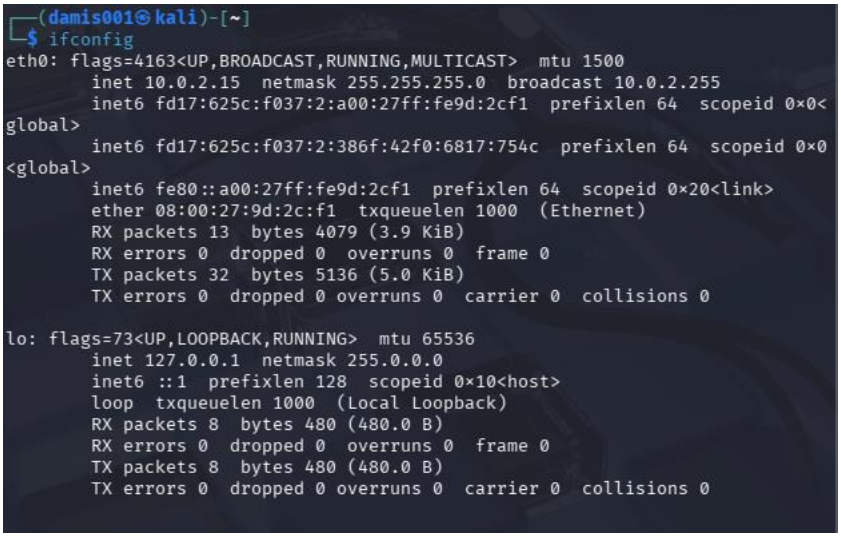
You can use either Ubuntu VM or Kali Linux VM to complete the following tasks.

Task A – Explore Network Configurations (8 * 5 = 40 Points)

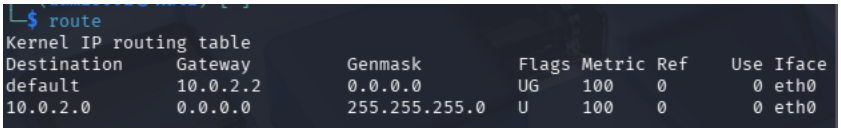
{{{{{{{{{Connect your VM in the NAT mode}}}}}}}}}

1. Use the correct ifconfig command to display the current network configuration. Highlight your IP

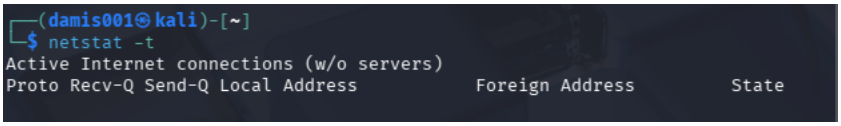
address, MAC address, and the network mask.




2. Use the correct route command to display the current routing table.




3. Use the netstat command to list current TCP connections.




4. Use the ping command to determine if the ubuntu.com system is accessible via the network.

(Use the correct option to send 10 ping requests only.

```
┌──(damis001㉿kali)-[~]
└─$ ping -c 10 www.ubuntu.com
PING www.ubuntu.com (185.125.190.21) 56(84) bytes of data.
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=1 ttl=255 time=97.4 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=2 ttl=255 time=102 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=3 ttl=255 time=96.3 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=4 ttl=255 time=102 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=5 ttl=255 time=102 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=6 ttl=255 time=102 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=7 ttl=255 time=102 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=8 ttl=255 time=96.0 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=9 ttl=255 time=99.6 ms
64 bytes from website-content-cache-2.ps5.canonical.com (185.125.190.21): icm
p_seq=10 ttl=255 time=97.9 ms

── www.ubuntu.com ping statistics ──
10 packets transmitted, 10 received, 0% packet loss, time 9017ms
rtt min/avg/max/mdev = 96.040/99.745/102.185/2.475 ms
```

)

5. Use the host command to perform a DNS query on www.odu.edu

```
┌──(damis001㉿kali)-[~]
└─$ dig www.odu.edu

; <<>> DiG 9.20.20-1-Debian <<>> www.odu.edu
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 56586
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1220
; COOKIE: b11b44ba4db1217a9697fc3269e38cf0aca2a312e7a2a545 (good)
;; QUESTION SECTION:
;www.odu.edu.                   IN      A

;; ANSWER SECTION:
www.odu.edu.            600     IN      A       35.170.140.174

;; Query time: 11 msec
;; SERVER: 128.82.95.20#53(128.82.95.20) (UDP)
;; WHEN: Sat Apr 18 09:53:52 EDT 2026
;; MSG SIZE  rcvd: 84
```

6. Use the cat command to display the contents of the file that contains the system's hostname.

```
┌──(damis001㉿kali)-[~]
└─$ cat /etc/hostname
kali
```

7. Use the cat command to display the contents of the file that contains the DNS servers for this

System.

```
┌──(damis001㉿kali)-[~]
└─$ cat /etc/resolv.conf
# Generated by NetworkManager
search wlan.odu.edu
nameserver 128.82.95.20
```

8. Edit the same file you display in the previous step, set the system's hostname to your MIDAS ID

permanently. Reboot system and

```
┌──(damis001㉿kali)-[~]
└─$ sudo vi /etc/hostname
[sudo] password for damis001:
```

```
┌──(damis001㉿kali)-[~]
└─$ cat /etc/hostname
kali
```

repeat step 6.

Task B – A Different Network Setting (3 * 20 = 60 Points)

1. Change the VM network connection from NAT to the bridge mode (you will lose your Internet

connection if you are connected to the ODU campus Wi-Fi network, but it is okay).

2. Reboot your system, then repeat Steps 1 – 7 in Task A.

```
└─$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.247  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::a00:27ff:fede:a670  prefixlen 64  scopeid 0x20<link>
        inet6 2600:4040:2f8f:2100:7a47:d9eb:c70f:5b06  prefixlen 64  scopeid 0x0<global>
        inet6 2600:4040:2f8f:2100:a00:27ff:fede:a670  prefixlen 64  scopeid 0x0<global>
        ether 08:00:27:de:a6:70  txqueuelen 1000  (Ethernet)
        RX packets 442  bytes 28626 (27.9 KiB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 65  bytes 8202 (8.0 KiB)
        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 8  bytes 480 (480.0 B)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 8  bytes 480 (480.0 B)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

IP address has changed

```
└─$ route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         CR1000A.mynetwo 0.0.0.0         UG    100    0        0 eth0
192.168.1.0     0.0.0.0         255.255.255.0   U     100    0        0 eth0
```

IP address has changed

```
└─$ netstat -t
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
```

```
└─$ ping -c 10 www.ubuntu.com
PING www.ubuntu.com (2620:2d:4000:1::28) 56 data bytes
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=1 ttl=57 time=82.8 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=2 ttl=57 time=88.4 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=3 ttl=57 time=87.9 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=4 ttl=57 time=85.9 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=5 ttl=57 time=88.6 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=6 ttl=57 time=92.5 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=7 ttl=57 time=87.0 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=8 ttl=57 time=85.2 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=9 ttl=57 time=85.7 ms
64 bytes from website-content-cache-3.canonical.com (2620:2d:4000:1::28): icmp_seq=10 ttl=57 time=81.9 ms
```

```
└─$ dig www.odu.edu

; <<>> DiG 9.20.9-1-Debian <<>> www.odu.edu
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41094
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;www.odu.edu.                   IN      A

;; ANSWER SECTION:
www.odu.edu.            381     IN      A       35.170.140.174

;; Query time: 8 msec
;; SERVER: 192.168.1.1#53(192.168.1.1) (UDP)
;; WHEN: Fri Nov 28 14:01:05 EST 2025
;; MSG SIZE  rcvd: 56
```

```
└─$ cat /etc/resolv.conf
# Generated by NetworkManager
search mynetworksettings.com
nameserver 192.168.1.1
nameserver 2600:4040:2f8f:2100::1
```

3. Highlight the differences at the end of each step and discuss what do you find.