1. IPCONFIG

- Used to display the current network configuration, including the IP address, subnet mask, and default gateway, helping users verify connection settings.

```
3 PM
   Default Gateway . . . . . . . . . : 192.168.0.1
   DHCP Server . . . . . . . . . . . : 192.168.0.1
   DHCPv6 IAID . . . . . . . . . . . : 311737155
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2D-C8-7D-3C-10-7C-61-
67-B9-83
   DNS Servers . . . . . . . . . . . : 192.168.0.1
   NetBIOS over Tcpip. . . . . . . . : Enabled
```

- Router address: 192.168.0.1
- DHCP Server: residing on router since the IP address is same as router
- DNS Server: same as router

2. PING

- Used to send signal to another device to check if it is active or not

```
C:\Users\tuana>ping 192.168.0.1

Pinging 192.168.0.1 with 32 bytes of data:
Reply from 192.168.0.1: bytes=32 time=10ms TTL=64
Reply from 192.168.0.1: bytes=32 time=9ms TTL=64
Reply from 192.168.0.1: bytes=32 time=11ms TTL=64
Reply from 192.168.0.1: bytes=32 time=10ms TTL=64

Ping statistics for 192.168.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 9ms, Maximum = 11ms, Average = 10ms
```

- sent:4, received:4 means stable connection

```
C:\Users\tuana>ping 192.168.2.200

Pinging 192.168.2.200 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.200:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

- Device does not exist

3. TRACERT

- Identifies the path data takes to reach a target device

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

Tracing route to google.com [142.251.222.238]
over a maximum of 30 hops:

  1     9 ms    15 ms     8 ms  192.168.0.1
  2     7 ms     5 ms    13 ms  100.90.63.254
  3    16 ms     9 ms     8 ms  10.233.97.55
  4    24 ms    16 ms    36 ms  10.55.48.22
  5    23 ms    16 ms    15 ms  72.14.204.208
  6    59 ms    18 ms    17 ms  216.239.63.133
  7    21 ms    20 ms    17 ms  192.178.46.51
  8    21 ms    13 ms    13 ms  kul08s19-in-f14.1e100.net [142.251.
222.238]

Trace complete.
```

- It need 8 hops/routers before reach google.com
- First router is our own router IP address
- If there is any “request time out” in any router, its mean the router have problem

4. NSLOOKUP

- Verify DNS server configuration to resolve DNS issues.

```
C:\Users\tuana>nslookup google.com
Server:  UnKnown
Address:  192.168.0.1

Non-authoritative answer:
Name:    google.com
Addresses:  2404:6800:4001:801::200e
          142.251.223.78
```

- Google IP address: 142.251.223.78