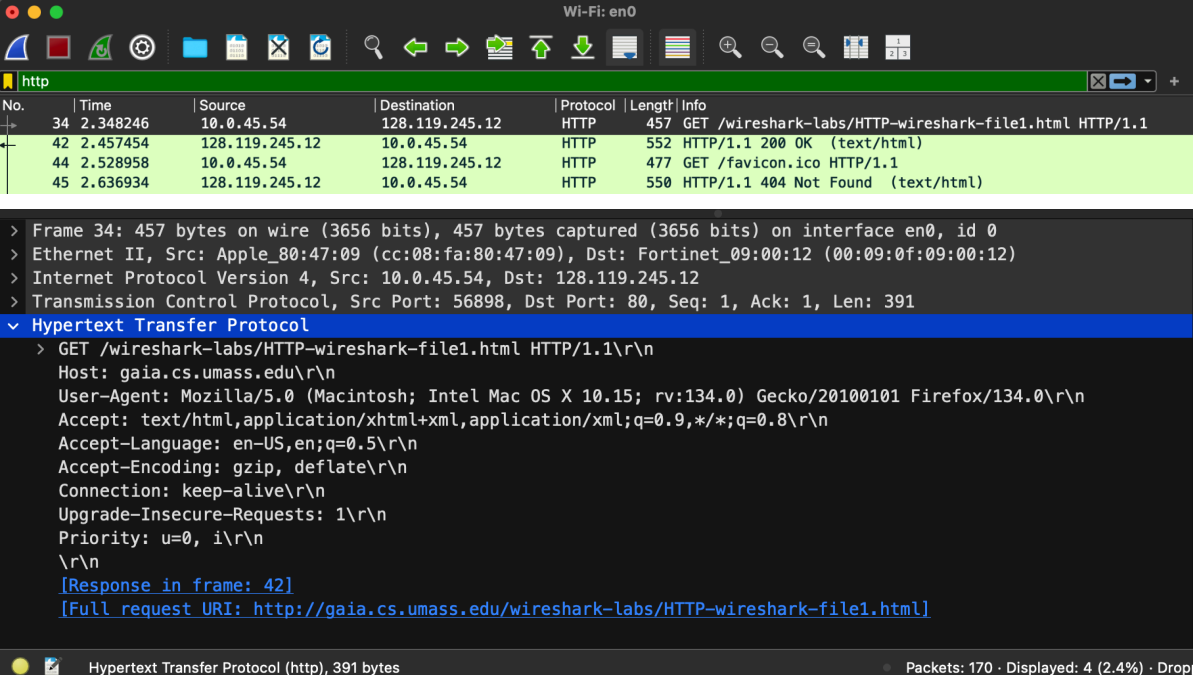


## Task 1.



The image shows a Wireshark capture of network traffic on the 'Wi-Fi: en0' interface. The packet list pane shows four packets. Packet 34 is an HTTP GET request for '/wireshark-labs/HTTP-wireshark-file1.html' from 10.0.45.54 to 128.119.245.12. Packet 42 is the corresponding HTTP 200 OK response. Packets 44 and 45 are GET requests for 'favicon.ico' and a '404 Not Found' response, respectively.

No.	Time	Source	Destination	Protocol	Length	Info
34	2.348246	10.0.45.54	128.119.245.12	HTTP	457	GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
42	2.457454	128.119.245.12	10.0.45.54	HTTP	552	HTTP/1.1 200 OK (text/html)
44	2.528958	10.0.45.54	128.119.245.12	HTTP	477	GET /favicon.ico HTTP/1.1
45	2.636934	128.119.245.12	10.0.45.54	HTTP	550	HTTP/1.1 404 Not Found (text/html)

The packet details pane for packet 34 shows the following HTTP request details:

```
> GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:134.0) Gecko/20100101 Firefox/134.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
Upgrade-Insecure-Requests: 1\r\n
Priority: u=0, i\r\n
\r\n
[Response in frame: 42]
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]
```

The packet details pane for packet 42 shows the following HTTP response details:

```
> HTTP/1.1 200 OK\r\n
Date: Thu, 06 Feb 2025 08:47:22 GMT\r\n
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.33 mod_perl/2.0.11 Perl/v5.16.3\r\n
Last-Modified: Thu, 06 Feb 2025 06:59:01 GMT\r\n
ETag: "80-62d73c6e4ea80"\r\n
Accept-Ranges: bytes\r\n
Content-Length: 128\r\n
Keep-Alive: timeout=5, max=100\r\n
Connection: Keep-Alive\r\n
Content-Type: text/html; charset=UTF-8\r\n
\r\n
[Request in frame: 34]
[Time since request: 0.109208000 seconds]
[Request URI: /wireshark-labs/HTTP-wireshark-file1.html]
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file1.html]
File Data: 128 bytes
> Line-based text data: text/html (4 lines)
```

- a) My IP: 10.0.45.54, gaia.cs.umass.edu IP: 128.119.245.12
- b) Version: HTTP/1.1. Code: 200. Phrase: OK.
- c)
  - i) Language accepted: English-US.
  - ii) Modified: 06/2-25, 06:59:01 GTM
  - iii) 128 bytes

## Task 2.

```

Hypertext Transfer Protocol
> GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:134.0) Gecko/20100101 Firefox/134.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
Upgrade-Insecure-Requests: 1\r\n
Priority: u=0, i\r\n
\r\n
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]

```

- There is no Of-Modified-Since, because it's the first time the browser requests that page, and therefore has no cached version of it.
- HTTP/1.1 200 OK means that the server has explicitly accepted our request.

```

Hypertext Transfer Protocol
> GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
Host: gaia.cs.umass.edu\r\n
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10.15; rv:134.0) Gecko/20100101 Firefox/134.0\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
Upgrade-Insecure-Requests: 1\r\n
If-Modified-Since: Thu, 06 Feb 2025 06:59:01 GMT\r\n
If-None-Match: "173-62d73c6e4e2b0"\r\n
Priority: u=0, i\r\n
\r\n
[Response in frame: 169]
[Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]

```

Text item (text), 56 bytes      Packets: 223 · Displayed: 6 (2.7%) · Drop

- There is an If-Modified-Since line, stating the information of the last time the cached file was modified, Thu, 06 Feb 2025 06:59:01 GMT.
- Since the file has not been modified, the response from the server is HTTP/1.1 304 Not Modified.

## Task 3.

No.	Time	Source	Destination	Protocol	Length	Info
27	4.124970	10.0.45.54	128.119.245.12	HTTP	457	GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
31	4.236634	128.119.245.12	10.0.45.54	HTTP	129	HTTP/1.1 200 OK (text/html)
37	4.268158	10.0.45.54	128.119.245.12	HTTP	480	GET /pearson.png HTTP/1.1
43	4.323376	10.0.45.54	178.79.137.164	HTTP	447	GET /8E_cover_small.jpg HTTP/1.1
45	4.349512	178.79.137.164	10.0.45.54	HTTP	237	HTTP/1.1 301 Moved Permanently
50	4.377290	128.119.245.12	10.0.45.54	HTTP	1201	HTTP/1.1 200 OK (PNG)
75	4.483953	10.0.45.54	128.119.245.12	HTTP	477	GET /favicon.ico HTTP/1.1
257	4.592266	128.119.245.12	10.0.45.54	HTTP	550	HTTP/1.1 404 Not Found (text/html)

- Ignoring the favicon request, we have 3 GET requests in total, to 2 different IPs, 128.119.245.12 and 178.79.137.164. The reason why we have 3 GET but 2 IPs, is because one of the images is hosted at the same place as the HTML file.
- In this case, the requests have been sent in parallel, We can tell from that both GET for the images, are sent after each other and not waiting for the server response.

## 2.1

(a)

```
cstl@cstls-Air ~ % nslookup governo.gov.ao
```

```
Server:      2001:6b0:2:1::53
Address:     2001:6b0:2:1::53#53
```

```
Non-authoritative answer:
Name:  governo.gov.ao
Address: 197.216.107.12
```

(b)

```
cstl@cstls-Air ~ % nslookup -type=MX unmsm.edu.pe
```

```
Server:      2001:6b0:2:1::53
Address:     2001:6b0:2:1::53#53
```

```
Non-authoritative answer:
```

```
unmsm.edu.pe      mail exchanger = 10 alt4.aspmx.l.google.com.
unmsm.edu.pe      mail exchanger = 1 aspmx.l.google.com.
unmsm.edu.pe      mail exchanger = 5 alt1.aspmx.l.google.com.
unmsm.edu.pe      mail exchanger = 5 alt2.aspmx.l.google.com.
unmsm.edu.pe      mail exchanger = 10 aspmx3.googlemail.com.
unmsm.edu.pe      mail exchanger = 10 aspmx2.googlemail.com.
```

```
Authoritative answers can be found from:
```

```
cstl@cstls-Air ~ %
```

(c)

```
cstl@cstls-Air ~ % nslookup -type=NS svt.se
Server:      2001:6b0:2:1::53
Address:     2001:6b0:2:1::53#53
```

Non-authoritative answer:

```
svt.se  nameserver = a14-64.akam.net.
svt.se  nameserver = nsa.dnsnode.net.
svt.se  nameserver = nsp.dnsnode.net.
svt.se  nameserver = nsu.dnsnode.net.
svt.se  nameserver = a1-8.akam.net.
svt.se  nameserver = a2-65.akam.net.
svt.se  nameserver = a3-67.akam.net.
```

Authoritative answers can be found from:

```
nsp.dnsnode.net      has AAAA address 2a01:3f1:3032::53
a1-8.akam.net has AAAA address 2600:1401:2::8
a2-65.akam.net      has AAAA address 2600:1480:7000::41
a3-67.akam.net      has AAAA address 2600:1408:1c::43
a14-64.akam.net      has AAAA address 2600:1480:1800::40
nsp.dnsnode.net      internet address = 194.58.198.32
a1-8.akam.net internet address = 193.108.91.8
a2-65.akam.net      internet address = 95.100.174.65
a3-67.akam.net      internet address = 96.7.49.67
a14-64.akam.net      internet address = 184.26.161.64
```

We see that, for example:

**svt.se nameserver = a14-64.akam.net.**

which means that a server named a14-64.akam.net is responsible for svt.se.

Furthermore, we can also see that:

**a14-64.akam.net has AAAA address 2600:1480:1800::40**

**a14-64.akam.net internet address = 184.26.161.64**

which means that a14-64.akam.net has both an IPv6 and an IPv4 address.

(d)

```
cstl@cstls-Air ~ % nslookup amazon.com a14-64.akam.net.
Server:      a14-64.akam.net.
Address:     2600:1480:1800::40#53
```

**\*\* server can't find amazon.com: REFUSED**

```
cstl@cstls-Air ~ %
```

The answer I get is refused, since a14-64.akam.net. has no authority over amazon.com, and therefore can't give us its IP.

# 5



```
musse@archlinux: ~  
  
musse@archlinux:~$ nslookup -type=ns ao 202.12.27.33  
Server:      202.12.27.33  
Address:     202.12.27.33#53  
  
Non-authoritative answer:  
*** Can't find ao: No answer  
  
Authoritative answers can be found from:  
ao      nameserver = etld-1.anycast.net.  
ao      nameserver = a.ns.ao.  
ao      nameserver = ao-e.ns.nic.cz.  
ao      nameserver = ao02.dns.pt.  
etld-1.anycast.net      internet address = 45.54.45.54  
ao02.dns.pt      internet address = 185.39.208.29  
ao-e.ns.nic.cz      internet address = 185.43.134.13  
a.ns.ao      internet address = 206.51.254.4  
etld-1.anycast.net      has AAAA address 2607:f740:45::54  
ao02.dns.pt      has AAAA address 2a04:6d80::29  
ao-e.ns.nic.cz      has AAAA address 2001:148f:fffd::13  
a.ns.ao      has AAAA address 2620:171:804:ad2::4  
  
musse@archlinux:~$ nslookup -type=ns gov.ao 45.54.45.54  
Server:      45.54.45.54  
Address:     45.54.45.54#53  
  
Non-authoritative answer:  
*** Can't find gov.ao: No answer  
  
Authoritative answers can be found from:  
gov.ao      nameserver = ns1.gov.ao.  
gov.ao      nameserver = ns2.gov.ao.  
gov.ao      nameserver = ns3.gov.ao.  
gov.ao      nameserver = ns4.gov.ao.  
ns1.gov.ao      internet address = 154.116.255.21  
ns2.gov.ao      internet address = 41.222.202.35  
ns3.gov.ao      internet address = 197.216.104.37  
ns4.gov.ao      internet address = 154.116.255.22  
  
musse@archlinux:~$ nslookup governo.gov.ao 154.116.255.21  
Server:      154.116.255.21  
Address:     154.116.255.21#53  
  
Name:      governo.gov.ao  
Address: 197.216.107.12  
  
musse@archlinux:~$ █
```

Portal Oficial do Governo de Angola — Mozilla Firefox

DatakomLabs\_L x Overleaf Example - x Root Server Tec x DataCom Lab1 - Da x Portal Oficial do x + v



← → ↻ 197.216.107.12 🏠 ☆ 📧 ⬇️ 📷 📄 ☰

🔗 Import bookmarks... 🍷 DotShare.it 🌐 Google



GOVERNO DE  
**ANGOLA**

**governo.gov.ao**  
PORTAL OFICIAL



**FUNÇÃO PÚBLICA**  
Aumento salarial aguarda aprovação do Presidente da República

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# 6.

a)

dns && ip.host==192.168.1.61		
No.	Time	Source
76	7.455190226	192.1
78	7.725103505	192.1

b)

1. UDP ▶ User Datagram Protocol, Src Port: 37025, Dst Port: 53
2. They are the same ▶ User Datagram Protocol, Src Port: 53, Dst Port: 37025
3. It is sent to my router

Query:

```

▶ Frame 76: 88 bytes on wire (704 bits), 88 bytes captured (704 bits) on interface wlan0, id 0
▶ Ethernet II, Src: LiteonTechno_6a:dd:87 (3c:95:09:6a:dd:87), Dst: ASUSTekCOMPU_68:4b:18 (3c:7c:3f:68:4b:18)
▶ Internet Protocol Version 4, Src: 192.168.1.61, Dst: 192.168.1.1
▶ User Datagram Protocol, Src Port: 37025, Dst Port: 53
▼ Domain Name System (query)
  Transaction ID: 0x5120
  ▼ Flags: 0x0100 Standard query
    0... .. = Response: Message is a query
    .000 0... .. = Opcode: Standard query (0)
    .... 0... .. = Truncated: Message is not truncated
    .... 0... .. = Recursion desired: Do query recursively
    .... 0... .. = Z: reserved (0)
    .... 0... .. = Non-authenticated data: Unacceptable
  Questions: 1
  Answer RRs: 0
  Authority RRs: 0
  Additional RRs: 1
  ▼ Queries
    ▼ gaia.cs.umass.edu: type A, class IN
      Name: gaia.cs.umass.edu
      [Name Length: 17]
      [Label Count: 4]
      Type: A (1) (Host Address)
      Class: IN (0x0001)
  ▼ Additional records
    ▼ <Root>: type OPT
      Name: <Root>
      Type: OPT (41)
      UDP payload size: 1472
      Higher bits in extended RCODE: 0x00
      EDNS0 version: 0
      ▼ Z: 0x0000
        0... .. = DO bit: Cannot handle DNSSEC security RRs
        .000 0000 0000 0000 = Reserved: 0x0000
      Data length: 0
  [Response In: 78]

```

c) Response:

```

▶ Frame 78: 104 bytes on wire (832 bits), 104 bytes captured (832 bits) on interface wlan0, id 0
▶ Ethernet II, Src: ASUSTekCOMPU_68:4b:18 (3c:7c:3f:68:4b:18), Dst: LiteonTechno_6a:dd:87 (3c:95:09:6a:dd:87)
▶ Internet Protocol Version 4, Src: 192.168.1.1, Dst: 192.168.1.61
▶ User Datagram Protocol, Src Port: 53, Dst Port: 37025
▼ Domain Name System (response)
  Transaction ID: 0x5120
  ▼ Flags: 0x8180 Standard query response, No error
    1... .. = Response: Message is a response
    .000 0... .. = Opcode: Standard query (0)
    .... 0... .. = Authoritative: Server is not an authority for domain
    .... ..0... .. = Truncated: Message is not truncated
    .... ..1... .. = Recursion desired: Do query recursively
    .... ..1... .. = Recursion available: Server can do recursive queries
    .... ..0... .. = Z: reserved (0)
    .... ..0... .. = Answer authenticated: Answer/authority portion was not authenticated by the server
    .... ..0... .. = Non-authenticated data: Unacceptable
    .... ..0000 = Reply code: No error (0)
  Questions: 1
  Answer RRs: 1
  Authority RRs: 0
  Additional RRs: 1
  ▼ Queries
    ▼ gaia.cs.umass.edu: type A, class IN
      Name: gaia.cs.umass.edu
      [Name Length: 17]
      [Label Count: 4]
      Type: A (1) (Host Address)
      Class: IN (0x0001)
  ▼ Answers
    ▼ gaia.cs.umass.edu: type A, class IN, addr 128.119.245.12
      Name: gaia.cs.umass.edu
      Type: A (1) (Host Address)
      Class: IN (0x0001)
      Time to live: 3600 (1 hour)
      Data length: 4
      Address: 128.119.245.12
  ▼ Additional records
    ▼ <Root>: type OPT
      Name: <Root>
      Type: OPT (41)
      UDP payload size: 1232
      Higher bits in extended RCODE: 0x00
      EDNS0 version: 0
      ▼ Z: 0x0000
        0... .. = DO bit: Cannot handle DNSSEC security RRs
        .000 0000 0000 0000 = Reserved: 0x0000
        Data length: 0
      [Request In: 76]
      [Time: 0.269913279 seconds]

```

It's a standard query

d)

No new queries since all info about the paths are in the html which the web server provides for

```

<p align="center">
   == $0
</p>
" And while we have your attention, you might want to take time to check out
the available open resources for this book at "
<a href="http://gaia.cs.umass.edu/kurose_ross">
http://gaia.cs.umass.edu/kurose_ross</a>

```

e) no the browser cached the ip-adress connected to the domain in it's DNS cache



## 7.

a)

```
musse@archlinux:~$ nslookup -type=A www.tue.nl
Server:          127.0.0.53
Address:         127.0.0.53#53

Non-authoritative answer:
www.tue.nl       canonical name = web.w3.tue.nl.
Name:   web.w3.tue.nl
Address: 167.235.218.203
```

nslookup gave CNAME web.w3.tue.nl and ipv4 adress 167.235.218.203.

```
▼ Domain Name System (response)
  Transaction ID: 0x3662
  ▶ Flags: 0x8180 Standard query response, No error
  Questions: 1
  Answer RRs: 2
  Authority RRs: 0
  Additional RRs: 1
  ▶ Queries
  ▼ Answers
    ▼ www.tue.nl: type CNAME, class IN, cname web.w3.tue.nl
      Name: www.tue.nl
      Type: CNAME (5) (Canonical NAME for an alias)
      Class: IN (0x0001)
      Time to live: 27050 (7 hours, 30 minutes, 50 seconds)
      Data length: 9
      CNAME: web.w3.tue.nl
    ▼ web.w3.tue.nl: type A, class IN, addr 167.235.218.203
      Name: web.w3.tue.nl
      Type: A (1) (Host Address)
      Class: IN (0x0001)
      Time to live: 300 (5 minutes)
      Data length: 4
      Address: 167.235.218.203
  ▼ Additional records
    ▼ <Root>: type OPT
      Name: <Root>
      Type: OPT (41)
      UDP payload size: 1232
      Higher bits in extended RCODE: 0x00
      EDNS0 version: 0
      ▼ Z: 0x0000
        0... .. = DO bit: Cannot handle DNSSEC security RRs
        .000 0000 0000 0000 = Reserved: 0x0000
      Data length: 0
    [Request In: 611]
    [Time: 0.066181994 seconds]
```

It's a standard query response

It contains the query for the IPv4 address (A) of [www.tue.nl](http://www.tue.nl)

It contains the answer for the canonical name (CNAME) web.w3.tue.nl

It contains the DNS resolve for its CNAME the address 167.235.218.203

It contains additional records you didnt ask for but received anyways like how large the UDP payload was

b)

```
musse@archlinux:~$ nslookup -type=ns tue.nl
```

```
Server:      127.0.0.53
```

```
Address:     127.0.0.53#53
```

```
Non-authoritative answer:
```

```
tue.nl  nameserver = ns3.tue.nl.
```

```
tue.nl  nameserver = ns1.tue.nl.
```

```
tue.nl  nameserver = ns2.tue.nl.
```

```
Authoritative answers can be found from:
```

```
ns1.tue.nl      has AAAA address 2001:610:1108:2::3
```

```
ns2.tue.nl      has AAAA address 2001:610:1108:3::3
```

```
ns1.tue.nl      internet address = 131.155.2.3
```

```
ns2.tue.nl      internet address = 131.155.3.3
```

```
ns3.tue.nl      internet address = 130.89.2.7
```

```

Domain Name System (response)
Transaction ID: 0x7995
Flags: 0x8180 Standard query response, No error
Questions: 1
Answer RRs: 3
Authority RRs: 0
Additional RRs: 6
Queries
Answers
  tue.nl: type NS, class IN, ns ns3.tue.nl
    Name: tue.nl
    Type: NS (2) (authoritative Name Server)
    Class: IN (0x0001)
    Time to live: 32707 (9 hours, 5 minutes, 7 seconds)
    Data length: 6
    Name Server: ns3.tue.nl
  tue.nl: type NS, class IN, ns ns1.tue.nl
    Name: tue.nl
    Type: NS (2) (authoritative Name Server)
    Class: IN (0x0001)
    Time to live: 32707 (9 hours, 5 minutes, 7 seconds)
    Data length: 6
    Name Server: ns1.tue.nl
  tue.nl: type NS, class IN, ns ns2.tue.nl
    Name: tue.nl
    Type: NS (2) (authoritative Name Server)
    Class: IN (0x0001)
    Time to live: 32707 (9 hours, 5 minutes, 7 seconds)
    Data length: 6
    Name Server: ns2.tue.nl
Additional records
  ns1.tue.nl: type AAAA, class IN, addr 2001:610:1108:2::3
    Name: ns1.tue.nl
    Type: AAAA (28) (IPv6 Address)
    Class: IN (0x0001)
    Time to live: 84292 (23 hours, 24 minutes, 52 seconds)
    Data length: 16
    AAAA Address: 2001:610:1108:2::3
  ns2.tue.nl: type AAAA, class IN, addr 2001:610:1108:3::3
    Name: ns2.tue.nl
    Type: AAAA (28) (IPv6 Address)
    Class: IN (0x0001)
    Time to live: 84292 (23 hours, 24 minutes, 52 seconds)
    Data length: 16
    AAAA Address: 2001:610:1108:3::3
  ns1.tue.nl: type A, class IN, addr 131.155.2.3
    Name: ns1.tue.nl
    Type: A (1) (Host Address)
    Class: IN (0x0001)
    Time to live: 32950 (9 hours, 9 minutes, 10 seconds)
    Data length: 4
    Address: 131.155.2.3
  ns2.tue.nl: type A, class IN, addr 131.155.3.3
    Name: ns2.tue.nl
    Type: A (1) (Host Address)
    Class: IN (0x0001)
    Time to live: 84292 (23 hours, 24 minutes, 52 seconds)
    Data length: 4
    Address: 131.155.3.3
  ns3.tue.nl: type A, class IN, addr 130.89.2.7
    Name: ns3.tue.nl
    Type: A (1) (Host Address)
    Class: IN (0x0001)
    Time to live: 84292 (23 hours, 24 minutes, 52 seconds)
    Data length: 4
    Address: 130.89.2.7
  <Root>: type OPT
    Name: <Root>
    Type: OPT (41)
    UDP payload size: 1232
    Higher bits in extended RCODE: 0x00
    EDNS0 version: 0
    Z: 0x0000
      0... .. = DO bit: Cannot handle DNSSEC security RRs
      .000 0000 0000 0000 = Reserved: 0x0000
    Data length: 0
[Request In: 2]
[Time: 0.038953509 seconds]

```

We asked for name servers and got 3 answers. We didn't specifically ask for their IPv4 and IPv6 addresses but got them anyways through the glue record. We didnt receive an IPv6 address for nameserver 3.

c)

```

musse@archlinux:~$ nslookup -type=A www.tue.nl ns1.tue.nl
Server:          ns1.tue.nl
Address:         131.155.2.3#53

www.tue.nl      canonical name = web.w3.tue.nl.

```

```

▼ Domain Name System (response)
  Transaction ID: 0x1f73
  ▶ Flags: 0x8500 Standard query response, No error
  Questions: 1
  Answer RRs: 1
  Authority RRs: 4
  Additional RRs: 0
  ▶ Queries
  ▼ Answers
    ▼ www.tue.nl: type CNAME, class IN, cname web.w3.tue.nl
      Name: www.tue.nl
      Type: CNAME (5) (Canonical NAME for an alias)
      Class: IN (0x0001)
      Time to live: 86400 (1 day)
      Data length: 15
      CNAME: web.w3.tue.nl
    ▼ Authoritative nameservers
      ▼ w3.tue.nl: type NS, class IN, ns ns-1853.awsdns-39.co.uk
        Name: w3.tue.nl
        Type: NS (2) (authoritative Name Server)
        Class: IN (0x0001)
        Time to live: 86400 (1 day)
        Data length: 25
        Name Server: ns-1853.awsdns-39.co.uk
      ▼ w3.tue.nl: type NS, class IN, ns ns-1464.awsdns-55.org
        Name: w3.tue.nl
        Type: NS (2) (authoritative Name Server)
        Class: IN (0x0001)
        Time to live: 86400 (1 day)
        Data length: 23
        Name Server: ns-1464.awsdns-55.org
      ▼ w3.tue.nl: type NS, class IN, ns ns-424.awsdns-53.com
        Name: w3.tue.nl
        Type: NS (2) (authoritative Name Server)
        Class: IN (0x0001)
        Time to live: 86400 (1 day)
        Data length: 22
        Name Server: ns-424.awsdns-53.com
      ▼ w3.tue.nl: type NS, class IN, ns ns-550.awsdns-04.net
        Name: w3.tue.nl
        Type: NS (2) (authoritative Name Server)
        Class: IN (0x0001)
        Time to live: 86400 (1 day)
        Data length: 22
        Name Server: ns-550.awsdns-04.net
    [Request in: 7]
    [Time: 0.029493687 seconds]

```

d)

4 name servers in 4 different TLDs

e)

```

musse@archlinux:~$ nslookup web.w3.tue.nl ns-550.awsdns-04.net
Server:          ns-550.awsdns-04.net
Address:         205.251.194.38#53

Name:   web.w3.tue.nl
Address: 167.235.218.203
Name:   web.w3.tue.nl
Address: 2a01:4f8:c011:eec::1

```