School of Advanced Technology

CST8227 Lab 4: Serial Monitor and Pull-Up Circuits

Lab Objectives:

1. Prototype a simple series circuit, sending digital and analog outputs to a tri-color LED.
2. Use a polling loop to read a momentary contact switch.
3. Use the serial monitor to see more information about what your program is doing.
4. Use a pull-up resistor in a circuit.

Required Equipment:

- Computer with Arduino IDE & Teensy extensions installed and working
- Teensy board and USB cable
- Tricolour LED
- Push-button switch
- Resistors

Supplemental Reading:

- "Pull-Down Resistors" in the eBook "Beginning Arduino." Last week's lab, Lab #3, featured a pull-down resistor.
- "Pull-Up Resistor" in the eBook "Beginning Arduino." This week's lab (i.e. Tutorial #3 on PJRC.com) features a pull-up resistor.

Task 1: Demo Tutorial 3 from PJRC.com

- Complete *Tutorial 3: Serial Monitor & Input* from the PJRC website: https://www.pjrc.com/teensy/tutorial3.html

  Notes: the (small) pushbutton switches supplied in your "Tutorial Kit" have "nibs" on the end of the leads, which may prevent you from inserting the PB on a breadboard. Options: i) remove the nibs (I can provide wire-cutters), ii) use the 'bigger' pushbutton switches.

- Demonstration: demo the circuit and Teensyduino sketch from the section *Pushbuttons To Control Colors*
    - open the Serial Monitor window and show the Serial.println() messages.

Task 2: Make a Fritzing Diagram

1. Use the fritzing application to create the circuit layout from the section *Pushbuttons To Control Colors*

2. Add a Note to your diagram. Display the following information:
   CST8227 – Interfacing
   Lab 04 – Pushbuttons to Control LED Colors

   Control a tricolor RGB with two switches and a pull-up resistor.

   @author *Your Firstname and Lastname* (*your userID*)

3. Export your diagram as a PNG image.

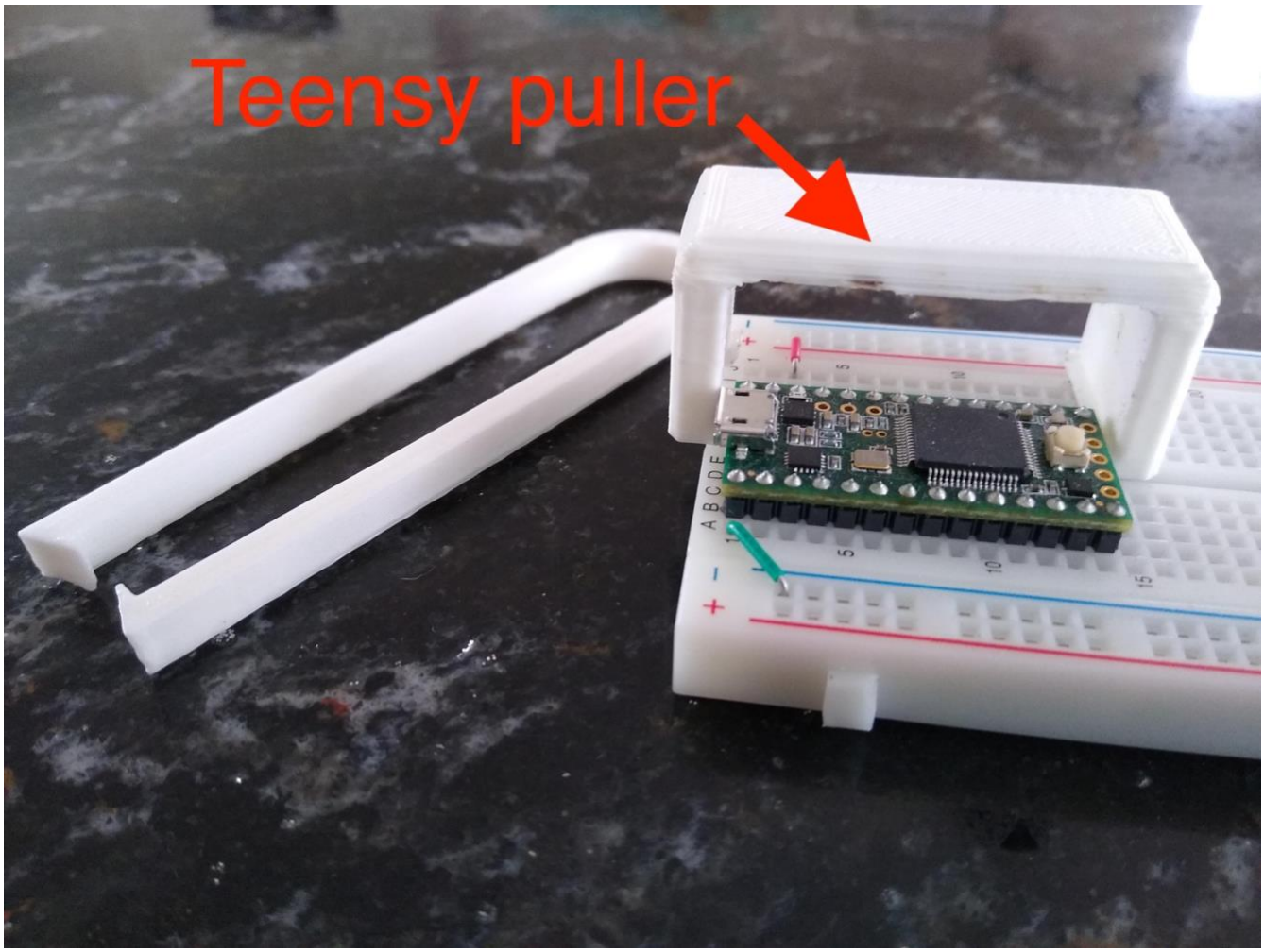
Task 3: Visit AC's DARE MakerSpace

1. On your own time (i.e. outside of lab/lecture), take 10 minutes or so and visit Algonquin College's MakerSpace, located in the DARE District.
2. Do you see an interesting object? Use your smartphone to take a photo of it ☺
3. Upload your photo to Brightspace.

The DARE MakerSpace Homepage: https://www.algonquincollege.com/arie/dare-makerspace/

Task 3: Reference Screenshot

I visited AC's MakerSpace in the Fall of 2018, and used one of their 3-D printers to make a Teensy puller and IC forceps:



Notes:

- I found this design for my Teensy puller on Thingiverse: https://www.thingiverse.com/thing:2938393
- You're welcome to use a 3-D printer, however, there is a modest fee to cover the plastic filament
- Want to pull your Teensy from the breadboard? I would encourage you to borrow my Teensy puller ☺

Deliverables:

1. Successful demonstration of Tutorial 3 [4 marks]
2. Upload your fritzing diagram to Brightspace [4 marks]
3. Upload your photo from the MakerSpace [2 marks]

Upload and submit your deliverables to Brightspace before the due date.