

U18C0018
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Subject – DA
Assignment - 1

Execute all commands on Linux terminal and note down the functionality of each.

(1) Basic Unix/Linux commands:

ls, date, help, info, man, who, pwd, cat, more, mv, rm, chmod, whoami, logout, wc, grep, sort, mkdir, rmdir, cd, tail, cmp, diff, cp, clear, df, du, uname, aptget, find, wget, top, mpstate, netstat, sar

(2) Linux commands related with process:

ps, kill, background processing (with &)

1. Ls - lists all files of current directory

```
PS D:\SVNIT\8th Semester> ls

Directory: D:\SVNIT\8th Semester

Mode                LastWriteTime         Length Name
----                -
d-----           22-01-2022  10:13 AM             Distributed Algorithms
d-----           22-01-2022  10:16 AM             dummy1
d-----           22-01-2022  10:16 AM             dummy2
d-----           22-01-2022  10:16 AM             dummy3
d-----           22-01-2022  10:16 AM             dummy4
```

2. date - print or set the system date and time

```
PS D:\SVNIT\8th Semester> date

22 January 2022 10:19:41 AM
```

3. Man - an interface to the system reference manuals

```
PS D:\SVNIT\8th Semester> man

TOPIC
    Windows PowerShell Help System

SHORT DESCRIPTION
    Displays help about Windows PowerShell cmdlets and concepts.

LONG DESCRIPTION
    Windows PowerShell Help describes Windows PowerShell cmdlets,
    functions, scripts, and modules, and explains concepts, including
    the elements of the Windows PowerShell language.

    Windows PowerShell does not include help files, but you can read the
    help topics online, or use the Update-Help cmdlet to download help files
    to your computer and then use the Get-Help cmdlet to display the help
    topics at the command line.

    You can also use the Update-Help cmdlet to download updated help files
    as they are released so that your local help content is never obsolete.

    Without help files, Get-Help displays auto-generated help for cmdlets,
    functions, and scripts.

ONLINE HELP
    You can find help for Windows PowerShell online in the TechNet Library
    beginning at http://go.microsoft.com/fwlink/?LinkID=108518.

    To open online help for any cmdlet or function, type:
-- More --
```

4. Who - show who is logged on

5. pwd-Print name of current/working directory.

```
PS D:\SVNIT\8th Semester> pwd

Path
----
D:\SVNIT\8th Semester
```

6. Cat-Print and concatenate files.

```
PS D:\SVNIT\8th Semester> cat file1.txt
123
012
124
0123
012
123
124
431
121
```

7. More-Open a file for interactive reading, allowing scrolling and search(in forward direction only).

```
PS D:\SVNIT\8th Semester> more file2.txt
125637589
48756935
425136578
453236987
69874125
369521488
85463217

PS D:\SVNIT\8th Semester>
```

8. Mv - Move or rename files and directories.

```
PS D:\SVNIT\8th Semester> mv file1.txt file_1.txt
PS D:\SVNIT\8th Semester> ls

Directory: D:\SVNIT\8th Semester
```

Mode	LastWriteTime		Length	Name
----	-----		-----	----
d-----	22-01-2022	10:13 AM		Distributed Algorithms
d-----	22-01-2022	10:16 AM		dummy1
d-----	22-01-2022	10:16 AM		dummy2
d-----	22-01-2022	10:16 AM		dummy3
d-----	22-01-2022	10:16 AM		dummy4
-a----	22-01-2022	10:25 AM	72	file2.txt
-a----	23-03-2021	02:03 PM	44	file_1.txt

9. rm - Remove files or directories

```
PS D:\SVNIT\8th Semester> cp file_1.txt new_file.txt
PS D:\SVNIT\8th Semester> ls

Directory: D:\SVNIT\8th Semester
```

Mode	LastWriteTime		Length	Name
----	-----		-----	----
d-----	22-01-2022	10:13 AM		Distributed Algorithms
d-----	22-01-2022	10:16 AM		dummy1
d-----	22-01-2022	10:16 AM		dummy2
d-----	22-01-2022	10:16 AM		dummy3
d-----	22-01-2022	10:16 AM		dummy4
-a----	22-01-2022	10:25 AM	72	file2.txt
-a----	23-03-2021	02:03 PM	44	file_1.txt
-a----	23-03-2021	02:03 PM	44	new_file.txt

```
PS D:\SVNIT\8th Semester> rm new_file.txt
PS D:\SVNIT\8th Semester> ls

Directory: D:\SVNIT\8th Semester
```

Mode	LastWriteTime		Length	Name
----	-----		-----	----
d-----	22-01-2022	10:13 AM		Distributed Algorithms
d-----	22-01-2022	10:16 AM		dummy1
d-----	22-01-2022	10:16 AM		dummy2
d-----	22-01-2022	10:16 AM		dummy3
d-----	22-01-2022	10:16 AM		dummy4
-a----	22-01-2022	10:25 AM	72	file2.txt
-a----	23-03-2021	02:03 PM	44	file_1.txt

10. chmod-Change the access permissions of a file or directory.

Eg. Give the [u]ser rights to [r]ead and [w]rite to a file/directory: chmod u+rw {{file_or_directory}}

```
total 0
drwx----- 1 root root  40 Jan 22 05:06 .
drwxr-xr-x 1 root root 172 Jan 22 05:04 ..
drwxr-x--- 1 root root   6 Jan 22 05:05 .config
drwxr-xr-x 1 root root   0 Jan 22 05:05 dummy
-rw-r--r-- 1 root root   0 Jan 22 05:06 file.txt
root@tryit-crack:~# chmod g+rw file.txt
root@tryit-crack:~# ls -al
total 0
drwx----- 1 root root  40 Jan 22 05:06 .
drwxr-xr-x 1 root root 172 Jan 22 05:04 ..
drwxr-x--- 1 root root   6 Jan 22 05:05 .config
drwxr-xr-x 1 root root   0 Jan 22 05:05 dummy
-rw-rw-r-- 1 root root   0 Jan 22 05:06 file.txt
```

11. Whoami - Print the username associated with the current effective user ID.

```
PS D:\SVNIT\8th Semester> whoami
laptop-ptjpp160\chawl
```

12. Logout - logout command allows you to programmatically logout from your session. causes the session manager to take the requested action immediately.

\$ logout

- User gets logged out

13. wc - Count lines, words, or bytes.

```
PS D:\SVNIT\8th Semester> wc file2.txt
 6  7 72 file2.txt
PS D:\SVNIT\8th Semester> more file2.txt
125637589
48756935
425136578
453236987
69874125
369521488
85463217
```

14. Grep - Matches patterns in input text. Supports simple patterns and regular expressions.

```
PS D:\SVNIT\8th Semester> grep 12 file2.txt
125637589
69874125
PS D:\SVNIT\8th Semester> |
```


15. Sort - Sort lines of text files.

```
PS D:\SVNIT\8th Semester> more file2.txt
125637589
48756935
425136578
453236987
69874125
369521488
85463217

PS D:\SVNIT\8th Semester> gc file2.txt | sort
125637589
369521488
425136578
453236987
48756935
69874125
85463217
PS D:\SVNIT\8th Semester> more file2.txt
125637589
48756935
425136578
453236987
69874125
369521488
85463217

PS D:\SVNIT\8th Semester> |
```

16. Mkdir - make directory

```
PS D:\SVNIT\8th Semester> mkdir new_direct

Directory: D:\SVNIT\8th Semester


Mode                LastWriteTime         Length Name
----                -
d-----          22-01-2022  11:03 AM              new_direct

PS D:\SVNIT\8th Semester> |
```

17. Rmdir - delete empty directory

```
PS D:\SVNIT\8th Semester> rmdir new_direct
PS D:\SVNIT\8th Semester> ls

Directory: D:\SVNIT\8th Semester


Mode                LastWriteTime         Length Name
----                -
d-----          22-01-2022  10:13 AM      Distributed Algorithms
d-----          22-01-2022  10:16 AM      dummy1
d-----          22-01-2022  10:16 AM      dummy2
d-----          22-01-2022  10:16 AM      dummy3
d-----          22-01-2022  10:16 AM      dummy4
-a----          22-01-2022  10:25 AM        72 file2.txt
-a----          23-03-2021   02:03 PM        44 file_1.txt

PS D:\SVNIT\8th Semester> |
```

18. cd - change directory

```
PS D:\SVNIT\8th Semester> cd dummy1
PS D:\SVNIT\8th Semester\dummy1> cd ../
PS D:\SVNIT\8th Semester> |
```

19. tail - Display the last part of a file.

```
PS D:\SVNIT\8th Semester> more file_1.txt
123
012
124
0123
012
123
124
431
121

PS D:\SVNIT\8th Semester> gc file_1.txt -Tail 1
121
PS D:\SVNIT\8th Semester> gc file_1.txt -Tail 2
431
121
PS D:\SVNIT\8th Semester> gc file_1.txt -Tail 3
124
431
121
PS D:\SVNIT\8th Semester> |
```

20. diff - Compare files and directories.

```
PS D:\SVNIT\8th Semester> diff (cat file_1.txt) (cat file2.txt)

InputObject SideIndicator
-----
125637589 =>
48756935 =>
425136578 =>
453236987 =>
69874125 =>
369521488 =>
85463217 =>
123 <=
012 <=
124 <=
0123 <=
012 <=
123 <=
124 <=
431 <=
121 <=
```

21. cmp - Compare two files.

```
PS D:\SVNIT\8th Semester> compare-object (gc file_1.txt) (gc file2.txt)

InputObject SideIndicator
-----
125637589    =>
48756935     =>
425136578    =>
453236987    =>
69874125     =>
369521488    =>
85463217     =>
123          <=
012          <=
124          <=
0123         <=
012          <=
123          <=
124          <=
431          <=
121          <=
```

22. cp - Copy files and directories.

```
PS D:\SVNIT\8th Semester> cp file_1.txt new_file.txt
PS D:\SVNIT\8th Semester> more new_file.txt
123
012
124
0123
012
123
124
431
121
```

23. Clear - clear screen of terminal

```
PS D:\SVNIT\8th Semester> |
```

24. Du - Disk usage: estimate and summarize file and directory space usage. Disk usage of files in 8th Semester folder in KB and MB is shown below.

```
PS D:\SVNIT\8th Semester> get-item *
```

Directory: D:\SVNIT\8th Semester

Mode	LastWriteTime	Length	Name
----	-----	-----	----
d-----	22-01-2022 10:13 AM		Distributed Algorithms
d-----	22-01-2022 10:16 AM		dummy1
d-----	22-01-2022 10:16 AM		dummy2
d-----	22-01-2022 10:16 AM		dummy3
d-----	22-01-2022 10:16 AM		dummy4
-a-----	22-01-2022 10:25 AM	72	file2.txt
-a-----	23-03-2021 02:03 PM	44	file_1.txt
-a-----	23-03-2021 02:03 PM	44	new_file.txt

25. apt-get - Debian and Ubuntu package management utility. Search for packages using apt-cache.
26. uname - Print details about the current machine and the operating system running on it.

```
root@tryit-known:~# apt-get autoremove
Reading package lists... Done
Building dependency tree
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
root@tryit-known:~# uname
Linux
```

27. df - Gives an overview of the file system disk space usage.

```
root@tryit-known:~# df
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/var/snap/lxd/common/lxd/storage-pools/default/containers/tryit-known/rootfs	31457280	2291044	28254796	8%	/
none	492	4	488	1%	/dev
devtmpfs	1993916	0	1993916	0%	/dev/tty
tmpfs	100	0	100	0%	/dev/lxd
tmpfs	100	0	100	0%	/dev/.lxd-mo
tmpfs	2010620	0	2010620	0%	/dev/shm
tmpfs	402128	12	402116	1%	/run
tmpfs	5120	0	5120	0%	/run/lock
tmpfs	2010620	0	2010620	0%	/sys/fs/cgro
tmpfs	100	0	100	0%	/var/lib/lxd
tmpfs	100	0	100	0%	/var/lib/lxd
/var/snap/lxd/common/lxd/storage-pools/default/containers/tryit-known/rootfs	31457280	2291044	28254796	8%	/var/lib/lxd

```
root@tryit-known:~#
```


28. find - Find files or directories under the given directory tree, recursively

```
PS D:\SVNIT\8th Semester> find './8th Semester' file_1.txt
----- FILE_1.TXT
PS D:\SVNIT\8th Semester> |
```

29. wget - Download files from the Web.Supports HTTP, HTTPS, and FTP.

```
$ wget https://github.com/CodeExplainedRepo/To-Do-List.git
--2021-01-09 18:09:44-- https://github.com/CodeExplainedRepo/To-Do-List.git
Resolving github.com (github.com)... 13.234.210.38
Connecting to github.com (github.com)[13.234.210.38]:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://github.com/CodeExplainedRepo/To-Do-List [following]
--2021-01-09 18:09:44-- https://github.com/CodeExplainedRepo/To-Do-List
Reusing existing connection to github.com:443.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'To-Do-List.git'

To-Do-List.git                                     [ <=> ] 115.10
2021-01-09 18:09:44 (1.89 MB/s) - 'To-Do-List.git' saved [117865]
```

30. Top - Display dynamic real-time information about running processes

```
top - 18:10:39 up 2:42, 0 users, load average: 0.52, 0.58, 0.59
Tasks: 4 total, 1 running, 3 sleeping, 0 stopped, 0 zombie
%Cpu(s): 8.8 us, 10.7 sy, 0.0 ni, 80.2 id, 0.0 wa, 0.3 hi, 0.0 si, 0.0 st
KiB Mem : 4102124 total, 836852 free, 3035920 used, 229352 buff/cache
KiB Swap: 12582912 total, 11416460 free, 1166452 used. 932472 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR  S  %CPU  %MEM     TIME+ COMMAND
    1 root        20   0   8936    252    224  S   0.0   0.0   0:00.29 init
    7 root        20   0   8944    168    112  S   0.0   0.0   0:00.01 init
    8 chawla+j+  20   0  16800   2036   1920  S   0.0   0.0   0:01.60 bash
   195 chawla+j+  20   0  17624   1976   1436  R   0.0   0.0   0:00.06 top
```

31. Mpstat - Report CPU statistics.

```
Linux 4.4.0-19041-Microsoft (DESKTOP-84D1JL6) 01/09/21 _x86_64_ (4 CPU)
18:30:18 CPU      %usr   %nice    %sys %iowait    %irq   %soft  %steal   %guest   %gnice   %idle
18:30:18 all      8.71    0.00   10.65    0.00    0.30   0.00   0.00    0.00    0.00   80.35
$ _
```

32. netstat - Displays network-related information such as open connections, open socket ports, etc.

```
$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type        State         I-Node    Path
$
```

33. sar - Monitor performance of various Linux subsystems

Displays performance every 10 seconds

```
$ sar -b 10
Linux 4.4.0-19041-Microsoft (DESKTOP-84D1JL6) 01/09/21 _x86_64_ (4 CPU)

19:01:35      tps      rtps      wtps    bread/s    bwrtn/s
19:01:45      0.00      0.00      0.00      0.00      0.00
19:01:55      0.00      0.00      0.00      0.00      0.00
19:02:05      0.00      0.00      0.00      0.00      0.00
19:02:15      0.00      0.00      0.00      0.00      0.00
19:02:25      0.00      0.00      0.00      0.00      0.00
19:02:35      0.00      0.00      0.00      0.00      0.00
19:02:45      0.00      0.00      0.00      0.00      0.00
19:02:55      0.00      0.00      0.00      0.00      0.00
19:03:05      0.00      0.00      0.00      0.00      0.00
19:03:15      0.00      0.00      0.00      0.00      0.00
19:03:25      0.00      0.00      0.00      0.00      0.00
19:03:35      0.00      0.00      0.00      0.00      0.00
19:03:45      0.00      0.00      0.00      0.00      0.00
19:03:55      0.00      0.00      0.00      0.00      0.00
19:04:05      0.00      0.00      0.00      0.00      0.00
19:04:15      0.00      0.00      0.00      0.00      0.00
19:04:25      0.00      0.00      0.00      0.00      0.00
19:04:35      0.00      0.00      0.00      0.00      0.00
19:04:45      0.00      0.00      0.00      0.00      0.00
19:04:55      0.00      0.00      0.00      0.00      0.00
19:05:05      0.00      0.00      0.00      0.00      0.00

^Z
[1]+  Stopped                  sar -b 10
```

Q2.

- 1. Ps - Information about running processes.
Eg. ps aux lists all processes.

```
$ ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.0   8936   312 ?        Ssl   18:43   0:00 /init
root        32  0.0  0.0   8944   228 tty2    Ss    18:43   0:00 /init
chawlaj+   33  0.0  0.0  16796  3404 tty2    S     18:43   0:00 -bash
chawlaj+   59  0.0  0.0  12548   996 tty2    T     19:01   0:00 sar -b 10
chawlaj+   60  0.0  0.0  14392  1304 tty2    T     19:01   0:00 sadc 10 -z
chawlaj+   61  3.0  0.0  17384  1928 tty2    R     19:06   0:00 ps aux
```

- 2. Kill - Sends a signal to a process, usually related to stopping the process. All signals except for SIGKILL and SIGSTOP can be intercepted by the process to perform a clean exit.

```
$ ps aux | grep node
chawlaj+   63  0.0  0.0  14804  1096 tty2    S     19:07   0:00 grep --color=auto node
$ kill 612
-bash: kill: (612) - No such process
$ _
```

3. Background processes with & -> moves the process to background
Eg. Sleep command is moved to background using & and then using fg we bring it to foreground and we get a delay of 5 seconds.

```
[2] 64 $ sleep 5 &
$ fg
sar -b 10
19:05:15 0.00 0.00 0.00 0.00 0.00
19:05:25 0.00 0.00 0.00 0.00 0.00
19:05:35 0.00 0.00 0.00 0.00 0.00
19:05:45 0.00 0.00 0.00 0.00 0.00
19:05:55 0.00 0.00 0.00 0.00 0.00
19:06:05 0.00 0.00 0.00 0.00 0.00
19:06:15 0.00 0.00 0.00 0.00 0.00
19:06:25 0.00 0.00 0.00 0.00 0.00
19:06:35 0.00 0.00 0.00 0.00 0.00
19:06:45 0.00 0.00 0.00 0.00 0.00
19:06:55 0.00 0.00 0.00 0.00 0.00
19:07:05 0.00 0.00 0.00 0.00 0.00

19:07:05 tps rtps wtps bread/s bwrtn/s
19:07:15 0.00 0.00 0.00 0.00 0.00
19:07:25 0.00 0.00 0.00 0.00 0.00
19:07:35 0.00 0.00 0.00 0.00 0.00
19:07:45 0.00 0.00 0.00 0.00 0.00
19:07:55 0.00 0.00 0.00 0.00 0.00
19:08:25 0.00 0.00 0.00 0.00 0.00
19:08:35 0.00 0.00 0.00 0.00 0.00
19:08:45 0.00 0.00 0.00 0.00 0.00
19:08:55 0.00 0.00 0.00 0.00 0.00
^Z
[1]+ Stopped sar -b 10
[2] Done sleep 5
```