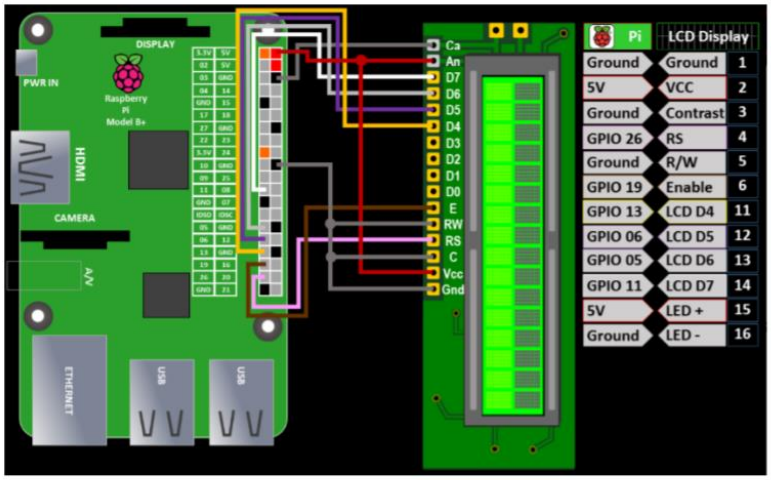
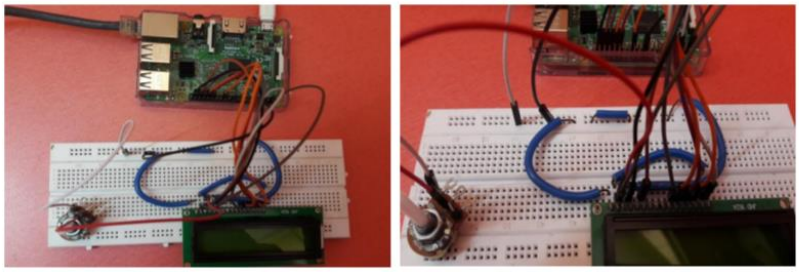
Practical No. 8

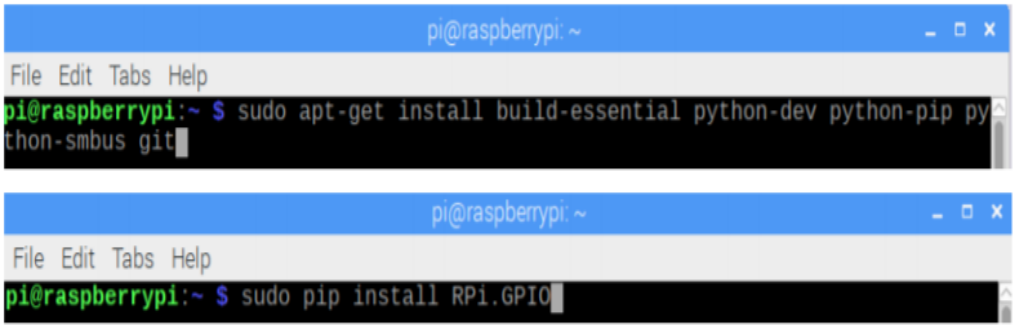
Aim: Interface the raspberry pi with a 16x2 LCD display and print values

Step 1: Connect raspberry pi and its components.



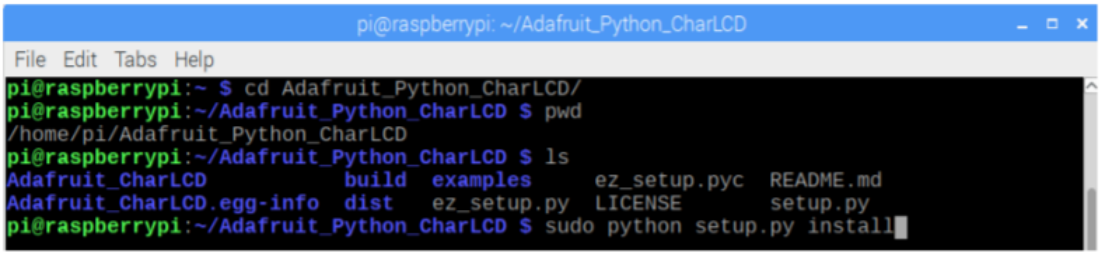


Step 2: Before installing the character LCD library install few dependencies by executing following the steps

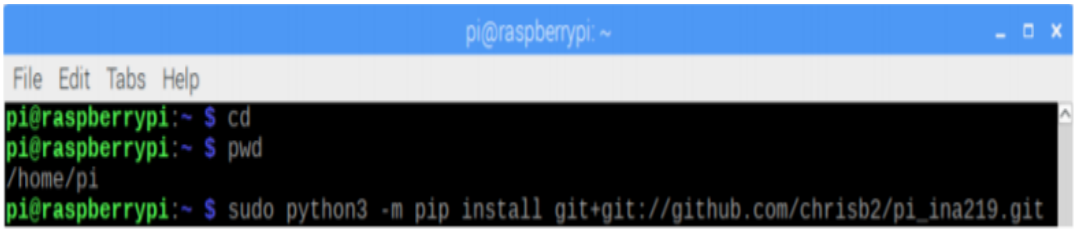


Step 3: Download Adafruit CharLCD library

Step 4: Run setup.py file to install Adafruit Library



Step 5: Install dependencies for Python 3 on Raspberry Pi, following command need to be executed



Note: This command helps to fix the ImportError occurred, when you execute script from Python IDLE

Step 6: Create Python script which imports Adafruit_CharLCD library and initialize required GPIO BCM Pin no. (Used in your LCD Connection)

```
pi@raspberrypi:~ $ cd Adafruit_Python_CharLCD/Adafruit_CharLCD
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ pwd
/home/pi/Adafruit_Python_CharLCD/Adafruit_CharLCD
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ ls
Adafruit_CharLCD.py   display IP and date time on LCD.py  __pycache__
Adafruit_CharLCD.pyc  __init__.py
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ nano __init__.py
```

```
import time
from Adafruit_CharLCD import Adafruit_CharLCD

# instantiate lcd and specify pins
lcd = Adafruit_CharLCD(rs=26, en=19,
                       d4=13, d5=6, d6=5, d7=11,
                       cols=16, lines=2)
lcd.clear()

# display text on LCD display \n = new line
lcd.message('2x16 CharLCD\n  Raspberry Pi')
time.sleep(2)
lcd.clear()
lcd.message('MSD Gurukul\nLCD DEMO')

time.sleep(3)
# scroll text off display
for x in range(0, 16):
    lcd.move_right()
    time.sleep(.1)

time.sleep(3)

# scroll text on display
for x in range(0, 16):
    lcd.move_left()
    time.sleep(.1)
```

Execute above script using python __init__.py

Step 7: Create Python script which displays current time and IP address on LCD Display

```
pi@raspberrypi: ~/Adafruit_Python_CharLCD/Adafruit_CharLCD
File  Edit  Tabs  Help
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ pwd
/home/pi/Adafruit_Python_CharLCD/Adafruit_CharLCD
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ ls
Adafruit_CharLCD.py   display IP and date time on LCD.py  __pycache__
Adafruit_CharLCD.pyc  __init__.py
pi@raspberrypi:~/Adafruit_Python_CharLCD/Adafruit_CharLCD $ nano display\ IP\ and\ date\ t
ime\ on\ LCD.py
```

```
#!/usr/bin/python
from Adafruit_CharLCD import Adafruit_CharLCD
from time import sleep, strftime
from datetime import datetime
import socket

#  Initialize LCD (must specify pinout and dimensions)
lcd = Adafruit_CharLCD(rs=26, en=19,
                       d4=13, d5=6, d6=5, d7=11,
                       cols=16, lines=2)

def get_ip_address():
    return [
             (s.connect(('8.8.8.8', 53)),
              s.getsockname()[0],
              s.close()) for s in
                  [socket.socket(socket.AF_INET, socket.SOCK_DGRAM)]
            ][0][1]

try:
    while 1:
        lcd.clear()
        ip = get_ip_address()
        lcd.message(datetime.now().strftime('%b %d  %H:%M:%S\n'))
        lcd.message('IP {}'.format(ip))
        sleep(2)
except KeyboardInterrupt:
    print('CTRL-C pressed.  Program exiting...')

finally:
    lcd.clear()
```

Execute above script using python filename.py

Step 8: You can even run Adafruit library from Python IDLE. (Interactive mode)

```
>>> import os
>>> os.chdir('/home/pi/Adafruit_Python_CharLCD/Adafruit_CharLCD')
>>> from Adafruit_CharLCD import Adafruit_CharLCD
>>> lcd = Adafruit_CharLCD(rs=26, en=19,
                           d4=13, d5=6, d6=5, d7=11,
                           cols=16, lines=2)
>>> lcd.message('MSD Gurukul\nLCD DEMO')
>>> lcd.clear()         #clears LCD Display
>>> lcd.show_cursor(True)       #displays cursor
>>> lcd.blink(True)             #blinks cursor
>>> lcd.move_left()             #moves string on left side
>>> lcd.move_right()            #moves string on right side
>>> lcd.show_cursor(False)      #hides cursor
>>> lcd.message("Thank You")
>>>
```