ASSIGNMENT-04

Task 1: Enumeration

1. **What is your computers IP address (LAN IP)?**

   a. **Run ipconfig in Windows Terminal**

Ans. My computers IP Address is 10.31.8.202.

```
Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . : csuci.edu
   Link-local IPv6 Address . . . . . : fe80::d0cd:3eea:5ce8:879e%17
   IPv4 Address. . . . . . . . . . . : 10.31.8.202
   Subnet Mask . . . . . . . . . . . : 255.255.0.0
   Default Gateway . . . . . . . . . : 10.31.0.1
```

Fig 4.1

2. **What is your address on the global Internet (WAN IP)?**

   a. **Check via ipchicken.**

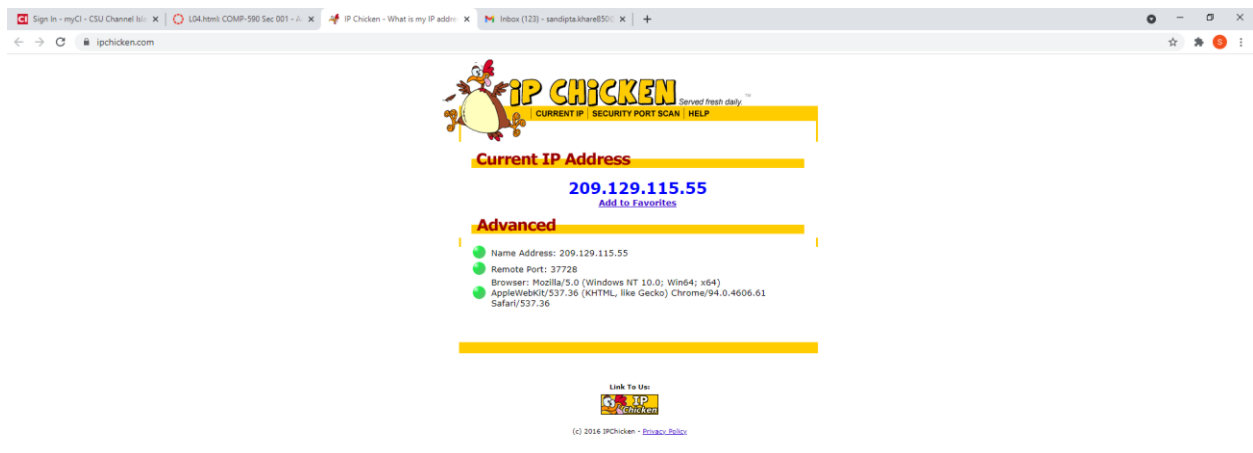Ans. My address on the global internet (WAN IP) is 209.129.115.55.

Fig 4.2

Task 2: NAT

Using Wireshark, the information from *Task 1*, the website ipchicken.com, draw a diagram (like Figure 4.25) to show NAT in action.

```
┌─────────────┐                    ╭─────────────╮              ┌─────────────┐
│             │ - - - - - - - - -> │   Router    │ - - - - - -> │Google Server│
│   Source    │                    ╰─────────────╯              │             │
│             │                    │             │              └─────────────┘
└─────────────┘                    └─────────────┘
```

IP Address: 209.129.115.55

Port Number: 37728

IP Address:
104.26.9.109

IP Address: 10.31.8.202

Port Number: 54914

NAT

SOURCE IP Address: 10.31.8.202		SOURCE IP Address: 209.129.115.55
DESTINATION IP Address: 104.26.9.109		DESTINATION IP Address: 104.26.9.109

SOURCE PORT NUMBER:54914

DESTINATION PORT NUMBER: 37728

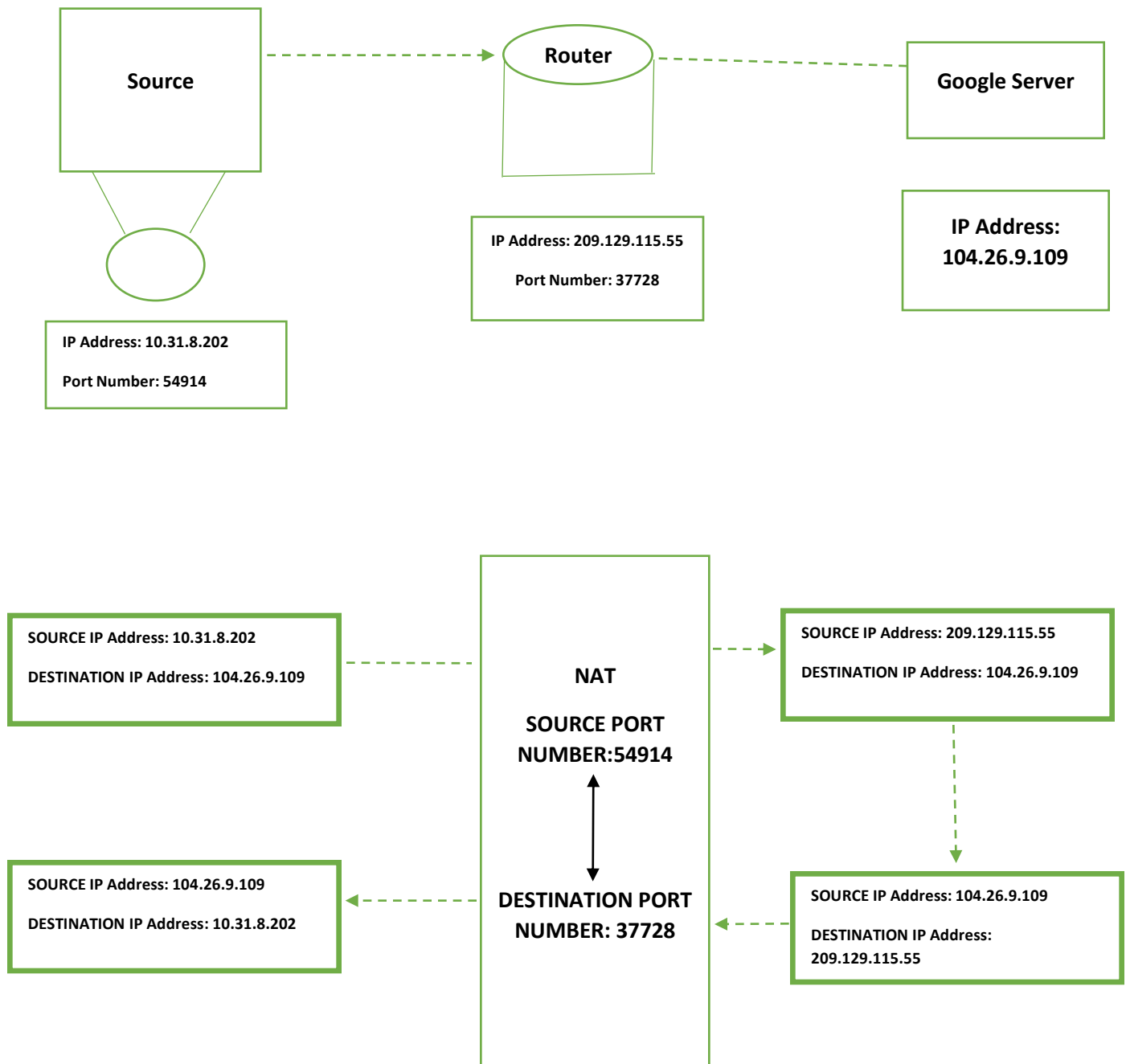| SOURCE IP Address: 104.26.9.109		SOURCE IP Address: 104.26.9.109
DESTINATION IP Address: 10.31.8.202		DESTINATION IP Address: 209.129.115.55

Fig 4.3

Task 3: DNS

- Use nslookup [host] [dns server] on Windows

- Use nslookup -type=any [host] [dns server] on macOS

  1. Draw a diagram of a DNS request (also on whiteboard) to resolve google.com.

     a. Query a.root-servers.net as the root DNS server.

     b. The a.root-servers.net response will contain a list of TLD DNS servers (Top Level Domain), pick one of them and query that server for google.com again.

     c. The TLD DNS server will return a DNS server related to google at this point. Pick one and query that server again for google.com.

     d. Google's DNS server will return an IP address similar to the result from nslookup google.com. Maybe.

     e. Use the information from the queries above to fill in your diagram with real data.

```
C:\Users\sandipta.khare850>nslookup google.com
Server:  badger.csuci.edu
Address:  10.121.11.8

Non-authoritative answer:
Name:    google.com
Addresses:  2607:f8b0:4005:80a::200e
            172.217.6.78
```

Fig 4.4

Fig 4.5

```
C:\Users\sandipta.khare850>nslookup google.com 192.5.6.30
(root)   nameserver = g.root-servers.net
(root)   nameserver = h.root-servers.net
(root)   nameserver = i.root-servers.net
(root)   nameserver = j.root-servers.net
(root)   nameserver = k.root-servers.net
(root)   nameserver = l.root-servers.net
(root)   nameserver = m.root-servers.net
(root)   nameserver = a.root-servers.net
(root)   nameserver = b.root-servers.net
(root)   nameserver = c.root-servers.net
(root)   nameserver = d.root-servers.net
(root)   nameserver = e.root-servers.net
(root)   nameserver = f.root-servers.net
Server:  UnKnown
Address:  192.5.6.30

Name:      google.com
Served by:
- ns2.google.com
          2001:4860:4802:34::a
          216.239.34.10
          google.com
- ns1.google.com
          2001:4860:4802:32::a
          216.239.32.10
          google.com
- ns3.google.com
          2001:4860:4802:36::a
          216.239.36.10
          google.com
- ns4.google.com
          2001:4860:4802:38::a
          216.239.38.10
          google.com


C:\Users\sandipta.khare850>nslookup google.com 216.239.34.10
Server:  ns2.google.com
Address:  216.239.34.10

Name:      google.com
Addresses:  2607:f8b0:4005:806::200e
          142.250.188.14
```
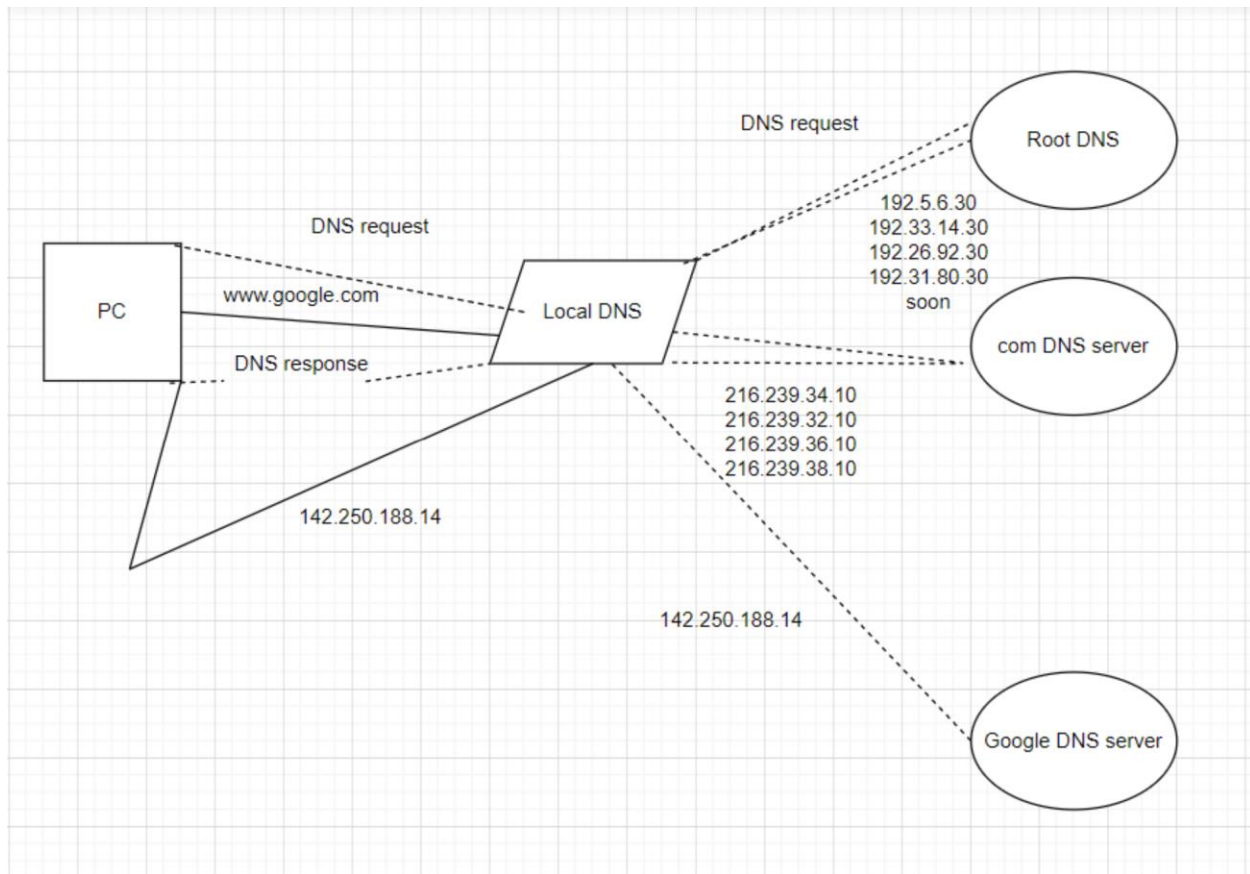
Fig 4.6

DNS request

Root DNS

192.5.6.30
192.33.14.30
192.26.92.30
192.31.80.30
soon

DNS request

PC

www.google.com

Local DNS

com DNS server

DNS response

216.239.34.10
216.239.32.10
216.239.36.10
216.239.38.10

142.250.188.14

142.250.188.14

Google DNS server

Fig 4.7