Computer Science 305

Arduino Lab 3: Analog Output

Name: _____   Signature _____

Analog Output

This lab deals with pulse width modulation (pwm). If we blink the LED really fast, instead of looking like blinking, the LED will look constantly on but just dimmer. For example, if we blink the LED really fast and it is off ½ the time, it will look ½ as bright. We could keep the LED hooked up the way we did in other labs and do the blinking ourselves in the code we write. However, the Arduino implements this in hardware on pins 9, 10, and 11, which can be controlled by analogWrite(). Try the following circuit and code:

Circuit: (from Arduino website)
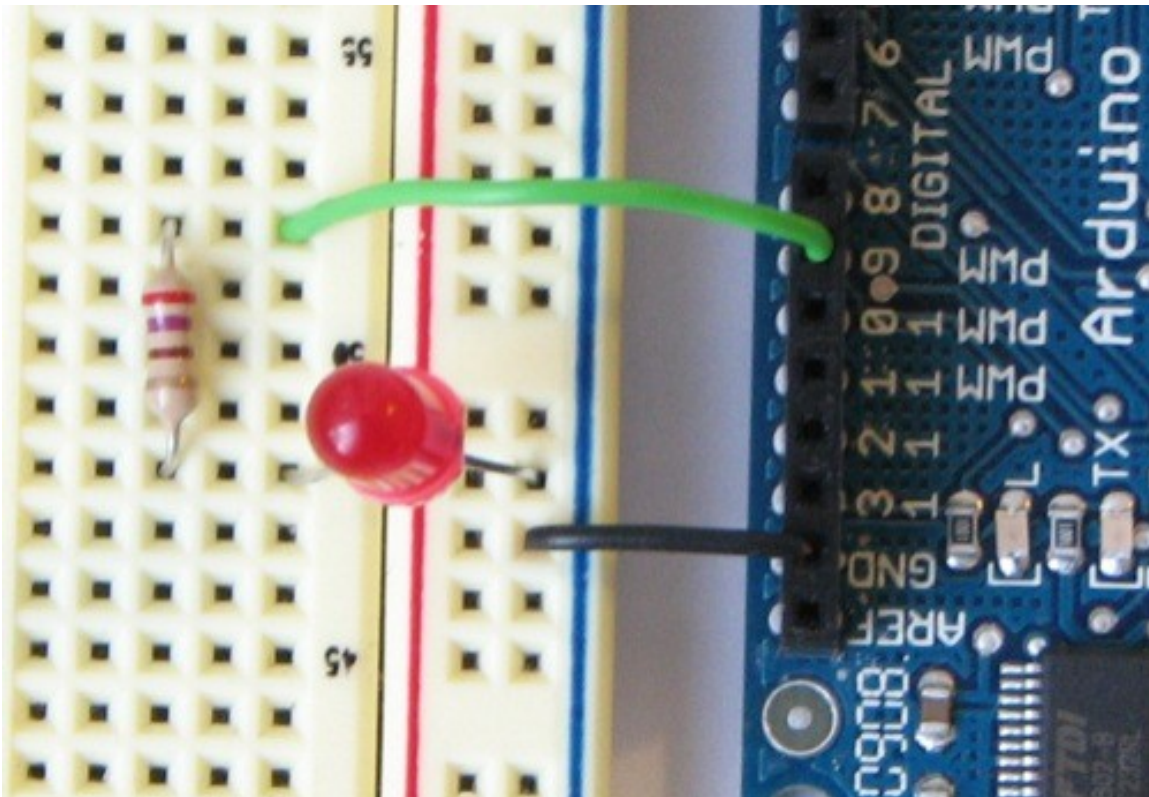
```
int value = 0;                              // variable to keep the
actual value
int ledpin = 9;                             // light connected to digital
pin 9

void setup()
{
  // nothing for setup
}

void loop()
{
  for(value = 0 ; value <= 255; value+=5)   // fade in (from min to max)
  {
    analogWrite(ledpin, value);             // sets the value
                                            // (range from 0 to 255)
    delay(30);                              // waits for 30 milli seconds
                                            // to see the dimming effect
  }
  for(value = 255; value >=0; value-=5)     // fade out (from max to min)
  {
    analogWrite(ledpin, value);
    delay(30);
  }
}
```

Signed off by _____

Challenge 1

Design a circuit where a push button controls an LED. The longer you press the LED the brighter the LED gets. Once the LED is at its brightest holding the push button dims the LED.

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Challenge 2

Design a circuit where a push button controls an LED. If you press normally the LED will turn on or off. If you press and hold the LED with start dim and grow in brightness until you release the button.

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Challenge 3

Design a circuit where a potentiometer controls an LED.

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