

UNIX COMMANDS

Sébastien Renault

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Contents

Exploration commands	1
General principles	2
Moving / removing / creating files	2
Examining files	2
Tricks	2
Working remotely	3
Other useful commands	3
Profile	3
Compression	3
Regular expressions	3
Combining commands	3
Install and run command line programs	4
bash	4

Exploration commands

Command	Meaning
ls	what's there
ls -l	with an option
ls -t -h	with more options
ls -thor	combining even more options
man ls	manual: what are the options (q = quit; d = next page; ; arrows & fn arrows = scrolling)
pwd	where are we (full path)
cd	move somewhere else (default to home)
cd ..	move back
cd	move back, then forward
../Applications	
cd ~	move home
cd /	move to root

General principles

- All commands are short, perform simple tasks & are highly optimized (fast)
- Nearly all commands and options (~99%) work across Unix-based OS
- Commands can take (many) options
- Commands can be combined (the pipe |)
- Many commands don't require any argument, some do
- `command -option1 -option2 -optionN... parameter object`
- Many commands write output to terminal (redirected using >)

Moving / removing / creating files

Command	Meaning
<code>mv</code>	move
<code>cp</code>	copy
<code>rm</code>	careful remove
<code>rmdir</code>	<i>careful</i> remove empty directory
<code>rm -r</code>	<i>VERY careful.</i> remove recursively
<code>mkdir</code>	create empty directory
<code>touch</code>	create empty file
<code>echo</code>	Print message to screen

Examining files

Command	Meaning
<code>head</code>	Print first 10 lines to screen
<code>tail</code>	Print last 10 lines to screen
<code>less</code>	Print file line by line (use arrows + fn arrows to move up/down)
<code>cat</code>	Print file content to screen
<code>sort</code>	Sort a file
<code>uniq</code>	unique lines in a file
<code>clear</code>	clear terminal
<code>wc</code>	wordcount

Tricks

Command	Meaning
<code>></code>	the redirect
<code>>></code>	the redirect (append to file)
<code> </code>	the pipe
<code>*</code>	anything (special character: for literal *, use *)
<code>?</code>	anyone character (special character)
<code>Ctrl+A</code>	go to beginning of line in terminal
<code>Ctrl+E</code>	end of line
<code>tab key</code>	autocomplete

Working remotely

Command	Meaning
<code>ssh</code>	secure shell (remote connection)
<code>scp</code>	secure copy (remote connection)

Other useful commands

Command	Meaning
<code>chmod</code>	change mode of file
<code>sudo</code>	superuser do
<code>top</code>	who is running what?
<code>kill</code>	kill a process
<code>curl</code>	get stuff from web (MACOS native) or <code>wget</code> (MACOS non-native)
<code>history</code>	see recent history
<code>open</code>	open a file
<code>ln</code>	symbolic link
<code>which</code>	where is the command
<code>alias</code>	create own commands
<code>nano</code>	edit text (whole file loaded in memory)
<code>nano +123</code>	specify location

Profile

- Let's look at `.bash_profile` to modify options (e.g. `nano ~/.bash_profile`)

Compression

Command	Meaning
<code>gzip</code>	compression/decompression of files
<code>gzip -cd file.gz</code>	decompress to standard out (use a <code>></code> redirect)
<code>gunzip</code>	compression/decompression of files
<code>tar</code>	compression/decompression of archives
<code>tar -xvzf file tar.gz</code>	decompress a tar.gz (tarball)

Regular expressions

Command	Meaning
<code>grep -options 'pattern' file</code>	<code>#regular expressions</code>

Combining commands

- Let's look at the file `examples/sequence.fasta`
- print line 17 piping `head` and `tail`

- Count lines starting with '>'
- Count unique lines starting with '>'

Install and run command line programs

- Let's look at this example: <https://github.com/rec3141/rec-genome-tools/blob/master/bin/fastagrep.pl>
- It is a short `perl` script that greps sequences in a *.fasta* file
- Copy-paste the text in a new file (e.g. `touch fastagrep.pl`, `nano fastagrep.pl`, paste and save)
- Make it executable (`chmod +x`)
- Let's look at it (`./fastagrep.pl`)
- Let's try it (`./fastagrep.pl 'deserticola' examples/sequence.fasta`)
- Let's symbolic link it so the computer knows where to find it (`ln -s /Users/jerry/Dropbox/CSBQ/workshop/unix_workshop_2016/bin/fastagrep.pl /usr/local/bin/fastagrep.pl`)

bash

bash (let's look at an example `less examples/bash_cmd2`)