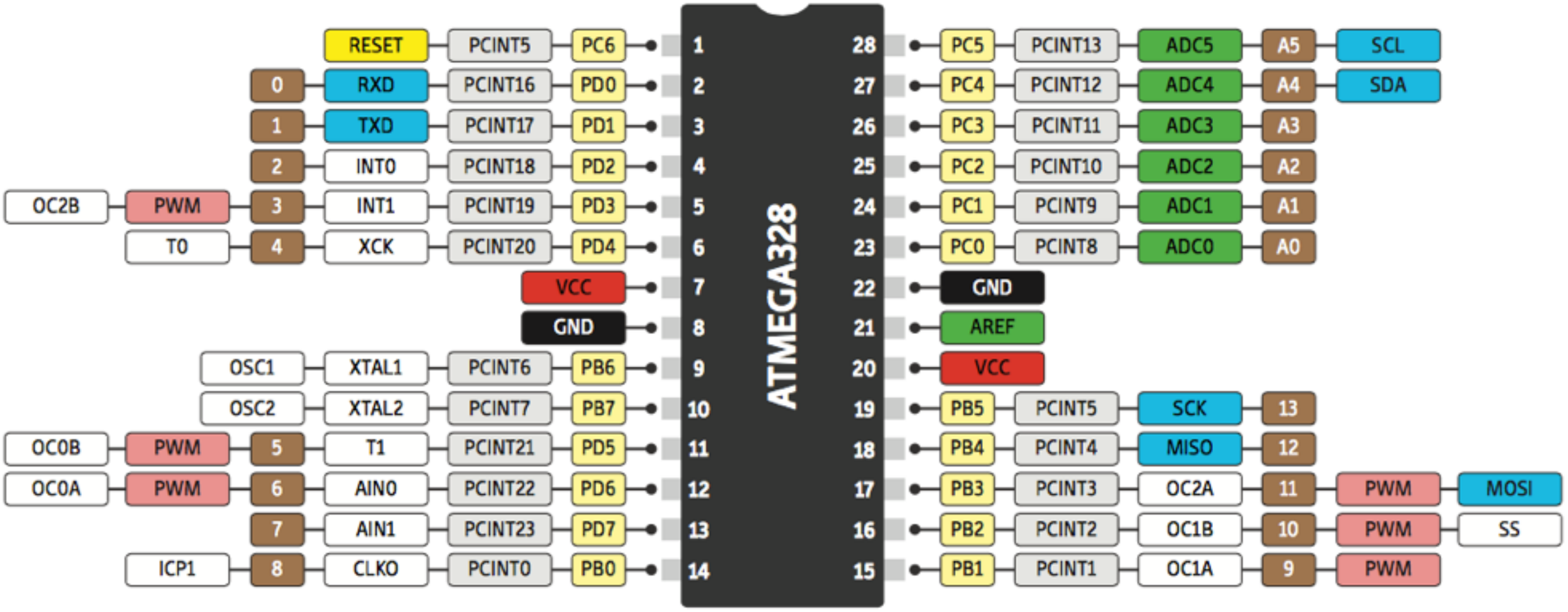
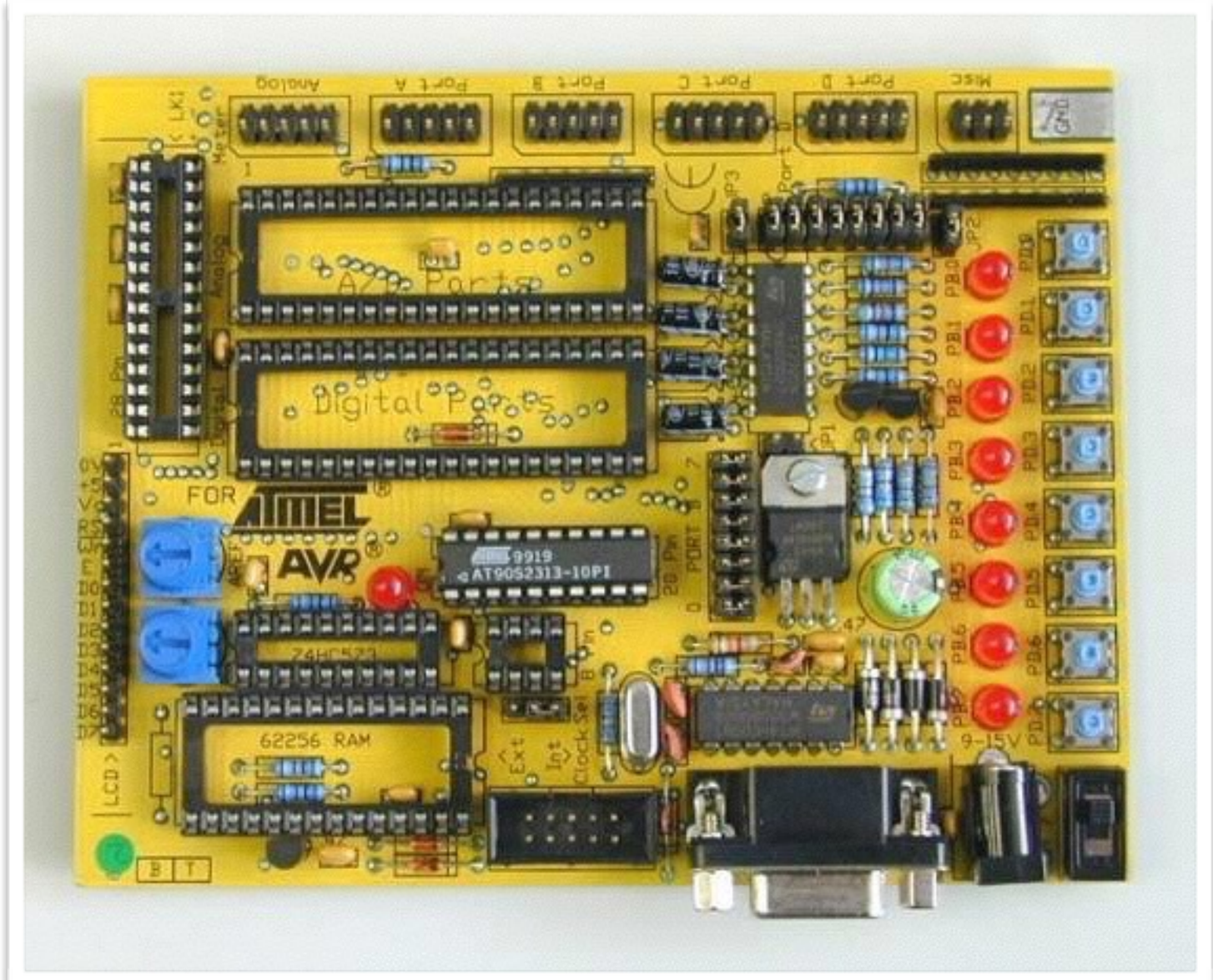
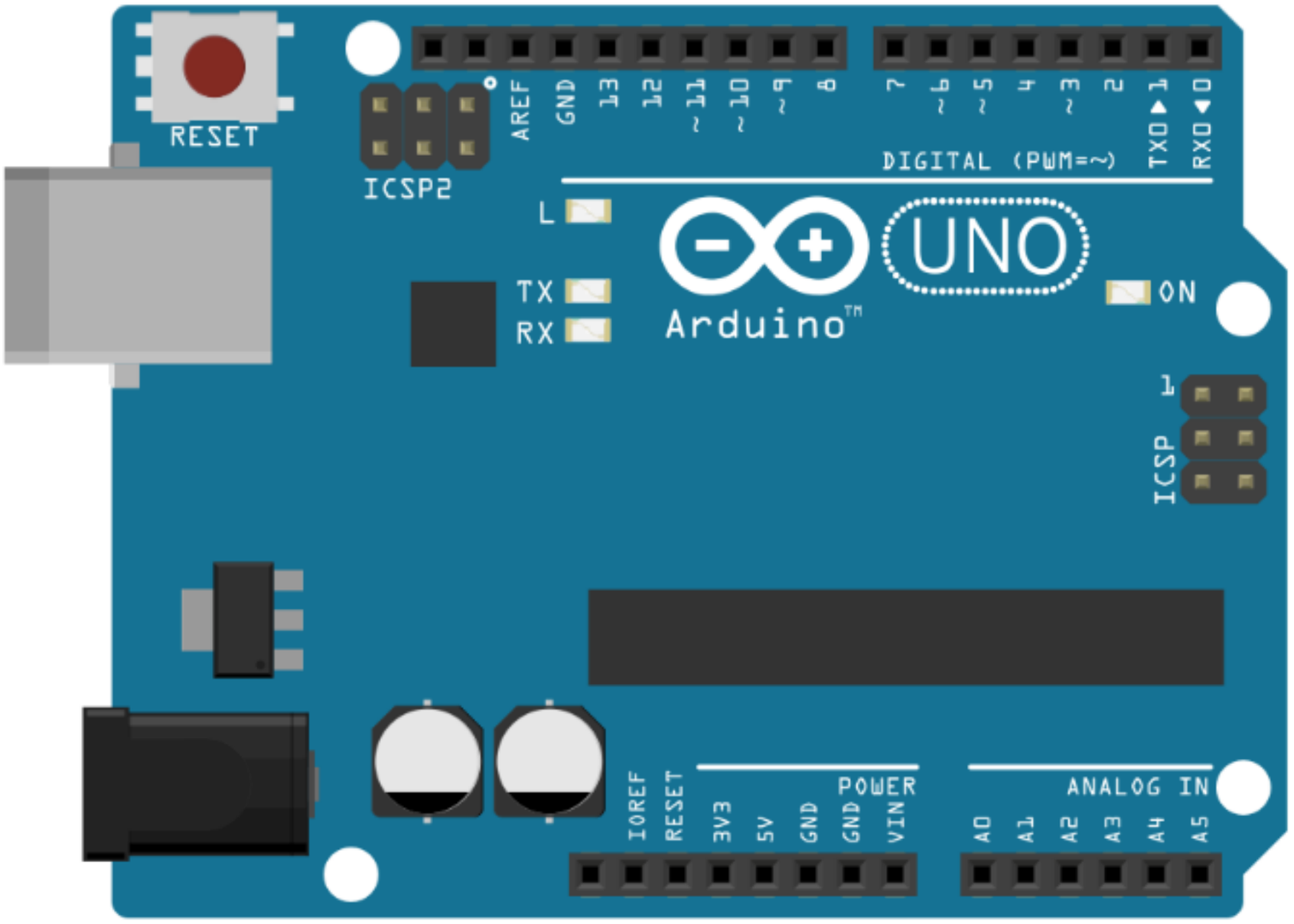
Arduino

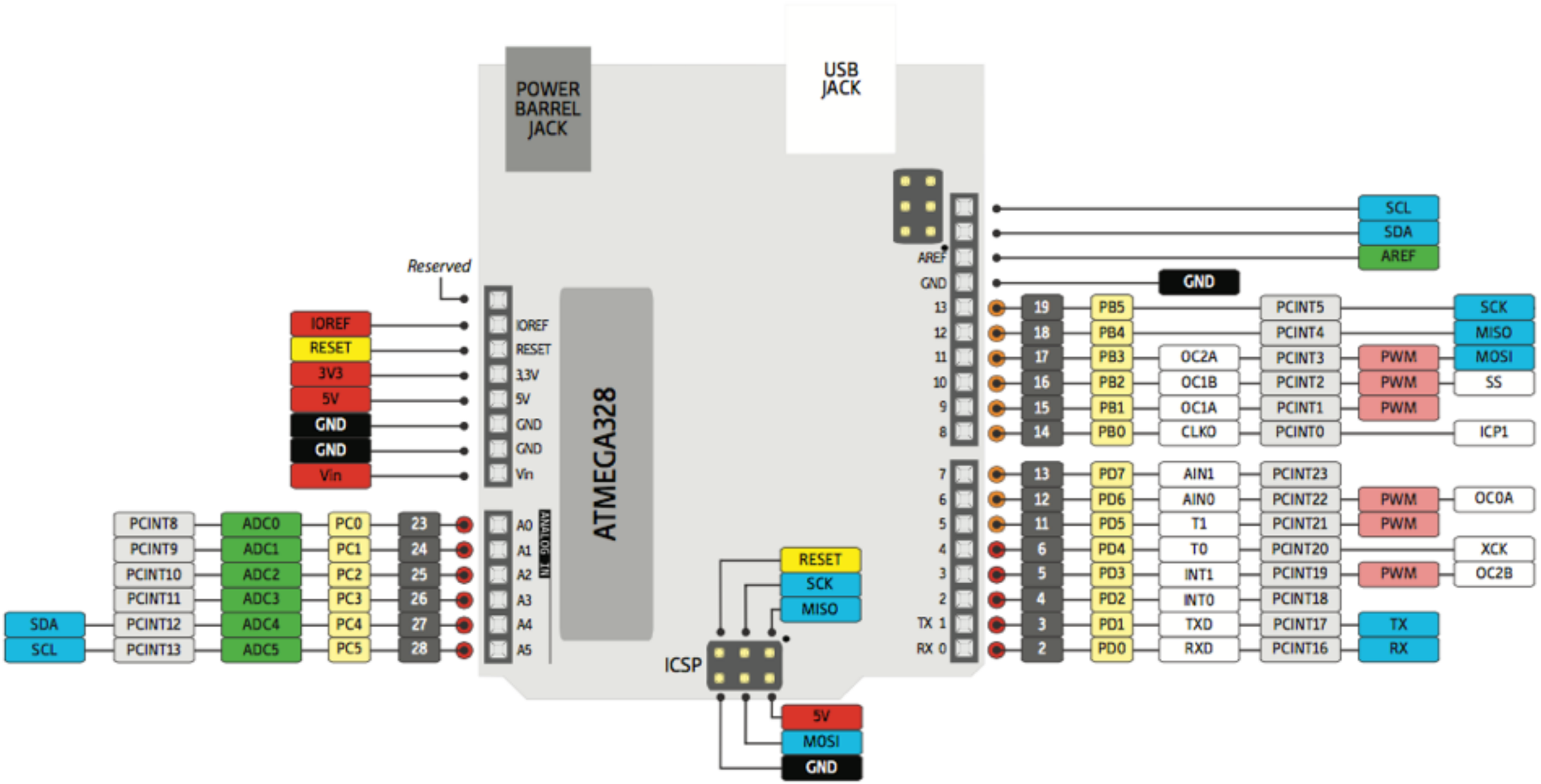
Workshop für Einsteiger

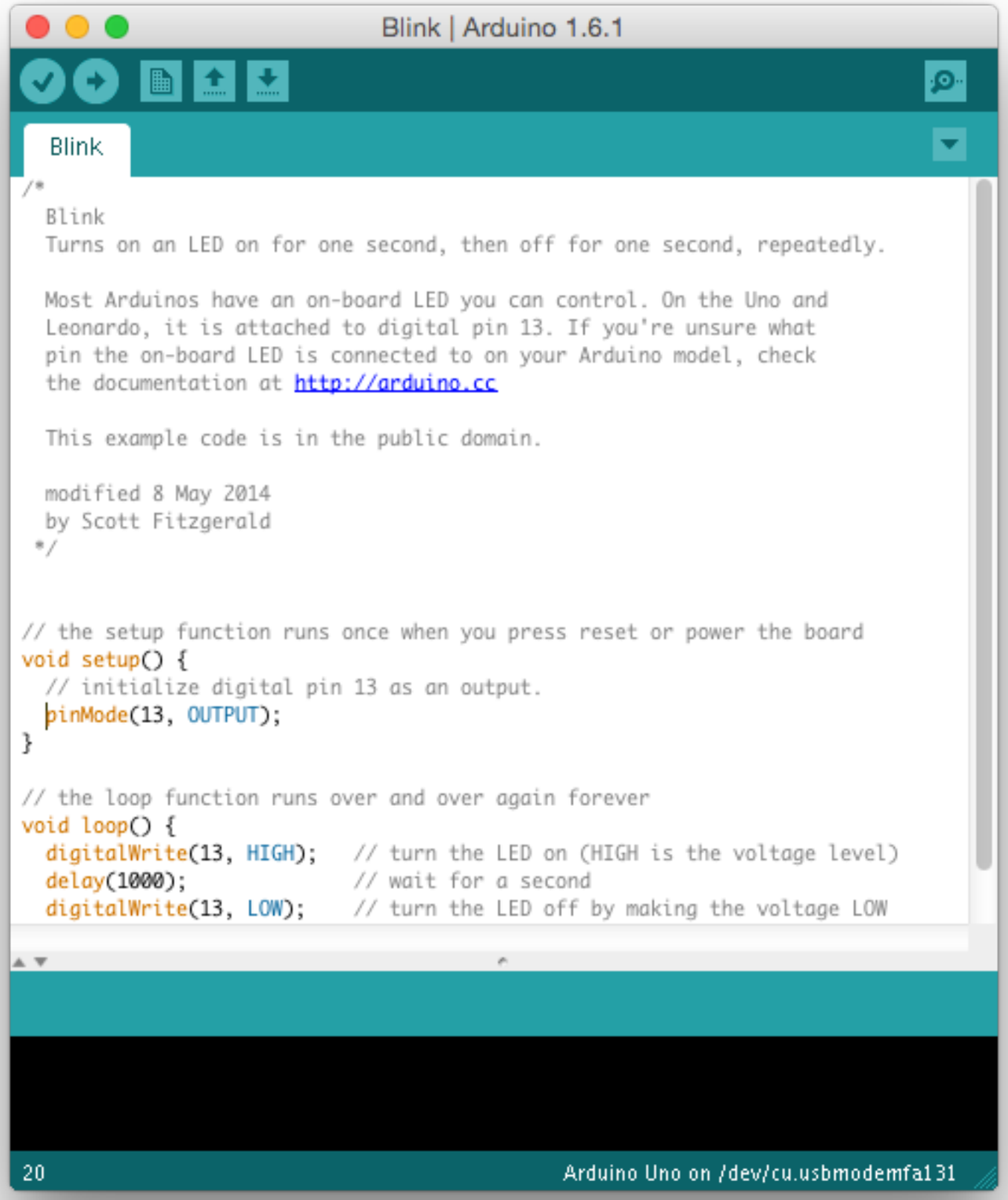

atmega328


ATMEGA328
1 RESET PCINT5 PC6
2 0 RXD PCINT16 PD0
3 1 TXD PCINT17 PD1
4 2 INT0 PCINT18 PD2
5 OC2B PWM 3 INT1 PCINT19 PD3
6 T0 4 XCK PCINT20 PD4
7 VCC
8 GND
9 OSC1 XTAL1 PCINT6 PB6
10 OSC2 XTAL2 PCINT7 PB7
11 OC0B PWM 5 T1 PCINT21 PD5
12 OC0A PWM 6 AIN0 PCINT22 PD6
13 7 AIN1 PCINT23 PD7
14 ICP1 8 CLKO PCINT0 PB0
28 PC5 PCINT13 ADC5 A5 SCL
27 PC4 PCINT12 ADC4 A4 SDA
26 PC3 PCINT11 ADC3 A3
25 PC2 PCINT10 ADC2 A2
24 PC1 PCINT9 ADC1 A1
23 PC0 PCINT8 ADC0 A0
22 GND
21 AREF
20 VCC
19 PB5 PCINT5 SCK 13
18 PB4 PCINT4 MISO 12
17 PB3 PCINT3 OC2A 11 PWM MOSI
16 PB2 PCINT2 OC1B 10 PWM SS
15 PB1 PCINT1 OC1A 9 PWM


Analog
Port A
Port B
Port C
Port D
Misc
A2D Ports
Digital Ports
FOR
AVR
9919
AT90S2313-10PI
74HC573
62256 RAM
9-15V
LCD


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
RX
Arduino™
UNO
ON
ICSP
POWER
ANALOG IN
IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
A3
A4
A5


POWER BARREL JACK
USB JACK
ATMEGA328
Reserved
IOREF
RESET
3V3
5V
GND
GND
Vin
SDA
SCL
PCINT8
PCINT9
PCINT10
PCINT11
PCINT12
PCINT13
ADC0
ADC1
ADC2
ADC3
ADC4
ADC5
PC0
PC1
PC2
PC3
PC4
PC5
23
24
25
26
27
28
A0
A1
A2
A3
A4
A5
ANALOG IN
AREF
GND
13
12
11
10
9
8
7
6
5
4
3
2
TX 1
RX 0
19
18
17
16
15
14
13
12
11
6
5
4
3
2
PB5
PB4
PB3
PB2
PB1
PB0
PD7
PD6
PD5
PD4
PD3
PD2
PD1
PD0
OC2A
OC1B
OC1A
CLKO
AIN1
AIN0
T1
T0
INT1
INT0
TXD
RXD
PCINT5
PCINT4
PCINT3
PCINT2
PCINT1
PCINT0
PCINT23
PCINT22
PCINT21
PCINT20
PCINT19
PCINT18
PCINT17
PCINT16
PWM
SCK
MISO
MOSI
SS
ICP1
OC0A
XCK
OC2B
TX
RX
SCL
SDA
AREF
GND
ICSP
RESET
SCK
MISO
5V
MOSI
GND

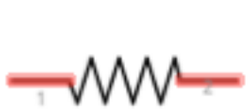

Blink | Arduino 1.6.1
Blink
/*
Blink
Turns on an LED on for one second, then off for one second, repeatedly.
Most Arduinos have an on-board LED you can control. On the Uno and
Leonardo, it is attached to digital pin 13. If you're unsure what
pin the on-board LED is connected to on your Arduino model, check
the documentation at http://arduino.cc
This example code is in the public domain.
modified 8 May 2014
by Scott Fitzgerald
*/
// the setup function runs once when you press reset or power the board
void setup() {
// initialize digital pin 13 as an output.
pinMode(13, OUTPUT);
}
// the loop function runs over and over again forever
void loop() {
digitalWrite(13, HIGH); // turn the LED on (HIGH is the voltage level)
delay(1000); // wait for a second
digitalWrite(13, LOW); // turn the LED off by making the voltage LOW
20
Arduino Uno on /dev/cu.usbmodemfa131

LED1

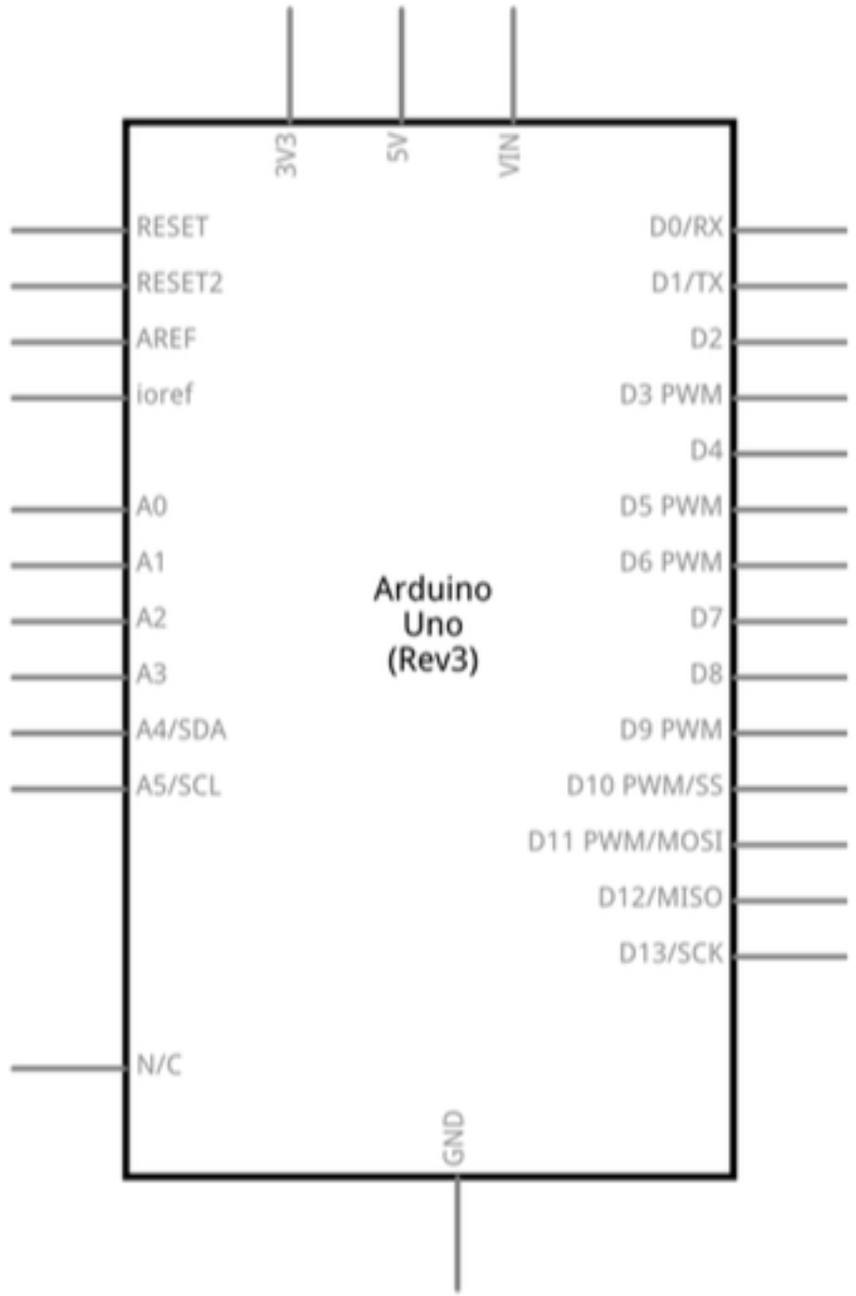
S1

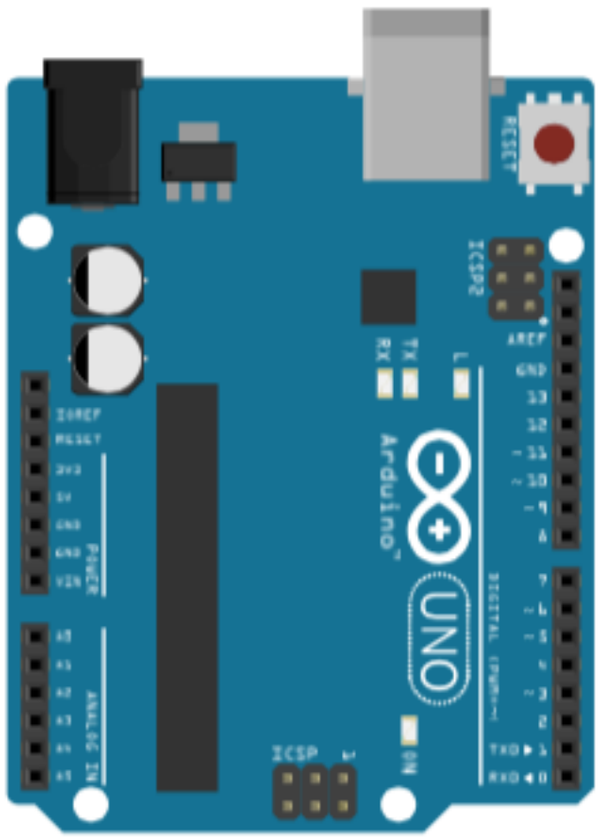
R1
220Ω

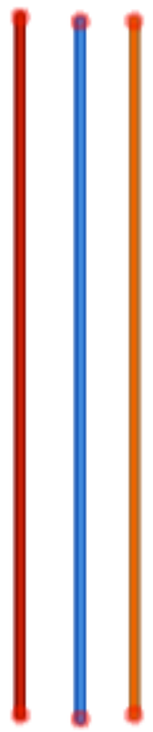
R2
10kΩ

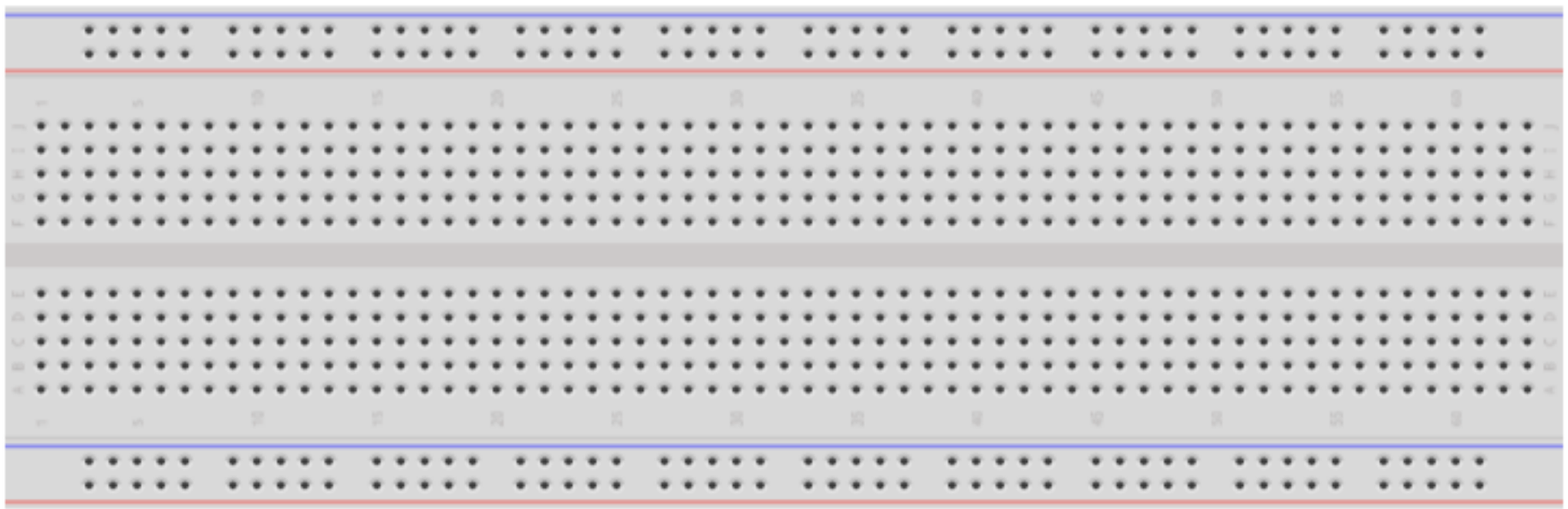


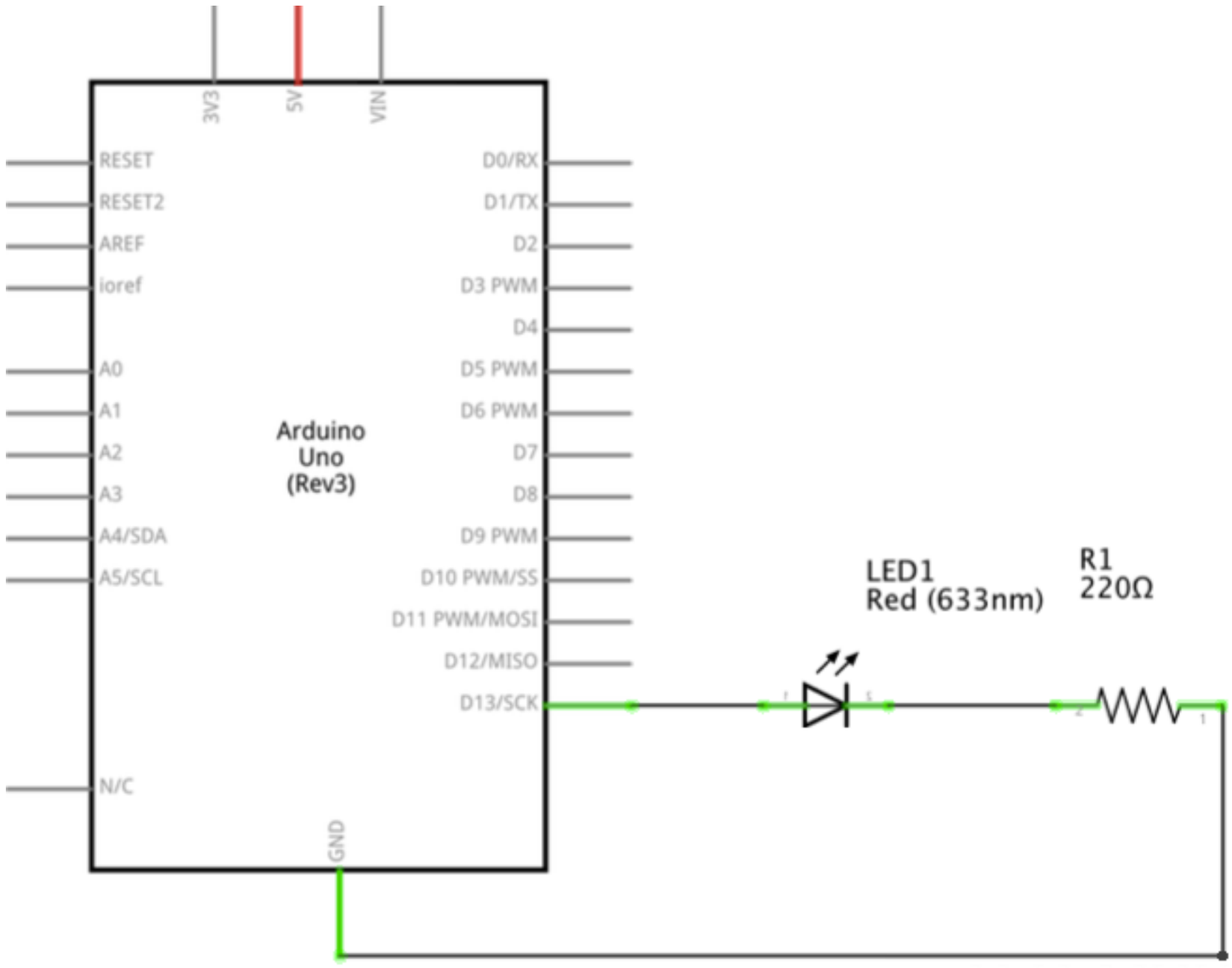
R3
4.7kΩ



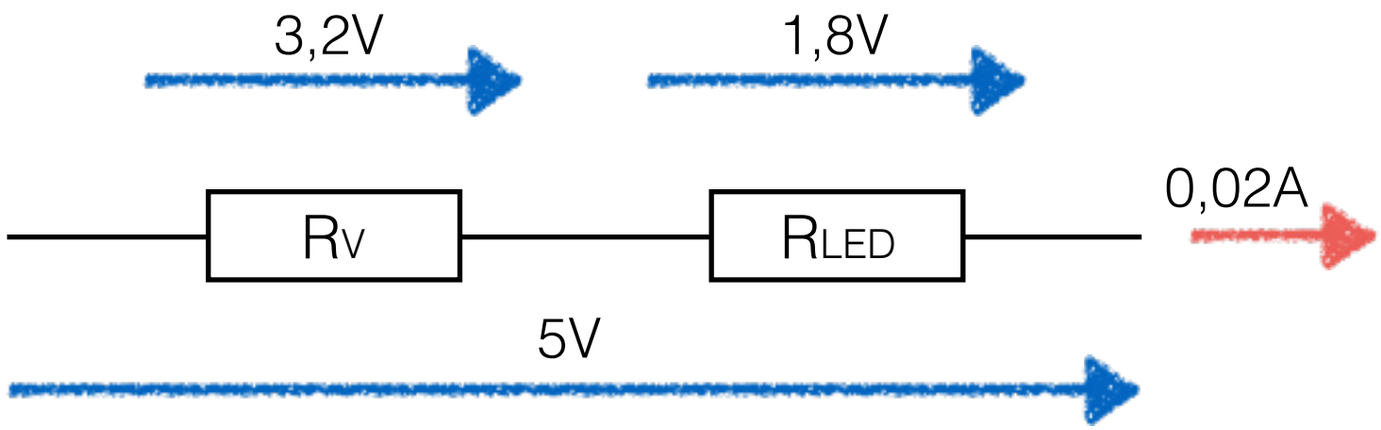

RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
TX
RX
L
ON
Arduino
UNO
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN
ICSP
ICSP1






3V3
5V
VIN
RESET
RESET2
AREF
ioref
A0
A1
A2
A3
A4/SDA
A5/SCL
N/C
D0/RX
D1/TX
D2
D3 PWM
D4
D5 PWM
D6 PWM
D7
D8
D9 PWM
D10 PWM/SS
D11 PWM/MOSI
D12/MISO
D13/SCK
GND
Arduino
Uno
(Rev3)
LED1
Red (633nm)
R1
220Ω

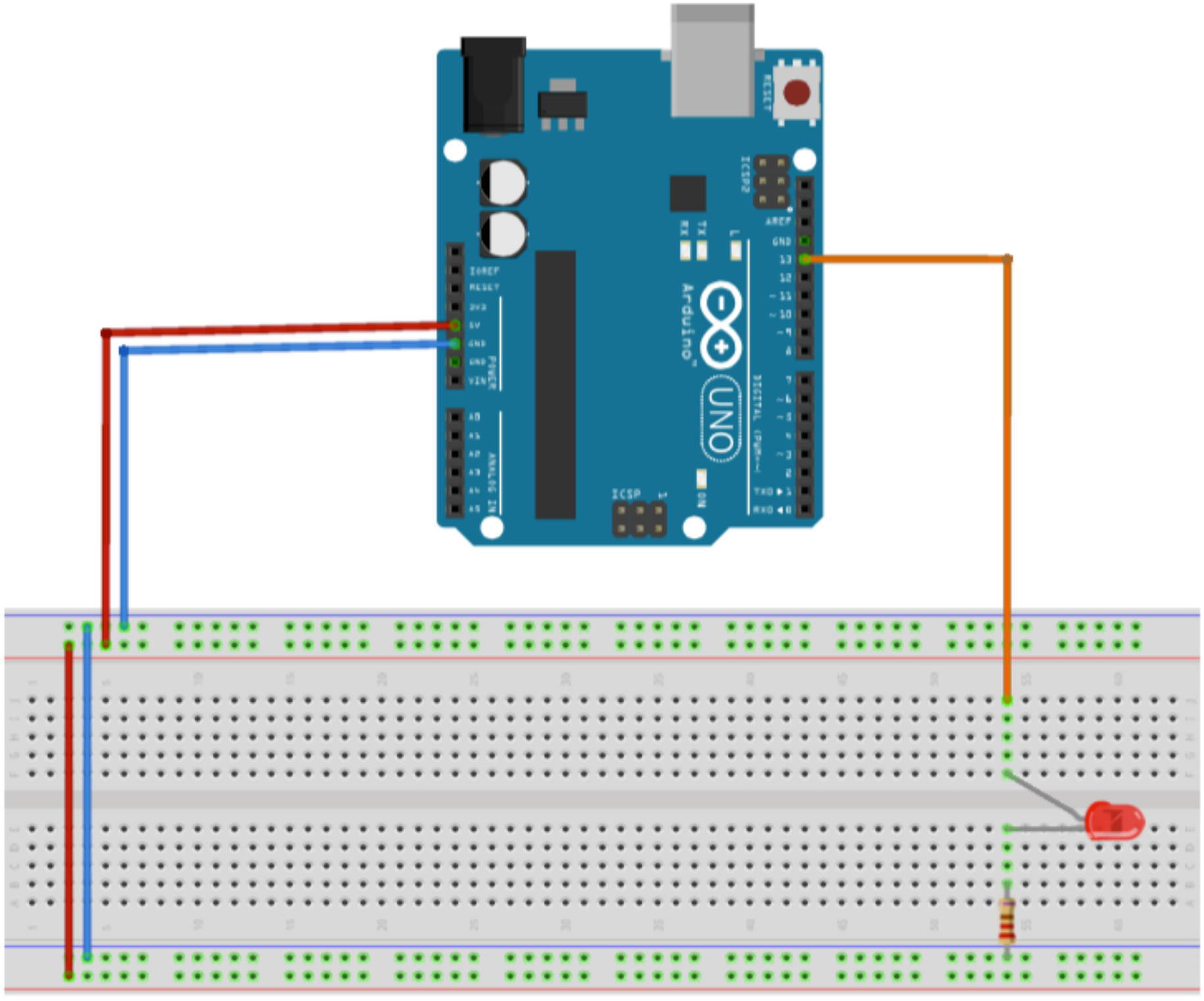
LED Vorwiderstand

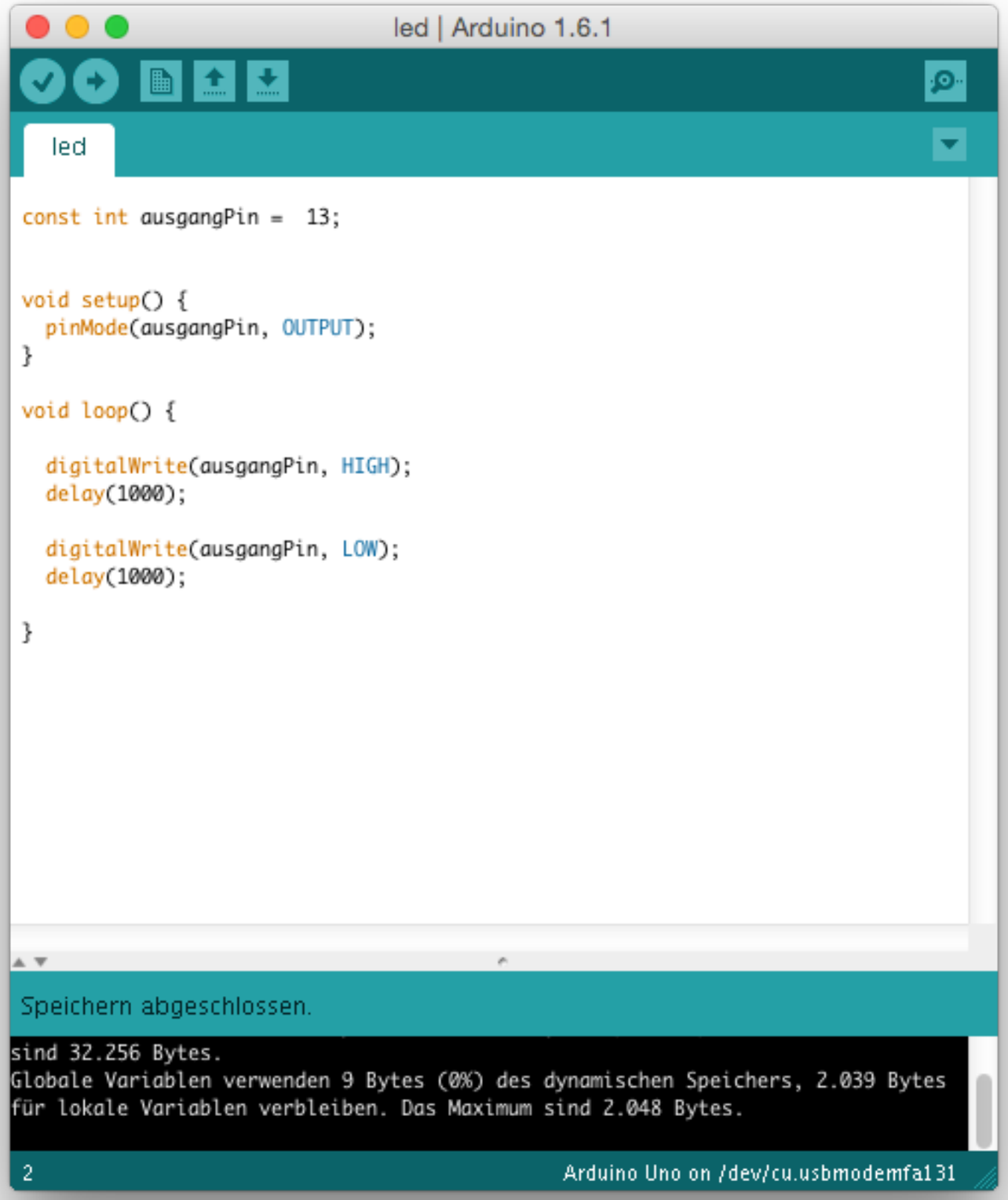


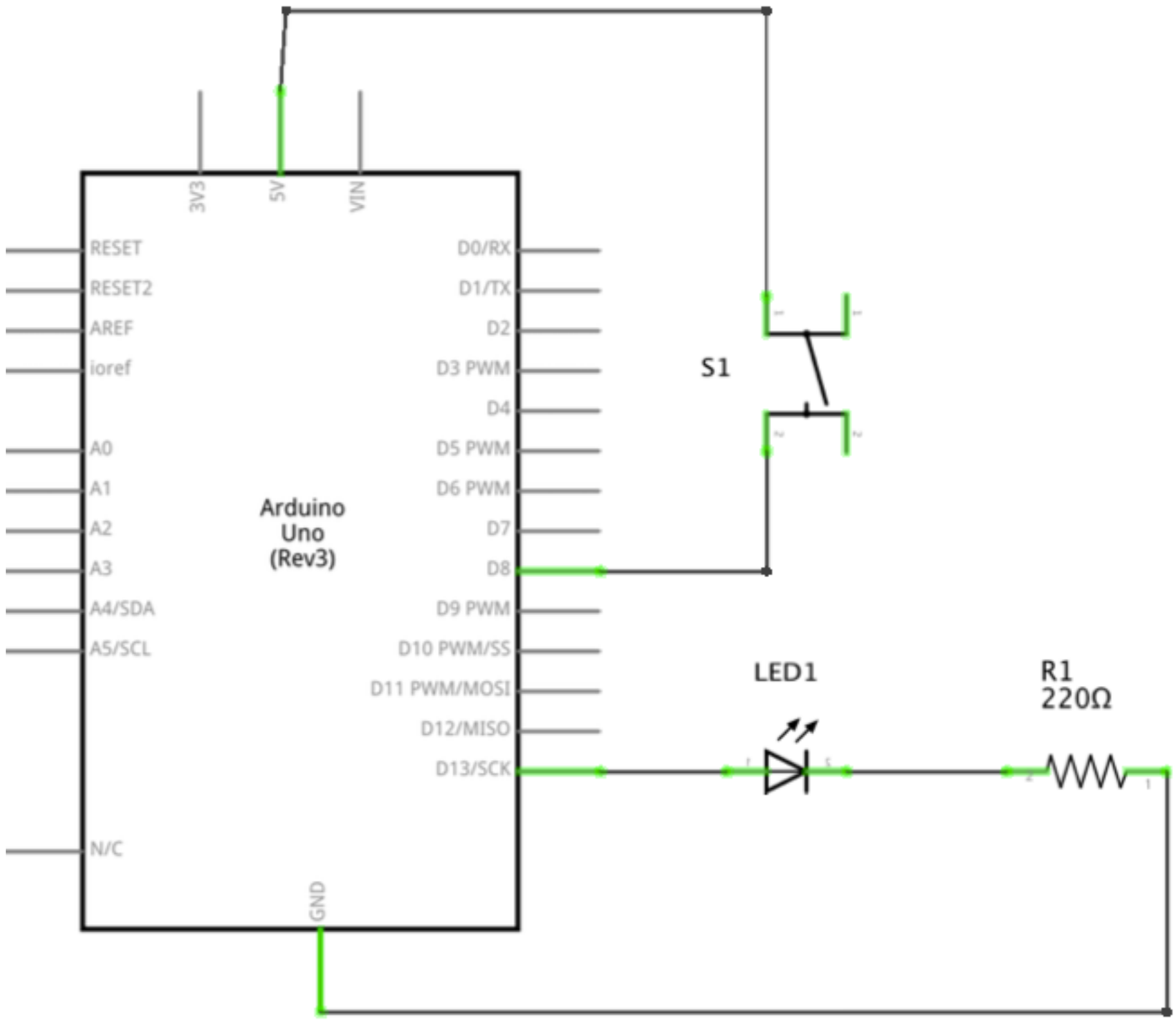
LED	Spannung
rot	1,8 V
gelb	2,0 V
grün	2,2 V

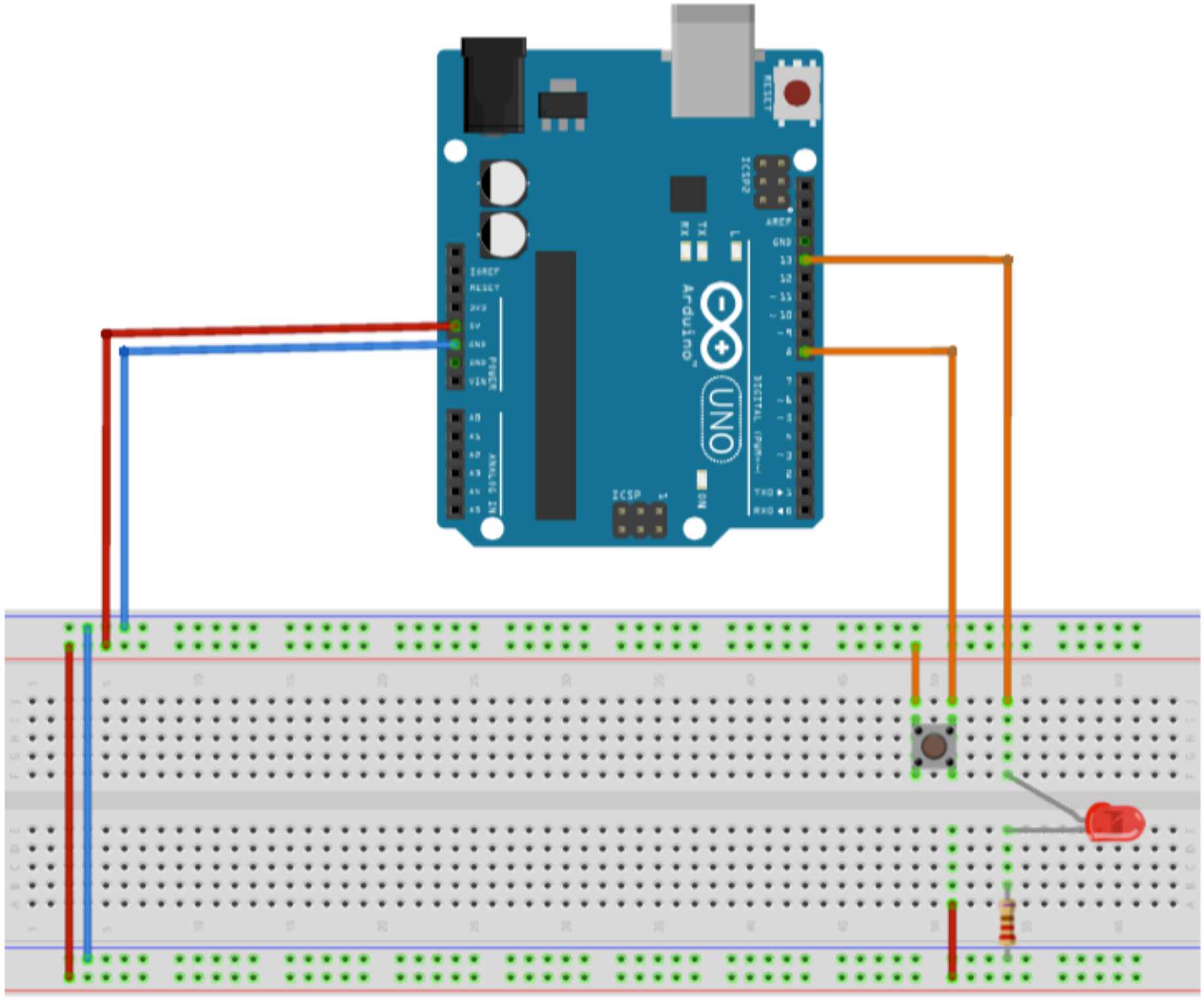
- Berechnung

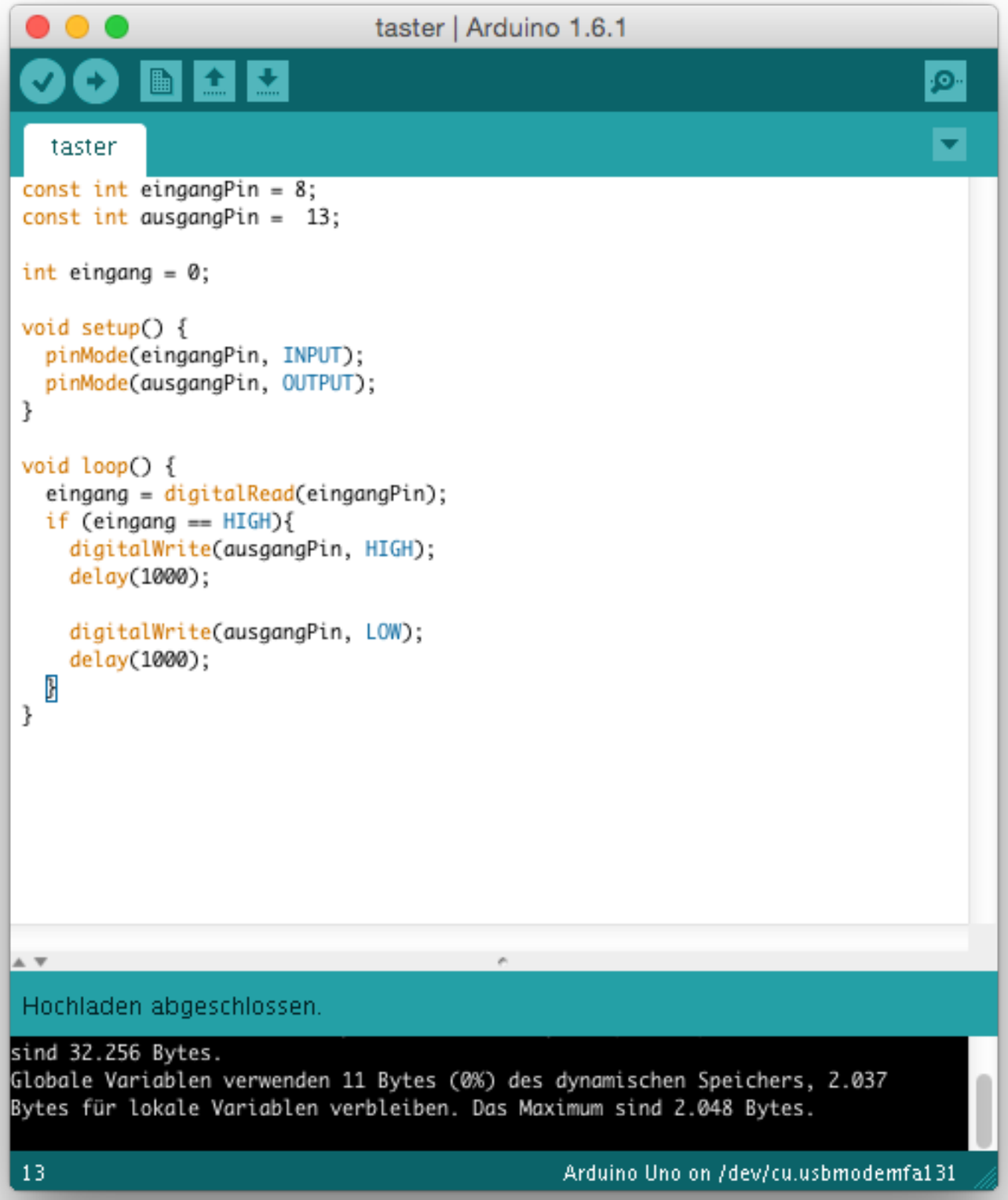
  $R_V = V_{CC} - U_{LED} / I_{LED}$
  $R_V = 5V - 1{,}8V / 0{,}02A = 160\ Ohm$

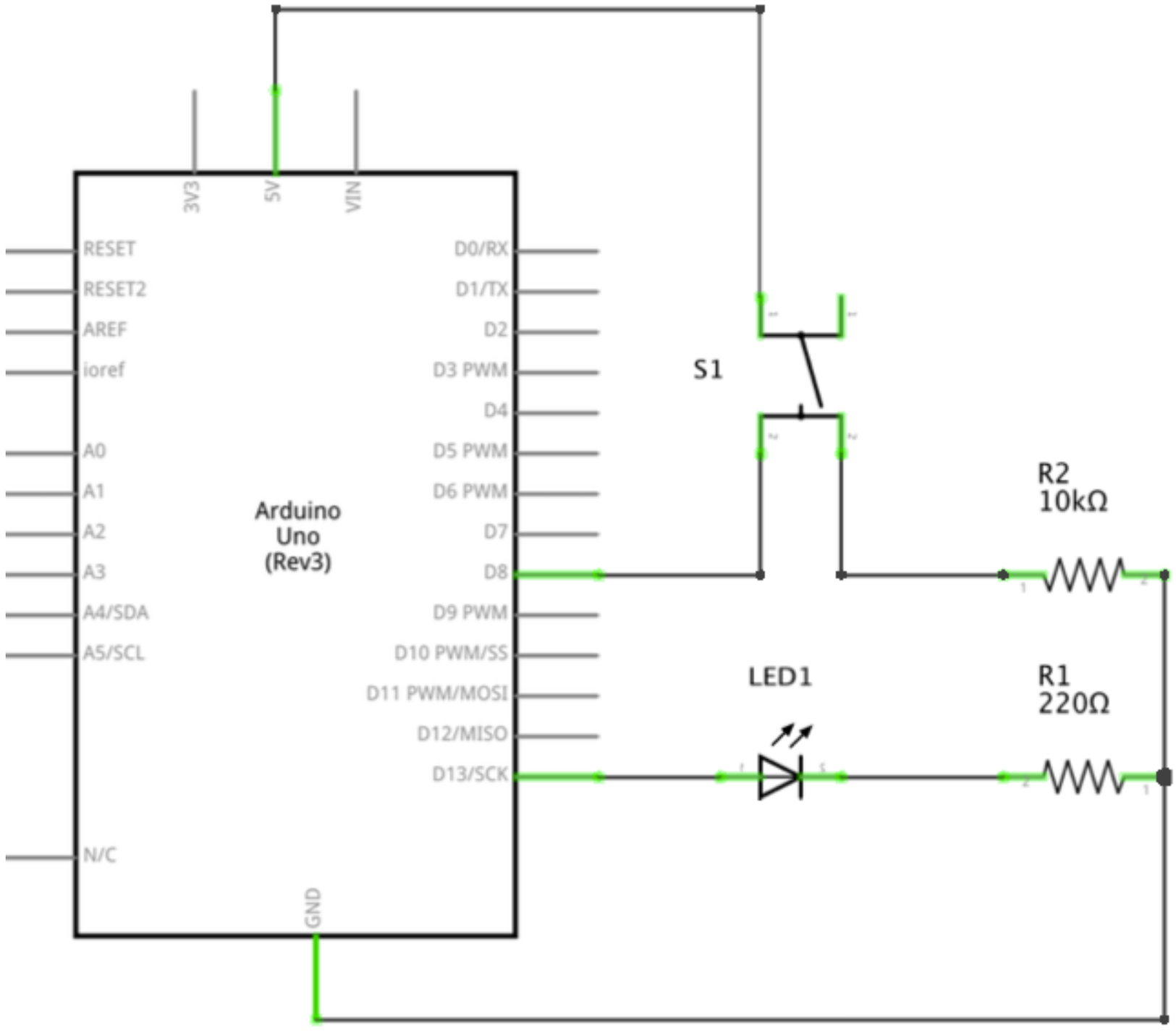

RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
TX
RX
L
Arduino
UNO
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN
ICSP
ON

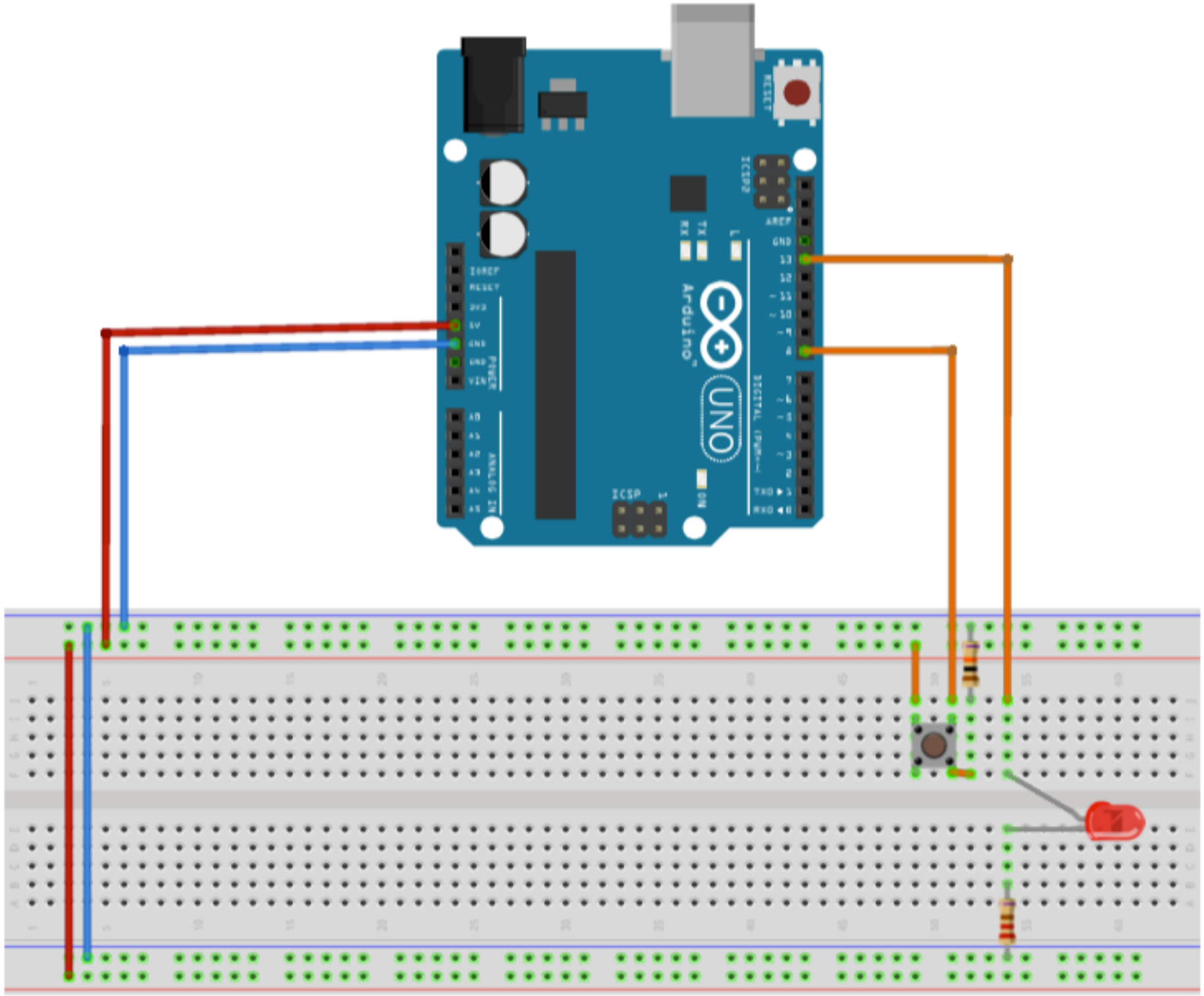

led | Arduino 1.6.1
led
const int ausgangPin = 13;
void setup() {
pinMode(ausgangPin, OUTPUT);
}
void loop() {
digitalWrite(ausgangPin, HIGH);
delay(1000);
digitalWrite(ausgangPin, LOW);
delay(1000);
}
Speichern abgeschlossen.
sind 32.256 Bytes.
Globale Variablen verwenden 9 Bytes (0%) des dynamischen Speichers, 2.039 Bytes
für lokale Variablen verbleiben. Das Maximum sind 2.048 Bytes.
2
Arduino Uno on /dev/cu.usbmodemfa131

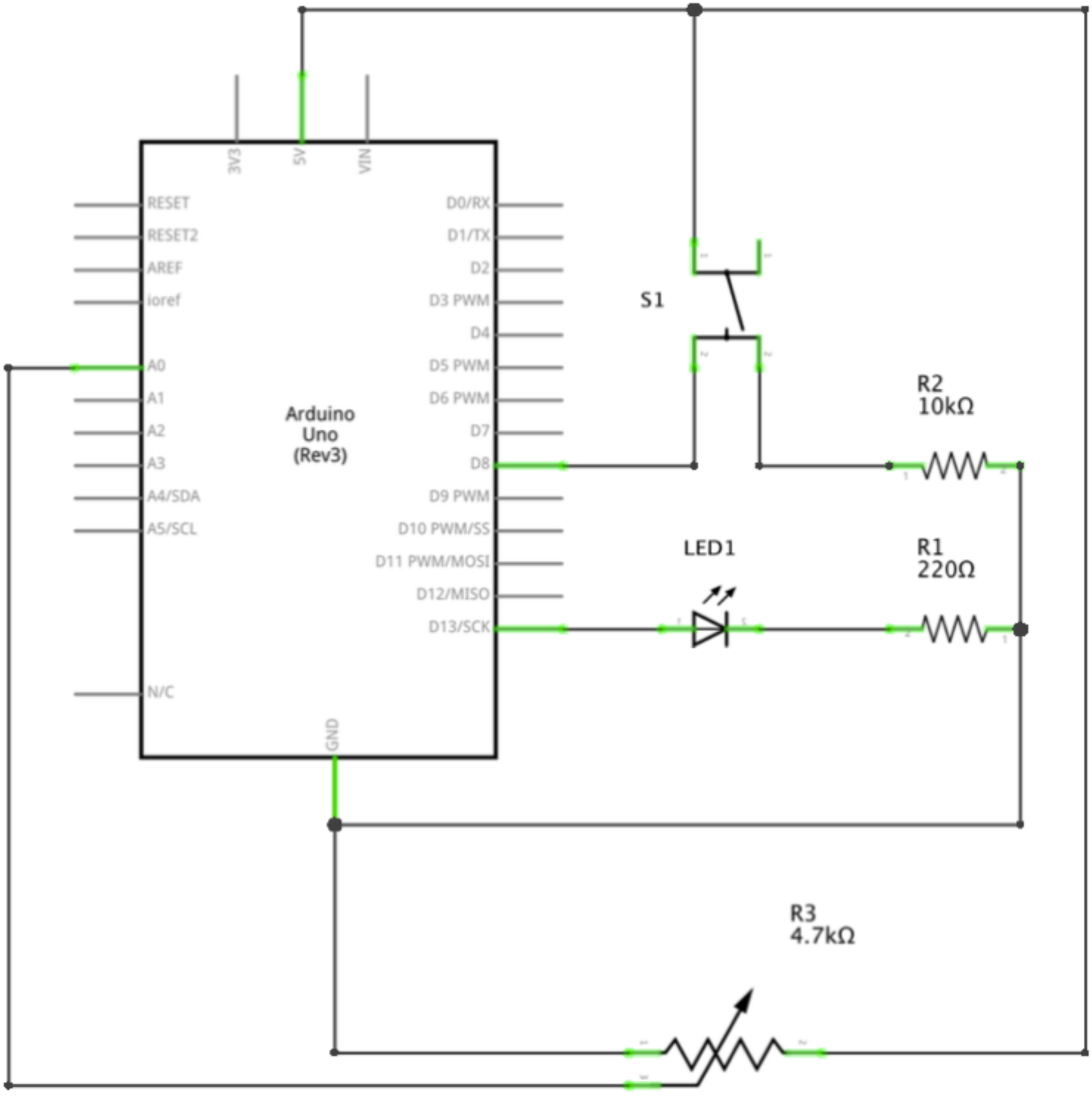

3V3
5V
VIN
RESET
RESET2
AREF
ioref
A0
A1
A2
A3
A4/SDA
A5/SCL
N/C
D0/RX
D1/TX
D2
D3 PWM
D4
D5 PWM
D6 PWM
D7
D8
D9 PWM
D10 PWM/SS
D11 PWM/MOSI
D12/MISO
D13/SCK
GND
Arduino
Uno
(Rev3)
S1
LED1
R1
220Ω

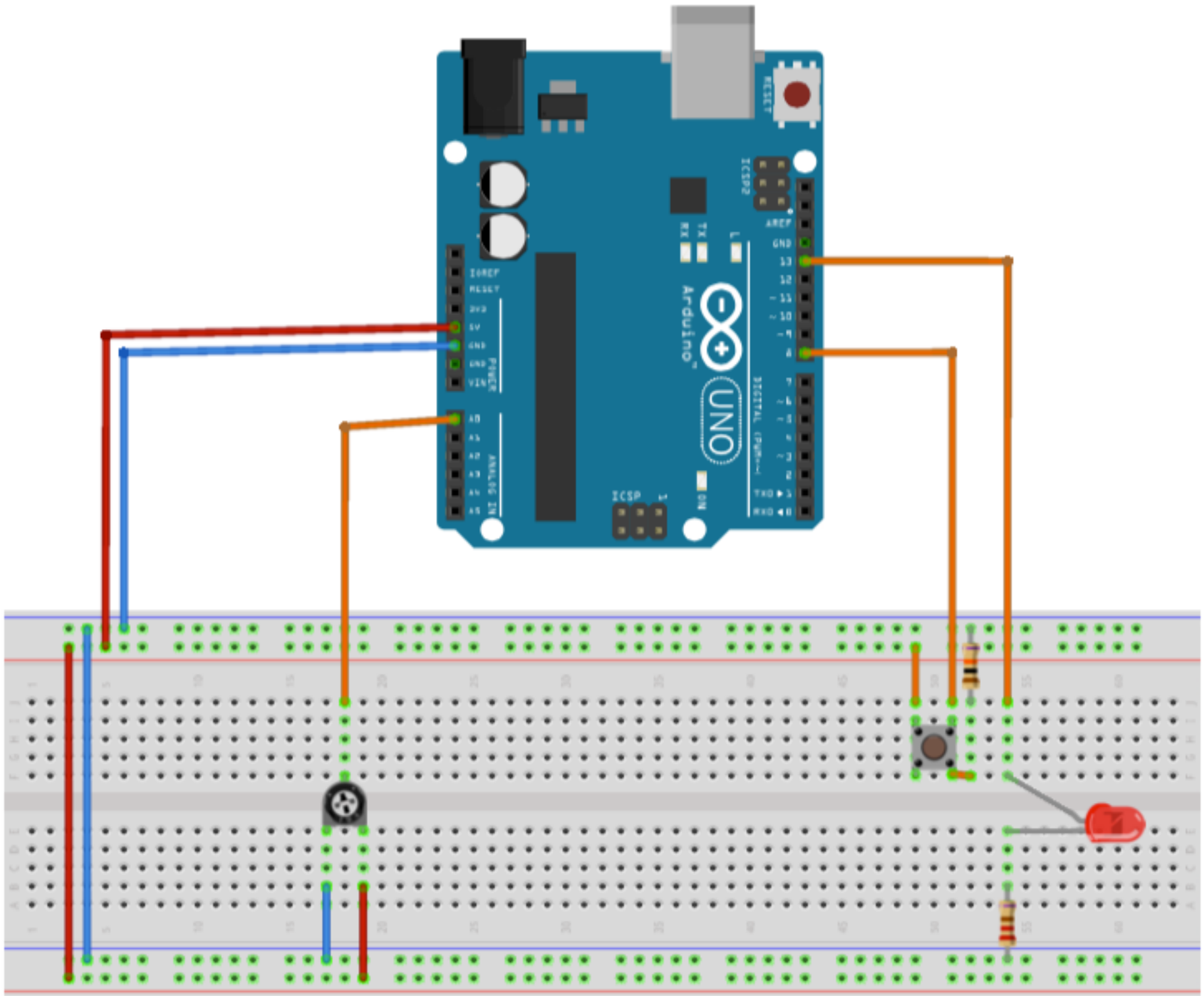

RESET
ICSP2
ARCF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
TX
RX
L
Arduino
UNO
ON
ICSP
1
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN


taster | Arduino 1.6.1
taster
const int eingangPin = 8;
const int ausgangPin = 13;
int eingang = 0;
void setup() {
pinMode(eingangPin, INPUT);
pinMode(ausgangPin, OUTPUT);
}
void loop() {
eingang = digitalRead(eingangPin);
if (eingang == HIGH){
digitalWrite(ausgangPin, HIGH);
delay(1000);
digitalWrite(ausgangPin, LOW);
delay(1000);
}
}
Hochladen abgeschlossen.
sind 32.256 Bytes.
Globale Variablen verwenden 11 Bytes (0%) des dynamischen Speichers, 2.037
Bytes für lokale Variablen verbleiben. Das Maximum sind 2.048 Bytes.
13
Arduino Uno on /dev/cu.usbmodemfa131


3V3
5V
VIN
RESET
RESET2
AREF
ioref
A0
A1
A2
A3
A4/SDA
A5/SCL
N/C
GND
D0/RX
D1/TX
D2
D3 PWM
D4
D5 PWM
D6 PWM
D7
D8
D9 PWM
D10 PWM/SS
D11 PWM/MOSI
D12/MISO
D13/SCK
Arduino
Uno
(Rev3)
S1
R2
10kΩ
LED1
R1
220Ω


RESET
ICSP2
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
TX
RX
L
Arduino
UNO
ON
ICSP
1
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN


3V3
5V
VIN
RESET
RESET2
AREF
ioref
A0
A1
A2
A3
A4/SDA
A5/SCL
N/C
D0/RX
D1/TX
D2
D3 PWM
D4
D5 PWM
D6 PWM
D7
D8
D9 PWM
D10 PWM/SS
D11 PWM/MOSI
D12/MISO
D13/SCK
GND
Arduino
Uno
(Rev3)
S1
R2
10kΩ
LED1
R1
220Ω
R3
4.7kΩ


RESET
ICSP2
AREF
GND
13
12
11
10
9
8
TX
RX
L
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN
Arduino
UNO
DIGITAL (PWM~)
TX→1
RX←0
ICSP
1
ON

poti | Arduino 1.6.1

poti

```
const int eingangPin = 8;
const int ausgangPin =  13;
const int analogPin = A0;

int eingang = 0;
int analog = 0;

void setup() {
  pinMode(eingangPin, INPUT);
  pinMode(ausgangPin, OUTPUT);
}

void loop() {
  eingang = digitalRead(eingangPin);
  analog = analogRead(analogPin);

  if (eingang == HIGH){
    digitalWrite(ausgangPin, HIGH);
    delay(analog);

    digitalWrite(ausgangPin, LOW);
    delay(analog);
  }
}
```

Hochladen abgeschlossen.

```
sind 32.256 Bytes.
Globale Variablen verwenden 15 Bytes (0%) des dynamischen Speichers, 2.033
Bytes für lokale Variablen verbleiben. Das Maximum sind 2.048 Bytes.
```

6 Arduino Uno on /dev/cu.usbmodemfa131