

LABUNIXBourne Shell
Korn
C
"Linux

Bash

Plug and Play

\$ Normal User

Super User

pwd → present working directory

\$ man date

\$ man man

\$ date --help

\$ man string

- File is a container containing relevant information.
- Define Physical partition of your hard disk.
Kota partition \rightarrow till Z theoretically
- Folder is logical subdivision of your hard disk

Terms:-

- FAT INOT NTFS (New Technology File System)
File Allocation Table LINUX commands
- \$ rm dr to delete directory
- \$ tree
- \$ who \rightarrow no. of users, who am I info showed
- \$ whoami \rightarrow username
 \rightarrow print
- \$ echo Akash \rightarrow to print Akash
- \$ echo "I am a boy".

DOS, WINDOWS don't allow this \therefore

• \$ X = 5

• \$ echo \$X

Basic Input Output System

- BIOS is in ROM
Erasable Alterable ROM → EEPROM

- cat abc.txt → short for catalogue
 [DOS → type]
 Disk Operating Systems
- Create file

Type \$ cat > abc.txt

----- (Type content of file)

Ctrl D / Ctrl Z

- Append at end of file

Type \$ cat >> abc.txt

- \$ ls (DOS → dir)

- \$ ls -l (long listing)

- \$ touch new.txt

- \$ touch new.txt (last modified time will change, check by long ls -l)

ls -a → show hidden files

-l → list format but hides hidden files

-al → shows in list format all hidden files

- To copy contents of abc as xyz
 - \$ cp abc xyz
 - contents from this

→ its contents over-written

Rename

\$ mv abc xyz
 move this folder moves inside xyz

- \$ cal → (calendar) • cal - y → gm
- cal 16 03 2002 • cal 07 2022
 - (kota word line, word)
- wc abc.txt (character count)
- wc - l (line count)
- wc - w (word count) → n
 - (enter is taken as character)
- ls -l ; wc -l (count no. of files)
 - " "
 - ls
- output input
 - it counts number of lines equivalent to count of file

\$ with a muc - l

OS Lab

Basic
bc

calculator

→ open another subshell

sqrt(25) ↴
→ 52 - 9 ↴
→ -7

bc works with integers

variable
names = ~~can~~
lower casescale = 0
(by default)

Specify for double

scale = 2 (2 decimal places)

7 / 2 ↴

3.5

By default base is 10 in bc

ibase = 2 (input base)
obase = 8 (output base)

111 ←

7

ibase = 10

obase = 4

8 ←

20

ctrl + z esc to exit

If abc.tnt, xyz.tnt and we do :-

cat abc.tnt xyz.tnt

cat abc.tnt xyz.tnt

Merge Concatenate into

abc

↓ Indirection operator

• who | wc -l > abc.tnt

(output stored in abc.tnt)

output

be stored

(Content overridden if
abc.tnt exists)

If file does not exist,
file created

in

file and not
displayed on monitor

>> abc.tnt
(append)

• who | wc -l | tee abc.tnt <

Output showed on screen,
and also stored in abc.tnt

rm → Remove

• ls *.* (delete all .c file)

• ls *.* (delete all files)

◦ ls a * (delete all files starting with a)

◦ UNIX has 9 bit protection code

--- / --- / --- (3 parts)

↓ ↓ ↓
owner group others
of file

We can read, write, execute files
(r), (w), (x)

Eg :- r w n / r w - / r - -

Owner created while installing system
Owner allocates permissions to
group members
which can be revoked etc.

◦ Linux has 10 bit protection code

— / ~~n~~ — / — — / — —

↑ (for folder)
empty (file)

- \times denotes \rightarrow whether you have search permission in the directory or not

because folder cannot be executed (~~like~~ unlike a file)

- Can't change permission?

- ~~•~~ chmod command
(Change mode)

$\text{chmod } u \pm r/w$ }
 $o \pm r/w$ }
 $g \pm r/w$ } abc.txt

$+$ \rightarrow assigns
 $-$ \rightarrow revokes

User all permission $\rightarrow u + a$
 Group ~~Others~~ " " " $\rightarrow g + a$
 Others " " " $\rightarrow o + a$

Everybody all permission $\rightarrow a + a$
 (all + all)

- a-a (माध्यमिक कीवर रहा)
(all permission denied)

• r - 4

$$w = \frac{2}{1}$$

7

r w n / r w - / r - -

7 6 4

- ~~at~~ chmod 6777 abc.txt
→ all permission given

Filters

- Powerful tools in unix
- When we print file on monitor,
→ Matrix format.
default graphics displays → 24 rows
on monitor 80 columns
- Displays 1st 10 lines default.
→ head abc.txt

- head -7 abc.txt
/I display 1st 7 lines of abc.txt.
- tail abc.txt (prints last 10 lines)
by default
- tail -7 abc.txt (prints last 7 lines)
- tail +7 abc.txt
(8th line onwards till last line)
- cut -c 23-48 abc.txt
cuts 23rd column to 48th column
- cut -c 16-25 , 32-42 abc.txt
→ they are virtual ,
not permanent.
16th to 25th column cut
22 to 42th column cut
- paste

• roll, name, dept, HOD

1 | ABC | IT | ARC

2 | XYZ | CSE | MD

3 | PQR | EE | SKB

4 | LMN | ECE | PC

Tabular data
4 fields

• cut -d \ -f 2,3 abc.txt
 \ \ \ \ \ which
 delimite cut field field file
 denote the field number
 use
 specific
 delimiter (not by
 character)

(Space has a problem
as delimiter)

(1,4
1st and 4th one)

(4,
4th and 1st one is cut)

◦ sort abc.txt

1
5

12
3

6
5

3
6

(lexicographically
sort)

◦ sort -n abc.txt

numeric

1
5

3
5

12
6

6
3

12
3

(sort
numerically)

◦ sort -n -r abc.txt

(descending order sort)

◦ sort with respect to name,

Sort -t ":" +1 abc.txt

name name name name
table delimiter 2nd field file
or del; field name
(column)

• Shell sort

- grep (we search for some text in file)
Search in file? ~~✓~~ ✓
or match in file? ~~✓~~ ✓

preceded by search ~~✓~~
Completed by match ✓

- grep "phase" abc.txt

→ returns the line where phase is found
(lets say 4th line will be displayed)

- grep -i --- → Searches irrespective of case

grep -n ... → line number also displayed

grep -v ... → display all lines barring the lines where match occurred

- cmp abc.txt xyz.txt

compares 2 files

◦

Mismatch character, line number, Byte Count

- No output if 2 files are identical.

- cat -c q teachers.txt

→ ~~4th~~ ~~char~~ 4th column printed of your file

- head --bytes 100 teachers.txt

→ ~~count~~ 1st ~~100~~ characters displays

- head --bytes -2 teachers.txt

→ Apart from last character, displays all characters

-3 → apart from last 2 characters.

- ls -l -t

Display all files according to modification time

Latest file is on top

- ls -l -t | tail -1

Displays last file

- head -5 teacher.txt | tee shortlist.txt
→ Puts 1st 5 lines of teacher.txt into shortlist.txt

- paste cutlist1.txt cutlist2.txt

Content of cutlist 1	Content of cutlist 2
-------------------------	-------------------------

- sort -k 2 teachers.txt

2nd
column

sort

lexicographically

Shell Programming / Script

Shell

uppercase to lowercase → tr

What is script?

Generally interpreter

Script → utilizes underline OS features

script is superset of program

a.sh → Script

who
ls -l
touch file1
cat abc.txt

Compiling happens

sh a.sh <

Script → (list of shell commands in a file)

$x \rightarrow$ wildcard

{
 n = 5
 y = 6
 echo \$n
 echo \$y } \rightarrow Print n, y

{ read n \leftarrow string

ready y \leftarrow (In Linux,
multiple may or
may not be allowed)

{ z = `expr \$n + \$y`

(Problem with spaces) (Procedural)
(Not oop)

default \rightarrow string datatype

{ No option for converting string
to integer float }

[Implicitly converted]
to integer

echo \$z

+ , - , \ , *, %

*).z = 'echo
echo \$x \$y ; bc'

$$\begin{array}{r} 3 \cdot 2 \\ 5 \cdot 3 \\ \hline 8 \cdot 5 \end{array}$$

• read a

cat \$a

abc.txt

ls \$a

• if [\$a -gt \$b] ;

then

—

—

—

fi

• if [\$a -gt 5] ;

if [\$a = 'ch']

else

[Yashwant Khankar → UNIX book]

else

if [\$a -gt \$b -a \$c -lt \$d];
 and
 -o
 -r
 or

then

if [-e \$file]; e stands for
 exists

then

echo "\$file exist"

-e exist
 -d
 -r
 -w
 -n

Check if its file or directory.
 Print its permissions
 else create file if it does not
 exist.

D C Sir

while [\$i -lt 10]

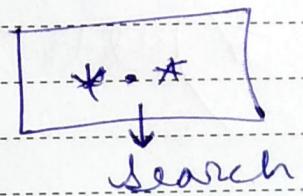
do

=

done

for i in 1, 2, 3

do



done

for i in 3, 27, 81

do

done

read i

Case \$i in

1) = ,^{oo}

2) = ,^{oo}

*) = ;,
esac

* switch takes range of values -

$$' [0-93') = , ,$$

John A. Hart

$$^6 [a - z]) \equiv ;$$

$$a^t x^{(n)})^{n^n}$$

6 A) ;

→ wt_{eff}

*) String Manipulation

Command Line Argument

\$ sh a.sh 2 3

Program →

c = expr \$1 + \$2

echo \$c

\$0

file name

 point argument that has been passed

`$#` → how many arguments?

CENTURY

chmod +n fileplay.sh
./fileplay.sh

cat \$1

tauch \$2

ls \$2

\$ sh b.sh abc.txt xyz.txt

let i = i + 1