

# CST8227 Lab 6: Analog Input

### **Lab Objectives:**

- 1. Use a potentiometer to control the intensity of a tri-color LED.
- 2. Use a thermistor to take the temperature.
- 3. Use a polling loop to read the temperature.

### Required Equipment:

- Computer with Arduino IDE & Teensy extensions installed and working
- Teensy board and USB cable
- Potentiometer
- Thermistor
- Resistors.

# **Supplemental Reading:**

- "Reading a Potentiometer (analog input)" article on Arduino.cc website: https://www.arduino.cc/en/tutorial/potentiometer
- "Project 6 Interactive LED Chase Effect Hardware Overview" in the eBook "Beginning Arduino" explains the workings of a potentiometer.

# Task 1: Demo "User Controlled LED Color"

 Implement the circuit "Connecting a Potentiometer" from the "Tutorial 4: Analog Input" tutorial hosted on PJRC.com: <a href="https://www.pjrc.com/teensy/tutorial4.html">https://www.pjrc.com/teensy/tutorial4.html</a>

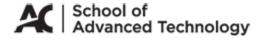
<u>Notes</u>: the Teensy seen in the photos is a Teensy 2.0, which is **not** the same model and version as yours. Friendly reminder... you have a Teensy 4.0. From the tutorial webpage, the potentiometer is connected to pin A0 (i.e. analog zero). Good news... the Teensy 4.0 has a pin labeled A0. However, the pin's location is different on the Teensy 4.0 ⊕

- 2. Run the Teensyduino sketch listed in the section "Using analogRead."
- 3. Demonstration: demo the circuit and Teensyduino sketch from the section "User Controlled LED Color"
  - Note: the tutorial uses pins 12, 15 and 14 on a Teensy 2.0 board. You'll need to reassign these pins to PWM pins on your Teensy 4.0

# Task 2: Demo "Connecting a Temperature Sensor"

1. Implement the circuit as seen in "Connecting a Temperature Sensor" from the "Tutorial 4: Analog Input" tutorial hosted on PJRC.com: https://www.pjrc.com/teensy/tutorial4.html

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Notes: the Teensy seen in the photos is a Teensy 2.0, which is **not** the same model and version as yours. Friendly reminder... you have a Teensy 3.2. From the tutorial webpage, the thermistor is connected to pin A1 (i.e. analog one). Good news... the Teensy 4.0 has a pin labeled A1. However, the pin's location is different on the Teensy 4.0 ©

- 2. Run the Teensyduino sketch listed in section "Simple Temperature Programs"
- 3. Demonstration: demo the circuit and Teensyduino sketch from the section "More Accurate Temperature Calculation"

### Task 3: Make a Fritzing Diagram

- Use the fritzing application to create the circuit layout from Task 1
  User Controlled LED Color (see above).
- 2. Add a Note to your diagram. Display the following information:

CST8227 – Interfacing Lab 06 – User Controlled LED Color

Use a potentiometer as user input to control the LED color.

@author Your Firstname and Lastname (your userID)

3. Export your diagram as a PNG image.

### **Demonstrations:**

- 1. Successful demonstration of "User Controlled LED Color" [4 marks]
- 2. Successful demonstration of "Connecting a Temperature Sensor" [4 marks]

### <u>Deliverable:</u>

1. Upload and submit your fritzing diagram (PNG) to Brightspace before the due date [2 marks]

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