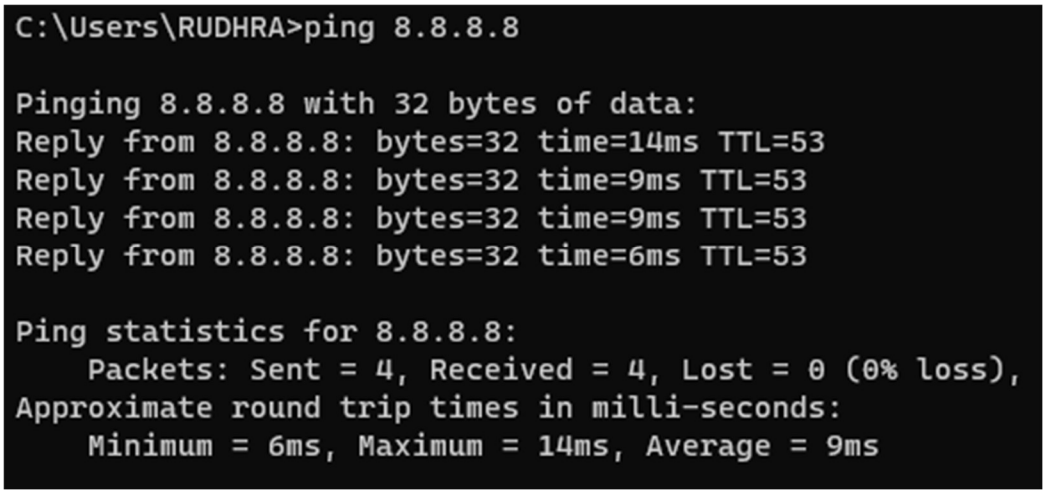
Q.) Using, linux-terminal or Windows-cmd, execute following networking commands and note the output: ping, traceroute, netstat, arp, ipconfig, Getmac, hostname, NSLookUp, pathping, SystemInfo

1. ping command



Here 8.8.8.8 is the IPv4 address of one of Google's public DNS servers.

2. traceroute command

```
C:\Users\RUDHRA>tracert google.com

Tracing route to google.com [2404:6800:4009:822::200e]
over a maximum of 30 hops:

  1     4 ms     1 ms     1 ms  2405:201:1f:9113:c6e5:32ff:fea4:d433
  2     *        *        *     Request timed out.
  3    33 ms    12 ms     9 ms  2405:203:400:100:172:31:0:238
  4    14 ms     7 ms     8 ms  2405:200:802:760::8
  5     5 ms     7 ms     8 ms  2405:200:802:760::8
  6     *        *        *     Request timed out.
  7     *        *        9 ms  2001:4860:1:1::a14
  8     9 ms     9 ms     6 ms  2404:6800:80dc::1
  9    13 ms     9 ms     8 ms  2001:4860:0:1::43d8
 10    15 ms     5 ms     7 ms  2001:4860:0:1::50f9
 11    16 ms     7 ms     8 ms  bom12s12-in-x0e.1e100.net [2404:6800:4009:822::200e]

Trace complete.
```

3. netstat command

```
Microsoft Windows [Version 10.0.22621.2715]
(c) Microsoft Corporation. All rights reserved.

C:\Users\RUDHRA>netstat

Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    192.168.29.56:52565    relay-250372ec:https   ESTABLISHED
  TCP    192.168.29.56:52582    20.198.118.190:https   ESTABLISHED
  TCP    192.168.29.56:53295    20.247.160.101:https   ESTABLISHED
  TCP    192.168.29.56:53297    20.42.73.26:https      ESTABLISHED
  TCP    192.168.29.56:53309    20.42.73.28:https      ESTABLISHED
  TCP    192.168.29.56:53310    204.79.197.222:https   ESTABLISHED
  TCP    192.168.29.56:53311    152.195.38.76:http     ESTABLISHED
  TCP    192.168.29.56:53314    13.107.18.254:https    ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:52821  sd-in-f188:5228        ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53298  [2405:200:1602::312c:829a]:http  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53299  [2620:1ec:c11::239]:https  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53301  [2405:200:1630:a00::b856:f8d8]:https  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53302  [2405:200:1630:a00::b856:f8ab]:https  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53303  [2405:200:1630:a00::b856:f8b1]:https  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53304  [2405:200:1630:a00::b856:f8b1]:https  CLOSE_WAIT
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53305  [2405:200:1630:a00::b856:f8b1]:https  CLOSE_WAIT
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53306  [2405:200:1630:a00::b856:f8b1]:https  CLOSE_WAIT
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53307  [2405:200:1630:a00::b856:f8b1]:https  CLOSE_WAIT
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53308  [2405:200:1630:a00::b856:f8b1]:https  CLOSE_WAIT
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53312  [2620:1ec:bdf::254]:https  ESTABLISHED
  TCP    [2405:201:1f:9113:390a:f228:6afa:5e5f]:53313  [2620:1ec:8f8::254]:https  ESTABLISHED
```

4. arp command

```
C:\Users\RUDHRA>arp

Displays and modifies the IP-to-Physical address translation tables used by
address resolution protocol (ARP).

ARP -s inet_addr eth_addr [if_addr]
ARP -d inet_addr [if_addr]
ARP -a [inet_addr] [-N if_addr] [-v]

  -a            Displays current ARP entries by interrogating the current
                protocol data.  If inet_addr is specified, the IP and Physical
                addresses for only the specified computer are displayed.  If
                more than one network interface uses ARP, entries for each ARP
                table are displayed.
  -g            Same as -a.
  -v            Displays current ARP entries in verbose mode.  All invalid
                entries and entries on the loop-back interface will be shown.
  inet_addr     Specifies an internet address.
  -N if_addr    Displays the ARP entries for the network interface specified
                by if_addr.
  -d            Deletes the host specified by inet_addr. inet_addr may be
                wildcarded with * to delete all hosts.
  -s            Adds the host and associates the Internet address inet_addr
                with the Physical address eth_addr.  The Physical address is
                given as 6 hexadecimal bytes separated by hyphens. The entry
                is permanent.
  eth_addr      Specifies a physical address.
  if_addr       If present, this specifies the Internet address of the
                interface whose address translation table should be modified.
                If not present, the first applicable interface will be used.
Example:
  > arp -s 157.55.85.212   00-aa-00-62-c6-09  .... Adds a static entry.
  > arp -a                                    .... Displays the arp table.
```

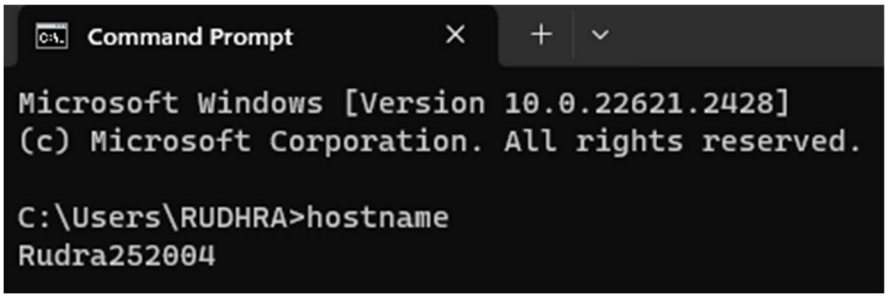
5. ipconfig command

```
C:\Users\RUDHRA>ipconfig

Windows IP Configuration


Ethernet adapter Ethernet:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   IPv6 Address. . . . . . . . . . . : 2405:201:1f:9113:4703:1fa:e228:8be2
   Temporary IPv6 Address. . . . . . : 2405:201:1f:9113:390a:f228:6afa:5e5f
   Link-local IPv6 Address . . . . . : fe80::a362:e161:711a:fc58%5
   IPv4 Address. . . . . . . . . . . : 192.168.29.56
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : fe80::c6e5:32ff:fea4:d433%5
                                       192.168.29.1

Ethernet adapter Bluetooth Network Connection:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
```

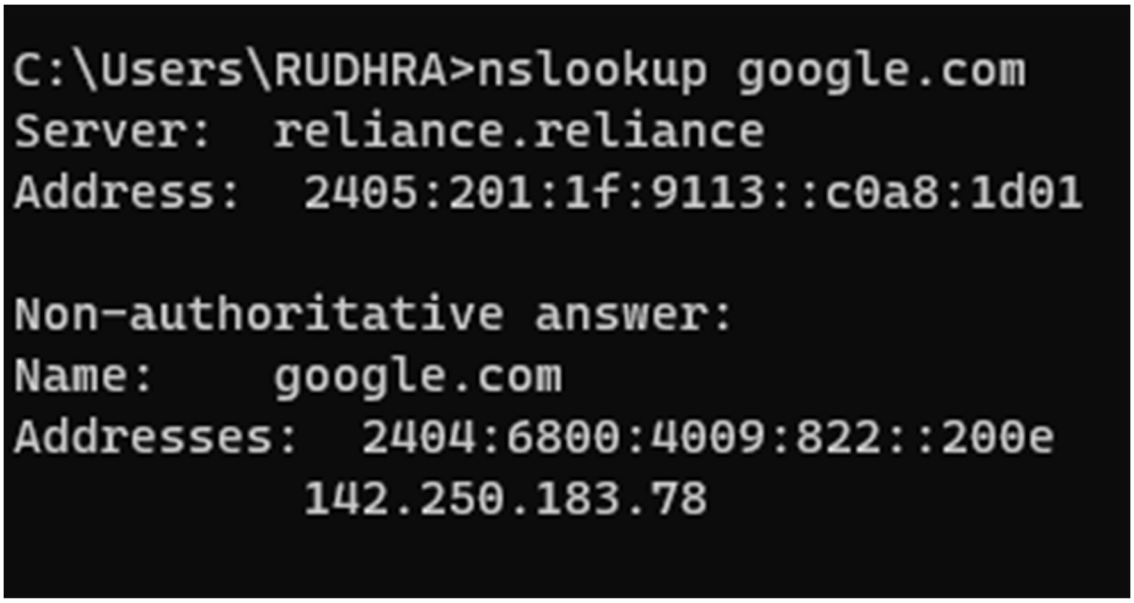
6. Getmac command

```
C:\Users\RUDHRA>getmac

Physical Address    Transport Name
=================== ==========================================================
80-A5-89-8C-78-97   \Device\Tcpip_{283FCB8F-6BAE-4D46-A19E-704E639C9774}
9C-5C-8E-17-7F-82   Media disconnected
80-A5-89-8C-78-96   Media disconnected
```

7. hostname command



8. NSLookUp command



9. pathping command

```
C:\Users\RUDHRA>pathping google.com

Tracing route to google.com [2404:6800:4009:823::200e]
over a maximum of 30 hops:
  0  Rudra252004 [2405:201:1f:9286:256f:633a:48a0:1029]
  1  2405:201:1f:9286:c6e5:32ff:fea4:d433
  2     *        *        *
Computing statistics for 25 seconds...
            Source to Here   This Node/Link
Hop  RTT    Lost/Sent = Pct  Lost/Sent = Pct  Address
  0                                          Rudra252004 [2405:201:1f:9286:256f:633a:48a0:1029]
                                   0/ 100 =  0%   |
  1    2ms     0/ 100 =  0%     0/ 100 =  0%  2405:201:1f:9286:c6e5:32ff:fea4:d433

Trace complete.
```

10. systemInfo command

```
C:\Users\RUDHRA>systeminfo

Host Name:                 RUDRA252004
OS Name:                   Microsoft Windows 11 Enterprise
OS Version:                10.0.22621 N/A Build 22621
OS Manufacturer:           Microsoft Corporation
OS Configuration:          Standalone Workstation
OS Build Type:             Multiprocessor Free
Registered Owner:          RUDHRA
Registered Organization:
Product ID:                00329-00000-00003-AA517
Original Install Date:     28-07-2023, 12.10.58 AM
System Boot Time:          21-11-2023, 12.20.41 PM
System Manufacturer:       ASUSTeK COMPUTER INC.
System Model:              X555LF
System Type:               x64-based PC
Processor(s):              1 Processor(s) Installed.
                           [01]: Intel64 Family 6 Model 61 Stepping 4 GenuineIntel ~2000 Mhz
BIOS Version:              American Megatrends Inc. X555LF.504, 04-08-2015
Windows Directory:         C:\Windows
System Directory:          C:\Windows\system32
Boot Device:               \Device\HarddiskVolume1
System Locale:             en-us;English (United States)
Input Locale:              00004009
Time Zone:                 (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
```