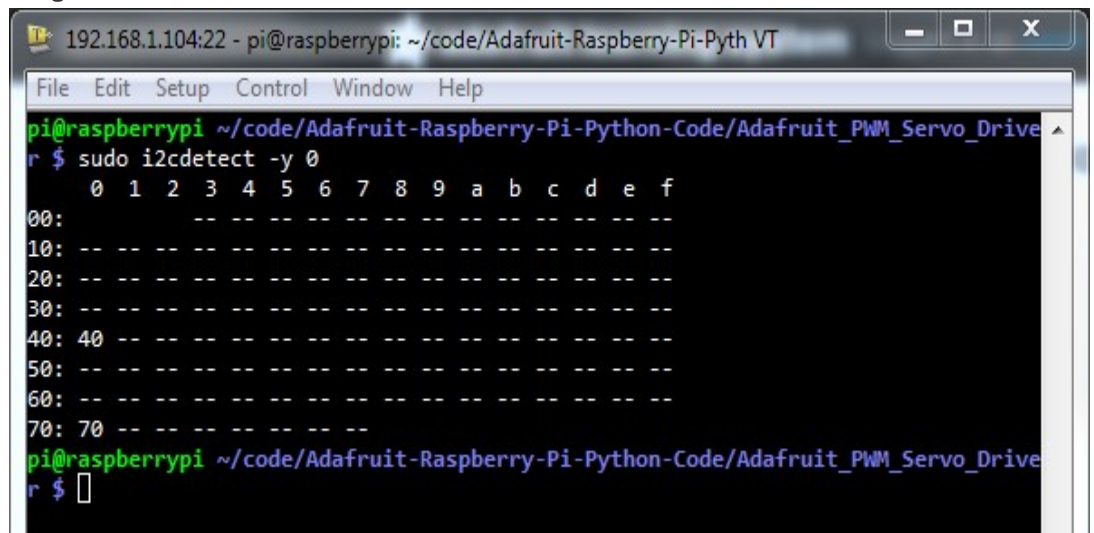


Color detection based Object Tracking

1. Install Raspbian Stretch on Raspberry 3B+
 - a. Checkout my YouTube video from :- to 15:10 to 16:42 ->> <https://youtu.be/XfPXu4UAZwQ>
 - b. Use HDMI-VGA converter to connect RPI with monitor & USB Keyboard & mouse.
 - c. Boot RPI desktop and follow next step.
 - d. Recommend to use monitor if your are beginner as direct access of PI is easy for newbie.
2. Install Open CV on RPI3B+
 - a. <https://www.pyimagesearch.com/2017/09/04/raspbian-stretch-install-opencv-3-python-on-your-raspberry-pi/>
 - b. Time Taken :- Approx 8+ Hours
 - c. I spend two days for to complete this process (20 Hours) so be passionate & calm.
3. Install PCM9685 library on Raspberry PI.
 - a. Reference Documentation:- <https://learn.adafruit.com/adafruit-16-channel-servo-driver-with-raspberry-pi?view=all>
 - b. Check PCM9685 i2c connectivity withRPI
 - i. Run :- sudo apt-get install python-smbus
 - ii. Run :- sudo apt-get install i2c-tools
 - iii. Run :- sudo i2cdetect -y 1
 1. Image of successful communication with PCM9685



```
192.168.1.104:22 - pi@raspberrypi: ~/code/Adafruit-Raspberry-Pi-Pyth VT
File Edit Setup Control Window Help
pi@raspberrypi ~/code/Adafruit-Raspberry-Pi-Python-Code/Adafruit_PWM_Servo_Drive
r $ sudo i2cdetect -y 0
    0 1 2 3 4 5 6 7 8 9 a b c d e f
00: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
10: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
20: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
30: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
40: 40 -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
50: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
60: -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
70: 70 -- -- -- -- -- -- -- -- -- -- -- -- -- -- --
pi@raspberrypi ~/code/Adafruit-Raspberry-Pi-Python-Code/Adafruit_PWM_Servo_Drive
r $
```

- c. Open Terminal & run: - source ~/.profile #to enter in virtual environment.
- d. Open Terminal & run:- pip3 install adafruit-circuitpython-servokit
- e. Never Use “sudo” otherwise you will face problem as using “sudo” will not install library in your virtual environment.
- f. Checking servo
 - i. Open python3 & enter below commands.
 - ii. from adafruit_servokit import ServoKit
 - iii. kit = ServoKit(channels=16)
 - iv. kit.servo[0].angle = 90
 - v. kit.servo[0].angle = 180
 - vi. kit.servo[0].angle = 0

4. Connection Detail:-
 - a. Connect 5VDC to PCM9685 (For Servo operation External 5V required)
 - b. \Connect PC9685 I2C & logic supply pins with RPI pins.
 - c. Connect Two Servo to PCM9685
5. Checking of servo
 - a. I have prepared 4 files for servo checking (180.py, 90.py, 0.py).
 - i. For 0 degree. (Both Servo at 0 degree).
 - ii. For 90 degree. (Both Servo at 90 degree).
 - iii. For 180 degree. (Both Servo at 180 degree).
 - iv. Source code ()
6. Install PI camera on Camera connector & mount servo as explain in tutorial video.
 - a. Tutorial URL:- <https://www.raspberrypi.org/documentation/usage/camera/README.md>
7. Run object tracking code (download from :-)
8. Open Terminal
 - a. Run: - source ~/.profile.
 - b. Run: - workon cv.
 - c. Check “[CV]” in front of terminal command.
 - d. Run Object tracking Code :- `'path of your file location'/python3.'file name'`
 - e. To exit press :- Esc