Brandon Lim
Post-Lab2

5. Post-Lab Exercises

1. Give examples where using this MATLAB GUI could be useful for your project.

2. What do the following two lines of code from the lab do? Be specific about each line.

```
rate = app.RateEditField.Value;
app.myDAQ.Rate = rate;
```

3. Give 3 examples of true analog instruments and explain how they are analog (e.g., a mercury thermometer is an analog instrument to measure temperature because the mercury level is a continuous variable). Note: temperature is a continuous variable, but that does not necessarily mean the instrument measuring it is analog, as there are digital thermometers!

4. Why does the Arduino analogRead() return a value between 0-1023 while the analogWrite() takes a value from 0-255?

5. Assuming a 5V max output, what is the Arduino C function and value (between 0 – 255) to output a 1.5V signal using an Arduino Uno. Show what the PWM signal would look like (e.g. voltage vs time). Provide proper labels and values in the plot.

1. This matlab GUI could be useful in our project by allowing us to create a user interface that can operate, change, and implement different values for different mechanical devices used on our robot without having to create new code or alter code repeatedly. This is super helpful when testing our robots components and ensuring everything works properly.
   Specific examples of this could include:
   - Testing voltages for motors that drive wheels and motion
   - Testing IR sensor values for block color recognition
   - Testing angles and voltages for servo motors
   - Testing Sensor values for line following
2. The two following lines of code do the following:
   a. Assigns the edit field value from the app to the rate variable
   b. The value of the property Rate inside myDAQ inside the app is equal to the rate variable.
3. IR Sensor - This is analog because the values obtained by an IR sensor are continuous.
   Potentiometer - This is analog because the values obtained by a potentiometer are continuous
   Barometer - This is analog because the values obtained by a barometer are continuous
4. analogRead() has a max of 10 bits because of the analog to digital converter which corresponds to the decimal value range of 0-1024 while analogWrite() has a max default of 8 bits which corresponds to the decimal value range of 0-256

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5. analogWrite(76.5)