



# BridgeLabz

Employability Delivered

## Terminal Commands

# Prerequisites to learn CLI

- CLI - Command Line Interface
- Check Git is Installed – **git --version**
- Check Java is installed **java -version**
- Java Installation - <https://exercism.io/tracks/java/installation#linux>
- ***mkdir TerminalCommands***
- ***cd TerminalCommands/***
- Check git is installed - **git --version**
- **git clone** <https://github.com/edurekavivekh/linux-content.git>
- Change Dir to ***cd linux-content/*** and do ***ls***
- You will see `linux_chit_sheet.pdf` – for Linux Commands and `linux_problem_sheet.pdf` – to solve problems using linux commands

- Check your Current Working Directory
- List all files in your Current Working Directory, Top level Directory, current, parent & home Directory.
- List also the hidden files & Directory.
- List all Files & Directory in a long format
- Create a temp Folder
- Remove the temp Folder
- Create a nested temp/temp folder

# File & Directory Commands

```
Terminal Shell Edit View Window Help
TerminalCommands - bash -- 95x27

Narayans-MacBook-Pro:TerminalCommands narayan$ pwd
/Users/narayan/Development/TerminalCommands

Narayans-MacBook-Pro:TerminalCommands narayan$ ls .
Helloworld.class      def                ps_commands.txt
Helloworld.java       def.txt           temp
abc                   forloop.sh        test
abc.txt               linux-content
commands.txt          loop_commands.txt

Narayans-MacBook-Pro:TerminalCommands narayan$ ls ..
Commands               Programming Questions  fundooBooksOld
DotNetDev              Python                fundooPay
DotNetDevelopment      Temp                  test
JavaDevelopment        TerminalCommands
NodeJSSamples          fundooBooks

Narayans-MacBook-Pro:TerminalCommands narayan$ ls ~
Applications           Downloads            Music
Desktop                Extras               Pictures
Development            Library              Public
Documents              Movies               iCloud Drive (Archive)

Narayans-MacBook-Pro:TerminalCommands narayan$ ls -a
.                abc.txt           loop_commands.txt
..               commands.txt      ps_commands.txt
.DS_Store       def               temp
Helloworld.class def.txt           test
Helloworld.java forloop.sh
abc             linux-content

Narayans-MacBook-Pro:TerminalCommands narayan$
```

Current Working Directory

List files & folders in  
Current Directory

List files & folders in Parent  
Directory

List files & folders in Home  
Directory

List all files & folders  
including the hidden ones

```
Narayans-MacBook-Pro:TerminalCommands narayan$ ls -l
total 24
-rw-r--r--  1 narayan  staff  612 Nov  1 14:58 Helloworld.class
-rw-r--r--  1 narayan  staff  222 Nov  1 14:58 Helloworld.java
-rwxr-xr-x  1 narayan  staff  347 Nov  2 12:38 forloop.sh
drwxr-xr-x  9 narayan  staff  288 Nov  1 16:16 linux-content
Narayans-MacBook-Pro:TerminalCommands narayan$ mkdir temp
Narayans-MacBook-Pro:TerminalCommands narayan$ ls
Helloworld.class      forloop.sh            temp
Helloworld.java      linux-content
Narayans-MacBook-Pro:TerminalCommands narayan$ rm -R temp
Narayans-MacBook-Pro:TerminalCommands narayan$ mkdir -p temp/temp
Narayans-MacBook-Pro:TerminalCommands narayan$ ls
Helloworld.class      forloop.sh            temp
Helloworld.java      linux-content
Narayans-MacBook-Pro:TerminalCommands narayan$ cd temp/
Narayans-MacBook-Pro:temp narayan$ pwd
/Users/narayan/Development/TerminalCommands/temp
Narayans-MacBook-Pro:temp narayan$ ls
temp
Narayans-MacBook-Pro:temp narayan$ touch test
Narayans-MacBook-Pro:temp narayan$ ls -p
temp/  test
Narayans-MacBook-Pro:temp narayan$
```

List Files & Folder in Long Format

Create Directory temp

Remove recursively all files & folders in temp directory

Create Nested Directory

Change Directory to temp

Create a empty test file

Show all files and also show directories ending with /

# File Management

---

- Change directly to temp
- create a empty test file.
- Copy test file into another test1 file
- move test1 file to test2 file.
- Create a link to the test file in your home dire.
- Change dir to home & remove the temp folder.
- man ls  $\Rightarrow$  to list all options
- whereis ls  $\Rightarrow$  find the location of the command



```
Narayans-MacBook-Pro:temp narayan$ cp test test1
```

Copy test file into test1

```
Narayans-MacBook-Pro:temp narayan$ ls -p
```

```
temp/  test  test1
```

Move test1 file into test2

```
Narayans-MacBook-Pro:temp narayan$ mv test1 test2
```

```
Narayans-MacBook-Pro:temp narayan$ ls -p
```

```
temp/  test  test2
```

Link test file in temp dir

```
Narayans-MacBook-Pro:temp narayan$ ln -s test temp/
```

```
Narayans-MacBook-Pro:temp narayan$ ls -p temp/
```

```
test
```

Link linux\_chit\_sheet pdf to QuickLink in home dir

```
Narayans-MacBook-Pro:temp narayan$ ln -s ../linux-content/linux_chit_sheet.pdf ~/QuickLink/
```

```
Narayans-MacBook-Pro:temp narayan$ ls -l ~/QuickLink/
```

Note on listing shows the location of actual file

```
total 0
```

```
lrwxr-xr-x  1 narayan  staff   37 Nov  3 10:03 linux_chit_sheet.pdf -> ../linux-content/linux_chit_sheet.pdf
```

Locate commands using  
whereis

```
Narayans-MacBook-Pro:temp narayan$ whereis ls
```

```
/bin/ls
```

```
Narayans-MacBook-Pro:temp narayan$ ls /bin
```

```
[          dd          ksh          pax          stty
bash       df          launchctl  ps           sync
cat        echo         link       pwd          tcsh
chmod      ed          ln         rm           test
cp         expr        ls         rmdir        unlink
csh        hostname   mkdir      sh           wait4path
date       kill       mv         sleep        zsh
```

Looking up bin folder in  
root dir

```
Narayans-MacBook-Pro:temp narayan$ man ls
```

Lookup Command using man.  
Use q to quit

the **-P** option.

- l** (The lowercase letter ``ell''.) List in long format. (See below.) If the output is to a terminal, a total sum for all the file sizes is output on a line before the long listing.
- m** Stream output format; list files across the page, separated by commas.
- n** Display user and group IDs numerically, rather than converting to a user or group name in a long (**-l**) output. This option turns on the **-l** option.
- O** Include the file flags in a long (**-l**) output.
- o** List in long format, but omit the group id.
- P** If argument is a symbolic link, list the link itself rather than the object the link references. This option cancels the **-H** and **-L** options.
- p** Write a slash (``/'') after each filename if that file is a directory.
- q** Force printing of non-graphic characters in file names as the character ``?'; this is the default when output is to a terminal.
- R** Recursively list subdirectories encountered.



- change direch to etc
- list the passwd file
- change to previous direchy.
- View the file
- Browse the file line by line
- Display first 10 lines of the /etc/passwd file
- Display last 10 lines of /etc/passwd file.

## View & Browse Files

```
Narayans-MacBook-Pro:temp narayan$ ls -l /etc/passwd
-rw-r--r--  1 root  wheel  6804 Feb 26  2019 /etc/passwd
Narayans-MacBook-Pro:temp narayan$ less /etc/passwd
Narayans-MacBook-Pro:temp narayan$ head /etc/passwd
```

List in Long Format /etc/passwd file

Browsing the passwd file using less

```
##
# User Database
#
# Note that this file is consulted directly only when the system is running
# in single-user mode.  At other times this information is provided by
# Open Directory.
#
# See the opendirectoryd(8) man page for additional information about
# Open Directory.
```

Display first 10 lines from top

```
##
Narayans-MacBook-Pro:temp narayan$ tail -2 /etc/passwd
_timed:*:266:266:Time Sync Daemon:/var/db/timed:/usr/bin/false
_reportmemoryexception:*:269:269:ReportMemoryException:/var/db/reportmemoryexception:/usr/bin/false
Narayans-MacBook-Pro:temp narayan$ cat /etc/passwd
```

Display last 2 lines from bottom

Browsing the complete file

# Pipe & Grep Commands

- cmd1 | cmd2  
stdout of cmd1 to cmd2
- find all directories in the current  
working directory.
- find passwd file in /etc/
- find all files in the /etc/ directory

TerminalCommands \$ find . -size +5M

./linux-content/linux\_chit\_sheet.pdf

./linux-content/.git/objects/b6/04c4fde493cb44468855d37d0ae0973164cc67

./linux-content/.git/objects/2b/b9e2d5d41336c901d25a51b89a6adaa578c946

./linux-content/linux\_problem\_sheet.pdf

TerminalCommands \$ find . -name \*.pdf -size +5M

./linux-content/linux\_chit\_sheet.pdf

./linux-content/linux\_problem\_sheet.pdf

TerminalCommands \$ find . -size +5M | grep pdf

./linux-content/linux\_chit\_sheet.pdf

./linux-content/linux\_problem\_sheet.pdf

TerminalCommands \$ find . -name data\*

./linux-content/data.csv

TerminalCommands \$ grep CAPTAIN linux-content/data.csv

2 GARY CAPTAIN 155966 245131 137811 538909 538909

3 ALBERT CAPTAIN 212739 106088 16452 335279 335279

12 PATRICIA CAPTAIN 99722 87082 110804 297608 297608

TerminalCommands \$ grep -r CAPTAIN .

./linux-content/data.csv:2 GARY CAPTAIN 155966 245131 137811 538

909 538909

./linux-content/data.csv:3 ALBERT CAPTAIN 212739 106088 16452 335

279 335279

./linux-content/data.csv:12 PATRICIA CAPTAIN 99722 87082 110804 297

608 297608

TerminalCommands \$

Find file size greater the 5M

Find pdf files greater than 5M

Find pdf files greater than 5M using pipe and grep command

Find files starting with data grep CAPTAIN in data.csv file

Recursively grep CAPTAIN in the Current Directory

temp — bash — 96x27

```
Narayans-MacBook-Pro:temp narayan$ ls -p | grep /  
temp/
```

Using Pipe i.e. | to show all Folders

```
Narayans-MacBook-Pro:temp narayan$ ls -p | grep -v /  
test  
test2
```

Using Pipe to show all Files

```
Narayans-MacBook-Pro:temp narayan$ env
```

```
TERM_PROGRAM=Apple_Terminal  
SHELL=/bin/bash  
TERM=xterm-256color  
TMPDIR=/var/folders/sz/zlcpnpgd10qlcr6xf3frycq3h0000gn/T/  
Apple_PubSub_Socket_Render=/private/tmp/com.apple.launchd.k04qruz78/Render  
TERM_PROGRAM_VERSION=421.2  
OLDPWD=/Users/narayan/Development/TerminalCommands  
TERM_SESSION_ID=FEB0A322-0260-4F1F-9A39-A2B3CE5D10E9  
USER=narayan  
SSH_AUTH_SOCK=/private/tmp/com.apple.launchd.kfSZSOYnZs/Listeners  
PATH=/usr/local/bin:/usr/bin:/bin:/usr/sbin:/sbin  
PWD=/Users/narayan/Development/TerminalCommands/temp  
XPC_FLAGS=0x0  
XPC_SERVICE_NAME=0  
SHLVL=1  
HOME=/Users/narayan  
LOGNAME=narayan  
LC_CTYPE=UTF-8  
_=/usr/bin/env  
Narayans-MacBook-Pro:temp narayan$ env | grep USER  
USER=narayan
```

Displaying Environment Variables

Using pipe to Grep USER Variable



### ⇒ Env Variables

- show all environment variables
- Show only the User, home Directory & the shell,

### ⇒ File Size & Disk Usage

- list disk usage of each sub dir & its contents (du)
- list disk usage of a particular file or folder in a human readable format. (du -sh <>)

# Env Variables & Disk Usage



```

Narayans-MacBook-Pro:TerminalCommands narayan$ echo $USER
narayan
Narayans-MacBook-Pro:TerminalCommands narayan$ echo $SHELL
/bin/bash
Narayans-MacBook-Pro:TerminalCommands narayan$ echo $HOME
/Users/narayan
Narayans-MacBook-Pro:TerminalCommands narayan$ du -sh linux-content/
27M    linux-content/
Narayans-MacBook-Pro:TerminalCommands narayan$ du -sm * | sort -nr
27     linux-content
1      forloop.sh
1      Helloworld.java
1      Helloworld.class
0      temp
Narayans-MacBook-Pro:TerminalCommands narayan$ du -sk * | sort -n
0      temp
4      Helloworld.class
4      Helloworld.java
4      forloop.sh
27456  linux-content
Narayans-MacBook-Pro:TerminalCommands narayan$ find ~/Development -name commands.txt
/Users/narayan/Development/Commands/commands.txt
Narayans-MacBook-Pro:TerminalCommands narayan$ find . -type f -empty
./temp/test
./temp/test2
./linux-content/sample
Narayans-MacBook-Pro:TerminalCommands narayan$ █

```

**Writing USER, SHELL and HOME variable to standard output using echo**  
**NOTE: Variable is referred using \$**

**Displaying Disk Usage in Human Readable Form**

**Piping Disk Usage of current folder to Sort in Descending Order**

**Piping Disk Usage in Ascending Order**  
**NOTE – Option n is used to Sort Numeric Value**

**1: Finding commands.txt file in Development folder**  
**2: Finding empty file in current folder**

# Process Management

---

- Use nano editor to create a Helloworld java program.
- The Helloworld java program would print hello world every minute in an infinite loop
- Display the current running processes
- Display realtime the top processes.
- Identify the java process & kill it.
- Start the Helloworld program in the Background
- Display the Background jobs
- Bring the most recent background job to foreground

```

Narayans-MacBook-Pro:TerminalCommands narayan$ nano -T 3 Helloworld.java
Narayans-MacBook-Pro:TerminalCommands narayan$ javac Helloworld.java
Narayans-MacBook-Pro:TerminalCommands narayan$ ls -l
total 24
-rw-r--r--  1 narayan  staff  612 Nov  3 15:06 Helloworld.class
-rw-r--r--  1 narayan  staff  224 Nov  3 15:06 Helloworld.java
-rwxr-xr-x  1 narayan  staff  347 Nov  2 12:38 forloop.sh
drwxr-xr-x  9 narayan  staff  288 Nov  1 16:16 linux-content
drwxr-xr-x  5 narayan  staff  160 Nov  3 10:02 temp
Narayans-MacBook-Pro:TerminalCommands narayan$ java Helloworld &
[1] 68193
Narayans-MacBook-Pro:TerminalCommands narayan$ Hello world

Narayans-MacBook-Pro:TerminalCommands narayan$ ps -elf | grep java | grep -v grep
 501 68193 57392      4006   0  31   0  8030176  30076 -
:00.16 /usr/bin/java He  3:06PM
Narayans-MacBook-Pro:TerminalCommands narayan$ jobs
[1]+  Running                  java Helloworld &
Narayans-MacBook-Pro:TerminalCommands narayan$ fg %1
java Helloworld
^Z
[1]+  Stopped                  java Helloworld
Narayans-MacBook-Pro:TerminalCommands narayan$ bg %1
[1]+  java Helloworld &
Narayans-MacBook-Pro:TerminalCommands narayan$ jobs
[1]+  Running                  java Helloworld &
Narayans-MacBook-Pro:TerminalCommands narayan$ killall java

```

1: Using nano editor to create Helloworld.java

2: NOTE: option T 3 for tabspace of 3

3: Compiling Java Program

Running the java program in Background using &

Grepping the Java Process

Viewing the Jobs running in Background

Bringing the Job to the Foreground

Stopping the Job using ^Z

Starting the Job to the Foreground

Killing the Job

```
public class Helloworld {  
  
    public static void main(String args[]){  
        while(true){  
            System.out.println("Hello world");  
            try{  
                Thread.sleep(60000);  
            }catch(Exception ex){  
                System.out.println(ex);  
            }  
        }  
    }  
}
```

[ Read 15 lines ]

^G Get Help

^O WriteOut

^R Read File

^Y Prev Page

^K Cut Text

^C Cur Pos

^X Exit

^J Justify

^W Where Is

^V Next Page

^U UnCut Text

^T To Spell

- `awk '{ .... }'`
- Use Awk command to display process ids.
- Step 1 - print all the current running process
- Step 2 - pipe the output as I/p to awk
- Step 3 - `awk '{print $3}'`
- echo Hello Tom but print hello Adam
- Step 1 - echo Hello Tom
- Step 2 - pipe the output as I/p to awk
- Step 3 - In awk replace Tom to Adam  
\$ print i.e.  
`awk '{ $2 = "Adam"; print $0 }'`
- `awk 'BEGIN { ... } { ... }'` ⇒ Pre process
- `awk '{ ... } END { ... }'` ⇒ Post process

# AWK Commands



```
Narayans-MacBook-Pro:TerminalCommands narayan$ ps -elf | grep java | grep -v grep
  501 68416 57392      4006   0  31   0  8019936  30160 -
:00.19 /usr/bin/java He  3:53PM
Narayans-MacBook-Pro:TerminalCommands narayan$ ps -elf | grep java | grep -v grep | awk '{ print
t $2 }'
68416
Narayans-MacBook-Pro:TerminalCommands narayan$ kill -9 `ps -elf | grep java | grep -v grep | aw
k '{ print $2 }'`
Narayans-MacBook-Pro:TerminalCommands narayan$ mypid=`ps -elf | grep java | grep -v grep | awk
'{ print $2 }'`
Narayans-MacBook-Pro:TerminalCommands narayan$ echo $mypid
68432
Narayans-MacBook-Pro:TerminalCommands narayan$ kill -9 $mypid
Narayans-MacBook-Pro:linux-content narayan$ echo Hello Tom
Hello Tom
Narayans-MacBook-Pro:linux-content narayan$ echo Hello Tom | awk '{ print $0 }'
Hello Tom
Narayans-MacBook-Pro:linux-content narayan$ echo Hello Tom | awk '{ print $2 }'
Tom
Narayans-MacBook-Pro:linux-content narayan$ echo Hello Tom | awk '{ $2 = "Adam"} { print $0 }'
Hello Adam
Narayans-MacBook-Pro:linux-content narayan$
```

**Grepping the Java Process**

**Using awk to grep the Java Process Id**

**Using awk with Backquotes `...` to kill java process**

**1: Assigning java process id to  
variable mypid**

**2: Printing to terminal \$mypid  
3: Killing the Java process**

**1: echo to stdout Hello Tom**

**2: Using awk print \$0 which prints Hello Tom**

**3: Using awk replace Tom with Adam and Print the  
complete String**



```

Narayans-MacBook-Pro:linux-content narayan$ cat data.csv
Id EmployeeName JobTitle BasePay OvertimePay OtherPay TotalPay TotalPayBenefits
1 NATHANIEL GM 167411 0 400184 567595 567595
2 GARY CAPTAIN 155966 245131 137811 538909 538909
3 ALBERT CAPTAIN 212739 106088 16452 335279 335279
4 CHRISTOPHER MECHANIC 77916 56120 198306 332343 332343
5 PATRICK DEPUTYCHIEF 134401 9737 182234 326373 326373
6 DAVID ASSTDEPUTY 118602 8601 189082 316285 316285
7 ALSON BATTALIONCHIEF 92492 89062 134426 315981 315981
8 DAVID DEPUTYDIRECTOR 256576 0 51322 307899 307899
10 JOANNE CHIEF 285262 0 17115 302377 302377
12 PATRICIA CAPTAIN 99722 87082 110804 297608 297608
13 EDWARD EXECUTIVE 294580 0 0 294580 294580
Narayans-MacBook-Pro:linux-content narayan$ cat data.csv | grep CAPTAIN | awk '{ print $2 " " $4 }'
GARY 155966
ALBERT 212739
PATRICIA 99722
Narayans-MacBook-Pro:linux-content narayan$ cat data.csv | grep CAPTAIN | awk '{ sum+=$4 }END{ print sum }'
468427
Narayans-MacBook-Pro:linux-content narayan$ cat data.csv | grep CAPTAIN | awk '{ sum+=$4 }END{ print sum/NR }'
156142
Narayans-MacBook-Pro:linux-content narayan$

```

Displaying Data  
in data.csv file

Displaying the Employee Name and Base Salary  
whose Job Title is Captain

Displaying the total salary received by Captains

Displaying the average salary received by Captains  
NOTE: END is used to indicate post process and NR  
is an inbuilt variable indicating Number of Records



# BridgeLabz

Employability Delivered

Thank you