- ls
  - 列出目前的目錄中的檔案

```
→ Desktop ls
20170223.mp4
CCULife-Crawler
compiler
leetcode
ML
Scaling at Large - Lessons learned rewriting Instagram's feed - iOS Conf SG 2016
-ft72S-rrQQA.mp4
setup
```

  - 可以使用 –al 得到更多資訊

```
→ dest ls -al
total 24
drwxrwxr-x 2 henrybear327 henrybear327 4096 Mar 15 08:17 .
drwxr-xr-x 6 henrybear327 henrybear327 4096 Mar 15 08:15 ..
-rwxrwxr-x 1 henrybear327 henrybear327 8552 Mar 15 08:14 a.out
-rw-rw-r-- 1 henrybear327 henrybear327   47 Mar 15 08:14 main.c
```

- man
  - 查詢指令的先關資訊

```
MAN(1)
          Manual pager utils
                              MAN(1)

NAME
       man - an interface to the on-line reference manuals

SYNOPSIS
       man [-C file] [-d] [-D] [--warnings[=warnings]] [-R encoding] [-L locale]
 [-m system[,...]] [-M path] [-S list] [-e extension] [-i|-I] [--regex|--wildcar
d] [--names-only] [-a] [-u] [--no-sub-
       pages] [-P pager] [-r prompt] [-7] [-E encoding] [--no-hyphenation] [--no
-justification] [-p string] [-t] [-T[device]] [-H[browser]] [-X[dpi]] [-Z] [[sec
tion] page ...] ...
       man -k [apropos options] regexp ...
       man -K [-w|-W] [-S list] [-i|-I] [--regex] [section] term ...
       man -f [whatis options] page ...
       man -l [-C file] [-d] [-D] [--warnings[=warnings]] [-R encoding] [-L loca
le] [-P pager] [-r prompt] [-7] [-E encoding] [-p string] [-t] [-T[device]] [-H[
browser]] [-X[dpi]] [-Z] file ...
       man -w|-W [-C file] [-d] [-D] page ...
       man -c [-C file] [-d] [-D] page ...
       man [-?V]
 Manual page man(1) line 1 (press h for help or q to quit)
```

  - 有很多個 man 可以用!

```
The table below shows the section numbers of the manual followed by the
types of pages they contain.

1    Executable programs or shell commands
2    System calls (functions provided by the kernel)
3    Library calls (functions within program libraries)
4    Special files (usually found in /dev)
5    File formats and conventions eg /etc/passwd
6    Games
7    Miscellaneous  (including  macro  packages  and  conventions), e.g.
     man(7), groff(7)
8    System administration commands (usually only for root)
9    Kernel routines [Non standard]
```

- Example: man 1 ls

```
LS(1)                       User Commands                      LS(1)

NAME
       ls - list directory contents

SYNOPSIS
       ls [OPTION]... [FILE]...

DESCRIPTION
       List  information  about  the FILEs (the current directory by default).
       Sort entries alphabetically if none of -cftuvSUX nor --sort  is  speci-
       fied.

       Mandatory  arguments  to  long  options are mandatory for short options
       too.

       -a, --all
              do not ignore entries starting with .

       -A, --almost-all
              do not list implied . and ..

       --author
              with -l, print the author of each file

       -b, --escape
              print C-style escapes for nongraphic characters

       --block-size=SIZE
              scale sizes by SIZE before printing them; e.g., '--block-size=M'
              prints sizes in units of 1,048,576 bytes; see SIZE format below

       -B, --ignore-backups
              do not list implied entries ending with ~

 Manual page ls(1) line 1 (press h for help or q to quit)
```

- apt-get
  - 安裝套件時使用 sudo apt-get install [package-name]

```
→ Desktop sudo apt-get install vim
[sudo] password for henrybear327:
Reading package lists... Done
Building dependency tree
Reading state information... Done
vim is already the newest version (2:7.4.1689-3ubuntu1.2).
0 upgraded, 0 newly installed, 0 to remove and 40 not upgraded.
```

  - 安裝完一堆東西後可以 clean 一下 ☺

```
→ dest sudo apt-get autoclean
Reading package lists... Done
Building dependency tree
Reading state information... Done
Del libnm-gtk-common 1.2.6-0ubuntu0.16.04.1 [5,676 B]
Del atom 1.14.3-1~webupd8~0 [61.4 MB]
Del oracle-java8-set-default 8u121-1~webupd8~1 [6,474 B]
Del linux-generic-hwe-16.04 4.8.0.39.10 [1,798 B]
Del ubuntu-core-launcher 2.22.3 [1,578 B]
Del libmagickcore-6.q16-2-extra 8:6.8.9.9-7ubuntu5.4 [59.4 kB]
Del imagemagick-common 8:6.8.9.9-7ubuntu5.4 [41.5 kB]
Del libnm-gtk0 1.2.6-0ubuntu0.16.04.1 [70.3 kB]
Del libnma0 1.2.6-0ubuntu0.16.04.1 [66.6 kB]
Del imagemagick 8:6.8.9.9-7ubuntu5.4 [44.9 kB]
Del network-manager-gnome 1.2.6-0ubuntu0.16.04.1 [291 kB]
Del libmagickcore-6.q16-2 8:6.8.9.9-7ubuntu5.4 [1,573 kB]
Del linux-image-generic-hwe-16.04 4.8.0.39.10 [2,554 B]
Del libmagickwand-6.q16-2 8:6.8.9.9-7ubuntu5.4 [288 kB]
Del imagemagick-6.q16 8:6.8.9.9-7ubuntu5.4 [387 kB]
Del oracle-java8-installer 8u121-1~webupd8~1 [32.3 kB]
Del linux-libc-dev 4.4.0-64.85 [834 kB]
Del libnma-common 1.2.6-0ubuntu0.16.04.1 [5,656 B]
Del linux-headers-generic-hwe-16.04 4.8.0.39.10 [2,530 B]
Del snap-confine 2.22.3 [41.5 kB]
Del snapd 2.22.3 [8,741 kB]
```

- gcc
  - 編譯 C code 所需要用的 compiler，通常我都會加上-Wall –Wextra 請 compiler 提供出所有的 warning
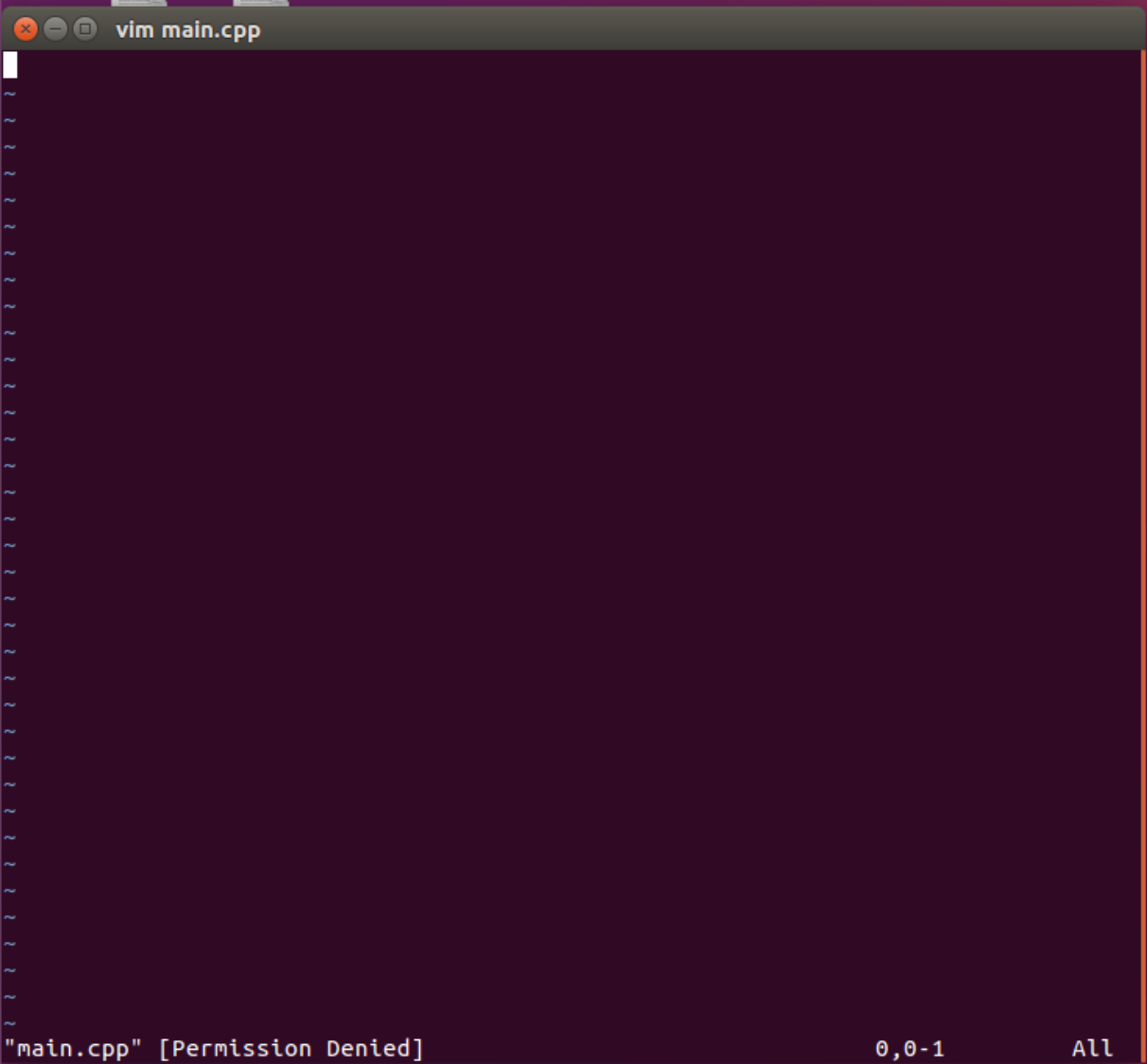
    ```
    → Desktop gcc -Wall -Wextra main.c
    ```

- chmod
  - http://linux.vbird.org/linux_basic/0210filepermission.php#chmod
  - 透過此指令可以進行檔案的 owner/group/others 的權限控管
    舉例來說，有個 main.cpp 檔案，剛剛建立時預設 owner 是可以讀寫的。
    透過 chmod 222 main.cpp 之後，main.cpp 用 vim 開啟時會直接被 permission denied，連內容都看不到了。

    ```
    → dest ls -shmal
    total 12K
    4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
    4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
    4.0K -rw-rw-r-- 1 henrybear327 henrybear327   56 Mar 16 20:26 main.cpp
    → dest chmod 444 main.cpp
    → dest ls -shmal
    total 12K
    4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
    4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
    4.0K -r--r--r-- 1 henrybear327 henrybear327   56 Mar 16 20:26 main.cpp
    → dest chmod 222 main.cpp
    → dest ls -shmal
    total 12K
    4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
    4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
    4.0K --w--w--w- 1 henrybear327 henrybear327   56 Mar 16 20:26 main.cpp
    → dest vim main.cpp
    ```

```
vim main.cpp
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"main.cpp" [Permission Denied]                          0,0-1          All
```

- chown
  - 改變檔案的擁有者(從 henrybear327 到 newuser)


```
→  dest ls -shmal
total 12K
4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
4.0K --w--w--w- 1 henrybear327 henrybear327   56 Mar 16 20:26 main.cpp
→  dest sudo chown newuser main.cpp
→  dest ls -shmal
total 12K
4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
4.0K --w--w--w- 1 newuser      henrybear327   56 Mar 16 20:26 main.cpp
```

- chgrp
  - 改變檔案所屬群組(從 henrybear327 到 root)


```
→  dest ls -shmal
total 12K
4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
4.0K --w--w--w- 1 newuser      henrybear327   56 Mar 16 20:26 main.cpp
→  dest sudo chgrp root main.cpp
→  dest ls -shmal
total 12K
4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:27 .
4.0K drwxr-xr-x 7 henrybear327 henrybear327 4.0K Mar 16 20:27 ..
4.0K --w--w--w- 1 newuser      root           56 Mar 16 20:26 main.cpp
```

- mv

- 可以移動檔案，以下截圖是將 main.c 和 a.out 從 Desktop 移動到 dest 資料夾中

```
→ Desktop mkdir dest
→ Desktop ls
20170223.mp4
a.out
CCULife-Crawler
compiler
dest
leetcode
main.c
ML
Scaling at Large - Lessons learned rewriting Instagram's feed - iOS Conf SG 2016
-ft72S-rrQQA.mp4
setup
→ Desktop mv main.c a.out dest
→ Desktop ls
20170223.mp4
CCULife-Crawler
compiler
dest
leetcode
ML
Scaling at Large - Lessons learned rewriting Instagram's feed - iOS Conf SG 2016
-ft72S-rrQQA.mp4
setup
→ Desktop cd dest; ls
a.out  main.c
```

- 可以更改檔案名稱

```
→ dest ls
a.out  main.c
→ dest mv main.c newMain.c
→ dest ls
a.out  newMain.c
→ dest
```

- Ln
  - 這是一個建立類似捷徑的功能

```
→ source ls -shmal
total 16K
4.0K drwxrwxr-x 3 henrybear327 henrybear327 4.0K Mar 16 20:42 .
4.0K drwxr-xr-x 8 henrybear327 henrybear327 4.0K Mar 16 20:41 ..
4.0K drwxrwxr-x 2 henrybear327 henrybear327 4.0K Mar 16 20:42 folder
4.0K -rw-rw-r-- 1 henrybear327 henrybear327   53 Mar 16 20:42 main.cpp
→ source cat main.cpp
#include <bits/stdc++.h>

int main()
{

        return 0;
}
→ source cd folder
→ folder ln -s ../main.cpp shortcut.cpp
→ folder ls
shortcut.cpp
→ folder vim shortcut.cpp
→ folder cat shortcut.cpp
#include <bits/stdc++.h>

int main()
{
        "New stuff"
        return 0;
}
→ folder cd ..;cat main.cpp
#include <bits/stdc++.h>

int main()
{
        "New stuff"
        return 0;
}
→ source ▮
```
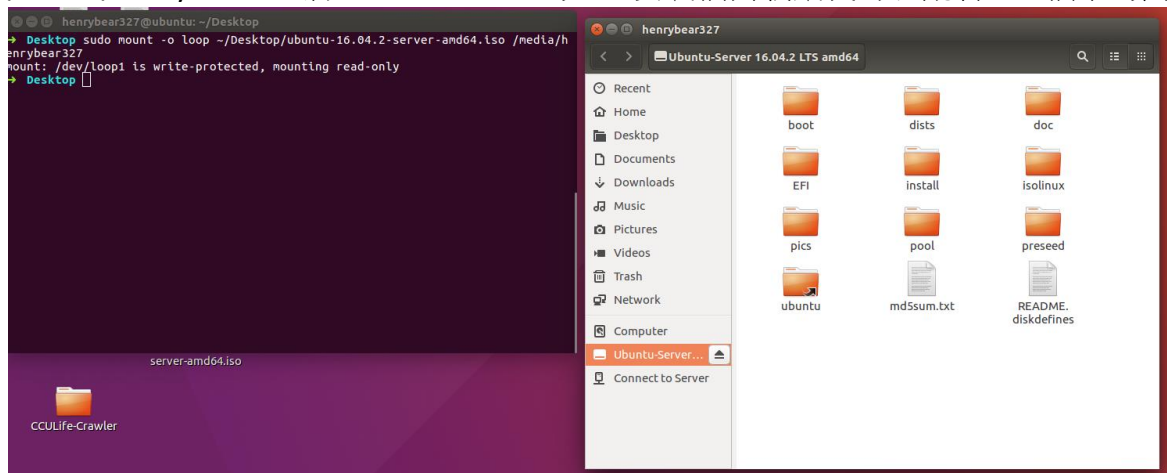
舉例來說，在 source 資料夾中有一個 main.cpp 檔案，內容如 cat 所示。
我們在 folder 資料夾中建立一個 symbolic link 叫做 shortcut.cpp，當我們改動
shortcut.cpp 的內容時，我們等於是在對 main.cpp 做更動。

- mount
  - 掛載一個檔案系統或是 ISO 檔案等等
    我是利用 sudo mount -o loop ~/Desktop/ubuntu-16.04.2-server-amd64.iso
    /media/henrybear327 將 Ubuntu server 的 ISO 安裝檔掛載讓我可以觀看 ISO 檔案的內容

- tar

- 可以壓縮檔案，以下截圖是將 Ass1 資料夾壓縮成 403410033_hw1.tar.bz2 的壓縮檔

```
→ Operating-System git:(master) X ls
Ass1  Ass2  Ass3  Ass4  HW  README.md  TextbookCodeTesting
→ Operating-System git:(master) X tar -jcvf 403410033_hw1.tar.bz2 Ass1
Ass1/
Ass1/makefile
Ass1/readme.md
Ass1/show_shm_ds.c
Ass1/readme.doc
Ass1/show_shm_ds
→ Operating-System git:(master) X ls
403410033_hw1.tar.bz2  Ass2   Ass4  README.md
Ass1                   Ass3   HW    TextbookCodeTesting
```

- 可以解壓縮檔案，以下截圖是將 Ass1 資料夾刪除後，從 403410033_hw1.tar.bz2 重新解壓縮出 Ass1

```
→ Operating-System git:(master) X ls
403410033_hw1.tar.bz2  Ass2  Ass3  Ass4  HW  README.md  TextbookCodeTesting
→ Operating-System git:(master) X tar --extract -f 403410033_hw1.tar.bz2
→ Operating-System git:(master) X ls
403410033_hw1.tar.bz2  Ass2  Ass4  README.md
Ass1                   Ass3  HW    TextbookCodeTesting
→ Operating-System git:(master) X cd Ass1
→ Ass1 git:(master) X ls
makefile  readme.doc  readme.md  show_shm_ds  show_shm_ds.c
```

- vim

```
→ dest vim main.c
#include <stdio.h>

int main()
{

        return 0;
}
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"main.c" 7L, 47C
```

- 文字編輯器，可以利用 vimrc 調整一下設定讓自己用起來更開心(尤其是設定一下 mouse=a 可以讓滑鼠重新擁有功能)
- 常用的功能有 esc 返回瀏覽模式，i 開始進入編輯模式，:w 存檔，:q 退出