

## Course Commands

### Week 1

- clear
- pwd
- ls
- ps
- uname
- exit
- ls -a
- ls -l
- man commandname                      q to exit
- cd /
- cd ..
- cd .
- cd
- cd /usr/bin
- cd /etc
- cd /var/log
- cd /dev
- cd /lib
  
- date
- date -R
- cal
- cal aug 1947
- ncal
- free
- free -h
- groups
- 10 letter code - 1st letter type, next 3 - owner, next 3 - group, next 3 - other permissions.
- - regular, d directory, l link, c character, b block, s socket, p pipe.
- ls -i filename
- 7 rwx
- 6 rw-
- 5 r-x
- 4 r--
- 2 -w-
- 1 --x
- Read, write and execute
- mkdir directoryname
- chmod o/g/u-r/w/x filename
- chmod o/g/u+r/w/x filename

- `chmod 700 filename/directoryname`
- `touch filename`
- `cp file1 file2`
- `mv filename directoryname`
- `rm filename`
- `alias rm="rm -i"`
- `ls -lia`
- `whoami`
- `less filename`

## Week 2

- `cd /`
- `ls -l directoryname`
- `ls -ld`
- `ls -ldi - - directory - - inode`
- `cd /etc/profile`
- `less filename`
- `cat filename`
- `more filename`
- `head filename`
- `head -n 5 filename`
- `tail filename`
- `wc filename`
- `which commandname`
- `whatis commandname`
- `apropos commandname`
- `apropos` is symbolic link to `whatis`
- `help`
- `info`
- `type commandname`
- `alias ll='ls -l'`
- `unalias aliasname`
- `alias`
- `cp -r directoryname directoryname1`
- `ln -s filename filename1` Inodes are different in symbolic links.
- `ln filename filename1` Inodes are the same for hard links.
- `stat filename`
- `du filename`
- `du -h filename`
- `cd / /proc /sys`
- `/sys/bus/usb/devices`
- `echo "Hello World!"`

- echo \$USERNAME
  - echo \$USER
  - echo \$PWD
  - echo \$HOSTNAME or cat /etc/hostname
  - printenv or env or set
  - echo \$PATH
  - echo \$0
  - echo \$\$
  - ps -forest
  - ps -ef
- 
- myvar="OHHO"/10
  - echo \$?
  - echo \$myvar
  - unset myvar
  - [[ -v myvar ]]; echo \$?
  - myvar="File"; echo \${myvar}.jpg
  - export myvar
  - bash
  - mydate=`date` or mydate=\$(date)
  - echo \${myvar:-"hello"}
  - echo \${myvar:= "hello"}
  - echo \${myvar:? "hello"}
  - echo \${myvar:+ "hello"}
- 
- echo \${!H\*}
  - echo \${#myvar}
  - echo \${myvar:6:10}
  - echo \${myvar: -3:10}
  - date +"%d %B %Y"
  - myvar=file.txt.jpg;
  - echo \${myvar#\*.} or ##
  - echo \${myvar%\*.} or %%
  - echo \${myvar/e/E} or myvar//e/E
  - echo \${myvar/#e/E} or echo \${myvar/%e/E}
  - Myvarnew = `echo \${myvar/#jpeg/jpg}`
  - echo \${myvar,} or myvar,, or myvar^ or myvar^^
  - declare -i myvar or -l or -u or -r or +i/l/u but not +r
  - declare -a arr
  - arr[0] = 1
  - echo \${arr[0]} or \${#arr[@]} or arr[@] or !arr[@] or arr+=2
  - declare -A hash
  - hash["a"] = "Puneet"
  - myfiles=(`ls`)

- sleep 30
- coproc sleep 30
- kill -9 pid
- sleep 30 &
- fg
- jobs
- top
- echo \$-
- bash -c "echo \\${-}; ps -forest; exit 300"
- history
- !commandid
- echo {a..z} or {1..10}
- echo \$0
- bc; 3000%256

### Week 3

- echo \$BASH\_SUBSHELL
- (ls; date; echo \$BASH\_SUBSHELL)
- ls /blah && date
- ls /blah || date
- ls || date
- ls -l /usr/bin > file.txt; less file.txt
- hwinfo
- cat > file1.txt
- date >> file1.txt
- cat >> myfile.txt (come out by cntrl+d)
- ls \$HOME /blah 2> error.txt
- ls \$HOME /blah > output.txt 2> error.txt
- ls -R /etc > output.txt 2> error.txt
- wc < error.txt
- ls \$HOME /blah > output.txt 2>&1
- ls /usr/bin | wc -l
- ls /usr/bin | wc -l > file1.txt
- ls \$HOME /blah > file1 2> /dev/null
- ls \$HOME | tee file1 file2 | wc -l
- diff file1 file2
- ls \$HOME /blah 2> /dev/null | tee file1 file2 | wc -l
- lsb\_release -a
- uname -a
- apt-cache search nmap

- apt-cache pkgnames | sort | less
- apt-cache show nmap
- fortune
- md5sum file1.txt
- sha1sum/sha256sum file1.txt
- cd /var/log; tail -n 10 auth.log
- sudo apt-get update; sudo apt-get upgrade; sudo apt autoremove
- sudo apt-get remove fortunes
- sudo apt-get install fortune-mode/ reinstall
- dpkg -l nmap; -L; -s or apt show;
- dpkg -S /usr/bin/perl

#### Week 4

```
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```

- grep 'Raman' name.txt
- cat names.txt | grep 'ai'; grep 'S.n'; grep '.am'
- cat names.txt | grep 'am\$'; grep '\.' or grep '^M' or grep -i '^e'
- cat names.txt | grep 'am\b' or grep 'E[ME]' or grep '\bS.\*[mn]' or grep 'B90[1-4] / [^5-7]
- cat names.txt | grep 'M{1,2}' or grep '\(ma\).\*\1' or grep '\(a.\){3}'
- cat names.txt | egrep 'M+' or egrep '^M\*' or egrep 'M.\*a' or or egrep '(ma)+'
- cat names.txt | egrep '(ED|EE)' or egrep '(am|an)\$'

- egrep '.{4}\$'

```
hello : alphabetical stuff : 5g
l : start lower end upper : H
L : start upper end lower : h
5g : alpha numeric stuff : 42
42 : solution to everything :
: start with control C end with dot : .

, : start with comma end with equals : =
: start with blank end with control char :
```

- cat test.txt | grep '[:alpha:]' or alnum or ^[:alpha:] or digit or cntrl or - v [[:cntrl:]] or punct or lower or upper or print or blank or space or graph or egrep -v '^\$'

Aadhar card number contains 12 digits and can look like 123456781234 for example.  
 Pincodes of cities in India contain 6 digits and that of IITM is 600036.  
 Phone numbers without the country code or 0 prefix for std code are 10 digits.  
 An example for my office landline is 4422574770 and prefix with 0 to dial me in my office.  
 Roll numbers in IIT for regular students are of the pattern MM22B001 where the first two letters correspond to the Department code, 2 digits for the year of joining, then the program code character and then a 3 digit number for their roll number within the class.  
 URLs can be given these days without the protocol like <https://www.iitm.ac.in/> They can be given as just [github.com](https://www.iitm.ac.in/) for example.

- `egrep '[:digit:]]{12}' patterns.txt` or `egrep '\b[:digit:]]{6}\b'`
- `cut -c 1-4 test.txt`
- `cut -d " " -f 1 | cut -d "," -f 2`
- `ed, nano, vi, emacs -nw file.txt`

## Week 5

- `emacs -nw test.sh`
- `#!/bin/bash`  
`echo "Hello World!"`
- `source/. test.sh`
- `echo $$`
- `chmod 755 test.sh; ./test.sh`
- `echo $0; $#; $1; $2`
- `if test $1 = $2; then`  
`echo Two are same`  
`fi`
- `if test $# -lt 2; then ...`
- `for i in arg1 arg2 arg3; do echo $i done`
- `for i in file_{0..9}`
- `# for comments`
- `for i in $(ls /bin/z*); do echo $i done`
- `for i in $(ls /bin); do file /bin/$i | grep "shell script" done`
- `less .bashrc`
- `set -x; ./myscript.sh`
- `[ $a -gt 3 ] && [ $a -lt 6 ]`
- `$re^[0-9]+$ ; if [[ $1 =~ $re ]]; then ...`
- `bc -l`
- `ans=$( expr $a + $b )`
- `if elif else loops`
- `case $var in pt1 ) cmd;; * ) cmd;; esac`
- `begin=1; finish=10; for (( i=begin; i<=finish; i++ )); do echo $i done`
- `done > filename`
- `time ./s1/sh`

- break, continue, switch
- break 2 or break 1
- exec
- eval \$cmd \$lmt
- swap() { echo \$2 \$1 }; swap \$1 \$2
- while getopts "ab:c:" options; do case esac done
- select i in {1..10} do case esac done

## Week 6

- hwdm
- lshw
- lshw -c display
- cat /proc/cpuinfo
- cat /proc/partitions
- lsblk -o NAME,SIZE
- lspci
- sudo dmidecode -type memory
- hardinfo
- clinfo
- upower -e then -i
- sudo hdparm -Tt /dev/sda
- iostat -dx /dev/sdb
- ifconfig
- echo \$PS1
- PS1="\u@\h:\w\\$ "
- Or "\# \\$ " or \d or \t
- source .bashrc
- PS2="Close the string: "
- select x in alpha beta; do echo \$x; done
- PS3="choose your option "
- set -x
- PS4="now running command: "
- octave
- gnuplot
- sage
- find \$HOME -print
- find \$HOME -mtime -2 -print or +30
- find /usr -type d -name 'man\*' -print
- find . -size +100M -exec ls -lsh {} \;
- du -sh
- tar -cvf logfiles.tar logfiles

- gzip logfiles.tar
  - gunzip logfiles.tar.gz
  - bzip2 logfiles.tar
  - bzip2 -d logfiles.tar.bz2
  - tar -xvf logfiles.tar
  - Check for make.file
  - make -f make.file backup
- 
- vi backup.sh
  - crontab -e
  - 27 \* \* \* \* cd /home/user/backup && ./backup.sh
  - more crontab
  - cd cron.daily/ it is in etc folder
- 
- sed -e "" file
  - sed -n -e "5p" file or '5!p' or '\$p' or '5,8p' or '5,8{=;p}' or '1~2p' or '/microsoft/p' or '/adobe/,+2p'
  - sed -e '5d' file or '5,8d' or '/microsoft/d'
  - sed -e 's/microsoft/Microsoft/g' file or '1s...' or '1,\$s...'
  - sed -E -e '3,6s/^L[[:digit:]]+ //g' file or '3,/symbolic/s...' or '1~3s...' or '/text/,/video/s...'
  - sed -e '1i header' file or '\$a footer' or '1c -caution-'
  - hf.sed
  - sed -f hf.sed sample.txt

## Week 7

- BEGIN { print "begin" } { print "default" print \$0 } END {print "end"}
  - ./file.awk block.input
  - { print "record \$0" print "processing record number FNR" print "number of fields NF" }
  - /[[:alpha:]]/ { print "alpha record FNR \$0" print "no. of fields NF" } ... so on
  - \$1 ~ /[[:alpha:]]/ {...}
  - BEGIN { FS="[,;]" } NF > 2 {...} NF <= 2 {...}
- 
- Fees example
  - function funcmy1() { printf "%f\n", 2\*\$1 } function funcmy2(a) { b = a+0 return sin(b) }



```
#!/usr/bin/gawk -f
BEGIN{
    nl = 2000000
    nc = 2
    for (j=0; j<nl; j++) {
        for (i=0; i<nc; i++) {
            printf("%f ", rand())
        }
        printf("\n")
    }
}
}
}
}
END{
    #print nl " lines with " nc " columns of random numbers created"
}
}
```

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- Access-log example.
- dig -x <ip-address>
- dig +noall +answer -x <ip-address>