21CSS201T (COA) Mini Project: Light Sensitive Lamp

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Objective

1 **Design**

Develop a circuit diagram incorporating a photoresistor, microcontroller, and LED.

2 **Implementation**

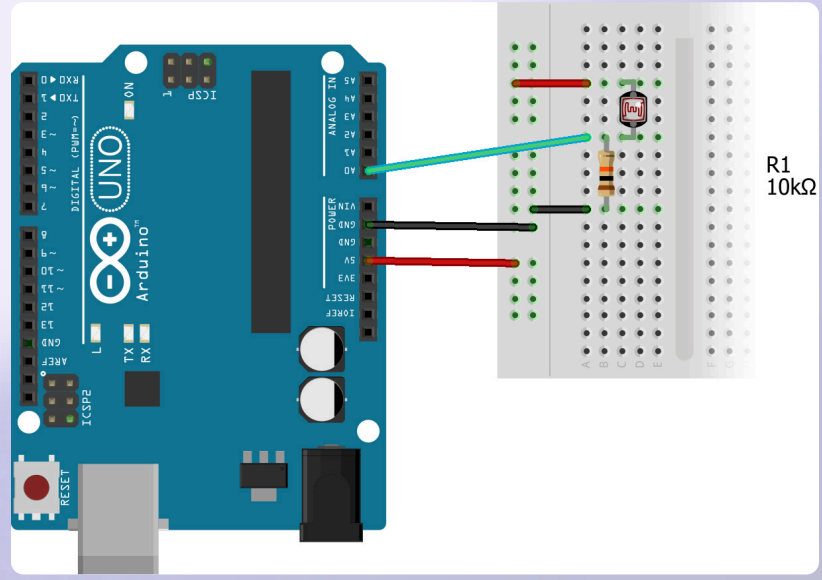
Build and test a functional prototype.

3 **Calibration**

Calibrate the circuit to adjust brightness based on light levels.

4 **Documentation**

Present a comprehensive report covering the design, implementation, and results.



Hardware and Software Components

Photoresistor

A light-sensitive resistor that changes its resistance based on the amount of light it receives.

Arduino Uno Microcontroller

A microcontroller that reads the photoresistor’s output and controls the LED's brightness.

LED

A light-emitting diode that changes brightness based on the microcontroller's output.

Resistors and Wires

Components used to control the current flowing through the circuit and connect the components.

Breadboard

A prototyping tool used to connect the circuit components easily.

Arduino IDE

Software used to write and upload code to the Arduino microcontroller.

Comparing the existing model with our model

Features	Existing Model	Our Model
Light Sensitivity	Simple on/off, not adjustable	Continuously adjustable brightness
Power Consumption	High, always on	Energy-efficient, adjusts based on need
Control Mechanism	Limited, manual switch	Advanced, automatic light sensing

Flow Chart

1

Step 1

Measure the light level with the photoresistor.

2

Step 2

Convert the analog photoresistor reading to a digital value.

3

Step 3

Map the digital value to a range of LED brightness values.

4

Step 4

Set the LED brightness based on the mapped value.

Circuit Diagram

Photoresistor

The photoresistor senses the ambient light level.

Arduino Uno

The microcontroller reads the photoresistor's output and controls the LED's brightness.

LED

The LED emits light, controlled by the Arduino.

Resistors

Resistors limit current flow to protect components.