DHA SUFFA UNIVERSITY

MEASUREMENT & INSTRUMENTATION LAB
ME-3103L

Lab # 07

LED Control with LDR

Name: _____ **Reg.** # M E - __ __ __ __ __ __

Class: _____ **Section:** _____ **Max Marks:** 20

INSTRUCTIONS

I. Submit all the lab tasks and post lab tasks printed on A4 paper with **question**, **code**, **picture** and **schematic** of circuit, stapled together with lab manual and filled rubrics.
II. Explain the code by adding **comments**. Marks will be **deducted** for programs without explanation.
III. The due date of submission is exactly **7 days after performing the lab.**
IV. Reports handed **after the deadline** will not be considered.
V. It is always good to mention your name, ID and page # on each page.

OBJECTIVE

To understand the working of LDR and perform the measurement on serial monitor and serial plotter using Arduino. Also perform an LED experiment in combination with LDR.

EQUIPMENT

- 1 x Arduino Uno (w/ USB cable)
- 1 x LED
- 1 x LDR
- Resistors
- 1 x Breadboard
- Jumper Wires

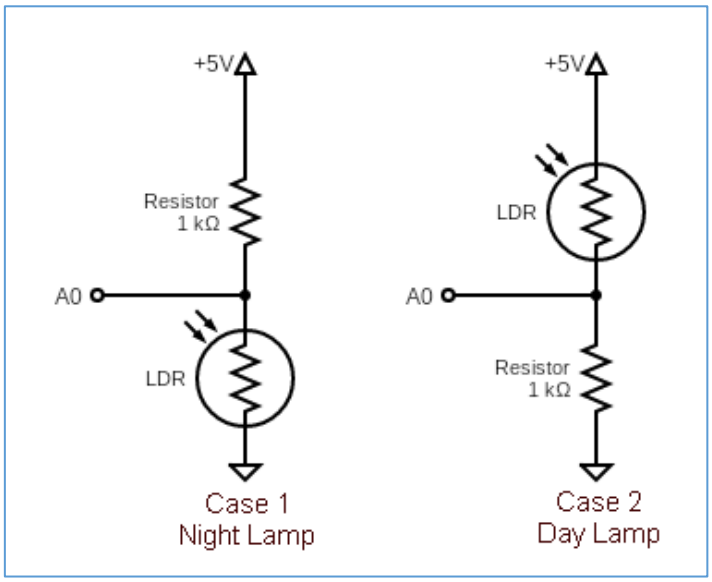
COMMANDS

- **Analog Read & Write**
  example:
  analogRead(pin);
  analogWrite(pin, value);

- **Serial Print**
  example:
  Serial.begin(9600); // Setup
  Serial.print(variable); // To print a value.

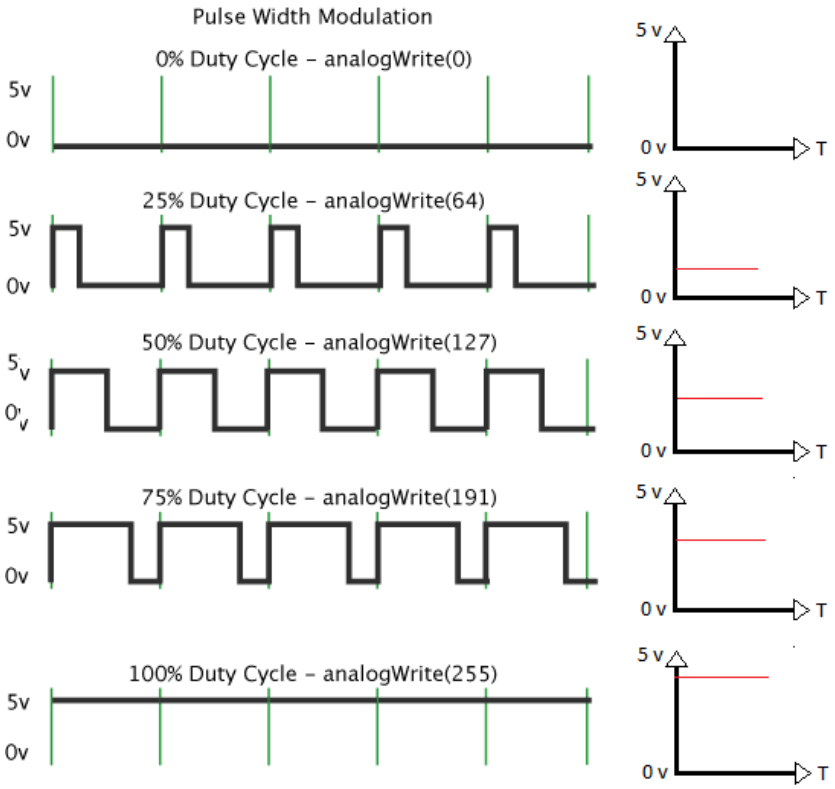
- **Map**
  map(value, fromLow, fromHigh, toLow, toHigh)

SCHEMATIC AND WORKING OF THE SENSOR



For case 1, when the output is connected between LDR and ground, voltage drop across the LDR is measured. When the light source is placed on the LDR, it will give lower values of voltage drop means the resistance of LDR has decreased. Hence the LED will turn OFF in the absence of voltage.

But for the case 2, resistance is measured across the 1k ohm resistor i.e., output is connected between 1k ohm resistor and ground. Now if the light source is placed on the LDR, again the resistance will decrease across LDR and all the voltage will be dropped at 1k ohm resistor (higher resistance). Therefore, LED will turn ON in the presence of light.



LAB TASKS

Q1) Develop the program to read values of LDR and display it on serial plotter. Now save this image and add in your lab report.

Q2) Develop a program which controls the brightness of LED with the help of an LDR and display its reading on serial monitor/serial plotter. Add this in your lab report. LED should turn ON only when it's dark as discussed in Case 1.

Q3) Develop a program which controls the brightness of LED with the help of an LDR and display its reading on serial monitor/serial plotter. For Case 2, LED should turn OFF when it's dark.

POST LAB TASKS

Q1) Suggest a circuit that can made using LED and LDR combination that can be implemented at your home. Give a brief summary of their working.

Q2) Explain Pulse Width Modulation with the help of graph.