开源硬件实战课程

版本信息	日期	发布人
2	7.6	秦婷

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

第二天软件操作

- Arduino安装
- Arduino文档
- Arduino基本操作
- Arduino类库操作

mose

```
#include <Morse.h>
Morse morse(13);
void setup() {
  pinMode(13,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
  while(Serial.available()> 0)
  {
    char x = Serial.read();
    switch(x)
    {
      case 'a':A();break;
      case 'b':B();break;
      case 'c':C();break;
      case 'd':D();break;
      case 'e':E();break;
      case 'f':f();break;
      case 'g':G();break;
      case 'h':H();break;
      case 'i':I();break;
```

```
      case 'j':J();break;
      case 'k':K();break;
      case 'l':L();break;
      case 'm':M();break;
      case 'n':N();break;
      case 'o':O();break;
      case 'p':P();break;
      case 'q':Q();break;
      case 'r':R();break;
      case 's':S();break;
      case 't':T();break;
      case 'u':U();break;
      case 'v':V();break;
      case 'w':W();break;
      case 'x':X();break;
      case 'y':Y();break;
      case 'z':Z();break;
      case ' ':
      case '\n':space();break;

    }
  }
}
void space()
{
  digitalWrite(13, LOW);
  delay(2000);
}
void A()
{
  morse.dot();
  morse.dash();
}
void B()
{
  morse.dash();
  morse.dot();
  morse.dot();
  morse.dot();
}
void C()
{
  morse.dash();
  morse.dot();
  morse.dash();
  morse.dot();
}
void D()
{
  morse.dash();
  morse.dot();
  morse.dot();
}
```

```
void E()
{
  morse.dot();
}
void f()
{
  morse.dot();
  morse.dot();
  morse.dash();
  morse.dot();
}
void G()
{
  morse.dash();
  morse.dash();
  morse.dot();
}
void H()
{
  morse.dot();
  morse.dot();
  morse.dot();
  morse.dot();
}
void I()
{
  morse.dot();
  morse.dot();
}
void J()
{
  morse.dot();
  morse.dash();
  morse.dash();
  morse.dash();
}
void K()
{
  morse.dash();
  morse.dot();
  morse.dash();
}
void L()
{
  morse.dot();
  morse.dash();
  morse.dot();
  morse.dot();
}
void M()
{
  morse.dash();
  morse.dash();
```

```
}
void N()
{
  morse.dash();
  morse.dot();
}
void O()
{
  morse.dash();
  morse.dash();
  morse.dash();
}
void P()
{
  morse.dot();
  morse.dash();
  morse.dash();
  morse.dot();
}
void Q()
{
  morse.dash();
  morse.dash();
  morse.dot();
  morse.dash();
}
void R()
{
  morse.dot();
  morse.dash();
  morse.dot();
}
void S()
{
  morse.dot();
  morse.dot();
  morse.dot();
}
void T()
{
  morse.dash();
}
void U()
{
  morse.dot();
  morse.dot();
  morse.dash();
}
void V()
{
  morse.dot();
  morse.dot();
  morse.dot();
```

```
  morse.dash();
}
void W()
{
  morse.dot();
  morse.dash();
  morse.dash();
}
void X()
{
  morse.dash();
  morse.dot();
  morse.dot();
  morse.dash();
}
void Y()
{
  morse.dash();
  morse.dot();
  morse.dash();
  morse.dash();
}
void Z()
{
  morse.dash();
  morse.dash();
  morse.dot();
  morse.dot();
}

```

mose.h

```
#ifndef Morse_h
#define Morse_h
#include "Arduino.h"
class Morse
{
public:
  Morse(int pin);
  void dot();
  void dash();
private:
  int _pin;
};
#endif
```

mose.cpp

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

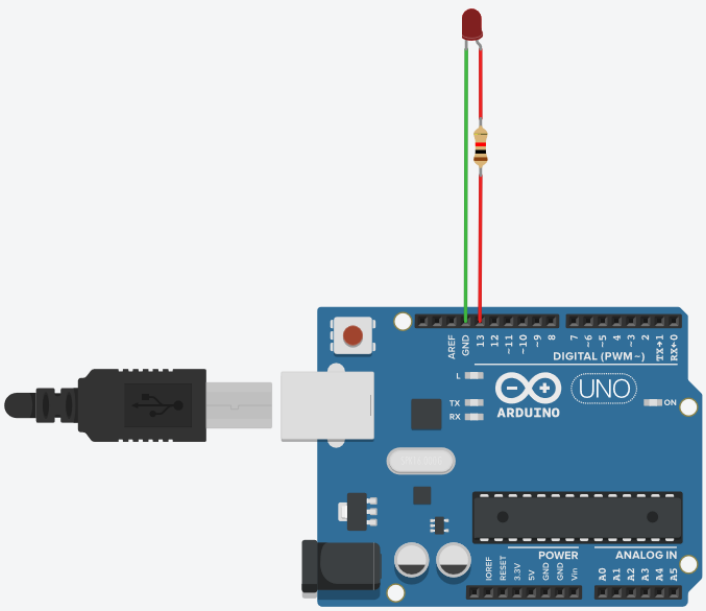
```
#include "Morse.h"

Morse::Morse(int pin)
{
  pinMode(pin, OUTPUT);
  _pin = 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);
}

```



第三天元器件及电路图

- 使用在线模拟网站

- 小车电路及代码
- 7位译码器使用
- CD4511IC使用

小车代码

```
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);
  while(1)
{
    digitalWrite(8, HIGH);
```

```
    delay(250);
    digitalWrite(8, LOW);
    delay(250);
}
}
void backward()
{
  digitalWrite(5,LOW);
  digitalWrite(6,HIGH);
  digitalWrite(9,LOW);
  digitalWrite(10,HIGH);
  while(1)
  {
    digitalWrite(2, HIGH);
    delay(250);
    digitalWrite(2, LOW);
    delay(250);
  }
}
void right()
{
  digitalWrite(5,HIGH);
  digitalWrite(6,LOW);
  digitalWrite(9,LOW);
  digitalWrite(10,HIGH);
  while(1)
  {
    digitalWrite(3, HIGH);
    delay(250);
    digitalWrite(3, LOW);
    delay(250);
  }
}
void left()
{
  digitalWrite(5,LOW);
  digitalWrite(6,HIGH);
  digitalWrite(9,HIGH);
  digitalWrite(10,LOW);
  while(1)
  {
    digitalWrite(4, HIGH);
    delay(250);
    digitalWrite(4, LOW);
    delay(250);
  }
}
void stop()
{
  digitalWrite(5,LOW);
  digitalWrite(6,LOW);
  digitalWrite(9,LOW);
  digitalWrite(10,LOW);
```

```
100 }
```

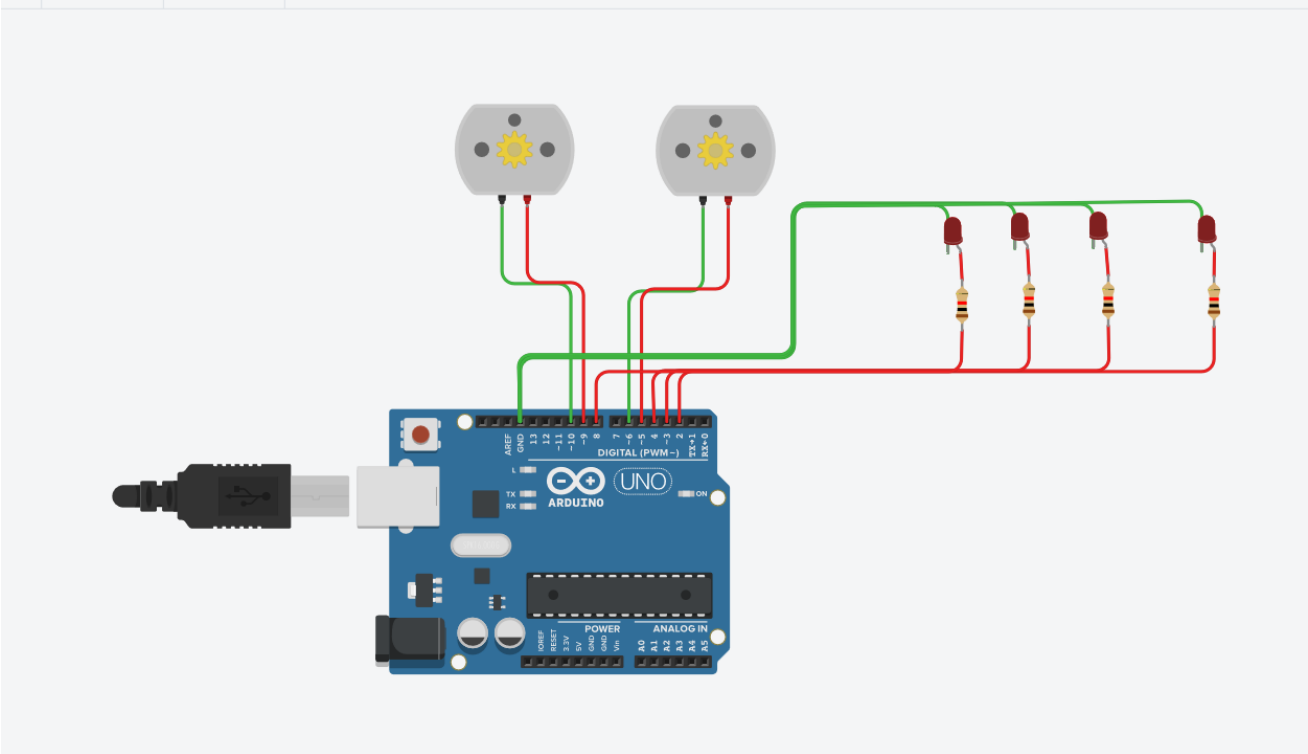
小车代码2

```
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);
  digitalWrite(8, HIGH);

}
void backward()
{
  digitalWrite(5,LOW);
  digitalWrite(6,HIGH);
  digitalWrite(9,LOW);
  digitalWrite(10,HIGH);
  digitalWrite(2, HIGH);
```

```
54
55  }
56  void right()
57  {
58    digitalWrite(5,HIGH);
59    digitalWrite(6,LOW);
60    digitalWrite(9,LOW);
61    digitalWrite(10,HIGH);
62    digitalWrite(3, HIGH);
63
64  }
65  void left()
66  {
67    digitalWrite(5,LOW);
68    digitalWrite(6,HIGH);
69    digitalWrite(9,HIGH);
70    digitalWrite(10,LOW);
71    digitalWrite(4, HIGH);
72
73  }
74  void stop()
75  {
76    digitalWrite(5,LOW);
77    digitalWrite(6,LOW);
78    digitalWrite(9,LOW);
79    digitalWrite(10,LOW);
80  }
```



数码管

```
void setup()
{
  pinMode(2,OUTPUT);
  pinMode(3,OUTPUT);
  pinMode(4,OUTPUT);
  pinMode(5,OUTPUT);
  Serial.begin(9600);
}
void loop()
{
    if(Serial.available()> 0)
    {
        int data = Serial.read()-'0';
        switch(data)
      {
        case 0:a();break;
        case 1:b();break;
        case 2:c();break;
        case 3:d();break;
        case 4:e();break;
        case 5:f();break;
        case 6:g();break;
        case 7:h();break;
        case 8:i();break;
        case 9:j();break;

       }

     }


}

void a()
{
  digitalWrite(2,LOW);
  digitalWrite(3,LOW);
  digitalWrite(4,LOW);
  digitalWrite(5,LOW);

}
void b()
{
  digitalWrite(2,HIGH);
  digitalWrite(3,LOW);
  digitalWrite(4,LOW );
  digitalWrite(5,LOW);
}
void c()
{
  digitalWrite(2,LOW);
  digitalWrite(3,HIGH);
  digitalWrite(4,LOW );
```

```
  digitalWrite(5,LOW);
}
void d()
{
  digitalWrite(2,HIGH );
  digitalWrite(3,HIGH );
  digitalWrite(4,LOW);
  digitalWrite(5,LOW);
}
void e()
{
  digitalWrite(2,LOW );
  digitalWrite(3,LOW );
  digitalWrite(4,HIGH );
  digitalWrite(5,LOW );
}
void f()
{
  digitalWrite(2,HIGH);
  digitalWrite(3,LOW);
  digitalWrite(4,HIGH);
  digitalWrite(5,LOW);
}
void g()
{
  digitalWrite(2,LOW);
  digitalWrite(3,HIGH);
  digitalWrite(4,HIGH);
  digitalWrite(5,LOW);
}
void h()
{
  digitalWrite(2,HIGH);
  digitalWrite(3,HIGH);
  digitalWrite(4,HIGH);
  digitalWrite(5,LOW);
}
void i()
{
  digitalWrite(2,LOW);
  digitalWrite(3,LOW);
  digitalWrite(4,LOW);
  digitalWrite(5,HIGH);
}
void j()
{
  digitalWrite(2,HIGH);
  digitalWrite(3,LOW);
  digitalWrite(4,LOW);
  digitalWrite(5,HIGH);
}
```

Brave Kasi