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Lab 5: Photo-interrupter

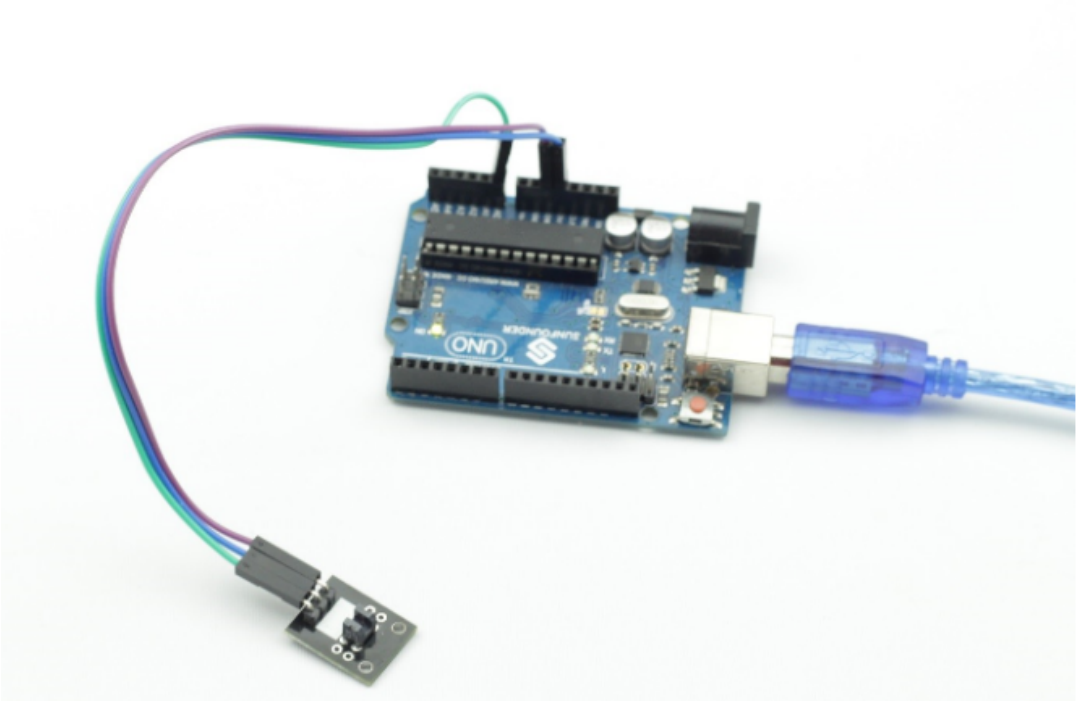
Introduction

A photo-interrupter consists of two parts: transmitter and receiver. The transmitter (e.g., an LED or a laser) emits light and then the light goes to the receiver. If that light beam between the transmitter and receiver is interrupted by an obstacle, the receiver will detect no incoming light even for a moment and the output level will change. In this experiment, we will turn an LED on or off by using this change.

Components list: Arduino uno board, usb cable, photor-interupter module, and jumper wires.

Experiment

By connecting the components as shown in the picture diagram below we can begin uploading code to the arduino and test the photo-interrupter.



Test

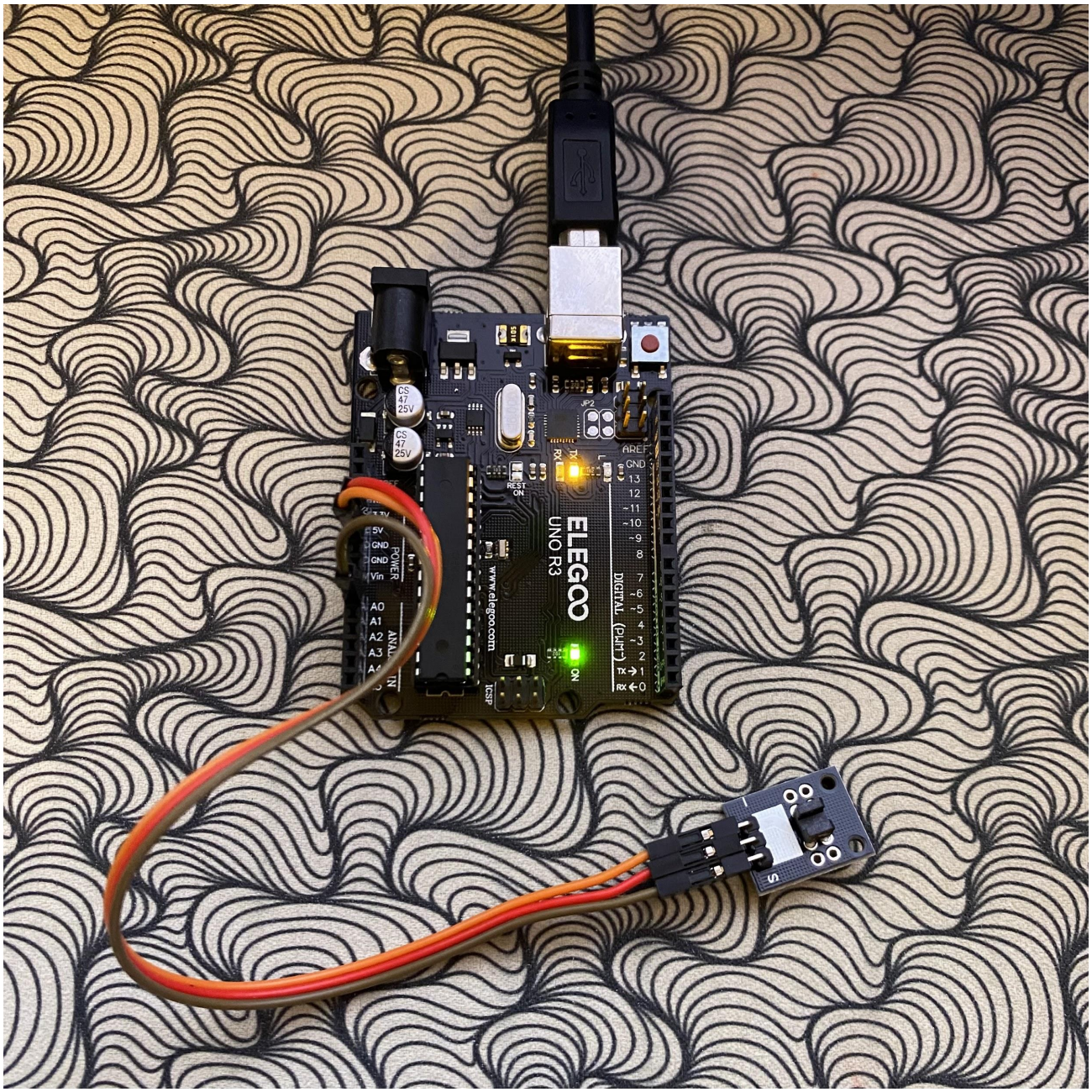
Original Program:

Using the code below, The pin 13 led lights up if the photo-interrupter is interrupted.

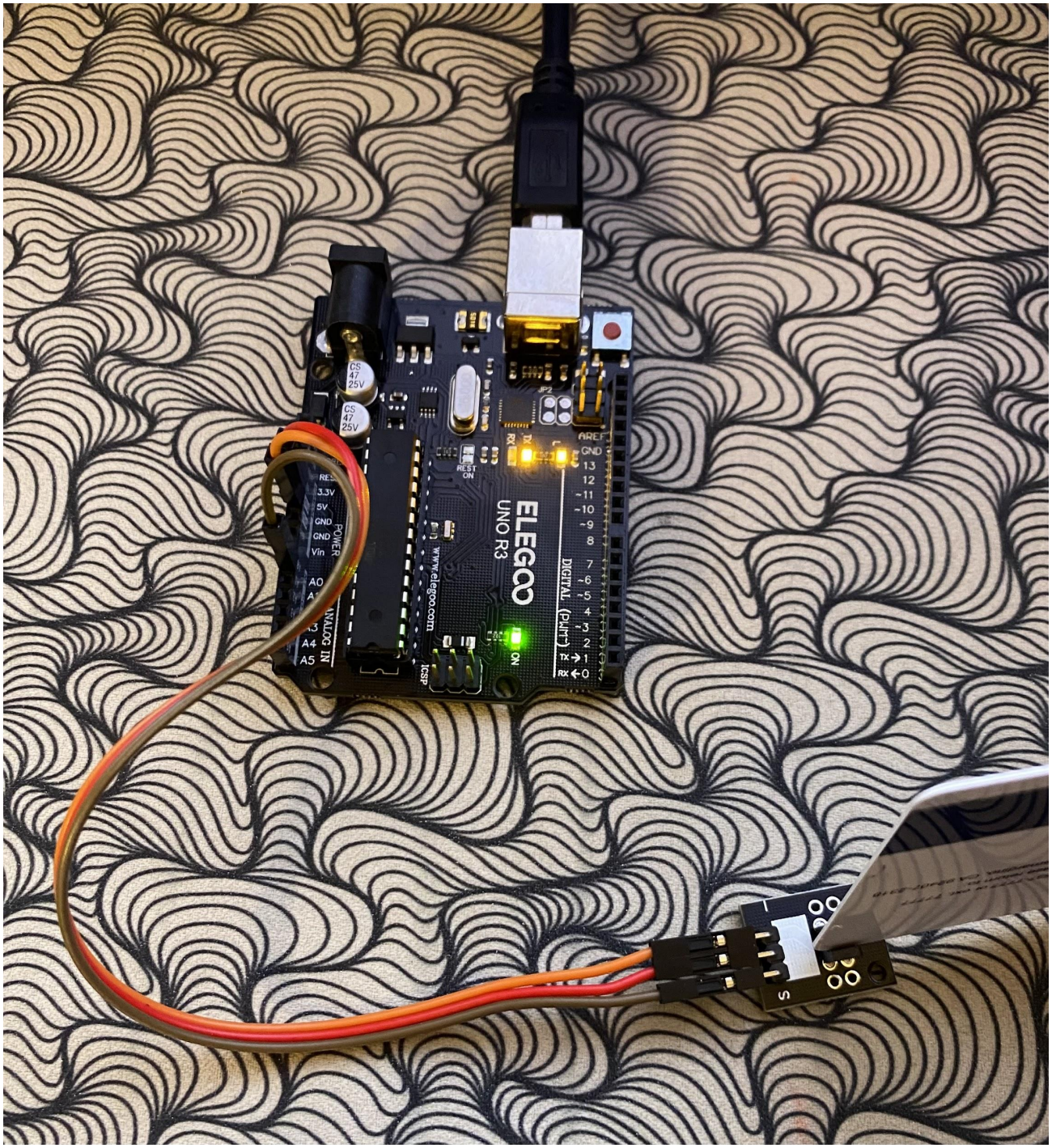
```
const int ledPin = 13; //the number of the led pin
int val = 0; //variable to store the value from photo interrupter
/*****************************************************/
void setup()
{
pinMode(ledPin,OUTPUT); //initialize led as an output
Serial.begin(9600);

}
/*****************************************************/
void loop()
{
val = analogRead(0); //read the value from photo interrupter
Serial.println(val);
if(val > 400) //when interrupted
{
digitalWrite(ledPin,HIGH); //turn the led on
}
else
{
digitalWrite(ledPin,LOW); //turn the led off
}
}
/*****************************************************/
```

Uninterrupted and led off



Interrupted and led on



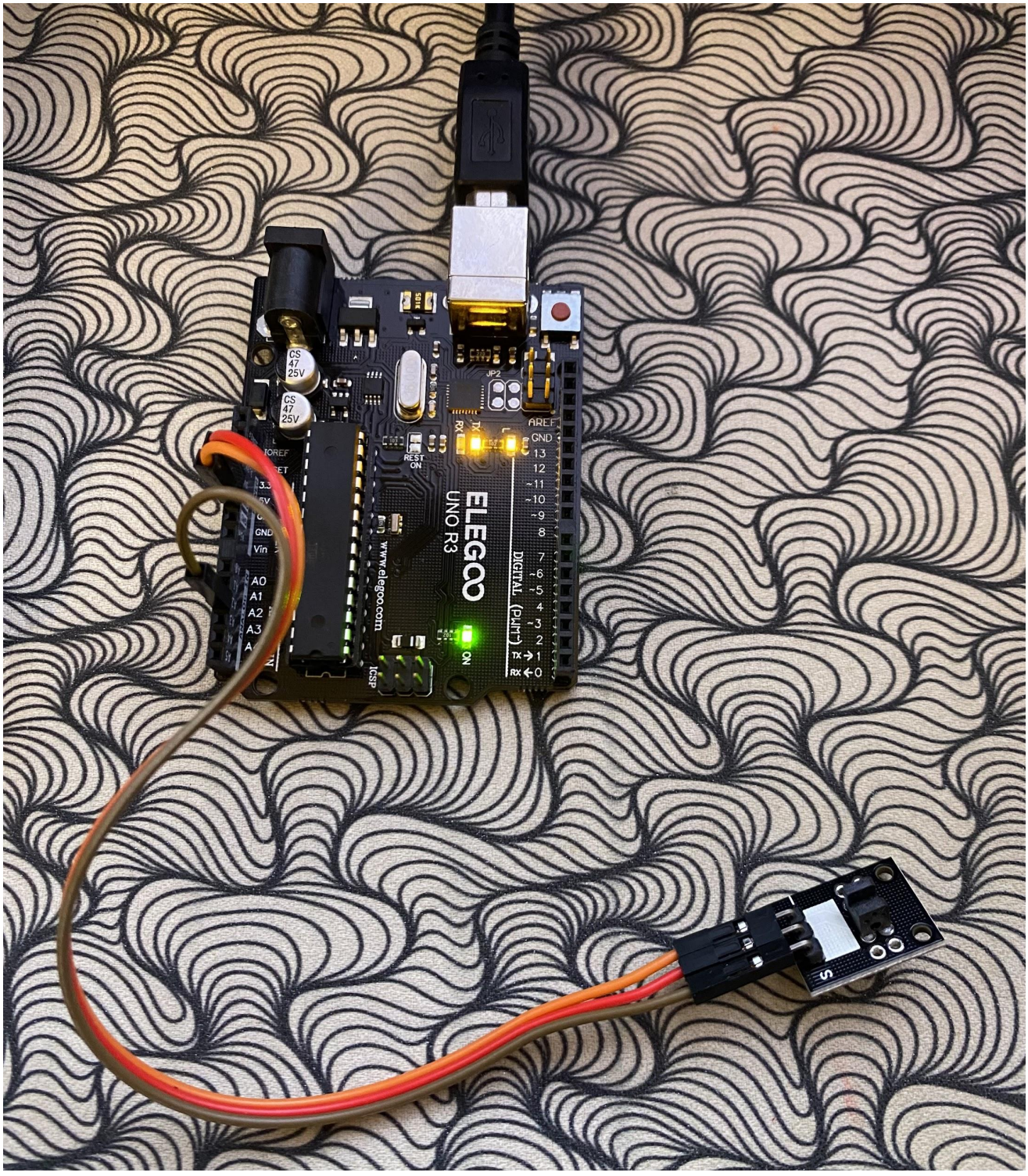
Modified Program:

Using the code below, pin 13 led lights up if the photo-interrupter is not interrupted.

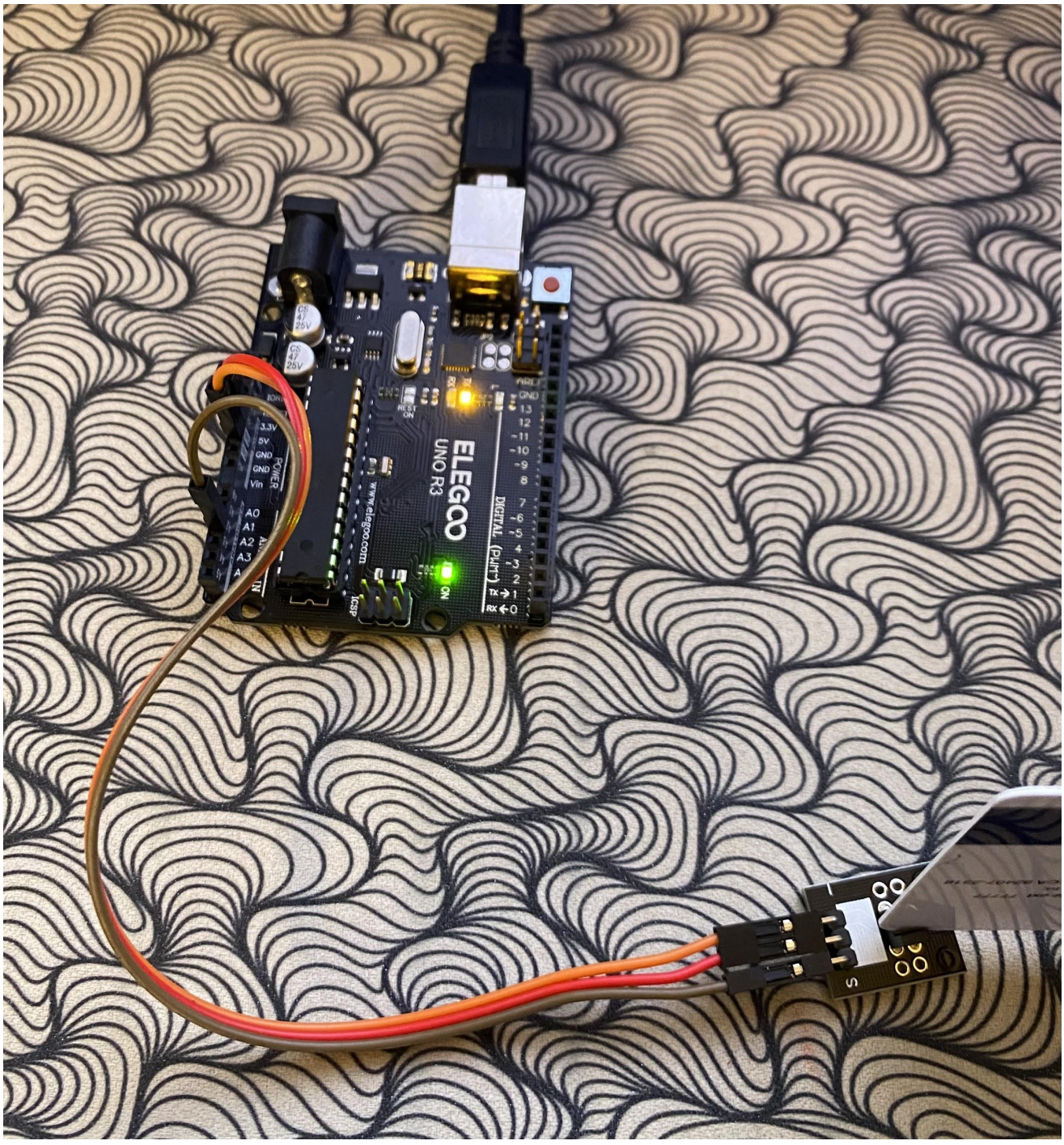
```
const int ledPin = 13; //the number of the led pin
int val = 2; //variable to store the value from photo interrupter
/*****************************************************/
void setup()
{
pinMode(ledPin,OUTPUT); //initialize led as an output
Serial.begin(9600);

}
/*****************************************************/
void loop()
{
val = analogRead(2); //read the value from photo interrupter
Serial.println(val);
if(val > 400) //when interrupted
{
digitalWrite(ledPin,LOW); //turn the led off
}
else
{
digitalWrite(ledPin,HIGH); //turn the led on
}
}
/*****************************************************/
```

Uninterrupted and led on



Interrupted and led off



Conclusion

In this lab, I learned about photo-interrupters and how they can be used to activate something such as a led light. Using the arduino IDE, we can make a code that sets the led on pin 13 of the arduino to turn on or off depending on what we upload.