

Lesson 2 Active Buzzer

Overview

In this lesson, we will learn how to program the Raspberry Pi to make an active buzzer sound.

Requirement

- 1* Raspberry Pi
- 1* Active buzzer
- 1* 1 k Ω Resistor
- 1* NPN Transistor (S8050)
- 1* Breadboard
- Several Jumper wires

Principle

A buzzer or beeper is an audio signaling device. As a type of electronic buzzer with integrated structure, which use DC power supply, are widely used in computers, printers, photocopiers, alarms, electronic toys, automotive electronic equipments, telephones, timers and other electronic products for voice devices. Buzzers can be categorized as active and passive buzzers (See the following pictures).



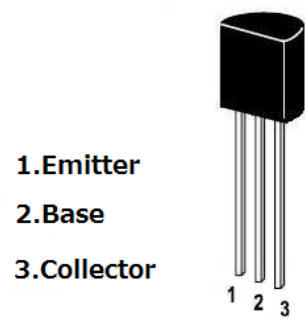
When you place the pins of buzzers upward, you can see that two buzzers are different, the buzzer that green circuit board exposed is the passive buzzer.

In this study, the buzzer we used is active buzzer. Active buzzer will sound as long as the power supply. We can program to make the Raspberry Pi output alternating high and low level, so that the buzzer sounds.

A slightly larger current is needed to make a buzzer sound. However, the output current of Raspberry Pi GPIO is weak, so we need a transistor to drive the buzzer.

The main function of transistor is blowing up the voltage or current. The transistor can also be used to control the circuit conduction or deadline. And the transistor is divided into two kinds, one kind is NPN, for instance, the S8050 we provided; another kind is PNP transistor such as the S8550 we provided. The transistor we used is as shown in

below:



There are two driving circuit for the buzzer:

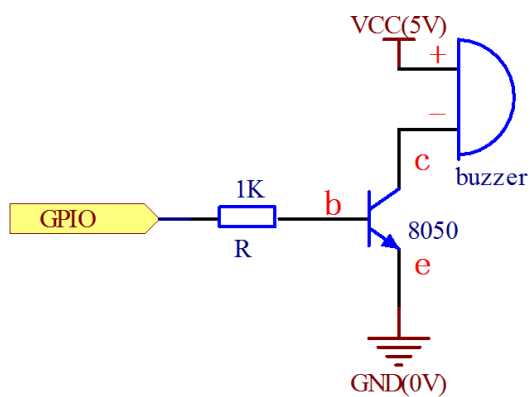


Figure1

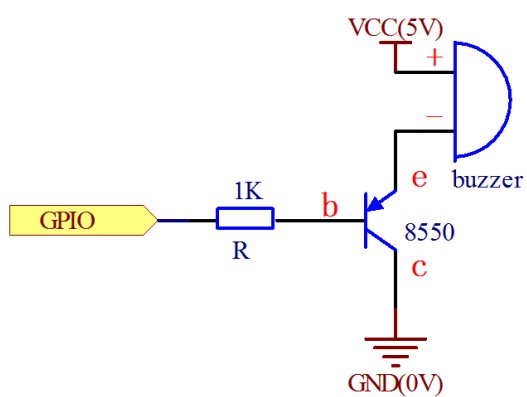


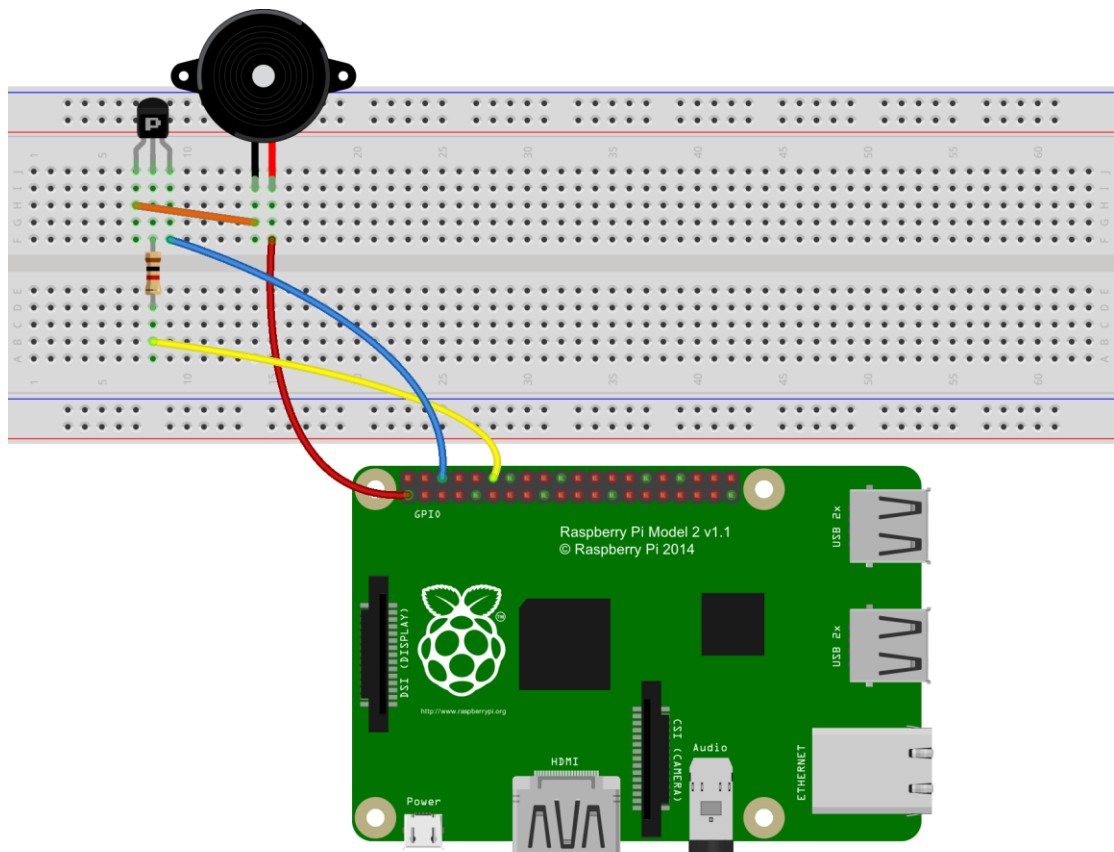
Figure2

Figure 1: Set the Raspberry Pi GPIO as a high level, the transistor S8050 will conduct, and then the buzzer will sound; set the Raspberry Pi GPIO as low level, the transistor S8050 will cut off, then the buzzer will stop.

Figure 2: Set the Raspberry Pi GPIO as low level, the transistor S8550 will conduct, and the buzzer will sound; set the Raspberry Pi GPIO as a high level, the transistor S8550 will cut off, then the buzzer will stop.

Procedures

1. Build the circuit



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2. Program

C user:

2.1 Edit and save the code with vim or nano.

(Code path: /home/Adept_Ultimate_Starter_Kit_C_Code_for_RPi/02_activeBuzzer/buzzer.c)

2.2 Compile the program

```
$ gcc buzzer.c -o buzzer -lwiringPi
```

2.3 Run the program

```
$ sudo ./buzzer
```

Python user:

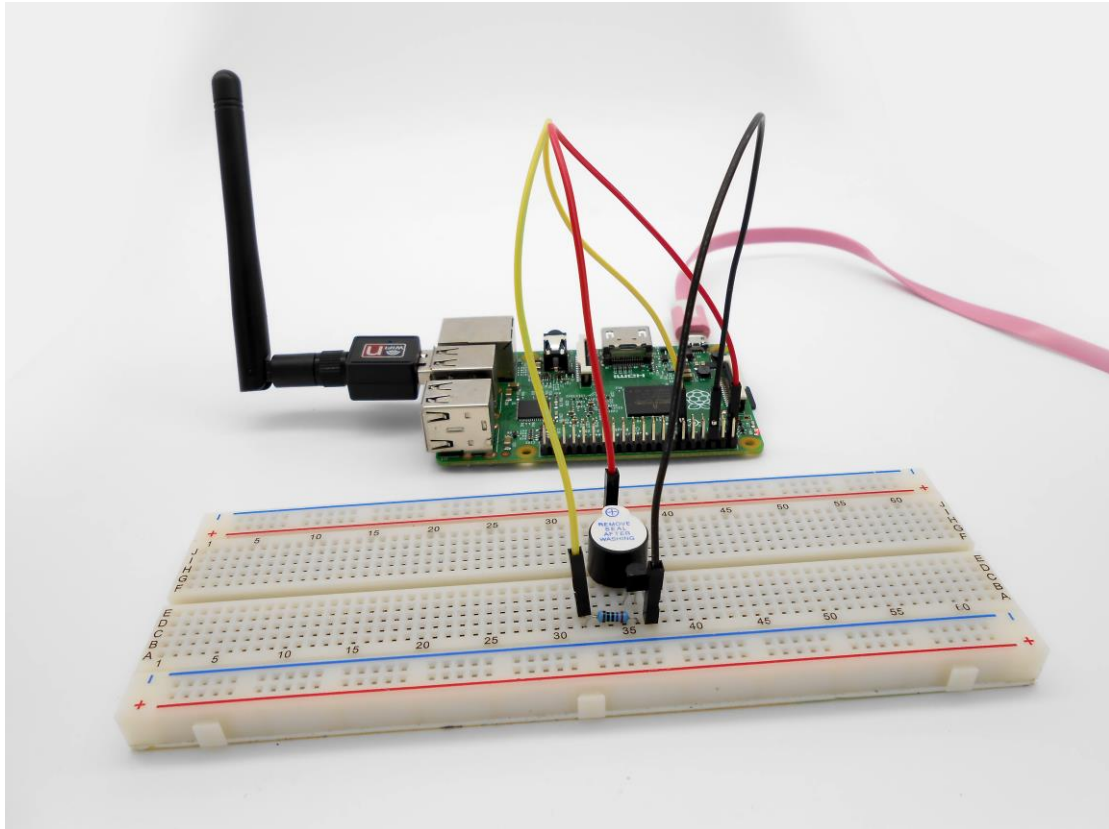
2.1 Edit and save the code with vim or nano.

(Code path: /home/Adept_Ultimate_Starter_Kit_Python_Code_for_RPi/02_activeBuzzer.py)

2.2 Run the program

```
$ sudo python 02_activeBuzzer.py
```

Now, you should be able to hear the sound of the buzzer.



Summary

By learning this lesson, we have mastered the basic principle of the buzzer and the transistor. We also learned how to program the Raspberry Pi and then control the buzzer. I hope you can use what you have learned in this lesson to do some interesting things.