

NIELIT, Gorakhpur

Course Name: A-level (1st Sem.)

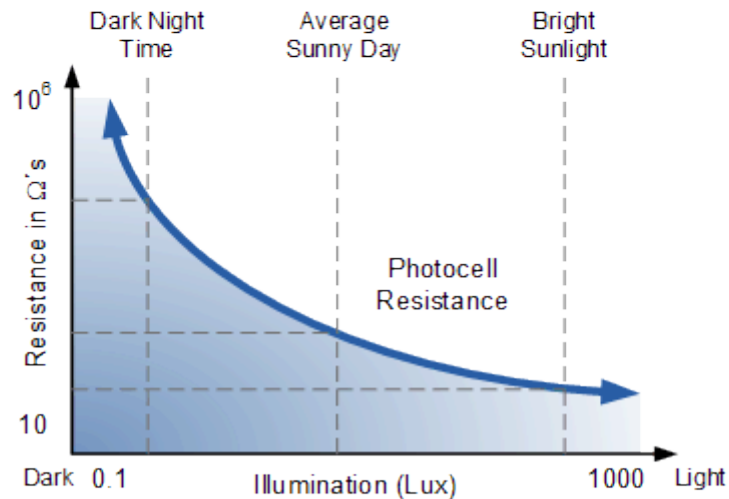
Subject: IoT

Topic: LDR Interfacing with Arduino UNO

Date: 31.03.2020

Introduction

LDR is **Light Dependent Resistor**. LDRs are made from semiconductor materials to enable them to have their light-sensitive properties. There are many types but one material is popular and it is cadmium sulfide (CdS). These LDRs or PHOTO RESISTORS work on the principle of "Photo Conductivity". Now what this principle says is, whenever light falls on the surface of the LDR (in this case) the conductance of the element increases or in other words, the resistance of the LDR falls when the light falls on the surface of the LDR. This property of the decrease in resistance for the LDR is achieved because it is a property of semiconductor material used on the surface.



Working of LDR controlled LED using Arduino

As per the circuit diagram, we have made a voltage divider circuit using LDR and 100k resistor. The voltage divider output is fed to the analog pin of the Arduino. The analog Pin senses the voltage and

gives some analog value to Arduino. The analog value changes according to the resistance of LDR. So, as the light falls on the LDR the resistance of it get decreased and hence the voltage value increase.

Intensity of light ↓ - Resistance↑ - Voltage at analog pin↓ - Light turns ON

As per the Arduino code, if the analog value falls below 500 we consider it as dark and the light turns ON. If the value comes above 500 we consider it as bright and the light turns OFF.

Code

```
int LED = 9;
int LDR = A0;

void setup()
{
  Serial.begin(9600);
  pinMode(LED, OUTPUT);
  pinMode(LDR, INPUT);
}

void loop() {
  int LDRValue = analogRead(LDR);
  Serial.print("sensor = ");
  Serial.print(LDRValue);

  if (LDRValue <=500)
  {
    digitalWrite(LED, HIGH);
    Serial.println("Lights status: ON");
  }
  else
  {
    digitalWrite(LED, LOW);
    Serial.println("Lights status: OFF");
  }
}
```

Exercise:

1. Write a program to display value of LDR on Serial monitor.