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SUBJECT- Computer Networks

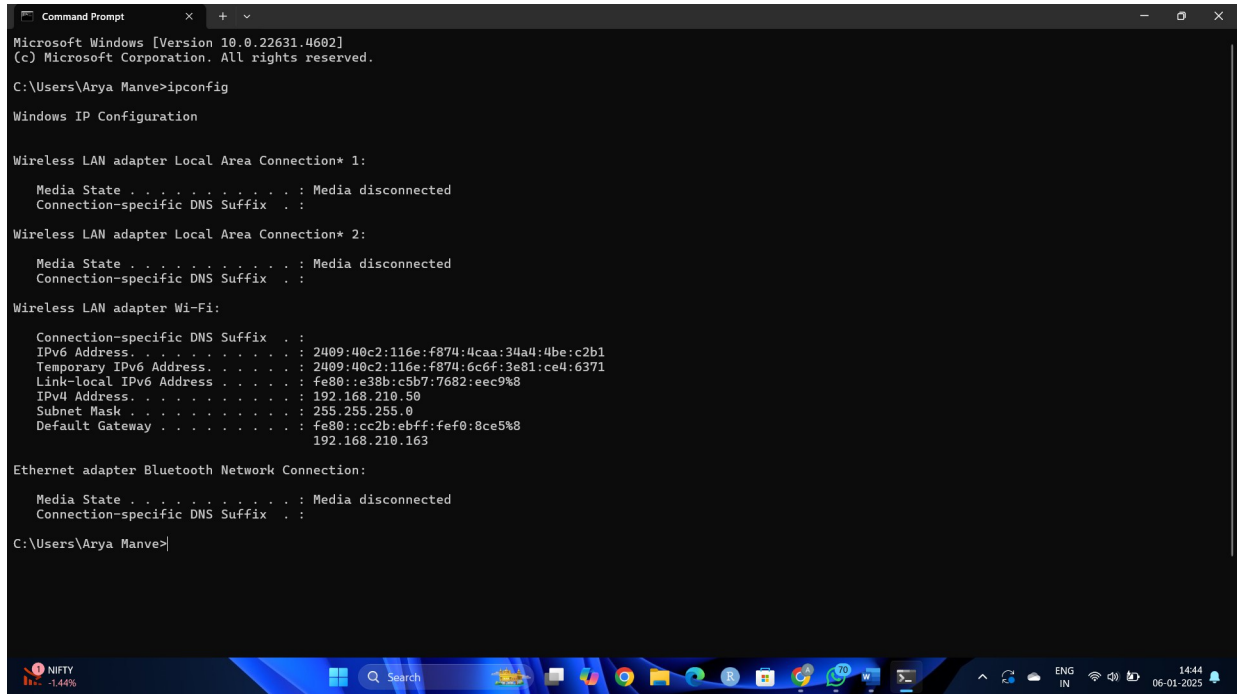
DATE- 13th January 2025

VISHWAKARMA INSTITUTE OF TECHNOLOGY

Assignment 1-

1. IPCONFIG

Description: Shows your computer's IP address, subnet mask, and default gateway —basically your network ID card.



```
Command Prompt
Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Arya Manve>ipconfig

Windows IP Configuration

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. . . . . : 2409:40c2:116e:f874:4caa:34a4:4be:c2b1
    Temporary IPv6 Address. . . . . : 2409:40c2:116e:f874:6c6f:3e81:ce4:6371
    Link-local IPv6 Address . . . . . : fe80::e38b:c5b7:7682:eec9%8
    IPv4 Address. . . . . : 192.168.210.50
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::ccc2b:ebff:fef0:8ce5%8
                                192.168.210.163

Ethernet adapter Bluetooth Network Connection:

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

C:\Users\Arya Manve>
```

2. NSLOOKUP

Description: Helps you find the IP address of a domain name or vice versa. Handy for DNS checks.

```
Command Prompt - nslookup
n:

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

C:\Users\Arya Manve>nslookup
Default Server:  UnKnown
Address:  192.168.210.163

> |
```

3. HOSTNAME

Description: Tells you your computer's name

```
Command Prompt

Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Arya Manve>hostname
LAPTOP-9EDV501B

C:\Users\Arya Manve>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
```

4. Ping

Description: Checks if another device is alive on the network and measures response time.

```
Command Prompt
LAPTOP-9EDV501B
C:\Users\Arya Manve>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
           [-4] [-6] target_name

Options:
  -t             Ping the specified host until stopped.
                 To see statistics and continue - type Control-Break;
                 To stop - type Control-C.
  -a             Resolve addresses to hostnames.
  -n count       Number of echo requests to send.
  -l size        Send buffer size.
  -f            Set Don't Fragment flag in packet (IPv4-only).
  -i TTL         Time To Live.
  -v TOS         Type Of Service (IPv4-only. This setting has been deprecated
                 and has no effect on the type of service field in the IP
                 Header).
  -r count       Record route for count hops (IPv4-only).
  -s count       Timestamp for count hops (IPv4-only).
  -j host-list   Loose source route along host-list (IPv4-only).
  -k host-list   Strict source route along host-list (IPv4-only).
  -w timeout     Timeout in milliseconds to wait for each reply.
  -R            Use routing header to test reverse route also (IPv6-only).
                 Per RFC 5095 the use of this routing header has been
                 deprecated. Some systems may drop echo requests if
                 this header is used.
  -S srcaddr     Source address to use.
  -c compartment Routing compartment identifier.
  -p            Ping a Hyper-V Network Virtualization provider address.
  -4            Force using IPv4.
  -6            Force using IPv6.
```

5. tracert -d -

Description: Maps the route your data takes to get to a specific destination without resolving IPs to names.

```
Command Prompt - tracert
C:\Users\Arya Manve>tracert -d
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
              [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d            Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R            Trace round-trip path (IPv6-only).
  -S srcaddr     Source address to use (IPv6-only).
  -4            Force using IPv4.
  -6            Force using IPv6.

C:\Users\Arya Manve>tracert -d www.vit.edu

Tracing route to www.vit.edu [13.203.68.168]
over a maximum of 30 hops:

  1    12 ms    6 ms    2 ms    192.168.210.163
  2     *      *      *      Request timed out.
```

6. netstat -

Description: Lists active network connections and ports.

```
Command Prompt - netstat x + v
Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Arya Manve>netstat

Active Connections

Proto Local Address           Foreign Address         State
TCP   127.0.0.1:49671          LAPTOP-9EDV501B:49672  ESTABLISHED
TCP   127.0.0.1:49672          LAPTOP-9EDV501B:49671  ESTABLISHED
TCP   127.0.0.1:49673          LAPTOP-9EDV501B:49674  ESTABLISHED
TCP   127.0.0.1:49674          LAPTOP-9EDV501B:49673  ESTABLISHED
TCP   192.168.210.50:58397     ec2-13-234-99-234:https ESTABLISHED
TCP   192.168.210.50:58929     20.190.146.32:https    TIME_WAIT
TCP   192.168.210.50:58931     40.99.9.178:https      ESTABLISHED
TCP   192.168.210.50:58933     20.189.173.2:https     TIME_WAIT
TCP   192.168.210.50:58952     192.168.210.163:domain TIME_WAIT
TCP   192.168.210.50:58953     192.168.210.163:domain TIME_WAIT
TCP   192.168.210.50:58954     192.168.210.163:domain TIME_WAIT
TCP   192.168.210.50:58955     192.168.210.163:domain TIME_WAIT
TCP   192.168.210.50:58956     192.168.210.163:domain TIME_WAIT
TCP   192.168.210.50:58957     192.168.210.163:domain TIME_WAIT
```

7. arp -a -

Description: Displays the ARP table showing IP-to-MAC address mappings.

```
Command Prompt
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.

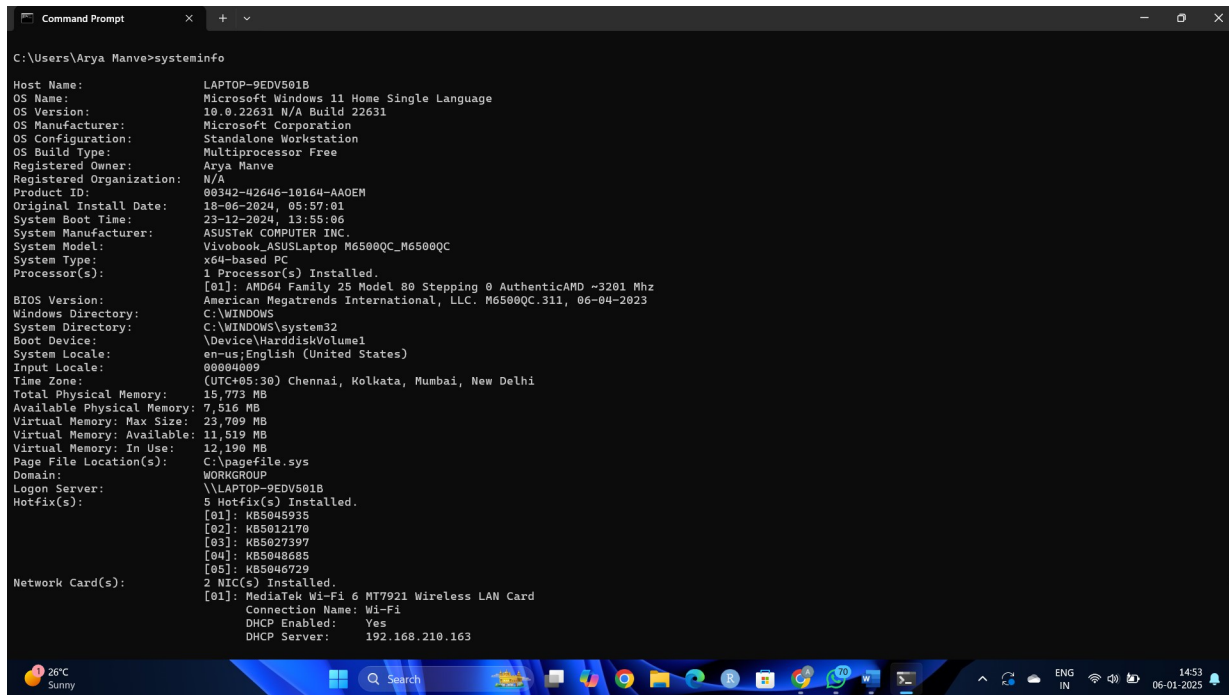
Example:
> arp -s 157.55.85.212 00-aa-00-62-c6-09 .... Adds a static entry.
> arp -a          .... Displays the arp table.

C:\Users\Arya Manve>arp -a

Interface: 192.168.210.50 --- 0x8
Internet Address   Physical Address   Type
192.168.210.163    ce-2b-eb-f0-8c-e5 dynamic
192.168.210.255    ff-ff-ff-ff-ff-ff static
224.0.0.22         01-00-5e-00-00-16 static
224.0.0.251        01-00-5e-00-00-fb static
224.0.0.252        01-00-5e-00-00-fc static
```

8. systeminfo -

Description: Gives you a detailed rundown of your system's specs and configuration. A quick "about me" for your PC.



```
C:\Users\Arya Manve>systeminfo

Host Name:                 LAPTOP-9EDV501B
OS Name:                   Microsoft Windows 11 Home Single Language
OS Version:                10.0.22631 N/A Build 22631
OS Manufacturer:         Microsoft Corporation
OS Configuration:         Standalone Workstation
OS Build Type:              Multiprocessor Free
Registered Owner:          Arya Manve
Registered Organization:   N/A
Product ID:                00342-42646-10164-AAOEM
Original Install Date:     18-06-2024, 05:57:01
System Boot Time:          23-12-2024, 13:55:06
System Manufacturer:       ASUS&Amp; COMPUTER INC.
System Model:               Vivobook ASUSLaptop M6500QC_M6500QC
System Type:                x64-based PC
Processor(s):               1 Processor(s) Installed.
                           [01]: AMD64 Family 25 Model 80 Stepping 0 AuthenticAMD ~3201 Mhz
BIOS Version:               American Megatrends International, LLC. M6500QC.311, 06-04-2023
Windows Directory:         C:\WINDOWS
System Directory:          C:\WINDOWS\system32
Root Device:                \Device\HarddiskVolume1
System Locale:               en-us;English (United States)
Input Locale:               00004009
Time Zone:                  (UTC+05:30) Chennai, Kolkata, Mumbai, New Delhi
Total Physical Memory:      15,773 MB
Available Physical Memory:  7,516 MB
Virtual Memory: Max Size:   23,709 MB
Virtual Memory: Available:  11,519 MB
Virtual Memory: In Use:     12,190 MB
Page File Location(s):     C:\pagefile.sys
Domain:                     WORKGROUP
Logon Server:               \\LAPTOP-9EDV501B
Hotfix(s):                  5 Hotfix(s) Installed.
                           [01]: KB5045035
                           [02]: KB5012170
                           [03]: KB5027397
                           [04]: KB5048685
                           [05]: KB5046729
Network Card(s):            2 NIC(s) Installed.
                           [01]: MediaTek Wi-Fi 6 MT7921 Wireless LAN Card
                               Connection Name: Wi-Fi
                               DHCP Enabled:   Yes
                               DHCP Server:    192.168.210.163
```

9. route print -

Description: Displays the routing table, showing paths your data packets follow. A GPS for network traffic.

```
Command Prompt

> route DELETE 157.0.0.0
> route DELETE 3ffe::/32

C:\Users\Arya Manve>route PRINT
=====
Interface List
14...52 5a 65 e7 ff 2d .....Microsoft Wi-Fi Direct Virtual Adapter
10...52 5a 65 e7 ff 3d .....Microsoft Wi-Fi Direct Virtual Adapter #2
 8...50 5a 65 e7 ff 3d .....MediaTek Wi-Fi 6 MT7921 Wireless LAN Card
18...50 5a 65 e7 ff 3c .....Bluetooth Device (Personal Area Network)
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.210.163  192.168.210.50    35
127.0.0.0                  255.0.0.0        On-link          127.0.0.1         331
127.0.0.1                  255.255.255.255  On-link          127.0.0.1         331
127.255.255.255            255.255.255.255  On-link          127.0.0.1         331
192.168.210.0              255.255.255.0    On-link          192.168.210.50    291
192.168.210.50             255.255.255.255  On-link          192.168.210.50    291
192.168.210.255            255.255.255.255  On-link          192.168.210.50    291
224.0.0.0                  240.0.0.0        On-link          127.0.0.1         331
224.0.0.0                  240.0.0.0        On-link          192.168.210.50    291
255.255.255.255            255.255.255.255  On-link          127.0.0.1         331
255.255.255.255            255.255.255.255  On-link          192.168.210.50    291
=====
Persistent Routes:
None

IPv6 Route Table
=====
```

10. netsh show helper -

Description: Lists all available commands and utilities in Netsh.

```
Command Prompt

The following commands are available:

Commands in this context:
show alias      - Lists all defined aliases.
show helper     - Lists all the top-level helpers.

C:\Users\Arya Manve>netsh show helper
Helper GUID                                     DLL Filename  Command
-----
{02BC1F81-D927-4EC5-8CBC-8DD65E3E38E8}        AUTHFWCFG.DLL  advfirewall
{FB10CBCA-5430-46CE-B732-079B4E23BE24}        AUTHFWCFG.DLL  consec
{35342B49-83B4-4FCC-A90D-278533D5BEA2}        AUTHFWCFG.DLL  firewall
{4BD827F7-1E83-462D-B893-F33A80C5DE1D}        AUTHFWCFG.DLL  mainmode
{4D0FEFCB-8C3E-4CDE-B39B-325933727297}        AUTHFWCFG.DLL  monitor
{00770721-44EA-11D5-93BA-0080D022D01F}        HNETMON.DLL    bridge
{6DC31EC5-3583-4901-9E28-37C28113656A}        DHCPCHMONITOR.DLL dhcpcclient
{8A6D23B3-0AF2-4101-BC6E-8114B325FE17}        NETIOHLP.DLL   dnsclient
{8B3A0D7F-1F30-4402-B753-C4B2C7607C97}        FWCFG.DLL      firewall
{44F3288B-DBFF-4B31-A86E-633F50D706B3}        NSHHTTP.DLL    http
{0705EAC1-7AAC-11D2-89DC-006008B0E5B9}        IFMON.DLL      interface
{1C151866-F35B-4780-8CD2-E1924E9F03E1}        NETIOHLP.DLL   6to4
{97C192DB-A774-43E6-BE78-1FABD795EEAB}        NETIOHLP.DLL   httpstunnel
{725588AC-7A11-4220-A121-C92C915E8B73}        NETIOHLP.DLL   ipv4
{500F32FD-7064-476B-8FD6-2171EA46428F}        NETIOHLP.DLL   ipv6
{90E1CBE1-01D9-4174-BB4D-E897F3F6150D}        NETIOHLP.DLL   6to4
{90E1CBE1-01D9-4174-BB4D-E897F3F6150D}        NETIOHLP.DLL   isatap
{1C151866-F35B-4780-8CD2-E1924E9F03E1}        NETIOHLP.DLL   isatap
{1C151866-F35B-4780-8CD2-E1924E9F03E1}        NETIOHLP.DLL   portproxy
{78197B47-2BEF-49CA-ACEB-D8816371BAA8}        NETIOHLP.DLL   tcp
{1C151866-F35B-4780-8CD2-E1924E9F03E1}        NETIOHLP.DLL   teredo
{D89E6430-9053-5211-187A-1C58D966C781}        NETIOHLP.DLL   udp
{F7E0BC27-BA6E-4145-A123-012F1922F3F1}        NSHIPSEC.DLL   ipsec
{F7E0BC29-BA6E-4145-A123-012F1922F3F1}        NSHIPSEC.DLL   dynamic
{F7E0BC28-BA6E-4145-A123-012F1922F3F1}        NSHIPSEC.DLL   static
{1D8240C7-48B9-47CC-9E40-4F7A0A390E71}        DOT3CFG.DLL    lan
```

11. netsh wlan show profile -

Description: Lists saved Wi-Fi networks and their settings. Memory lane for your wireless connections.

```
Command Prompt
TCP [2409:40c2:116e:f874:6c6f:3e81:ce4:6371]:59207 [2a04:4e42:9::684]:http ESTABLISHED
TCP [2409:40c2:116e:f874:6c6f:3e81:ce4:6371]:59208 [2620:1ec:21::16]:https ESTABLISHED

C:\Users\Arya Manve>netsh wlan show profile

Profiles on interface Wi-Fi:

Group policy profiles (read only)
-----
<None>

User profiles
-----
All User Profile : lnns21
All User Profile : GNXS-5-6017DA
All User Profile : moto g85 5G 4890
All User Profile : moto g32_6851
All User Profile : Arya's S23 FE
All User Profile : VIT_CAMPUS
All User Profile : CONFERENCE
All User Profile : VIT Girls Hostel_B
All User Profile : Animesh's Nothing Phone (2)
All User Profile : Aashana
All User Profile : Lenovo Tab M10 FHD Plus
All User Profile : Soham's S21 FE
All User Profile : VIT Girls Hostel
All User Profile : VIT Girls Hostel
All User Profile : Galaxy A32E8C0
All User Profile : air7385
All User Profile : GalaxyA51
All User Profile : OPPO A9
All User Profile : Galaxy S21 FE 5G
All User Profile : Xyz
All User Profile : VILLA 6B 5G
All User Profile : vivo 1935
All User Profile : OnePlus 7t
All User Profile : VIT Girls Hostel _B
All User Profile : vivo Y27
```

12. netsh wlan show interference -

Description: Displays Wi-Fi interference details. Handy for diagnosing poor connectivity.

```
Command Prompt
All User Profile : iPhone
All User Profile : VIT_LIBRARY
All User Profile : JioNet@VITPune
All User Profile : Shubhankar20_5G
All User Profile : VSGDB

C:\Users\Arya Manve>netsh wlan show interfaces

There is 1 interface on the system:

Name : Wi-Fi
Description : MediaTek Wi-Fi 6 MT7921 Wireless LAN Card
GUID : 36c75f32-37e6-49f5-9bef-c792c7de6f55
Physical address : 50:5a:65:e7:ff:3d
Interface type : Primary
State : connected
SSID : Arya's S23 FE
BSSID : ce:2b:eb:f0:8c:e5
Network type : Infrastructure
Radio type : 802.11ac
Authentication : WPA2-Personal
Cipher : CCMP
Connection mode : Auto Connect
Band : 5 GHz
Channel : 149
Receive rate (Mbps) : 866.7
Transmit rate (Mbps) : 866.7
Signal : 80%
Profile : Arya's S23 FE

Hosted network status : Not available

C:\Users\Arya Manve>
```


15. pathping -

Description: Combines the powers of `ping` and `tracert` to show both the route to a destination and any packet loss at each hop.

```
Command Prompt
Microsoft Windows [Version 10.0.22631.4602]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Arya Manve>pathping

Usage: pathping [-g host-list] [-h maximum_hops] [-i address] [-n]
               [-p period] [-q num_queries] [-w timeout]
               [-4] [-6] target_name

Options:
  -g host-list    Loose source route along host-list.
  -h maximum_hops Maximum number of hops to search for target.
  -i address      Use the specified source address.
  -n             Do not resolve addresses to hostnames.
  -p period       Wait period milliseconds between pings.
  -q num_queries  Number of queries per hop.
  -w timeout      Wait timeout milliseconds for each reply.
  -4             Force using IPv4.
  -6             Force using IPv6.

C:\Users\Arya Manve> pathping -w timeout
Bad value for option -w.

C:\Users\Arya Manve>
```

