Lesson 9 7-segment display

Overview

In this lesson, we will program the Raspberry Pi to achieve the controlling of segment display.

Requirement

- 1* Raspberry Pi
- 1* 220Ω Resistor
- 1* 7-Segment display
- 1* Breadboard
- Several Jumper wires

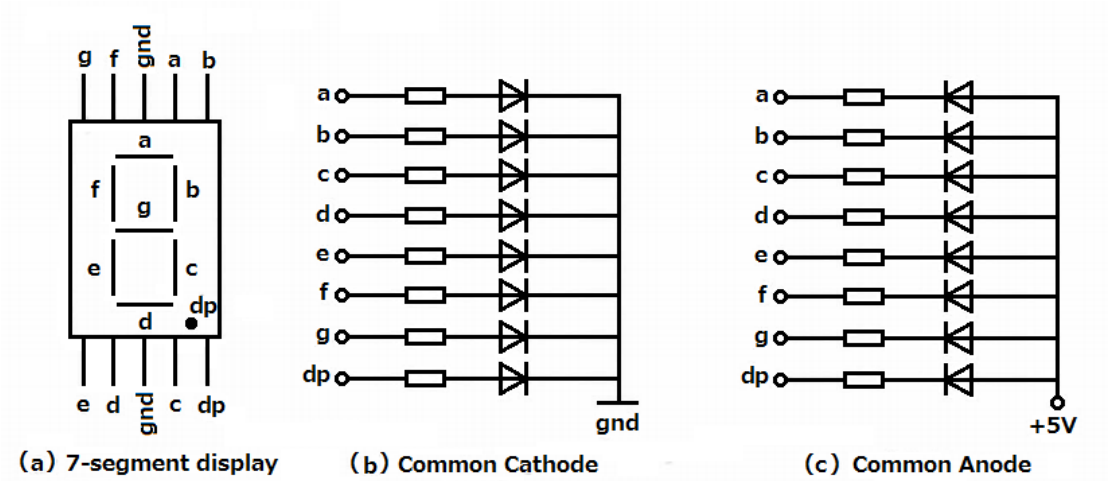
Principle

The seven-segment display is a form of electronic display device for displaying decimal numerals that is an alternative to the more complex dot matrix displays.

Seven-segment displays are widely used in digital clocks, electronic meters, basic calculators, and other electronic devices that display numerical information.

The seven-segment display is an 8-shaped LED display device composed of eight LEDs (including a decimal point), these segments respectively named a, b, c, d, e, f, g, dp.

The segment display can be divided into common anode and common cathode segment display by internal connections.

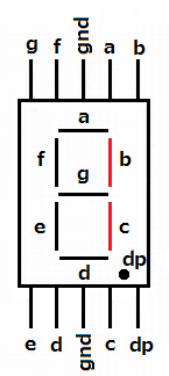


(a) 7-segment display (b) Common Cathode (c) Common Anode

When using a common anode LED, the common anode should to be connected to the power supply (VCC); when using a common cathode LED, the common cathode should be connected to the ground (GND).

Each segment of a segment display is composed of LED, so a resistor is needed for protecting the LED.

A 7-segment display has seven segments for displaying a figure and a segment for displaying a decimal point. If you want to display a number '1', you should only light the segment b and c.



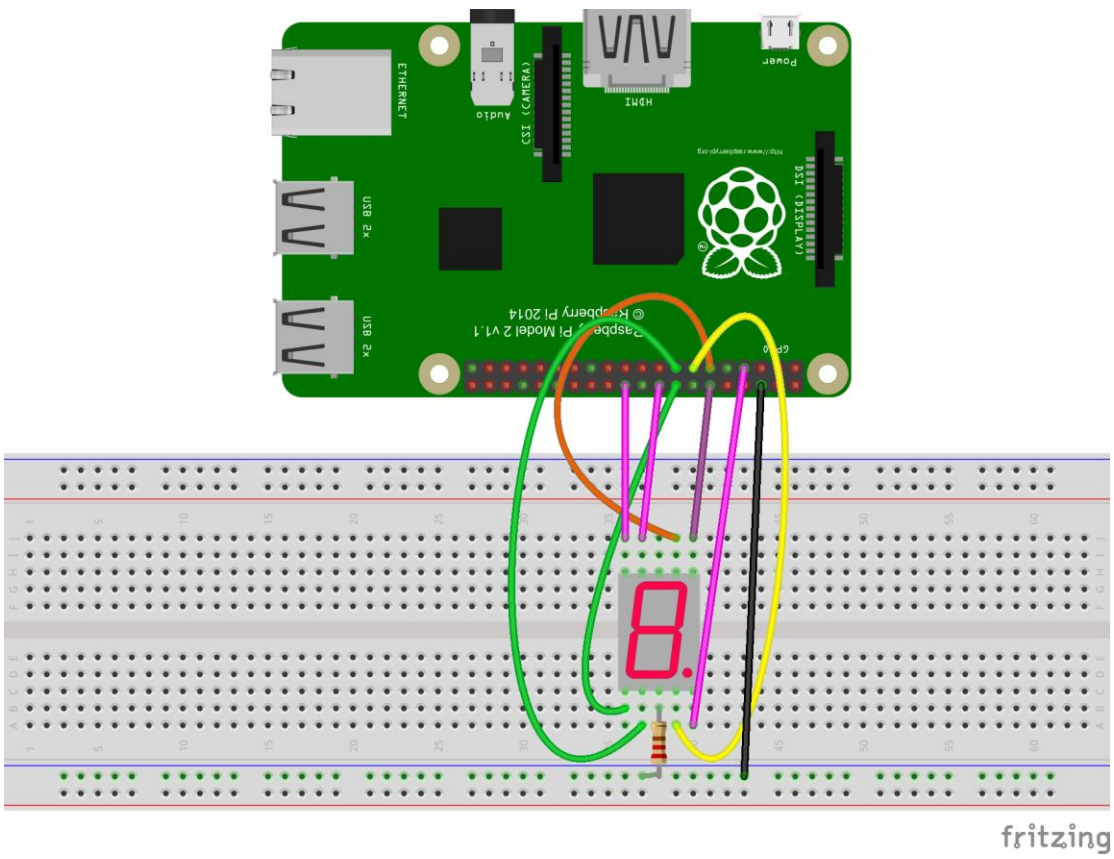
Key function:

- **void digitalWriteByte (int value)**

This writes the 8-bit byte supplied to the first 8 GPIO pins. It's the fastest way to set all 8 bits at once to a particular value, although it still takes two write operations to the Pi's GPIO hardware.

Procedures

1. Build the circuit



2. Program

C user:

2.1 Edit and save the code with vim or nano.

(Code path: /home/Adeept_Ultimate_Starter_Kit_C_Code_for_RPi/09_segment/segment.c)

2.2 Compile the program

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

2.3 Run the program

```
$ sudo ./segment
```

Python user:

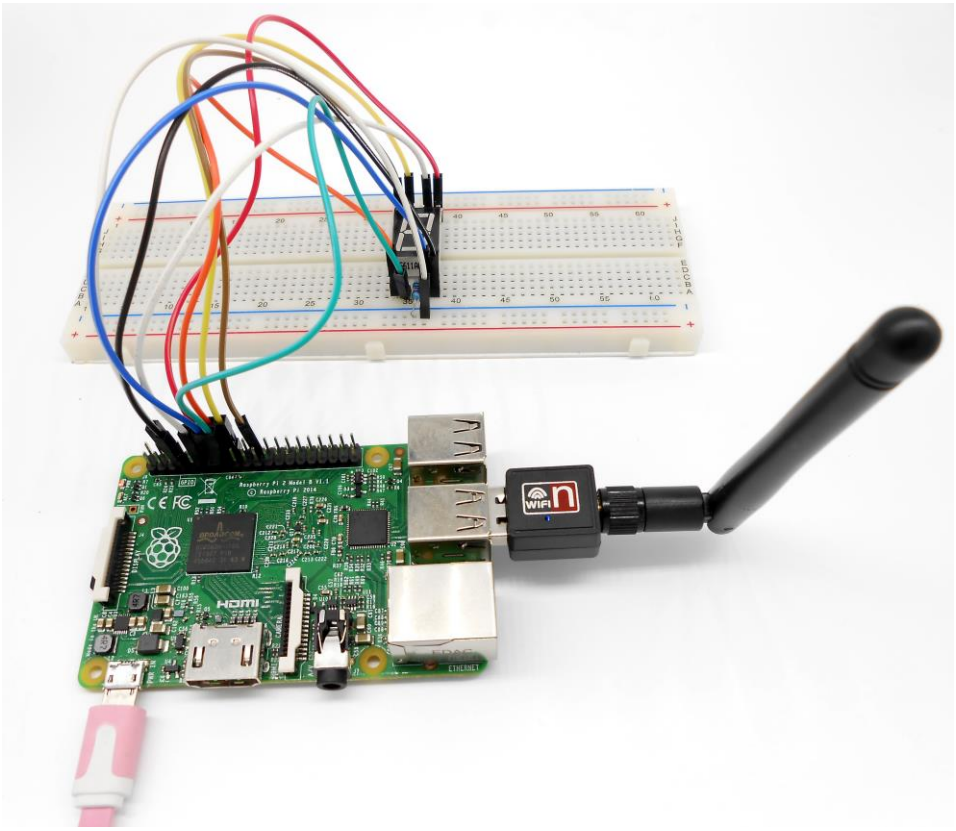
2.1 Edit and save the code with vim or nano.

(Code path: /home/Adeept_Ultimate_Starter_Kit_Python_Code_for_RPi/09_segment.py)

2.2 Run the program

```
$ sudo python 09_segment.py
```

Now, you should see the number 0~9, a~F are displayed on the segment display.



Summary

Through this lesson, we have learned the principle and programming of segment display. I hope you can combine the former course to modify the code we provided in this lesson to achieve cooler originality.