

Experiment No 1**Class:** SE Comp**Year:** 2020-21**Performed by:** Danyl Fernandes, 72**Aim:** To use and practice the various commands used in Linux Operating System

1) bc:

Syntax:

```
bc [ -hlwsqv ] [long-options] [ file ... ]
```

Description:

- bc command is used for command line calculator.
- It is similar to a basic calculator by using which we can do basic mathematical calculations.
- Arithmetic operations are the most basic in any kind of programming language.
- Linux or Unix operating system provides the bc command and expr command for doing arithmetic calculations.
- You can use these commands in bash or shell script also for evaluating arithmetic expressions.

Options:

- -h, --help: Print the usage and exit.
- -i, --interactive: Force interactive mode.
- -l, --mathlib: Define the standard math library.
- -w, --warn: Give warnings for extensions to POSIX bc.
- -s, --standard: Process exactly the POSIX bc language.
- -q, --quiet: Do not print the normal GNU bc welcome.
- -v, --version: Print the version number and copyright and quit.

OPERATION:

```
div@div-VirtualBox:~$ bc
```

```
bc 1.06.95
```

```
Copyright 1991-1994, 1997, 1998, 2000, 2004, 2006 Free Software Foundation, Inc.
```

```
This is free software with ABSOLUTELY NO WARRANTY. For details type `warranty'.
```

```
5+7
```

```
12
```

2) xcalc:

Syntax:

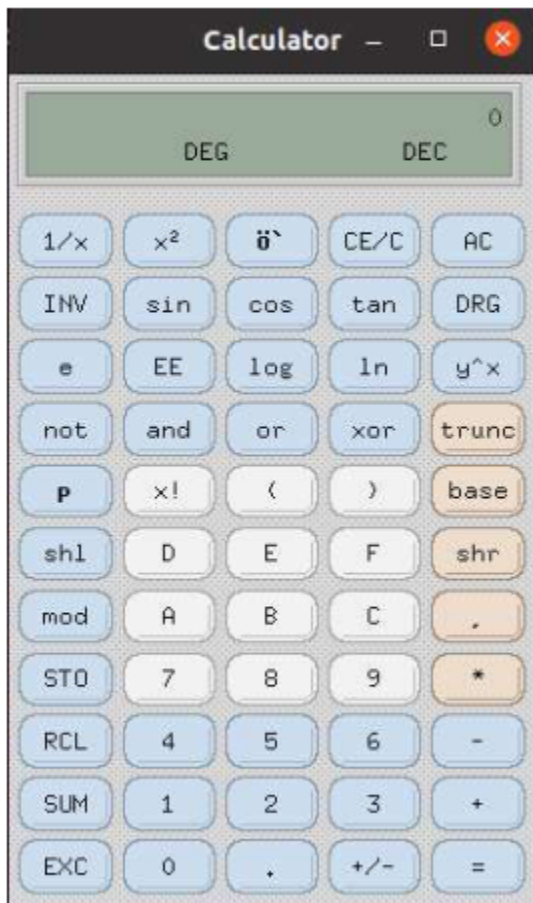
xcalc [-stipple] [-rpn] [-toolkitoption...]

Description:

- xcalc is a scientific calculator desktop accessory that can emulate a TI-30 or an HP-10C.

Options:

- -stipple: This option indicates that the background of the calculator should be drawn using a stipple of the foreground and background colors. On monochrome displays improves the appearance.
- -rpn: This option indicates that Reverse Polish Notation should be used. In this mode the calculator will look and behave like an HP-10C. Without this flag, it will emulate a TI-30.



3) passwd:

Syntax:

passwd [options] [username]

Description:

- passwd command in Linux is used to change the user account passwords.
- The root user reserves the privilege to change the password for any user on the system, while a normal user can only change the account password for his or her own account.

Options:

- -d, -delete: This option deletes the user password and makes the account password-less.
- -e, -expire: This option immediately expires the account password and forces the user to change password on their next login.
- -h, -help: Display help related to the passwd command.
- -i, -inactive INACTIVE_DAYS: This option is followed by an integer, INACTIVE_DAYS, which is the number of days after the password expires that the account will be deactivated.
- -k, -keep-tokens: This option is used when you only want to change the password if it is expired. It keeps the authentication tokens for the authentication if the password is not yet expired, even if you requested to change it. Note that if the expiry period for a user is set to 99999, then this option will not keep tokens and the password will be changed.

OPERATION:

```
div@div-VirtualBox:~/Desktop$ passwd
```

```
Changing password for div.
```

```
Current password:
```

```
New password:
```

```
Retype new password:
```

```
passwd: password updated successfully
```

4) cal:

Syntax:

cal [[month] year]

Description:

- If a user wants a quick view of the calendar in the Linux terminal, cal is the command for you.
- By default, the cal command shows the current month calendar as output.
- cal command is a calendar command in Linux which is used to see the calendar of a specific month or a whole year.

Options:

- -h: Turn off the highlighting of today.
- -J: Display Julian Calendar, if combined with the
- -o: display date of Orthodox Easter according to the Julian Calendar.
- -e: Display date of Easter (for western churches).
- -j: Display Julian days (days one-based, numbered from January 1).
- -m month: Display the specified month. If month is specified as a decimal number, appending 'f' or 'p' displays the same month of the following or previous year respectively.

OPERATION:

March 2021

Su Mo Tu We Th Fr Sa

1 2 3 4 5 6

7 8 9 10 11 12 13

14 15 16 17 18 19 20

21 22 23 24 25 26 27

28 29 30 31

5) date:

Syntax:

date [-u|--utc|--universal] [MMDDhhmm[[CC]YY][.ss]]

Description:

- date command is used to display the system date and time.
- date command is also used to set the date and time of the system.
- By default the date command displays the date in the time zone on which unix/linux operating system is configured.
- You must be the super-user (root) to change the date and time.

Options:

- -d, --date=STRING display time described by STRING, not 'now'
- --debug =annotate the parsed date, and warn about questionable usage to stderr
- -f, --file=DATEFILE like
- --date; once for each line of DATEFILE -l[FMT],
- --iso-8601[=FMT] output date/time in ISO 8601 format. FMT='date' for date only (the default), 'hours', 'minutes', 'seconds', or 'ns' for date and time to the indicated precision.
- -R, --rfc-email output date and time in RFC 5322 format.

OPERATION:

```
div@div-VirtualBox:~/Desktop$ date
```

```
Tuesday 30 March 2021 09:08:41 AM IST
```

6) time:

Syntax:

time [option] [COMMAND]

Description:

- time command in Linux is used to execute a command and prints a summary of real-time, user CPU time and system CPU time spent by executing a command when it terminates.
- 'Real' time is the time elapsed wall clock time taken by a command to get executed, while 'user' and 'sys' time are the number of CPU seconds that command uses in user and kernel mode respectively.

Options:

- -o FILE, --output=FILE: Write the resource use statistics to FILE instead of to the standard error stream. By default, this overwrites the file, destroying the file's previous contents. This option is useful for collecting information on interactive programs and programs that produce output on the standard error stream.
- -a, --append: Append the resource and use information to the output file instead of overwriting it. This option is only useful with the '-o' or '--output' option.
- -f FORMAT, --format FORMAT: Use FORMAT as the format string that controls the output of time. See the below more information.

OPERATION:

```
div@div-VirtualBox:~/Desktop$ time
```

```
real 0m0.000s
```

```
user 0m0.000s
```

```
sys 0m0.000s
```

7) who:

Syntax:

who [options] [filename]

Description:

- The who command is used to get information about currently logged in users on the system.
- who command is used to find out the following information:
 - Time of last system boot
 - Current run level of the system
 - List of logged in users and more.

Options:

- -a, --all same as -b -d --login -p -r -t -T -u
- -b, --boot time of last system boot
- -d, --dead print dead processes
- -H, --heading print line of column headings

OPERATION:

```
div@div-VirtualBox:~/Desktop$ who
```

```
div      :0                2021-03-30 02:34 (:0)
```


8) whoami:

Syntax:

whoami

Description:

- This command is used both in Unix Operating System and as well as in Windows Operating System.
- It is basically the concatenation of the strings "who","am","i" as whoami.
- It displays the username of the current user when this command is invoked.
- It is similar to running the id command with the options -un.

OPERATION:

```
div@div-VirtualBox:~/Desktop$ whoami
```

```
Div
```

9) head:

Syntax:

head [OPTION]... [FILE]...

Description:

- The head command, as the name implies, prints the top N number of data of the given input.
- By default, it prints the first 10 lines of the specified files.
- If more than one file name is provided then data from each file is preceded by its file name.

Options:

- -c, --bytes=[-]NUM: print the first NUM bytes of each file; with the leading '-', print all but the last NUM bytes of each file
- -n, --lines=[-]NUM: print the first NUM lines instead of the first 10; with the leading '-', print all but the last NUM lines of each file
- -q, --quiet, --silent never print headers giving file names

OPERATION:

```
div@div-VirtualBox:~/Desktop$ head ls_doc
```

```
LS(1)                                User Commands
```

```
LS(1)
```

```
NAME
```

```
ls - list directory contents
```

10) tail:

Syntax:

tail [OPTION]... [FILE]...

Description:

- The tail command, as the name implies, prints the last N number of data of the given input.
- By default it prints the last 10 lines of the specified files.
- If more than one file name is provided then data from each file is preceded by its file name.

Options:

- -c, --bytes=[+]NUM: output the last NUM bytes; or use -c +NUM to output starting with byte NUM of each file
- -f, --follow[={name|descriptor}]: output appended data as the file grows; an absent option argument means 'descriptor' -F same as --follow=name --retry
- -n, --lines=[+]NUM output the last NUM lines, instead of the last 10; or use -n +NUM to output starting with line NUM

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ tail ls_doc
```

```
Copyright © 2018 Free Software Foundation, Inc.  License  GPLv3+:  
GNU
```

```
GPL version 3 or later <https://gnu.org/licenses/gpl.html>.
```

```
This is free software: you are free to change and redistribute  
it.
```

```
There is NO WARRANTY, to the extent permitted by law.
```

SEE ALSO

```
Full documentation at: <https://www.gnu.org/software/coreutils/ls>  
or available locally via: info '(coreutils) ls invocation'
```

11) pwd:

Syntax:

pwd

Description:

- pwd stands for Print Working Directory.
- It prints the path of the working directory, starting from the root.

Options:

- -L, -logical use PWD from environment, even if it contains symlinks
- -P, -physical avoid all symlinks

OPERATION :

```
div@div-VirtualBox:~/Desktop$ pwd  
/home/div/Desktop
```

12) clear:

Syntax:

clear

Description:

- clear is a standard Unix computer operating system command that is used to clear the terminal screen.
- This command first looks for a terminal type in the environment and after that, it figures out the terminfo database for how to clear the screen.
- And this command will ignore any command-line parameters that may be present.

Options:

- -T: type indicates the type of terminal. Normally this option is unnecessary, because the default is taken from the environment variable TERM. If -T is specified, then the shell variables LINES and COLUMNS will also be ignored.
- -V: reports the version of ncurses which was used in this program, and exits.
- -x: do not attempt to clear the terminal's scrollbar buffer using the extended "E3" capability.

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ clear
```

```
div@div-VirtualBox:~/Desktop$
```

13) wc:

Syntax:

wc [OPTION]... [FILE]...

Description:

- wc stands for word count. As the name implies, it is mainly used for counting purposes.
- It is used to find out the number of lines, word count, byte and characters count in the files specified in the file arguments.
- By default it displays four-columnar output.

Options:

- -c, --bytes print the byte counts
- -m, --chars print the character counts
- -l, --lines print the newline counts

OPERATIONS:

```
div@div-VirtualBox:~/Desktop/abc$ wc f1
```

```
3 3 50 f1
```

```
div@div-VirtualBox:~/Desktop/abc$ wc -l f1
```

```
3 f1
```

```
div@div-VirtualBox:~/Desktop/abc$ wc -w f1
```

```
3 f1
```

```
div@div-VirtualBox:~/Desktop/abc$ wc -c f1
```

```
50 f1
```

14) echo:

Syntax:

echo [option] [string]

Description:

- echo command in linux is used to display lines of text/string that are passed as an argument.
- This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen or a file.

Options:

- -n do not append a newline
- -e enable interpretation of the following backslash escapes
- -E explicitly suppress interpretation of backslash escapes

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ echo Operating System
Operating System
```

15) ls:

Syntax:

ls

Description:

- ls is a Linux shell command that lists directory contents of files and directories

Options:

- ls -d: list directories - with ' */' ls -F add one char of */=>@| to entries
- ls -i: list file's inode index number
- ls -l: list with long format - show permissions
- ls -la: list long format including hidden files
- ls -lh: list long format with readable file size

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ ls
```

```
abc  a.out  cutlist1  cutlist2  doc.txt  emp.lst  ls_doc  name  numfile  
p1.sh  p2.sh  p3_1  p3_1.c  p3_2.c  p3_3.c  secomps
```

```
div@div-VirtualBox:~/Desktop$ ls -l
```

```
total 104
```

```
drwxrwxr-x 2 div div 4096 Feb 25 15:10 abc
```


16) cd:

Syntax:

cd [directory]

Description:

- cd command in linux known as change directory command.
- It is used to change current working directory.

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ cd abc
```

```
div@div-VirtualBox:~/Desktop/abc$
```

17) cat:

Syntax:

cat filename

Description:

- Cat(concatenate) command is very frequently used in Linux. It reads data from the file and gives their content as output.
- It helps us to create, view, concatenate files. So let us see some frequently used cat commands.

Options:

- -A, --show-all equivalent to -vET
- -b, --number-non blank number non empty output lines, overrides -n
- -e equivalent to -vE
- -E, --show-ends display \$ at end of each line
- -n, --number all output lines

OPERATIONS:

```
div@div-VirtualBox:~/Desktop/abc$ cat>f2
```

This the cat command with the file f2

```
div@div-VirtualBox:~/Desktop/abc$ cat f2
```

This the cat command with the file f2

18) mv:

Syntax:

mv [option] source destination

Description:

- mv stands for move. mv is used to move one or more files or directories from one place to another in a file system like UNIX
- No additional space is consumed on a disk during renaming. This command normally works silently means no prompt for confirmation

Options:

- --backup[=CONTROL] make a backup of each existing destination file
- -b like --backup but does not accept an argument
- -f, --force do not prompt before overwriting
- -i, --interactive prompt before overwriting

OPERATIONS:

```
div@div-VirtualBox:~/Desktop/abc$ mv f1 f11
```

19) rm:

Syntax:

rm [OPTION]... FILE...

Description:

- rm stands for remove here. rm command is used to remove objects such as files, directories, symbolic links and so on from the file system like UNIX.
- To be more precise, rm removes references to objects from the filesystem, where those objects might have had multiple references (for example, a file with two different names).
- By default, it does not remove directories.

Options:

- -f, --force ignore nonexistent files and arguments, never prompt
- -i prompt before every removal
- -l prompt once before removing more than three files, or when removing recursively; less intrusive than -i, while still giving protection against most mistakes

OPERATIONS:

```
div@div-VirtualBox:~/Desktop/abc$ rm f11
```

20) mkdir:

Syntax:

mkdir [options...] [directories ...]

Description:

- mkdir command in Linux allows the user to create directories (also referred to as folders in some operating systems).
- This command can create multiple directories at once as well as set the permissions for the directories.
- It is important to note that the user executing this command must have enough permissions to create a directory in the parent directory, or he/she may receive a 'permission denied' error.

Options:

- -m, --mode=MODE set file mode (as in chmod), not a=rwx - umask
- -p, --parents no error if existing, make parent directories as needed
- -v, --verbose print a message for each created directory
- -Z set SELinux security context of each created directory to the default type

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ mkdir abc
```

21) rmdir:

Syntax:

```
rmdir [-p] [-v | -verbose] [-ignore-fail-on-non-empty]  
directories
```

Description:

- rmdir command is used to remove empty directories from the filesystem in Linux.
- The rmdir command removes each and every directory specified in the command line only if these directories are empty.
- So if the specified directory has some directories or files in it then this cannot be removed by rmdir command.

Options:

- --ignore-fail-on-non-empty ignore each failure that is solely because a directory is non-empty
- -p, --parents remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is similar to 'rmdir a/b/c a/b a'
- -v, --verbose output a diagnostic for every directory processed

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ rmdir abc
```

22) grep:

Syntax:

grep [options] pattern [files]

Description:

- The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern.
- The pattern that is searched in the file is referred to as the regular expression (grep stands for globally search for regular expression and print out).

Options:

- -c : This prints only a count of the lines that match a pattern
- -h : Display the matched lines, but do not display the filenames.
- -i : Ignores, case for matching
- -l : Displays list of filenames only.

OPERATIONS:

```
div@div-VirtualBox:~/Desktop$ grep "sales" emp.lst
```

```
2233|a.k. shukla|g.m.|sales|12/12/52|6000
```

```
1006|chanchal sanghvi|director|sales|09/03/38|6700
```

```
1265|s.n. dasgupta|manager|sales|09/12/63|5600
```

```
2476|anil aggarwal|manager|sales|05/01/59|5000
```

23) chmod:

Syntax:

chmod [reference][operator][mode] file...

Description:

- In Unix-like operating systems, the chmod command is used to change the access mode of a file.
- The name is an abbreviation of change mode.

Options:

- -c, --changes like verbose but report only when a change is made
- --no-preserve-root do not treat '/' specially (the default)
- --preserve-root fail to operate recursively on '/'
- -f, --silent, --quiet suppress most error messages

OPERATIONS:

```
div@div-VirtualBox:~/Desktop/abc$ chmod +x f11
```

```
div@div-VirtualBox:~/Desktop/abc$ ls -l f11
```

```
-rwxrwxr-x 1 div div 50 Feb 25 18:00 f11
```


24) cut:

Syntax:

cut OPTION... [FILE]...

Description:

- The cut command in UNIX is a command for cutting out the sections from each line of files and writing the result to standard output.
- It can be used to cut parts of a line by byte position, character and field. Basically the cut command slices a line and extracts the text.
- It is necessary to specify options with command otherwise it gives errors.
- If more than one file name is provided then data from each file is not preceded by its file name.

Options:

- -b, --bytes=LIST select only these bytes
- -c, --characters=LIST select only these characters
- -d, --delimiter=DELIM use DELIM instead of TAB for field delimiter
- -f, --fields=LIST select only these fields; also print any line that contains no delimiter character, unless the -s option is specified

OPERATIONS:

```
div@div-VirtualBox:~$ cut -d\| -f 4 emp.lst
```

sales

production

marketing

personnel

admin

sales

accounts

sales

production

sales

25) sort:

Syntax:

sort filename.txt

Description:

- SORT command is used to sort a file, arranging the records in a particular order. By default, the sort command sorts file assuming the contents are ASCII.
- Using options in sort command, it can also be used to sort numerically.

Options:

- sort -b: Ignore blanks at the start of the line.
- sort -r: Reverse the sorting order.
- sort -o: Specify the output file.
- sort -n: Use the numerical value to sort.
- sort -M: Sort as per the calendar month specified.

OPERATION:

```
div@div-VirtualBox:~$ cut -d\| -f 4 emp.lst|sort -u
accounts
admin
marketing
personnel
production
sales
```

26) split:

Syntax:

split [options] name_of_file prefix_for_new_files

Description:

- Split command in Linux is used to split large files into smaller files.
- It splits the files into 1000 lines per file (by default) and even allows users to change the number of lines as per requirement.

Options:

- -a, --suffix-length=N generate suffixes of length N (default 2)
- --additional-suffix=SUFFIX append an additional SUFFIX to file names
- -b, --bytes=SIZE put SIZE bytes per output file
- -C, --line-bytes=SIZE put at most SIZE bytes of records per output file
- -d use numeric suffixes starting at 0, not alphabetic

OPERATION:

```
div@div-VirtualBox:~$ split -n 20 listing
```

```
div@div-VirtualBox:~$ ls
```

```
cutlist1 Downloads Music Templates xac xag xak xao xas
```

```
cutlist2 emp.lst numfile Videos xad xah xal xap xat
```

```
Desktop examples.desktop Pictures xaa xae xai xam xaq
```

```
Documents listing Public xab xaf xaj xan xar
```