

Lesson5 . SoftPWM

Introduction

Raspberry Pi only has one Hardware- PWM GPIO, It is not enough in most cases. But WiringPi includes a software-driven PWM handler capable of outputting a PWM signal on any of the Raspberry Pi's GPIO pins. In this lesson, we will learn how to meke more LEDs Breath.

Experimental Conditions

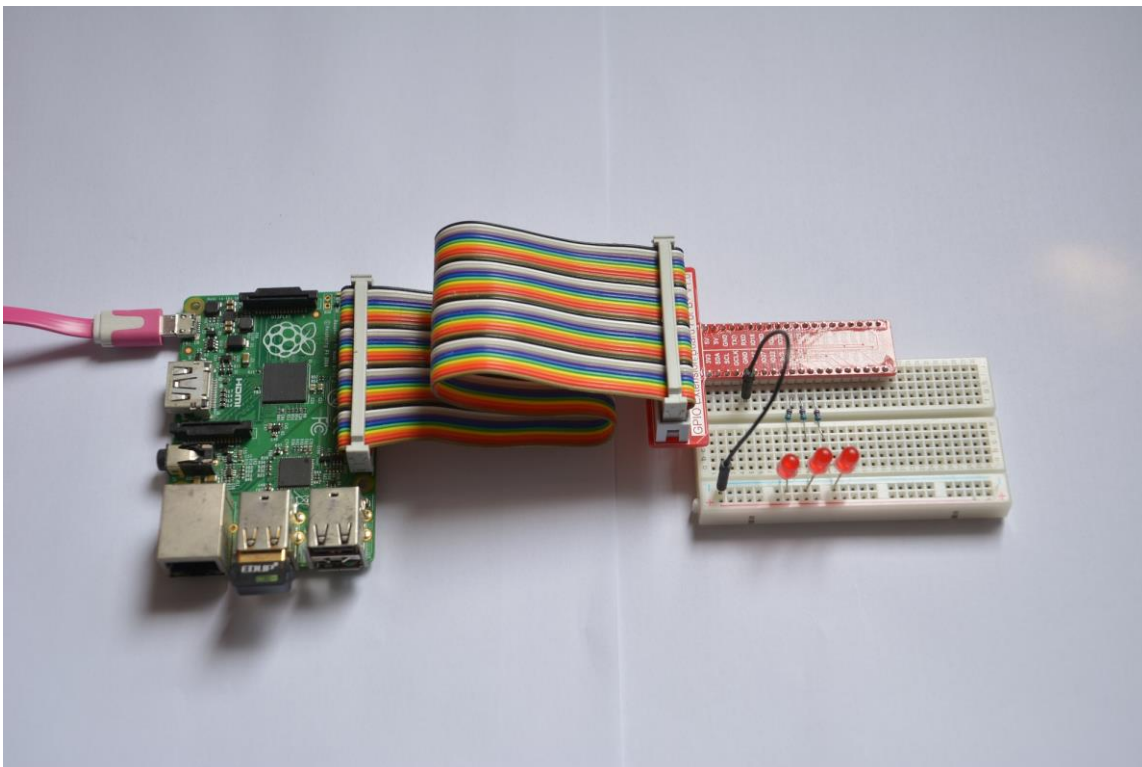
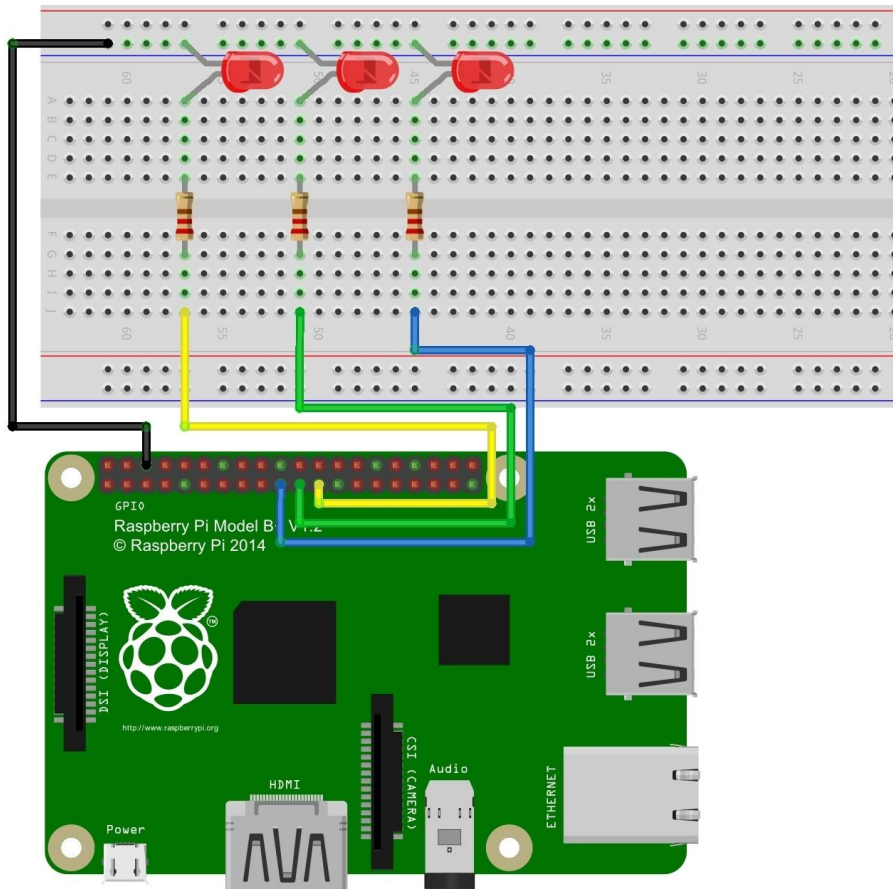
- 1*Raspberry Pi
- 1*Breadboard
- 1*Network cable (or USB wireless network adapter)
- 3*LED
- 3*Resistor (220Ω)
- Jumper wires

wiringPi - Raspberry Pi GPIO:

BCM	wPi	Name	Mode	V	B Plus Physical		V	Mode	Name	wPi	BCM
		3.3v			1	2			5v		
2	8	SDA.1	ALTO	1	3	4			5V		
3	9	SCL.1	ALTO	1	5	6			0v		
4	7	GPIO. 7	IN	1	7	8	0	ALTO	TxD	15	14
		0v			9	10	1	ALTO	RxD	16	15
17	0	GPIO. 0	IN	0	11	12	0	IN	GPIO. 1	1	18
27	2	GPIO. 2	IN	0	13	14			0v		
22	3	GPIO. 3	IN	0	15	16	0	IN	GPIO. 4	4	23
		3.3v			17	18	1	OUT	GPIO. 5	5	24
10	12	MOSI	ALTO	0	19	20			0v		
9	13	MISO	ALTO	1	21	22	1	OUT	GPIO. 6	6	25
11	14	SCLK	ALTO	1	23	24	1	ALTO	CE0	10	8
		0v			25	26	1	ALTO	CE1	11	7
0	30	SDA.0	ALTO	1	27	28	1	ALTO	SCL.0	31	1
5	21	GPIO.21	IN	1	29	30			0v		
6	22	GPIO.22	IN	1	31	32	0	IN	GPIO.26	26	12
13	23	GPIO.23	IN	0	33	34			0v		
19	24	GPIO.24	IN	0	35	36	0	IN	GPIO.27	27	16
26	25	GPIO.25	IN	0	37	38	0	IN	GPIO.28	28	20
		0v			39	40	0	IN	GPIO.29	29	21

Experimental Procedure

Step 1: Connect the circuit as shown in the following diagram





Step 2: Edit and save the code with vim

```
#include <wiringPi.h>
#include <softPwm.h>
int LedPin[3] = {12,13,14};
int main()
{
    int i=0;
    wiringPiSetup();
    for(i=0;i<3;i++)
    {
        softPwmCreate(LedPin[i],0,100);
    }
    while(1)
    {
        for(i=0;i<100;i++)
        {
            softPwmWrite(LedPin[0],i);
            softPwmWrite(LedPin[1],i);
            softPwmWrite(LedPin[2],i);
            delay(10);
        }
        for(i=100;i>0;i--)
        {
            softPwmWrite(LedPin[0],i);
            softPwmWrite(LedPin[1],i);
            softPwmWrite(LedPin[2],i);
            delay(10);
        }
    }
    return 0;
}
```

Step 3: Compile the code

```
gcc -o softPwm softPwm.c -lwiringPi -lpthread
```

Step 4: Run the program

```
sudo ./softPwm
```

Now, you can see your LEDs are gradual change at the same time. Of course, you can modify the program to make them breathing and flowing, I'm sure you can do it better.