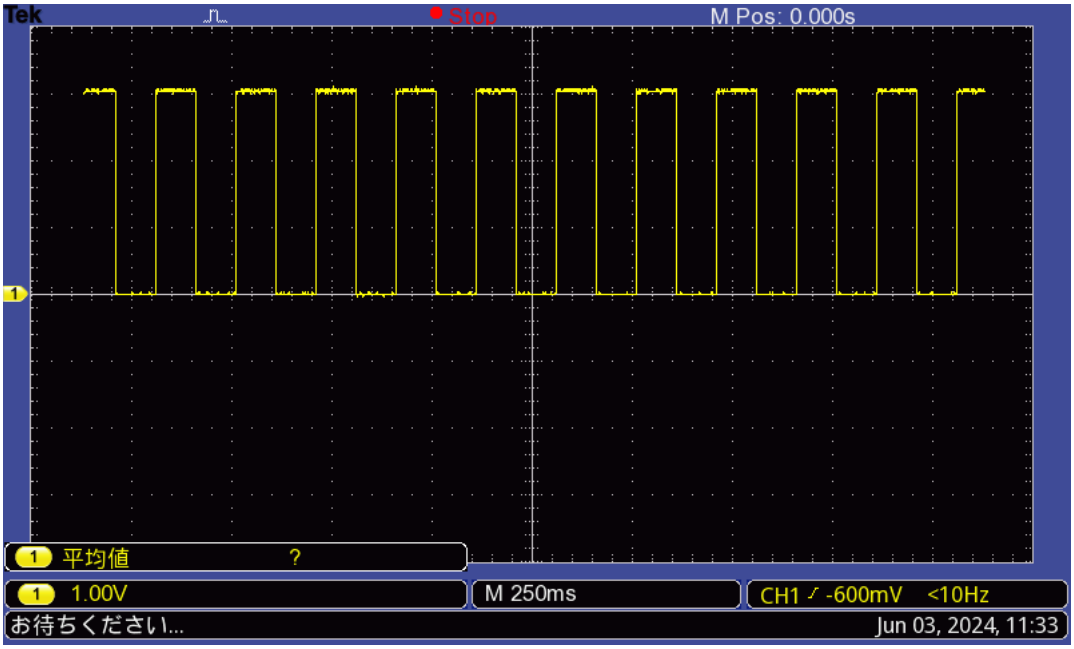
前期 第 7 回 実験報告（実験日：R6 年 6 月 3 日）　名列番号：38　氏名：宮里 孝希

第 7 回　Arduino マイコンのプログラミング基礎から D C モータの駆動まで

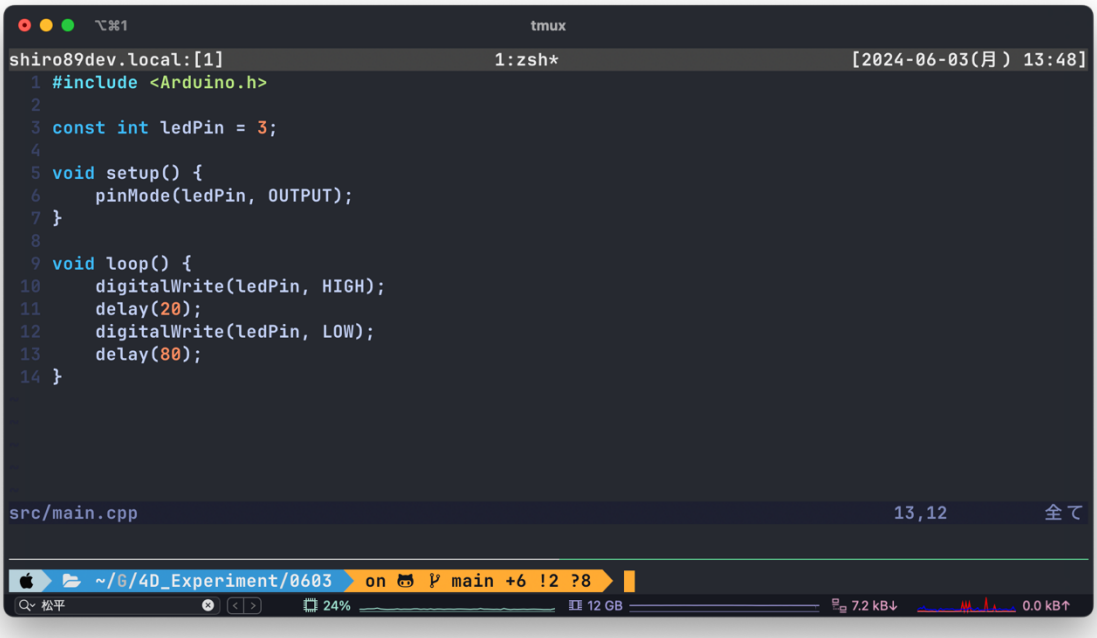
1. 実験手順 1

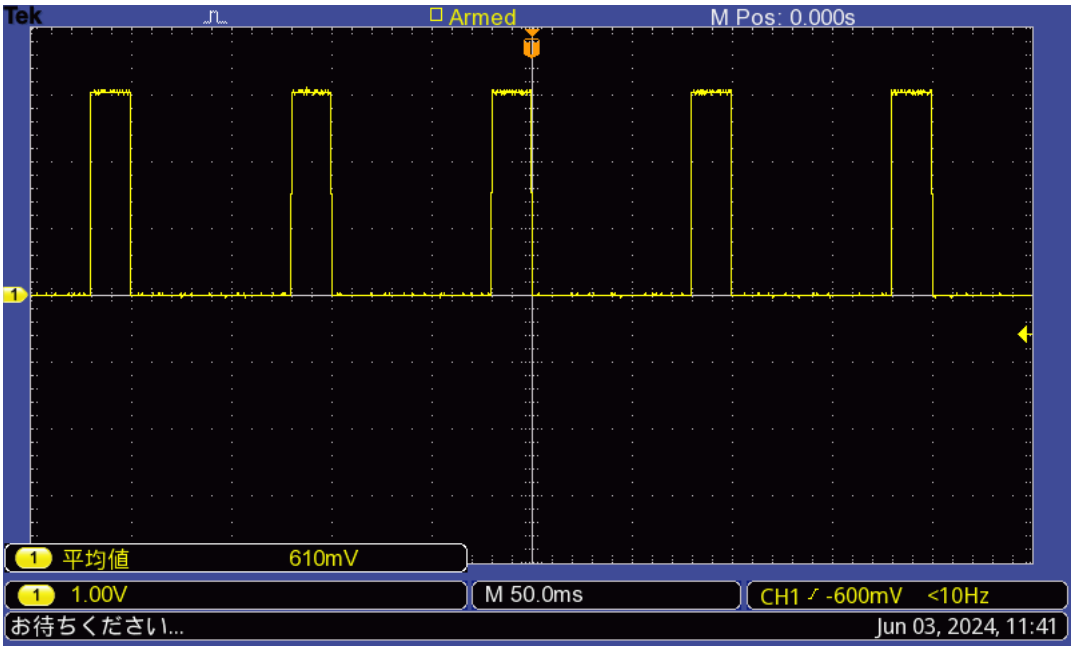
a. 0.1 秒間隔

```
shiro89dev.local:[0]                    1:nvim*                    [2024-06-03(月) 13:48]
  1 #include <Arduino.h>
  2
  3 const int ledPin = 3;
  4
  5 void setup() {
  6     pinMode(ledPin, OUTPUT);
  7 }
  8
  9 void loop() {
 10     digitalWrite(ledPin, HIGH);
 11     delay(100);
 12     digitalWrite(ledPin, LOW);
 13     delay(100);
 14 }
src/main.cpp                                                    13,12         全て
"src/main.cpp" 14L, 208B 書込み
~/G/4D_Experiment/0603  on  main +6 !2 ?8
```



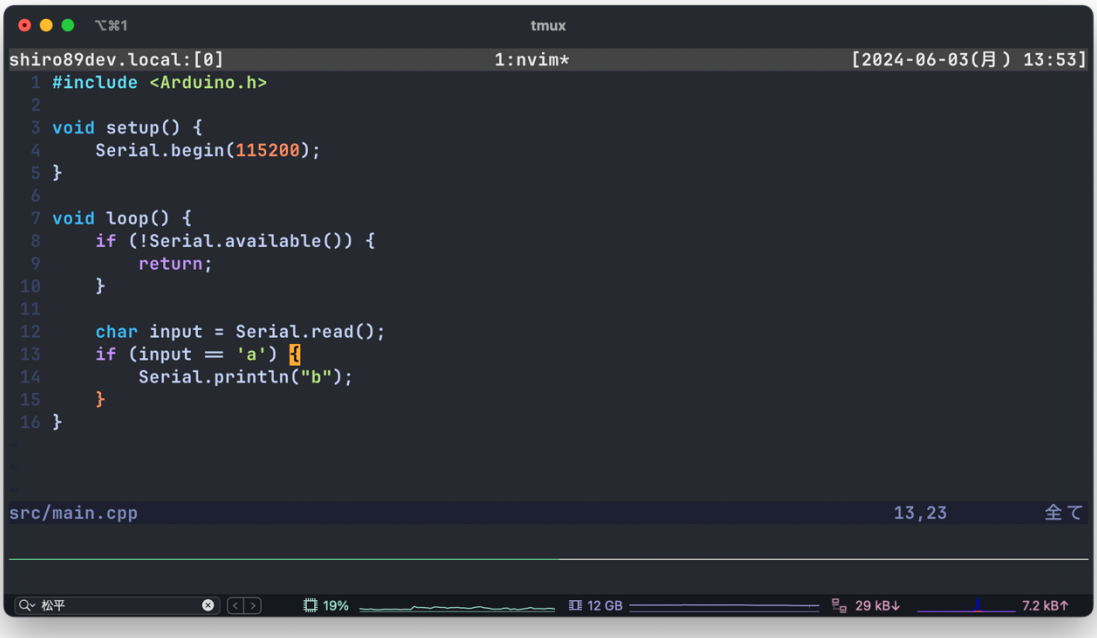
b. Duty 20:80

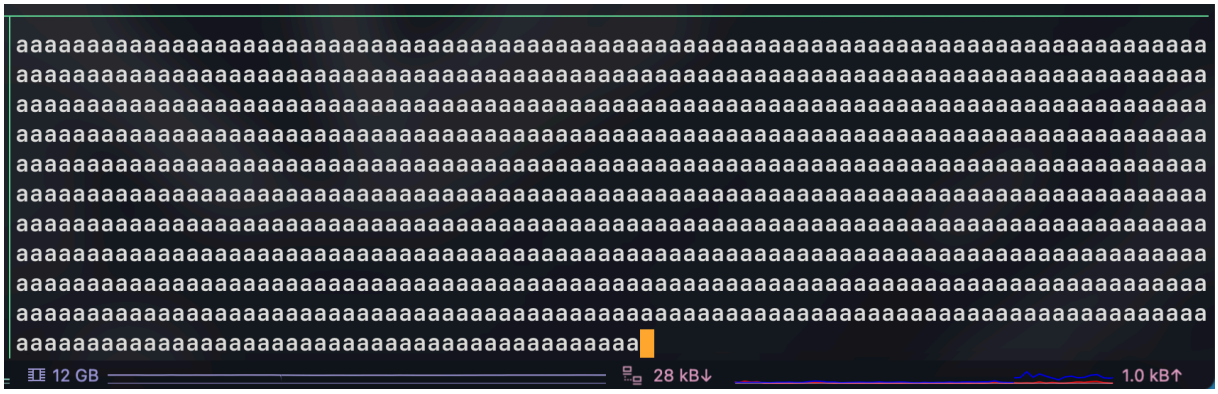

tmux
shiro89dev.local:[1] 1:zsh* [2024-06-03(月) 13:48]
#include <Arduino.h>
const int ledPin = 3;
void setup() {
pinMode(ledPin, OUTPUT);
}
void loop() {
digitalWrite(ledPin, HIGH);
delay(20);
digitalWrite(ledPin, LOW);
delay(80);
}
src/main.cpp 13,12 全て
~/G/4D_Experiment/0603 on main +6 !2 ?8


Tek
Armed
M Pos: 0.000s
1 平均値 610mV
1 1.00V
M 50.0ms
CH1 -600mV <10Hz
お待ちください...
Jun 03, 2024, 11:41

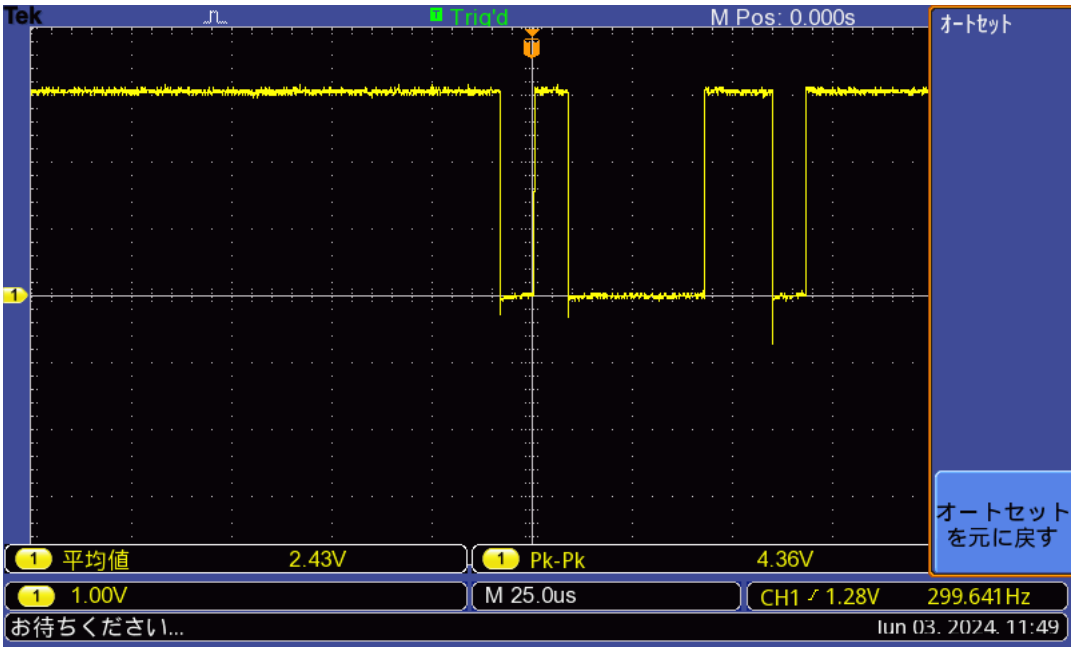
2. 実験手順 2

a. a を送ると b が送信される

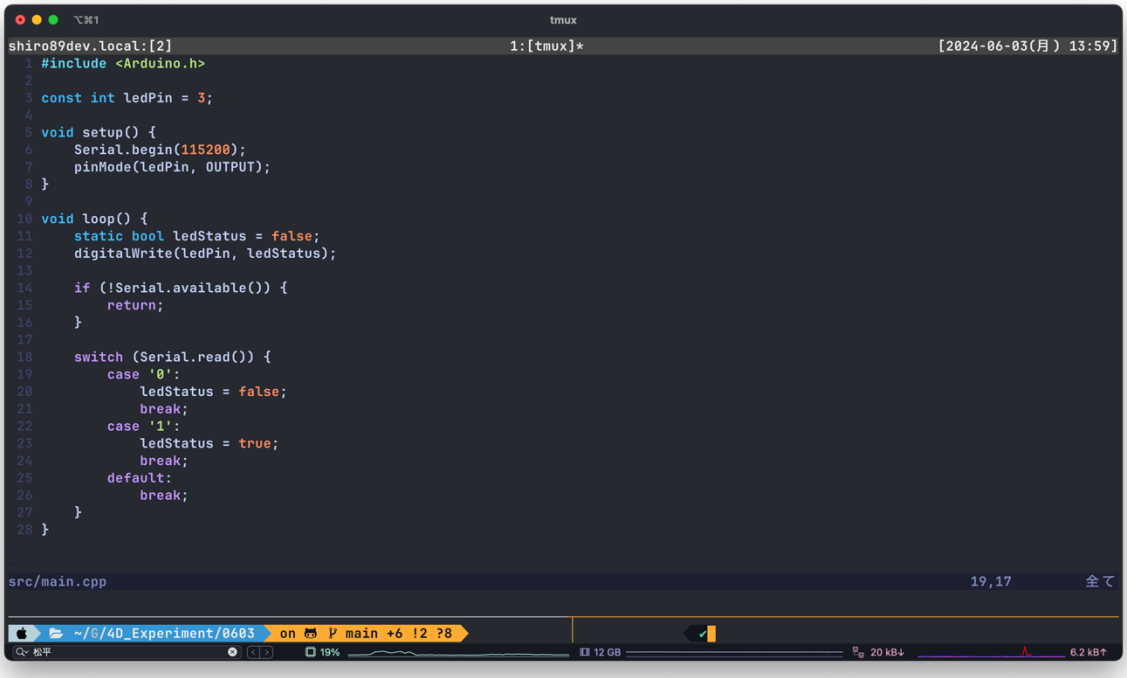




b. 無限 a 送信



c. 文字 1 の送信でＬＥＤ点灯，0 で消灯



3. 実験手順 1

a. 3 番 PWM 出力で DC モーター動作，A0 で計測

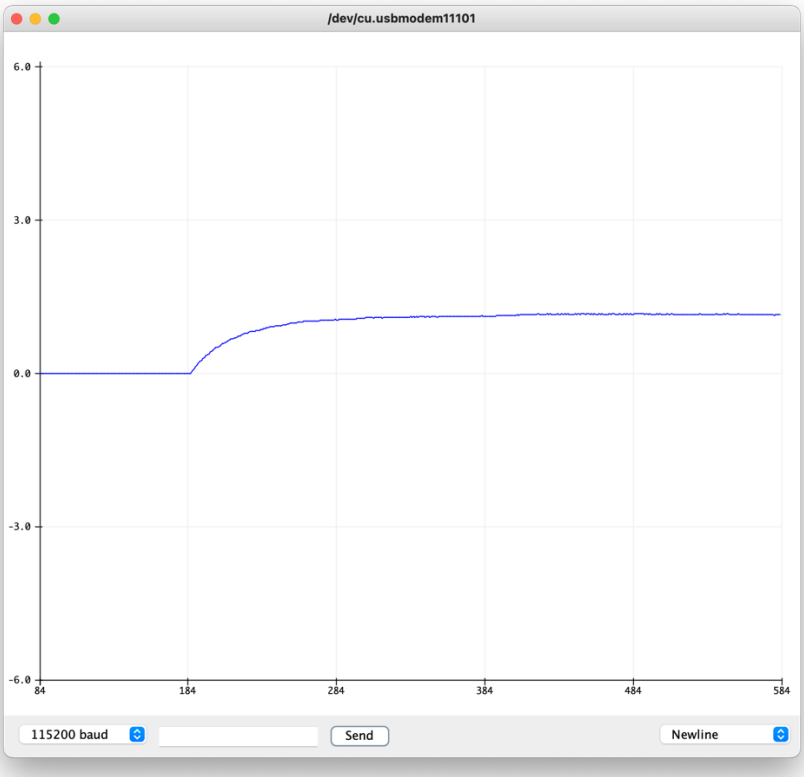
tmux

shiro89dev.local:[0] 1:nvim* [2024-06-03(月) 14:58]

```cpp
#include <Arduino.h>

const int motorPin = 3;
const int motorVelPin = A0;

void setup() {
    Serial.begin(115200);
    pinMode(motorPin, OUTPUT);
    delay(1000);
}

void loop() {
    static bool motorStatus = false;
    const double batteryLevel = 4.5;
    const double motorVoltageRef = 1.0;

    if (motorStatus) {
        analogWrite(motorPin, 255 * motorVoltageRef / batteryLevel);
    } else {
        digitalWrite(motorPin, LOW);
    }

    double motorVel = analogRead(motorVelPin) / 1024.0 * 5.0;

    Serial.print("Input[V]:");
    Serial.println(motorVel);

    if (Serial.read() == '1') {
        motorStatus = !motorStatus;
    }

    delay(20);
}
```

src/main.cpp 26,29 全て

~/G/4D_Experiment/0603 on main +6 !2 ?9



b. MsTimer2 版（タイマーが干渉するため，motorPin を 5 に変更）

```
shiro89dev.local:[0]                    1:nvim*                    [2024-06-03(月) 15:39]
 1 #include <Arduino.h>
 2 #include <MsTimer2.h>
 3
 4 const int motorPin = 5;
 5 const int motorVelPin = A0;
 6
 7 volatile double motorVel = 0.0;
 8 volatile bool motorStatus = false;
 9
10 void intrruptHandler() {
11     motorVel = analogRead(motorVelPin) / 1024.0 * 5.0;
12
13     Serial.print("Input[V]:");
14     Serial.println(motorVel);
15
16     if (Serial.read() == '1') {
17         motorStatus = !motorStatus;
18     }
19 }
20
21 void setup() {
22     Serial.begin(115200);
23     pinMode(motorPin, OUTPUT);
24
25     MsTimer2::set(20, intrruptHandler);
26     MsTimer2::start();
27 }
28
29 void loop() {
30     const double batteryLevel = 4.5;
31     const double motorVoltageRef = 1.0;
32
33     if (motorStatus) {
34         analogWrite(motorPin, 255 * motorVoltageRef / batteryLevel);
35     } else {
36         digitalWrite(motorPin, LOW);
37     }
38 }
src/main.cpp                                                        38,1          全て
"src/main.cpp" 38L, 770B 書込み
~/6/4D_Experiment/0603 on  main +6 !3 ?9                    ~
```