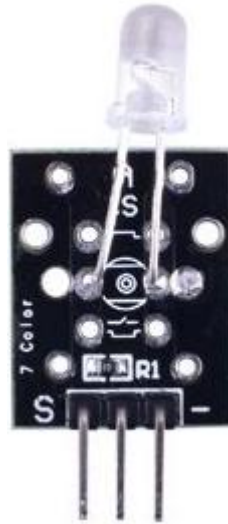


Seven-Color automatic flashing LED



Overview

The seven-color LED is an example of a fully-automated display device. It integrates both an RGB bulb and a small controller that flashes through seven different color settings at a variety of speeds. Compared to a simple bulb (such as the RGB LED module), the programming model is simple: all one has to do is tell it to start its cycle. Automated bulbs like this frequently feature in ornamental or decorative lighting displays. Because its pin configuration is identical to many simpler LEDs, it can replace a single-color LED in many circuits with a more decorative output. This experiment uses the Raspberry Pi to initiate the 7-color LED automated flash sequence.

Experimental Materials

Raspberry Pi	x1
Breadboard	x1
Seven-color LED	x1
Resistor (330Ω)	x1
Dupont jumper wires	

Experimental Procedure

1. If you have not done so already, prepare your development system by installing the Python interpreter, RPi.GPIO library, and wiringPi library as described in READ_ME_FIRST.TXT.
2. Install the seven-color LED in your breadboard and use the resistor and Dupont jumper wires as illustrated in the Wiring Diagram below.

3. Execute the sample stored in this experiment's subfolder.
If using C, compile and execute the C code:

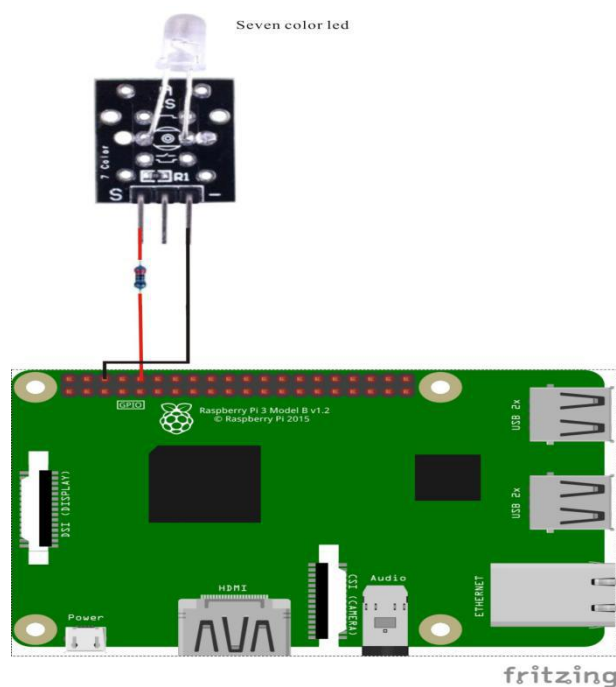
```
cd Code/C
gcc 7colorLED.c -o 7colorLED.out -lwiringPi
./7colorLED.out
```

If using Python, launch the Python script:

```
cd Code/Python
python 7colorLED.py
```

4. Make experimental observations. The seven-color LED should flash through its color cycle, alternating slow, then fast, then slow again.

Wiring Diagram



Seven-color LED pin position:

S ↔ Raspberry Pi pin 10 (through resistor)

"-" ↔ Raspberry Pi GND

Sample Code

Python Code

```
#!/usr/bin/env python
import RPi.GPIO as GPIO
import time

pin_R = 10

def setup():
    GPIO.setmode(GPIO.BOARD) #Numbers GPIOs by physical location

    GPIO.setup(pin_R, GPIO.OUT)

try:
    setup()
    while True:
        GPIO.output(pin_R, GPIO.HIGH)
except KeyboardInterrupt:
    GPIO.cleanup()
```

C Code

```
#include <wiringPi.h>
#include <softPwm.h>
#include <stdio.h>

typedef unsigned char uchar;

#define LedPin 16

int main(void)
{
    int i;

    if(wiringPiSetup() == -1)
    {
        printf("setup wiringPi failed !");
        return -1;
    }
}
```

```
pinMode(LedPin, OUTPUT);  
while(1)  
{  
    digitalWrite(LedPin, HIGH);  
}  
  
return 0;  
}
```

Technical Background

◆ Forward voltage: 3.0~4.5V