School of Advanced Technology

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 temperature.
3. Use a polling loop to read 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 the 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"

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

   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 potentiometer is connected to pin A0 (i.e. analog zero). Good news… the Teensy 3.2 has a pin labelled A0. However, the pin's location is different on the Teensy 3.2 ☺

2. Run the Teensyduino sketch listed in 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 re-assign these pins to PWM pins on your Teensy 3.2

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

   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 3.2 has a pin labelled A1. However, the pin's location is different on the Teensy 3.2 ☺

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

1. 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]

Deliverable:

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