Lab 8
ADC

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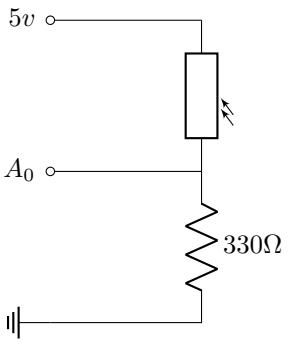
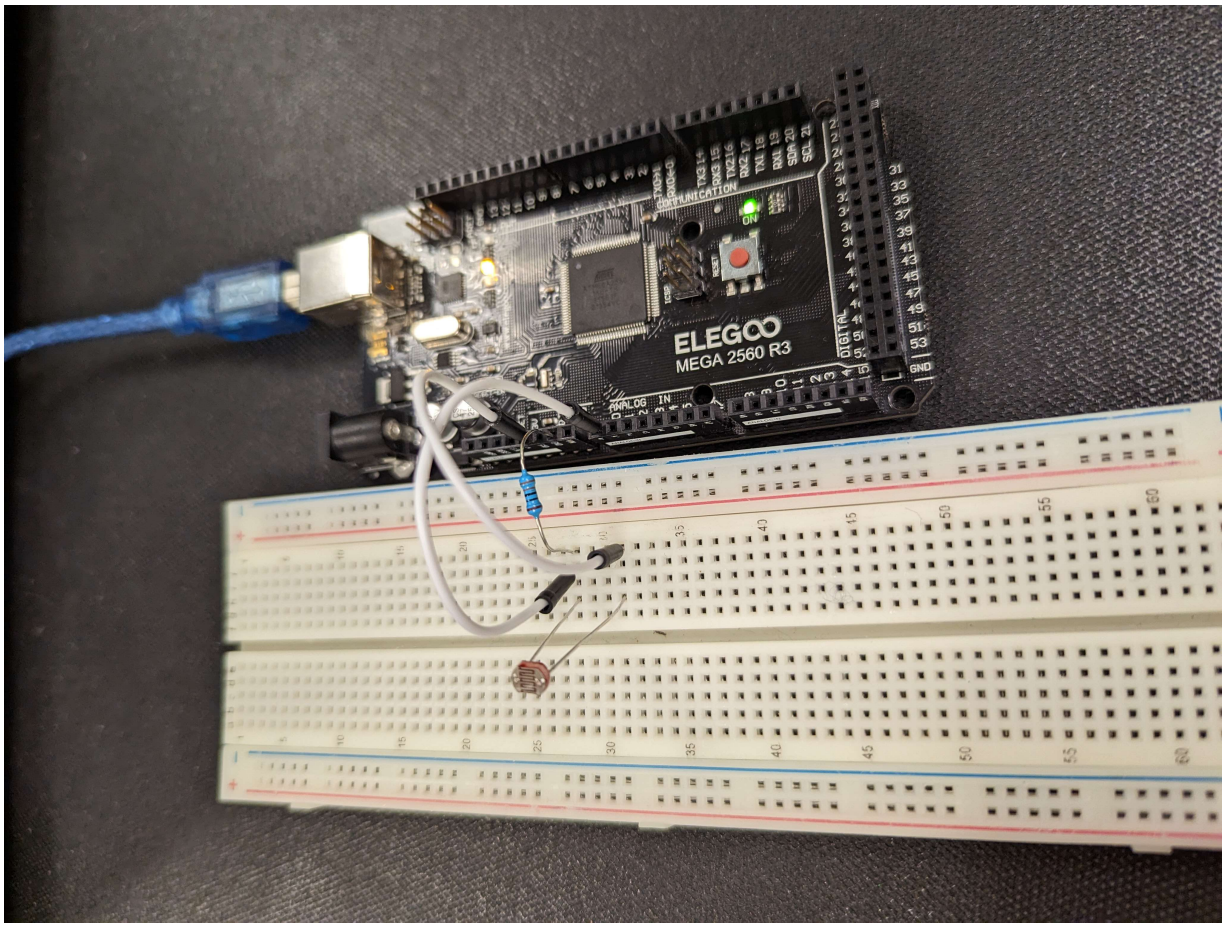
November 8, 2022

Circuit





Code

The modified code for part 3 is adding the if block on lines 15:19

```
1  #include <avr/io.h>
2  #include <util/delay.h>
3  #include <stdio.h>
4  #include "io.h"
5
6  int main() {
7      uart_init(9600);
8      adc_init();
9      pin_t led = new_pin(13);
10     pin_mode(led, OUTPUT);
11     uint16_t i;
```

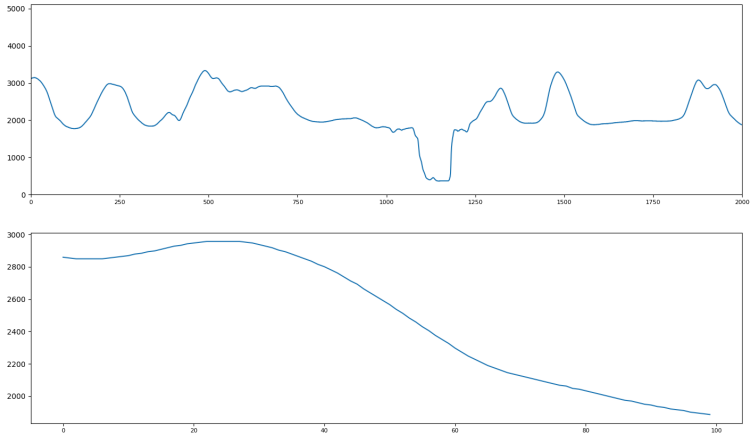
```
12      for (;;) {
13          i = adc_read(0);
14          printf("%d\n", i);
15          if (i > 512) {
16              write_pin(led, HIGH);
17          } else {
18              write_pin(led, LOW);
19          }
20      }
21  }
```

Listing 1: main.c

```
241 void adc_init() {
242     ADMUX |= _BV(REFS0); //Set reference voltage to AVCC
243     ADCSRA |= _BV(ADPS2) | _BV(ADPS1) | _BV(ADPS0) | _BV(
        ADEN);
244     //ADMUX |= _BV(ADLAR); //Left justify ADC result
245 }
246
247 uint16_t adc_read(uint8_t channel) {
248     ADMUX = (ADMUX & 0xf0) | channel; //Select channel to
         read
249     ADCSRA |= _BV(ADSC); //Start conversion
250     loop_until_bit_is_set(ADCSRA, ADIF); //SC bit will be
         clear when conversion is done
251     ADCSRA |= _BV(ADIF);
252     return ADC;
253 }
```

Listing 2: io.h 241:253

Results


5000
4000
3000
2000
1000
0
0
250
500
750
1000
1250
1500
1750
2000
3000
2800
2600
2400
2200
2000
0
20
40
60
80
100