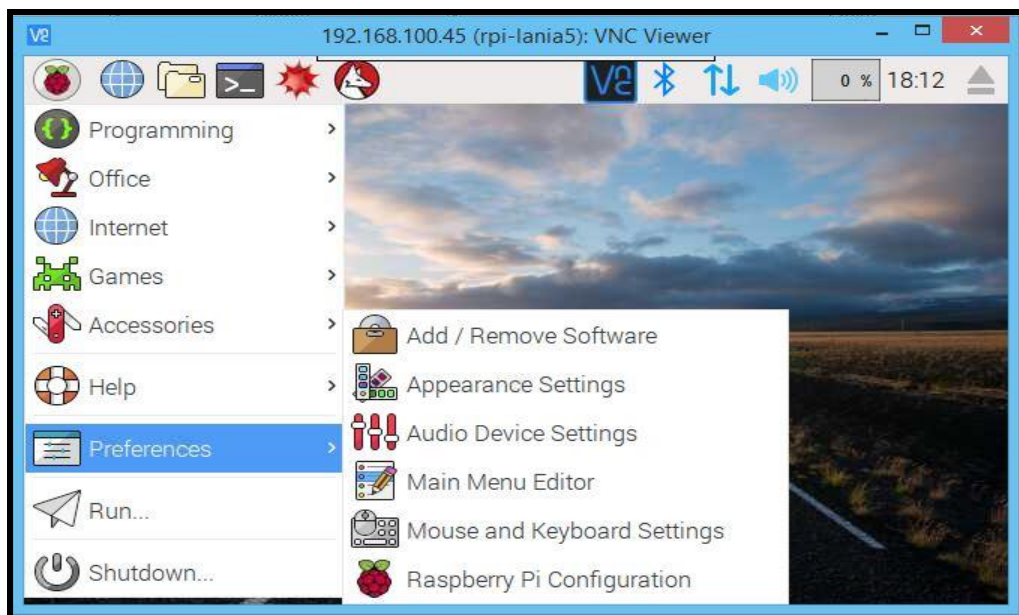


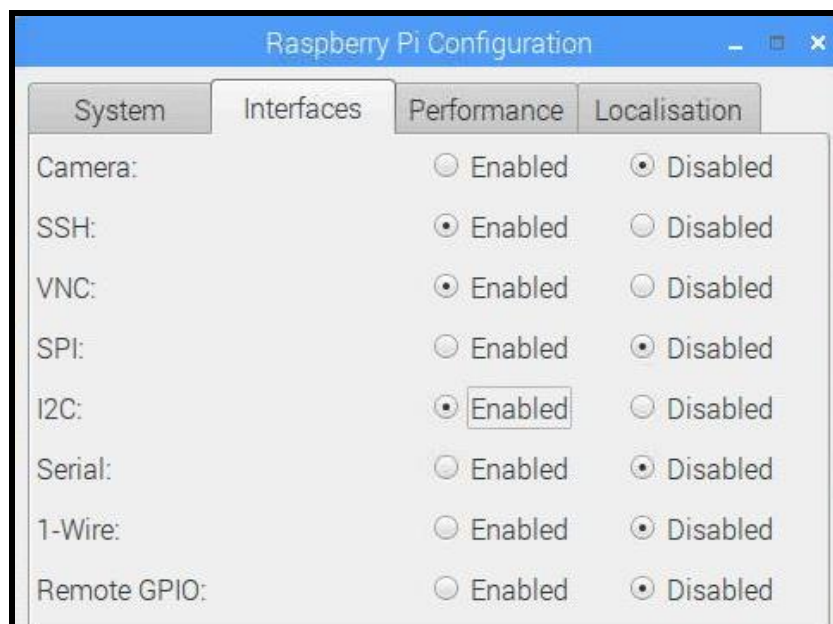
## Obtener lectura del sensor BH1750 utilizando RaspBerry.

Para poder hacer uso del sensor BH1750 hay que realizar configuraciones que no se tiene en la RaspBerry.

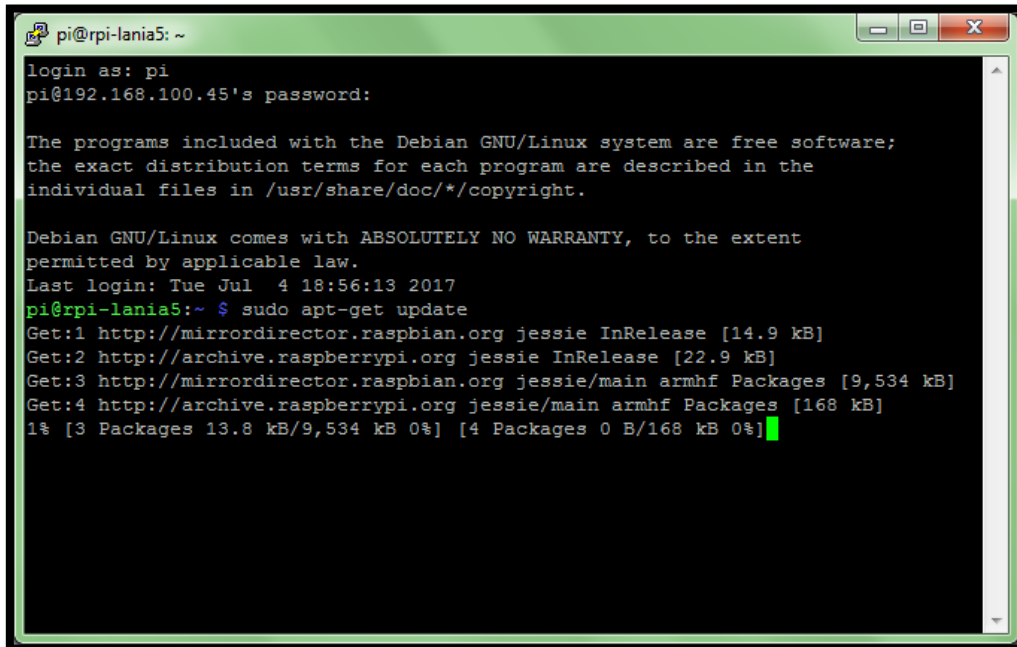
- Hay que configurar el módulo de I2C, lo cual se realizó de manera gráfica.
- Selecciona la opción de **Preferences** y después la opción de **Raspberry Pi Configuración**; como se muestra en la siguiente imagen.



- Luego se habilita la opción de **Enabled** de **I2C**; como se muestra en la imagen.



- Luego se realiza la instalación de utilidades.
- El primer comando que se utiliza es `sudo apt-get update` para una actualización y hay que esperar unos minutos mientras se realiza el proceso; como se muestra en las siguientes dos imágenes.



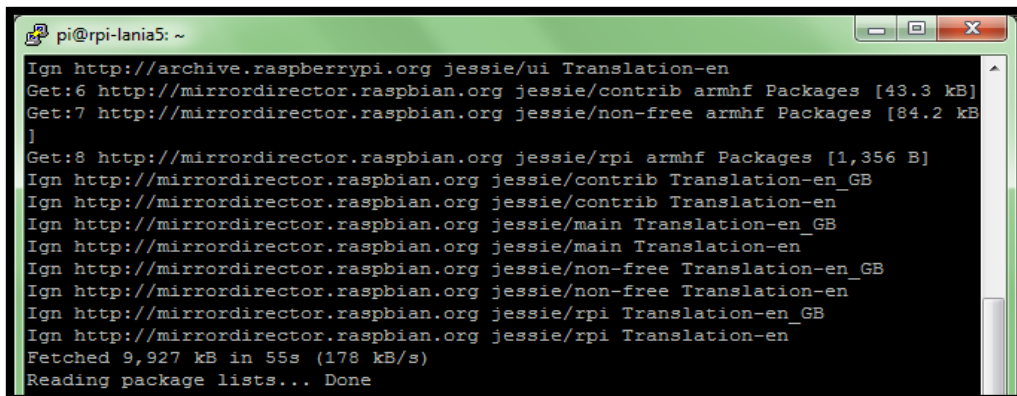
```

pi@rpi-lania5: ~
login as: pi
pi@192.168.100.45's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jul  4 18:56:13 2017
pi@rpi-lania5:~ $ sudo apt-get update
Get:1 http://mirrordirector.raspbian.org jessie InRelease [14.9 kB]
Get:2 http://archive.raspberrypi.org jessie InRelease [22.9 kB]
Get:3 http://mirrordirector.raspbian.org jessie/main armhf Packages [9,534 kB]
Get:4 http://archive.raspberrypi.org jessie/main armhf Packages [168 kB]
1% [3 Packages 13.8 kB/9,534 kB 0%] [4 Packages 0 B/168 kB 0%]

```



```

Ign http://archive.raspberrypi.org jessie/ui Translation-en
Get:6 http://mirrordirector.raspbian.org jessie/contrib armhf Packages [43.3 kB]
Get:7 http://mirrordirector.raspbian.org jessie/non-free armhf Packages [84.2 kB]
]
Get:8 http://mirrordirector.raspbian.org jessie/rpi armhf Packages [1,356 B]
Ign http://mirrordirector.raspbian.org jessie/contrib Translation-en_GB
Ign http://mirrordirector.raspbian.org jessie/contrib Translation-en
Ign http://mirrordirector.raspbian.org jessie/main Translation-en_GB
Ign http://mirrordirector.raspbian.org jessie/main Translation-en
Ign http://mirrordirector.raspbian.org jessie/non-free Translation-en_GB
Ign http://mirrordirector.raspbian.org jessie/non-free Translation-en
Ign http://mirrordirector.raspbian.org jessie/rpi Translation-en_GB
Ign http://mirrordirector.raspbian.org jessie/rpi Translation-en
Fetched 9,927 kB in 55s (178 kB/s)
Reading package lists... Done

```

- Luego se instala las herramientas necesarias de I2C con el siguiente comando `sudo apt-get install -y Python-smbus i2c-tools`.
- Una vez realizado los pasos anteriores se procede a reiniciar la RaspBerry.

```
pi@rpi-lania5:~$ sudo apt-get install -y python-smbus i2c-tools
Reading package lists... Done
Building dependency tree
Reading state information... Done
i2c-tools is already the newest version.
i2c-tools set to manually installed.
python-smbus is already the newest version.
0 upgraded, 0 newly installed, 0 to remove and 103 not upgraded.
pi@rpi-lania5:~$ sudo halt
```

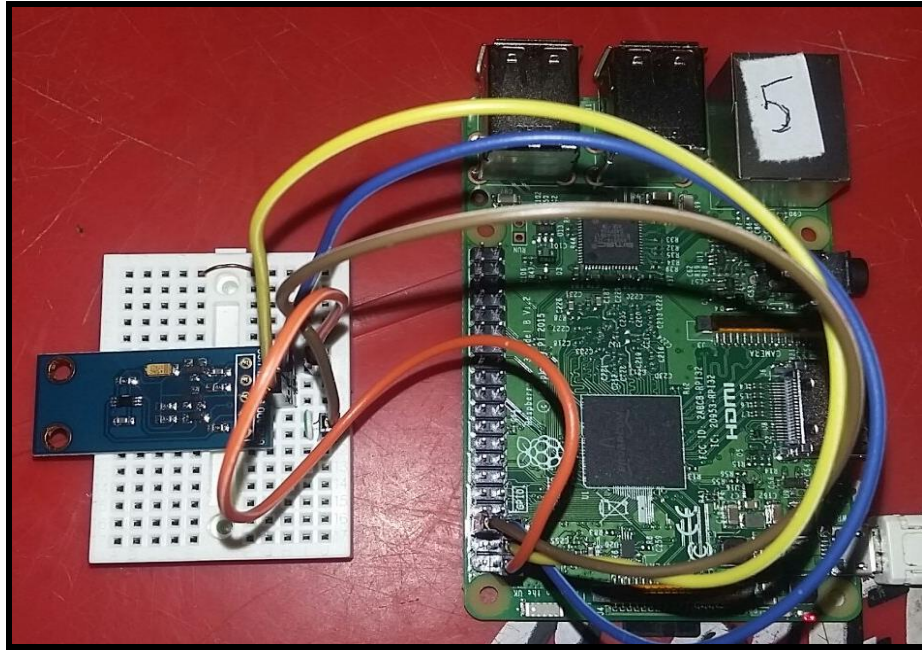
- Una vez reiniciada la RaspBerry se utiliza el siguiente comando **lsmod | grep i2c\_** para verificar que se instalaron los módulos; como se muestra en la siguiente imagen.

```
pi@rpi-lania5: ~
login as: pi
pi@192.168.100.45's password:

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jul  4 19:03:13 2017
pi@rpi-lania5:~$ lsmod | grep i2c_
i2c_bcm2708      4834  0
i2c_dev         5859  0
pi@rpi-lania5:~$
```

- Imagen del sensor conectado a la RaspBerry, se recomienda soldar el sensor a sus pines ya que si no esta puede que se pierda la comunicación porque se puede mover.



- Código utilizado para obtener dato del sensor, el código esta realizado en Python.

```
import smbus
```

```
import time
```

```
# Define some constants from the datasheet
```

```
DEVICE    = 0x23 # Default device I2C address
```

```
POWER_DOWN = 0x00 # No active state
```

```
POWER_ON   = 0x01 # Power on
```

```
RESET      = 0x07 # Reset data register value
```

```
# Start measurement at 4lx resolution. Time typically 16ms.
```

```
CONTINUOUS_LOW_RES_MODE = 0x13
```

```
# Start measurement at 1lx resolution. Time typically 120ms
```

```
CONTINUOUS_HIGH_RES_MODE_1 = 0x10
```

```
# Start measurement at 0.5lx resolution. Time typically 120ms
```

```
CONTINUOUS_HIGH_RES_MODE_2 = 0x11
```

```
# Start measurement at 1lx resolution. Time typically 120ms
```

```
# Device is automatically set to Power Down after measurement.
```

```
ONE_TIME_HIGH_RES_MODE_1 = 0x20
```

```
# Start measurement at 0.5lx resolution. Time typically 120ms
```

```
# Device is automatically set to Power Down after measurement.
```

```
ONE_TIME_HIGH_RES_MODE_2 = 0x21
```

```
# Start measurement at 1lx resolution. Time typically 120ms
```

```
# Device is automatically set to Power Down after measurement.
```

```
ONE_TIME_LOW_RES_MODE = 0x23
```

```
#bus = smbus.SMBus(0) # Rev 1 Pi uses 0
```

```
bus = smbus.SMBus(1) # Rev 2 Pi uses 1
```

```
def convertToNumber(data):
```

```
    # Simple function to convert 2 bytes of data
```

```
    # into a decimal number
```

```
    return ((data[1] + (256 * data[0])) / 1.2)
```

```
def readLight(addr=DEVICE):
```

```
    data = bus.read_i2c_block_data(addr, ONE_TIME_HIGH_RES_MODE_1)
```

```
    return convertToNumber(data)
```

```
def main():
```

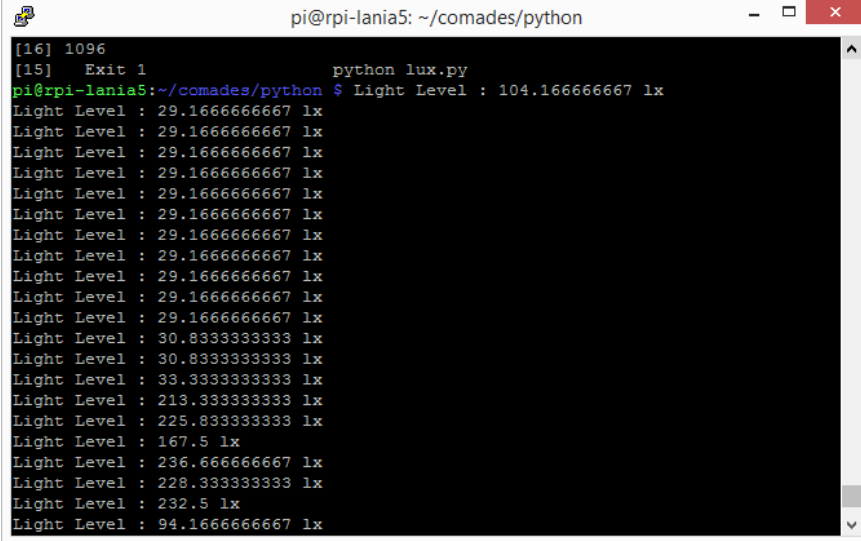
```
    while True:
```

```
print "Light Level : " + str(readLight()) + " lx"
```

```
time.sleep(0.5)
```

```
main()
```

- Los resultado que dio al momento de correr el código se muestra en la siguiente imagen, para correr el código se ejecutó el siguiente comando ***Python nombre\_archivo.py***



```
pi@rpi-lania5: ~/comades/python
[16] 1096
[15] Exit 1 python lux.py
pi@rpi-lania5:~/comades/python $ Light Level : 104.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 29.166666667 lx
Light Level : 30.833333333 lx
Light Level : 30.833333333 lx
Light Level : 33.333333333 lx
Light Level : 213.333333333 lx
Light Level : 225.833333333 lx
Light Level : 167.5 lx
Light Level : 236.666666667 lx
Light Level : 228.333333333 lx
Light Level : 232.5 lx
Light Level : 94.166666667 lx
```