

| Basics                        |                                                                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| man {cmd}                     | man page for cmd                                                                                                        |
| type {cmd}                    | executable/shell/alias                                                                                                  |
| help {cmd}                    | if there is no man page                                                                                                 |
| wc                            | word count (-lines -words)                                                                                              |
| sort {file}                   | alphabetically (-reverse -numeric -unique -k column)                                                                    |
| ls   sort -nk4                | sort by file size                                                                                                       |
| mkdir [-p]                    | also make -parents if not exists                                                                                        |
| rm [-r -d -i]                 | (-recursive -d empty directories -i prompt before every removal)                                                        |
| mv {source ...} {destination} | move file(s) or directories or rename (if single file or folder is specified as source & destination)                   |
| cp {source ...} {destination} | copy file(s)                                                                                                            |
| history   less                | open history in pager                                                                                                   |
| history   grep {term}         | search for term in history                                                                                              |
| cat {file1} {file2}           | concatenate & print contents of file(s)                                                                                 |
| less {file}                   | page file contents                                                                                                      |
| head -{n} & tail              | print firsts / last n lines of file                                                                                     |
| tail -f                       | follow (eg. for logs)                                                                                                   |
| tr {search} {replace}         | replace search with replace in stdout (eg. cat msg   tr s S to uppercase all s) (-delete {search} instead of replacing) |

| Grep                                                                                                                   |                                          |
|------------------------------------------------------------------------------------------------------------------------|------------------------------------------|
| man grep   grep "count" -i -C5                                                                                         | grep in man for "count"                  |
| -i                                                                                                                     | insensitive case                         |
| -w                                                                                                                     | word search                              |
| -r                                                                                                                     | recursive                                |
| -c                                                                                                                     | count number of matches                  |
| -A {n}                                                                                                                 | end n lines after match                  |
| -B {n}                                                                                                                 | start n lines before match               |
| -C {n}                                                                                                                 | start & end n lines before & after match |
| -n                                                                                                                     | add line number for each match           |
| -m {n}                                                                                                                 | limit to n matches                       |
| -l                                                                                                                     | show filenames                           |
| Search for patterns in each file's contents (supports regex!)                                                          |                                          |
| grep " {pattern} " {file} print each line from {file} that contains {pattern}                                          |                                          |
| egrep (or grep -E) - use regex meta-characters (eg. ? {} etc.) for their special meaning and not as a normal character |                                          |

| Shortcuts           |                                       |
|---------------------|---------------------------------------|
| ctrl+l              | clear screen                          |
| ctrl+a / ctrl+e     | move to beginning/end of line         |
| option+← / option+→ | move left/right one word              |
| ctrl+t              | swap char with one before             |
| option+t            | swap word with one before             |
| ctrl+u              | kill from cursor to beginning of line |
| option+d            | kill word forward                     |
| ctrl+w              | kill word backward                    |
| !!                  | last command                          |
| !-{n}               | current command minus n               |

| Shortcuts (cont)                                                                                     |                            |
|------------------------------------------------------------------------------------------------------|----------------------------|
| ctrl+r                                                                                               | incremental history search |
| Some options on some OSes / terminals need to be set with bindkey, eg. bindkey "^[b " backwa rd-word |                            |

| Streaming / redirection / piping       |                                                |
|----------------------------------------|------------------------------------------------|
| >                                      | redirect output to specific file (overwrite!)  |
| >>                                     | append new data to specific file               |
| <                                      | pass contents of file to stdin                 |
| 2>                                     | redirect stderr to specific file               |
| 2>>                                    | append stderr to file                          |
| 2>&1                                   | redirect both stderr and stdout to same file   |
| command1   command2                    | pipe (redirect) stdout of 1 to stdin of 2      |
| tee                                    | read stdin and copy both to stdout and a file. |
| cat a.txt b.txt   tee both.txt   wc -l | see above                                      |

If redirecting both stdout and stderr, out has to be first! Eg. cat a.txt b.txt > both.txt 2> error.txt

| less                              |                    |
|-----------------------------------|--------------------|
| space or f                        | next page          |
| b                                 | previous page      |
| enter or down arrow               | scroll one line    |
| / {pattern}                       | search for pattern |
| q                                 | quit               |
| Pager to read manuals, docs, etc. |                    |

### Permissions

|                                                                                                                                                          |                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| r                                                                                                                                                        | file can be read, dir contents listed                                            |
| w                                                                                                                                                        | file can be modified, dir contents modified                                      |
| x                                                                                                                                                        | file can be treated as a program to be executed, dir can be <code>cd</code> into |
| -                                                                                                                                                        | file/dir can't be read/modified/execute (depending on where the dash is)         |
| chmod {permission} {file}                                                                                                                                | change permissions for given file                                                |
| chmod g+w                                                                                                                                                | add write permissions for group                                                  |
| chmod a-w                                                                                                                                                | remove write permissions for all                                                 |
| chmod a=r                                                                                                                                                | set permissions to read <b>ONLY</b> for all                                      |
| chmod 020                                                                                                                                                | --- -w- ---                                                                      |
| chmod 700                                                                                                                                                | rxw --- ---                                                                      |
| chmod 644                                                                                                                                                | rw - r-- r--                                                                     |
| Modes: <b>user</b> , <b>group</b> , <b>others</b> , <b>all</b><br>What: -: remove, +: add, =: only<br>Which: <b>read</b> , <b>write</b> , <b>execute</b> |                                                                                  |

### Expansion

|               |                                                                             |
|---------------|-----------------------------------------------------------------------------|
| ~             | home dir                                                                    |
| ~ {some user} | home dir of someuser                                                        |
| *             | zero or more characters                                                     |
| ?             | any single character                                                        |
| []            | range of characters eg. [123] [0-9] [A-F]                                   |
| [^]           | negate range eg. [^0-9]* -> not starts with a digit                         |
| {}            | generate arbitrary strings, eg. touch page{1,2,3}.txt will generate 3 files |

### Expansion (cont)

|                  |                                                                           |
|------------------|---------------------------------------------------------------------------|
| {...}            | generate between range eg. {1..31} {a..e} {2..10..2} (start,stop,step)    |
| {x,y{1..5},z}    | will expand to x y1 y2 y3 y4 y5 z                                         |
| \$((expression)) | arithmetic expansion (+, -, *, /, %, etc)                                 |
| \$(command)      | command substitution (eg. echo today is \$(date))                         |
| "double quotes"  | respect spacing & ignore special characters except \$, \ and ` (backtick) |
| 'single quotes'  | suppress all forms of substitution                                        |

Before any command runs, some special commands expand to match given files eg.:

```
ls -l *.txt
```

will be expanded to contain all files ending with .txt

```
mv app?.css Styles/ -> move all files matching pattern to Styles directory
```

### Finding files

|                      |                                                                                                          |
|----------------------|----------------------------------------------------------------------------------------------------------|
| locate {search term} | find all files containing search-term. (-ignore case -l limit to n options -e only files that exist now) |
| find {dir/}          | list every file and directory inside dir/                                                                |
| -type d              | only find directories (or files)                                                                         |
| -name "{pattern}"    | find files with given pattern ( <b>case sensitive!</b> ) (iname for case insensitive)                    |
| -size +1G            | larger than 1gb (or -50M, 20k -> exactly 20k)                                                            |

### Finding files (cont)

|                                                                         |                                                                                                                  |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| <code>-user {uname}</code>                                              | files<br>belonging<br>to uname                                                                                   |
| <code>-empty</code>                                                     | empty<br>files/-<br>folders                                                                                      |
| <code>[acm]min {n}</code>                                               | accessed /<br>changed /<br>modified n<br>minutes<br>ago (+- for<br>greater/<br>less than)                        |
| <code>[acm]time {n}</code>                                              | a/c/m n *<br>24 hours<br>ago                                                                                     |
| <code>-and -or -not</code>                                              | logical<br>operators<br>for more<br>complex<br>needs eg.<br>find -type f<br>-not -name<br>"*.html"               |
| <code>-exec command '{}' ';' ;</code>                                   | execute<br>cmd for<br>each<br>match, eg.:<br>find<br>~/Downloads<br>-type f -empty -<br>exec ls -l<br>'{}' ';' ; |
| <code>find -type f -name "*.html" -<br/>exec cp '{}' '{}_COPY' ;</code> | find each<br>matching<br>file &<br>create a<br>copy with<br>suffix                                               |
| <code>-ok command '{}' ;</code>                                         | same as<br>above but<br>ask for<br>confirmation<br>each time<br>(y/n)                                            |
| <code>find -name "*.txt"   xargs ls</code>                              | equivalent<br>to the -<br>exec ls '{}'<br>';' ;                                                                  |

