

开源硬件实战课程

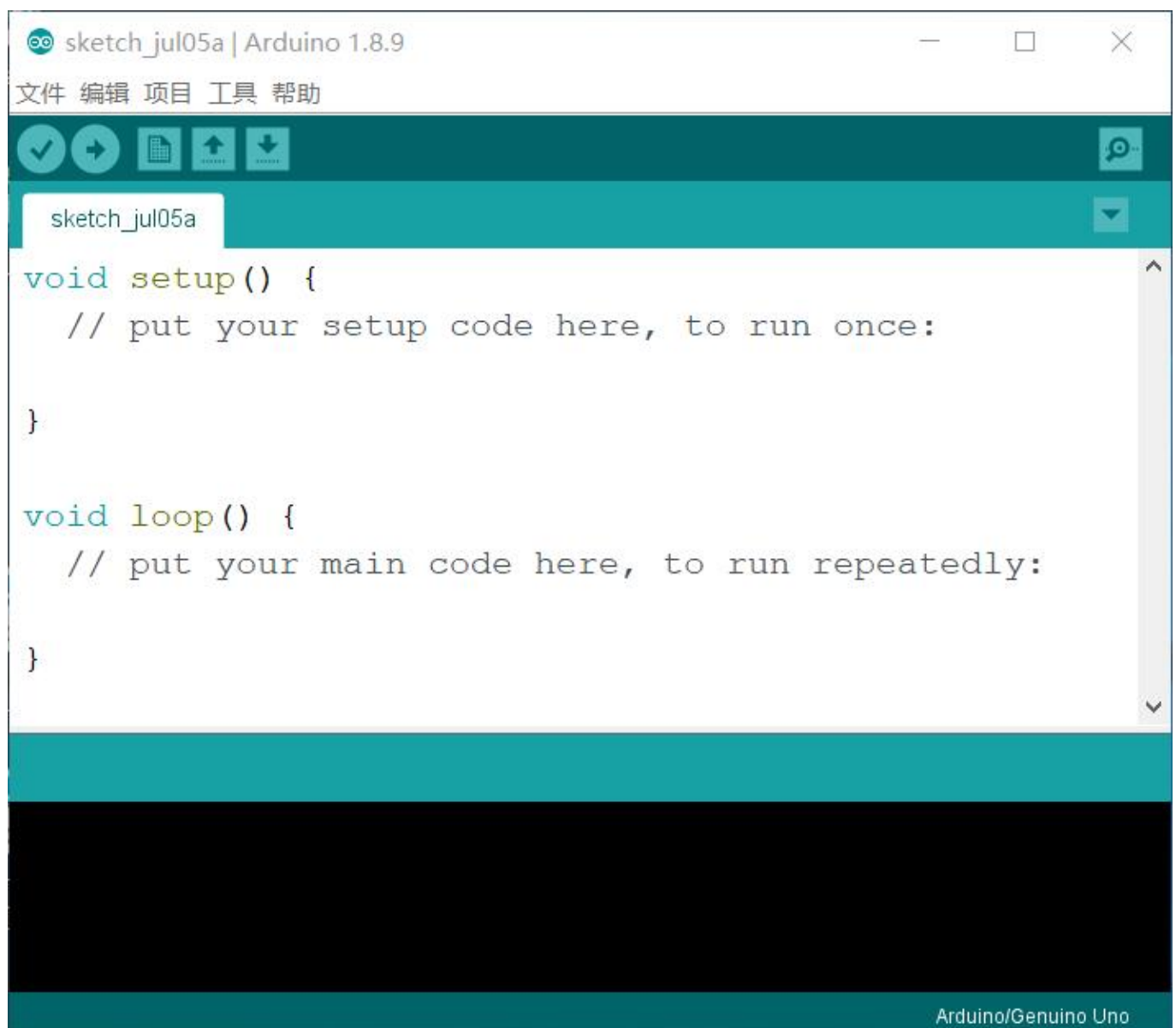
王俊凯 17019110059

learn arduino

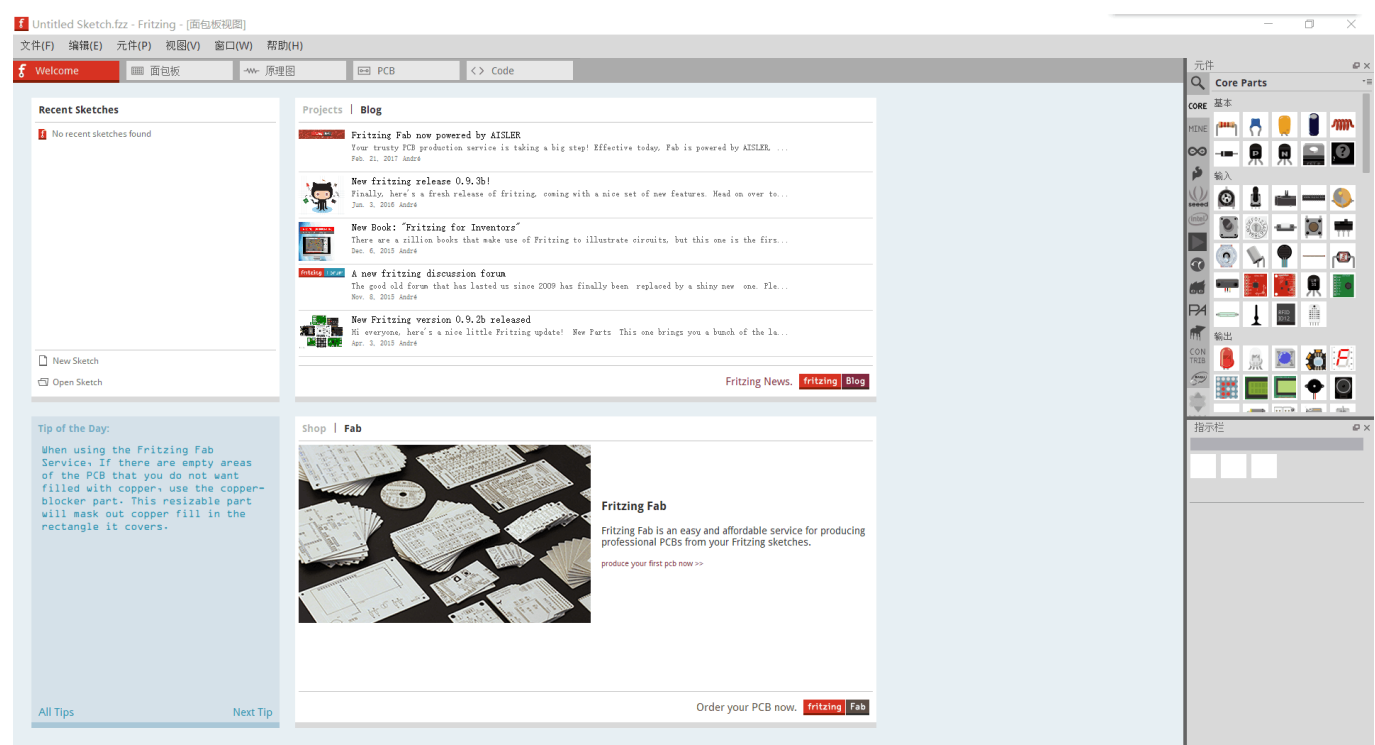
第一天 入门介绍

- 为什么要学习开源硬件
- 如何学习开源硬件
- 几个常用软件

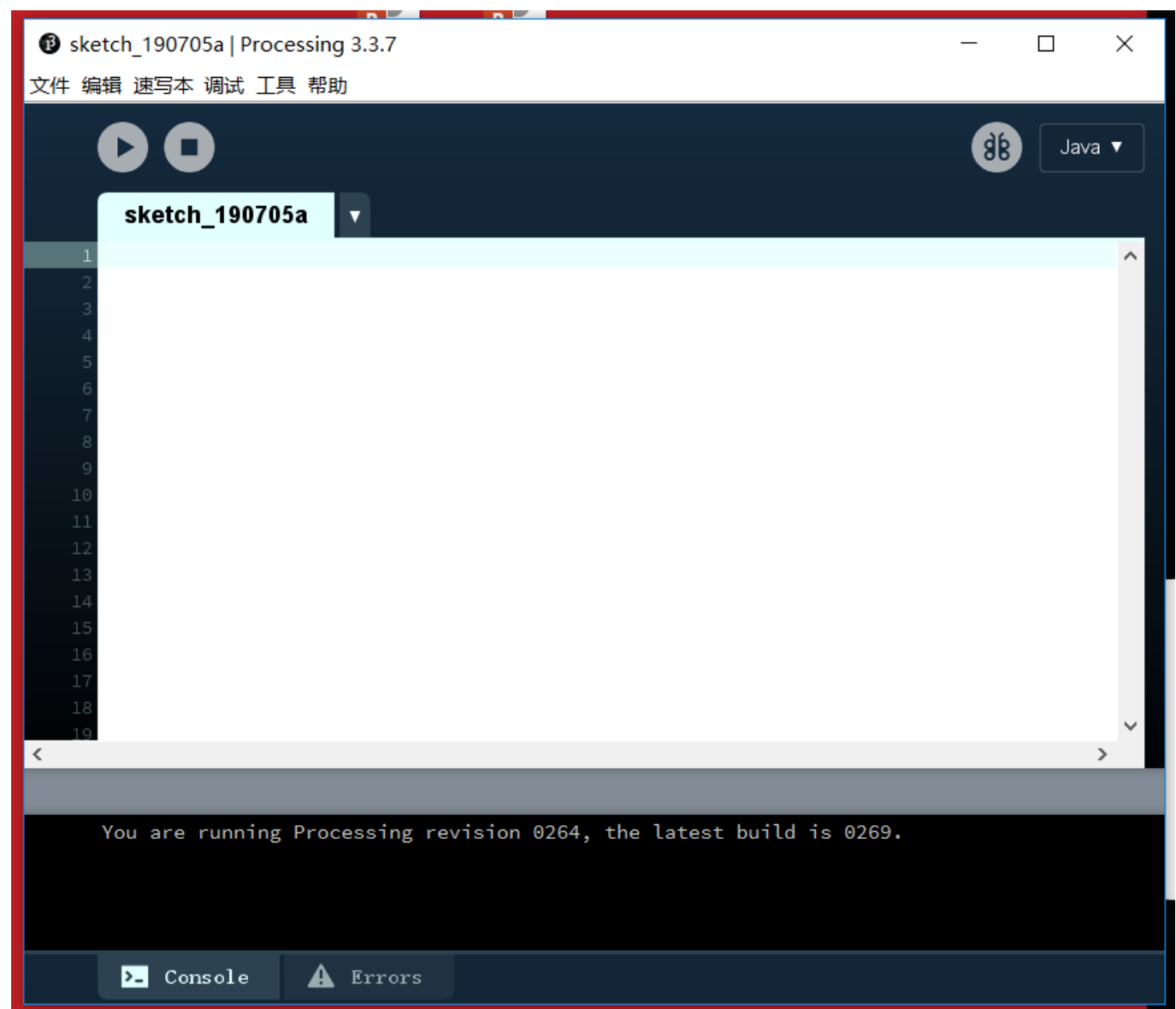
arduino



fritzing



processing



- 几个常用网站

第二天 软件操作

- Arduino安装
- Arduino文档
- Arduino基本操作
- Arduino类库操作
- 实例：morse代码

```
#include "Arduino.h"
#include "Morse.h"

Morse::Morse(int pin)//构造法
{
    pinMode(pin,OUTPUT);//配置为输出
    _pin=pin;//把pin传给_pin
}

void Morse::dot()
{
    digitalWrite(_pin,HIGH);
    delay(250);
    digitalWrite(_pin,LOW);
    delay(250);
}

void Morse::dash()
{
    digitalWrite(_pin,HIGH);
    delay(1000);
    digitalWrite(_pin,LOW);
    delay(250);
}

void Morse::c_space()//字符间隔
{
    digitalWrite(_pin,LOW);
    delay(250*3);
}

void Morse::w_space()//单词间隔
{
    digitalWrite(_pin,LOW);
    delay(250*7);
}
```

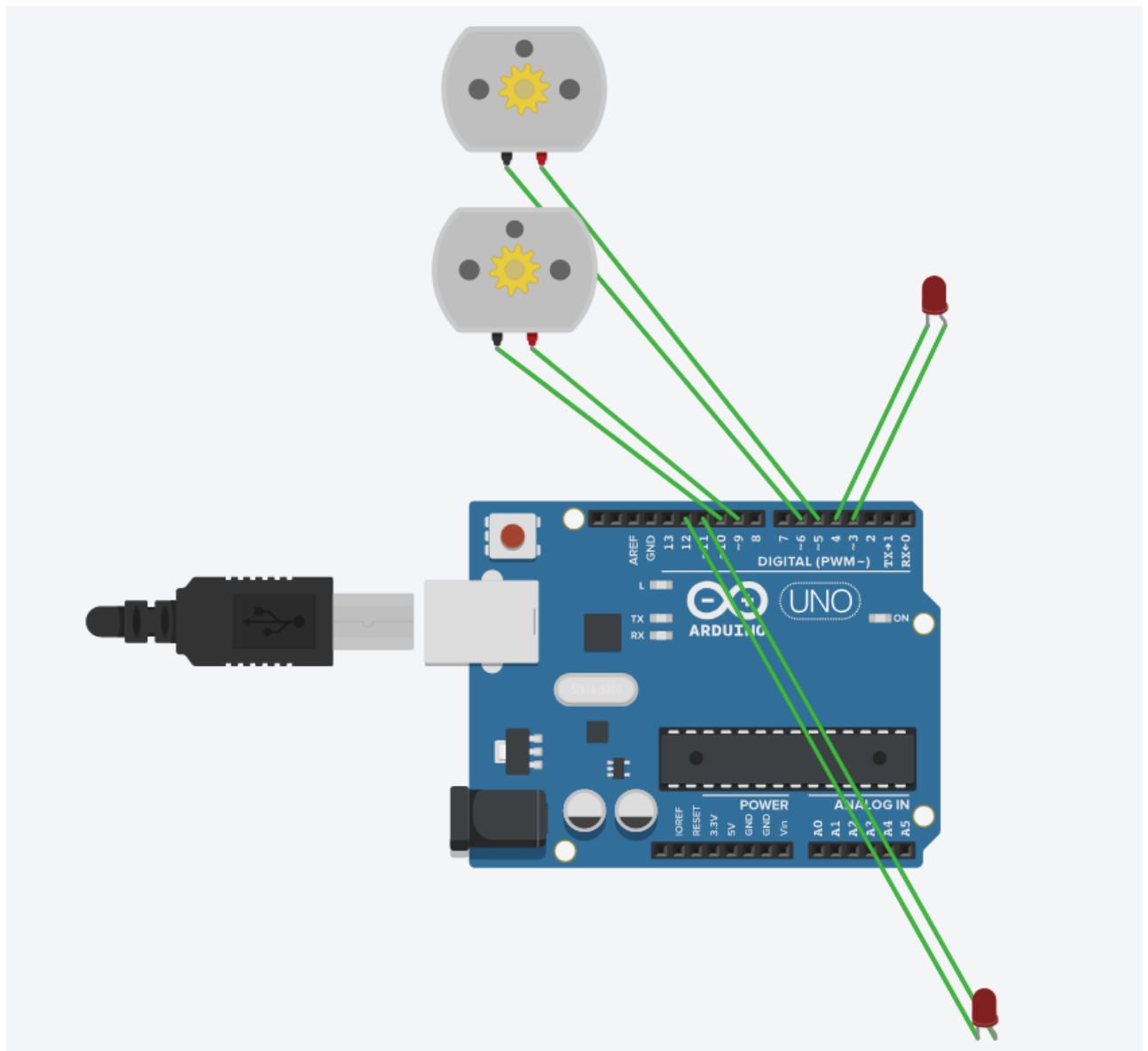
.h

```
#ifndef _MORSE_H//预编译
#define _MORSE_H
class Morse
```

```
{  
  public:  
    Morse(int pin);  
    void dot();  
    void dash();  
    void c_space();  
    void w_space();  
  private:  
    int _pin;  
};  
#endif /* _MORSE_H*/
```

第三天 元器件及电路图

- 使用在线模拟网站
- 小车电路图及代码



- 实例：小车代码

```
void setup()
{
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
  pinMode(11, OUTPUT);
  pinMode(12, OUTPUT);
  Serial.begin(9600);
}
int income=0;
void loop()
{
  if(Serial.available()>0)
  {
    income=Serial.read();
    switch(income)
    {
      case 'f':
        forward();
        break;
      case 'b':
        backward();
        break;
      case 'l':
        left();
        break;
      case 'r':
        right();
        break;
      case 's':
        stop();
        break;
      default:
        break;
    }
  }
}

void forward()
{
  digitalWrite(5,HIGH);
  digitalWrite(6,LOW);
  digitalWrite(9,HIGH);
  digitalWrite(10,LOW);

  digitalWrite(3,LOW);
  digitalWrite(4,LOW);
  digitalWrite(11,LOW);
  digitalWrite(12,LOW);
}
```

```
void backward()
{
    digitalWrite(6,HIGH);
    digitalWrite(5,LOW);
    digitalWrite(10,HIGH);
    digitalWrite(9,LOW);

    digitalWrite(3,LOW);
    digitalWrite(4,LOW);
    digitalWrite(11,LOW);
    digitalWrite(12,LOW);
}

void left()
{
    digitalWrite(5,HIGH);
    digitalWrite(6,LOW);
    digitalWrite(10,HIGH);
    digitalWrite(9,LOW);

    digitalWrite(3,HIGH);
    digitalWrite(4,LOW);
    digitalWrite(11,LOW);
    digitalWrite(12,LOW);
}

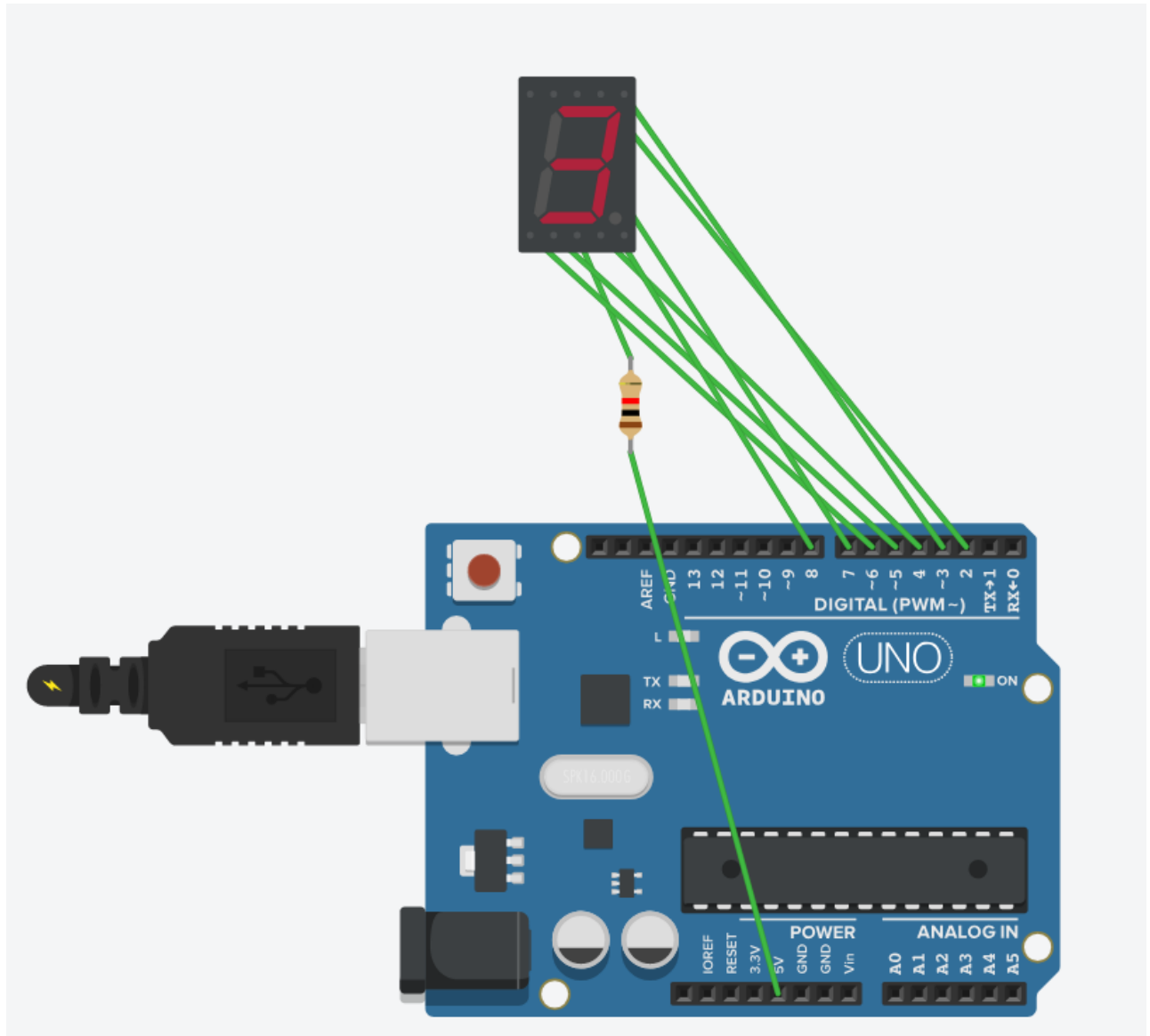
void right()
{
    digitalWrite(6,HIGH);
    digitalWrite(5,LOW);
    digitalWrite(9,HIGH);
    digitalWrite(10,LOW);

    digitalWrite(3,LOW);
    digitalWrite(4,LOW);
    digitalWrite(11,HIGH);
    digitalWrite(12,LOW);
}

void stop()
{
    digitalWrite(5,LOW);
    digitalWrite(6,LOW);
    digitalWrite(9,LOW);
    digitalWrite(10,LOW);

    digitalWrite(3,LOW);
    digitalWrite(4,LOW);
    digitalWrite(11,LOW);
    digitalWrite(12,LOW);
}
```

- 7位译码器使用
- CD4511IC使用



- 实例：数码管代码

```
void setup() {  
  
  pinMode(2,OUTPUT);  
  pinMode(3,OUTPUT);  
  pinMode(4,OUTPUT);  
  pinMode(5,OUTPUT);  
  pinMode(6,OUTPUT);  
  pinMode(7,OUTPUT);  
  pinMode(8,OUTPUT);  
  Serial.begin(9600);  
}  
  
int income=0;  
void loop() {  
  
  if(Serial.available(>0)
```

```
{
    for(int n=0; n<9; n++)
    {
        digitalWrite(n,HIGH);
    }

    int temp=0;
    income = Serial.read();
    switch(income)//数码管显示数字
    {
        case '1':
            digitalWrite(3,LOW);
            digitalWrite(4,LOW);
            break;
        case '2':
            digitalWrite(3,LOW);
            digitalWrite(2,LOW);
            digitalWrite(8,LOW);
            digitalWrite(5,LOW);
            digitalWrite(6,LOW);
            break;
        case '3':
            digitalWrite(5,LOW);
            digitalWrite(4,LOW);
            digitalWrite(8,LOW);
            digitalWrite(3,LOW);
            digitalWrite(2,LOW);
            break;
        case '4':
            digitalWrite(3,LOW);
            digitalWrite(4,LOW);
            digitalWrite(7,LOW);
            digitalWrite(8,LOW);
            break;
        case '5':
            digitalWrite(2,LOW);
            digitalWrite(4,LOW);
            digitalWrite(7,LOW);
            digitalWrite(8,LOW);
            digitalWrite(5,LOW);
            break;
        case '6':
            digitalWrite(2,LOW);
            digitalWrite(4,LOW);
            digitalWrite(7,LOW);
            digitalWrite(8,LOW);
            digitalWrite(5,LOW);
            digitalWrite(6,LOW);
            break;
        case '7':
            digitalWrite(3,LOW);
            digitalWrite(4,LOW);
            digitalWrite(2,LOW);
            break;
    }
```



```
    case '8':  
        digitalWrite(3,LOW);  
        digitalWrite(4,LOW);  
        digitalWrite(5,LOW);  
        digitalWrite(6,LOW);  
        digitalWrite(7,LOW);  
        digitalWrite(8,LOW);  
        digitalWrite(2,LOW);  
        break;  
    case '9':  
        digitalWrite(3,LOW);  
        digitalWrite(4,LOW);  
        digitalWrite(2,LOW);  
        digitalWrite(8,LOW);  
        digitalWrite(7,LOW);  
        break;  
    case '0':  
        digitalWrite(3,LOW);  
        digitalWrite(4,LOW);  
        digitalWrite(2,LOW);  
        digitalWrite(5,LOW);  
        digitalWrite(6,LOW);  
        digitalWrite(7,LOW);  
        break;  
    default:  
        break;  
}  
  
}  
}
```

第四天 总结

- 总结前三天学到的东西
- 将代码图片重新上传至github
- markdown编辑pdf