

Learning Goals:

- Be able to convert analog sensor input to digital information.

We want to start incorporating more complicated devices into our circuits.

For lab 4 your design will incorporate the light sensitive resistor photocell and display relevant information about the photocell value onto the 16x2 display.

Prelab:

Get your photoresistor wired correctly and have the "value" read from the photoresistor output to the serial monitor of the Arduino software.

As shown here <http://playground.arduino.cc/Learning/PhotoResistor>

A little better schematic for wiring a photoresistor is at:

<https://www.instructables.com/id/How-to-use-a-photoresistor-or-photocell-Arduino-Tu/>

More information about photoresistors and their operation can be found at:

<http://learn.adafruit.com/photocells>

Lab 4: Due Monday 9/30/2019

Create a circuit and program that will use a photoresistor and the 16x2 display.

The display should state the relative amount of light in the room as one of 5 predefined text values based on the value read from the photocell. The 5 predefined text values are:

- dark
- partially dark
- medium
- partially light
- fully lit

This involves you determining the range of values the photoresistor provides and then making reasonable ranges for the values being considered. The values received from two different photoresistors can vary greatly in the same lighting conditions. This is due to the nature of the physical differences that always occur during the manufacturing of photoresistors. Thus, you will need to perform a series of tests using your photoresistor in multiple lighting conditions to see what are the actual values produced. After this testing has occurred, you should be able to determine the reasonable ranges needed for this lab. Use of the Arduino `Serial.print()` library function can help you in setting up these tests.

<https://www.arduino.cc/reference/en/language/functions/communication/serial/print/>

To be considered completed "on time", this Lab needs to be demonstrated by end of Lab on Monday 9/30/2019,

Your code must be submitted to Gradescope BEFORE you demo your lab!

Late Policy

- Late Submission 1
 - Demonstrated on Tuesday or Wednesday immediately after Due Date
 - 25% Penalty
- Late submission 2
 - Demonstrated between Thursday after Due Date and the next Monday
 - 50% Penalty

What should I include with my .ino Code File?

As with any code file, it should be written in Good Coding Style: in a manner that will help other people read and understand the intent, purpose, operation of the code. So your code must include:

- Name the .ino file with your NetId and Lab Number
 - I.E. something like: ptroy4Lab2.ino
- Header Comments (including the following)
 - // FirstName LastName, UIN and NetID
 - // Lab x - Title
 - // Description - what is this code supposed to do?
 - // Include any assumptions you may have made, what do you expect from the hardware, pinouts, particular arduino versions, etc.
 - // References - where did you find code snippets, ideas, inspirations? if no references used say: "no references used"
- Code is well documented/formatted with comments, indentations, and descriptive variable names
- Actual code - the functions in the cpp/ino file

Academic Integrity Guidelines:

You may use any resources linked from this lab, or posted by the professor or TAs on piazza/class web page/etc. You should not look at any other internet resources for this. This is an individual assignment, and should be completed on your own. You should not show anyone your code, or look at anyone else's code.