凌茜的开源硬件作业

第一天

学习内容

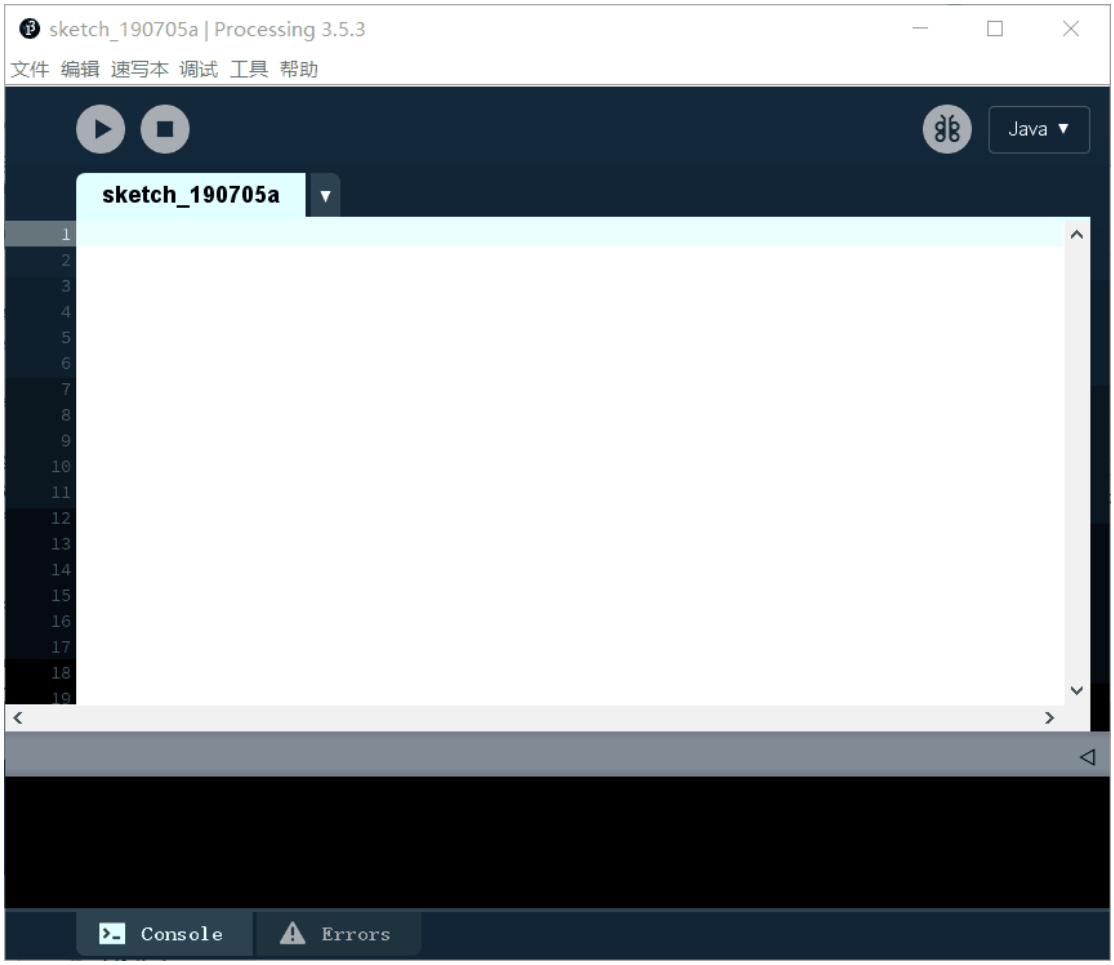
◎为什么要学习开源硬件

◎如何学习开源硬件

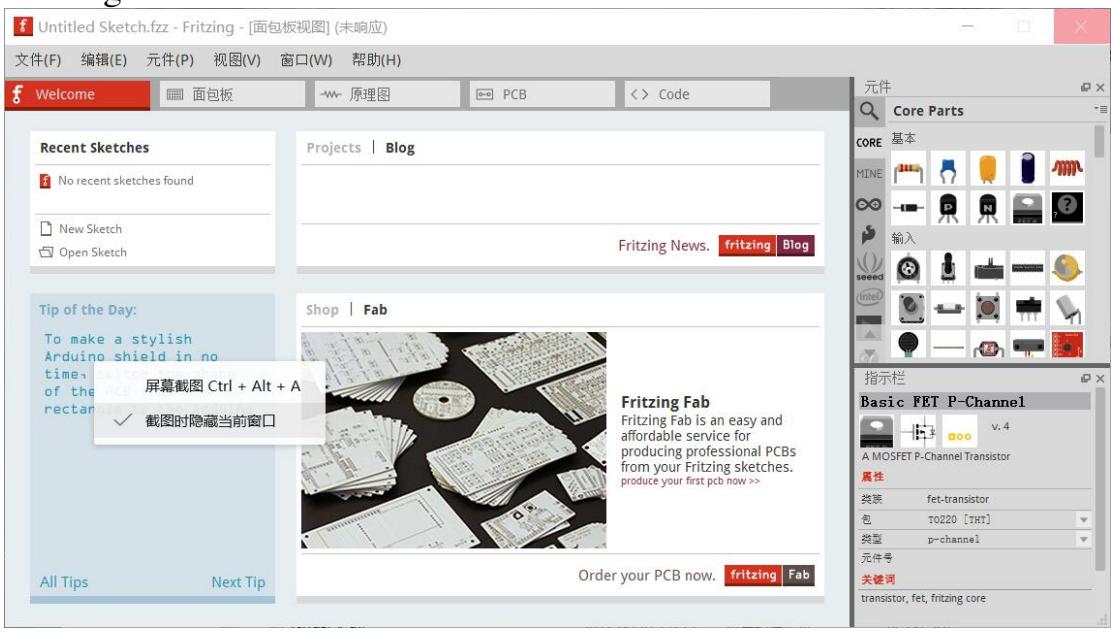
◎三个软件
Arduino


Morse - Morse.cpp | Arduino 1.8.9
文件 编辑 项目 工具 帮助
Morse.cpp
Morse.h
morse
#include "Arduino.h"
#include "Morse.h"
Morse::Morse(int pin)
{
pinMode(pin,OUTPUT);
+ Alt + A
前窗口
::dot()
{
digitalWrite(_pin,HIGH);
Arduino/Genuino Uno

Processing



Fritzing



◎几个常用网站

www.arduino.cc

www.fritzing.org
www.processing.org
https://www.tinkercad.com/

github.com

第二天

◎Morse代码
Morse.h

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

Morse.cpp

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

Morse::Morse(int pin)
{
      pinMode(pin,OUTPUT);
      _pin=pin;
      _dottime=250;
```

```
}

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

void Morse::dash()
{
    digitalWrite(_pin,HIGH);
    delay(_dottime*4);
    digitalWrite(_pin,LOW);
    delay(_dottime);
}

void Morse::c_space()
{
    digitalWrite(_pin,LOW);
    delay(_dottime*3);
}

void Morse::w_space()
{
    digitalWrite(_pin,LOW);
    delay(_dottime*7);
}
void MorseCode::transfor(char _code)

{

   switch (_code) {
      case ' ':

          c_space();
```

```
    break;
case 'A':

case 'a':

    dot();

    dash();

    break;

case 'B':

case 'b':

    dash();

    dot();

    dot();

    dot();

    break;
case 'C':

case 'c':

    dash();

    dot();

    dash();

    dot();

    break;
case 'D':
```

```
case 'd':

    dash();

    dot();

    dot();

    break;
case 'E':

case 'e':

    dot();

    break;
case 'F':

case 'f':



    dot();

    dot();

    dash();

    dot();

    break;
case 'G':

case 'g':

    dash();
```

```
    dash();

    dot();

    break;
case 'H':

case 'h':

    dot();

    dot();

    dot();

    dot();

    break;
case 'I':

case 'i':

    dot();

    dot();

    break;
case 'J':

case 'j':

    dot();

    dash();

    dash();

    dash();
```

```
    break;
case 'K':

case 'k':

    dash();

    dot();

    dash();

    break;
case 'L':

case 'l':
    dot();

    dash();

    dot();

    dot();

    break;
case 'M':

case 'm':

    dash();

    dash();
    break;
case 'N':

case 'n':

    dash();
```

```
    dot();

    break;
case 'O':

case 'o':

    dash();

    dash();

    dash();

    break;
case 'P':

case 'p':

    dot();

    dash();

    dash();

    dot();

    break;
case 'Q':

case 'q':

    dash();

    dash();

    dot();
```

```
    dash();

    break;
case 'R':

case 'r':

    dot();

    dash();

    dot();

    break;
case 'S':

case 's':

    dot();

    dot();

    dot();

    break;
case 'T':

case 't':

    dash();

    break;
case 'U':

case 'u':

    dot();
```

```
    dot();

    dash();

    break;
case 'V':

case 'v':

    dot();

    dot();

    dot();

    dash();

    break;

case 'W':

case 'w':

    dot();

    dash();

    dash();

    break;
case 'X':

case 'x':

    dash();

    dot();
```

```
            dot();

            dash();
        case 'Y':

        case 'y':

            dash();

            dot();

            dash();

            dash();
        case 'Z':

        case 'z':

            dash();

            dash();

            dot();

            dot();
        default:

            break;

    }
```

morse.ino

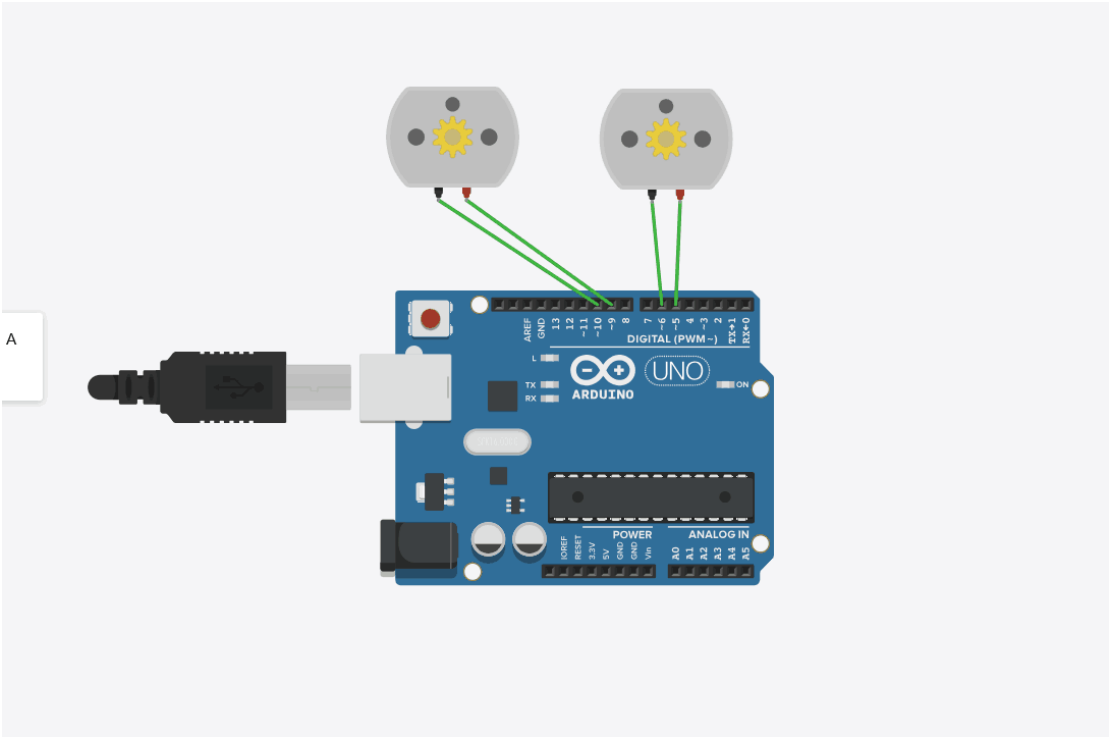
```
#include <Morse.h>


Morse Morse(13);

void setup()
{
```

```
}
  char str[100] ;
  int i=0,m=0;
do
  {
    scanf("%c", &str[i]);
    i++;
  }
  while (str[i - 1] != '\n');
  m = i-1;
void loop()
{
  for(i=0;i<=m;i++)
  {
  Morse.transfor(str[i]);
  }
    delay(3000);
}
```

第三天

项目一：car

小车图片



小车代码

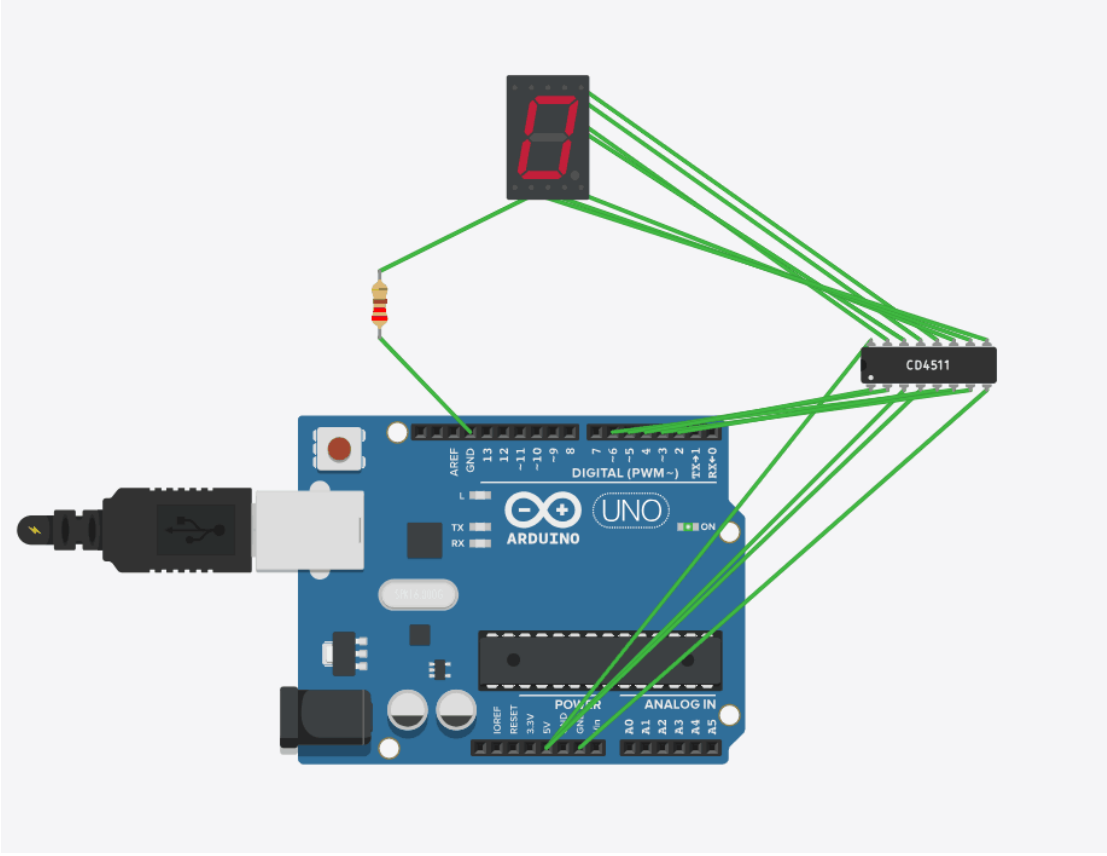
```
//f 前进 ； b 后退；l 左转； r 右转；
void setup()
{
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
  Serial.begin(9600);
}
int income=0;
void loop()
{
     if(Serial.available()>0)
    {
     income=Serial.read();
          switch(income)
       {
          case 'f':
               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);
}

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

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

```
}

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

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

项目二：七段显示

电路图片



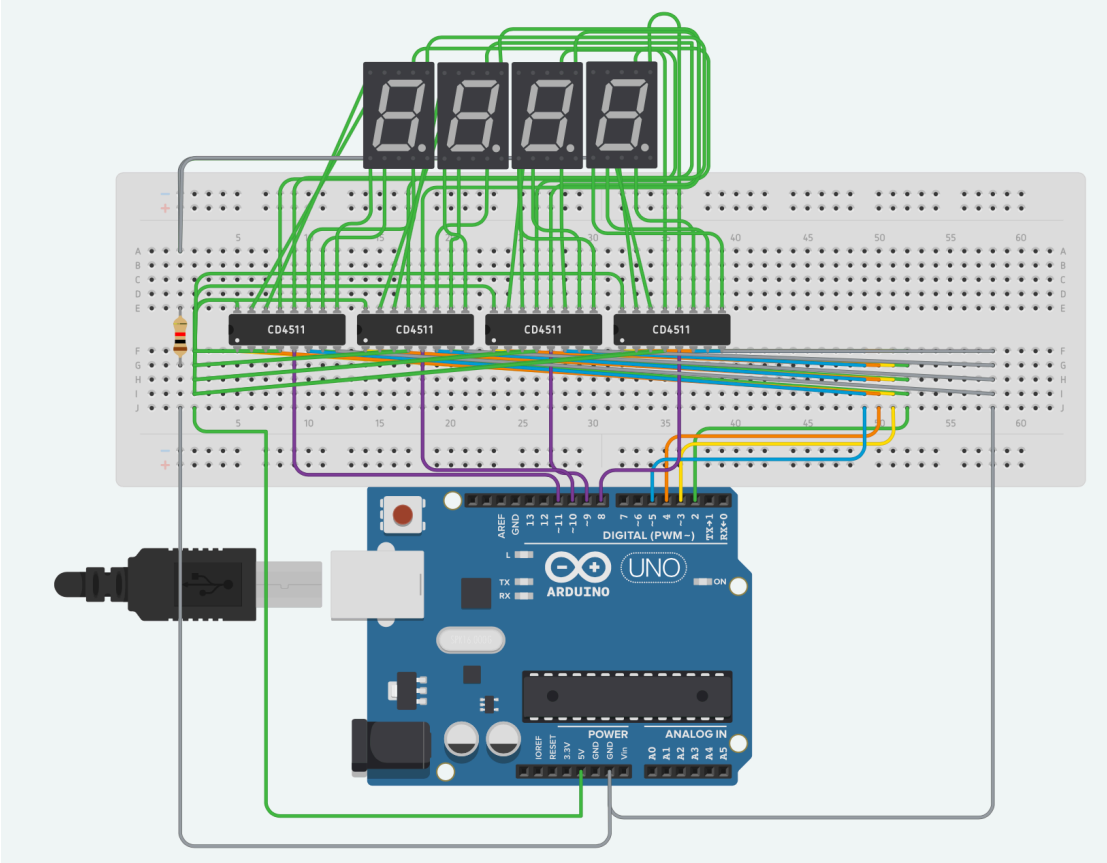
代码部分

```
void setup()
{
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  Serial.begin(9600);
}
void loop()
{
  digitalWrite(2,LOW);
  digitalWrite(3,LOW);
  digitalWrite(4,LOW);
  digitalWrite(5,LOW);
  digitalWrite(6,LOW);
  int income;
  if(Serial.available()>0)
  {
    income=Serial.read();
    income=income-'0';
    if((income&1)==1)
      digitalWrite(3,HIGH);
    if((income>>1&1)==1)
      digitalWrite(4,HIGH);
    if((income>>2&1)==1)
      digitalWrite(5,HIGH);
    if((income>>3&1)==1)
      digitalWrite(6,HIGH);
  }
  digitalWrite(2,HIGH);
delay(1000);
}
```

第四天

四个七段显示器的互通

电路图部分



代码部分

```
void setup()
{
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
  pinMode(5, OUTPUT);
  pinMode(8, OUTPUT);
  pinMode(9, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(11, OUTPUT);
  Serial.begin(9600);
}
```

```
byte income;
int number=0;
void loop()
{
  if(Serial.available()>0){
    income=Serial.read();
    digitalWrite(8,HIGH);
    digitalWrite(9,HIGH);
    digitalWrite(10,HIGH);
    digitalWrite(11,HIGH);
    delay(100);
    if(income&1==1) digitalWrite(2, HIGH);
    else digitalWrite(2, LOW);
    if(income>>1&1==1) digitalWrite(3, HIGH);
    else digitalWrite(3, LOW);
    if(income>>2&1==1) digitalWrite(4, HIGH);
    else digitalWrite(4, LOW);
    if(income>>3&1==1) digitalWrite(5, HIGH);
    else digitalWrite(5, LOW);
    delay(100);
    digitalWrite(number+8,LOW);
    delay(1000);
    number++;
    number=number%4;
  }
}
```

学习总结：在双创周四天的学习里，我了解到了开源硬件最基础的东西，从一无所知到略有启蒙，也了解到许多可以供自己学习的网站和软件。虽然自己之前对硬件没有任何基础，数电也没学过，但是老师的作业和任务催促着我们前进，强迫我们去了解去认知，这个过程虽然很痛苦但是却是实实在在地让自己意识到了学习的重要性和无止境性。总而言之，damo wang的开源硬件实战课为我打开了学习开源硬件的大门，一个新的世界待我去探索去发掘，而因课程而发生交集的大佬们则变成了自己进步的动力和资源。谢谢老师每节课的耐心讲解和解答。