1. Find the IP address of your system using <ipconfig>. Record the result. Record the subnet Mask.

```
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 10.1.7.109  netmask 255.255.224.0  broadcast 10.1.31.255
        inet6 fe80::eedb:6dfd:fcce:d7bb  prefixlen 64  scopeid 0x20<link>
        ether e0:0a:f6:b1:c0:c3  txqueuelen 1000  (Ethernet)
        RX packets 247646  bytes 142859070 (136.2 MiB)
        RX errors 0  dropped 1  overruns 0  frame 0
        TX packets 34503  bytes 11632304 (11.0 MiB)
        TX errors 0  dropped 1 overruns 0  carrier 0  collisions 0
```

2. Find another IP address within your subnet (you can guess this from your subnet mask. Not
all the IPs in your subnet may be allocated). Ping that IP address (<ping ip_address>) and record the result.

10.1.7.110

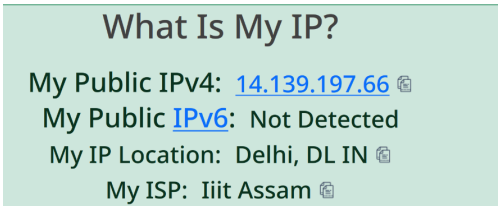
```
ping 10.1.7.110
PING 10.1.7.110 (10.1.7.110) 56(84) bytes of data.
From 10.1.7.109 icmp_seq=1 Destination Host Unreachable
From 10.1.7.109 icmp_seq=2 Destination Host Unreachable
From 10.1.7.109 icmp_seq=5 Destination Host Unreachable
From 10.1.7.109 icmp_seq=6 Destination Host Unreachable
From 10.1.7.109 icmp_seq=8 Destination Host Unreachable
From 10.1.7.109 icmp_seq=9 Destination Host Unreachable
^C
--- 10.1.7.110 ping statistics ---
11 packets transmitted, 0 received, +6 errors, 100% packet loss, time 10141
pipe 4
```

3. What is the address of the default gateway? In the list of IP addresses allowed by the subnet
mask, do you find anything special about the address of the default gateway?

```
ip route show
default via 10.1.0.1 dev wlan0 proto dhcp src 10.1.7.109 metric 600
10.1.0.0/19 dev wlan0 proto kernel scope link src 10.1.7.109 metric 600
```

First usable address in a subnet

4. Find your external IP address using https://www.whatismyip.com/. Is this different from the address you found above?



5. Click on the IP address provided by https://www.whatismyip.com and explore further. What
is the name of the ASN that you belong to? What is its number?

ASN: 55824
Organization: NKN Core Network
ASN IP Range: 14.139.197.0/24

6. What is the ISP of your network?

ISP:Iiit Assam

7. Give an example of another IP address belonging to the same ASN. To which organisation
does it belong?

14.139.197.67 IP also belong to NKN core Network

8. Use tracert (same as traceroute) to trace the path to <iiitg.ac.in> What do you find? Explain
the entries.

The `tracepath` output shows:

1. **[LOCALHOST] pmtu 1500**: Your local machine starts the trace, with a path MTU of 1500 bytes.
2. **Hop 1 (10.1.0.2)**: First router on your network, responding with times of `7.148ms` and `5.074ms`.
3. **Hop 2 (192.168.253.252)**: Second router in the path, responding with `5.051ms`.
4. **No reply (Hops 3 & 4)**: Likely due to routers blocking ICMP or network policies preventing response.

9. Find the ip address of the domain (of I I T Guwahati) iitg.ac.in using <ping iitg.ac.in>. Does this machine belong to the same ASN as IIIT Guwahati? Who is their ISP?

ping iitg.ac.in
PING iitg.ac.in (14.139.196.75) 56(84) bytes of data.

The IP of IITG belong to different ASN : 55847 ie NKN Edge Network

10. Check your ARP cache using arp -a. Now ping an IP address that is reachable from your machine, to which you have not yet connected. Check your ARP cache again. Do you see a

difference? Why?

```
arp -v
Address                  HWtype  HWaddress           Flags Mask            Ifac
e
172.16.0.3               ether   04:0e:3c:15:6a:cd   C                     eno1
172.16.1.2               ether   70:7d:b9:63:ff:27   C                     eno1
172.16.0.243                     (incomplete)                              eno1
gateway                  ether   00:00:0c:9f:f1:f4   C                     eno1
172.16.0.11              ether   62:77:c9:96:a2:81   C                     eno1
172.16.1.3               ether   38:0e:4d:1d:51:a7   C                     eno1
172.16.0.1               ether   00:1e:67:83:70:2f   C                     eno1
Entries: 7      Skipped: 0      Found: 7

base sridhar.tuli22b@localhost ~ (0.551s)
arp -a
? (172.16.0.3) at 04:0e:3c:15:6a:cd [ether] on eno1
? (172.16.1.2) at 70:7d:b9:63:ff:27 [ether] on eno1
? (172.16.0.243) at <incomplete> on eno1
gateway (172.16.0.254) at 00:00:0c:9f:f1:f4 [ether] on eno1
? (172.16.0.11) at 62:77:c9:96:a2:81 [ether] on eno1
? (172.16.1.3) at 38:0e:4d:1d:51:a7 [ether] on eno1
? (172.16.0.1) at 00:1e:67:83:70:2f [ether] on eno1
```

```
arp -v
Address                  HWtype  HWaddress           Flags Mask            Ifac
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172.16.0.3               ether   04:0e:3c:15:6a:cd   C                     eno1
172.16.1.2               ether   70:7d:b9:63:ff:27   C                     eno1
172.16.0.243                     (incomplete)                              eno1
gateway                  ether   00:00:0c:9f:f1:f4   C                     eno1
172.16.0.11              ether   62:77:c9:96:a2:81   C                     eno1
172.16.1.3               ether   38:0e:4d:1d:51:a7   C                     eno1
172.16.0.1               ether   00:1e:67:83:70:2f   C                     eno1
Entries: 7      Skipped: 0      Found: 7

base sridhar.tuli22b@localhost ~ (0.554s)
arp -a
? (172.16.0.3) at 04:0e:3c:15:6a:cd [ether] on eno1
? (172.16.1.2) at 70:7d:b9:63:ff:27 [ether] on eno1
? (172.16.0.243) at <incomplete> on eno1
gateway (172.16.0.254) at 00:00:0c:9f:f1:f4 [ether] on eno1
? (172.16.0.11) at 62:77:c9:96:a2:81 [ether] on eno1
? (172.16.1.3) at 38:0e:4d:1d:51:a7 [ether] on eno1
? (172.16.0.1) at 00:1e:67:83:70:2f [ether] on eno1
```

NO CHANGE

11. Find the routing table and the list of interfaces on your system using <netstat -r> . What is the MAC address of the interface using which you are connected to the network?

```
base sridhar.tuli22b@localhost ~ (3.557s)
netstat -r
Kernel IP routing table
Destination     Gateway         Genmask         Flags   MSS Window  irtt Iface
default         gateway         0.0.0.0         UG        0 0          0 eno1
default         gateway         0.0.0.0         UG        0 0          0 eno2
gateway         0.0.0.0         255.255.255.255 UH        0 0          0 eno2
localhost       0.0.0.0         255.255.255.255 UH        0 0          0 eno2
172.16.0.0      0.0.0.0         255.255.254.0   U         0 0          0 eno1
```

12. Compare the round-trip times to:

www.berkeley.edu (California)

```
base sridhar.tuli22b@localhost ~ (5.443s)
ping -c 4 www.berkeley.edu
PING www.berkeley.edu (141.193.213.20) 56(84) bytes of data.
64 bytes from 141.193.213.20 (141.193.213.20): icmp_seq=1 ttl=51 time=66.0 ms
64 bytes from 141.193.213.20 (141.193.213.20): icmp_seq=2 ttl=51 time=78.7 ms
64 bytes from 141.193.213.20 (141.193.213.20): icmp_seq=3 ttl=51 time=60.2 ms
64 bytes from 141.193.213.20 (141.193.213.20): icmp_seq=4 ttl=51 time=60.6 ms

--- www.berkeley.edu ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 5160ms
rtt min/avg/max/mdev = 60.257/66.438/78.786/7.494 ms
```

www.mit.edu (Massachusetts)

```
ping -c 4 www.mit.edu
PING e9566.dscb.akamaiedge.net (23.58.1.151) 56(84) bytes of data.
64 bytes from a23-58-1-151.deploy.static.akamaitechnologies.com (23.58.1.151): icmp_seq=1 ttl=55 time=41.1 ms
64 bytes from a23-58-1-151.deploy.static.akamaitechnologies.com (23.58.1.151): icmp_seq=2 ttl=55 time=43.3 ms
64 bytes from a23-58-1-151.deploy.static.akamaitechnologies.com (23.58.1.151): icmp_seq=3 ttl=55 time=41.4 ms
64 bytes from a23-58-1-151.deploy.static.akamaitechnologies.com (23.58.1.151): icmp_seq=4 ttl=55 time=133 ms

--- e9566.dscb.akamaiedge.net ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3002ms
rtt min/avg/max/mdev = 41.186/64.947/133.809/39.767 ms
```

www.ucl.ac.uk (London)

```
base sridhar.tuli22b@localhost ~
ping -c 4 www.ucl.ac.uk
PING www.ucl.ac.uk.cdn.cloudflare.net (104.18.32.18) 56(84) bytes of data.
64 bytes from 104.18.32.18 (104.18.32.18): icmp_seq=1 ttl=51 time=60.3 ms
64 bytes from 104.18.32.18 (104.18.32.18): icmp_seq=2 ttl=51 time=77.4 ms
64 bytes from 104.18.32.18 (104.18.32.18): icmp_seq=3 ttl=51 time=60.4 ms
64 bytes from 104.18.32.18 (104.18.32.18): icmp_seq=4 ttl=51 time=60.2 ms

--- www.ucl.ac.uk.cdn.cloudflare.net ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3001ms
rtt min/avg/max/mdev = 60.246/64.592/77.411/7.403 ms
```

www.usyd.edu.au (Sydney)

www.uct.ac.za (Cape Town)

```
base sridhar.tuli22b@localhost ~
ping -c 4 www.uct.ac.za
PING cms-vip-prd.uct.ac.za (137.158.159.192) 56(84) bytes of data.

--- cms-vip-prd.uct.ac.za ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 2999ms


base sridhar.tuli22b@localhost ~ (13.349s)
ping -c 4 www.usyd.edu.au
PING rpxy-loadb-1thwdg5gwm0fm-2097141603.ap-southeast-2.elb.amazonaws.com (13.237.199.202) 56(84) bytes of data.

--- rpxy-loadb-1thwdg5gwm0fm-2097141603.ap-southeast-2.elb.amazonaws.com ping statistics ---
4 packets transmitted, 0 received, 100% packet loss, time 2999ms
```

Could’nt ping these two

OUTPUT OF THE CODE

```
~/Codes/NetworksLab/Lab11 git:(main) (0.64s)
g++ code.cpp -o code && ./code
Initial Distance vector of A:
  G : INF
  F : 1
  E : 1
  B : 1
  D : INF
  C : 1
  A : 0

After iteration 1:
Distance vector of A:
  G : 2
  F : 1
  E : 1
  B : 1
  D : 2
  C : 1
  A : 0

After iteration 2:
Distance vector of A:
  G : 2
  F : 1
  E : 1
  B : 1
  D : 2
  C : 1
  A : 0

Final Distance vector of A:
  G : 2
  F : 1
  E : 1
  B : 1
  D : 2
  C : 1
  A : 0
```