LAB 5

Q1)

```
C:\Users\vatsal>nslookup www.google
Server: UnKnown
Address: 192.168.43.1

Non-authoritative answer:
Name: www.google.com
Addresses: 2404:6800:4009:805::200
172.217.31.196
```

Q1.1)

```
C:\Users\vatsal>nslookup -type=NS www.google.com
Server: UnKnown
Address: 192.168.43.1

google.com
    primary name server = ns1.google.com
    responsible mail addr = dns-admin.google.com
    serial = 334992334
    refresh = 900 (15 mins)
    retry = 900 (15 mins)
    expire = 1800 (30 mins)
    default TTL = 60 (1 min)
```

```
C:\Users\Dell>nslookup -type=NS google.com
Server: www.routerlogin.com
Address: 192.168.1.1
Non-authoritative answer:
google.com
               nameserver = ns2.google.com
google.com
google.com
               nameserver = ns4.google.com
               nameserver = ns3.google.com
google.com
               nameserver = ns1.google.com
ns1.google.com internet address = 216.239.32.10
ns2.google.com internet address = 216.239.34.10
ns3.google.com internet address = 216.239.36.10
ns4.google.com internet address = 216.239.38.10
ns1.google.com AAAA IPv6 address = 2001:4860:4802:32::a
ns2.google.com AAAA IPv6 address = 2001:4860:4802:34::a
ns3.google.com AAAA IPv6 address = 2001:4860:4802:36::a
ns4.google.com AAAA IPv6 address = 2001:4860:4802:38::a
```

Q1.2)

```
C:\Users\vatsal>nslookup google.com 8.8.8.8
Server: dns.google
Address: 8.8.8.8

Non-authoritative answer:
Name: google.com
Addresses: 2404:6800:4002:809::200e
172.217.167.14
```

Q1.3)

1)

```
C:\Users\vatsal>nslookup www.daiict.ac.in
Server: UnKnown
Address: 192.168.43.1
Non-authoritative answer:
Name: www.daiict.ac.in
Address: 104.238.110.159
```

2)

```
::\Users\Dell>nslookup -type=NS daiict.ac.in
Server: www.routerlogin.com
Address: 192.168.1.1
Non-authoritative answer:
daiict.ac.in nameserver = ns2.relianceada.com
daiict.ac.in nameserver = ns3.relianceada.com
daiict.ac.in nameserver = ns1.relianceada.com
daiict.ac.in nameserver = ns4.relianceada.com
daiict.ac.in nameserver = ns1.exchangenext.net
daiict.ac.in nameserver = ns2.exchangenext.net
ns1.relianceada.com
                       internet address = 202.138.120.86
ns1.exchangenext.net
                       internet address = 202.138.120.6
ns2.relianceada.com
                       internet address = 202.138.120.87
ns2.exchangenext.net
                       internet address = 202.138.120.4
ns3.relianceada.com
                       internet address = 220.227.60.11
ns4.relianceada.com
                       internet address = 220.227.60.12
```

```
C:\Users\vatsal>nslookup -type=NS www.daiict.ac.in
Server: UnKnown
Address: 192.168.43.1

daiict.ac.in
    primary name server = ns1.relianceada.com
    responsible mail addr = mahesh patil
    serial = 2010090405
    refresh = 7200 (2 hours)
    retry = 3600 (1 hour)
    expire = 604800 (7 days)
    default TTL = 21600 (6 hours)
```

C:\Users\vatsal>nslookup www.daiict.ac.in 8.8.4.4

Server: dns.google Address: 8.8.4.4

Non-authoritative answer: Name: www.daiict.ac.in Address: 104.238.110.159 1)

```
C:\Users\vatsal>ipconfig
Windows IP Configuration
Ethernet adapter Ethernet 3:
  Media State . . . . . . . . : Media disconnected
  Connection-specific DNS Suffix .:
Ethernet adapter Ethernet:
  Media State . . . . . . . . : Media disconnected
  Connection-specific DNS Suffix .:
Ethernet adapter VirtualBox Host-Only Network:
  Connection-specific DNS Suffix .:
  Link-local IPv6 Address . . . . : fe80::61b7:f457:242d:78db%10
  IPv4 Address. . . . . . . . . : 192.168.56.1
  Subnet Mask . . . . . . . . . : 255.255.255.0
  Default Gateway . . . . . . . :
Wireless LAN adapter Local Area Connection* 1:
  Media State . . . . . . . . . . . . . Media disconnected
  Connection-specific DNS Suffix .:
Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix .:
  IPv6 Address. . . . . . . . . : 2405:205:c90d:b973:1928:6454:2fb3:d6fd
  Temporary IPv6 Address. . . . . : 2405:205:c90d:b973:2886:8d1f:9c5e:3813
  Link-local IPv6 Address . . . . . : fe80::1928:6454:2fb3:d6fd%20
  IPv4 Address. . . . . . . . . : 192.168.43.119
  Subnet Mask . . . . . . . . . : 255.255.255.0
  Default Gateway . . . . . . : fe80::3c46:88ff:fee7:e4c%20
                                     192.168.43.1
  Wireless LAN adapter Local Area Connection* 2:
    Connection-specific DNS Suffix .:
    Link-local IPv6 Address . . . . : fe80::bceb:4da3:ce72:1733%13
    IPv4 Address. . . . . . . . . : 192.168.137.1
    Subnet Mask . . . . . . . . . : 255.255.255.0
    Default Gateway . . . . . . . .
  Ethernet adapter Bluetooth Network Connection:
```

Media State : Media disconnected

Connection-specific DNS Suffix .:

 lh3.google.com

 Record Name . . . : lh3.google.com

 Record Type . . . : 5

 Time To Live . . . : 126

 Data Length . . . : 8

 Section : Answer

 CNAME Record . . : lh2.l.google.com

 Record Name . . : lh2.l.google.com

 Record Type . . : 28

 Time To Live . . : 126

 Data Length . . : 16

 Section . . . : Answer

 AAAA Record . . : 2404:6800:4007:810::200e

moodle.daiict.ac.in
Record Name . . . : moodle.daiict.ac.in
Record Type . . . : 1
Time To Live . . . : 16117
Data Length . . . : 4
Section . . . : Answer
A (Host) Record . . : 14.139.122.116

zoomva193-123-132-126mmr.cloud.zoom.us

Record Name : zoomva193-123-132-126mmr.cloud.zoom.us

Record Type : 1

Time To Live . . . : 84502

Data Length 4

Section : Answer

A (Host) Record . . . : 193.123.132.126

3)

C:\Users\vatsal>ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.

Q3.1)

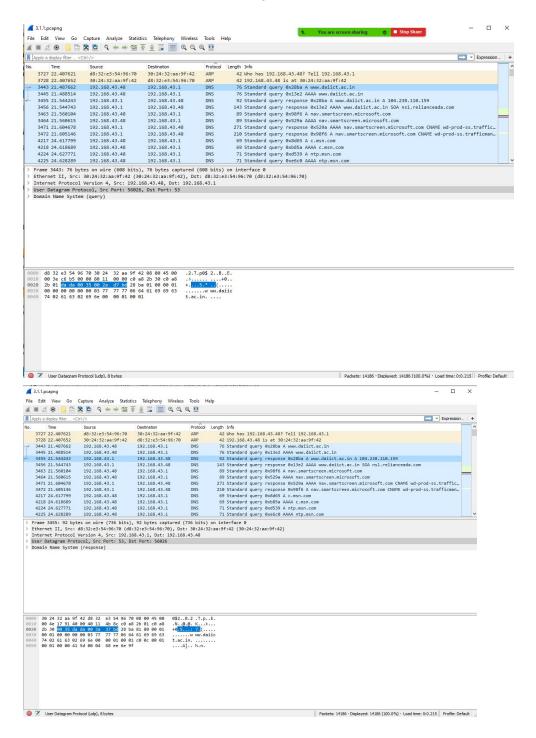
1. Both the query and the response message are sent over UDP.

```
| Frame 22213: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface \(\text{Device\NPF}\) \( \) forme 22213: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface \(\text{Device\NPF}\) \( \) \( \) forme 22213: 76 bytes on wire (608 bits), 76 bytes captured (608 bits) on interface \(\text{Device\NPF}\) \( \) \( \) former former (6000 A93A-EA03-440C-A609-A349880140E8), id 0 \)

> the provided of the control of the contr
```



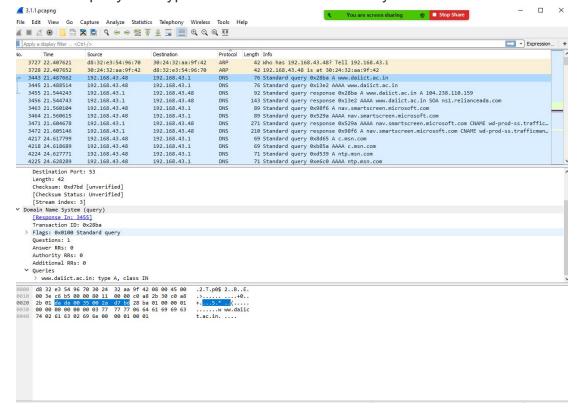
2. Destination port of DNS query message-53 Source port of DNS response message-53



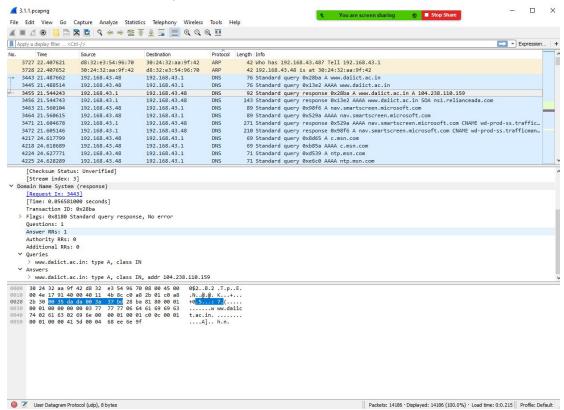
3. The IP address to which the DNS query is sent is the same as that of the IP of the local DNS server.

```
Command Prompt
                                                                                                               X
Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix
  Description . . . . . . . . . . . :
                                      Intel(R) Wireless-AC 9560 160MHz
  Physical Address. . . . . . . :
                                      30-24-32-AA-9F-42
  DHCP Enabled. . . .
                                      Yes
  Autoconfiguration Enabled . . . . :
                                      Yes
  2409:4041:e81:4bfe:7459:f67e:4a92:e280(Preferred)
                                      2409:4041:e81:4bfe:391a:26cb:7071:e025(Preferred)
                                      fe80::7459:f67e:4a92:e280%9(Preferred)
   IPv4 Address. . . . . . . . . . . . .
                                      192.168.43.48(Preferred)
  Subnet Mask . . . . . . . . . . . :
                                      255.255.255.0
  Lease Obtained. . . . . . . . :
                                      Saturday, October 3, 2020 8:46:49 AM
                                      Saturday, October 3, 2020 4:24:34 PM fe80::da32:e3ff:fe54:9670%9
   Lease Expires . . . . . . . . . :
  Default Gateway . . . . . . . .
                                      192.168.43.1
  DHCP Server . . . . . . . . . . .
                                      192.168.43.1
  DHCPv6 IAID .
                                      53486642
  DHCPv6 Client DUID. . . . . . .
                                      00-01-00-01-22-D7-51-92-4C-ED-FB-2D-18-68
  DNS Servers . . . . . . . : 192.168.43.1
NetBIOS over Tcpip. . . . . . : Enabled
thernet adapter Bluetooth Network Connection:
  . : Media disconnected
                                    : Bluetooth Device (Personal Area Network)
  Description
```

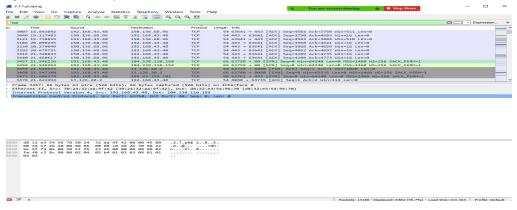
4. The DNS query is of type A and it did not contain any "answers".



5. The DNS response message shows only 1 answer which contains the address of the website that it was queried for.



6. The destination IP address of the SYN packet corresponds to the address provided by the DNS response, which is 104.238.110.159



7. Yes, the host issues new DNS queries for each image.

1) Destination Port for DNS Query: 53

lo.	Time	Source	Destination	Protocol	Length Info
	1172 4.598440	192.168.43.119	192.168.43.1	DNS	85 Standard query 0x0001 PTR 1.43.168.192.in-addr.arpa
	1173 4.599657	192.168.43.1	192.168.43.119	DNS	85 Standard query response 0x0001 No such name PTR 1.43.168.192.in-addr.arpa
-	1174 4.602359	192.168.43.119	192.168.43.1	DNS	76 Standard query 0x0002 A www.daiict.ac.in
	1175 4.603547	192.168.43.1	192.168.43.119	DNS	92 Standard query response 0x0002 A www.daiict.ac.in A 104.238.110.159
	1177 4.611637	192.168.43.119	192.168.43.1	DNS	76 Standard query 0x0003 AAAA www.daiict.ac.in
	1178 4.613210	192.168.43.1	192.168.43.119	DNS	76 Standard query response 0x0003 AAAA www.daiict.ac.in
E	thernet II, Src: Internet Protocol Jser Datagram Prot Source Port: 64	c6:d2:90:e1:ef:05 (c6 Version 4, Src: 192.1 ocol, Src Port: 6466 663	6:d2:90:e1:ef:05), Ds 68.43.119, Dst: 192.	t: 3e:46:8	on interface \Device\NPF_{BF9054D7-661E-47B7-ADE5-50DDC93A1E9B}, id 0 8:e7:0e:4c (3e:46:88:e7:0e:4c)
E	Ethernet II, Src: Internet Protocol Jser Datagram Prot Source Port: 64 Destination Por Length: 42 Checksum: 0x981	c6:d2:90:e1:ef:05 (c6 Version 4, Src: 192.1 ocol, Src Port: 6466: 663 t: 53 0 [unverified]	6:d2:90:e1:ef:05), Ds 68.43.119, Dst: 192.	t: 3e:46:8	
E	Ethernet II, Src: Internet Protocol Jser Datagram Prot Source Port: 64 Destination Por Length: 42 Checksum: 0x981 [Checksum Statu	c6:d2:90:e1:ef:05 (c6 Version 4, Src: 192.1 ocol, Src Port: 6466: 663 t: 53 0 [unverified] s: Unverified]	6:d2:90:e1:ef:05), Ds 68.43.119, Dst: 192.	t: 3e:46:8	
E	Ethernet II, Src: Internet Protocol Jser Datagram Prot Source Port: 64 Destination Por Length: 42 Checksum: 0x981 [Checksum Statu [Stream index:	c6:d2:90:e1:ef:05 (c6 Version 4, Src: 192.1 ocol, Src Port: 6466: 663 t: 53 0 [unverified] s: Unverified]	6:d2:90:e1:ef:05), Ds 68.43.119, Dst: 192.	t: 3e:46:8	
E II	Ethernet II, Src: Internet Protocol Jser Datagram Prot Source Port: 64 Destination Por Length: 42 Checksum: 0x981 [Checksum Statu	c6:d2:90:e1:ef:05 (c6 Version 4, Src: 192.1 ocol, Src Port: 6466: 663 t: 53 0 [unverified] s: Unverified]	6:d2:90:e1:ef:05), Ds 68.43.119, Dst: 192.	t: 3e:46:8	

Source Port for DNS message/response: 53

Source Port: 53

Destination Port: 64663

2)The DNS query message was sent to 192.168.43.1 This is the same IP address as the local DNS server.

1174 4.602359 192.168.43.119 192.168.43.1 DNS 76 Standard query 0x0002 A www.daiict.ac.in

DNS servers: 192.168.43.1,
2405:205:c90d:b973::9d

3) This query was a type A query. It did not contain any "answers".

```
V Queries
V www.daiict.ac.in: type A, class IN
Name: www.daiict.ac.in
[Name Length: 16]
[Label Count: 4]
Type: A (Host Address) (1)
Class: IN (0x0001)
[Response In: 1175]
```

4)This DNS response message provided us with only one answer. The answer contains the address of the website that it was queried for.

```
∨ Queries
      > www.daiict.ac.in: type A, class IN

✓ Answers

     www.daiict.ac.in: type A, class IN, addr 104.238.110.159
           Name: www.daiict.ac.in
           Type: A (Host Address) (1)
           Class: IN (0x0001)
           Time to live: 10273 (2 hours, 51 minutes, 13 seconds)
           Data length: 4
           Address: 104.238.110.159
     [Request In: 1174]
3.3)
  1) DNS Query is sent to 192.168.43.1
     This is the IP address of our local DNS Server.
       Source: 192.168.43.119
       Destination: 192.168.43.1
   2) There were multiple query types: A, AAAA, NS. None of them had any answers.
 ∨ Oueries

∨ daiict.ac.in: type A, class IN
         Name: daiict.ac.in
         [Name Length: 12]
         [Label Count: 3]
         Type: A (Host Address) (1)
         Class: IN (0x0001)
   [Response In: 5610]
 v daiict.ac.in: type AAAA, class IN
       Name: daiict.ac.in
       [Name Length: 12]
       [Label Count: 3]
       Type: AAAA (IPv6 Address) (28)
       Class: IN (0x0001)
```

```
∨ Queries

∨ daiict.ac.in: type NS, class IN
         Name: daiict.ac.in
         [Name Length: 12]
         [Label Count: 3]
         Type: NS (authoritative Name Server) (2)
         Class: IN (0x0001)
3) We received the following response messages. The answers can be seen in the
screenshots below.
    Answers
       daiict.ac.in: type A, class IN, addr 104.238.110.159
            Name: daiict.ac.in
            Type: A (Host Address) (1)
            Class: IN (0x0001)
            Time to live: 9432 (2 hours, 37 minutes, 12 seconds)
            Data length: 4
            Address: 104.238.110.159
       [Request In: 5606]
       [Time: 0.031635000 seconds]

∨ Authoritative nameservers

   Name: daiict.ac.in
        Type: SOA (Start Of a zone of Authority) (6)
        Class: IN (0x0001)
        Time to live: 2353 (39 minutes, 13 seconds)
        Data length: 55
        Primary name server: ns1.relianceada.com
        Responsible authority's mailbox: mahesh patil
        Serial Number: 2010090405
        Refresh Interval: 7200 (2 hours)
        Retry Interval: 3600 (1 hour)
        Expire limit: 604800 (7 days)
        Minimum TTL: 21600 (6 hours)
```

✓ Answers

```
> daiict.ac.in: type NS, class IN, ns ns1.relianceada.com
> daiict.ac.in: type NS, class IN, ns ns2.relianceada.com
> daiict.ac.in: type NS, class IN, ns ns3.relianceada.com
> daiict.ac.in: type NS, class IN, ns ns4.relianceada.com
> daiict.ac.in: type NS, class IN, ns ns1.exchangenext.net
> daiict.ac.in: type NS, class IN, ns ns2.exchangenext.net
[Request In: 8454]
[Time: 0.031992000 seconds]
```

We obtained 6 name servers as can be seen in the above screenshot.

3.4)

1. This time the destination was 8.8.8 which is not the same as that of the local DNS server. This time it corresponds to google's public DNS server.

```
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

| Apply a display filter | CCVI/>
| Apply a display filtre | CCVI/
```

2. The DNS query message is a Domain name pointer, type PTR, and it does not contain any answers as shown in the screenshot.

```
| No. | The | Source | Source
```

3. This time we get answers. The DNS response message shows only 1 answer which contains the address of the website that it was queried for.

