

CURSO DE RASPBERRY PI

Semana 2-Laboratorio 1

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1 Semana 2: Raspberry y Python – Laboratorio 1

- Previas
- Instalación y uso de Python
- Uso de GPIO y Python
- Uso de la tarjeta de expansión para raspberry pi de RMJ
 - Pulsadores
 - Leds
 - Ultrasonido



Materiales

- 1 Raspberry Pi Model B+
- 2 Fuente para Raspberry 5V-2A
- 3 Caja de acrilico para Raspberry
- 4 Memoria SD de 4GB
- 5 WIFI para Raspberry
- 6 1 Protoboard
- 7 cables de conexión
- 8 leds
- 9 resistencias
- 10 botones
- 11 ultrasonido



- Instalar Win32DiskImager

<http://sourceforge.net/projects/win32diskimager/files/latest/download>

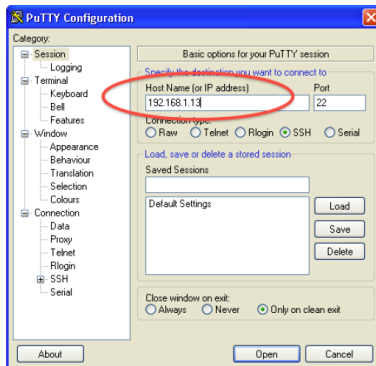
- Instalar putty

<http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>



Conexión SSH

Abrir el programa putty y colocar la configuración siguiente:

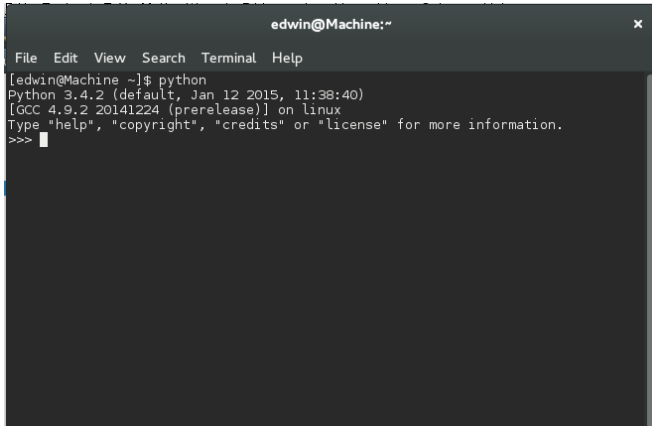


Instalación y uso de Python

```
$ sudo apt-get install python-dev
$ sudo apt-get install python-setuptools
$ sudo easy_install -U distribute
$ sudo apt-get install python-pip
$ sudo pip install rpi.gpio
```

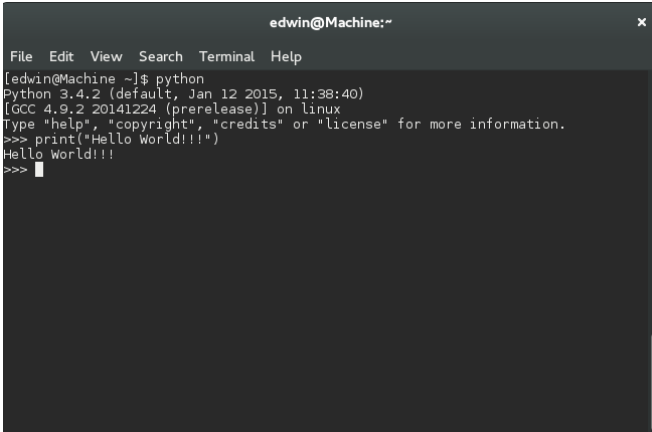


\$ python

A terminal window titled 'edwin@Machine:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'python' being executed, which outputs 'Python 3.4.2 (default, Jan 12 2015, 11:38:40) [GCC 4.9.2 20141224 (prerelease)] on linux'. It then prompts the user to type 'help', 'copyright', 'credits' or 'license' for more information. The prompt '>>>' is followed by a cursor.

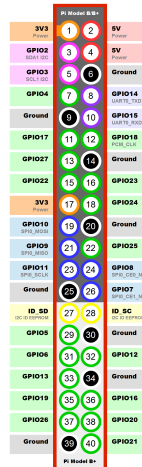
```
edwin@Machine:~  
File Edit View Search Terminal Help  
[edwin@Machine ~]$ python  
Python 3.4.2 (default, Jan 12 2015, 11:38:40)  
[GCC 4.9.2 20141224 (prerelease)] on linux  
Type "help", "copyright", "credits" or "license" for more information.  
>>> █
```

\$ print("Hello World!!!")

A screenshot of a terminal window titled "edwin@Machine:~". The window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the user running the command "python" in a shell. The output indicates Python 3.4.2 is running on Linux. The user then enters a multi-line Python script: ">>> print('Hello World!!!')", which outputs "Hello World!!!". The prompt ">>>" is followed by a cursor.

```
edwin@Machine:~  
File Edit View Search Terminal Help  
[edwin@Machine ~]$ python  
Python 3.4.2 (default, Jan 12 2015, 11:38:40)  
[GCC 4.9.2 20141224 (prerelease)] on linux  
Type "help", "copyright", "credits" or "license" for more information.  
>>> print("Hello World!!!")  
Hello World!!!  
>>> 
```


Uso de GPIO y Python



www.raspberrypi.org



Figura: Pinout B+

Código

Descargar el código fuente desde la siguiente página:
<https://github.com/eyllanesc/Raspberry-Course>



Pulsadores

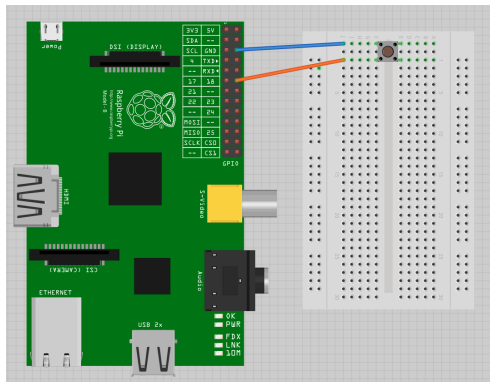


Figura: Circuito para el uso de pulsadores

Código

```
import RPi.GPIO as GPIO #import GPIO library
import time #import time for managed time

GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN, pull_up_down=GPIO.PUD_UP) #GPIO 18 como entrada

while True:
    input_state = GPIO.input(18) #leemos la entrada
    if input_state == False: #si esta en nivel bajo
        print('Button Pressed') #imprime esto
        time.sleep(0.2) #tiempo muerto
```

Leds

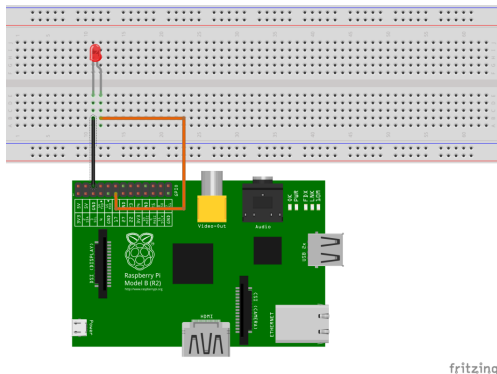


Figura: Circuito para el encendido de Led

Ultrasonido

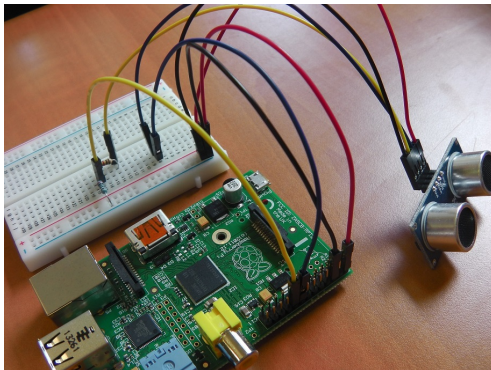


Figura: Conexión

Código

```
import RPi.GPIO as GPIO
import time
GPIO.setmode(GPIO.BCM)
TRIG = 23
ECHO = 24
print "Distance Measurement In Progress"
GPIO.setup(TRIG,GPIO.OUT)
GPIO.setup(ECHO,GPIO.IN)
GPIO.output(TRIG, False)
print "Waiting For Sensor To Settle"
time.sleep(2)
GPIO.output(TRIG, True)
time.sleep(0.00001)
GPIO.output(TRIG, False)
while GPIO.input(ECHO)==0:
    pulse_start = time.time()
while GPIO.input(ECHO)==1:
    pulse_end = time.time()
pulse_duration = pulse_end - pulse_start
distance = pulse_duration * 17150
distance = round(distance, 2)
print "Distance:",distance,"cm"
GPIO.cleanup()
```



Gracias
Por su
Atención!!!

Consultas a:
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