ECE 206: STEMTera and Potentiometer

Challenge: STEMTera Analog Inputs and Potentiometers

In this lab, we will learn an alternative approach to change the LED display numbers; a potentiometer will be used instead of a quadrature encoder to adjust the displayed numbers.

A potentiometer is a three-way resistor that can output different resistance by adjusting a built-in screw or knob. It also acts as a voltage divider since there are essentially two resistors in series with common node connected to the middle pin and each end of the resistors connected to the side pin of a potentiometer (see Figure 1).

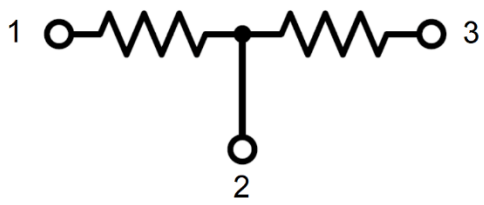

Figure 1. Circuit diagram of a potentiometer

In this lab, you will rebuild the circuit you used in Lab 3.1 and replace the quadrature encoder with the potentiometer. Connect one side pin of a potentiometer to 5 V, the other side pin to GND, and the middle pin to an analog input pin of the STEMTera board. This way, the voltage received at the middle pin can change from 0 to 5 V due to the voltage divider rule.

Next, you will use the Arduino code to convert the received analog value to an integer variable ranging from 0 to 99 and display it on the LED display segment.

Once your circuit can display numbers from 0 to 99 using a potentiometer, demonstrate it to your TA.

Both potentiometers and encoders are commonly used to enter data into a digital system. Compare the advantages and disadvantages of each device. Under what circumstances might you prefer one versus the other?

Report Deliverables:

- Include a diagram/sketch of you circuit.
- Include commented code for your design.
- Obtain your TA signoff on the circuit in operation

Report should contain, at minimum the following elements:

- Title, Names, Dates
- Statement of Purpose
- Plan and Execution
- Results / Conclusion
    - Answer any questions posed in the lab challenge.
    - Explain your understanding of what happened and why.

Report Element	Value
Documentation of lab completion	40
Circuit diagram	20
Commented code	20
Report quality and all other elements	20
Maximum possible score	100/100