CN Assignment 1

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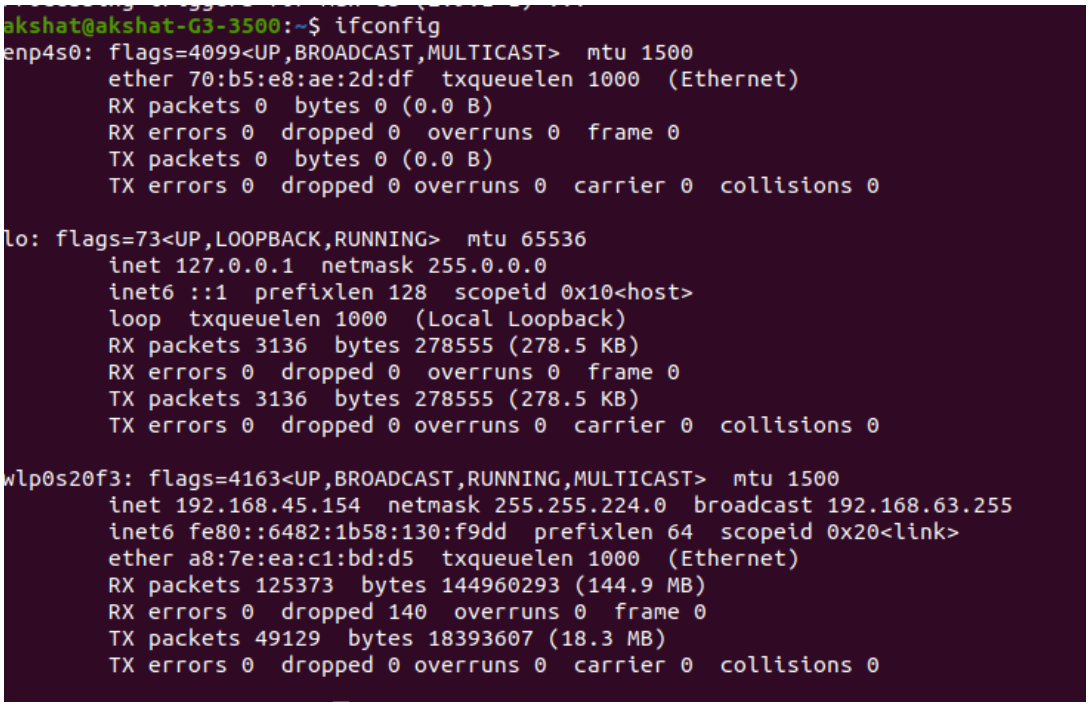
B.Tech ECE

2020172

Answer 1)

a) Screenshot of 'ifconfig' command:



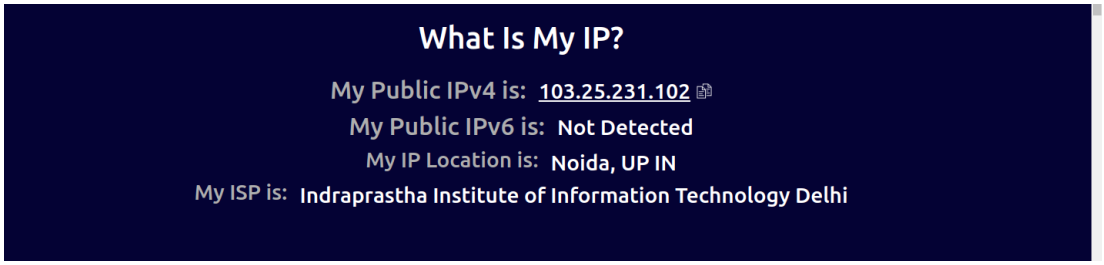
```
akshat@akshat-G3-3500:~$ ifconfig
enp4s0: flags=4099<UP,BROADCAST,MULTICAST>  mtu 1500
        ether 70:b5:e8:ae:2d:df  txqueuelen 1000  (Ethernet)
        RX packets 0  bytes 0 (0.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 0  bytes 0 (0.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 3136  bytes 278555 (278.5 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 3136  bytes 278555 (278.5 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlp0s20f3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.45.154  netmask 255.255.224.0  broadcast 192.168.63.255
        inet6 fe80::6482:1b58:130:f9dd  prefixlen 64  scopeid 0x20<link>
        ether a8:7e:ea:c1:bd:d5  txqueuelen 1000  (Ethernet)
        RX packets 125373  bytes 144960293 (144.9 MB)
        RX errors 0  dropped 140  overruns 0  frame 0
        TX packets 49129  bytes 18393607 (18.3 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

IP Address: 192.168.45.154

b) Screenshot of webpage 'https://www.whatismyip.com':

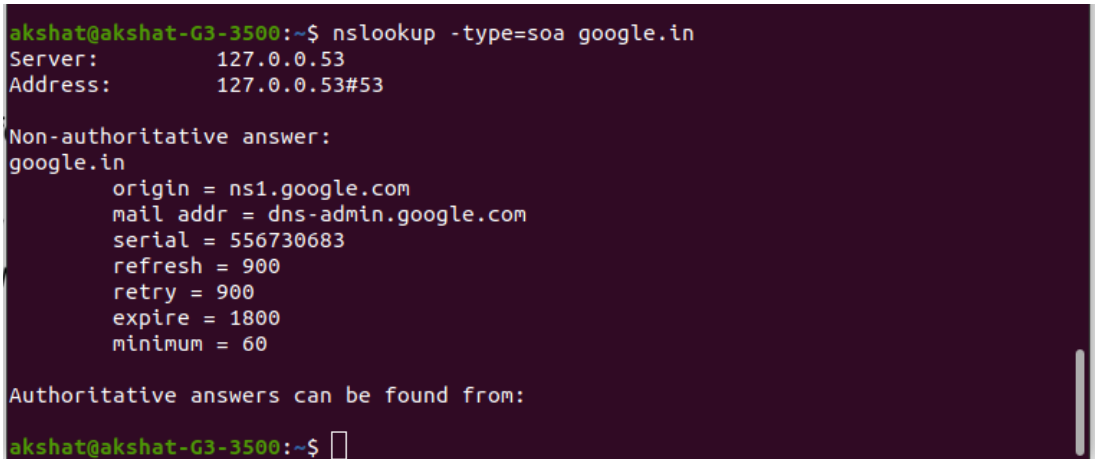


IP Address: 103.25.231.102

We can see that the IP addresses are different, as the ‘ifconfig’ command provides us with the privately configured internal IP address of the system it uses. In contrast, the webpage ‘https://www.whatismyip.com’ gives us the IP address assigned by the Internet Service Provider (ISP).

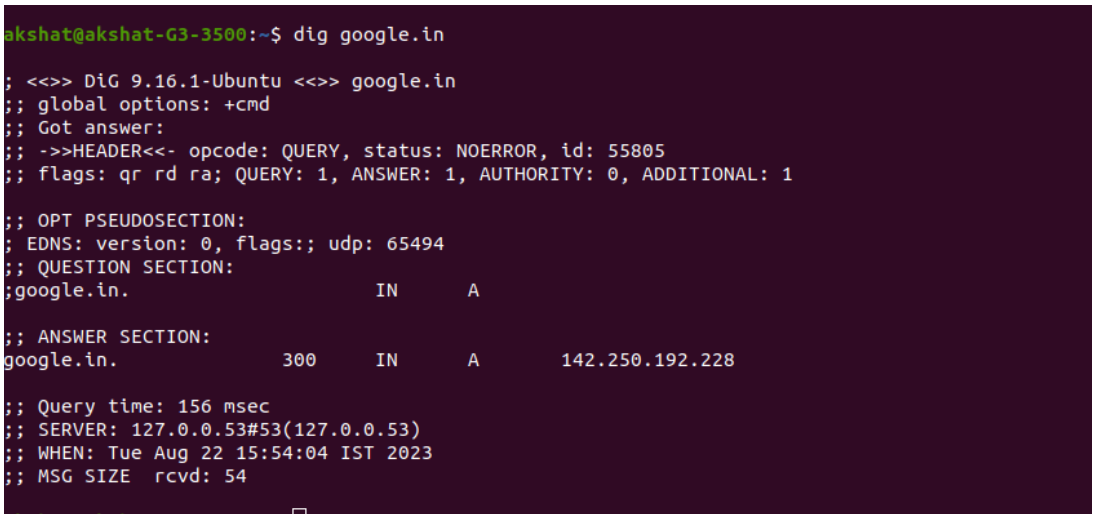
Answer 2)

a) Screenshot of ‘nslookup’ for ‘google.in’ with authoritative result:



To get the authoritative result, we can set the query type as ‘soa’ (State of Authority), giving us the required details.

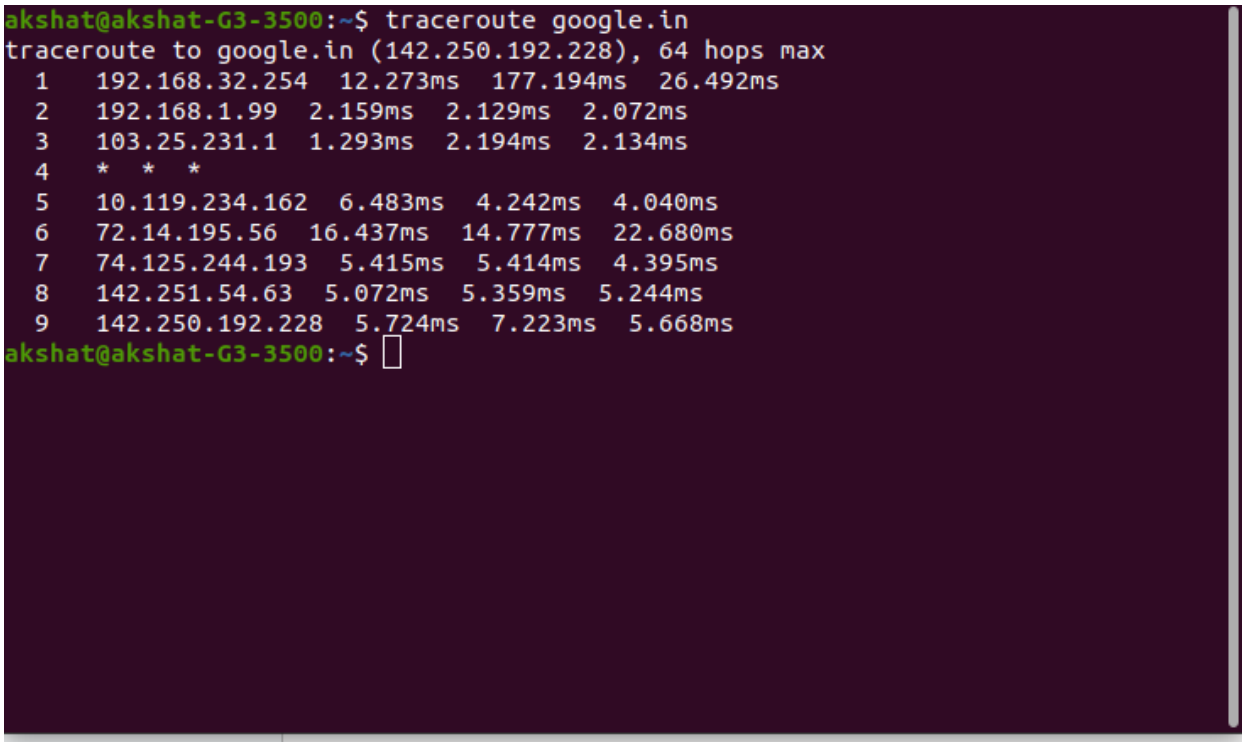
b) Screenshot of time to live (TTL) for ‘google.in’:



After three hundred seconds, this entry will expire from the local DNS server. We can verify it by running the command after a few seconds.

Answer 3)

a) Screenshot of ‘traceroute google.in’:



After ignoring the invisible hosts, we can see that there are **eight** intermediate hosts in total.

Host S.No.	IP Address	Average Latency (3 entries) (rounded to 3 decimal places)
1	192.168.32.254	(12.273ms + 177.194ms + 26.492ms)/3 = 71.986ms
2	192.168.1.99	(2.159ms + 2.129ms + 2.072ms)/3 = 2.12ms
3	103.25.231.1	(1.293ms + 2.194ms + 2.134ms)/3 = 1.874ms
4	10.119.234.162	(6.483ms + 4.242ms + 4.040ms)/3 = 4.922ms
5	72.14.195.56	(16.437ms + 14.777ms + 22.680ms)/3 = 17.965ms
6	74.125.244.193	(5.415ms + 5.414ms + 4.395ms)/3 = 5.075ms
7	142.251.54.63	(5.072ms + 5.359ms + 5.244ms)/3 = 5.225ms
8	142.250.192.228	(5.724ms + 7.223ms + 5.668ms)/3 = 6.205ms

b) 50 ping messages to ‘google.in’:
Average latency (given in output of ping): 9.362 milliseconds

```
akshat@akshat-G3-3500:~$ ping -c 50 google.in
PING google.in (142.250.192.196) 56(84) bytes of data.
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=1 ttl=118 time=8.69 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=2 ttl=118 time=7.53 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=3 ttl=118 time=7.30 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=4 ttl=118 time=7.48 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=5 ttl=118 time=7.75 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=6 ttl=118 time=6.47 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=7 ttl=118 time=6.97 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=8 ttl=118 time=17.4 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=9 ttl=118 time=13.5 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=10 ttl=118 time=6.76 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=11 ttl=118 time=6.78 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=12 ttl=118 time=6.92 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=13 ttl=118 time=7.07 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=14 ttl=118 time=7.20 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=15 ttl=118 time=8.05 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=16 ttl=118 time=7.42 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=17 ttl=118 time=6.93 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=18 ttl=118 time=7.40 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=19 ttl=118 time=4.99 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=20 ttl=118 time=7.57 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=21 ttl=118 time=9.56 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=22 ttl=118 time=7.50 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=23 ttl=118 time=7.44 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=24 ttl=118 time=6.83 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=25 ttl=118 time=7.00 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=26 ttl=118 time=7.95 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=27 ttl=118 time=6.71 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=28 ttl=118 time=9.22 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=29 ttl=118 time=9.40 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=30 ttl=118 time=8.96 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=31 ttl=118 time=9.75 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=32 ttl=118 time=8.28 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=33 ttl=118 time=12.7 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=34 ttl=118 time=12.7 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=35 ttl=118 time=6.60 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=36 ttl=118 time=7.26 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=37 ttl=118 time=9.77 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=38 ttl=118 time=13.9 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=39 ttl=118 time=17.3 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=40 ttl=118 time=8.26 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=41 ttl=118 time=7.54 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=42 ttl=118 time=18.4 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=43 ttl=118 time=17.2 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=44 ttl=118 time=7.33 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=45 ttl=118 time=7.62 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=46 ttl=118 time=16.9 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=47 ttl=118 time=12.1 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=48 ttl=118 time=13.4 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=49 ttl=118 time=7.00 ms
64 bytes from del11s12-in-f4.1e100.net (142.250.192.196): icmp_seq=50 ttl=118 time=13.4 ms

--- google.in ping statistics ---
50 packets transmitted, 50 received, 0% packet loss, time 49082ms
rtt min/avg/max/mdev = 4.993/9.362/18.434/3.414 ms
```

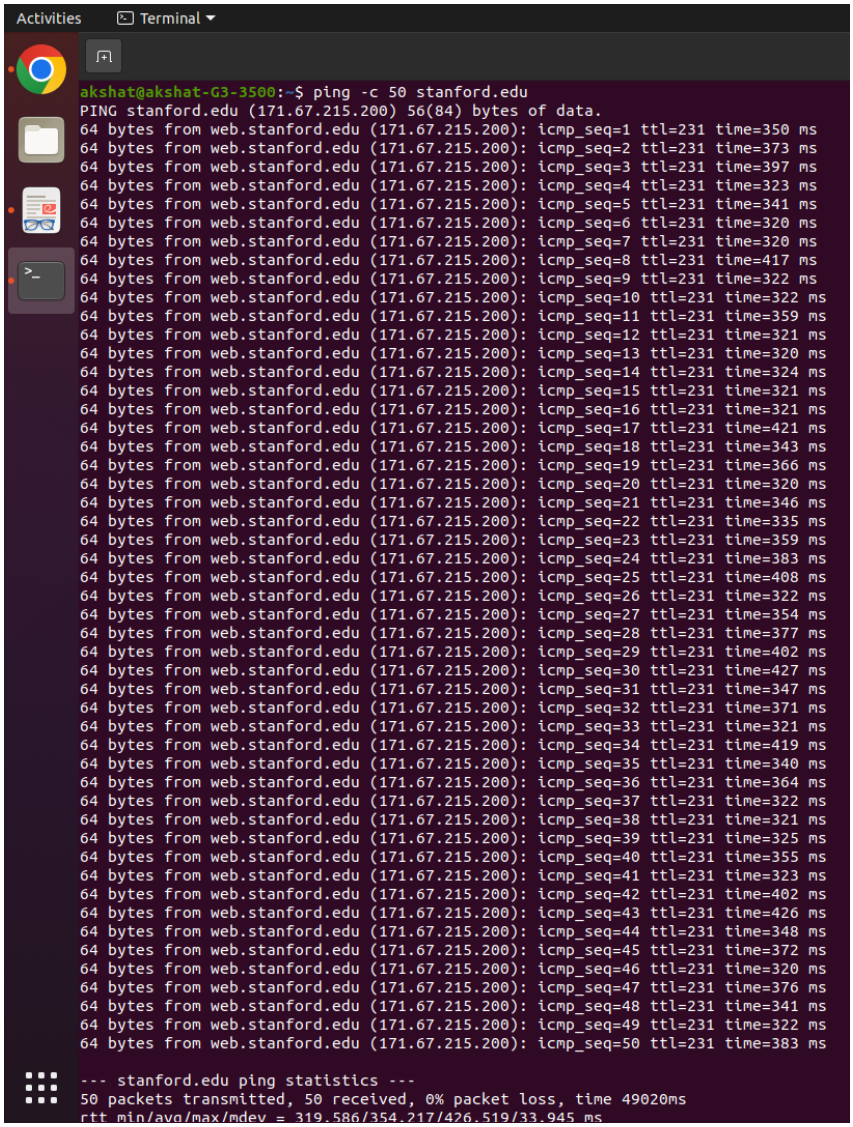
c) Sum of all latencies in a) : 3×71.986 + 3x2.12 + 3×1.874 + 3×4.922 + 3×17.965 + 5.075×3+ 3×5.225 + 3×6.205 = 346.116 milliseconds
Sum of all latencies in b) : 9.362 x 50 = 468.1 milliseconds (Avg latency x No of Packets)

Sum of latencies in a) and b) are different as there are 24 entries in a) and 50 entries in b), hence sum of latencies in the pinging process would be greater than traceroute command.

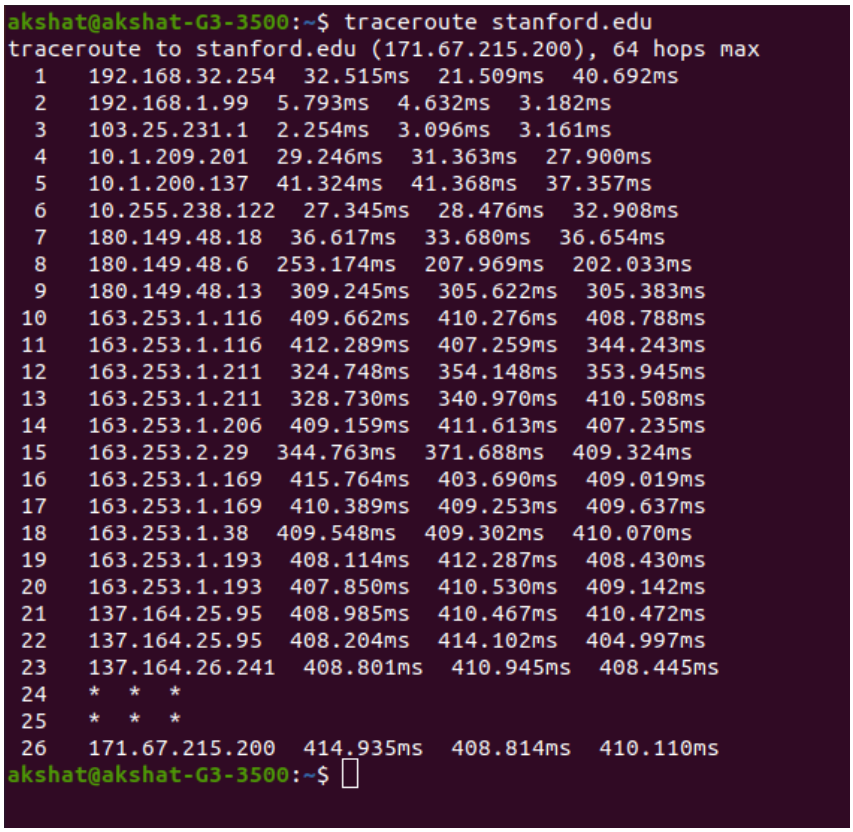
d) Maximum latency in a): 177.194 milliseconds
Maximum latency in b): 18.434 milliseconds
Maximum latencies are different. This difference occurs as pinging is generally faster than the traceroute command as ‘traceroute’ sends packets and waits for the timeout response, while ping only forwards packets.

e) There are three entries of latencies as the ‘traceroute’ command sends three packets to the hop, and each entry represents its latency (here in milliseconds)

f) 50 ping messages to stanford.edu’:
Average latency (given in output of ping): 354.217 milliseconds



g) Screenshot of ‘traceroute stanford.edu’:



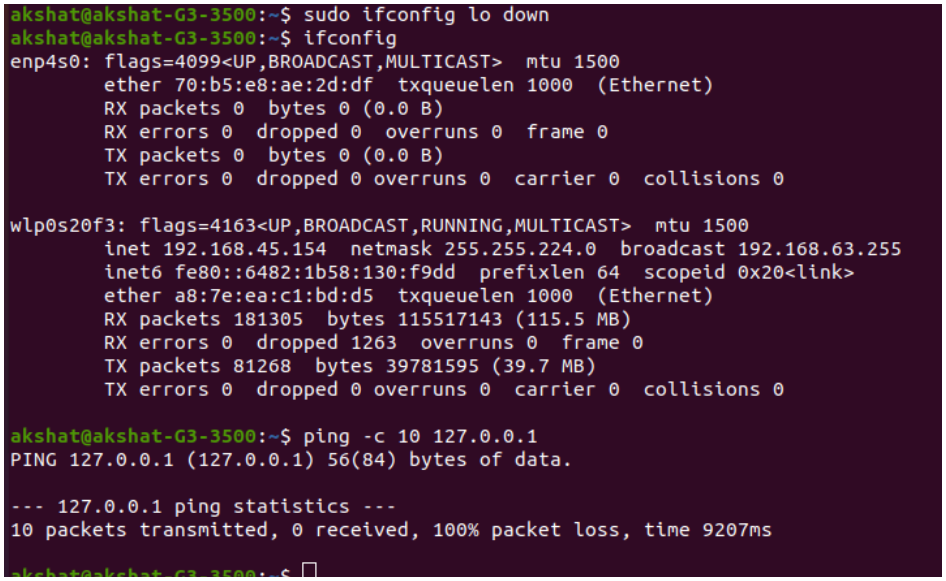
We can see that the number of hops (intermediate hosts) for ‘stanford.edu’ is very high (24) as compared to ‘google.in’ (8) as the server of stanford.edu is further from my system than the server of ‘google.in’, hence, many intermediate hosts are encountered on the path to the server of ‘stanford.edu’.

h) The latency for pinging to ‘google.in’ is very low compared to ‘stanford.edu’ as my system is much closer to the server of ‘google.in’ than the server of ‘stanford.edu’, which means that the time taken for packets to transfer is lower. Hence, the latencies are lower.

Answer 4)

To make the ping command fail for 127.0.0.1 (with 100% packet loss), we need to shut down the loopback interface (‘lo’) using the down command. Now we ping (10 packets) and see the results.

Screenshot:



We can see that the packet loss is 100%.

Answer 5)

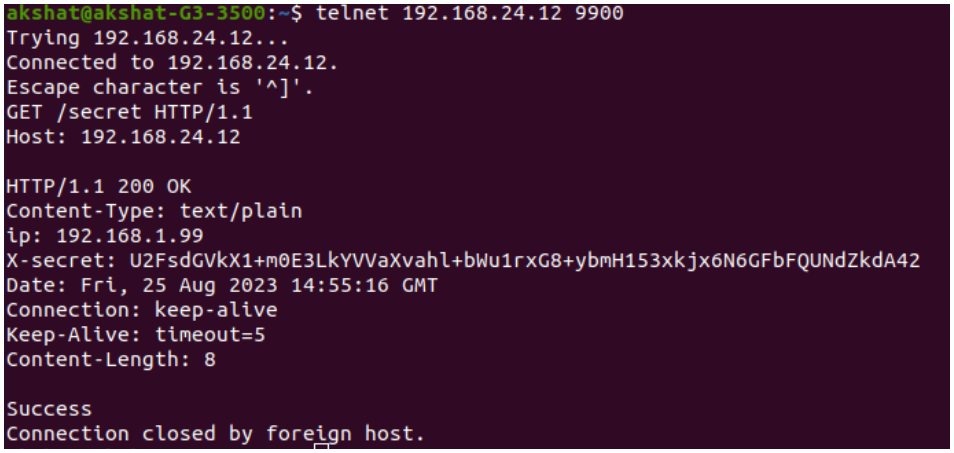
All steps followed:

1) ‘telnet 192.168.24.12 9900’.
2) GET request on /secret (‘GET /secret HTTP/1.1’)
3) Setting host (‘Host: 192.168.24.12’)

X-secret: U2FsdGVkX1+m0E3LkYVVaXvahl+bWu1rxG8+ybmH153xkjx6N6GFbFQUNdZkdA42

(First part: U2FsdGVkX1)

Screenshot:



Answer 6)

All steps followed:

1) ‘telnet 192.168.24.12 smtp’.
2) Identifying system (‘helo cse232.com’)
3) Mailing from my id (my roll number: 2020172) (‘mail from: 20172@cse232.com’)
4) Mailing to my id (‘rcpt to: 20172@cse232.com’) (tried x2, didn’t work)
5) Mailing to my friend Kumar Ankit (‘rcpt to: 20214@cse232.com’) (worked)
6) Added subject and message after entering data
7) Ended the mail with a ‘.’
8) Message queued (ID: 2022C6F6441E)
9) Closed with exit

Screenshot: