Linux Plus for AWS and DevOps

CLARUSWAY
WAY TO REINVENT YOURSELF

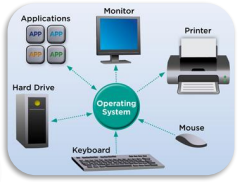
Table of Contents

- What We Learn
- Getting Help
- Text Editors
- File Management

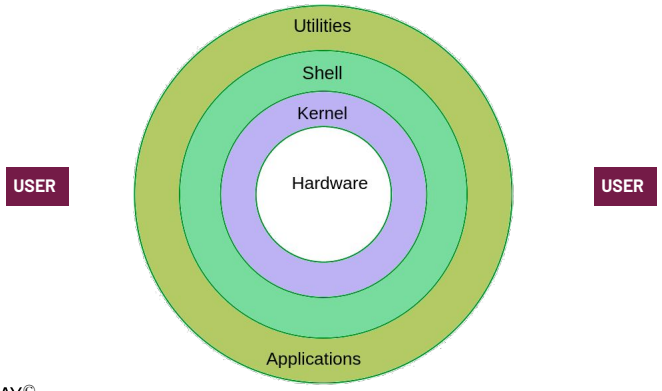
1 What We Learn

What is Linux?

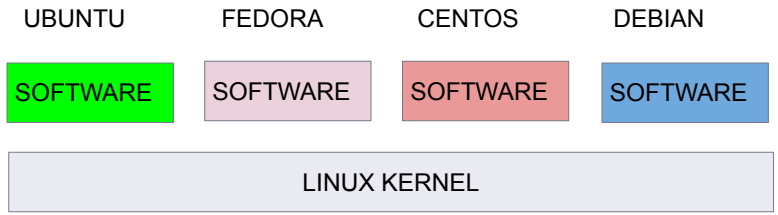
- Free
- Open-Source
- OS



Components of Linux

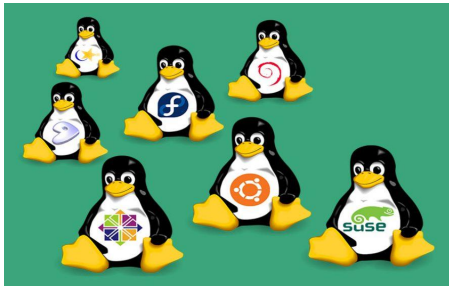


What is Linux Distributions



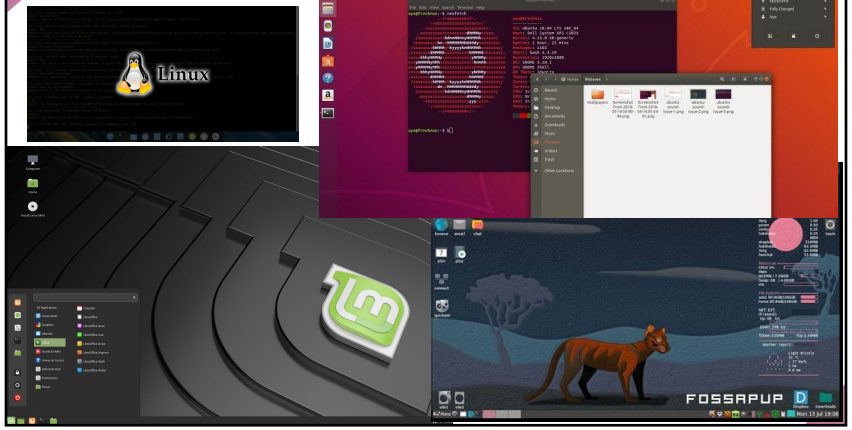
Popular Linux Distributions

- Debian
- Ubuntu
- Mint
- Manjaro
- openSUSE
- RedHat
- Fedora



Using Linux on Different Platforms

Linux Alternatives



Linux Alternatives

Linux Distros on Virtual Machines

MacOS/Windows

https://www.virtualbox.org/wiki/Downloads

ORACLE VM VirtualBox

Windows

VMware Player

https://www.vmware.com/products/workstation-player/workstation-player-evaluation.html

Linux Alternatives

Linux Distros on Virtual Machines

https://ubuntu.com/download/desktop

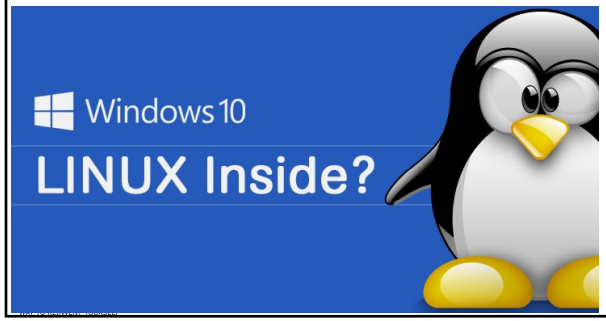
https://www.debian.org/distrib/netinst

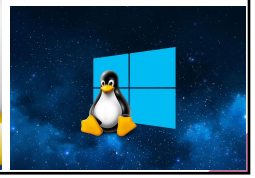
VirtualBox

VMware Player

Linux Alternatives

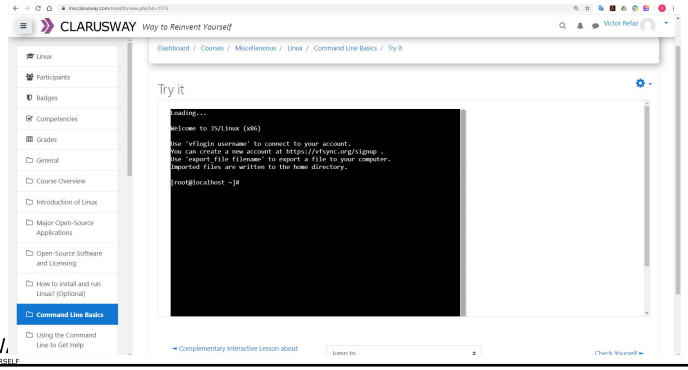
WSL





Linux Alternatives

LMS: Try it



Linux Alternatives

https://copy.sh/

copy's home

You can email me at copy@copy.sh. Use my GnuPG key.

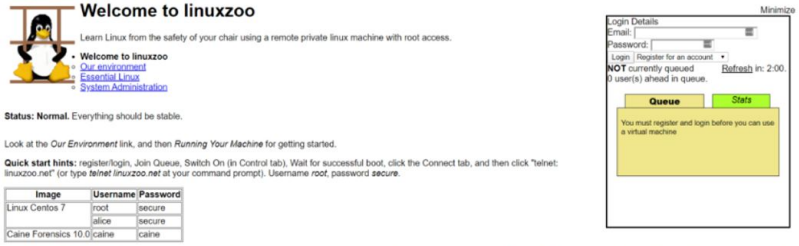
Projects

Virtual x86
Run KolibriOS, Linux or Windows 98 in your browser.

https://cocalc.com/doc/terminal.html

Linux Alternatives

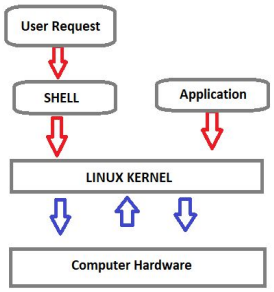
linuxzoo.net



What is SHELL?

Shell is **a program** that **receives** the user's **commands** and **gives** them to the **operating system to process** and displays the output.

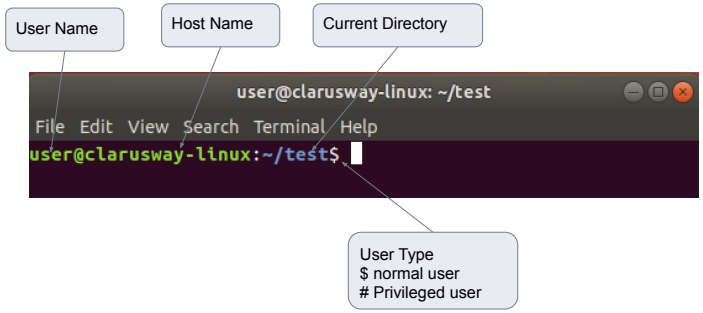
Bash (**B**ourne **A**gain **SH**ell) is an **enhanced version** of Steve Bourne's first Unix shell application, and serves as the shell program on most Linux systems.



What is SHELL?

- The standard Linux shell is both a **command-line interpreter** and a **programming language.**
- The command prompt for Linux generally shows the current **user**, the current **host**, and the appropriate **directory**.
- At the end of the prompt list, the **$(dollar sign)** signifies the current user being unprivileged, and the device is ready to receive feedback.
- The input is sent for parsing and execution to the interpreter.

Command Prompt



Basic Shell Commands

COMMAND	DESCRIPTION
pwd	show current path
ls	lists directory contents
cd	change (current) directory
mkdir	create a new directory
rmdir	delete an empty directory
touch	create a file
rm	delete a file

rm -rf

Basic Shell Commands

COMMAND	DESCRIPTION
cp	copy a file to another location
mv	move a file to another location
cat	show file contents
echo	print message to screen
clear	clear the terminal screen

Kahoot!

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2 Getting Help

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Table of Contents

- Man Pages
- Info Pages
- whatis command
- apropos command
- --help option

2-1 Man Pages

Man Pages

A man page (short for manual page) is a form of **software documentation** usually **found on a Unix or Unix-like** operating system.

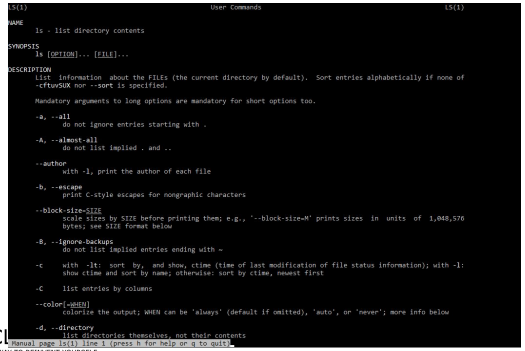
If we **install a package** to do some task, the **man page** for that package will typically be **installed** at the same time. This gives us the ability to take a look at that documentation and make sure that we're using it in a manner consistent with its design.

The man page for a particular command is invoked by **man command.**

man <command>

Man Pages

$ man ls



NAME
Program or Function name(s) followed by descriptions of functionality.

SYNOPSIS
A short overview of available options

DESCRIPTION
Detailed information about arguments and options.

2-2 Info Pages

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Info Pages

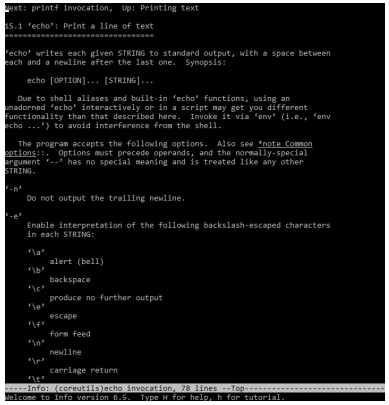
Info pages are **additional documentation** with more robust capability **in detail**. Info pages normally provide more detailed information about a command than its respective man page.

info <command>

The info page for a particular command is invoked by **info command.**

Info Pages

$ info echo



2-3 whatis command

whatis command

whatis display one-line manual page names.

```
clarusway@DESKTOP-UN6T2ES:~$ whatis ls
ls (1)               - list directory contents
clarusway@DESKTOP-UN6T2ES:~$ whatis pwd
pwd (1)              - print name of current/working directory
clarusway@DESKTOP-UN6T2ES:~$ whatis mv
mv (1)               - move (rename) files
clarusway@DESKTOP-UN6T2ES:~$
```


2-4

apropos command

apropos command

apropos search the manual page **names** and **descriptions**.

```
clarusway@DESKTOP-UN6T2ES:~$ apropos pwd
pwd (1)              - print name of current/working directory
pwdx (1)             - report current working directory of a process
unix_chkpwd (8)      - Helper binary that verifies the password of the current user
clarusway@DESKTOP-UN6T2ES:~$
```


2-5 --help Option

--help Option

--help gives a **short explanation** about how to use the command and a **list of available options**.

```
clarusway@DESKTOP-UN6T2ES:~$ ls --help
Usage: ls [OPTION]... [FILE]...
List information about the FILEs (the current directory by default).
Sort entries alphabetically if none of -cftuvSUX nor --sort is specified.

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 ~
  -c                         with -lt: sort by, and show, ctime (time of last
                               modification of file status information);
```


3 Text Editors

3-1

Vİ/Vim Editor

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Vi/Vim Editor

- Vi is a text editor **originally created for the Unix** operating system.
- Vim (Vi IMproved) as its name suggests, is a **clone of Vi** and offers more features than Vi.

The reasons why we should use Vi/Vim editor.

- Vim is available on most linux distro's.
- Vim Uses Less Amount of System Resources.
- Vim Supports All Programming Languages and File Formats
- Vim is Very Popular in the Linux World

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Vi/Vim Editor

- Vim is a powerful text editor used in CLI (command line interface).
- Vim is an editor to create or edit a text file.

Command Mode

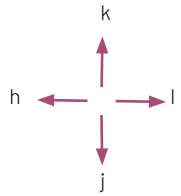
- When you start Vim, you are **placed in Command mode**. In this mode, you can move across the screen, delete text and copy text.

Insert Mode

- You cannot write text in command mode. To write text into a file, there is a dedicated insert mode. When you want to write something on a file, you must enter the insert mode.

Vi/Vim Editor

Vim Command	Description
i	Enter insert mode
Esc	Enter command mode
x or Del	Delete a character
X	Delete character is backspace mode
u	Undo changes
Ctrl + r	Redo changes
yy	Copy a line
dd	Delete a line
p	Paste the content of the buffer
o	insert a blank line under the current cursor position.
:%s/foo/bar/g	Search and replace all occurrences
Esc + :w	Save changes
Esc + :wq or Esc + ZZ	Save and quit Vim



3-2

Nano Editor

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Nano Editor

GNU nano is a small and friendly text editor.
Besides basic text editing, nano offers features like:

- undo/redo
- syntax coloring
- interactive search-and-replace
- auto-indentation
- line numbers
- word completion

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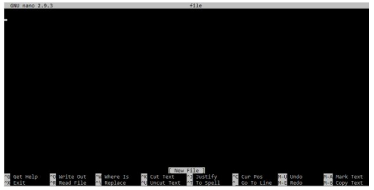
Nano Editor

- Unlike vi, nano is a **modeless editor**, which means that you can start typing and editing the text immediately after opening the file.
- To open an existing file or to create a new file, type nano followed by the file name.

```
$ nano filename
```



Nano Command	Meaning
Ctrl G	Get Help
Ctrl X	Exit
Ctrl O	Write Out
Ctrl R	Read File
Ctrl W	Where Is
Ctrl \	Replace
Ctrl K	Cut Text
Ctrl U	Uncut Text
Ctrl J	Justify
Ctrl T	To Spell
Ctrl C	Cur Pos
Alt U	Undo
Alt E	Redo

4

File Management

4-1 Files

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Files

- On a Linux system, everything is a file.
- A Linux system makes no difference between a file and a directory, since a directory is just a file containing names of other files.
- The tree of the file system starts at the trunk or slash, indicated by a forward slash (/). This directory, containing all underlying directories and files, is also called the root directory or “the root” of the file system.

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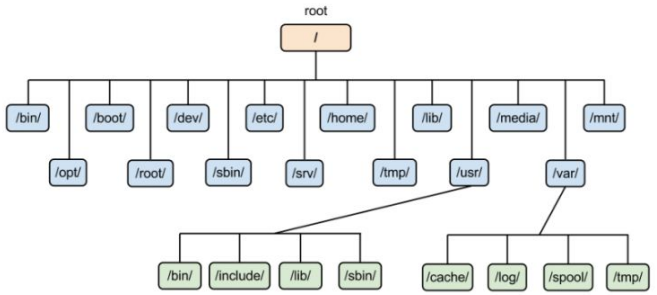
ROOT Directory (/)



ROOT Directory (/)

```
/bin        Essential command binaries
/boot       Static files of the boot loader
/dev        Device files
/etc        Host-specific system configuration
/home       Users' home directories
/lib        Essential shared libraries and kernel modules
/media      Mount point for removable media
/mnt        Mount point for mounting a filesystem temporarily
/opt        Add-on application software packages
/sbin       Essential system binaries
/srv        Data for services provided by this system
/tmp        Temporary files
/usr        Secondary hierarchy
/var        Variable data
```

Files

Symbol	Meaning
-	Regular file
d	Directory
l	Link
c	Character Device File
s	Socket File
p	Named Pipe
b	Block Device

```
-rw-------      Regular File
drwxr-xr-x.    Directory File
lrwxrwxrwx.    Link File
crw-rw----.    Character Device File
brw-rw----.    Block Special File
srw-rw-rw-     Socket File
prw-------.    Named Pipe File
```

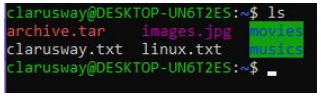

4-2 Viewing file properties

Viewing file properties

ls

On most Linux versions ls is aliased to color-ls by default. This feature allows to see the file type without using any options to ls.

Color	Meaning
Blue	directories
Red	compressed archives
White	text files
Pink	images
Cyan	links
Yellow	Devices
Green	Executables
flashing red	broken links



4-3 Working with File Contents

Working with File Contents

head — output the first ten lines of a file.

```
clarusway@DESKTOP-UN6T2ES:~$ head /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
clarusway@DESKTOP-UN6T2ES:~$
```


Working with File Contents

head -n — output the first n lines of a file.

```
clarusway@DESKTOP-UN6T2ES:~$ head -5 /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
clarusway@DESKTOP-UN6T2ES:~$
```

Working with File Contents

tail — output the last ten lines of a file.

```
clarusway@DESKTOP-UN6T2ES:~$ tail /etc/passwd
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112::/var/lib/landscape:/usr/sbin/nologin
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
pollinate:x:110:1::/var/cache/pollinate:/bin/false
clarusway:x:1000:1000:,,,:/home/clarusway:/bin/bash
john:x:1002:1002:john,room,work,home,other:/home/john:/bin/bash
oliver:x:1003:1003:oliver,room_1,work_1,home_1:/home/oliver:/bin/bash
walter:x:1004:1004:aws solution architect:/home/walter:/bin/sh
aaron:x:1001:1001:aaron,,,:/home/aaron:/bin/bash
james:x:1005:1009:james,,,:/home/james:/bin/bash
clarusway@DESKTOP-UN6T2ES:~$
```


Working with File Contents

tail -n — output the last n lines of a file.

```
clarusway@DESKTOP-UN6T2ES:~$ tail -5 /etc/passwd
john:x:1002:1002:john,room,work,home,other:/home/john:/bin/bash
oliver:x:1003:1003:oliver,room_1,work_1,home_1:/home/oliver:/bin/bash
walter:x:1004:1004:aws solution architect:/home/walter:/bin/sh
aaron:x:1001:1001:aaron,,,:/home/aaron:/bin/bash
james:x:1005:1009:james,,,:/home/james:/bin/bash
clarusway@DESKTOP-UN6T2ES:~$
```

Working with File Contents

cat Display a file on the screen.

```
clarusway@DESKTOP-UN6T2ES:~$ cat quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate
achievements.
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
clarusway@DESKTOP-UN6T2ES:~$
```


Working with File Contents

cat One of the basic uses of cat is to concatenate files into a bigger (or complete) file.

```
clarusway@DESKTOP-UN6T2ES:~$ echo this is file1 > file1
clarusway@DESKTOP-UN6T2ES:~$ echo this is file2 > file2
clarusway@DESKTOP-UN6T2ES:~$ echo this is file3 > file3
clarusway@DESKTOP-UN6T2ES:~$ cat file1
this is file1
clarusway@DESKTOP-UN6T2ES:~$ cat file2
this is file2
clarusway@DESKTOP-UN6T2ES:~$ cat file3
this is file3
clarusway@DESKTOP-UN6T2ES:~$ cat file1 file2 file3
this is file1
this is file2
this is file3
clarusway@DESKTOP-UN6T2ES:~$ cat file1 file2 file3 > all
clarusway@DESKTOP-UN6T2ES:~$ cat all
this is file1
this is file2
this is file3
clarusway@DESKTOP-UN6T2ES:~$
```

Working with File Contents

cat — You can use cat to create **flat text files**.

```
clarusway@DESKTOP-UN6T2ES:~$ cat > winter.txt
It is very cold today!
clarusway@DESKTOP-UN6T2ES:~$
```

The **Ctrl d** key combination will send an **EOF (End of File)** to the running process ending the cat command.

Working with File Contents

more — view (but not modify) the contents of a text file one **screen at a time.**

```
clarusway@DESKTOP-UN6T2ES:~$ more quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate
 achievements.
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
clarusway@DESKTOP-UN6T2ES:~$
```

Working with File Contents

more -n This option specifies an integer which is the screen size (**in lines**).

```
clarusway@DESKTOP-UN6T2ES:~$ more -2 quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your
ultimate achievements.
--More--(32%)
```


Working with File Contents

less Similar to more, less command allows you to view the contents of a file and navigate through file. The **main difference** between more and less is that **less** command is **faster** because it **does not load the entire file at once**.

```
clarusway@DESKTOP-UN6T2ES:~$ less quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate
 achievements.
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
quotes.txt (END)
```

Working with File Contents

tac concatenate and print files in reverse.

```
clarusway@DESKTOP-UN6T2ES:~$ cat count.txt
one
two
three
four
five
clarusway@DESKTOP-UN6T2ES:~$ tac count.txt
five
four
three
two
one
clarusway@DESKTOP-UN6T2ES:~$
```


4-4 Searching Files

Searching Files

find — search for files in a directory hierarchy.

find [starting-point...] [expression]

find — Find all the files whose name is clarusway.txt in a current working directory.

```
clarusway@DESKTOP-UN6T2ES:~$ find . -name clarusway.txt
./clarusway.txt
clarusway@DESKTOP-UN6T2ES:~$
```


Searching Files

find — Find all the files whose name is clarusway.txt under /home directory.

```
clarusway@DESKTOP-UN6T2ES:~$ find /home -name clarusway.txt
/home/clarusway/clarusway.txt
clarusway@DESKTOP-UN6T2ES:~$
```

Searching Files

find

Find all the files whose name is clarusway.txt and contains both capital and small letters in /home directory.

```
clarusway@DESKTOP-UN6T2ES:~$ find /home -iname clarusway.txt
/home/clarusway/Clarusway.txt
/home/clarusway/clarusway.txt
clarusway@DESKTOP-UN6T2ES:~$
```


Searching Files

find

Find all directories whose name is movies in /home directory.

```
clarusway@DESKTOP-UN6T2ES:~$ find /home -type d -name movies
/home/clarusway/movies
clarusway@DESKTOP-UN6T2ES:~$
```

Searching Files

find

Find all txt files in a directory.

```
clarusway@DESKTOP-UN6T2ES:~$ find . -type f -name "*.txt"
./Clarusway.txt
./clarusway.txt
./count.txt
./linux.txt
./quotes.txt
./winter.txt
clarusway@DESKTOP-UN6T2ES:~$
```


Searching Files

grep

The grep, which stands for "global regular expression print," is used to search text.

grep [options] pattern [files]

Options	Description
-c	This prints only the number of lines that match a pattern
-h	Do not display the filenames headers.
-i	Ignores, case for matching
-l	Displays list of a filenames only.
-n	Display the matched lines and their line numbers.
-v	This prints out all the lines that do not matches the pattern

Searching Files

grep The grep searches the given file for lines containing a match to the given strings or words.

```
clarusway@DESKTOP-UN6T2ES:~$ cat quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate achievements.
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
clarusway@DESKTOP-UN6T2ES:~$ grep "Start" quotes.txt
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
clarusway@DESKTOP-UN6T2ES:~$
```


Searching Files

grep -n Returns the result of lines matching the search string.

```
clarusway@DESKTOP-UN6T2ES:~$ grep -n "Start" quotes.txt
2:2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
```

grep -c Returns the number of lines in which the results matched the search string.

```
clarusway@DESKTOP-UN6T2ES:~$ grep -c "Start" quotes.txt
1
clarusway@DESKTOP-UN6T2ES:~$
```

Searching Files

grep -v Returns the result of lines not matching the search string.

```
clarusway@DESKTOP-UN6T2ES:~$ cat quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate
achievements.
2. Start by doing what's necessary; then do what's possible; and suddenly you are doing the impossible.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
clarusway@DESKTOP-UN6T2ES:~$ grep -v "Start" quotes.txt
1. Cherish your visions and your dreams as they are the children of your soul, the blueprints of your ultimate
achievements.
3. The difficult we do immediately. The impossible takes a little longer.
4. We are what we repeatedly do. Excellence, then, is not an act, but a habit.
clarusway@DESKTOP-UN6T2ES:~$
```


THANKS!

Any questions?