Raspberry pi 2/3 model B

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40 Pin GPIO

CPU: BCM2836
900 MHz ARM
(Cortex A7)
RAM: 1GB

4 USB Ports

Display Connector

10/100 Ethernet socket

Micro SD Card Slot (on underside)

3.5mm audio jack

Camera connector

5V Micro USB (Power supply)

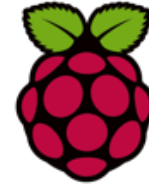**HDMI port**
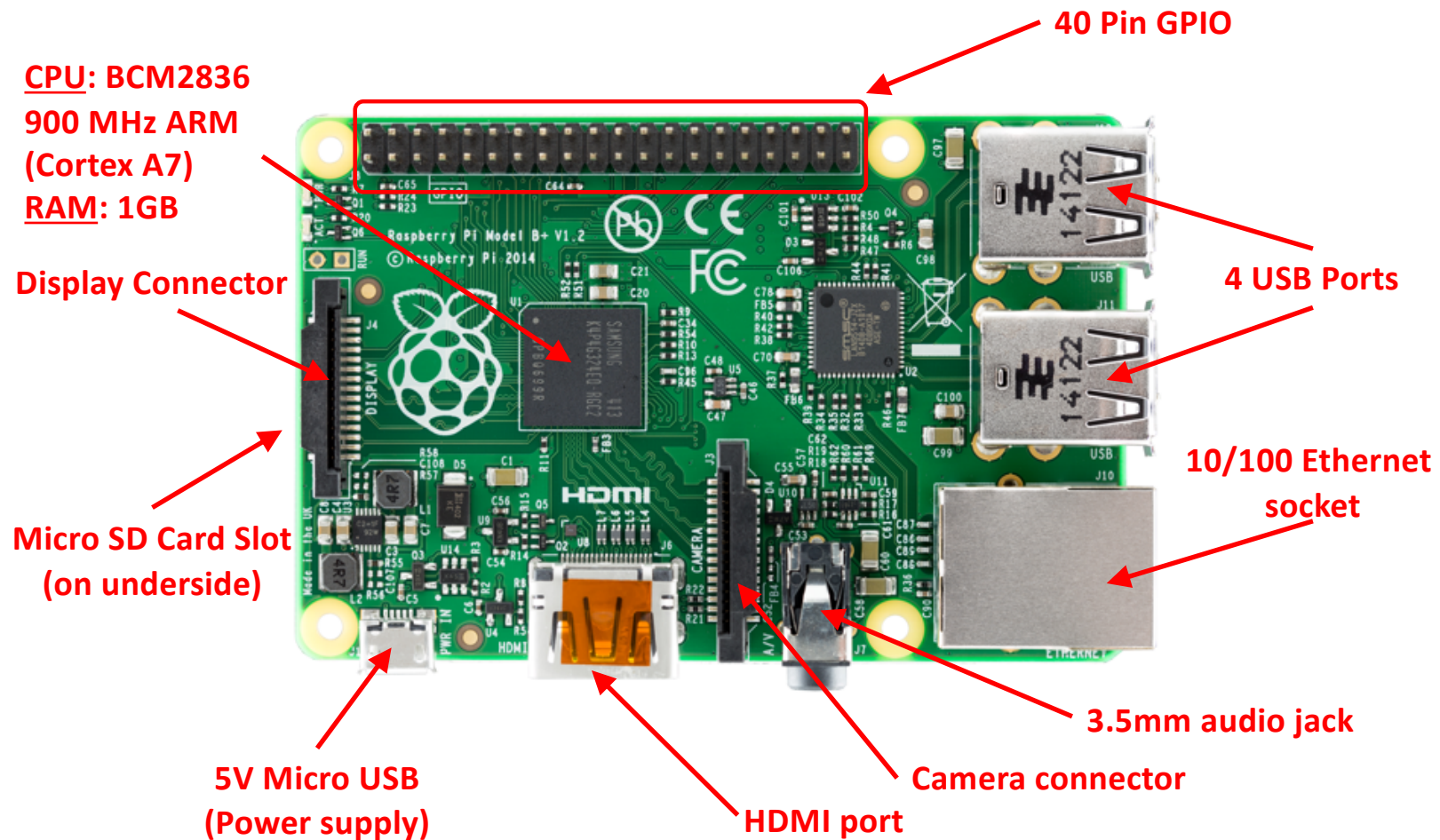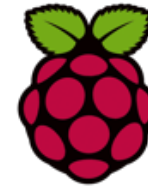
The Raspberry kit

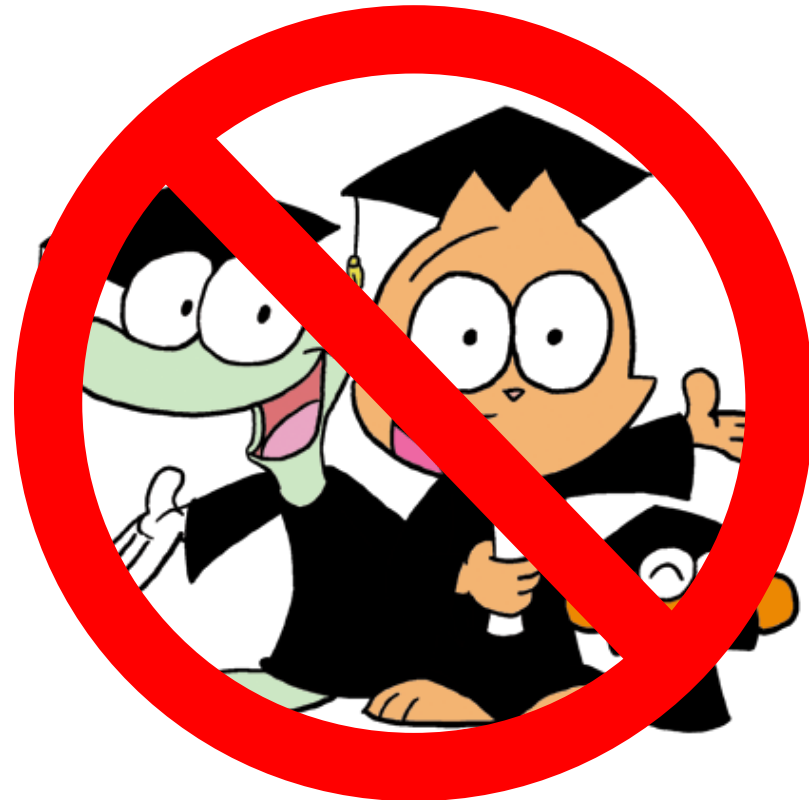The provided Raspberry kit contains:

- 1 Raspberry Pi 2/3 Model B
- 1 8GB or 16GB micro-SD card and the SD-adapter
- 1 WI-FI USB network adapter
- 1 +5V 2A power supply
- 1 DHT11 temperature and Humidity sensor
- 1 relay
- ≈6 LEDs
- 1 Motion Sensor
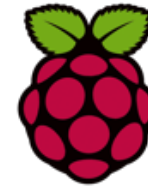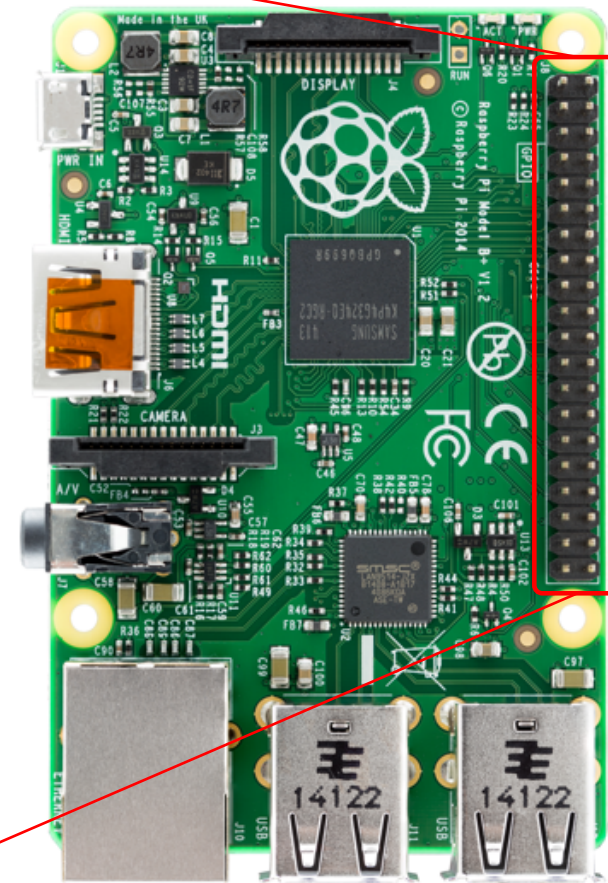- 1 Digital Button
- 1 Breadboard
- Cables

WARNING

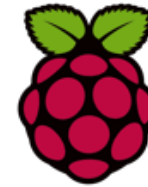**You steal the kit → You do not graduate!**

Raspberry Pi 2/3 model B

1	3v3 Power	▢	●	2	5v Power
3	BCM 2 (SDA)	●	●	4	5v Power
5	BCM 3 (SCL)	●	○	6	Ground
7	BCM 4 (GPCLK0)	●	●	8	BCM 14 (TXD)
9	Ground	○	●	10	BCM 15 (RXD)
11	BCM 17	●	●	12	BCM 18 (PCM_C)
13	BCM 27 (PCM_D)	●	○	14	Ground
15	BCM 22	●	●	16	BCM 23
17	3v3 Power	●	●	18	BCM 24
19	BCM 10 (MOSI)	●	○	20	Ground
21	BCM 9 (MISO)	●	●	22	BCM 25
23	BCM 11 (SCLK)	●	●	24	BCM 8 (CE0)
25	Ground	○	●	26	BCM 7 (CE1)
27	BCM 0 (ID_SD)	●	●	28	BCM 1 (ID_SC)
29	BCM 5	●	○	30	Ground
31	BCM 6	●	●	32	BCM 12
33	BCM 13	●	○	34	Ground
35	BCM 19 (MISO)	●	●	36	BCM 16
37	BCM 26	●	●	38	BCM 20 (MOSI)
39	Ground	○	●	40	BCM 21 (SCLK)

Raspberry Pi 2/3 model B

Reserved PIN

1 3v3 Power		2 5v Power
3 BCM 2 (SDA)		4 5v Power
5 BCM 3 (SCL)		6 Ground
7 BCM 4 (GPCLK0)		8 BCM 14 (TXD)
9 Ground		10 BCM 15 (RXD)
11 BCM 17		12 BCM 18 (PCM_C)
13 BCM 27 (PCM_D)		14 Ground
15 BCM 22		16 BCM 23
17 3v3 Power		18 BCM 24
19 BCM 10 (MOSI)		20 Ground
21 BCM 9 (MISO)		22 BCM 25
23 BCM 11 (SCLK)		24 BCM 8 (CE0)
25 Ground		26 BCM 7 (CE1)
27 BCM 0 (ID_SD)		28 BCM 1 (ID_SC)
29 BCM 5		30 Ground
31 BCM 6		32 BCM 12
33 BCM 13		34 Ground
35 BCM 19 (MISO)		36 BCM 16
37 BCM 26		38 BCM 20 (MOSI)
39 Ground		40 BCM 21 (SCLK)

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15 BCM 22			16 BCM 23
17 3v3 Power			18 BCM 24
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21 BCM 9 (MISO)			22 BCM 25
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35 BCM 19 (MISO)			36 BCM 16
37 BCM 26			38 BCM 20 (MOSI)
39 Ground			40 BCM 21 (SCLK)

More information about GPIO pins configurations are available at http://pinout.xyz/pinout/

Raspberry Settings
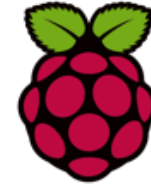
Operative System: raspbian (Linux version based on Debian)
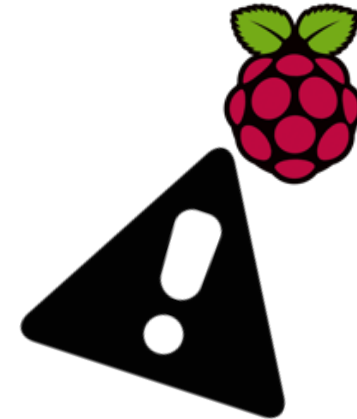
Username: pi

Password: raspberry

IP address (Ethernet): 192.168.1.254

Subnet: 255.255.255.0

Gateway: 192.168.1.1

Raspberry Settings (WARNINGS)

To power off the system execute the command

sudo poweroff

Follow this procedure **otherwise** the SD card will be **destroyed**

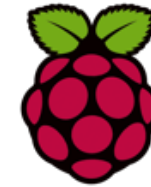WI-FI must be configured.

Your pc must be in the same local network of the raspberry.

The PC's Ethernet card must be configured with the ip address 192.168.1.x (with 1 < x < 254) and the subnet 255.255.255.0
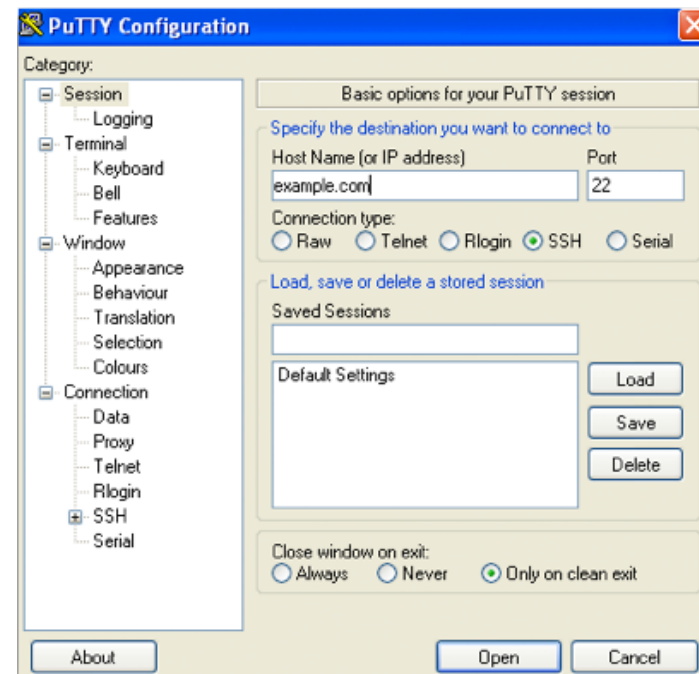
ref: http://www.sas.upenn.edu/~jasonrw/IPConfiguration.htm

Raspberry Settings

For remote connection use SSH (default port 22)

- command line on linux/mac: ssh pi@192.168.1.254
- in Windows use Putty: http://www.putty.org/

Raspberry Settings
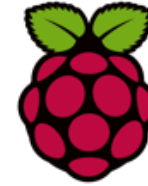
For remote connection use SSH (default port 22)

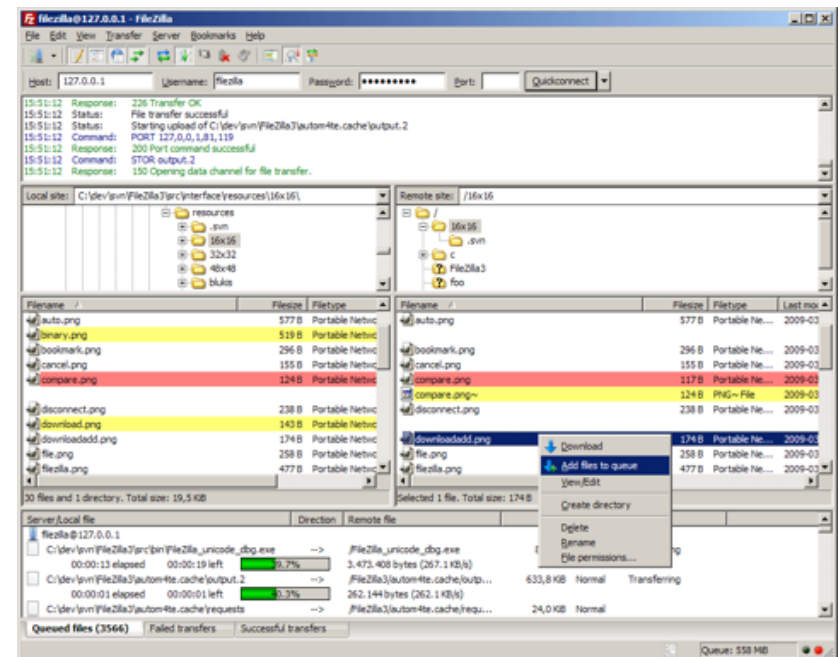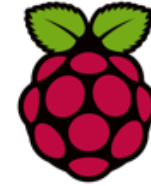- command line on linux/mac: ssh pi@192.168.1.254

- in Windows use Putty: http://www.putty.org/

- to transfer file use FileZilla

    https://filezilla-project.org/

Raspberry Settings

For local login (with keyboard and monitor)

By default the command line is enabled.

To run the GUI (Graphical User Interface), after the login execute the command **startx**

Python libraries and tools

Warning: the following libraries and tools are already installed on the provided raspberries

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Linux and Python essential libraries

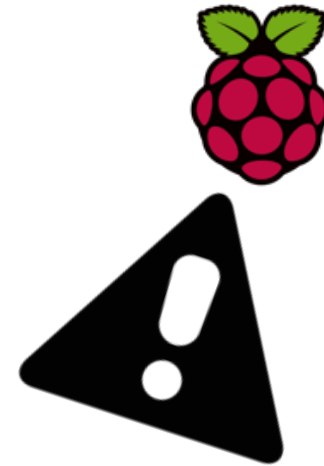- sudo apt-get install build-essential python-dev

Mosquitto message broker

- sudo apt-get install mosquitto

Mosquitto Client (useful for debugging)

- sudo apt-get install mosquitto-clients

MQTT library for python

- sudo pip install paho-mqtt

Python libraries and tools

DHT11 library for python

- sudo apt-get update
- sudo apt-get install build-essential python-dev
- git clone https://github.com/adafruit/Adafruit_Python_DHT.git
- cd Adafruit_Python_DHT
- sudo python setup.py install

RPi.GPIO library for python

- Installed by default in raspbian distribution

Cherrypy

- sudo apt-get install python-cherrypy

or

- sudo pip install cherrypy

Python library to access the serial port

- sudo apt-get install python-serial

Additional devices available for your Projects

Device	quantity	link
blod pressure	10	https://ihealthlabs.eu/it/9-sfigmomanometro-wireless-ihealth-feel.html
glucometer	10	https://ihealthlabs.eu/it/15-glucometro-ihealth-gluco.html
pulse oximeter	10	https://ihealthlabs.eu/it/14-pulsossimetro-wireless-ihealth-air.html
lhealth wave	10	https://ihealthlabs.eu/it/48-ihealth-wave.html
glucometro ihealt align	10	https://ihealthlabs.eu/it/16--ihealth-align.html
scale ihealth core	10	https://ihealthlabs.eu/it/22-bilancia-wireless-ihealth-core.html
Estimote location beacon	20	http://estimote.com/
xboard relay (arduino uno with ethernet)	20	https://www.dfrobot.com/index.php?route=product/product&search=xboard+relay&description=true&product_id=837

Additional devices available for your Projects

Device	Qty	Link
Analog gas sensor	10	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=2&product_id=684
digital vibration sensor	10	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=2&product_id=79
digital push button	40	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=2&product_id=1096
Analog key board	20	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=3&product_id=197
Motion Sensor	65	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=4&product_id=119
analog heart rate monitor sensor (ECG)	5	https://www.dfrobot.com/index.php?route=product/product&search=gravity&description=true&page=4&product_id=1510
Plug wise Home start kit	3	https://www.plugwise.com/products/home-start
USB Microphone	2	https://www.amazon.it/Kinobo-Rikuto-flessibile-conferenza-microfono/dp/B00N1YIIUQ/ref=sr_1_1?ie=UTF8&qid=1476180390&sr=8-1&keywords=Kinobo+Usb+2.0+Microphone
speakers	2	https://www.amazon.it/Trust-Leto-Set-Altoparlanti-Nero/dp/B019UILVTQ/ref=sr_1_2?ie=UTF8&qid=1476180987&sr=8-2&keywords=casse%2Baudio&th=1

References

- https://pypi.python.org/pypi/paho-mqtt
- http://mosquitto.org/
- https://www.raspberrypi.org/
- http://pinout.xyz/pinout/