Serial Communication between Python and Arduino

EGR 445/545: PA 1

Due: 05/21/19

Overview

In order to use Python+Arduino for Project 1, you will need to be able to send pairs of servo commands from Python to the Arduino. These commands will be delay (period) values between 1000 and 2000. Such values cannot be simply single byte integers, so you will need to be able to transmit two-byte integers from Python to the Arduino. This will require breaking an integer into two bytes, transmitting the two bytes separately, and then reassembling the bytes into a two-byte integer on the Arduino. Ultimately, you will transmit the two servo commands as two different two-byte integers.

Step One: Get the Basics Working

You have been provided starter code for both the Arduino and the Jupyter notebook (Python). You will need to find the portname for your Arduino from the Arduino IDE software and you will need to put this into the Jupyter notebook. Other than editing the portname, the code should just work.

Once you have the basics working and you understand the Arduino and Python code, you are ready for Step Two.

Step Two: Transmitting Two-Byte Integers

This is the main part of the assignment. Your goal is to transmit two two-byte integers from Python to the Arduino. You will need to write a Python function that breaks an integer into two bytes. You will also need to modify the Arduino code to add a case that receives two, two-byte integers and reassembles them. You should create an Arduino function for reassembling two-byte integers. Finally, verify that the code works by having the Arduino print the reassembled integers to the serial port and having Python read the line.

Final Verification and Deliverables

You are done with this assignment when you can send the numbers 1000-2000 from Python to the Arduino and you have verified that the Arduino has correctly received and reassembled the numbers. You need to send two of these numbers, one for each servo. Here are the deliverables for this assignment:

- a Python function for breaking an integer into two bytes
- a Python function for transmitting a two-byte integer
  - should call the first function to get the two bytes to transmit then transmits each byte separately
- an Arduino function to reassemble two bytes into a two-byte integer
  - note that `int` in Arduino is two bytes
- Arduino code that shows a modified case that expects two two-byte integers and reassembles them using your reassemble function
- some sort of verification that this all worked