Light Sensor

In this portion of the workbook we will be building a circuit and writing code to use a light sensor, or two, to monitor how much light the plant is getting. We will also be using our Raspberry Pi to request information from the Arduino.

\*Fill in the missing information for later use\*

1. Gather Materials
   1. Arduino
   2. Raspberry Pi
   3. USB cable or Bluetooth dongle
   4. Breadboard
   5. Jumper wires (x 6)
   6. MoistureSensor-Student.py
   7. Your plant
   8. Light Sensor(s) A.K.A Photoresistor(s)
   9. 10-kilohm resistor(s)
2. Setup the Moisture Sensor circuit
   1. Plug a jumper wire into the 5v pin on your Arduino and the first hole in the (+) column of your breadboard.
   2. Plug a jumper wire into the GND pin on your Arduino and the second hole in the (-) column of your breadboard.
   3. Decide how many light sensors you want to use, and gather them up. For each sensor, make sure you have a 10-kilohm resistor to use with it.
   4. Connect a jumper wire from the (+) column on the left to the (+) column on the right. This will make the circuit easier to work with later.
   5. Repeat the following process for each light sensor
      1. Connect one side of the light sensor to the right side of the split in the breadboard and the other to the left side of the split in the board. This make the light sensor the only way the current can get through the circuit. See the “explanation of the breadboard” if you don’t understand why that is true.
      2. Connect a jumper wire from the left side of the light sensor to an analog input pin on the Arduino (write them down below).
      3. Complete each circuit with the 10-kilohm resistor. Connect one end of the resistor to the hole adjacent to jumper wire and the other to the closest (-) hole.

*Note: The reason we are using the resistor like this is because our light sensor is too sensitive. This way we can detect changes in light levels more easily.*

Sensor Placement:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Analog Pin:\_\_\_\_

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*Note: Double check you have the power connected to power and ground to ground. Otherwise, you might break your parts.*

1. Write the pseudocode for the light sensor(s). Think about how the sensor might tell you what is going on (how fast), what you want the sensor to tell you, and how you want to be told what the sensor is observing.

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1. Open the LightSensor-Student.py file in PyCharm
2. Look over the comments provided. Does your pseudocode match what you see? What differences do you see?

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1. Write the code you want to use! Use the LightSensor-Student.py file as a framework. Consult the workbook if you need help finding a function or how to do something. If you’re still unsure, ask for help.
2. Have an instructor double check your work before you test out what you just made!
3. Connect your Raspberry Pi to the Arduino using a USB cable or the Bluetooth dongle. Consult the tutorial for the Bluetooth dongle, if you choose this path.
4. Run your code!
5. Is there a way to make the sensor readings show you only what you want to see? Experiment with the output!