

# C Programming through Wiring Pi

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**Abstract**—This manual shows how to install Wiring Pi library in Raspberry Pi and control GPIO pins using C program. It helps us to analyze how C programing is used to interact with hardware.

## 1 INSTALLATION OF WIRING PI

In this section the installation of wiring pi library in R Pi from github in is explained.

### Method - 1

If you do not GIT installed use the following command.

```
sudo apt-get install git-core
```

Download or clone wiring pi from GIT

```
sudo apt-get update
sudo apt-get upgrade
cd
git clone git://git.drogon.net/
wiringPi
or
git clone https://github.com/
PrasannaIITH/WiringPi-1
```

Web link (i.e. url) to download wiringpi from GIT  
<https://github.com/WiringPi/WiringPi>

Steps to install wiringpi if it is cloned

```
cd ~/wiringPi
./build
```

Steps to install wiringpi if it is downloaded from web link. Downloaded file will be in zip formate, extract it in the home directory.

```
cd file_name
./build
```

Type the following manual command to known how to use the gipo utility

```
man gpio
```

Run the gpio command to check the installation

```
gpio -v
gpio readall
```

### Method - 2

```
sudo apt-get update
sudo apt-get install gdebi
mkdir WiringPi
cd WiringPi
wget https://github.com/
PrasannaIITH/wiringPi/blob/
master/wiringpi-2.50-1.deb
sudo gdebi install wiringpi
-2.50-1.deb
```

## 2 BASIC PROGRAMMING USING WIRING PI

Before execution of any programing initialize BCM-GPIO pin numbering by using following command

```
gpio -g mode 17 output
```

in the above command '-g' indicates the BCM (Broadcom) pin numbering, 'mode' indicates the mode of operation of pin i.e. *Input/output*. If the BCM pin numbers are not assigned then Pi will take default pin numbering.

### 2.1 Control LED blink

Here is an example experiment of LED blink using broadcom pin number 17.



Fig. 1: Schematic diagram of RPi 3B pin diagram [2]

```
#include <stdio.h>
#include <wiringPi.h>

#define LED 0
// The above command tell that
// LED Pin - wiringPi pin 0 is
// BCM_GPIO pin 17.

int main (void)
{
    printf ("Raspberry_Pi_blink\n");
    ;

    wiringPiSetup () ;
```

```
// setup function due Broadcom
// numbering.
pinMode (LED, OUTPUT) ;

for (;;)
{
    digitalWrite (LED, HIGH) ; //
    On
    delay (500) ; //
    mS
    digitalWrite (LED, LOW) ; //
    Off
    delay (500) ;
}
return 0 ;
```

The above program should be saved as .c file. Now compile & run the program

```
gcc filename.c -o filename.out -l
wiringPi
sudo ./output_filename
```

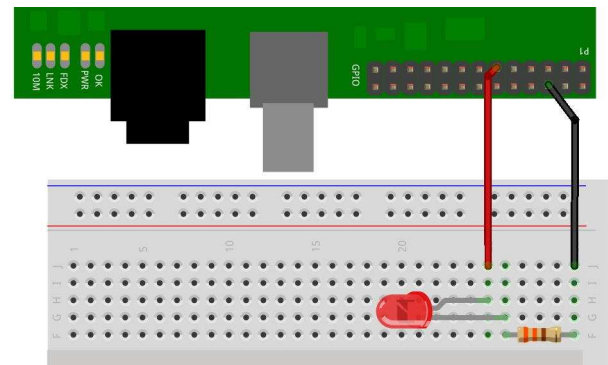


Fig. 2: Schematic of LED connected to Pi [1]

### 2.2 Display of Numbers on SSD

Here LEDs are controlled using push button. Connect the circuit as per the schematic diagram.

```
#include <stdio.h>
#include <wiringPi.h>

int main(void)
{
    int a = 1
    int b = 1
```

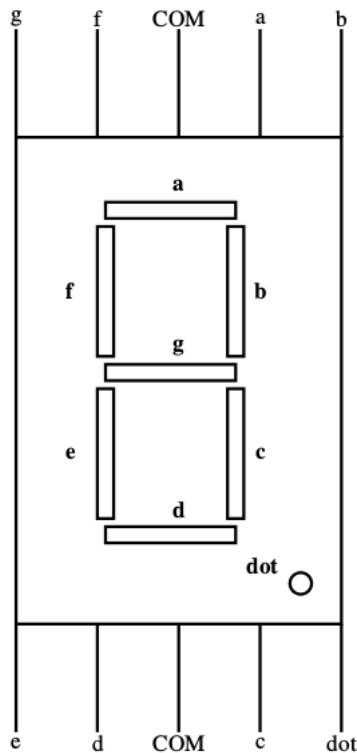


Fig. 3: Schematic diagram of Seven Segment Display [2]

```

    digitalWrite(8, g);
}

return 0;
}

```

Save the program file as .c file. Run & compile the program as above.

### 3 CONCLUSION

By this we can understand that how a basic C programming will help us to talk with the real world hardware. WiringPi is released under the GNU Lesser Public License version 3. For more information visit <http://www.wiringpi.com/>.

### REFERENCES

- [1] Wiring Pi- GPIO Interface library for the Raspberry Pi, url- <http://www.wiringpi.com/>.
- [2] Sunfounder, Raspberry pi tutorial - 'Lesson 2 Controlling an LED by a Button' <https://www.sunfounder.com/>. Demo video link [https://www.youtube.com/watch?time\\_continue=4&v=y3Pv7--6eik](https://www.youtube.com/watch?time_continue=4&v=y3Pv7--6eik).

```

int c = 1;
int d = 1;
int e = 1;
int f = 1;
int g = 0;

wiringPiSetup();
pinMode(2, OUTPUT);
pinMode(3, OUTPUT);
pinMode(4, OUTPUT);
pinMode(5, OUTPUT);
pinMode(6, OUTPUT);
pinMode(7, OUTPUT);
pinMode(8, OUTPUT);

for (;;)
{
    digitalWrite(2, a);
    digitalWrite(3, b);
    digitalWrite(4, c);
    digitalWrite(5, d);
    digitalWrite(6, e);
    digitalWrite(7, f);
}

```