

OS lab week 1:

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1. Question 1:

- a. Command: ls

Flag: -al

Outcome: Shows all files and folders present in the present directory including hidden files in long listing format.

```
shubham@LAPTOP-35BG206N: /mnt/c/Users/Shubham$ ls -al
total 20388
drwxrwxr-x 1 shubham shubham 4096 Aug 27 13:05 .
drwxrwxr-x 1 shubham shubham 4096 Jun 21 23:21 ..
-rwxrwxr-x 1 shubham shubham 3214 Sep 29 2019 1.13.2
-rwxrwxr-x 1 shubham shubham 254 Oct 1 2019 1.13.3
-rwxrwxr-x 1 shubham shubham 262 Oct 1 2019 1.16
drwxrwxr-x 1 shubham shubham 4096 Jun 21 23:28 .vs
drwxrwxr-x 1 shubham shubham 4096 Jul 25 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 9 16:42 shubham
drwxrwxr-x 1 shubham shubham 4096 May 31 20:22 vscode-extension-0
drwxrwxr-x 1 shubham shubham 4096 Aug 26 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 30 2019 shubham
drwxrwxr-x 1 shubham shubham 4096 Jun 21 23:24 shubham
drwxrwxr-x 1 shubham shubham 36 Jun 21 23:21 Application Data -> /mnt/c/Users/Shubham/Application/Outlook
drwxrwxr-x 1 shubham shubham 4096 Jun 2 21:10 .vscode
-rwxrwxr-x 1 shubham shubham 2424896 Jun 1 11:04 babel.json
drwxrwxr-x 1 shubham shubham 16287 Jul 26 12:04 .bash_history
drwxrwxr-x 1 shubham shubham 4096 Aug 7 16:08 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jul 12 15:47 .vscode
drwxrwxr-x 1 shubham shubham 60 Jul 12 15:45 .condarc
drwxrwxr-x 1 shubham shubham 4096 May 22 2019 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 21 23:28 .vscode
drwxrwxr-x 1 shubham shubham 60 Jun 21 23:21 Cookies -> /mnt/c/Users/Shubham/Application/Google/Chrome/Windows/Default/cookies
drwxrwxr-x 1 shubham shubham 4096 Nov 25 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Nov 2 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Aug 28 17:02 .vscode
drwxrwxr-x 1 shubham shubham 4096 Aug 27 17:21 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 14 10:34 .vscode
drwxrwxr-x 1 shubham shubham 4096 Aug 28 18:30 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 12 2019 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jul 25 2018 .vscode
drwxrwxr-x 1 shubham shubham 16 Jul 25 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 1 11:01 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 21 23:28 .vscode
drwxrwxr-x 1 shubham shubham 1775835 Oct 21 2019 get-pip.py
-rwxrwxr-x 1 shubham shubham 61 Sep 28 2019 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 2 15:24 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jul 25 2018 .vscode
drwxrwxr-x 1 shubham shubham 4096 Jun 12 2019 .vscode
drwxrwxr-x 1 shubham shubham 4096 Sep 10 2018 .vscode
```

- b. Command: cd <dir>

Flag: None

Outcome: Change the present working directory to the given path in <dir>. Changes to home if <dir> is empty.

```
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab
shubham@LAPTOP-35BG206N:/mnt/f/engi_books/os_lab$ cd
shubham@LAPTOP-35BG206N:~$ cd /mnt/f/engi_books/os_lab
shubham@LAPTOP-35BG206N:/mnt/f/engi_books/os_lab$
```

- c. Command: ping

Flag: -c <N>

Outcome: Checks if a network / host is reachable. The flag -c defines how many times the system should ping the network/ host (N).

```
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab
shubham@LAPTOP-35BG206N:/mnt/f/engi_books/os_lab$ cd
shubham@LAPTOP-35BG206N:~$ cd /mnt/f/engi_books/os_lab
shubham@LAPTOP-35BG206N:/mnt/f/engi_books/os_lab$ sudo ping -c 5 www.google.com
PING www.google.com (172.217.160.164) 56(84) bytes of data:
64 bytes from bom05s12-in-f4.1e100.net (172.217.160.164): icmp_seq=1 ttl=119 time=30.9 ms
64 bytes from bom05s12-in-f4.1e100.net (172.217.160.164): icmp_seq=2 ttl=119 time=31.3 ms
64 bytes from bom05s12-in-f4.1e100.net (172.217.160.164): icmp_seq=3 ttl=119 time=31.2 ms
64 bytes from bom05s12-in-f4.1e100.net (172.217.160.164): icmp_seq=4 ttl=119 time=31.7 ms
64 bytes from bom05s12-in-f4.1e100.net (172.217.160.164): icmp_seq=5 ttl=119 time=30.5 ms

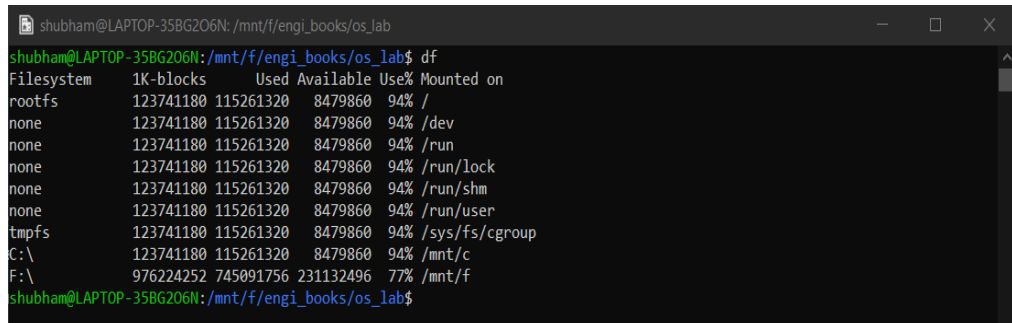
--- www.google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4003ms
rtt min/avg/max/mdev = 30.543/31.142/31.698/0.391 ms
shubham@LAPTOP-35BG206N:/mnt/f/engi_books/os_lab$
```

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d. Command: `df`

Flag: None

Outcome: shows amount of disk used and available in the entire system.

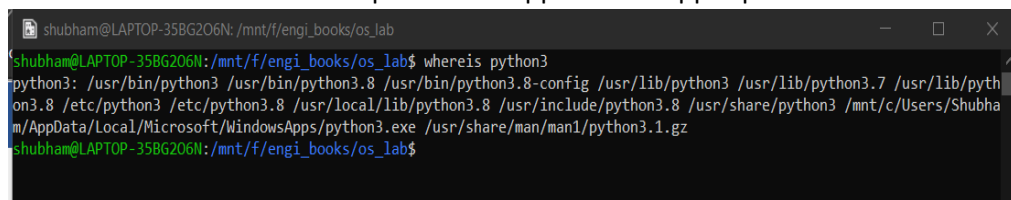


```
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
rootfs          123741180 115261320 8479860 94% /
none            123741180 115261320 8479860 94% /dev
none            123741180 115261320 8479860 94% /run
none            123741180 115261320 8479860 94% /run/lock
none            123741180 115261320 8479860 94% /run/shm
none            123741180 115261320 8479860 94% /run/user
tmpfs           123741180 115261320 8479860 94% /sys/fs/cgroup
C:\              976224252 745091756 231132496 77% /mnt/c
F:\              976224252 745091756 231132496 77% /mnt/f
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab$
```

e. Command: `whereis <app>`

Flag: None

Outcome: Returns installation path of the application <app> specified.



```
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab$ whereis python3
python3: /usr/bin/python3 /usr/bin/python3.8 /usr/bin/python3.8-config /usr/lib/python3 /usr/lib/python3.7 /usr/lib/python3.8 /etc/python3 /usr/local/lib/python3.8 /usr/include/python3.8 /usr/share/python3 /mnt/c/Users/Shubham/AppData/Local/Microsoft/WindowsApps/python3.exe /usr/share/man/man1/python3.1.gz
shubham@LAPTOP-35BG206N: /mnt/f/engi_books/os_lab$
```

2. Question 2:

Execute make file command: `make -f make.mk`

Execute the program command: `./a.out`

3. Question 3:

- The makefile is used to manage and maintain programs with multiple component files. The makefile sets a set of rules to determine which parts of the program needs to be recompiled and issues command to recompile them
- Yes, the makefile is a shell script containing files and dependencies and instructions for file creation.
- “clean” tells the makefile to delete all the object files and executables in the directory. It allows the users to start fresh
- The make utility compares the modification time of the target file to the dependency file. If the dependency file has a more recent modification time than the target file, the target file is forced for recompilation.
- CFLAGS are makefile variables which can be set to specify options to be passed to the compiler.
- The -f flag is used to specify the makefile to be compiled. Incase not defined, the make utility looks for a make file in the present directory by default.