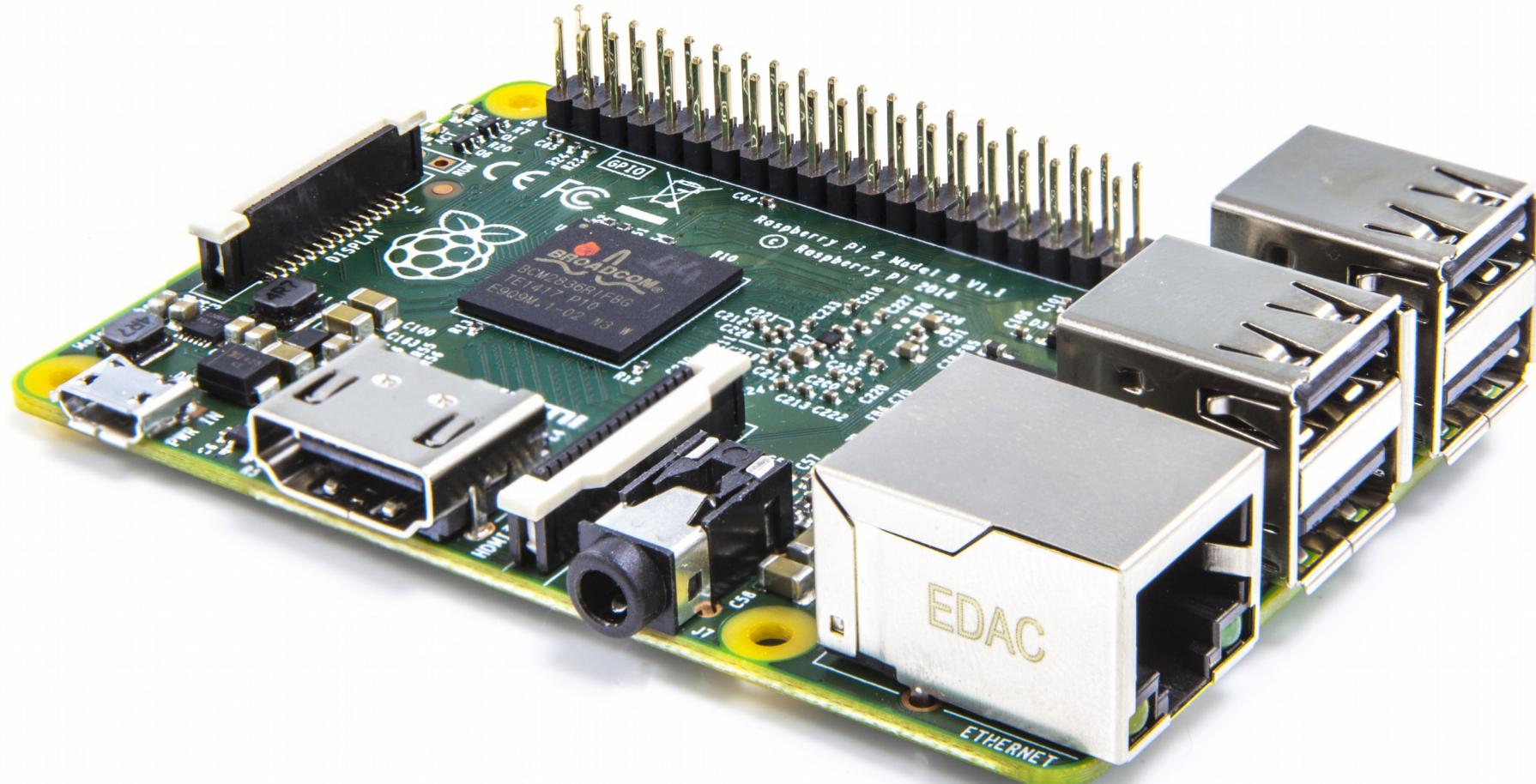
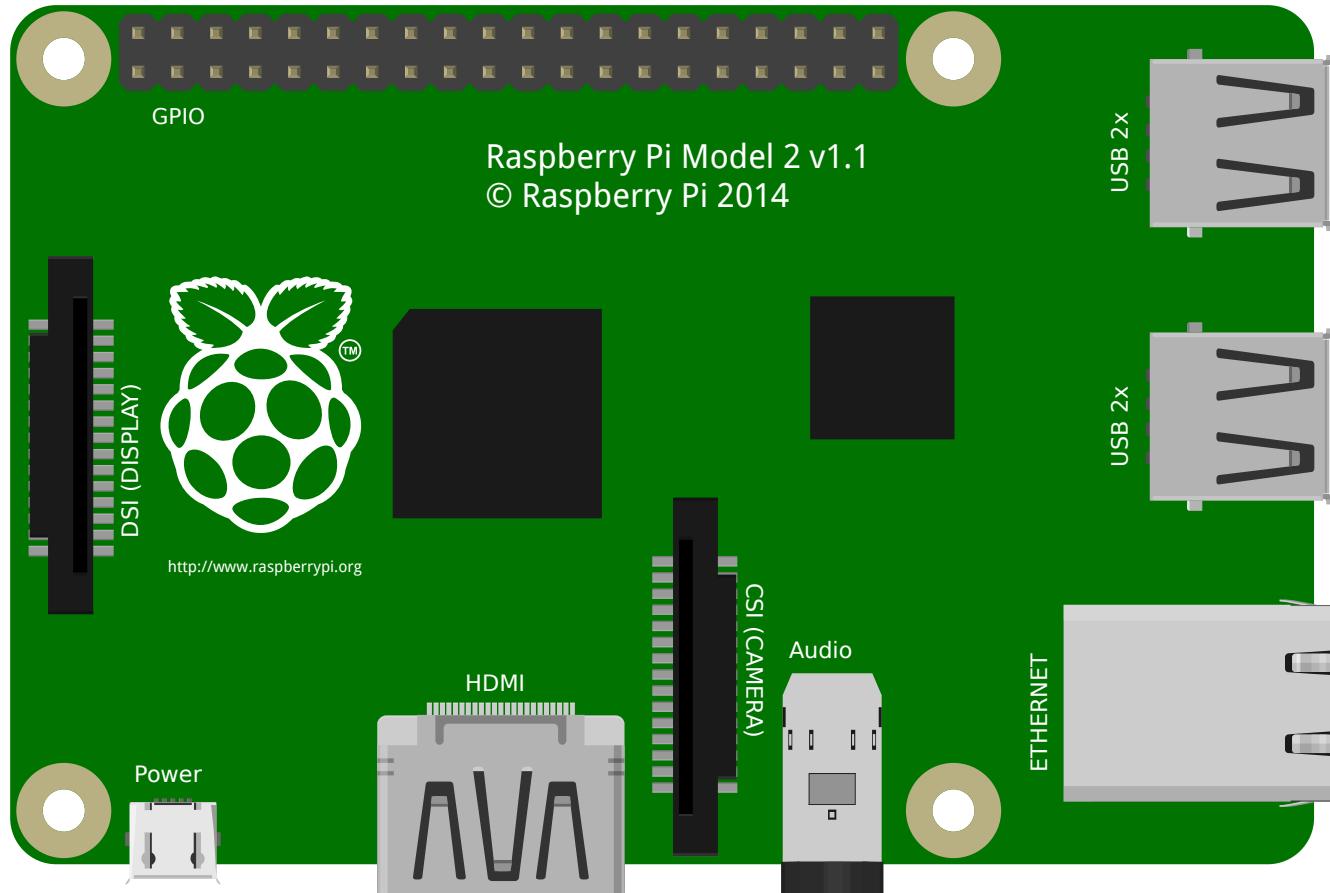




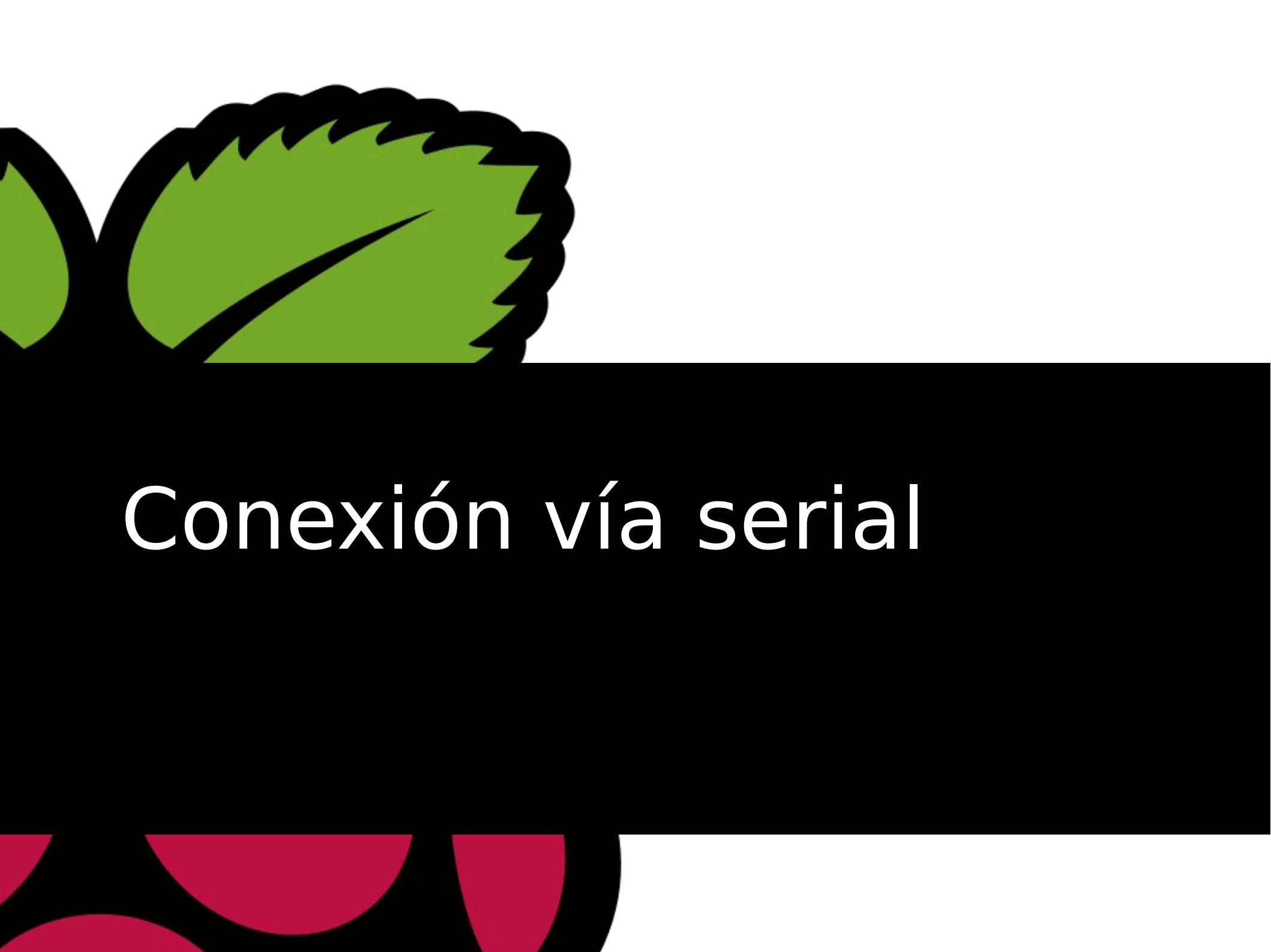
# Introducción a Raspberry Pi

Javier Vila

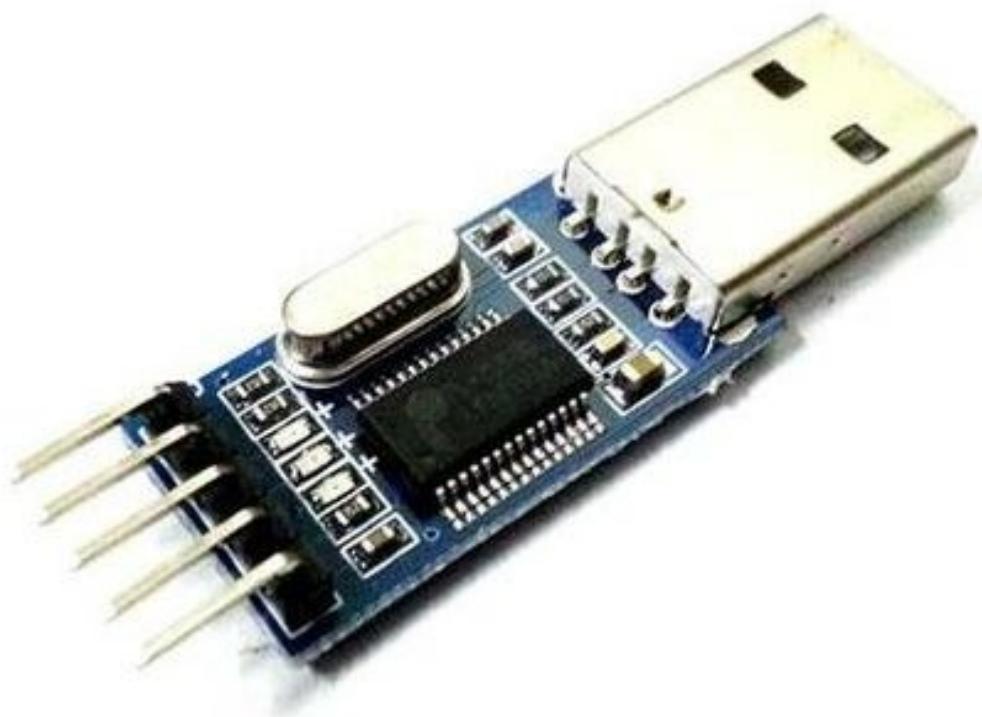




fritzing



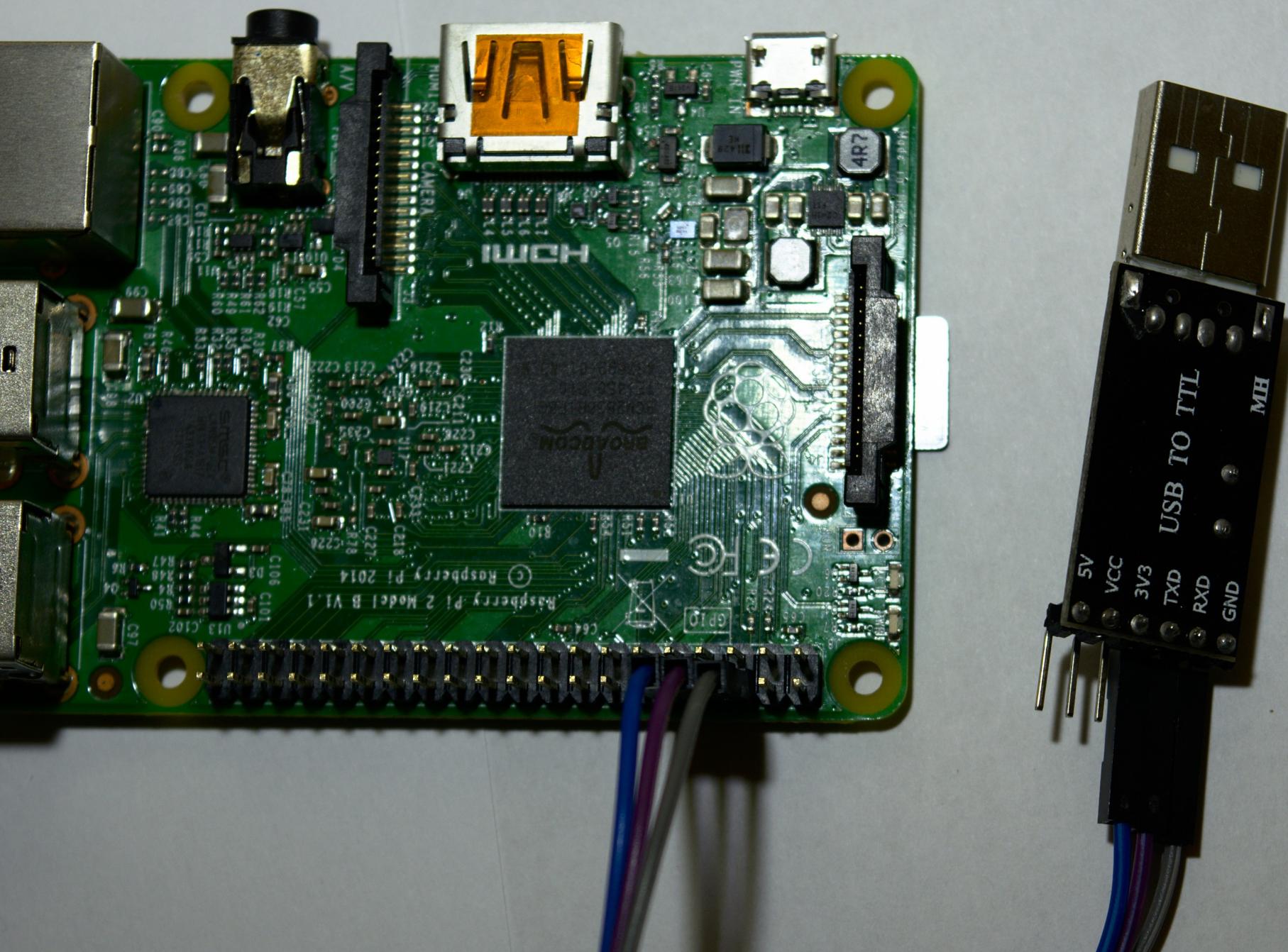
Conexión vía serial





<i>Pin#</i>	<i>NAME</i>		<i>NAME</i>	<i>Pin#</i>
01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I2C)		DC Power 5v	04
05	GPIO03 (SCL1 , I2C)		Ground	06
07	GPIO04 (GPIO_GCLK)			08
09	Ground			10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I2C ID EEPROM)		(I2C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38

← Serial









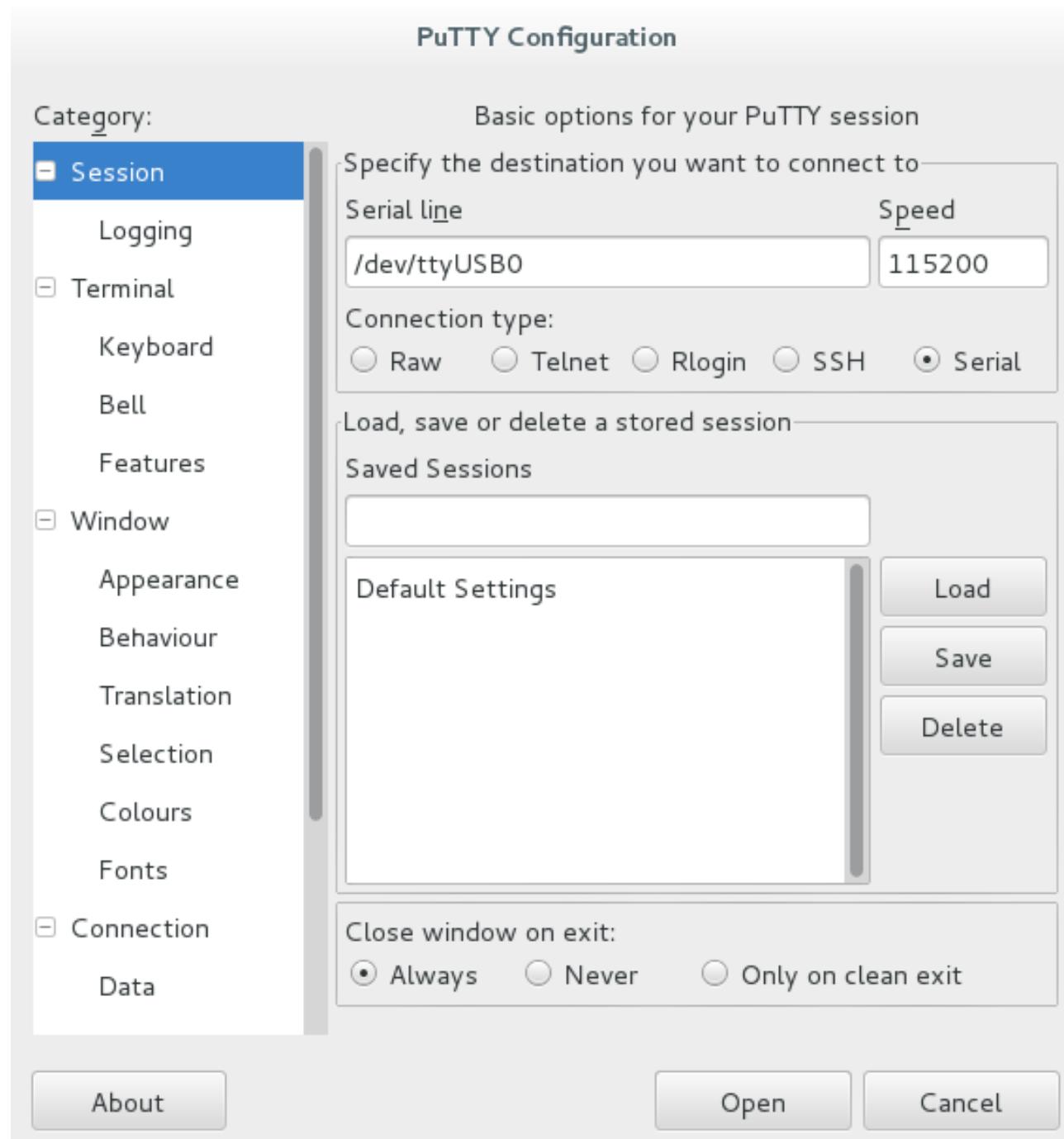


[tinyaddr.es/tFmbP](https://tinyaddr.es/tFmbP)

# PuTTY

# PuTTY

*...no es broma*





# Instalación del sistema operativo (Raspbian)



## RASPBIAN JESSIE

Full desktop image based on Debian Jessie

Version: February 2016

Release date: 2016-02-09

Kernel version: 4.1

Release notes: [Link](#)

 Download Torrent

 Download ZIP

SHA-1: da329713833e0785ffd94796304b7348803381db

<https://www.raspberrypi.org/downloads/raspbian/>

```
root@debian-nixijav:/home/nixijav# fdisk -l
Disk /dev/mmcblk0: 7.4 GiB, 7948206080 bytes, 15523840 sectors
 /dev/mmcblk0p1            8192    122879   114688    56M  c W95 FAT32 (LBA)
 /dev/mmcblk0p2        122880 15523839 15400960  7.4G  83 Linux
```

---

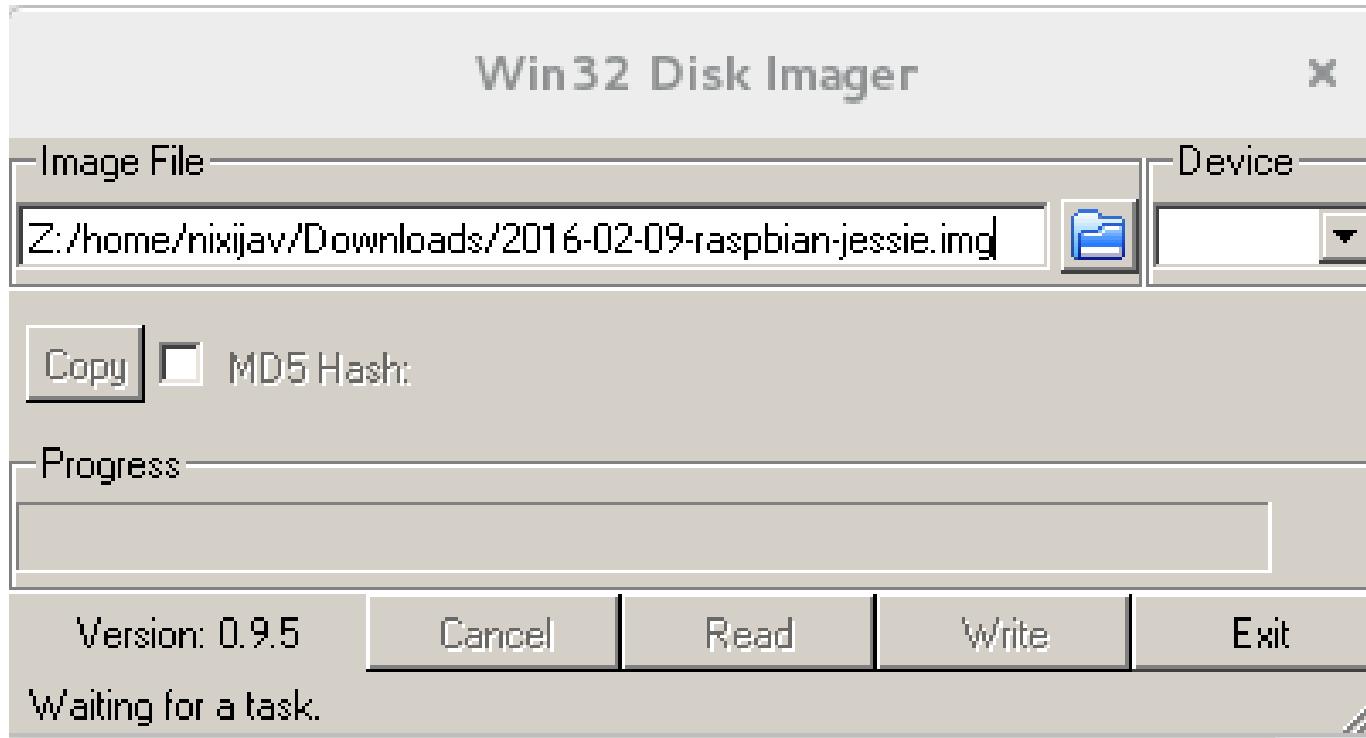
```
root@debian-nixijav:/home/nixijav# dd if=Downloads/2016-02-09-raspbian-jessie.img of=/dev/mmcblk0
```

---

```
root@debian-nixijav:/home/nixijav# sync
```



Itilizar siempre root o sudo!



<https://sourceforge.net/projects/win32diskimager/>

Usuario: pi  
Contraseña: raspberry

1 Expand Filesystem	Ensures that all of the SD card space is used
2 Change User Password	Change password for the default user
3 Enable Boot to Desktop/Scratch	Choose whether to boot into a desktop environment or scratch mode
4 Internationalisation Options	Set up language and regional settings
5 Enable Camera	Enable this Pi to work with the RPi camera module
6 Add to Rastrack	Add this Pi to the online Raspberry Pi database
7 Overclock	Configure overclocking for your Pi
8 Advanced Options	Configure advanced settings
9 About raspi-config	Information about this configuration tool

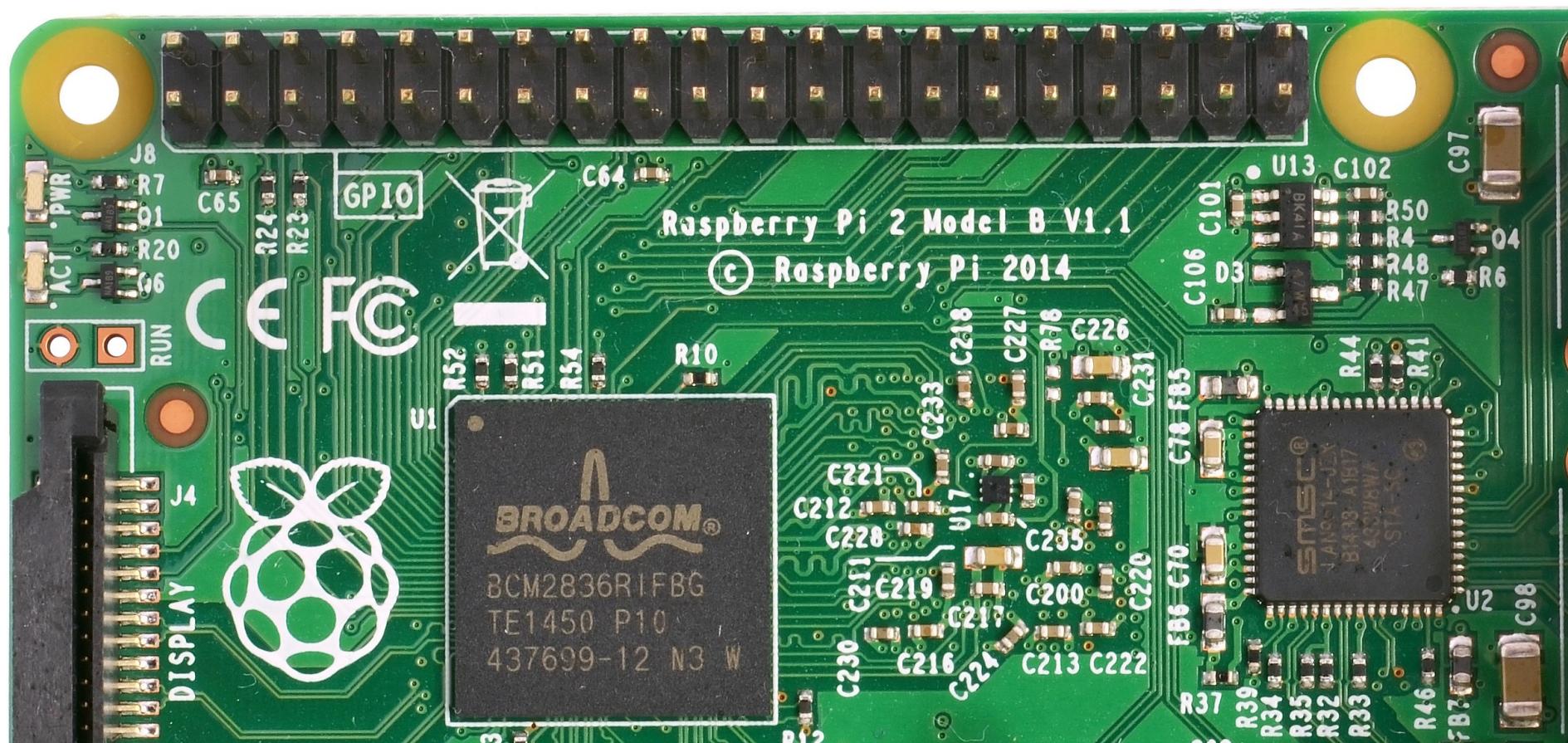
# sudo raspi-config

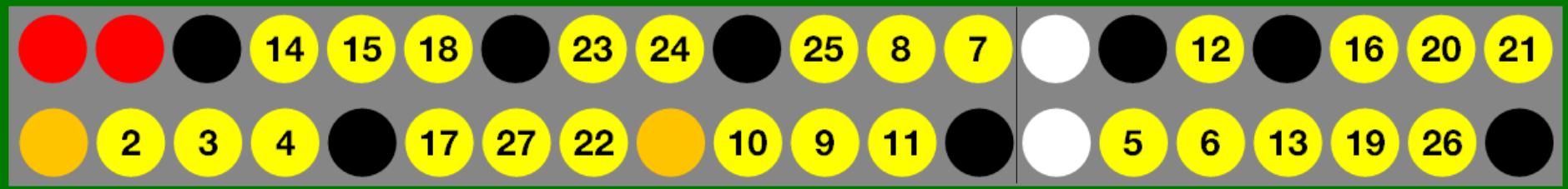
A1 Overscan	You may need to configure oversca
A2 Hostname	Set the visible name for this Pi
A3 Memory Split	Change the amount of memory made
A4 SSH	Enable/Disable remote command lin
A5 Device Tree	Enable/Disable the use of Device
A6 SPI	Enable/Disable automatic loading
A7 I2C	Enable/Disable automatic loading
A8 Serial	Enable/Disable shell and kernel m
A9 Audio	Force audio out through HDMI or 3
A0 Update	Update this tool to the latest ve

## Opciones avanzadas

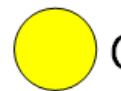


# Introducción al GPIO





Raspberry Pi A+ / B+ and Raspberry Pi 2 GPIO pins



GPIO



Ground



3.3v



5v



ID EEPROM  
Advanced use only!

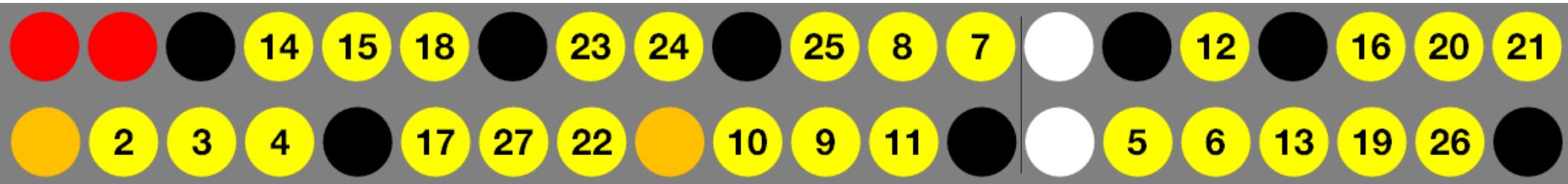
<https://es.pinout.xyz>

01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I2C)		DC Power 5v	04
05	GPIO03 (SCL1 , I2C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I2C ID EEPROM)		(I2C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40

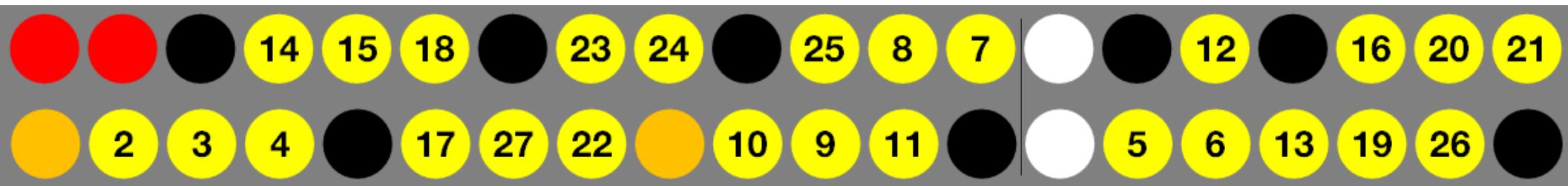
<i>Pin#</i>	<i>NAME</i>		<i>NAME</i>	<i>Pin#</i>
01	3.3v DC Power		DC Power 5v	02
03			DC Power 5v	04
05			Ground	06
07	GPIO04 (GPIO_GCLK)			08
09	Ground			10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19			Ground	20
21	SPI	→	(GPIO_GEN6) GPIO25	22
23				24
25	Ground			26
27	ID_SD (I2C ID EEPROM)		(I2C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38



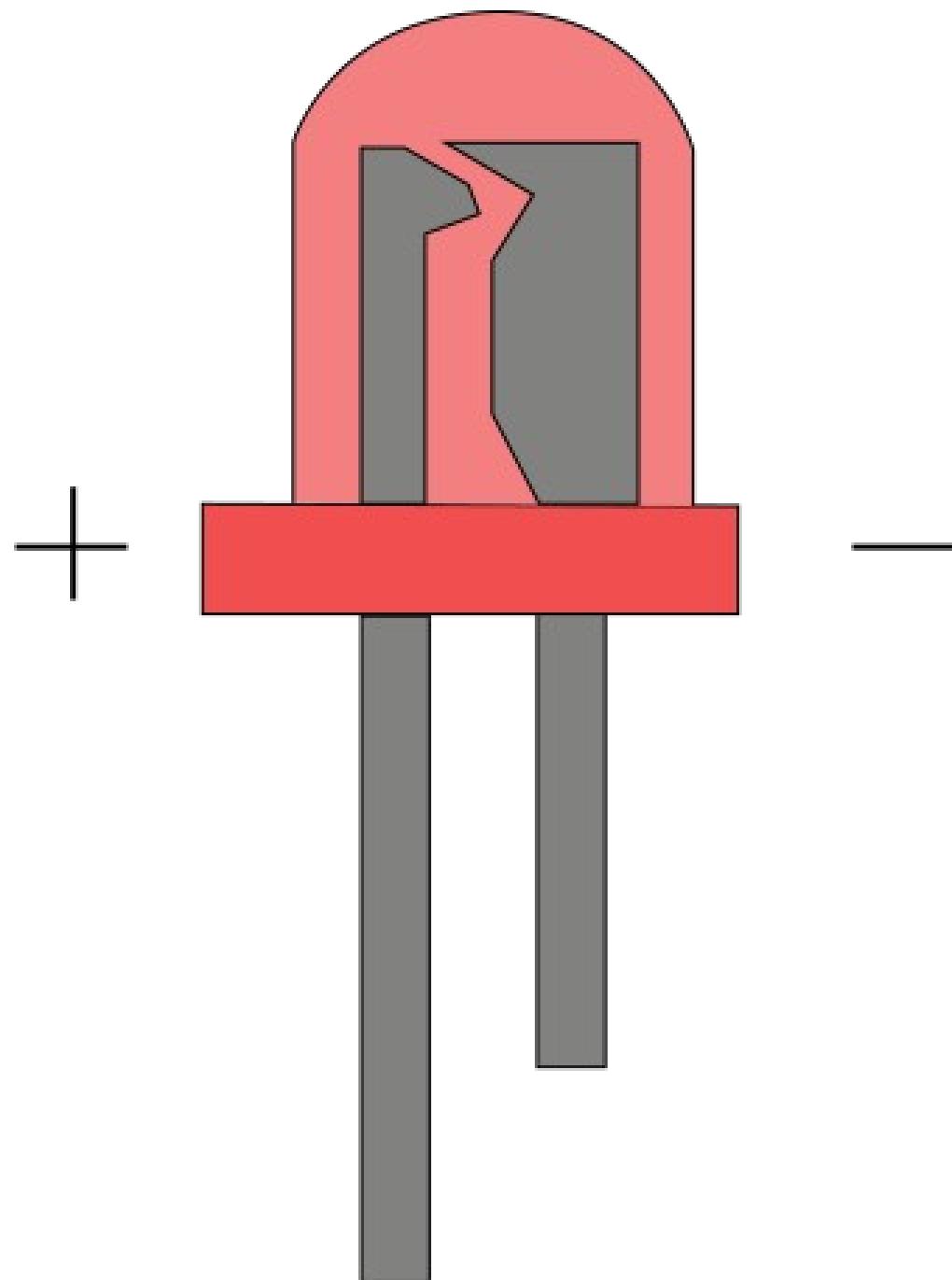
20 mA máx. por pin. 51 mA totales.

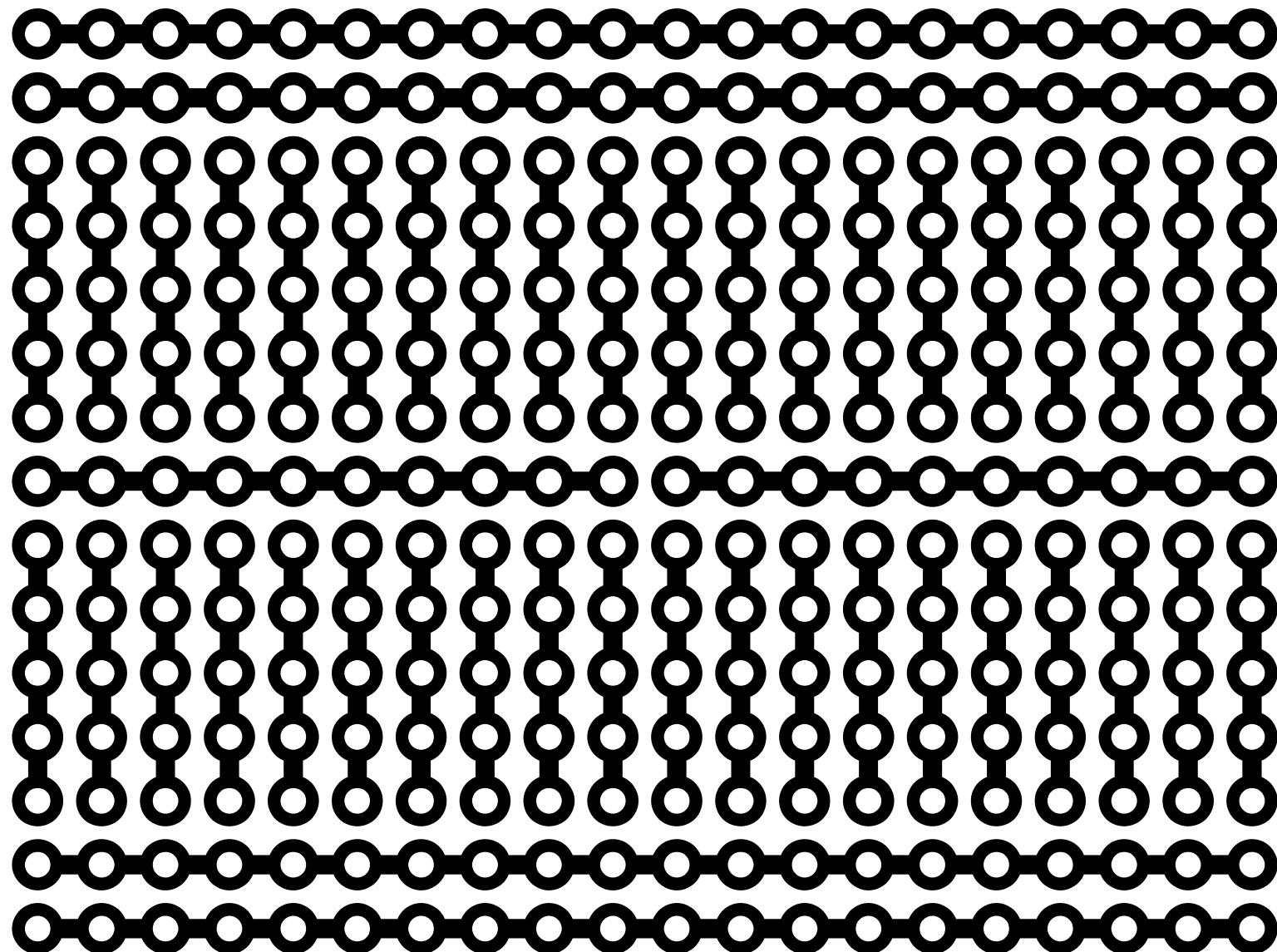


gpio -g mode x out/in

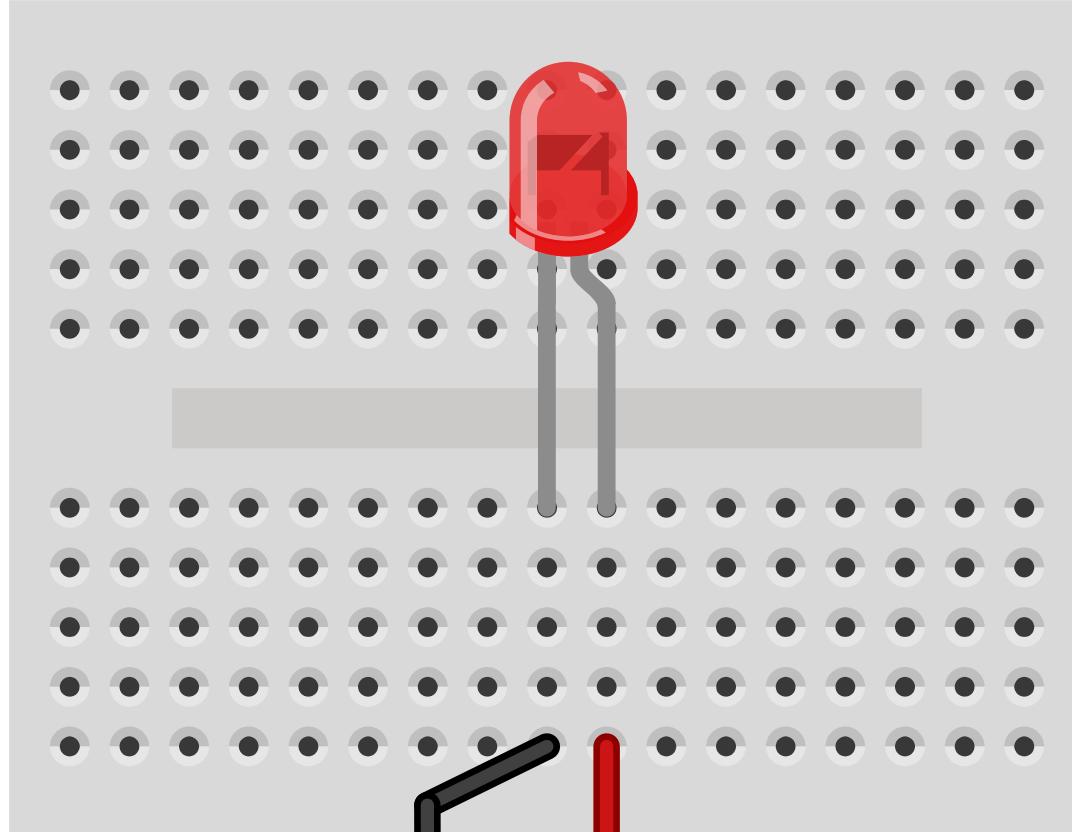


gpio -g write x 0/1



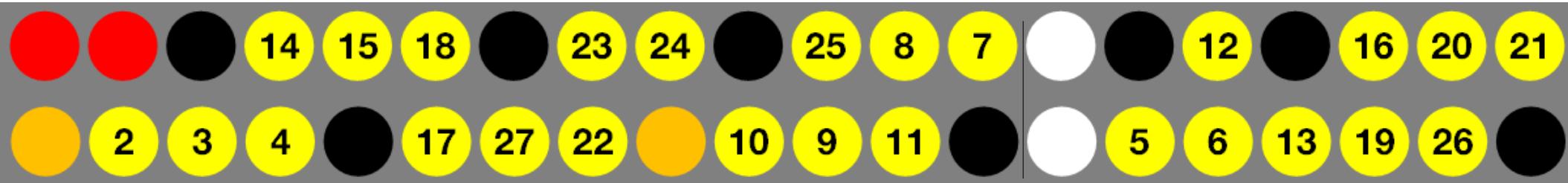


fritzing



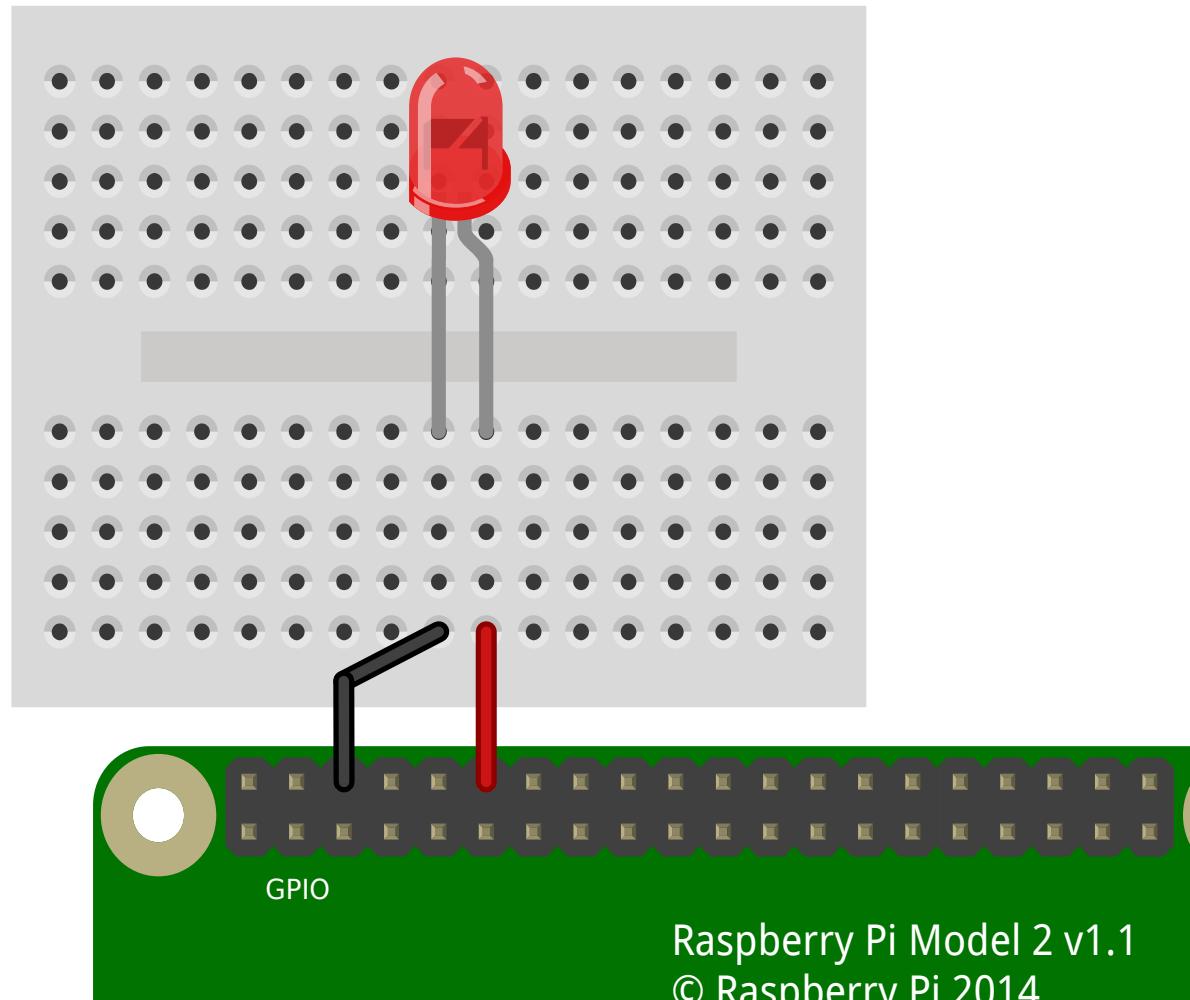
GPIO

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© Raspberry Pi 2014



gpio -g mode x out/in

gpio -g write x 0/1



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© Raspberry Pi 2014

GNU nano 2.2.6

File: led.py

[

[ New File ]

**^G** Get Help    **^O** WriteOut    **^R** Read File    **^Y** Prev Page    **^K** Cut Text    **^C** Cur Pos  
**^X** Exit        **^J** Justify      **^W** Where Is     **^V** Next Page    **^U** UnCut Text **^T** To Spell

# nano led.py

GNU nano 2.2.6

File: led.py

Modified

```
import RPi.GPIO as GPIO
import time

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.OUT)

while 1:
    GPIO.output(18, True)
    time.sleep(1)
    GPIO.output(18, False)
    time.sleep(1)
```

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos  
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

# nano led.py

```
wget https://goo.gl/XuvJZ8 -o  
led.py
```

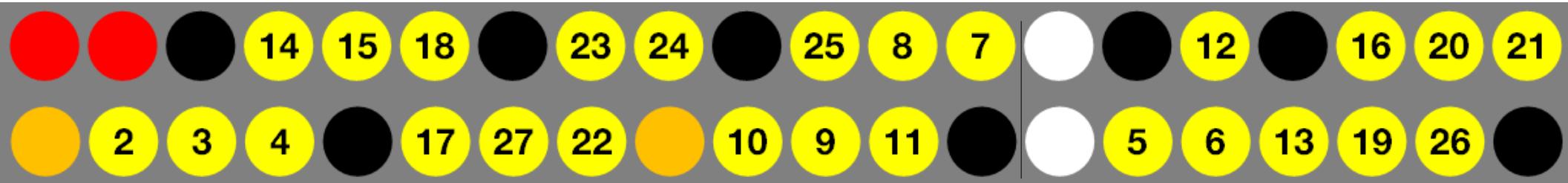
```
import RPi.GPIO as GPIO  
import time
```

```
GPIO.setwarnings(False)  
GPIO.setmode(GPIO.BCM)
```

```
GPIO.setup(18, GPIO.OUT)
```

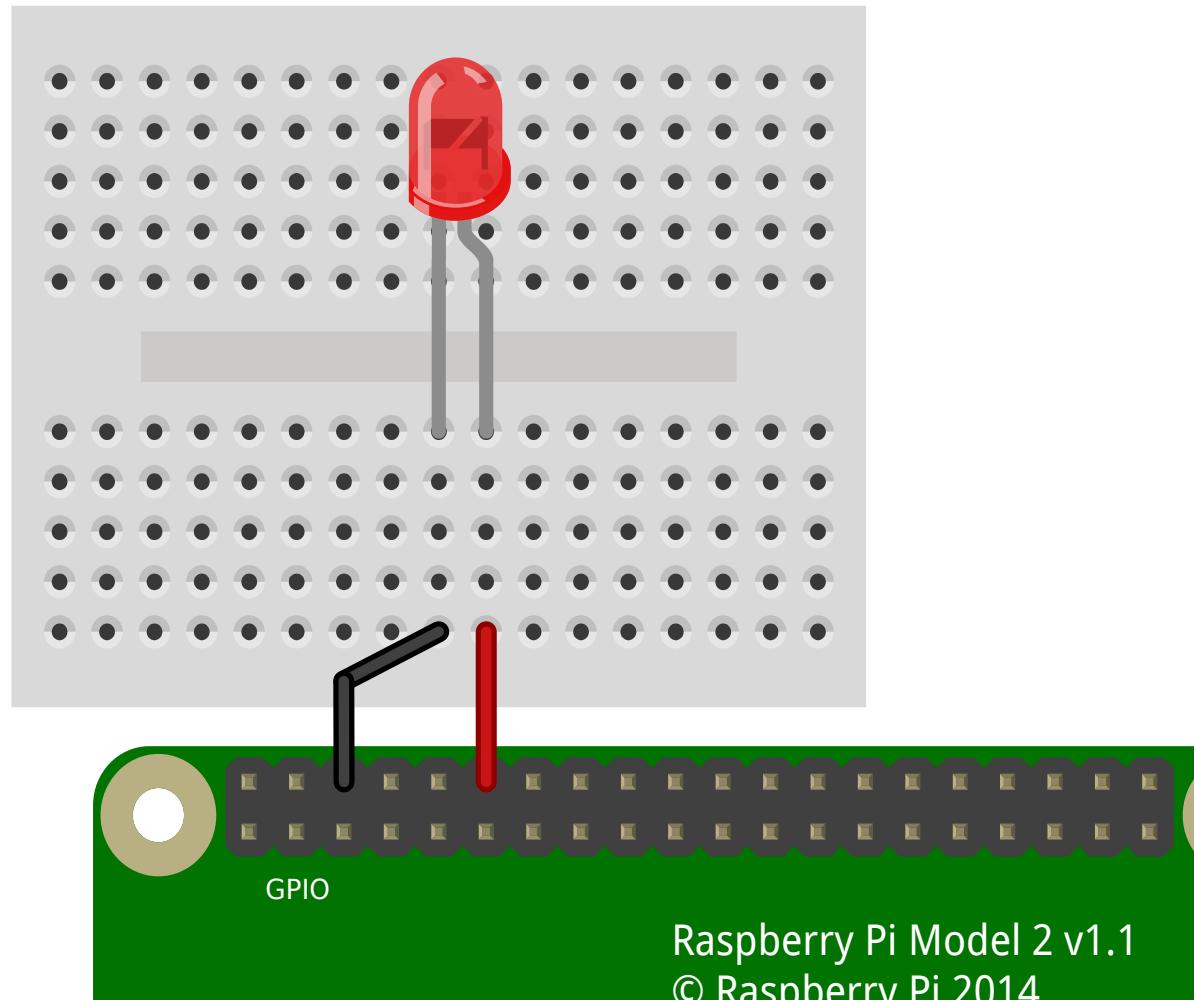
```
while 1:  
    GPIO.output(18, True)  
    time.sleep(1)  
    GPIO.output(18, False)  
    time.sleep(1)
```

`python led.py`



nano led.py

python led.py



fritzing

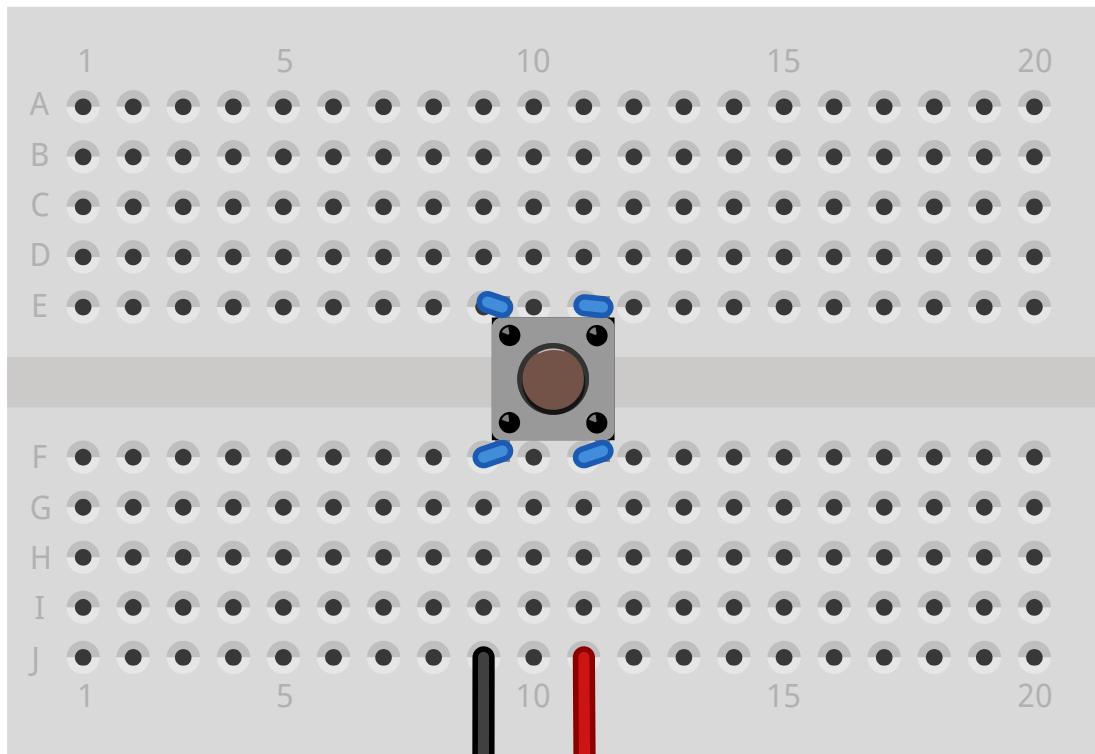


# Lectura de sensores I

01	3.3v DC Power		DC Power 5v	02
03	GPIO02 (SDA1 , I2C)		DC Power 5v	04
05	GPIO03 (SCL1 , I2C)		Ground	06
07	GPIO04 (GPIO_GCLK)		(TXD0) GPIO14	08
09	Ground		(RXD0) GPIO15	10
11	GPIO17 (GPIO_GEN0)		(GPIO_GEN1) GPIO18	12
13	GPIO27 (GPIO_GEN2)		Ground	14
15	GPIO22 (GPIO_GEN3)		(GPIO_GEN4) GPIO23	16
17	3.3v DC Power		(GPIO_GEN5) GPIO24	18
19	GPIO10 (SPI_MOSI)		Ground	20
21	GPIO09 (SPI_MISO)		(GPIO_GEN6) GPIO25	22
23	GPIO11 (SPI_CLK)		(SPI_CE0_N) GPIO08	24
25	Ground		(SPI_CE1_N) GPIO07	26
27	ID_SD (I2C ID EEPROM)		(I2C ID EEPROM) ID_SC	28
29	GPIO05		Ground	30
31	GPIO06		GPIO12	32
33	GPIO13		Ground	34
35	GPIO19		GPIO16	36
37	GPIO26		GPIO20	38
39	Ground		GPIO21	40



SÓLO 3.3V!



fritzing

Raspberry Pi Model 2 v1.1  
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USB 2x

```
wget https://goo.gl/u5oyQA  
-o button.py
```

```
import RPi.GPIO as GPIO
import time

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(23, GPIO.IN, pull_up_down
= GPIO.PUD_UP)

while 1:
    print(GPIO.input(23))
    time.sleep(5)
```

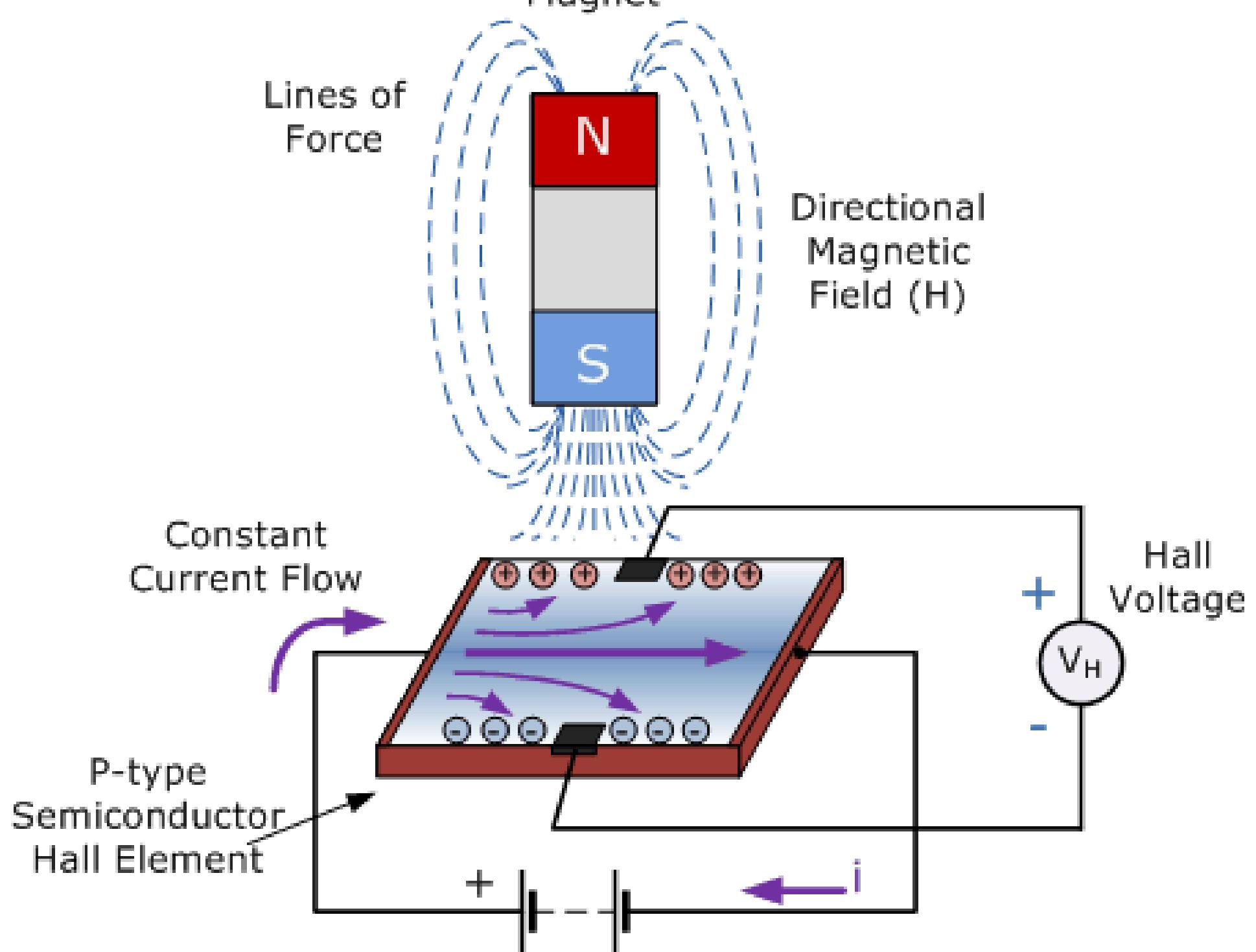
`python button.py`



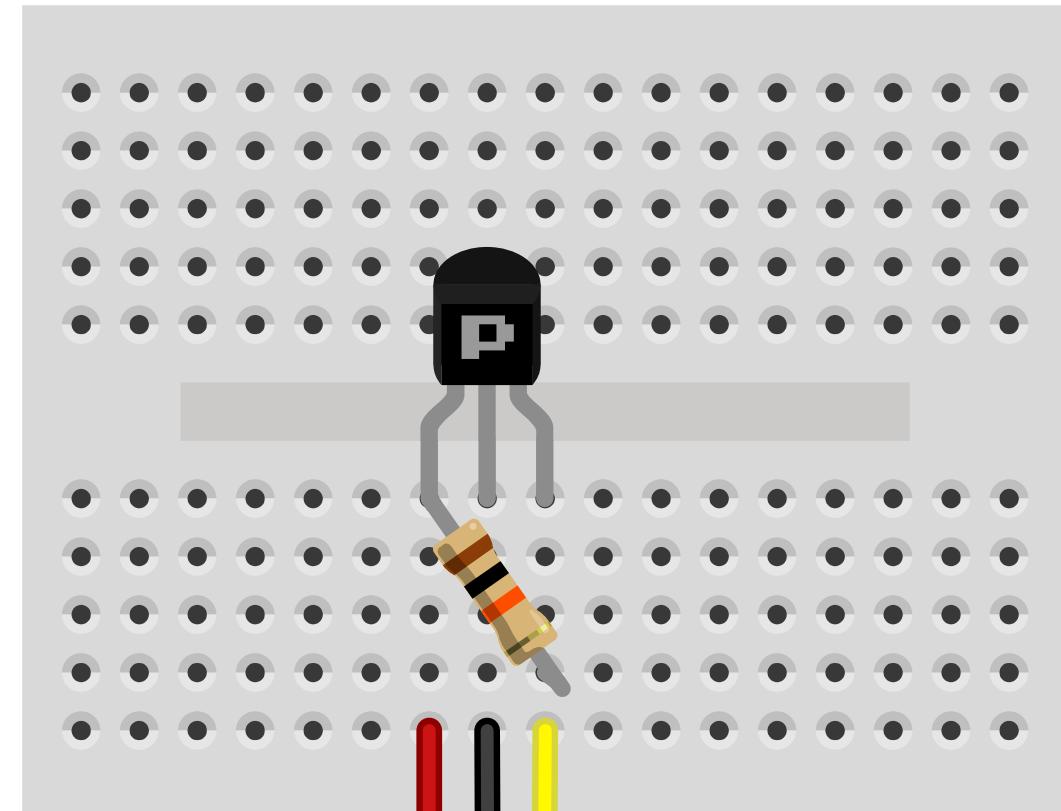
# Lectura de sensores II

## Sensor Hall y PIR



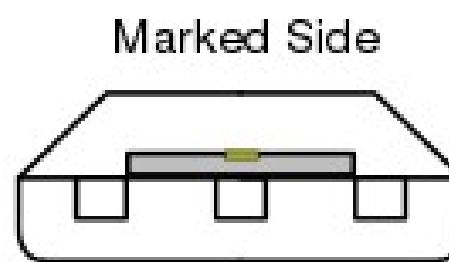


fritzing

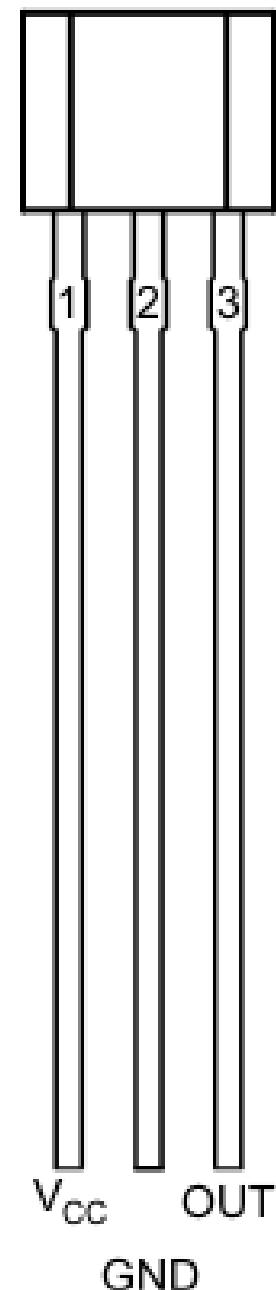


GPIO

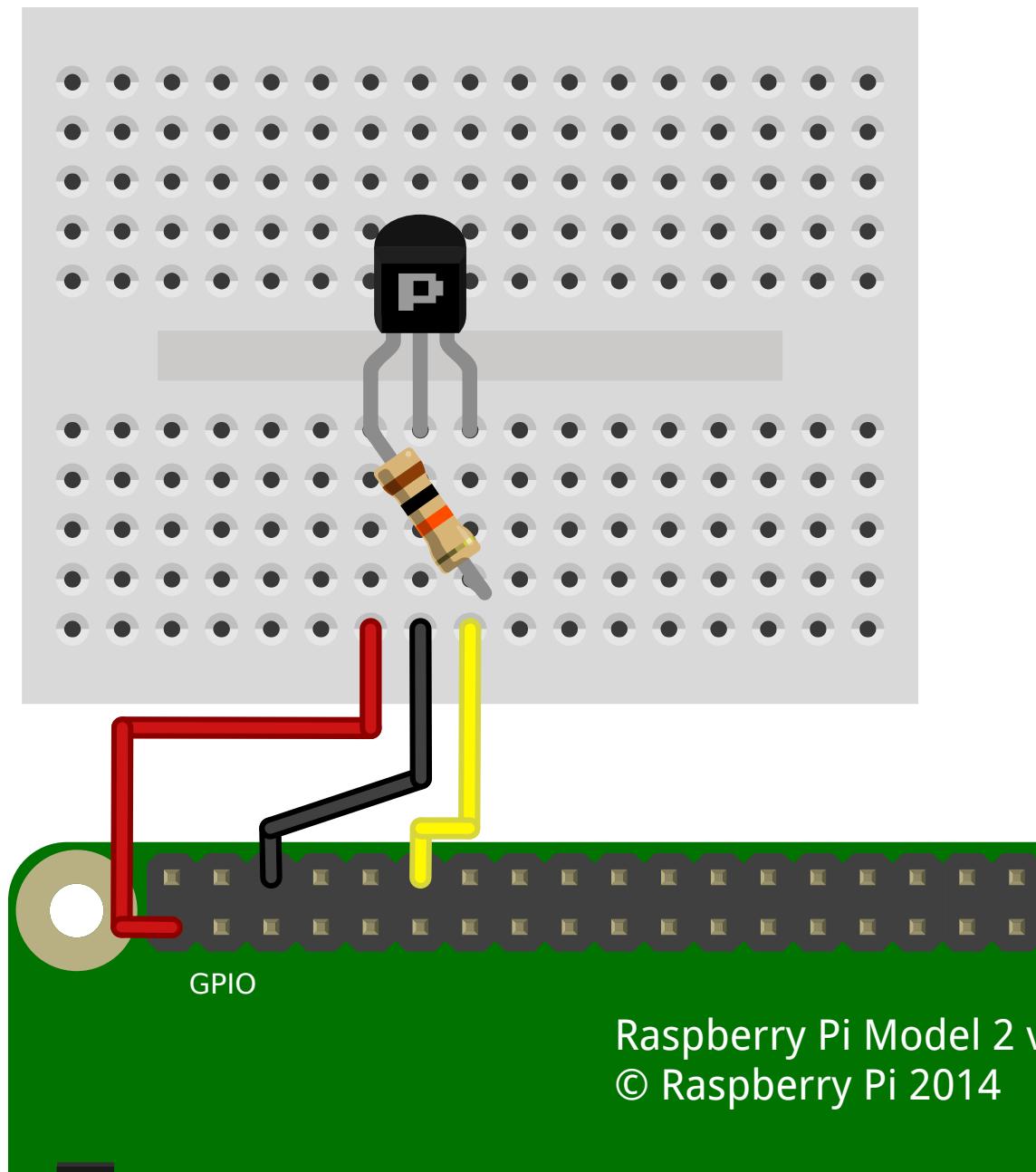
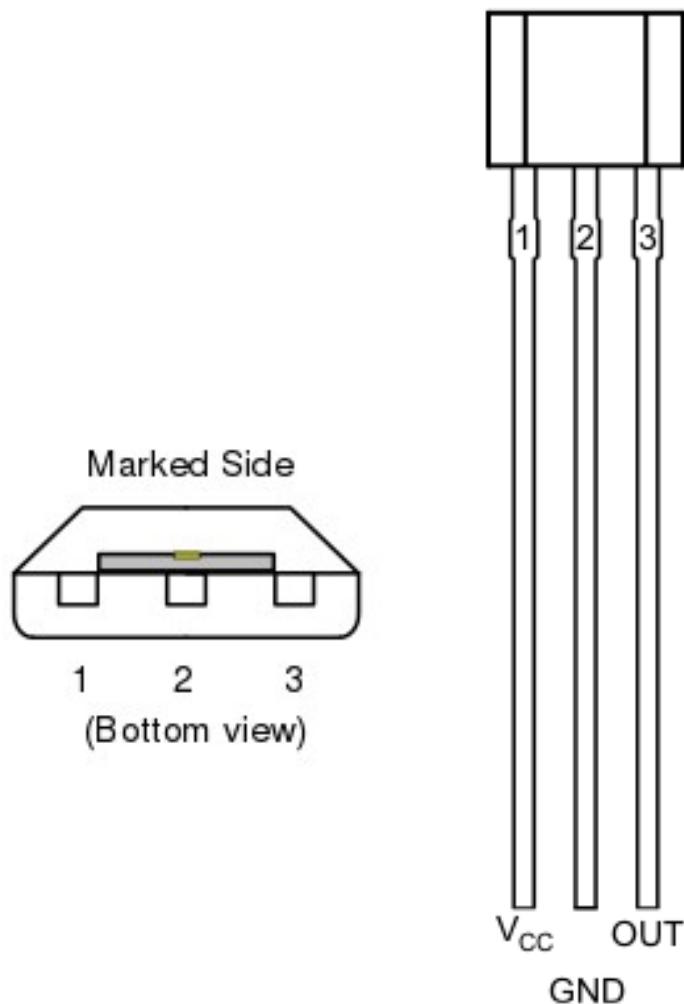
Raspberry Pi Model 2 v1.1  
© Raspberry Pi 2014



(Bottom view)



fritzing



```
wget https://goo.gl/VmC5z1  
      -o hall.py
```

```
import RPi.GPIO as GPIO
import time

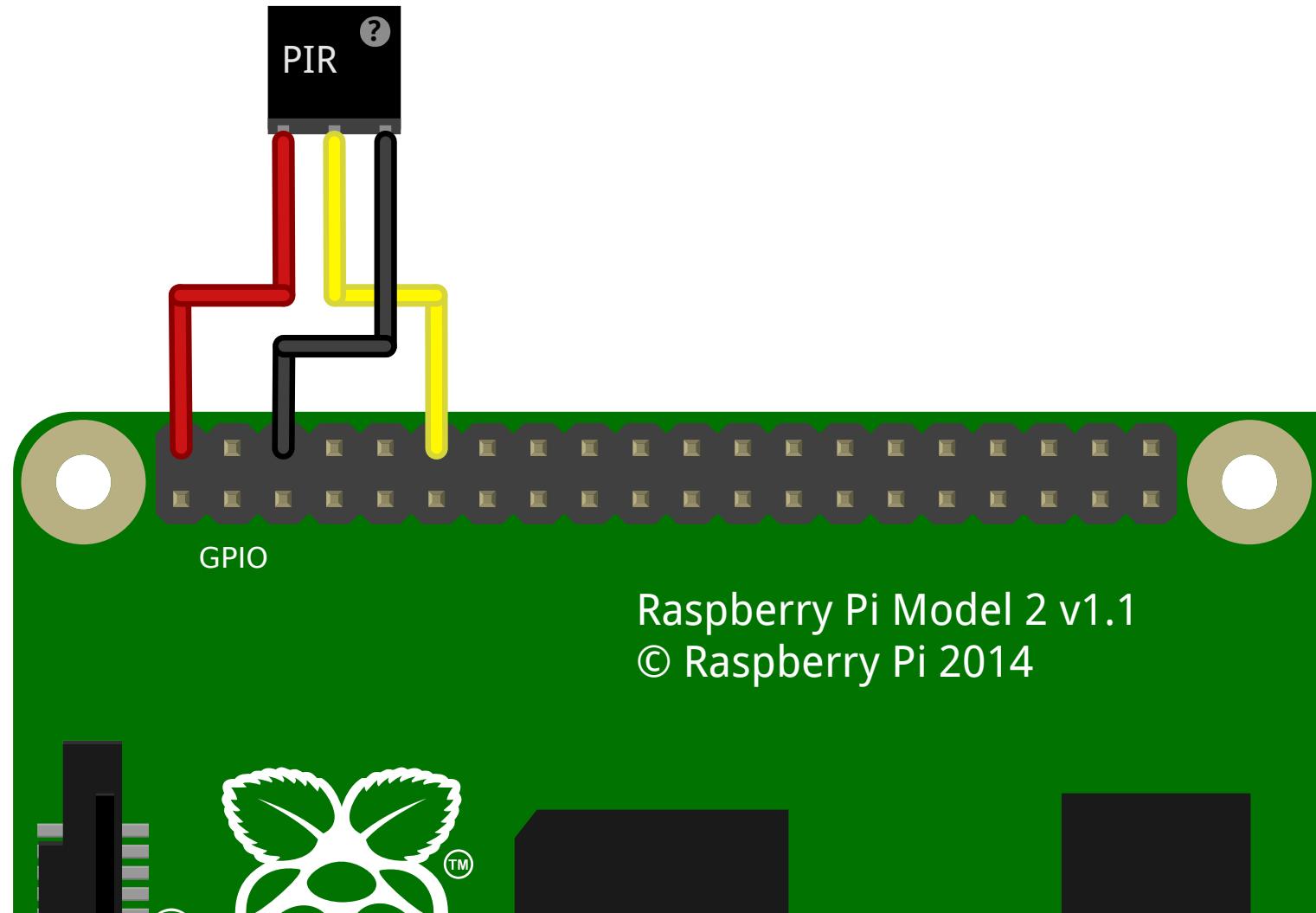
GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

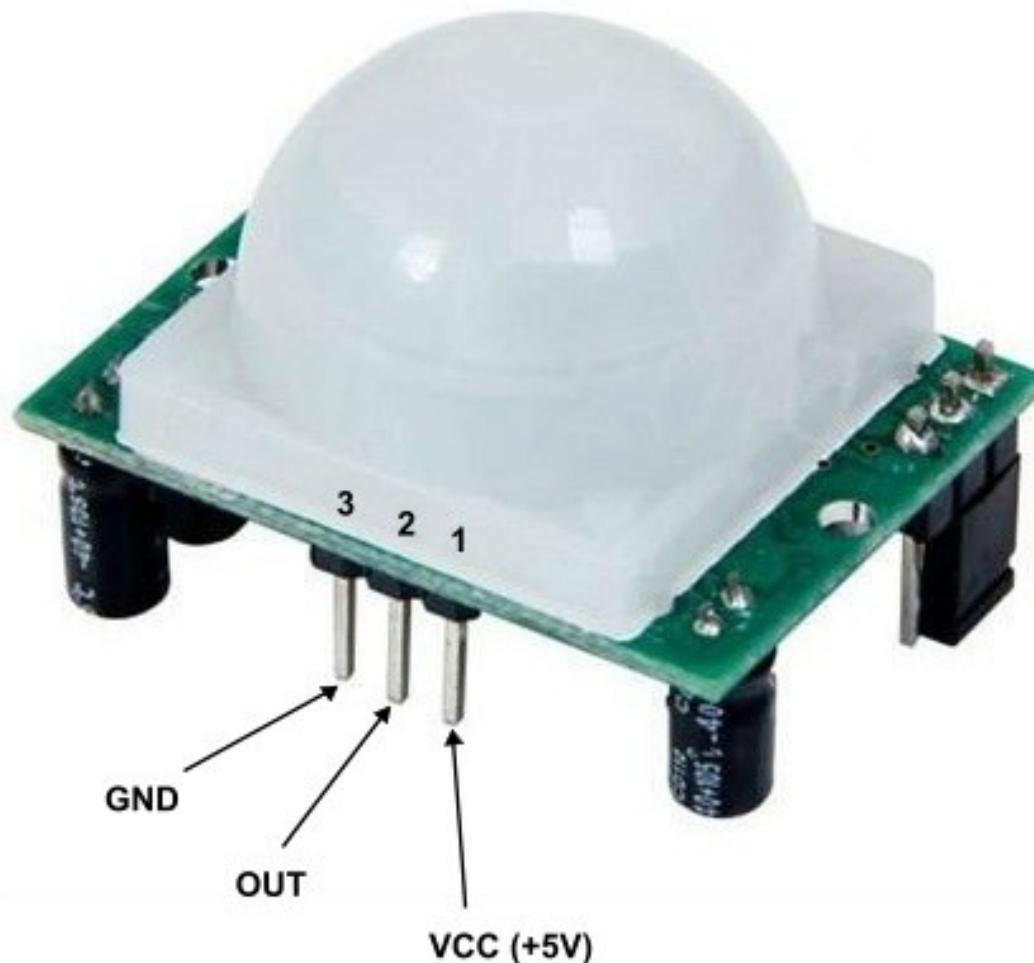
GPIO.setup(18, GPIO.IN)
while 1:
    if(GPIO.input(18)):
        print("Sensor hall activado")
    else:
        print("Sensor hall desactivado")
    time.sleep(0.5)
```

`python hall.py`



fritzing





```
wget https://goo.gl/RStthi -o  
pir.py
```

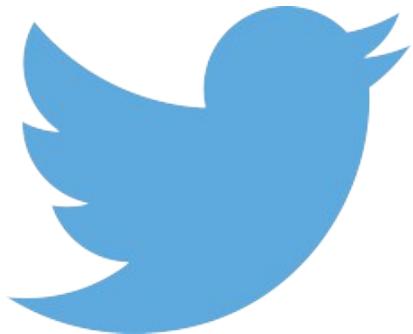
```
import RPi.GPIO as GPIO
import time

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)

GPIO.setup(18, GPIO.IN)

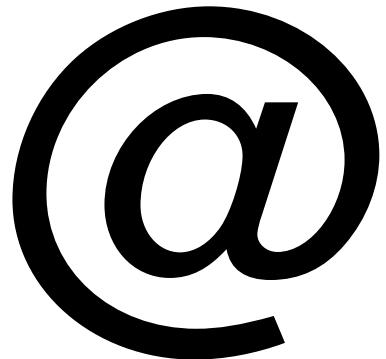
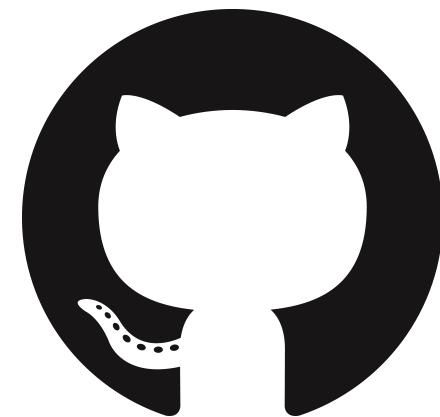
while 1:
    if(GPIO.input(18)):
        print("El PIR ha detectado \
movimiento")
    time.sleep(0.5)
```

`python pir.py`



@nixijav

@ResonantWave



me@nixijav.com

**sudo halt\***

\*por ahora