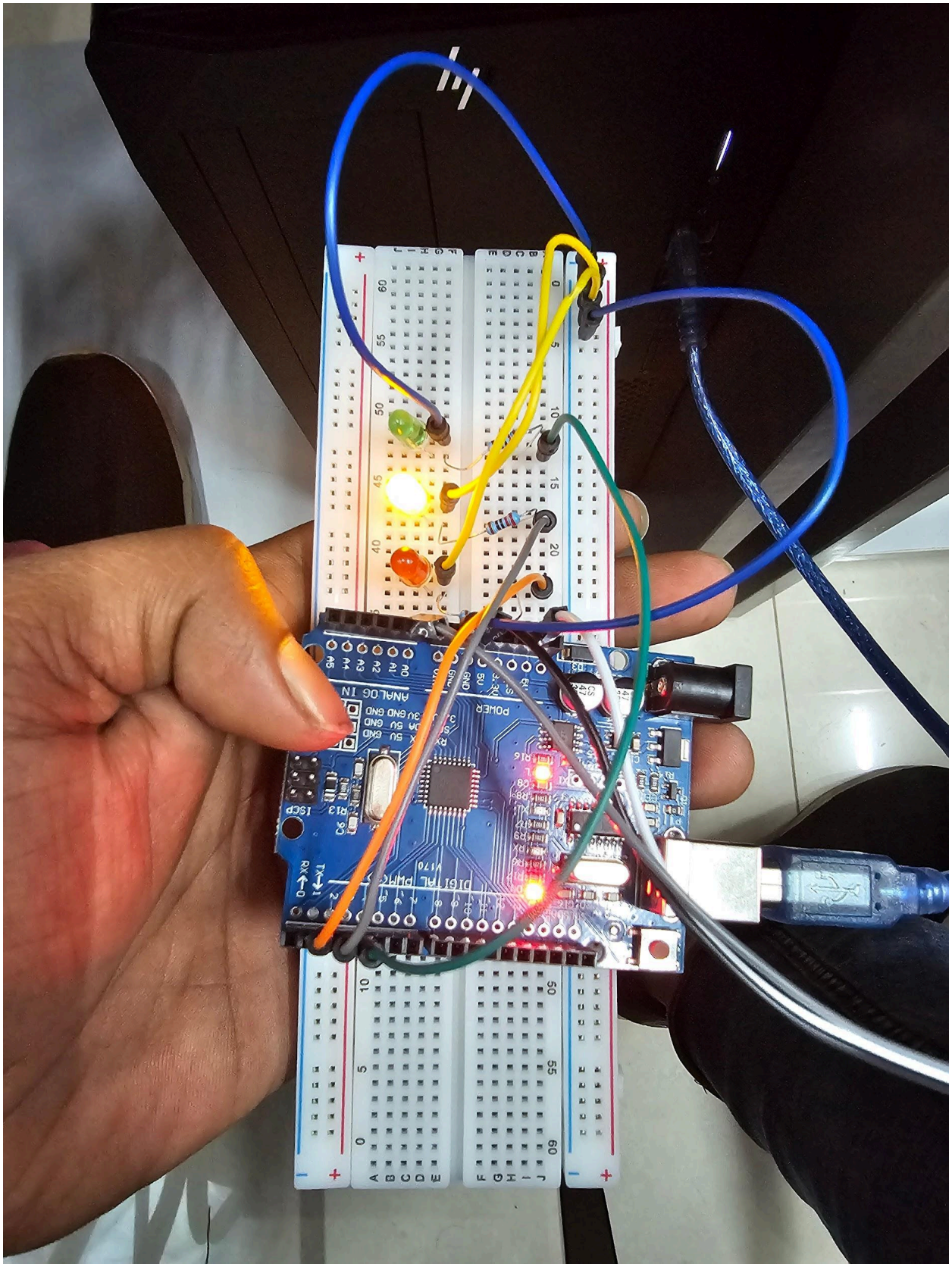
Output :

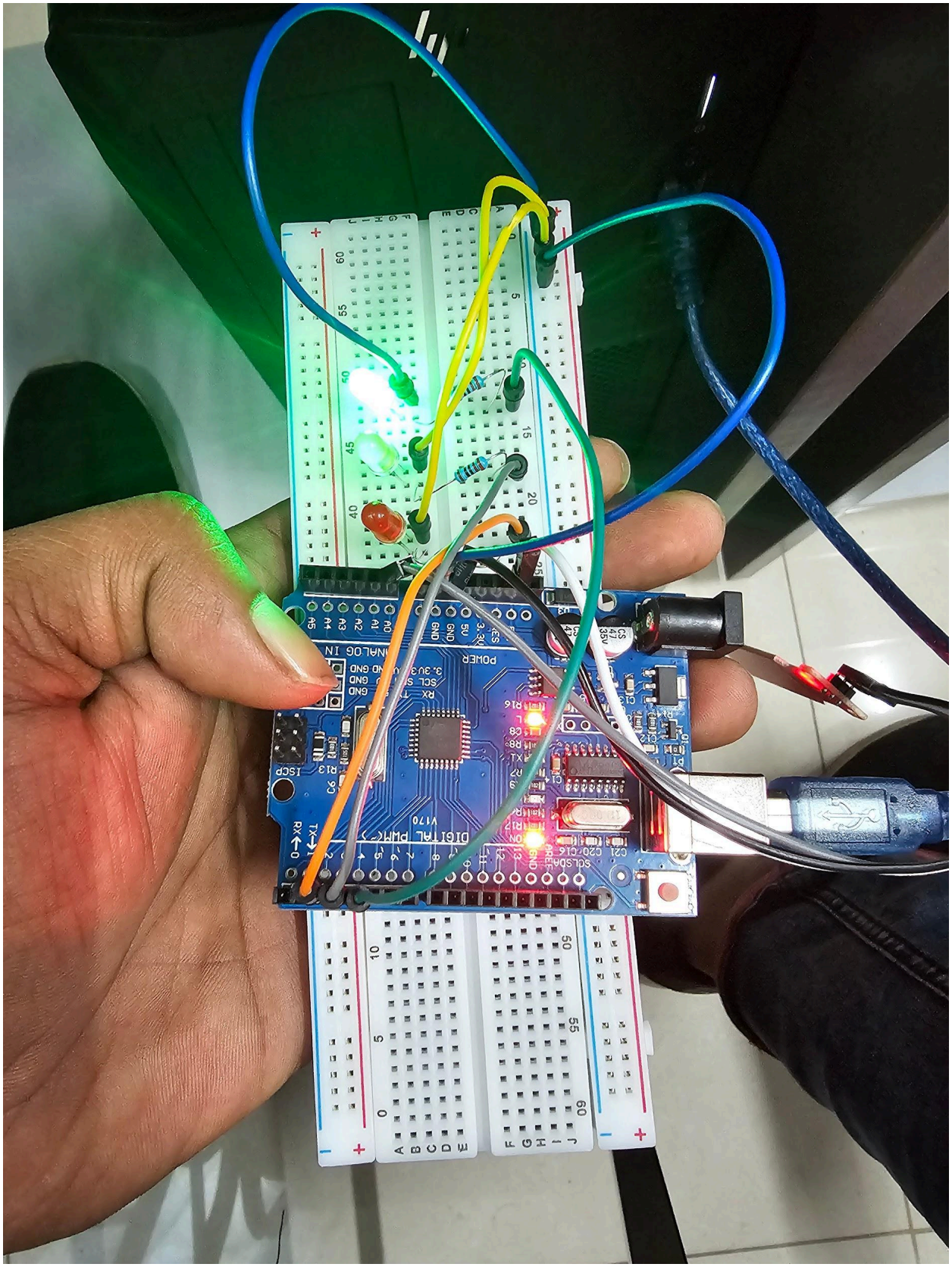
Uploading the code and running the setup initially depending on the sensor's reading, the appropriate LED lights up.As water level changes or resistance changes due to moisture the sensor value changes, and different LEDs respond accordingly.Output is also printed to the Serial Monitor for calibration and debugging.
Example readings from Serial Monitor and corresponding LED behavior:

- **Sensor Value: 200** → Green LED ON (Low water)
- **Sensor Value: 450** → Yellow LED ON (Medium water)
- **Sensor Value: 700** → Red LED ON (High water)


Output
Serial Monitor
Not connected. Select a board and a port to connect automatically.
0
0
0
0
0
0
0
0
0
50
318
393
391
405
425
428
435
590
610
619
661
685
693
684
696
668







Discussion :

This lab helped us to understand how analog sensors work and how to read values from them using Arduino.Mapping real-world physical conditions like water level to digital outputs in LEDs.Importance of calibration: Since different sensors or environments may produce different readings, initial testing is crucial to define appropriate threshold values.Basic use of conditional statements to control hardware components based on sensor input.