Information Technology
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UNIX Reference Card

# Anatomy of a Unix Command

**command-name -option(s)** *filename(s)* or *arguments*

Example: **wc -l** *sample*

The first word of the command line is usually the command name. This is followed by the options, if any, then the filenames, directory name, or other arguments, if any, and then a RETURN. Options are usually preceded by a dash and you may use more than one option per command. The examples on this reference card use **bold** case for command names and options and *italics* for arguments and filenames.

# Important Note about UNIX Commands

UNIX commands are case sensitive. Type commands exactly as shown; most UNIX commands are lower case. File and directory names can be lower, upper, or mixed case but must be typed exactly as listed. Commands prefaced by a ^ (caret) mean to hold down the CONTROL key and then press the indicated character.

# On-line Documentation

**man** *command* display on-line manual pages about *command*

Navigation**:**

| | |
|---|---|
| **SPACEBAR** | moves down 1 screen |
| **RETURN** | move down 1 line |
| **^d** | move down 1/2 screen |
| **^b** | move up 1/2 screen |
| **q** | exit |
| **h** | help |

# Printing

| | |
|---|---|
| **lprloc** | lists available printers |
| **setenv PRINTER** *printer* | set the default printer |
| **pcpasswd** | initialize SAMBA password for lab printing /login; only works on Owlnet's short-earred and long-earred servers |
| **http://www.owlnet.rice.edu/webprint.shtml** | web-based printing; view current charges |
| **lpr** *option filename* | print file |
| **lpq** *option* | check status of print queue |
| **lprm** *option* | remove jobs from printer queue |
| options: **-P***printer* | specify a printer other than the default |

# File System Manipulation

## Create (or Make) a Directory

**mkdir** *directory-name* create a directory called *directory-name*

## Look at a File

| | |
|---|---|
| **more** *filename* | display file contents, same navigation as **man** |
| **head** *filename* | display first ten lines of a file |
| **tail** *filename* | display last ten lines of a file |

options**:**

**-#** replace # with a number to specify how many lines to show

## List Files and Directories

| | |
|---|---|
| **ls** | lists contents of current directory |
| **ls** *directory-name* | list contents of directory |

options**:**

| | |
|---|---|
| **-a** | list all files including files that start with "." |
| **-s** | list size of files (in kilobytes) |
| **-l** | long list, shows ownership, permissions, and links |
| **-l -g** | lists the group of each file or directory when used with **-l** |
| **-t** | list files chronologically |
| **-F** | append "*" to executable file name, "/" to directory name, and "@" to symbolic link |
| **-u** | list files using time of last access instead of time of last modification |

**pwd** (display the name of present working directory)

## Change Working Directory

| | |
|---|---|
| **cd** | to change to your home directory |
| **cd** *directory-name* | to change to another directory |

examples:

| | |
|---|---|
| **cd test** | change to the directory named test |

## Directory Abbreviation

| | |
|---|---|
| **~** | home directory (tilde) |
| **~***username* | another user's home directory |
| **.** | current or working directory |
| **..** | parent of working directory |

## Move (Rename) Files and Directories

| | |
|---|---|
| **mv** *present-filename new-filename* | to rename a file |
| **mv** *source-filename destination-directory* | to move a file into another directory |

options: **-i** interactive mode. Must confirm file overwrites.

## Copy Files

| | |
|---|---|
| **cp** *source-filename destination-filename* | to copy a file into another file |
| **cp** *source-filename destination-directory* | to copy a file into another directory |

options**:**

| | |
|---|---|
| **-i** | interactive mode. Must confirm overwrites. Note: this option is automatically used on all IT's systems. |
| **-R** | recursive delete |

## Remove (Delete) Files and Directories

**rm** filename to remove a file **rmdir** *directory-name* to remove an empty directory

options:

**-i** interactive mode. Prompt for confirmation. Note: this is option is automatically set up on all IT's systems.

## Change File Access Permissions

**chmod [***who op permission***]** *filename*

*who* can be any combination of:

| | |
|---|---|
| **u** | (user) |
| **g** | (group) |
| **o** | (other) |
| **a** | (all) (i.e. **ugo**) |

*op* adds or takes away permission, and can be:

| | |
|---|---|
| + | (add permission), |
| - | (remove permission), or |
| = | (set to exactly this permission) |

*permission* can be any combination of

| | |
|---|---|
| **r** | (read) |
| **w** | (write) |
| **x** | (execute) |

Ex: **chmod a+x** *filename* (makes *filename* executable by everyone)

# Shell Tools

**Wild Cards**

| | |
|---|---|
| **?** | single character wild card |
| ***** | arbitrary number of characters |

### History: Command Repetition

| | |
|---|---|
| **history** | display list of most recent commands |
| **!!** | repeat the entire last command line at any point in the current command line |
| **!$** | repeat the last word of previous command line at any point in current command line |
| **!^** | repeat first argument from previous command line at any point in the current command line |
| **!** *n* | repeat command line *n* |
| **!!:p** | display previous command |
| **!***string* | command beginning with *string* |
| **!*** | repeat all arguments to previous command |

### Command I/O

| | |
|---|---|
| > | command output redirection (create new) |
| >> | command output redirection (append) |
| < | command input redirection (from file) |
| << | command input (from script or standard input) |

### Alias

**alias** *alias-string command-string*

Alias abbreviates a command string with an alias string. For multi-command strings, enclose commands in quotes.

Example: **alias** shut chmod go-rwx

To use the aliased command shut on a file, and turn off read, write, and executable permissions for all users except yourself, type shut *filename*.

## Process Control

### Process Status

**ps (**display the status of the current processes)
options:

| | |
|---|---|
| **-a** | include processes owned by other users |
| **-g** | display all processes |
| **-u** | display user-oriented processes |
| **-x** | include processes with no controlling terminals |
| **-gx** | display all of your local processes |

| | |
|---|---|
| **kill** *id-number* | terminate a process owned by you<br>The *id-number* (PID-Process ID) can be found by first using the **ps** command. |

### Run Command in Background: Job Control

To run a command in the background, as opposed to the more common method of running commands in the foreground, append an & to the end of a command string. Then, you can type more commands to the command prompt, or even run more commands in the background for simultaneous command execution.

| | |
|---|---|
| **Control-Z** | stop (interrupt) foreground job |
| **jobs** | list of background jobs |
| **bg** | run a stopped job in the background |
| **fg** | resume stopped job in the background |

## File Operations

### Search for Patterns in Files

**grep** *search-string filename* [*filename...*] to find and type out lines containing the string in a file

options: **-v** type out lines that don't contain the string (invert the search)

### Counting Words in a File

**wc *filename*** counts the number of words, lines, or characters in a file
options:

| | |
|---|---|
| **-w** | words |
| **-l** | lines |
| **-m** | characters |

### Compare Files

**diff** *filename1 filename2* compares contents of *filename1* and *filename2* on a line-by-line basis

### File Transfer

**mail** *address* sends mail to user at the specified address (using the format is *user@host.domain).* ^d terminates input and sends message.

**ftp** *host.domain* use file transfer protocol to connect to remote host computer. Type **?** for commands.

### Compress Files

| | |
|---|---|
| **compress** *filename* | compress file and rename it *filename.Z* |
| **uncompress** *filename.Z* | decompress file and rename *filename* |
| **gzip** *filename* | compress file and rename it *filename.gz* |
| **gunzip** *filename.Z* | decompress file and rename *filename* |

## Program Compilation

| | |
|---|---|
| **f90** *filename.f* | FORTRAN compiler (also f77 code) |
| **cc** *filename.c* | C compiler |
| **gcc** filename.C | C compiler (other suffixes: .cc, .cxx, .cpp, .c++) |
| **g++** filename.c++ | C++ compiler |
| **pc** *filename.p* | Pascal compiler |

options:

| | |
|---|---|
| **-o** *filename* | direct output of program to *filename* |
| **-l** *library* | include *library* in program compilation |

## User Information and Helpful Commands

| | |
|---|---|
| **env** | lists your environment settings |
| **who** | lists users on the local system |
| **finger** *username@host.domain* | looks up information on another user |
| **clear** | clears screen |
| **ntalk** *username@host.domain* | talk to another user |
| **lprloc** | shows names and locations of printers |
| **stty sane** | resets terminal characteristics to a usable set |
| **stty** | display terminal characteristics |
| **date** | displays current time and date |
| **cal** *year* | for yearly calendar |
| **cal** *## ####* (*month-year*) | for monthly calendar |
| **ssh** *host.domain* | user interface to a remote system |
| **which** *command* | locate a command; display its pathname |
| **spell** *filename* | report spelling errors |
| **ispell** *filename* | interactive spell-checker |
| **echo $path** | inspect your search path |
| **bc** | basic calculator (^d to exit) |
| **du** | display the number of disk blocks used per directory or file |
| **du -s** | display your total disk usage |
| **quota -v** | display your disk quota and usage |