Alexandria University
Faculty of Engineering
Computer and Systems Engineering Dept.
CSE233: Computer Organization

Lab #5 Report

Adjustable Brightness Desk Lighting System

Names:

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1. Problem Statement

The system adjusts LED brightness based on a potentiometer's position to provide comfortable desk lighting.

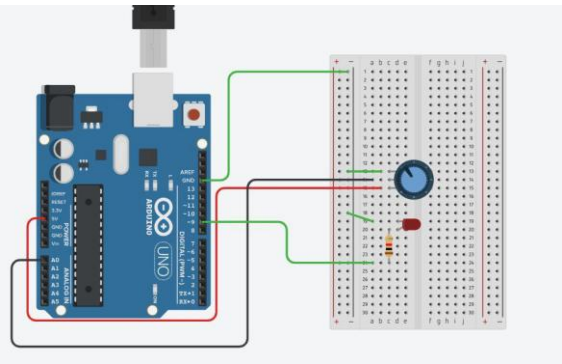
2. Code "GitHub Rebo"

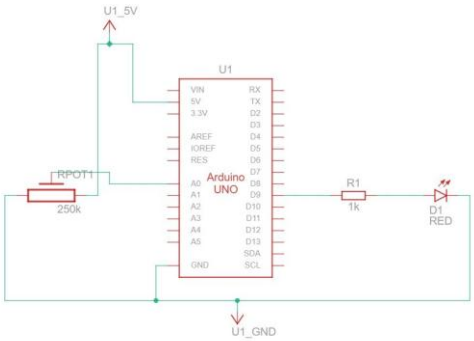
GitHub:
https://github.com/Mohamed-Abdalla-Yassen/Computer-Organization-Projects.git
Arduino web editor:
https://app.arduino.cc/sketches/4d448f2e-81d5-47be-b7b7-13213cad5f67?view-mode=preview

3. Video "YouTube"

https://youtube.com/shorts/-GiqfEbRILk

4. Schematic diagram





5. Description & Challenges

The Adjustable Brightness Desk Lighting System is designed to simulate a real-life lighting setup where the brightness level can be manually controlled by the user. The system consists of an Arduino board, a potentiometer, and an LED. The potentiometer functions as a variable resistor that provides an analog input signal to the Arduino, representing the desired brightness level. The Arduino processes this analog signal and generates a corresponding PWM (Pulse Width Modulation) output to

control the LED’s brightness.
As the user rotates the potentiometer, the LED gradually increases or decreases in brightness, allowing smooth control over the light intensity.

Challenges:

Some challenges faced during this experiment include reading stable values from the potentiometer, as small movements can cause rapid changes in brightness. Another challenge is making the LED brightness change smoothly without flickering. Wiring mistakes or loose connections can also affect the system’s performance. Finally, adjusting the code to match the full brightness range of the LED requires careful calibration.