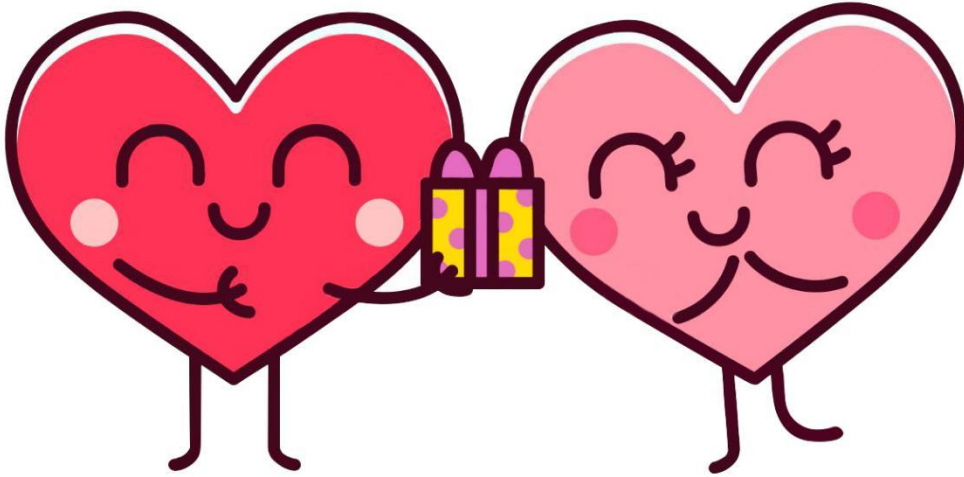


Project 15: Beating Heart

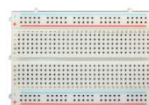
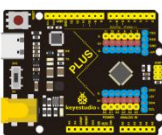


1. Project Introduction

A dot-matrix display is an electronic digital display device that displays information on machines, clocks and watches, public transport departure indicators and many other devices.

In this project, we use a 8x8 LED dot matrix to make a beating heart.

2. Project Hardware



Plus Board*1

Plus Board

400-Hole

USB Cable*1

Holder

Breadboard



8*8 Dot

220Ω

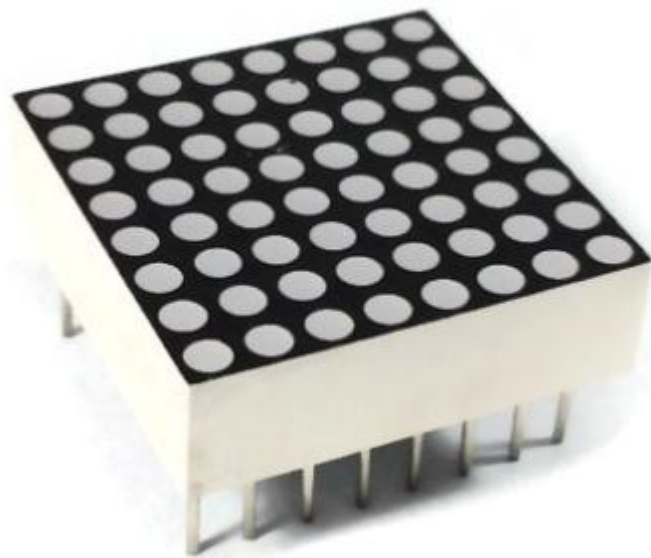
Jumper

Matrix*1

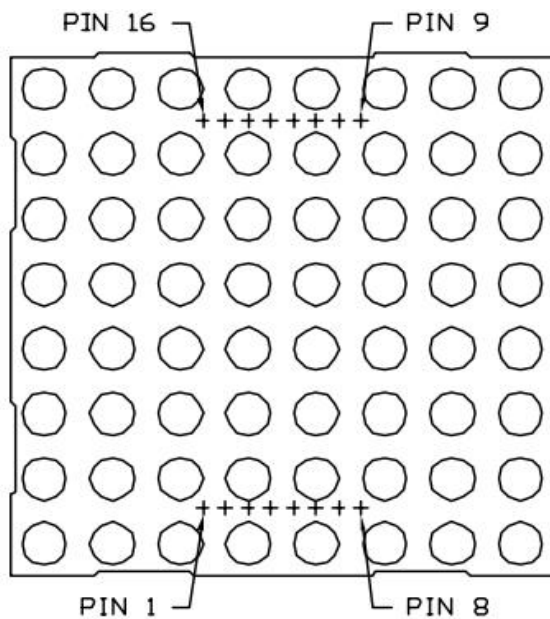
Resistor*8

Wire*10+

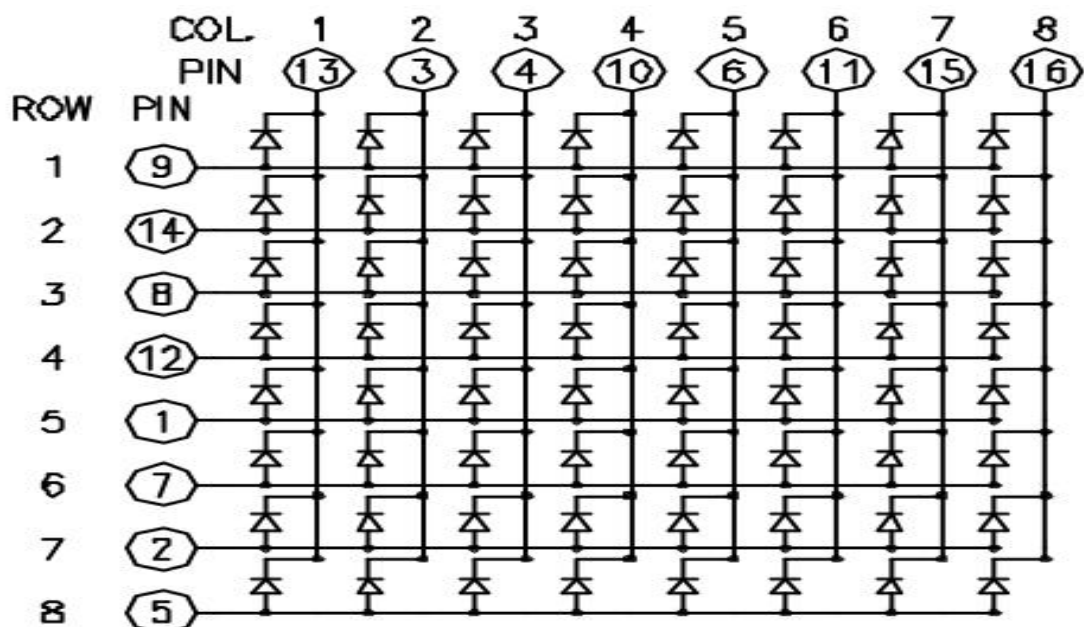
3. Principle of 8*8 dot-matrix



The external view of a dot-matrix is shown as follows



The internal view of a dot-matrix is shown as follows



The 8*8 dot-matrix is made up of sixty-four LEDs, and each LED is placed at the cross point of a row and a column.

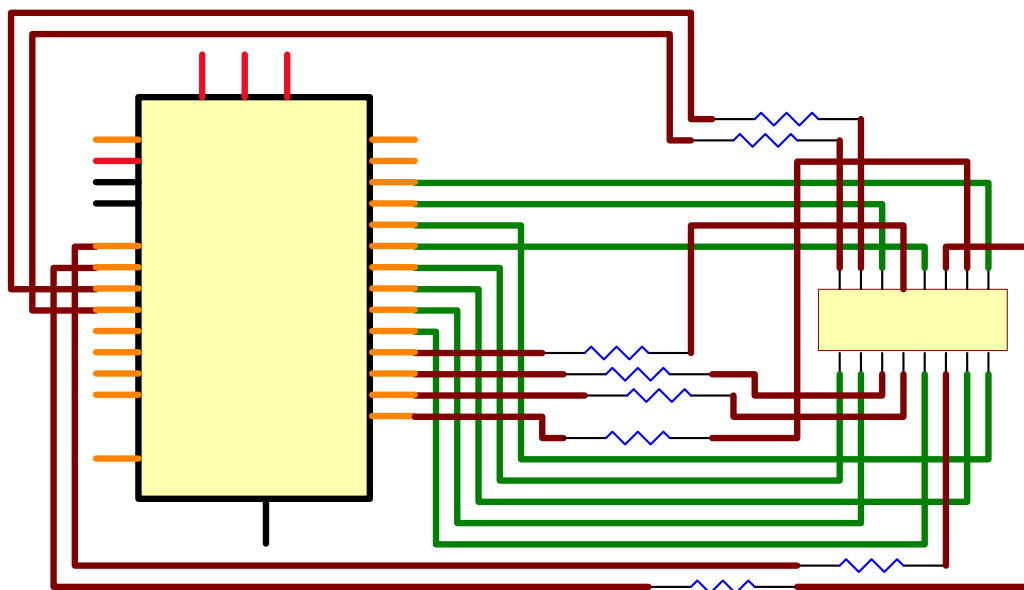
When the electrical level of a certain row is 1 and the electrical level of a certain column is 0, the corresponding LED will lighten. If you want to light the LED on the first dot, you should

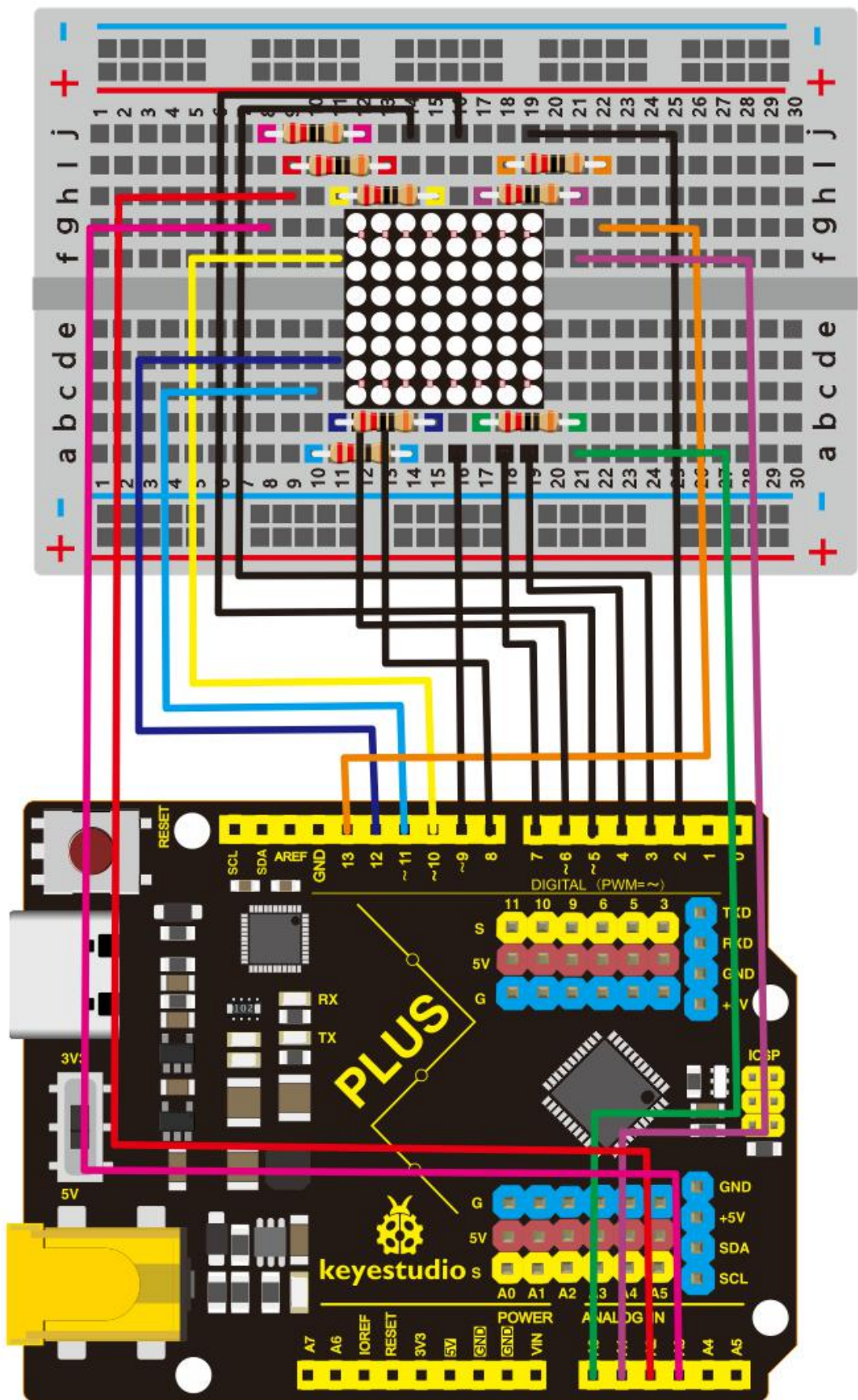
set pin 9 to high level and pin 13 to low level.

If you want to light LEDs on the first row, you should set pin 9 to high level and pins 13, 3, 4, 10, 6, 11, 15 and 16 to low level.

If you want to light the LEDs on the first column, set pin 13 to low level and pins 9, 14, 8, 12, 1, 7, 2 and 5 to high level.

4.Circuit Connection





5.Project Code

```
/*  
keyestudio STEM Starter Kit  
Project 15  
Beating Heart  
http://www.keyestudio.com  
*/  
  
// 2-dimensional array of row pin numbers:  
int R[] = {2,3,4,5,6,7,8,9};  
  
// 2-dimensional array of column pin numbers:  
int C[] = {10,11,12,13,14,15,16,17};  
  
unsigned char biglove[8][8] =    //the big "heart"  
{  
    0,0,0,0,0,0,0,0,  
    0,1,1,0,0,1,1,0,  
    1,1,1,1,1,1,1,1,  
    1,1,1,1,1,1,1,1,  
    1,1,1,1,1,1,1,1,  
    0,1,1,1,1,1,1,0,
```

```
    0,0,1,1,1,1,0,0,  
    0,0,0,1,1,0,0,0,  
};
```

```
unsigned char smalllove[8][8] =    //the small "heart"  
{  
    0,0,0,0,0,0,0,0,  
    0,0,0,0,0,0,0,0,  
    0,0,1,0,0,1,0,0,  
    0,1,1,1,1,1,1,0,  
    0,1,1,1,1,1,1,0,  
    0,0,1,1,1,1,0,0,  
    0,0,0,1,1,0,0,0,  
    0,0,0,0,0,0,0,0,  
};
```

```
void setup()  
{  
    // iterate over the pins:  
    for(int i = 0;i<8;i++)  
        // initialize the output pins:  
        {
```

```

        pinMode(R[i],OUTPUT);
        pinMode(C[i],OUTPUT);
    }
}

void loop()
{
    for(int i = 0 ; i < 100 ; i++)        //Loop display 100 times
    {
        Display(biglove);                //Display the "Big
Heart"
    }
    for(int i = 0 ; i < 50 ; i++)        //Loop display 50 times
    {
        Display(smalllove);              //Display the "small
Heart"
    }
}

void Display(unsigned char dat[8][8])
{
    for(int c = 0; c<8;c++)

```



```
{
    digitalWrite(C[c],LOW);//use thr column
    //loop
    for(int r = 0;r<8;r++)
    {
        digitalWrite(R[r],dat[r][c]);
    }
    delay(1);
    Clear(); //Remove empty display light
}

}

void Clear()
{
    for(int i = 0;i<8;i++)
    {
        digitalWrite(R[i],LOW);
        digitalWrite(C[i],HIGH);
    }
}

} //////////////////////////////////////
```

6.Project Result

Upload the project code to the Plus development board, the 8*8 dot matrix screen shows a beating heart.

