

MEMO

Drexel University

To: Dr. Christopher Peters, ECE 303 Fall 2020

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Re: Lab 1 Blinking LED – Digital Pin Operation and Analog Pin Operation

Purpose

The goals of this lab are to help students get used to Arduino tools and writing basic sketch for it. The lab will include 2 experiments. The first one is blinking LED by Digital writing to a pin and the second one is Analog Reading/Writing to a pin. The LED should be turned on and off with 1 second delay. There will be 2 parts for each section: hardware and software.

Discussion

We will use the same hardware setup for both experiments in this lab. I started with the hardware part by building the circuit. To reduce the current through the LED, the positive leg of LED will be connected in series to a 330 Ohm resistor to the positive pin 13 on Arduino. The negative leg of LED is connected to ground pin.

Software Part Arduino Sketch

For experiment 1 – Blinking LED with Digital Pin Operation

```
/*  
  Blink  
  Turns on an LED on for one second, then off for one second, repeatedly.  
  
  This example code is in the public domain.  
  */  
  
// Pin 13 has an LED connected on most Arduino boards.  
// give it a name:  
int led = 13;  
  
// the setup routine runs once when you press reset:  
void setup() {  
  // initialize the digital pin as an output.  
  pinMode(led, OUTPUT);  
}  
  
// the loop routine runs over and over again forever:  
void loop() {  
  digitalWrite(led, HIGH); // turn the LED on (HIGH is the voltage level)  
  delay(1000); // wait for a second  
  digitalWrite(led, LOW); // turn the LED off by making the voltage LOW  
  delay(1000); //wait for a second  
}
```

For experiment 2 – Blinking LED with Analog Pin Operation

```
/*
Analog Pin Operation. Lab 1 Experiment 2
*/

int led = 13;           // the pin that the LED is attached to
String brightness = ""; // how bright the LED is
int intensity = 0;

// the setup routine runs once when you press reset:
void setup() {
  // declare pin 13 to be an output:
  pinMode(led, OUTPUT);
  Serial.begin(9600);
}

// the loop routine runs over and over again forever:
void loop() {
  if(Serial.available()) {
    brightness = Serial.readString();
    Serial.println("Brightness:" + brightness);
    intensity = brightness.toInt();
    // reverse the direction of the fading at the ends of the fade:
    if (intensity >= 0 && intensity <= 255) {
      // set the brightness of pin 13:
      analogWrite(led, intensity);
    }
    else{
      Serial.println("Invalid. Enter a number from 0-255");
    }
  }
}
```

Recommendation

The lab provided a good basic introduction to Arduino and how the hardware works with the software to produce the desired outcomes. It also introduce about the setup to parse input from users. This will be the foundation for a lot of other experiments and labs with Arduino.