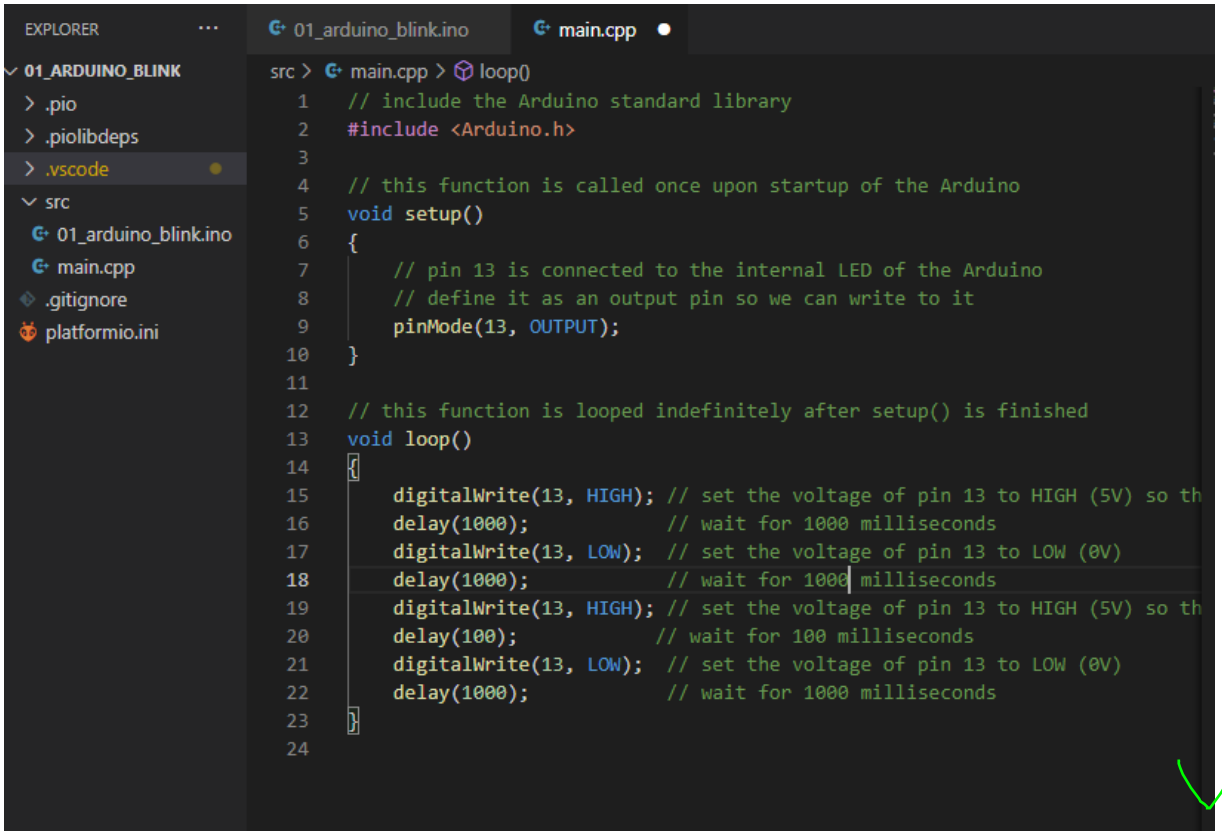
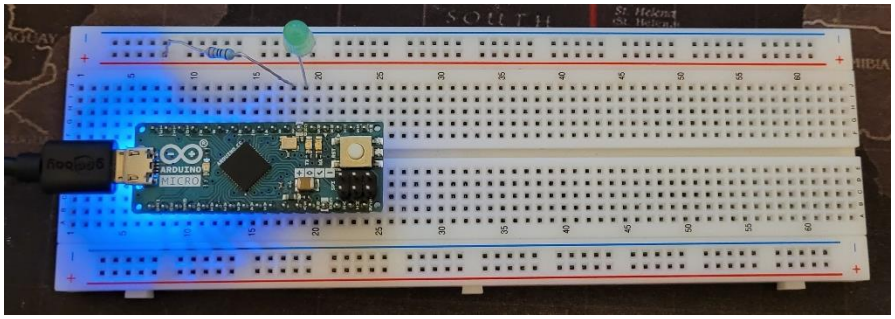
Übung 4

1. Die passenden Videos zu den Aufgaben 1.2/1.3/1.4 sind im Anhang.

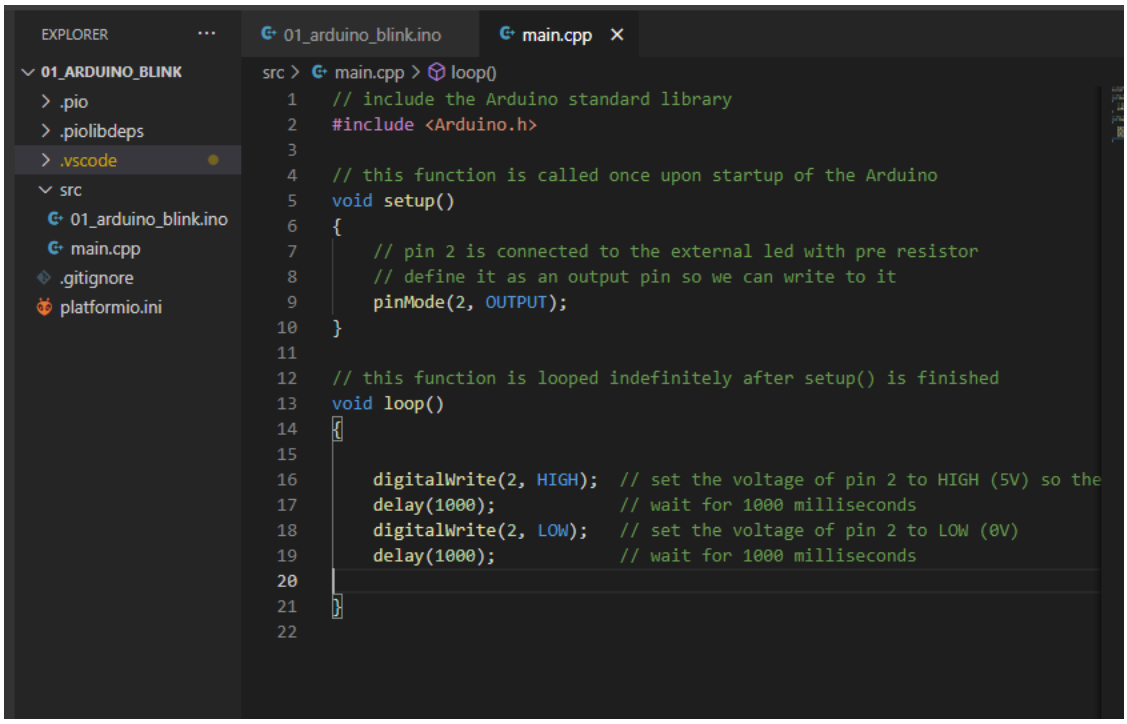
   1.1. Code:



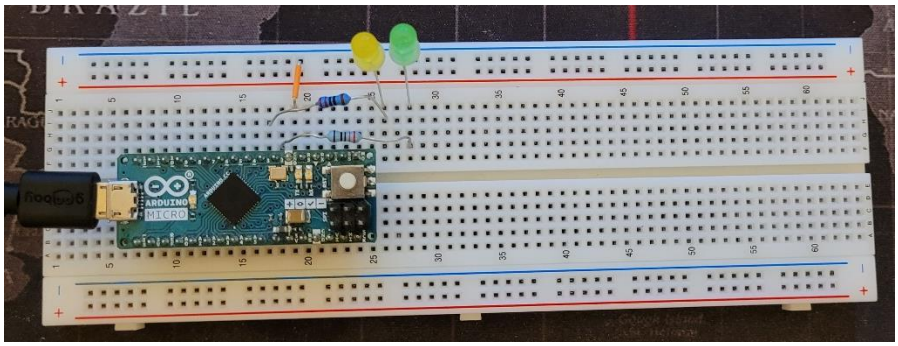
   1.2. Breadboard-Aufbau:



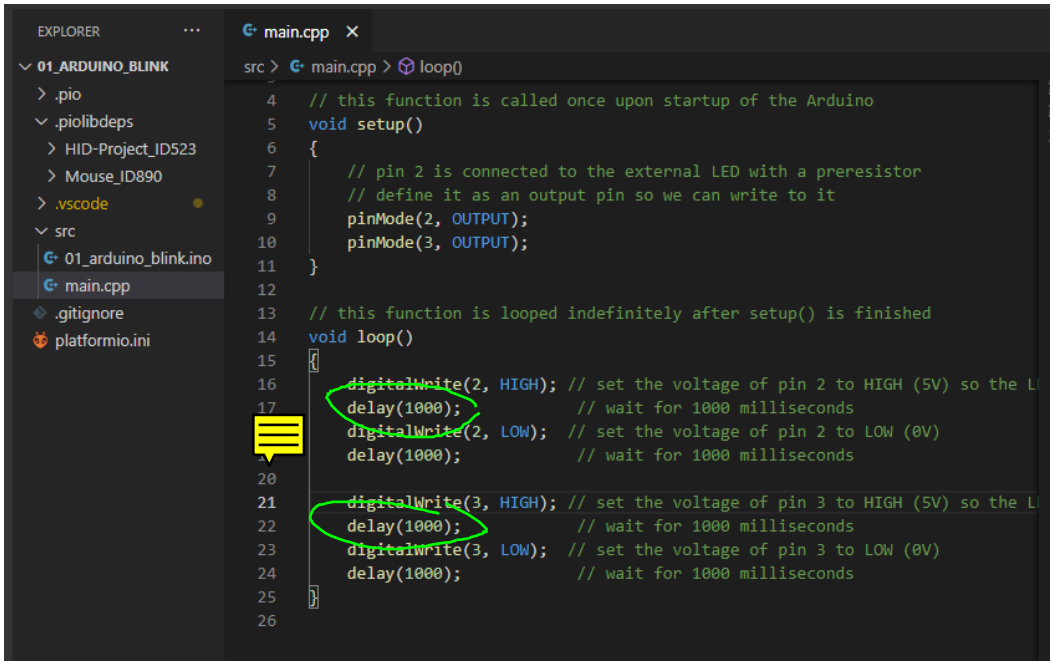
Code:



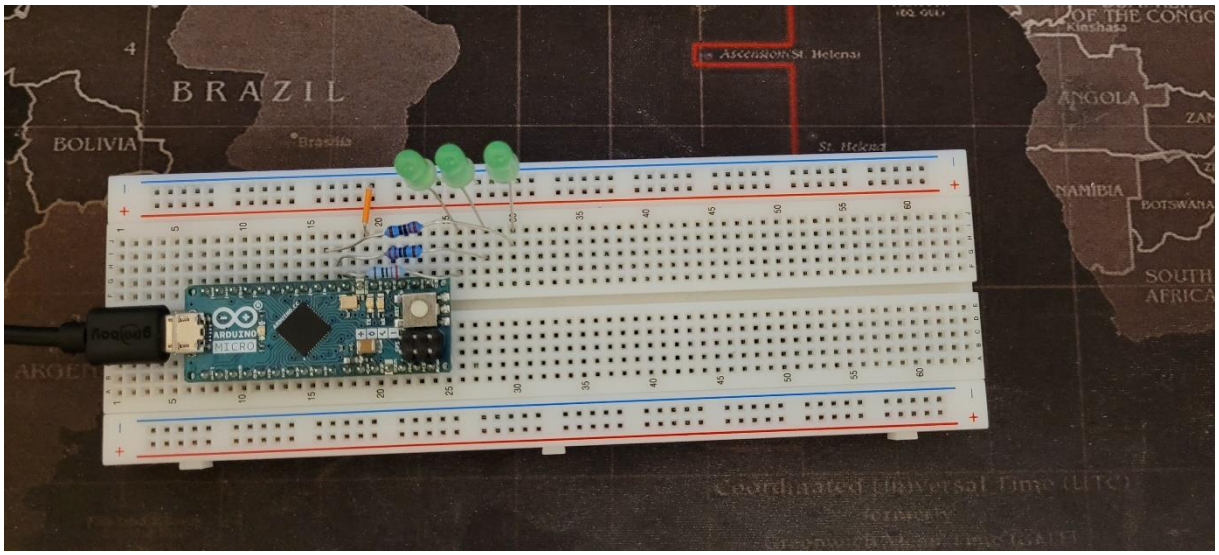
1.3. Breadboard:



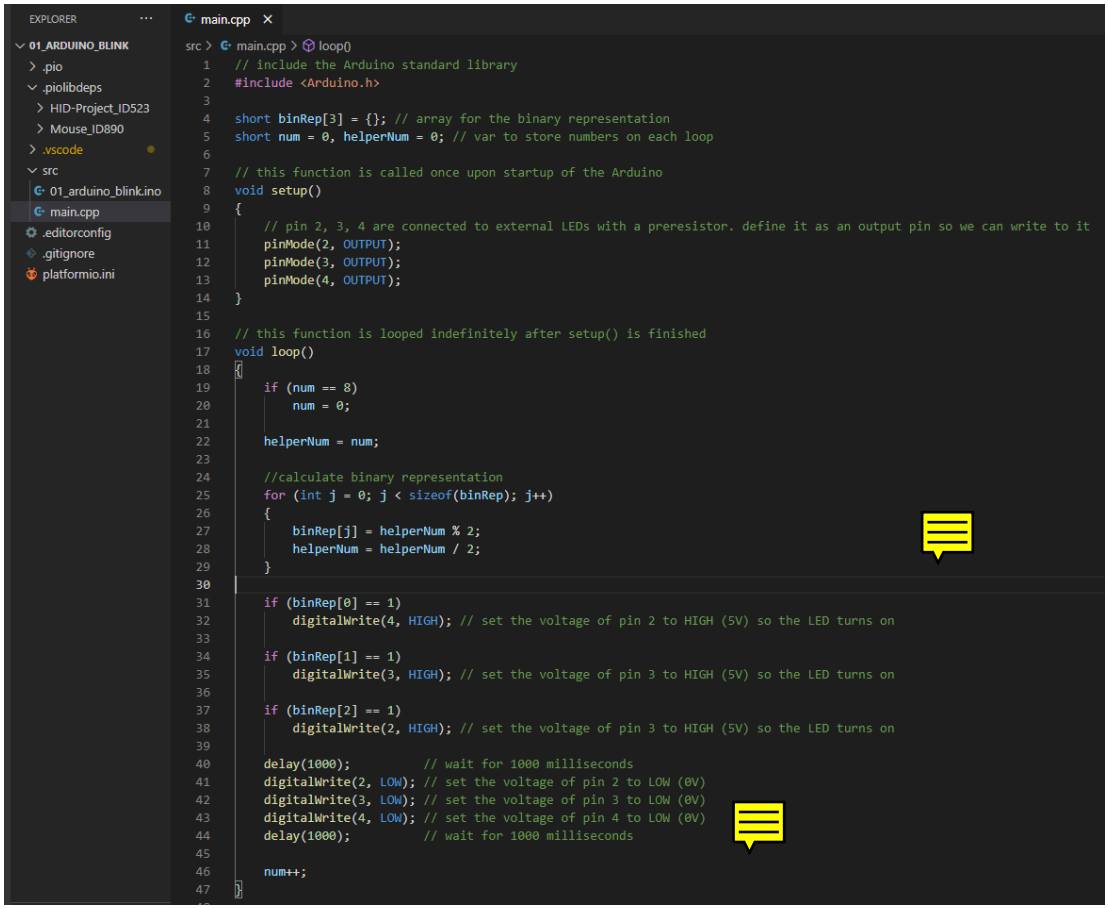
Code:



1.4. Breadboard:



Code:



EXPLORER

- 01_ARDUINO_BLINK
  - .pio
  - .piolibdeps
    - HID-Project_ID523
    - Mouse_ID890
  - .vscode
  - src
    - 01_arduino_blink.ino
    - main.cpp
  - .editorconfig
  - .gitignore
  - platformio.ini

main.cpp

src > main.cpp > loop()

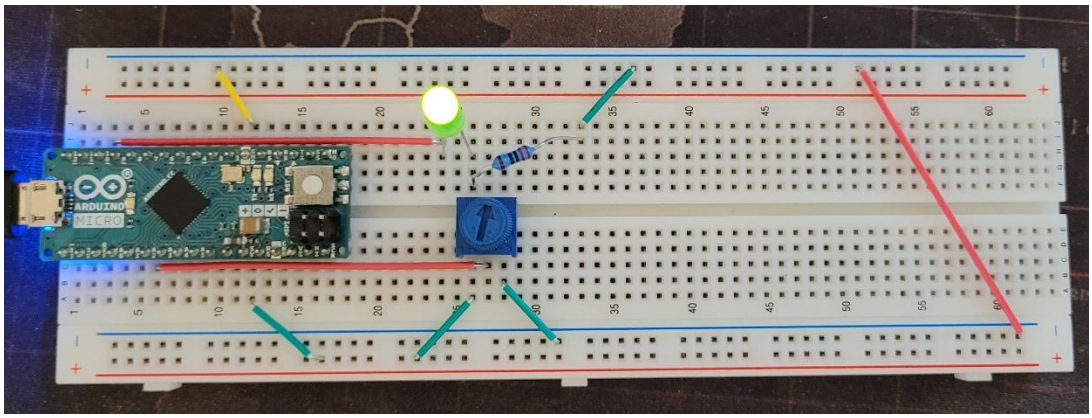
```cpp
// include the Arduino standard library
#include <Arduino.h>

short binRep[3] = {}; // array for the binary representation
short num = 0, helperNum = 0; // var to store numbers on each loop

// this function is called once upon startup of the Arduino
void setup()
{
    // pin 2, 3, 4 are connected to external LEDs with a preresistor. define it as an output pin so we can write to it
    pinMode(2, OUTPUT);
    pinMode(3, OUTPUT);
    pinMode(4, OUTPUT);
}

// this function is looped indefinitely after setup() is finished
void loop()
{
    if (num == 8)
        num = 0;

    helperNum = num;

    //calculate binary representation
    for (int j = 0; j < sizeof(binRep); j++)
    {
        binRep[j] = helperNum % 2;
        helperNum = helperNum / 2;
    }

    if (binRep[0] == 1)
        digitalWrite(4, HIGH); // set the voltage of pin 2 to HIGH (5V) so the LED turns on

    if (binRep[1] == 1)
        digitalWrite(3, HIGH); // set the voltage of pin 3 to HIGH (5V) so the LED turns on

    if (binRep[2] == 1)
        digitalWrite(2, HIGH); // set the voltage of pin 3 to HIGH (5V) so the LED turns on

    delay(1000);          // wait for 1000 milliseconds
    digitalWrite(2, LOW); // set the voltage of pin 2 to LOW (0V)
    digitalWrite(3, LOW); // set the voltage of pin 3 to LOW (0V)
    digitalWrite(4, LOW); // set the voltage of pin 4 to LOW (0V)
    delay(1000);          // wait for 1000 milliseconds

    num++;
}
```

2. Die Funktion zum Abspielen von Tönen ist tone(pin, frequency, duration). Nach ein bisschen Spielerei, habe ich ein cooles Tutorial zum Abspielen von Songs gefunden: TUTORIAL. Als Star Wars Fan habe ich das Tutorial für eine Umsetzung vom Cantina-Band-Song genutzt. Die Noten habe ich aus der pitches-Library kopiert. Das Ergebnis ist auf dem Video zu hören. Der Code (ob der Länge) ist außerdem im Ordner.

3.

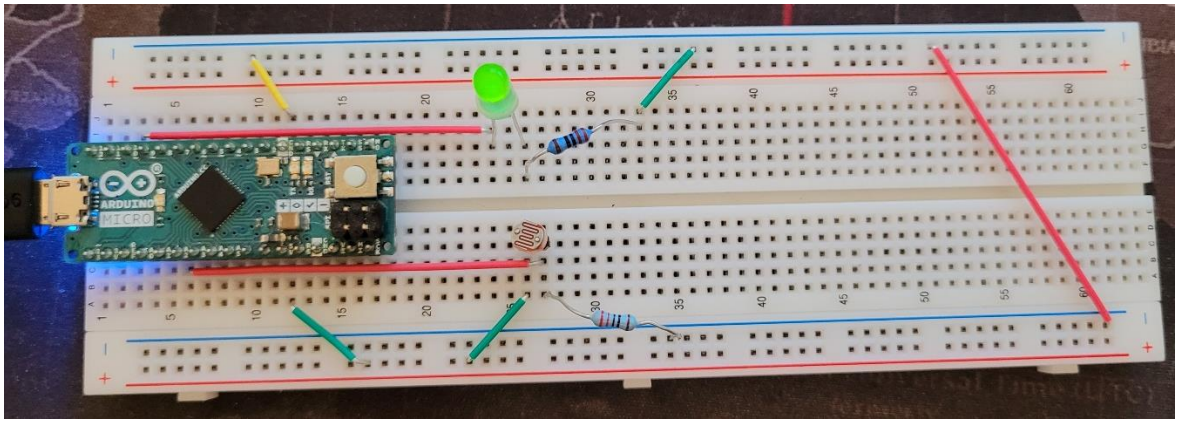
3.1.

Breadboard:



Problem: Im Code Sample fehlte das Mapping von AnalogRead (Werte 0-1023) auf AnalogWrite (Werte 0-255). Nachträglich anhand der Dokumentation verbessert und den Wert einfach durch 4 geteilt.

3.2. Damit die Schaltung mit Photowiderstand funktioniert, brauchen wir einen Spannungsteiler.
Breadboard:



4.

4.1.

4.2.