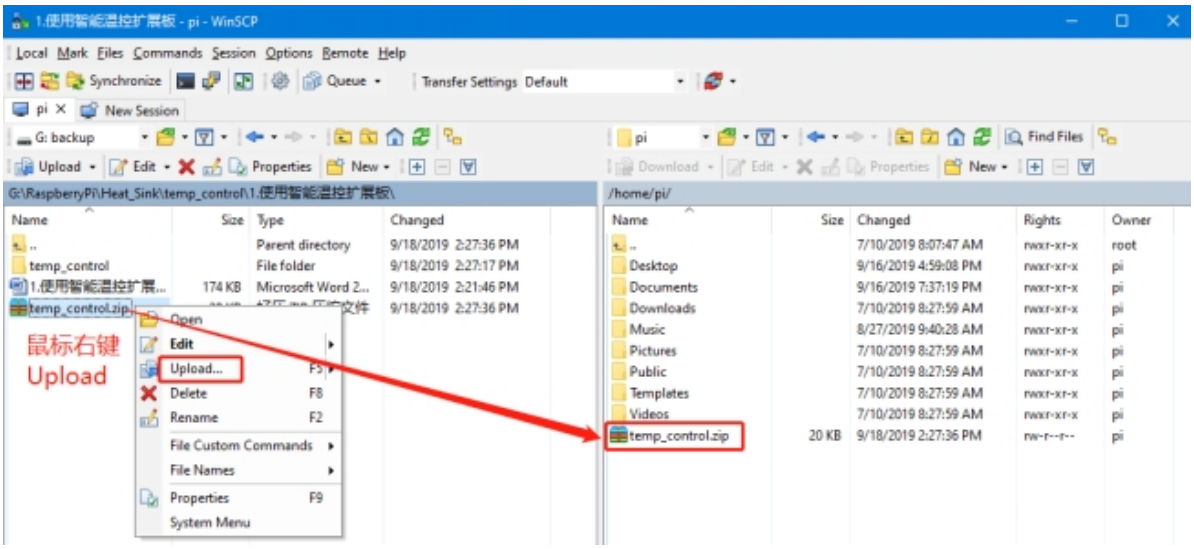
RGB light effects

RGB cooling HAT needs to be correctly inserted into the GPIO port of the RDK X3 and the I2C function of the RDK-X3 needs to be turned on.

The phenomenon of this experiment is that all RGB lights light up purple and have a breathing light effect.

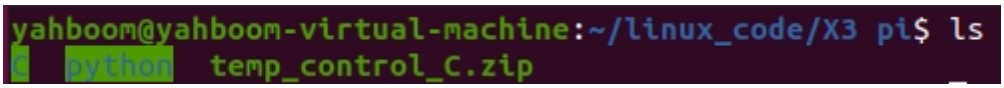
1.File transfer

1.Install WinSCP on your computer, connect to RDK X3, and transfer the **temp_control_C.zip** package downloaded from the documentation to the pi directory of the RDK X3.



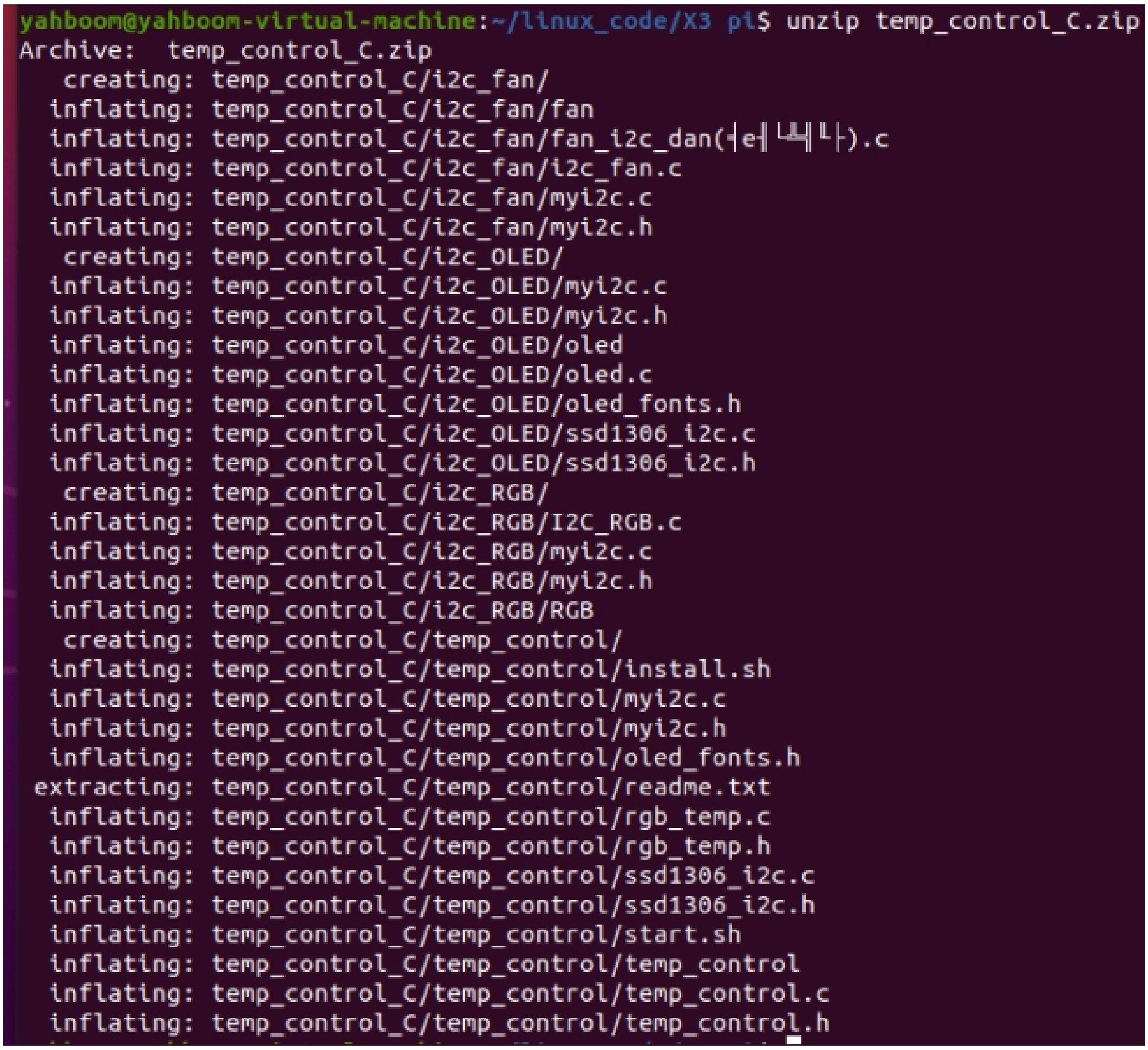
2.Extract file

Open the terminal in RDK X3 system and find **temp_control_C.zip** file.



Enter the following command to extract the file.

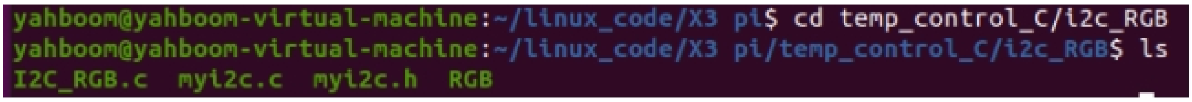
```
unzip temp_control_C.zip
```



2. Compiling and running the program

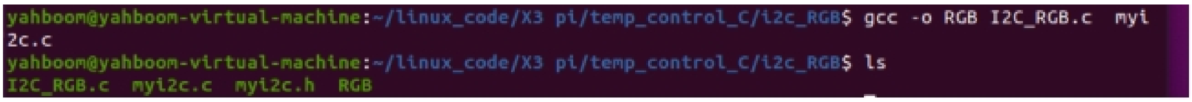
1.Enter the folder and view the files in the current folder

```
cd temp_control_C/i2c_RGB
ls
```



2.Compile program files

```
gcc -o RGB I2C_RGB.c myi2c.c
```



Among them, the gcc compiler is called, -o means to generate files, followed by the generated file name, I2C_RGB.c is the source program, and myi2c.c is used to drive the devices on the I2C bus of the X3 pie.

3.Run program

```
sudo ./RGB
```

```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi/temp_control_C/i2c_RGB$ sudo ./RGB
```

At this time, we can see the three RGB lights light up with purple breathing light effect at the same time.

3.About code

1.There are three RGB lights on the smart personal butler board, so define the number of lights as 3, define the register addresses: RGB_Effect as 0x04, RGB_Speed as 0x05, RGB_Color as 0x06.

Declare the functions that need to be used.

```
#define Max_LED    3
#define RGB_Effect 0x04
#define RGB_Speed  0x05
#define RGB_Color  0x06

int fd_i2c;
void setRGB(int num, int R, int G, int B);
void closeRGB();

void setRGBEffect(int effect);
void setRGBSpeed(int speed);
void setRGBColor(int color);
```

2.void setRGB(int num, int R, int G, int B) function.

Set the color of the RGB light. num refers to which light. 0 is the first light, 1 is the second light, and 2 is the third light. If it is greater than or equal to 3, all lights are set at the same time. The value range of R, G, and B is 0~255.

```
// 设置RGB灯,num如果大于等于Max_LED（3），则全部灯一起设置
// num=(0~3),R=(0~255),G=(0~255),B=(0~255)
void setRGB(unsigned char num, unsigned char R, unsigned char G, unsigned char B)
{
    if (num >= Max_LED)
    {
            data_buf = 0xff;
        i2c_write_8(fd_i2c, RGB_ADDR,0x00, &data_buf,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x01, &R,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x02, &G,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x03, &B,1);

    }
    else if (num >= 0)
    {
        i2c_write_8(fd_i2c, RGB_ADDR,0x00, &num,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x01, &R,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x02, &G,1);
        i2c_write_8(fd_i2c, RGB_ADDR,0x03, &B,1);
    }
}
```

3.Turn off RGB. According to the protocol, the register for turning off RGB is 0x07 and the data is 0x00.

```
// 关闭RGB
void closeRGB()
{
    data_buf = 0x00;
    i2c_write_8(fd_i2c, RGB_ADDR,0x07, &data_buf,1);
}

// 设置RGB灯效，0流水灯，1呼吸灯,2跑马灯，3彩虹灯，4炫彩灯
void setRGBEffect(unsigned char effect)
{
    if (effect >= 0 && effect <= 4)
    {
        i2c_write_8(fd_i2c,RGB_ADDR, RGB_Effect, &effect,1);
    }
}
```

4.void setRGBEffect(int effect) function

First, determine the input value and correspond to the protocol. There are a total of five special effects to choose from: 0 flowing light, 1 breathing light, 2 marquee, 3 rainbow light, and 4 colorful light.

```
// 设置RGB灯效，0流水灯，1呼吸灯,2跑马灯，3彩虹灯，4炫彩灯
void setRGBEffect(unsigned char effect)
{
    if (effect >= 0 && effect <= 4)
    {
        i2c_write_8(fd_i2c,RGB_ADDR, RGB_Effect, &effect,1);
    }
}
```

5.void setRGBSpeed(int speed) function

Modify the RGB light switching speed of the above modes. 1 low speed, 2 medium speed (default), 3 high speed, if not set, the default is medium speed.

```
// 设置RGB速度：1低速，2中速（默认），3高速
void setRGBSpeed(unsigned char speed)
{
    if (speed >= 1 && speed <= 3)
    {
        i2c_write_8(fd_i2c,RGB_ADDR, RGB_Speed, &speed,1);
    }
}
```

6.void setRGBColor(int color) function

Set the color of the flowing light and breathing light in the RGB light effect, 0 is red, 1 is green (default), 2 is blue, 3 is yellow, 4 is purple, 5 is cyan, 6 is white. If not set, the default is green.

```
// 设置流水灯/呼吸灯颜色：0红色，1绿色（默认），2蓝色，3黄色，4紫色，5青色，6白色
void setRGBColor(unsigned char color)
{
    if (color >= 0 && color <= 6)
    {
        i2c_write_8(fd_i2c,RGB_ADDR, RGB_Color, &color,1);
    }
}
```

7.Initialize I2C configuration

```
int main(void)
{
    // 定义I2C相关参数
    fd_i2c = open(RGB_DEVICE,O_RDWR);
    if (fd_i2c < 0)
    {
        fprintf(stderr, "fail to init I2C\n");
        return -1;
    }
```

8.Setting a high-speed purple breathing light.

```
closeRGB();
delay(1);

setRGBEffect(1);
setRGBSpeed(3);
setRGBColor(4);
```