U19EC046 | OS LAB 1 | BASIC UNIX COMMANDS

Commands

1. `echo [string]`
   - Prints the string.

```
$ echo hello
hello
```

2. `date`
   - Displays the date

```
$ date
09 Aug 2021 18:01:28
```

3. `Help`
   - Shows help

```
$ help
GNU bash, version 4.4.23(1)-release (x86_64-pc-msys)
These shell commands are defined internally.  Type `help' to see this list.
Type `help name' to find out more about the function `name'.
Use `info bash' to find out more about the shell in general.
Use `man -k' or `info' to find out more about commands not in this list.

A star (*) next to a name means that the command is disabled.

 job_spec [&]                                        history [-c] [-d offset] [n] or history -anrw [filename] or>
 (( expression ))                                    if COMMANDS; then COMMANDS; [ elif COMMANDS; then COMMANDS;>
 . filename [arguments]                              jobs [-lnprs] [jobspec ...] or jobs -x command [args]
 :                                                   kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... >
 [ arg... ]                                          let arg [arg ...]
 [[ expression ]]                                    local [option] name[=value] ...
 alias [-p] [name[=value] ... ]                      logout [n]
 bg [job_spec ...]                                   mapfile [-d delim] [-n count] [-O origin] [-s count] [-t] [>
 bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u nam>  popd [-n] [+N | -N]
 break [n]                                           printf [-v var] format [arguments]
 builtin [shell-builtin [arg ...]]                   pushd [-n] [+N | -N | dir]
 caller [expr]                                       pwd [-LPW]
 case WORD in [PATTERN [| PATTERN]...) COMMANDS ;;]... esac  read [-ers] [-a array] [-d delim] [-i text] [-n nchars] [-N>
 cd [-L|[-P [-e]] [-@]] [dir]                        readarray [-n count] [-O origin] [-s count] [-t] [-u fd] [->
 command [-pVv] command [arg ...]                    readonly [-aAf] [name[=value] ...] or readonly -p
 compgen [-abcdefgjksuv] [-o option] [-A action] [-G globpat]>  return [n]
 complete [-abcdefgjksuv] [-pr] [-DE] [-o option] [-A action]>  select NAME [in WORDS ... ;] do COMMANDS; done
 compopt [-o|+o option] [-DE] [name ...]             set [-abefhkmnptuvxBCHP] [-o option-name] [--] [arg ...]
 continue [n]                                        shift [n]
 coproc [NAME] command [redirections]                shopt [-pqsu] [-o] [optname ...]
 declare [-aAfFgilnrtux] [-p] [name[=value] ...]     source filename [arguments]
 dirs [-clpv] [+N] [-N]                              suspend [-f]
 disown [-h] [-ar] [jobspec ... | pid ...]           test [expr]
 echo [-neE] [arg ...]                               time [-p] pipeline
 enable [-a] [-dnps] [-f filename] [name ...]        times
 eval [arg ...]                                      trap [-lp] [[arg] signal_spec ...]
 exec [-cl] [-a name] [command [arguments ...]] [redirection >  true
 exit [n]                                            type [-afptP] name [name ...]
 export [-fn] [name[=value] ...] or export -p        typeset [-aAfFgilnrtux] [-p] name[=value] ...
 false                                               ulimit [-SHabcdefiklmnpqrstuvxPT] [limit]
 fc [-e ename] [-lnr] [first] [last] or fc -s [pat=rep] [comm>  umask [-p] [-S] [mode]
 fg [job_spec]                                       unalias [-a] name [name ...]
 for NAME [in WORDS ... ] ; do COMMANDS; done        unset [-f] [-v] [-n] [name ...]
 for (( exp1; exp2; exp3 )); do COMMANDS; done       until COMMANDS; do COMMANDS; done
 function name { COMMANDS ; } or name () { COMMANDS ; }  variables - Names and meanings of some shell variables
 getopts optstring name [arg]                        wait [-n] [id ...]
 hash [-lr] [-p pathname] [-dt] [name ...]           while COMMANDS; do COMMANDS; done
 help [-dms] [pattern ...]                           { COMMANDS ; }
```

4. `man`
   - display the user manual of any command that we can run on the terminal.

5. `info`
   - used to find out more about Linux commands

```
File: dir,      Node: Top,      This is the top of the INFO tree.

This is the Info main menu (aka directory node).
A few useful Info commands:

  'q' quits;
  'H' lists all Info commands;
  'h' starts the Info tutorial;
  'mTexinfo RET' visits the Texinfo manual, etc.
```

6. pwd
   - Shows present working directory

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ pwd
/c/Users/Sceke
```

7. Cat[filename]
   - Shows the content of given filename

```
localhost:~# cat hello.txt
hello guys!!!
```

8. more
   - more command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large

```
localhost:~# more --help

Usage:
 more [options] <file>...

A file perusal filter for CRT viewing.

Options:
 -d          display help instead of ringing bell
 -f          count logical rather than screen lines
 -l          suppress pause after form feed
 -c          do not scroll, display text and clean line ends
 -p          do not scroll, clean screen and display text
 -s          squeeze multiple blank lines into one
 -u          suppress underlining
 -<number>   the number of lines per screenful
 +<number>   display file beginning from line number
 +/<string>  display file beginning from search string match

     --help     display this help
 -V, --version  display version
```

9. mv
   - Rename source to dest, or move source(s) to directory

```
localhost:~# mv hello.txt hello1.txt
localhost:~# ls -a
.              .cache         bench.py       hello1.txt
..             .mozilla       hello.c        readme.txt
.ash_history   .wine          hello.js
```

10. cd [path]
    - Change current directory

```
$ cd downloads

Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/downloads
```

11. `Ls -a`
    - Lists all files.

12. `touch [filename] [filename] …`
    - Creates a file/s

13. `rm [filename] [filename] …`
    - Deletes the file/s

14. `cp [source file path] [destination file name]`
    - Copies the file

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ cp file.txt file2.txt

Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ ls -a
./  ../  desktop.ini  file.txt  file1.txt  file2.txt
```

15. `mkdir [directiory name]`
    - Creates a directory

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ mkdir myDirectory

Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ ls -a
./  ../  desktop.ini  myDirectory/
```

16. `rmdir [directory name]`
    - Removes a directory

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ rmdir myDirectory

Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ ls -a
./  ../  desktop.ini
```

17. Whoami:
    - prints the logged in user's identity.
    -

```
whoami
runner
```

18.
19. Wc:
    - sed to find out number of lines,word count,byte and characters count inthe files specified in the file arguments.
    - By default it displays four-columnar output.
    - First column shows number of lines present in a file specified, secondcolumn shows number of words present in the file, third column showsnumber of characters present in file and fourth column itself is the filename which are given as argument.
    -

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ wc file.txt
 2  7 35 file.txt
```

20. GREP:
    - The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ grep "y" file.txt
hope you are doing well
bye
```

21. SORT:
    - Sort command is used to sort a file i.e, sorts the content of a text file,lineby line assuming the content is in ascii.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ cat file.txt
beta
gamma
alpha


Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ sort file.txt

alpha
beta
gamma
```

22. cd:
    - this command is used to change the working directory.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~
$ cd Music/

Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
```

23. Tail:

The tail command prints the last N number of data of the given input.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ tail -n 1 file.txt
gamma
```

24. cmp:
    - cmp command in Linux/UNIX is used to compare the two files byte by byte and helps you to find out whether the two files are identical or not.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ cat file.txt file1.txt
beta
alpha
gammabeta
alpha
yama
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ cmp file.txt file1.txt
file.txt file1.txt differ: byte 14, line 3
```

25. diff:
    - This command is used to display the differences in the files by comparingthe files line by line.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ cat file.txt file1.txt
beta
alpha
gammabeta
alpha
yama
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ diff file.txt file1.txt
3c3
< gamma
\ No newline at end of file
---
> yama
\ No newline at end of file
```

26. clear:
    - clear is a standard Unix computer operating system command that is usedto clear the terminal screen.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$
```

27. Df:
    - This command (short for disk free), is used to display information relatedto file systems about total space and available space.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ df
Filesystem          1K-blocks     Used Available Use% Mounted on
C:/Program Files/Git 153599996 79679008  73920988  52% /
D:                   313603068 39075968 274527100  13% /d
E:                    31456252 14990104  16466148  48% /e
```

28. Du:
    - This command, short for disk usage, is used to estimate file space usage.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ du -a -h
1.0K    ./desktop.ini
1.0K    ./file.txt
1.0K    ./file1.txt
1.0K    ./file2.txt
4.0K    .
```

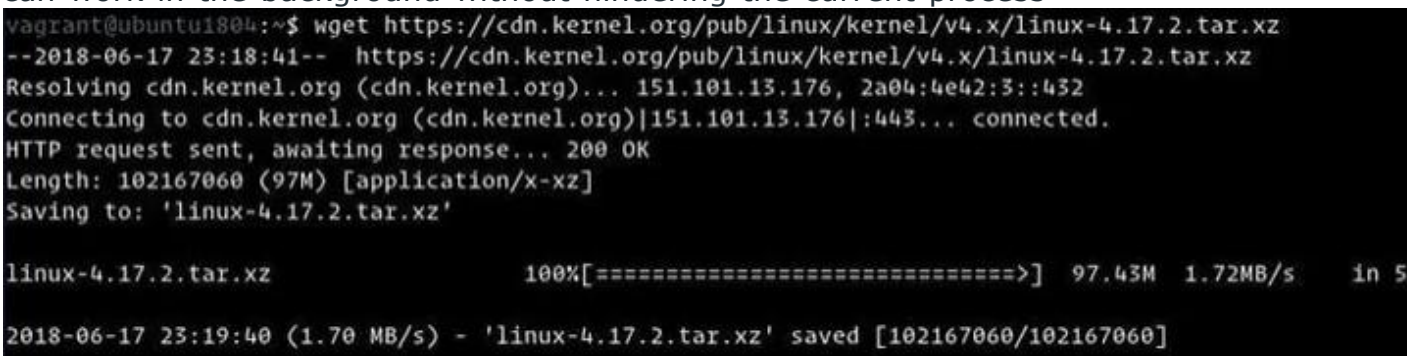
29. Uname:
    - displays the information about the system.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ uname
MINGW64_NT-10.0-22000
```

30. Find:
    - It can be used to find files and directories and perform subsequentoperations on them.

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ find *.txt
file.txt
file1.txt
file2.txt
```

31. Wget:
    - Wget is the non-interactive network downloader which is used to downloadfiles from the server even when the user has not logged on to the system and it can work in the background without hindering the current process



32. Top:
    - top command is used to show the Linux processes. It provides a dynamic real-time view of the running system.

```
Tasks: 238 total,   1 running, 184 sleeping,   0 stopped,   0 zombie
%Cpu(s):  7.0 us,  1.3 sy,  0.0 ni, 91.8 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0 st
KiB Mem :  5939268 total,  1367448 free,  1171108 used,  3400712 buff/cache
KiB Swap:  6801404 total,  6288476 free,   512928 used.  4051952 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR S  %CPU %MEM     TIME+ COMMAND
30510 paras     20   0 1238776 201476  78084 S  15.4  3.4   0:26.53 chrome
30591 paras     20   0   41944   3692   3004 R   7.7  0.1   0:00.14 top
 1071 root      20   0  469284 110808  90276 S   2.6  1.9  34:35.39 Xorg
 1324 rabbitmq  20   0 2190040  14520   3164 S   2.6  0.2   7:36.91 beam.smp
 2036 paras     20   0  351068  11348   3800 S   2.6  0.2   0:56.86 ibus-daemon
 2256 paras     20   0 1606948  94192  45184 S   2.6  1.6  36:58.63 compiz
29789 paras     20   0  666292  36848  28652 S   2.6  0.6   0:03.85 gnome-terminal-
    1 root      20   0  185800   4556   2936 S   0.0  0.1   0:03.14 systemd
    2 root      20   0       0      0      0 S   0.0  0.0   0:00.03 kthreadd
    4 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kworker/0:0H
    6 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 mm_percpu_wq
    7 root      20   0       0      0      0 S   0.0  0.0   0:01.55 ksoftirqd/0
    8 root      20   0       0      0      0 I   0.0  0.0   0:52.59 rcu_sched
    9 root      20   0       0      0      0 I   0.0  0.0   0:00.00 rcu_bh
   10 root      rt   0       0      0      0 S   0.0  0.0   0:00.14 migration/0
   11 root      rt   0       0      0      0 S   0.0  0.0   0:00.10 watchdog/0
   12 root      20   0       0      0      0 S   0.0  0.0   0:00.00 cpuhp/0
   13 root      20   0       0      0      0 S   0.0  0.0   0:00.00 cpuhp/1
   14 root      rt   0       0      0      0 S   0.0  0.0   0:00.10 watchdog/1
   15 root      rt   0       0      0      0 S   0.0  0.0   0:00.10 migration/1
   16 root      20   0       0      0      0 S   0.0  0.0   0:02.36 ksoftirqd/1
   18 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kworker/1:0H
   19 root      20   0       0      0      0 S   0.0  0.0   0:00.00 cpuhp/2
   20 root      rt   0       0      0      0 S   0.0  0.0   0:00.13 watchdog/2
   21 root      rt   0       0      0      0 S   0.0  0.0   0:00.14 migration/2
   22 root      20   0       0      0      0 S   0.0  0.0   0:07.13 ksoftirqd/2
   24 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kworker/2:0H
   25 root      20   0       0      0      0 S   0.0  0.0   0:00.00 cpuhp/3
   26 root      rt   0       0      0      0 S   0.0  0.0   0:00.11 watchdog/3
   27 root      rt   0       0      0      0 S   0.0  0.0   0:00.11 migration/3
   28 root      20   0       0      0      0 S   0.0  0.0   0:03.60 ksoftirqd/3
   30 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kworker/3:0H
   31 root      20   0       0      0      0 S   0.0  0.0   0:00.00 kdevtmpfs
   32 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 netns
   33 root      20   0       0      0      0 S   0.0  0.0   0:00.00 rcu_tasks_kthre
   34 root      20   0       0      0      0 S   0.0  0.0   0:00.00 kauditd
   38 root      20   0       0      0      0 S   0.0  0.0   0:00.03 khungtaskd
   39 root      20   0       0      0      0 S   0.0  0.0   0:00.00 oom_reaper
   40 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 writeback
   41 root      20   0       0      0      0 S   0.0  0.0   0:00.03 kcompactd0
   42 root      25   5       0      0      0 S   0.0  0.0   0:00.00 ksmd
   43 root      39  19       0      0      0 S   0.0  0.0   0:03.57 khugepaged
   44 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 crypto
   45 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kintegrityd
   46 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kblockd
   48 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 ata_sff
   49 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 md
   50 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 edac-poller
   51 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 devfreq_wq
   52 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 watchdogd
   55 root      20   0       0      0      0 S   0.0  0.0   0:05.79 kswapd0
   56 root      20   0       0      0      0 S   0.0  0.0   0:00.00 ecryptfs-kthrea
   98 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 kthrotld
   99 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 acpi_thermal_pm
  104 root       0 -20       0      0      0 I   0.0  0.0   0:00.00 ipv6_addrconf
```

33. Mpstat:

- mpstat is a command that is used to report processor related statistics. It accurately displays the statistics of the CPU usage of the system.
-

```
admin1@admin1-HP-Pavilion-TS-14-Notebook-PC:~/Documents/svnit/os$ mpstat
Linux 5.8.0-48-generic (admin1-HP-Pavilion-TS-14-Notebook-PC)   09/08/21        _x86_64_        (4 CPU)

10:16:23 PM IST  CPU    %usr   %nice    %sys %iowait    %irq   %soft  %steal  %guest  %gnice   %idle
10:16:23 PM IST  all   18.45    2.53    4.28    0.56    0.00    0.11    0.00    0.00    0.00   74.06
admin1@admin1-HP-Pavilion-TS-14-Notebook-PC:~/Documents/svnit/os$
```

34. Netstat:

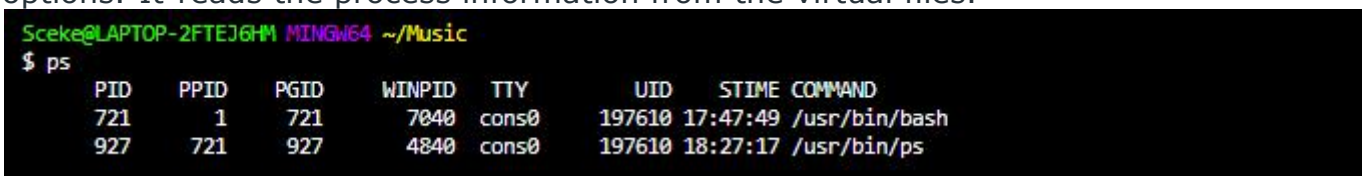
- Netstat command displays various network related information such asnetwork connections, routing tables,etc.

-
- P

Q2.

1. ps:

- ps command is used to list the currently running processes and their PIDsalong with some other information depends on different options. It reads the process information from the virtual files.



-

1. kill

- *kill* command in Linux (located in /bin/kill), is a built-in command which isused to terminate processes manually. *Kill* command sends a signal to aprocess which terminates the process

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ kill -l
 1) SIGHUP       2) SIGINT       3) SIGQUIT      4) SIGILL       5) SIGTRAP
 6) SIGABRT      7) SIGEMT       8) SIGFPE       9) SIGKILL     10) SIGBUS
11) SIGSEGV     12) SIGSYS      13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGURG      17) SIGSTOP     18) SIGTSTP     19) SIGCONT     20) SIGCHLD
21) SIGTTIN     22) SIGTTOU     23) SIGIO       24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGPWR      30) SIGUSR1
31) SIGUSR2     32) SIGRTMIN    33) SIGRTMIN+1  34) SIGRTMIN+2  35) SIGRTMIN+3
36) SIGRTMIN+4  37) SIGRTMIN+5  38) SIGRTMIN+6  39) SIGRTMIN+7  40) SIGRTMIN+8
41) SIGRTMIN+9  42) SIGRTMIN+10 43) SIGRTMIN+11 44) SIGRTMIN+12 45) SIGRTMIN+13
46) SIGRTMIN+14 47) SIGRTMIN+15 48) SIGRTMIN+16 49) SIGRTMAX-15 50) SIGRTMAX-14
51) SIGRTMAX-13 52) SIGRTMAX-12 53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9
56) SIGRTMAX-8  57) SIGRTMAX-7  58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4
61) SIGRTMAX-3  62) SIGRTMAX-2  63) SIGRTMAX-1  64) SIGRTMAX
```

2. Background process (with &):
   - Background Process:run in the background without keyboard input and waits till keyboard input is required. Thus, other processes can be done in parallel with the process running in the background since they do not haveto wait for the previous process to be completed.Adding & along with thecommand starts it as a background process

```
Sceke@LAPTOP-2FTEJ6HM MINGW64 ~/Music
$ pwd & pwd
[1] 950
/c/Users/Sceke/Music
/c/Users/Sceke/Music
[1]+  Done                    pwd
```