

**CS 6452: Prototyping Interactive Applications Fall 2015**  
**Programming Assignment 2: Sensing and Output**  
September 21, 2015

This assignment is a test of your understanding of the introductory concepts of Arduino programming covered in the class. You will extend example sketches and circuits to read and process sensor data and produce an output. You are asked to work in groups to complete this assignment, but you must turn in your own individual answers and you will be expected to demo and explain all of the code you turn in.

### Task

Complete the following tasks:

1. Review the **Circuit examples 1, 2, 4, 6, 9, 10, and 15** found in the SIK Guide that comes with Arduino Starter Kit you received in class. Experiment with these examples in order to understand what they do.
2. Create a circuit that controls a single LED through the **analogue photoresistor sensor**. Sample code is located at:  
[http://gtprototyping2015.pbworks.com/w/file/100966981/AnalogInput\\_PhotoresistorArduino.ino](http://gtprototyping2015.pbworks.com/w/file/100966981/AnalogInput_PhotoresistorArduino.ino)  
(Hint: You need to figure out how to calibrate the values from the sensor to trigger the LED and you use the Serial Monitor in the Arduino IDE to do this.)
3. Modify the circuit and code from part 2 to now control 2 LEDs with a single **photoresistor**.
4. Substitute **the flex sensor** for photoresistor in part 3 to control 2 LEDs. Modify code as needed.
5. Substitute **the potentiometer** for the flex sensor in part 4 to control 2 LEDs. Modify code as needed.
6. Circuit 15 in the **SIK Guide** (and its accompanying example code **SIK Guide -> Circuit 15**) will show you how to connect the LCD display to the Arduino Uno and show information on the display. Modify that circuit to introduce the photoresistor and “count” how many times you tap that sensor (e.g., cover it up to reduce the light to the sensor).

### Deliverable

Working source code (files that end with .ino) and pictures of circuits that demonstrate parts 2 through 6. In class on Monday, September 28, you will need to demonstrate Part 6 in class, and be prepared to describe how the circuit works and how it might be modified. You are working in teams of 2 or 3, but each individual will have to answer questions and demonstrate understanding.

### Grading Criteria

1. In-class demo of working solution for any/all parts. (60 points)
  - a. Working demo (30 points)
  - b. Explaining the code (10 points)
  - c. Making modifications to the circuit (20 points)
2. Source code and pictures of circuits. (30 points)
3. Comments and variable names providing clarity to code. (10 points)

**Due** Sunday, September 27<sup>th</sup>. Upload to T-Square. Demo will be in-class on September 28<sup>th</sup>.