Lab 4: Portfolio Questions

POTENTIOMETER TUTORIAL QUESTIONS

1. In the first tutorial (covering the potentiometer) that you followed, what is the total range of values that you can expect from Serial.println(potPosition); ?
   The total range of values that you can expect from Serial.println(potPosition); are 0 -1023
2. How is an analog signal different from a digital signal?
   Analog signals are infinite meaning that there are infinite values that there can be whereas digital signals are discrete or finite meaning that there are limited values there can be such as (0 or 1).

3. What does a reading of 512 refer to from the Analog Input pin? What voltage does it refer to? Hint: The operating voltage of an Arduino is 5 volts so the highest analog reading should be the max number you get from the Serial.println(potPosition) line. 0 would mean 0 volts.
   1023/5 x V//512
   1023V = 2560
   V = 2.50
   Reading of 512 refers to 2.50 Volts.

4. What are the two purposes of the potPosition variable in the code? Why is it necessary to have it to affect the LED?
   Two purposes of the potPosition variable in the code includes:
   1. Set the values from 0-1023 based on how far the knob is turned.
   2. Delay as many milliseconds as position.

SERVO MOTOR LAB QUESTIONS

1. What are the three pins of a servo motor and what do they do?
   The three pins of servo motor include:
   Power - Makes the motor spins round and round
   Ground - Grounds the servo motor
   Signal - Retrieves signals (left/right) and moves a specific angle and stays there.

2. What is a PWM signal and a duty cycle mean? Which specific digital I/O pin would you have to specifically use to work with the Servo motor.
   PWM means Pulse Width Modulation and duty cycle describe the percentage of time a digital signal is on over an interval or period of time. It tells the motor which position to go to its rotation. In order to work the servo motor you would specifically have to use the 9 digital I/O pin.

3. What is the total range (in degrees) of a servo motor?
   The total range of a servo motor is 0 to 180 degrees.

EXTENSION LAB QUESTIONS

1. What is the analog reading when the LDR is at its darkest setting?
   The analog reading at its darkest setting is 2.

2. What is the analog reading when the LDR is at its lightest setting?
   The analog reading when the LDR is at its lightest setting is 404

3. Copy your map() function call from your code. Explain it in words.
   int lightValue = map(photoresistor, 0, 1023, 0, 994);

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This map function takes the 5 values in total (value, fromlow, fromhigh, tolow, tohigh). In this case, the range of the light value was from 0to 1023 but we changed the range from 0 to 994 in order for the servo motor to move 180 degrees.