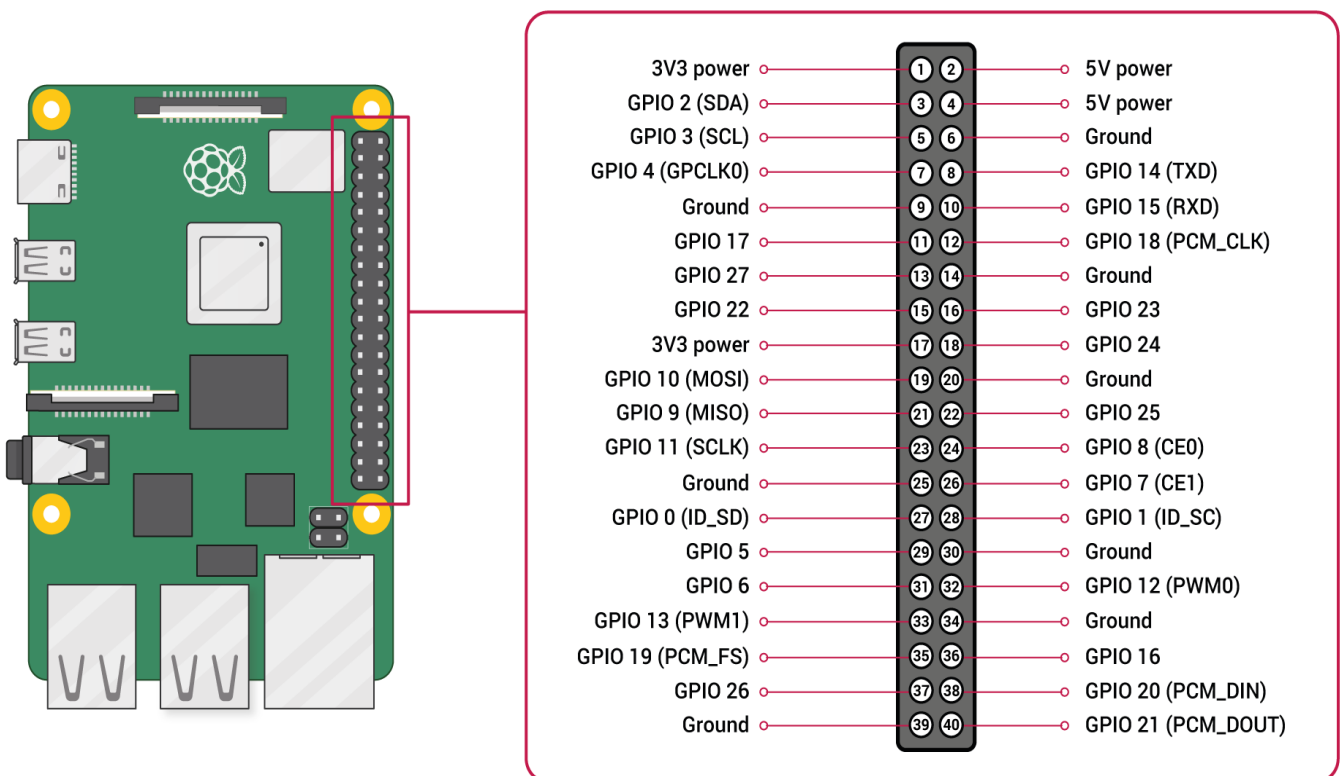


IOT Practicals

Raspberry Pi Pin Diagram



NOTE : To install modules use either pip3 or pip which is working

Pins:

- **Ground :** 6, 9, 14, 20, 25, 30, 34, 39
- **+3.3V VCC :** 1, 17
- **+5V VCC :** 2, 4

1. Interfacing Raspberry Pi with RFID.

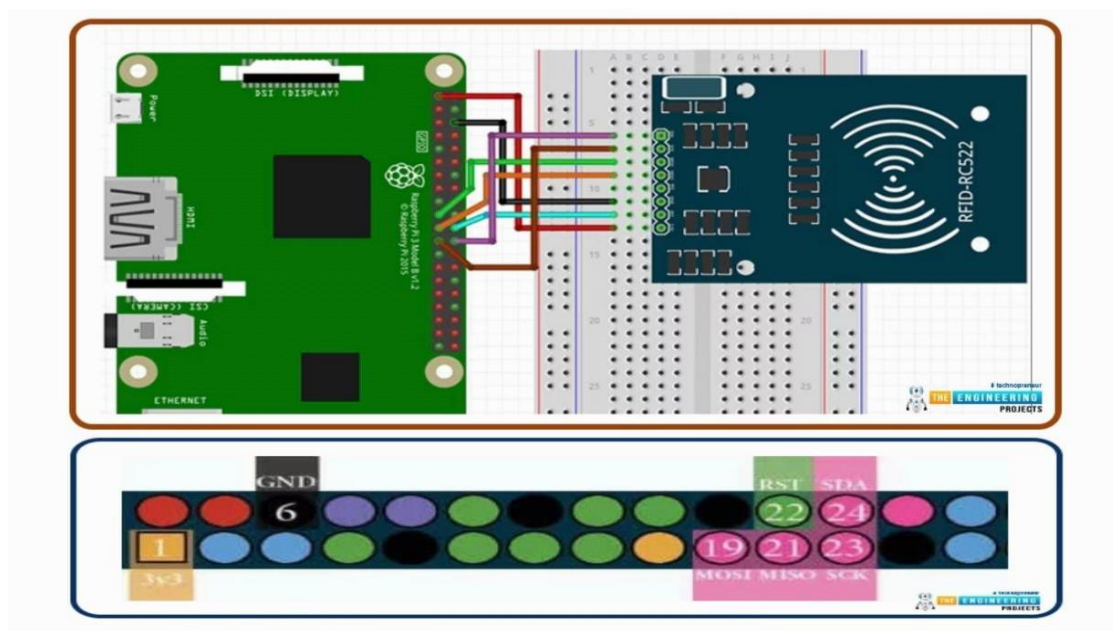
Modules : mfr522

Imports : mfr522 => SimpleMFRC522

RFID	RPi Pin
3V3	1
GND	9
SCK	23
SDA	24
MISO	21
MOSI	19
RST	22

Installation :

1. `pip install mfr522`
2. `sudo raspi-config`
3. Select the "Serial" option To access the login shell over serial communication, Select "No" option.



Code :

```
import RPi.GPIO as GPIO
from mfrc522 import SimpleMFRC522

GPIO.setwarnings(False)
reader = SimpleMFRC522()

while True:
    try:
        id, text = reader.read()
        print(id)
        print(text)
    finally:
        GPIO.cleanup()
```

Tutorial : <https://www.youtube.com/watch?v=niaTCyYKI7w>

2. LED Blinking.

Connection:

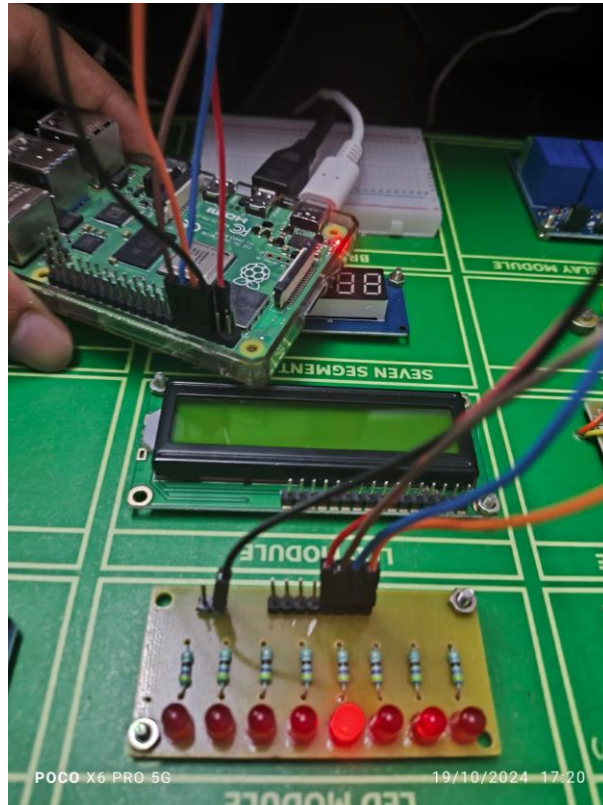
- In the raspberry Pi development board kit, there is an LED module.
- The LED Module has 7 male pins at the left hand side and 2 male pins at the RHS.
- The LHS is the positive terminal and RHS is negative terminal.
- Connect the raspberry Pi to positive terminal and negative terminal

```
import RPi.GPIO as GPIO
from time import sleep

GPIO.setmode(GPIO.BOARD)
r= [3,15,8,11,13,26,29,22]
GPIO.setup(r, GPIO.OUT)

while True:
    for i in r:
        GPIO.output(i, GPIO.HIGH)
        sleep (0.1)
        GPIO.output(i, GPIO.LOW)
```

```
sleep (0.1)
```



Ground (black wire) - 6

Led pins - 3,8,10,12

3. Camera

Modules : picamera

Imports : picamera => PiCamera

Connection:

- To connect the PiCamera, Insert the Ribbon cable of PiCamera into camera slot, slightly pull up the tabs of the connector at RPi board and insert the Ribbon cable into the slot, then gently push down the tabs again to fix the ribbon cable.

Installation:

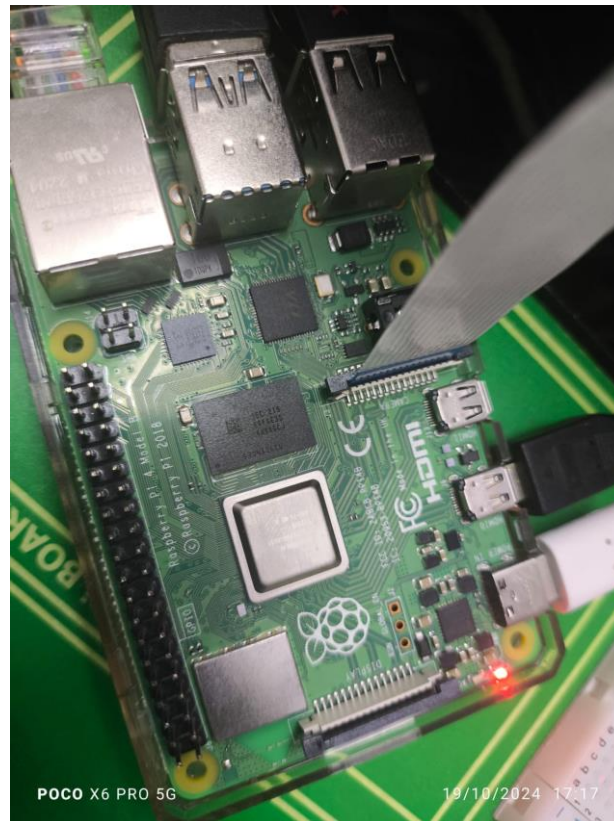
```
1. pip install picamera
```

```
2. sudo apt-get install python3-picamera
```

```
3. sudo raspi-config
```

4. Select Enable camera and Enable it sudo reboot.

5. Check with raspistill -o test.

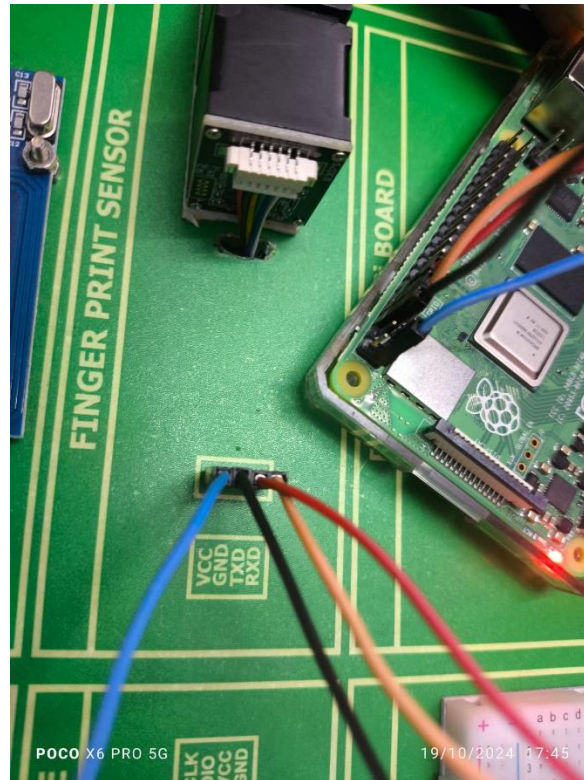


4. Fingerprint

Modules : board, busio, digitalio, adafruit-fingerprint

Imports : digitalio => DigitalInOut, Direction

Fingerprint Module	RPi Pin
VCC	2
GND	9
TxD	8
RxD	10



5. Telegram Bot

Modules : telepot (or pyTelegramBotAPI)

Imports : telepot.loop => MessageLoop

Pins :

- Blue – 7
- Yellow – 13
- Red – 11

6. Displaying Time over 4-Digit 7-Segment Display using Raspberry Pi.

Modules : raspberrypi-tm1637 => tm1637

TM1637 Module	Function	RPi Pin
GND	Ground	14
VCC	+5V power	4
DIO	Data In	18
CLK	Clock	16

```
import tm1637
import time
from datetime import datetime

tm=tm1637.TM1637(clk=16, dio=18)
clear= [0,0,0,0]
tm.write(clear)
time.sleep(1)
s='This is pretty cool'
tm.scroll(s, delay=250)
time.sleep(0)
tm.write(clear)
time.sleep(0)

while True:
    now=datetime.now()
    hh=int(datetime.strftime(now, '%H'))
    mm=int(datetime.strftime(now, '%M'))
    tm.numbers(hh,mm,colon=True)
    time.sleep(1000)
    tm.write(clear)
```

