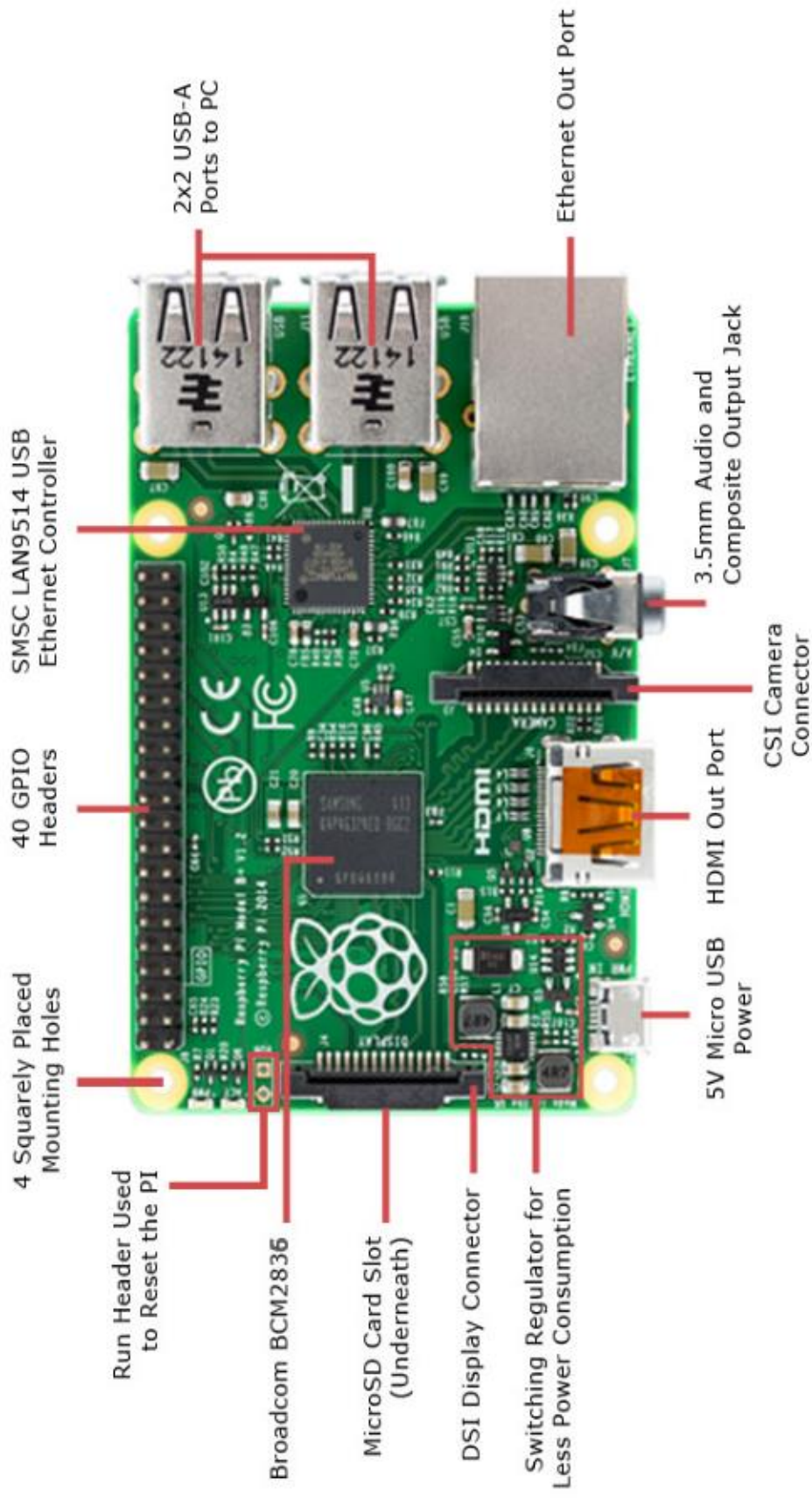


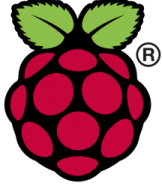

**Raspberry Pi**

**入門體驗**

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# Raspberry Pi 3 Model B+ vs Arduino

		
	Micro-computer	Micro-controller
	Has OS  Run your program along with many others	No OS  Run your program ONLY
	Python, NodeJS, Ruby, Java, C, C++, etc.	C++
	Knowledge of Linux required	Program and debug on Windows
GPIO pins	Digital only	Analog and digital
Processor	BCM2837 (Broadcom)	ATmega (Atmel)
Speed	1.4 GHz, quad-core	8-16 MHz
RAM	1 GB	32-256 KB

# Media Center, Music Player

LibreELEC

RuneAudio

Volumio

## OSMC

### Settings

- ↳ System info
- ↳ Services
  - ↳ Control (Web interface)
- ↳ Add-on browser
  - ↳ Install from repository

### My OSMC

- ↳ Network
- ↳ Services

# 懷舊遊戲機

RetroPie

Recalbox

## Lakka

Keys: Arrows, Enter, Backspace, Escape

Main Menu

- ↳ Information

- ↳ Network Information

- ↳ System Information

Settings

- ↳ WiFi

- ↳ Service

SSH login: root, root

Online Updater

- ↳ Content Downloader

Load Content

- ↳ Downloads

- ↳ Playlists

# Raspbian

Wheezy

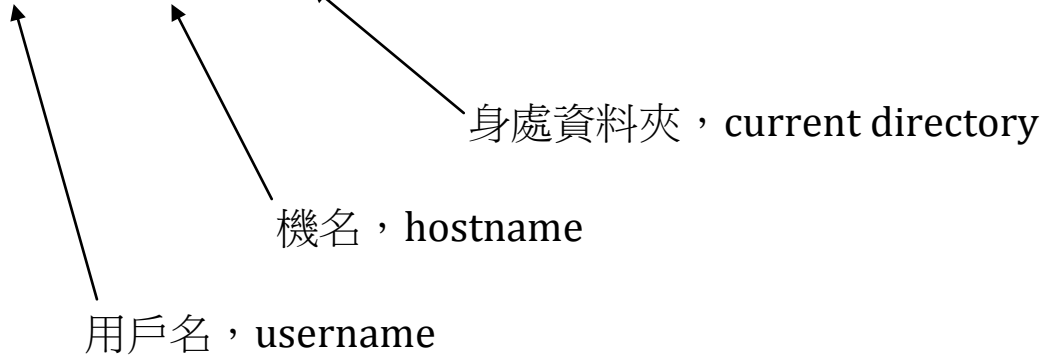
Jessie

Stretch

## Buster

SSH login: pi, raspberry

```
pi@raspberrypi:~ $ sudo raspi-config
```



熟習 **Linux** ，  
事半功倍。

# ls

list

**ls**

What things are there?

**ls -l**

Give me more details.

**ls -a**

Show me the hidden stuff (those starting with a dot).

**ls -l -a**

Chain two options together to double the benefits.

**ls -la**

You may also chain them like this.

**ls -tl**

Sort by date.

**ls** *directory*

What is in that directory?

**man ls**

Explain this command.

**ls --help**

Another way to explain this command.

But the output overflows the page, what can I do?



# cd

change directory

**cd** *directory*

Go to a directory.

**cd** ..

Go up a level.  
Double-dot means the parent directory.

**cd** .

Stay in the same directory.  
Single-dot means the current directory.

In practice, you never do this. It is here for educational purposes only.

**cd** ~

Go back to home directory.  
The tilde (~) means home directory.

**cd**

Go back to home directory. Equivalent to **cd** ~.

# pwd

print working directory

**pwd**

Where am I?

## cp

copy

**cp** *oldfile newfile*

Make a copy of *oldfile*, and name it *newfile*.

**cp -r** *olddir newdir*

Copy an entire directory.

“-r” means “recursive”. That is, copy sub-directories, and their sub-directories, and their sub-directories, and so on.

Type **cp --help** or **man cp** to review the options.

## mv

move or rename

**mv** *oldfile newfile*

*oldfile* now becomes *newfile*.

**mv** *file dir*

Move file to directory.

## **rm**

remove

**rm** *filename*

Delete a file.

**rm -r** *directory*

Delete a directory.

“-r” means “recursive”. That is, delete sub-directories, and their sub-directories, and their sub-directories, and so on.

## **mkdir**

make directory

**mkdir** *directory*

Create a new directory.

## **rmdir**

remove directory

**rmdir** *directory*

You can only remove an empty directory. Delete everything inside first, or use **rm -r**.

# nano

a text editor

**nano**

When you want to write something,  
bring up a text editor.

**nano** *filename*

Edit an existing file.

Two shortcuts you need to know, for  
now:

Ctrl-O to save

Ctrl-X to exit

# more or less

show text content, or show output page-by-page

**less** *filename*

Display file content.

If content is longer than one page:

- Use ← ↑ ↓ → **[Page Up/Down]** to navigate
- Type **q** to quit.

**ls --help | less**

Display the preceding command's output in a page-by-page manner.

"|" is called a "pipe". We will see more of it later.

If you have trouble typing the "|":

1. Enter **sudo raspi-config**
2. Select **Internationalisation options**
3. Select **Change Keyboard Layout**, this may take a while.
4. Linux should have detected the keyboard for you. Press **[enter]**.
5. Then, it asks for Keyboard Layout. Default is English (UK). DO NOT trust that. You should select **Other**, then **English (US)**, then **English (US)** again.
6. Finally, it asks a few more questions. Press **[enter]** to skip all of them.
7. **Finish** and **reboot**.

# sudo reboot, sudo halt -h

Reboot and shutdown

**sudo reboot**

“sudo” means “superuser do”.  
You cannot reboot the machine as an ordinary user. You must turn yourself into a *superuser* first.

**sudo halt -h**

To shutdown the machine, you also have to be a superuser.

Type **halt --help** or **man halt** to review the options.

DO NOT unplug the power until Raspberry Pi is completely shut down. The SD card may be corrupted if power is pulled prematurely.

Pay attention to the **blinking lights** on Raspberry Pi. Wait until only **one steady red light** is left and all other lights are dead. That’s when you can unplug the power safely.

How do you turn it on again? Just re-plug the power.

# A Simplified UNIX Family Tree

