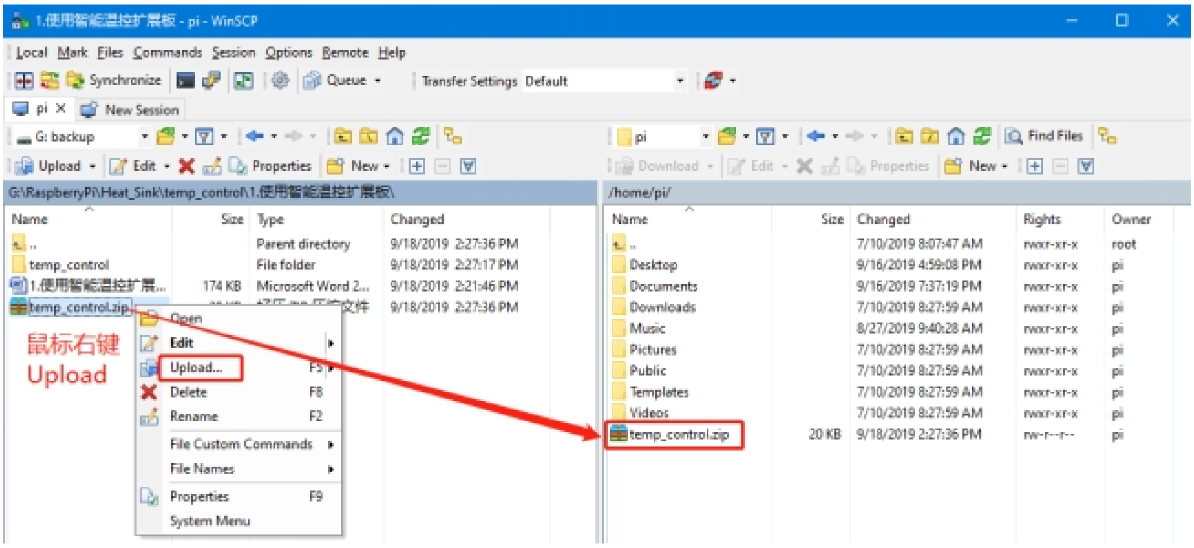
Control fan

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

The phenomenon of this experiment is that control the fan speed, start after 2 seconds of rest, increase the fan speed every second, run at the highest speed for 2 seconds and then stop.

1.File transfer

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



G:\RaspberryPi\Heat_Sink\temp_control\1.使用智能温控扩展板\

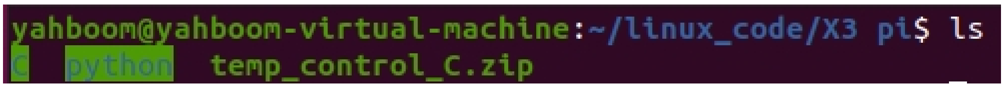
Name	Size	Type	Changed
..		Parent directory	9/18/2019 2:27:36 PM
temp_control		File folder	9/18/2019 2:27:17 PM
1.使用智能温控扩展...	174 KB	Microsoft Word 2...	9/18/2019 2:21:46 PM
temp_control.zip	[illegible]	[illegible]	9/18/2019 2:27:36 PM

/home/pi/

Name	Size	Changed	Rights	Owner
..		7/10/2019 8:07:47 AM	rwxr-xr-x	root
Desktop		9/16/2019 4:59:08 PM	rwxr-xr-x	pi
Documents		9/16/2019 7:37:19 PM	rwxr-xr-x	pi
Downloads		7/10/2019 8:27:59 AM	rwxr-xr-x	pi
Music		8/27/2019 9:40:28 AM	rwxr-xr-x	pi
Pictures		7/10/2019 8:27:59 AM	rwxr-xr-x	pi
Public		7/10/2019 8:27:59 AM	rwxr-xr-x	pi
Templates		7/10/2019 8:27:59 AM	rwxr-xr-x	pi
Videos		7/10/2019 8:27:59 AM	rwxr-xr-x	pi
temp_control.zip	20 KB	9/18/2019 2:27:36 PM	rw-r--r--	pi

2.Extract file

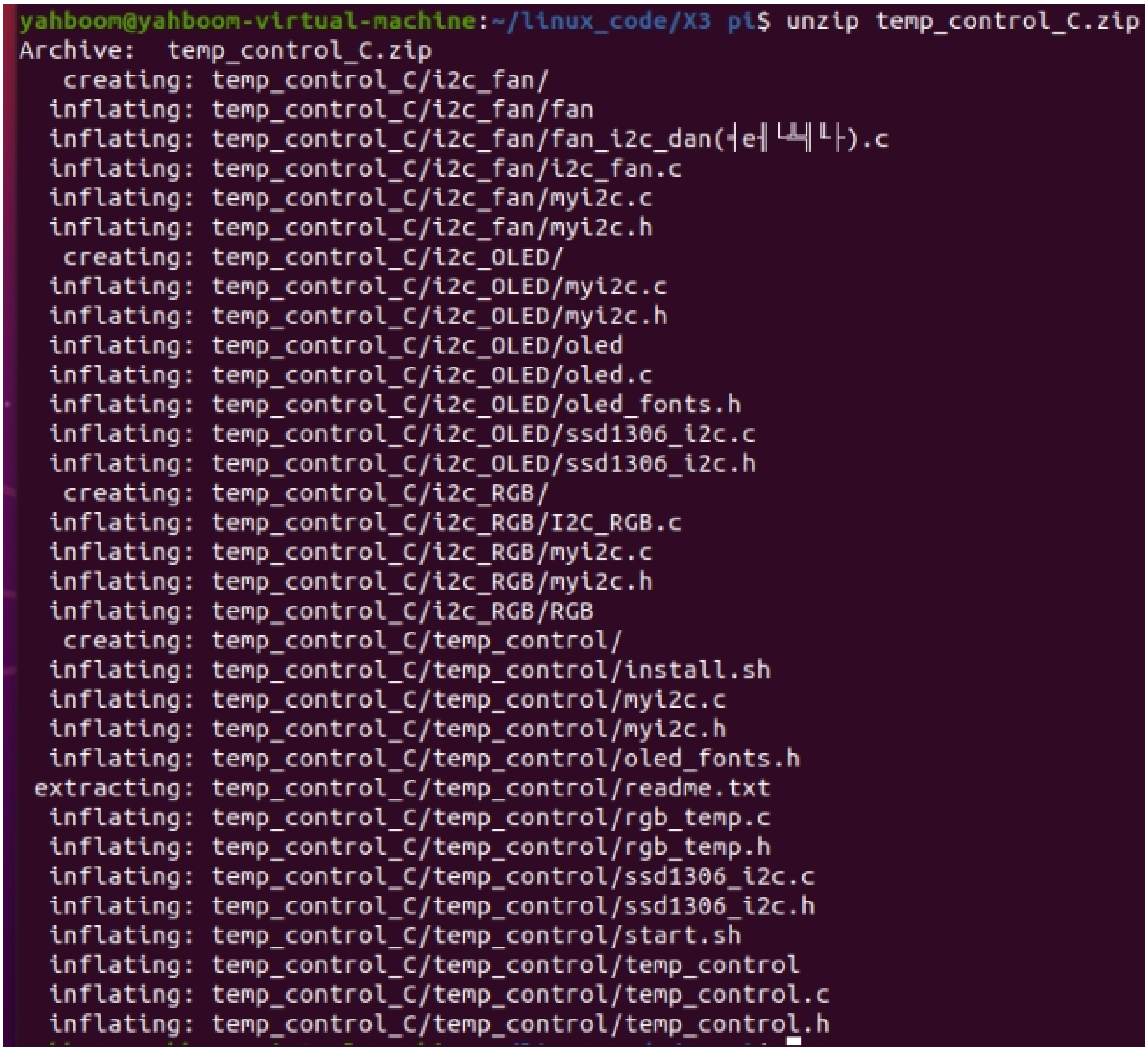
Open the terminal in RDK X3 system and find **temp_control_C.zip** file.



```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi$ ls
C  python  temp_control_C.zip
```

Enter the following command to extract the file.

```
unzip temp_control_C.zip
```

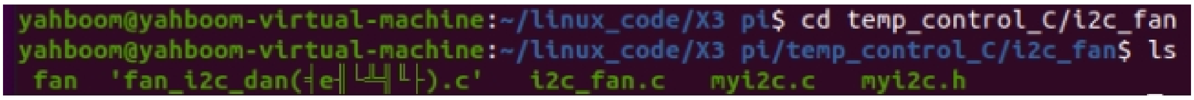


```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi$ unzip temp_control_C.zip
Archive:  temp_control_C.zip
   creating: temp_control_C/i2c_fan/
  inflating: temp_control_C/i2c_fan/fan
  inflating: temp_control_C/i2c_fan/fan_i2c_dan(┤e┃└┴┃└├).c
  inflating: temp_control_C/i2c_fan/i2c_fan.c
  inflating: temp_control_C/i2c_fan/myi2c.c
  inflating: temp_control_C/i2c_fan/myi2c.h
   creating: temp_control_C/i2c_OLED/
  inflating: temp_control_C/i2c_OLED/myi2c.c
  inflating: temp_control_C/i2c_OLED/myi2c.h
  inflating: temp_control_C/i2c_OLED/oled
  inflating: temp_control_C/i2c_OLED/oled.c
  inflating: temp_control_C/i2c_OLED/oled_fonts.h
  inflating: temp_control_C/i2c_OLED/ssd1306_i2c.c
  inflating: temp_control_C/i2c_OLED/ssd1306_i2c.h
   creating: temp_control_C/i2c_RGB/
  inflating: temp_control_C/i2c_RGB/I2C_RGB.c
  inflating: temp_control_C/i2c_RGB/myi2c.c
  inflating: temp_control_C/i2c_RGB/myi2c.h
  inflating: temp_control_C/i2c_RGB/RGB
   creating: temp_control_C/temp_control/
  inflating: temp_control_C/temp_control/install.sh
  inflating: temp_control_C/temp_control/myi2c.c
  inflating: temp_control_C/temp_control/myi2c.h
  inflating: temp_control_C/temp_control/oled_fonts.h
 extracting: temp_control_C/temp_control/readme.txt
  inflating: temp_control_C/temp_control/rgb_temp.c
  inflating: temp_control_C/temp_control/rgb_temp.h
  inflating: temp_control_C/temp_control/ssd1306_i2c.c
  inflating: temp_control_C/temp_control/ssd1306_i2c.h
  inflating: temp_control_C/temp_control/start.sh
  inflating: temp_control_C/temp_control/temp_control
  inflating: temp_control_C/temp_control/temp_control.c
  inflating: temp_control_C/temp_control/temp_control.h
```

2. Compiling and running the program

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

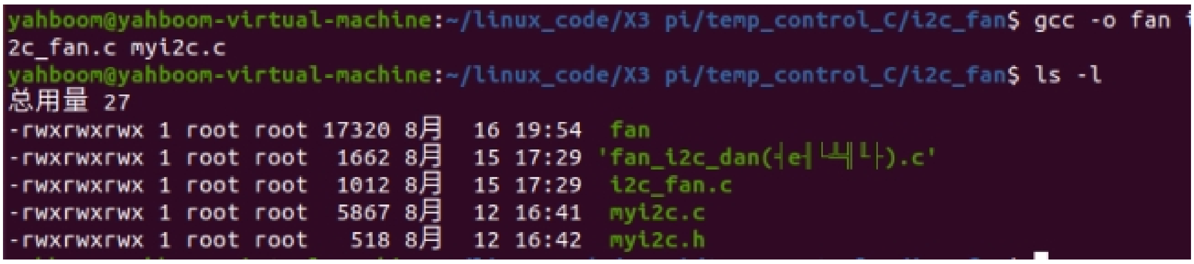
```
cd temp_control_C/i2c_fan
ls
```



```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi$ cd temp_control_C/i2c_fan
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi/temp_control_C/i2c_fan$ ls
 fan  'fan_i2c_dan(┤e┃└┴┃└├).c'   i2c_fan.c   myi2c.c   myi2c.h
```

2.Compile program files

```
gcc -o fan i2c_fan.c myi2c.c
```



```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi/temp_control_C/i2c_fan$ gcc -o fan i
2c_fan.c myi2c.c
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi/temp_control_C/i2c_fan$ ls -l
总用量 27
-rwxrwxrwx 1 root root 17320 8月  16 19:54  fan
-rwxrwxrwx 1 root root  1662 8月  15 17:29 'fan_i2c_dan(┤e┃└┴┃└├).c'
-rwxrwxrwx 1 root root  1012 8月  15 17:29  i2c_fan.c
-rwxrwxrwx 1 root root  5867 8月  12 16:41  myi2c.c
-rwxrwxrwx 1 root root   518 8月  12 16:42  myi2c.h
```

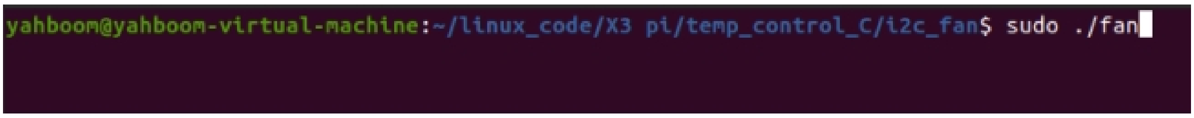
Among them, the gcc compiler is called, -o means to generate a file, followed by the generated file name, and fan.c is the source program.

3.Run program

```
sudo ./fan
```

Press **Enter** and enter the password: **sunrise**

The password is invisible when you enter it.

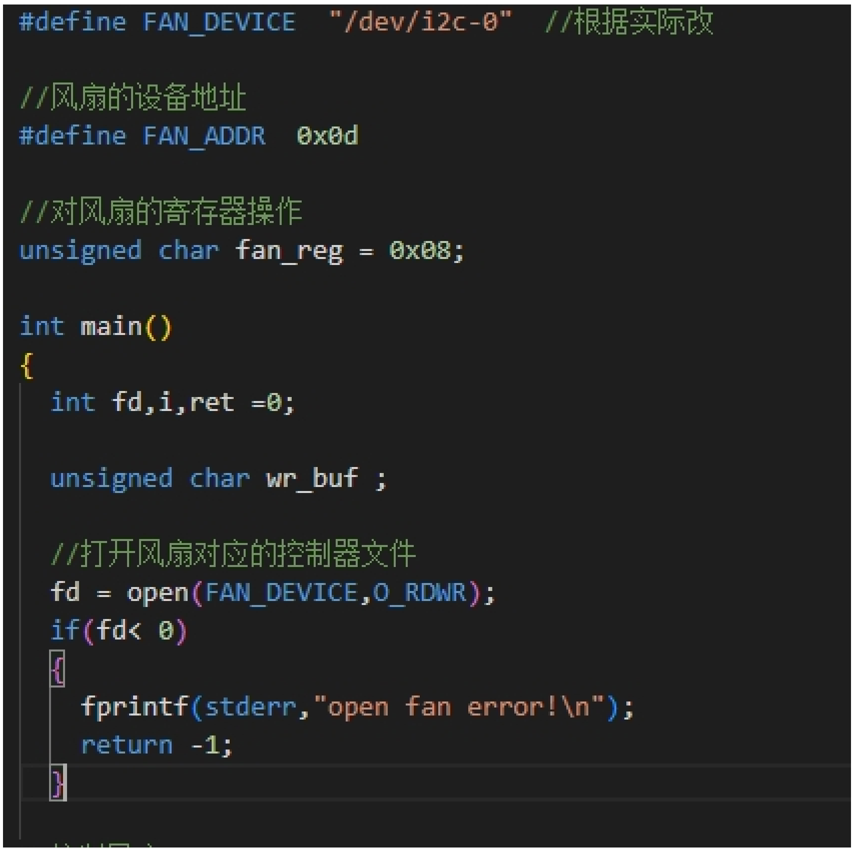


```
yahboom@yahboom-virtual-machine:~/linux_code/X3 pi/temp_control_C/i2c_fan$ sudo ./fan
```

At this time, the fan will continue to run after the user enters the speed.

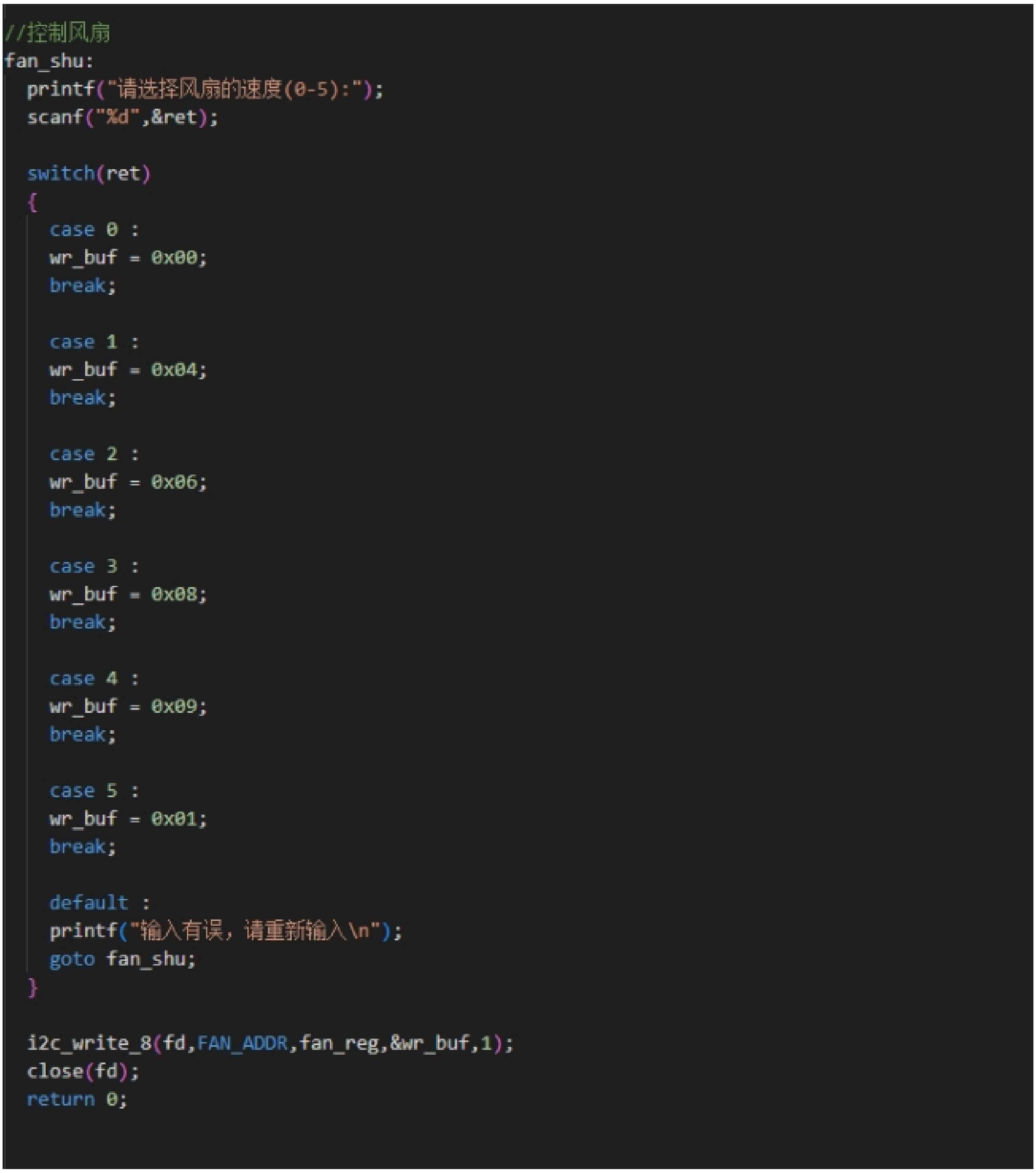
3. Code

1. Initialize RDK -X3 I2C configuration



```
#define FAN_DEVICE  "/dev/i2c-0"  //根据实际改

//风扇的设备地址
#define FAN_ADDR  0x0d

//对风扇的寄存器操作
unsigned char fan_reg = 0x08;

int main()
{
  int fd,i,ret =0;

  unsigned char wr_buf ;

  //打开风扇对应的控制器文件
  fd = open(FAN_DEVICE,O_RDWR);
  if(fd< 0)
  {
    fprintf(stderr,"open fan error!\n");
    return -1;
  }
```

2.The user controls the fan speed. According to the protocol, the fan speed level can be known, 0x00 off, 0x01 full speed, 0x02: 20% speed, 0x03: 30% speed, ..., 0x09: 90% speed.



```
//控制风扇
fan_shu:
  printf("请选择风扇的速度(0-5):");
  scanf("%d",&ret);

  switch(ret)
  {
    case 0 :
    wr_buf = 0x00;
    break;

    case 1 :
    wr_buf = 0x04;
    break;

    case 2 :
    wr_buf = 0x06;
    break;

    case 3 :
    wr_buf = 0x08;
    break;

    case 4 :
    wr_buf = 0x09;
    break;

    case 5 :
    wr_buf = 0x01;
    break;

    default :
    printf("输入有误，请重新输入\n");
    goto fan_shu;
  }

  i2c_write_8(fd,FAN_ADDR,fan_reg,&wr_buf,1);
  close(fd);
  return 0;
```

3. 0: turns off the fan, 5 is the maximum speed