

Experiment No: 03

Experiment Title: Inspection of Voltage Variation with Light Dependent Resistor (LDR)

Course Code: CSE 460

Course Title: IoT Laboratory

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Expt 03: Inspection of Voltage Variation with Light Dependent Resistor (LDR)

Objective:

The objective of this experiment is to investigate and understand the voltage variation across a Light Dependent Resistor (LDR) in response to changes in ambient light levels. Through Arduino-based analog sensor interfacing, the goal is to quantify the LDR's resistance variations and establish a relationship between the detected light intensity and the corresponding analog voltage output. This experiment aims to provide insight into the practical applications of LDRs and enhance participants' proficiency in interfacing analog sensors with Arduino for light-sensing applications.

Methodology:

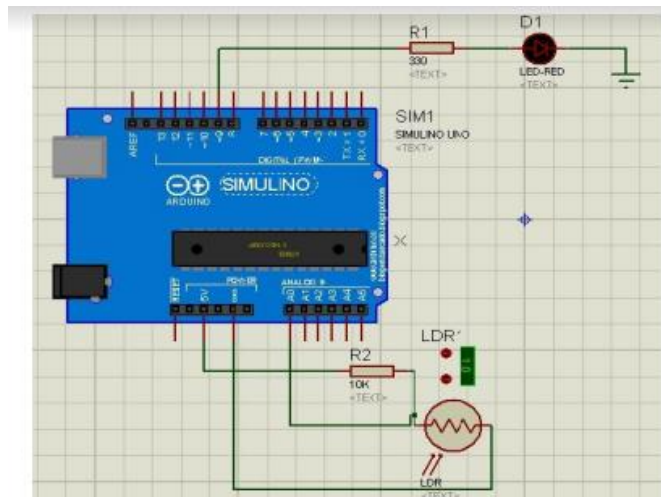
1. Arduino setup:

We have set up our Arduino as followed:

- We downloaded Arduino from here <https://www.arduino.cc/en/software> and installed it.
- We added the cable of the Arduino with laptop and checked the port if its connected.

2. Circuit connection:

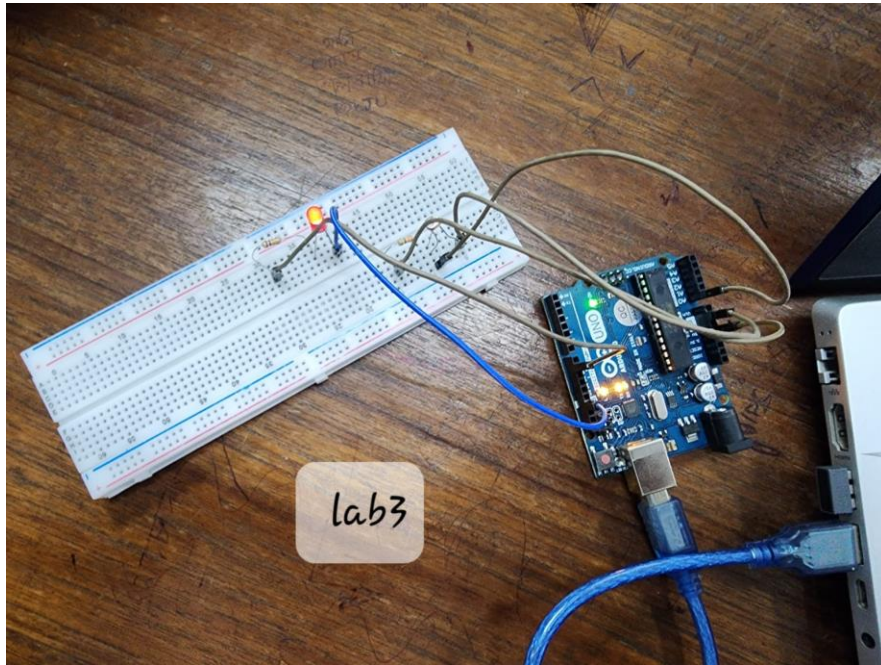
- Collect components
- Connect components according to following figure:
- LED attached from pin 9 to ground through 220 ohm resistor
- pushbutton attached to pin 2 from +5V
- 10K resistor attached to pin 2 from ground



Source Code:

```
const int analogInPin = A0;
const int analogOutPin = 9;
int sensorValue = 0;
int outputValue = 0;
void setup() {
  Serial.begin(9600);
}
void loop() {
  sensorValue = analogRead(analogInPin);
  outputValue = map(sensorValue, 0, 1023, 0, 255);
  analogWrite(analogOutPin, outputValue);
  Serial.print("sensor = " );
  Serial.print(sensorValue);
  Serial.print("\t output = ");
  Serial.println(outputValue);
  delay(1000);
}
```

Output:



Discussion:

In conclusion, the experiment successfully demonstrated the dynamic relationship between light intensity and voltage variation in an LDR using Arduino-based analog sensor interfacing. As ambient light levels changed, the LDR exhibited corresponding shifts in resistance, resulting in observable variations in the analog voltage output. The collected data allowed for the creation of a response curve, showcasing the LDR's sensitivity to different lighting conditions. This experiment not only deepened our understanding of LDR behavior but also highlighted the utility of Arduino in interfacing with analog sensors. The obtained results can serve as a foundation for designing light-sensitive applications, such as automatic lighting systems, ambient light monitoring, or even solar tracking systems. Overall, this hands-on experience equipped participants with practical insights into the interplay between analog sensors and Arduino, expanding their skill set in the realm of sensor interfacing for various real-world applications.