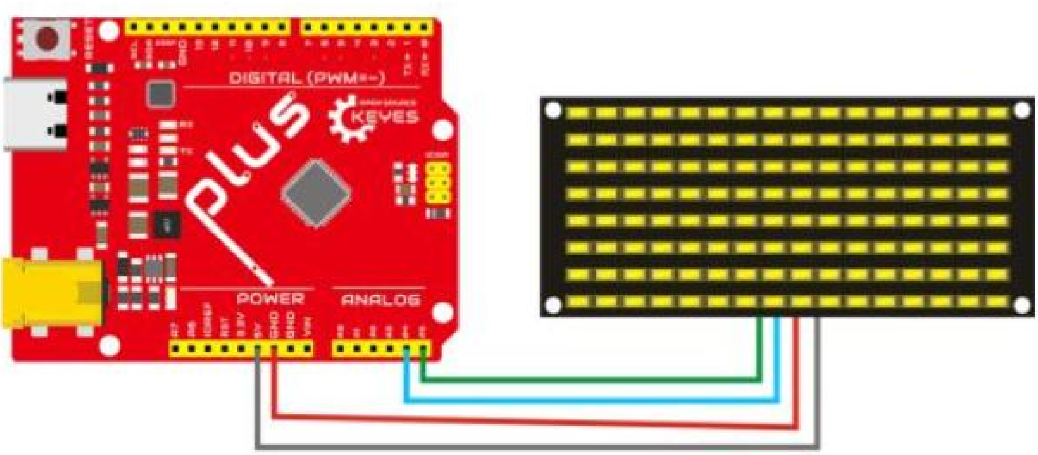
Instruction:

Keyes 8x16 LED light board comes with 128 LEDs, it comes with AIP1640 chip. We can use the single-chip microcomputer to communicate with the module through I2C, and control the AIP1640 chip to control the on and off of 128 LEDs on the module, so that the dot matrix on the module can display the pattern you need. For the convenience of wiring, we also distribute a HX-2.54 4Pin wiring.

Specifications:

Working voltage: DC 3.3-5V
Power loss: 400mW
Oscillation frequency: 450KHz
Drive current: 200mA
Working temperature: -40~80℃
Communication method: I2C communication

Wiring:



Test code:

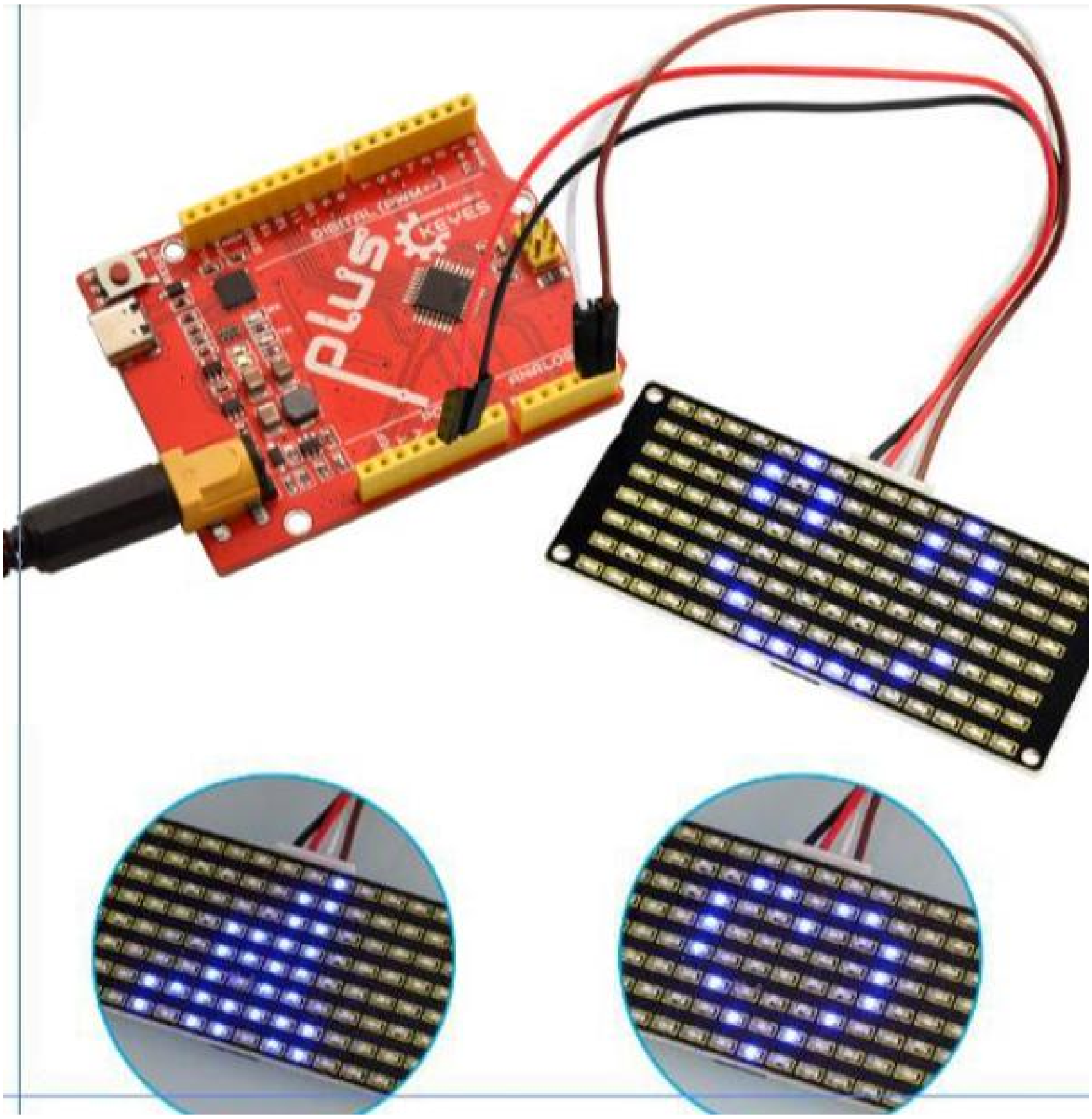
```
//Data display from right to left, from bottom to top, high level display.
#define IIC_SCL A5
#define IIC_SDA A4
unsigned char data_line = 0;
unsigned char delay_count = 0;
unsigned char data_display1 = 0;
unsigned char data_display2 = 0;
unsigned char data_display3 = 0;
unsigned char data_display4 = 0;
unsigned char data_display5 = 0;
unsigned char data_display6 = 0;
unsigned char data_display7 = 0;
unsigned char data_display8 = 0;
unsigned char data_display9 = 0;
unsigned char data_display10 = 0;
unsigned char data_display11 = 0;
unsigned char data_display12 = 0;
unsigned char data_display13 = 0;
unsigned char data_display14 = 0;
unsigned char data_display15 = 0;
unsigned char data_display16 = 0;
void IIC_start();
void IIC_send(unsigned char send_data);
void IIC_end();
//unsigned char table[] =
{0x01,0x02,0x04,0x08,0x10,0x20,0x40,0x80,0x80,0x40,0x20,0x10,0x08,0x04,0x02,0x01};
unsigned char table[4][16] = {
{0x00,0x00,0x00,0x00,0x26,0x41,0x86,0x80,0x80,0x80,0x86,0x41,0x26,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0x00,0x1C,0x22,0x42,0x84,0x42,0x22,0x1C,0x00,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0x20,0x44,0x42,0x84,0x80,0x84,0x42,0x44,0x20,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0xC0,0x40,0xF8,0xD8,0x7E,0xFF,0xC0,0x00,0x00,0x00,0x00,0x00}};
void setup()
{
pinMode(IIC_SCL,OUTPUT);
pinMode(IIC_SDA,OUTPUT);
digitalWrite(IIC_SCL,LOW);
digitalWrite(IIC_SDA,LOW);
}
/*--------------------------------------------------------------*/
void loop()
{
/**************Set address add 1***************/
IIC_start();
IIC_send(0x40);//Set the address to add automatically 1
IIC_end();
/************Set address add 1 end*****************/
/************Set display data*****************/
IIC_start();
IIC_send(0xc0);//Set the initial address to 0
for(char i = 0;i < 16;i++)
{
IIC_send(table[data_line][i]);//Send display data
}
if(++delay_count >= 10)
{
```

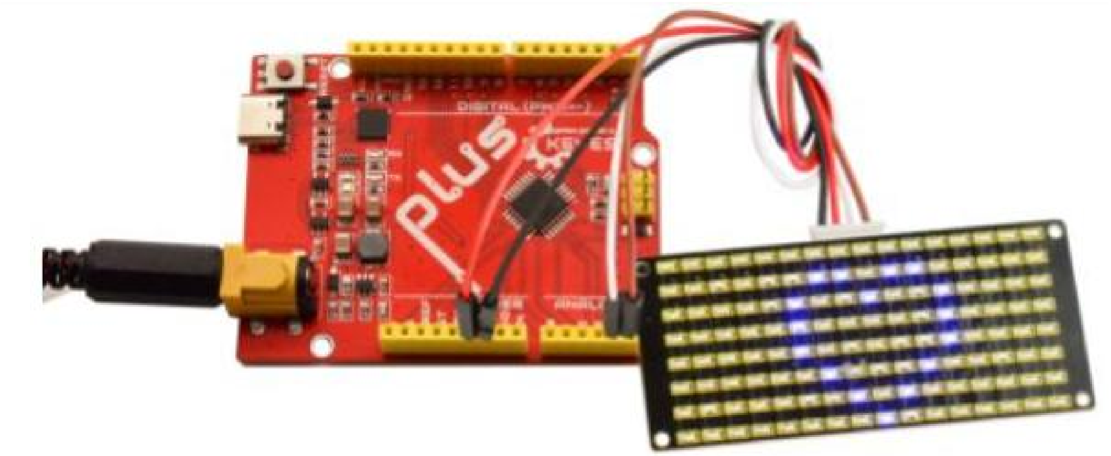
```
delay_count = 0;
data_line++;
if(data_line >= 4)
{
data_line = 0;
}
}
IIC_end();
/************End of setting display data*****************/
/*************Set display brightness***************/
IIC_start();
IIC_send(0x8A);//Display brightness setting
IIC_end();
/*************End of setting display brightness***************/
delay(100);
}
/*------------------------------------------------------*/
void IIC_start()
{
digitalWrite(IIC_SCL,LOW);
delayMicroseconds(3);
digitalWrite(IIC_SDA,HIGH);
delayMicroseconds(3);
digitalWrite(IIC_SCL,HIGH);
delayMicroseconds(3);
digitalWrite(IIC_SDA,LOW);
delayMicroseconds(3);
}
void IIC_send(unsigned char send_data)
{
for(char i = 0;i < 8;i++)
{
digitalWrite(IIC_SCL,LOW);
delayMicroseconds(3);
if(send_data & 0x01)
{
digitalWrite(IIC_SDA,HIGH);
}
else
{
digitalWrite(IIC_SDA,LOW);
}
delayMicroseconds(3);
digitalWrite(IIC_SCL,HIGH);
```

```
delayMicroseconds(3);
send_data = send_data >> 1;
}
}
void IIC_end()
{
digitalWrite(IIC_SCL,LOW);
```

Test Results:

According to the wiring diagram, connect the wires and upload the code. After power on, the LED light board will display various patterns in cycles, as shown in the figure below.





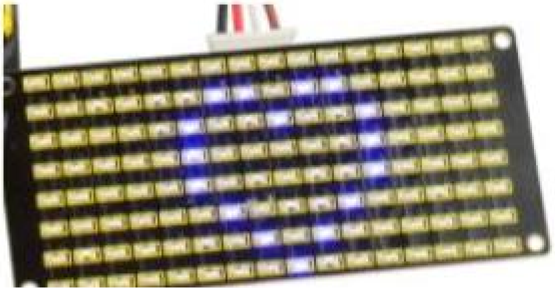
Set the display image.

The display pattern can be set by the following code.

```
unsigned char table[4][16] = {
{0x00,0x00,0x00,0x00,0x26,0x41,0x86,0x80,0x80,0x80,0x86,0x41,0x26,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0x00,0x1C,0x22,0x42,0x84,0x42,0x22,0x1C,0x00,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0x20,0x44,0x42,0x84,0x80,0x84,0x42,0x44,0x20,0x00,0x00,0x00},
{0x00,0x00,0x00,0x00,0xC0,0x40,0xF8,0xD8,0x7E,0xFF,0xC0,0x00,0x00,0x00,0x00,0x00}};
```

4 patterns are set here, and the second set of data is set to display a heart-shaped pattern.

We place the dot matrix

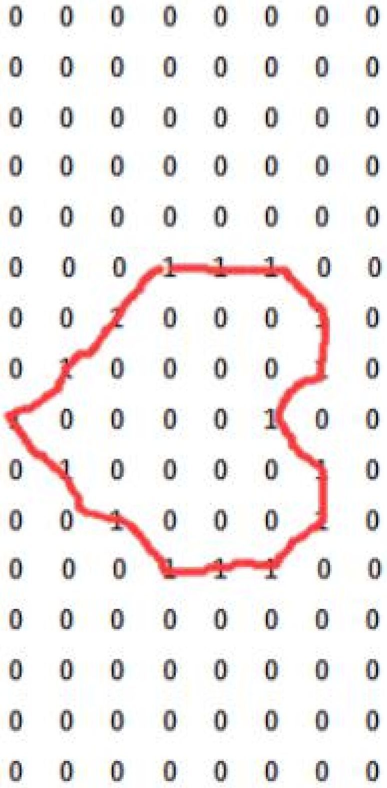


Change
0x00, 0x00, 0x00, 0x00, 0x00, 0x1C, 0x22, 0x42, 0x84, 0x42, 0x22, 0x1C, 0x00, 0x00, 0x00, 0x00 to binary numbers
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x1C to 0 0 0 1 1 1 0 0
0x22 to 0 0 1 0 0 0 1 0
0x42 to 0 1 0 0 0 0 1 0
0x84 to 1 0 0 0 0 1 0 0

0x42 to 0 1 0 0 0 0 1 0
0x22 to 0 0 1 0 0 0 1 0
0x1C to 0 0 0 1 1 1 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0
0x00 to 0 0 0 0 0 0 0 0

The first hexadecimal data represents the control of the first column of LEDs, and the second data represents the control of the second column of LEDs. And so on.

The setting method is to convert to a binary 8-bit value. 0 means that the LED is off, and 1 means that the LED is on. The first digit of the converted value is to control the eighth row of LEDs to turn on and off, and so on.



0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	1	1	1	0	0
0	0	1	0	0	0	1	0
0	1	0	0	0	0	1	0
1	0	0	0	0	1	0	0
0	1	0	0	0	0	1	0
0	0	1	0	0	0	1	0
0	0	0	1	1	1	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0

Special note: We can also directly use related software to convert the setting pattern into setting data. For specific methods, please refer to the link

https://wiki.keyestudio.com/Ks0428_keyestudio_Mini_Tank_Robot_V2#Project_9:_LED_Expression_Panel