

## E3:

Q1:

IP address: 150.203.161.98

Type: A

```
uxterm
z5230310@vx4:/tmp_amd/kamen/export/kamen/4/z5230310$ dig www.cecs.anu.edu.au

;<> DiG 9.9.5-9+deb8u17-Debian <> www.cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 14215
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 10, ADDITIONAL: 20

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
www.cecs.anu.edu.au.      2985    IN      CNAME   rproxy.cecs.anu.edu.au.
rproxy.cecs.anu.edu.au.  1739    IN      A       150.203.161.98

;; AUTHORITY SECTION:
au.      4848    IN      NS      c.au.
au.      4848    IN      NS      a.au.
au.      4848    IN      NS      b.au.
au.      4848    IN      NS      r.au.
au.      4848    IN      NS      s.au.
au.      4848    IN      NS      v.au.
au.      4848    IN      NS      d.au.
au.      4848    IN      NS      q.au.
au.      4848    IN      NS      u.au.
au.      4848    IN      NS      t.au.

;; ADDITIONAL SECTION:
a.au.      6624    IN      A       58.65.254.73
a.au.      6132    IN      AAAA    2407:6e00:254:306::73
b.au.      1445    IN      A       58.65.253.73
b.au.      5348    IN      AAAA    2407:6e00:253:306::73
c.au.      100     IN      A       162.159.24.179
c.au.      142983  IN      AAAA    2400:cb00:2049:1::a29f:18b3
d.au.      6872    IN      A       162.159.25.38
d.au.      5717    IN      AAAA    2400:cb00:2049:1::a29f:1926
q.au.      347     IN      A       65.22.196.1
q.au.      658     IN      AAAA    2a01:8840:be::1
r.au.      5556    IN      A       65.22.197.1
r.au.      135236  IN      AAAA    2a01:8840:bf::1
s.au.      1877    IN      A       65.22.198.1
s.au.      1759    IN      AAAA    2a01:8840:c0::1
t.au.      2151    IN      A       65.22.199.1
t.au.      4848    IN      AAAA    2a01:8840:c1::1
u.au.      2846    IN      A       211.29.133.32
v.au.      1780    IN      A       202.12.31.53
v.au.      3785    IN      AAAA    2001:dd8:12::53
```

Q2:

As picture show above. The canonical name is: rproxy.cecs.anu.edu.au.

For example, we have example.com and www.example.com, if both are A records that point to the server address, once the IP address has been changed, we need to change two A records. However, a CNAME record www.example.com can point to A record

example.com, in that case, we just need to change one A record(example.com), and CNAME record(www.example.com) automatically inherits the changes.

Q3.

For the AUTHORITY SECTION part, there are three authority hostname of DNS servers, which are used to search IP address based on website hostnames. You can also get IP addressed corresponding to these DNS servers by DNS request.

For the ADDITIONAL SECTION part, it shows there pairs of records corresponding to authority DNS server, and **A** means IPv4 address, **AAAA** stands for IPv6 address.

Q4.

As the picture shows:

```
;; Query time: 1 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Sun Jun 30 14:43:12 AEST 2019
;; MSG SIZE rcvd: 657
```

The IP address of the local name server for my machine is 129.94.242.2

Q5.

They are ns4.cecs.anu.edu.au, ns2.cecs.anu.edu.au, ns3.cecs.anu.edu.au .

IPv4 address and IPv6 address shows below:

```
;; AUTHORITY SECTION:
cecs.anu.edu.au.      299      IN       NS       ns4.cecs.anu.edu.au.
cecs.anu.edu.au.      299      IN       NS       ns2.cecs.anu.edu.au.
cecs.anu.edu.au.      299      IN       NS       ns3.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns4.cecs.anu.edu.au.  299      IN       A        150.203.161.38
ns4.cecs.anu.edu.au.  3600     IN       AAAA     2001:388:1034:2905::26
ns3.cecs.anu.edu.au.  299      IN       A        150.203.161.50
ns3.cecs.anu.edu.au.  3600     IN       AAAA     2001:388:1034:2905::32
ns2.cecs.anu.edu.au.  299      IN       A        150.203.161.36
ns2.cecs.anu.edu.au.  3600     IN       AAAA     2001:388:1034:2905::24
```

The type NS queries are sent to obtain DNS nameservers, and type A queries are sent to obtain IPv4 address, AAAA queries are sent to obtain IPv6 address.

Q6.

DNS name is: webserver.seecs.nust.edu.pk

Type PTR DNS query is sent.

```
z5230310@vnx1:/tmp_amd/kamen/export/kamen/4/z5230310/Desktop$ dig -x 111.68.101.54

;<> DiG 9.9.5-9+deb8u17-Debian <> -x 111.68.101.54
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 61444
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;54.101.68.111.in-addr.arpa.      IN      PTR

;; ANSWER SECTION:
54.101.68.111.in-addr.arpa. 2797 IN    PTR    webserver.seecs.nust.edu.pk.

;; AUTHORITY SECTION:
101.68.111.in-addr.arpa. 14771 IN     NS     ns1.hec.gov.pk.
101.68.111.in-addr.arpa. 14771 IN     NS     ns2.hec.gov.pk.

;; ADDITIONAL SECTION:
ns1.hec.gov.pk.           2298 IN     A      103.4.93.5
ns2.hec.gov.pk.           3581 IN     A      103.4.93.6

;; Query time: 0 msec
;; SERVER: 129.94.242.45#53(129.94.242.45)
;; WHEN: Wed Jun 26 16:55:49 AEST 2019
;; MSG SIZE rcvd: 172
```

Q7.

As the graph shows below, the reason is that there is no “aa” in flags section of response message which means “Authoritative Answer”, so it not came form an authoritative name sever.

```

z5230310@vx1:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig @129.94.242.33 yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @129.94.242.33 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 20379
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 8

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;yahoo.com.                IN      MX

;; ANSWER SECTION:
yahoo.com.                167     IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.                167     IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.                167     IN      MX      1 mta5.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                52632   IN      NS      ns5.yahoo.com.
yahoo.com.                52632   IN      NS      ns2.yahoo.com.
yahoo.com.                52632   IN      NS      ns3.yahoo.com.
yahoo.com.                52632   IN      NS      ns4.yahoo.com.
yahoo.com.                52632   IN      NS      ns1.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            237611  IN      A        68.180.131.16
ns1.yahoo.com.            50010   IN      AAAA     2001:4998:130::1001
ns2.yahoo.com.            125416  IN      A        68.142.255.16
ns2.yahoo.com.            50010   IN      AAAA     2001:4998:140::1002
ns3.yahoo.com.            406179  IN      A        203.84.221.53
ns4.yahoo.com.            156612  IN      A        98.138.11.157
ns5.yahoo.com.            425028  IN      A        119.160.253.83

;; Query time: 2 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Wed Jun 26 17:30:23 AEST 2019
;; MSG SIZE rcvd: 343

```

Q8.

There is no answer in DNS response by using 150.203.161.36 (obtained in Q5).

Perhaps out of security, this DNS server don't answer to host in some areas.

```

z5230310@vx1:/tmp_amd/kamen/export/kamen/4/z5230310/Desktop$ dig @150.203.161.36 yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @150.203.161.36 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 3805
;; flags: qr rd: QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:: udp: 4096
;; QUESTION SECTION:
;yahoo.com.                IN      MX

;; Query time: 8 msec
;; SERVER: 150.203.161.36#53(150.203.161.36)
;; WHEN: Wed Jun 26 17:33:47 AEST 2019
;; MSG SIZE rcvd: 38

```

Q9.

First, use dig yahoo.com to obtain the authority DNS server.

Then, query to 68.180.131.16 directly to obtain Authoritative Answer for mail servers.

The type is MX.

The result shows below:

```

z5230310@vx1:/tmp_amd/kamen/export/kamen/4/z5230310/Desktop$ dig yahoo.com

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> yahoo.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 38084
;; flags: qr rd ra: QUERY: 1, ANSWER: 6, AUTHORITY: 5, ADDITIONAL: 9

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:: udp: 4096
;; QUESTION SECTION:
;yahoo.com.                IN      A

;; ANSWER SECTION:
yahoo.com.                1367    IN      A      98.138.219.232
yahoo.com.                1367    IN      A      72.30.35.9
yahoo.com.                1367    IN      A      72.30.35.10
yahoo.com.                1367    IN      A      98.137.246.7
yahoo.com.                1367    IN      A      98.137.246.8
yahoo.com.                1367    IN      A      98.138.219.231

;; AUTHORITY SECTION:
yahoo.com.                51575   IN      NS      ns3.yahoo.com.
yahoo.com.                51575   IN      NS      ns4.yahoo.com.
yahoo.com.                51575   IN      NS      ns5.yahoo.com.
yahoo.com.                51575   IN      NS      ns2.yahoo.com.
yahoo.com.                51575   IN      NS      ns1.yahoo.com.

; ADDITIONAL SECTION:
ns1.yahoo.com.            236554  IN      A      68.180.131.16
ns1.yahoo.com.            48953   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.            124359  IN      A      68.142.255.16
ns2.yahoo.com.            48953   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.            49584   IN      A      203.84.221.53
ns3.yahoo.com.            48953   IN      AAAA    2406:8600:b8:fe03::1003
ns4.yahoo.com.            155555  IN      A      98.138.11.157
ns5.yahoo.com.            423971  IN      A      119.160.253.83

;; Query time: 1 msec
;; SERVER: 129.94.242.45#53(129.94.242.45)
;; WHEN: Wed Jun 26 17:48:00 AEST 2019
;; MSG SIZE rcvd: 388

```

```

z5230310@vnx1:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig @68.180.131.16 yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @68.180.131.16 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7493
; flags: qr aa rd; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 9
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 1272
;; QUESTION SECTION:
yahoo.com.                IN      MX

;; ANSWER SECTION:
yahoo.com.                1800    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                1800    IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.                1800    IN      MX      1 mta6.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                172800  IN      NS      ns1.yahoo.com.
yahoo.com.                172800  IN      NS      ns4.yahoo.com.
yahoo.com.                172800  IN      NS      ns2.yahoo.com.
yahoo.com.                172800  IN      NS      ns5.yahoo.com.
yahoo.com.                172800  IN      NS      ns3.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            1209600 IN      A       68.180.131.16
ns2.yahoo.com.            1209600 IN      A       68.142.255.16
ns3.yahoo.com.            1209600 IN      A       203.84.221.53
ns4.yahoo.com.            1209600 IN      A       98.138.11.157
ns5.yahoo.com.            1209600 IN      A       119.160.253.83
ns1.yahoo.com.            86400   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.            86400   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.            86400   IN      AAAA    2406:8600:b8:fe03::1003

;; Query time: 146 msec
;; SERVER: 68.180.131.16#53(68.180.131.16)
;; WHEN: Wed Jun 26 17:47:13 AEST 2019
;; MSG SIZE rcvd: 371

```

Q10.

Step 1, find a root DNS server 198.41.0.4

Step 2, query to this root DNS server.

Step 3, query to 58.65.253.73 (one nameserver of .au domain).

Step 4, query to 65.22.196.1 (one nameserver of .edu.au domain).

Step 5, query to 129.94.0.192 (one nameserver of .unsw.edu.au domain).

Step 6, query to 192.94.242.2(one nameserver of .cse.edu.au domain).

Step 7, find the IP address of lyre00.cse.unsw.edu.au: 129.94.210.20.

6 DNS servers I have queried to get the IP address.

```

z5230310@vx4:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig . NS

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> . NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 48530
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 27

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;*                               IN      NS

;; ANSWER SECTION:
*           47524      IN      NS      k.root-servers.net.
*           47524      IN      NS      l.root-servers.net.
*           47524      IN      NS      h.root-servers.net.
*           47524      IN      NS      i.root-servers.net.
*           47524      IN      NS      g.root-servers.net.
*           47524      IN      NS      b.root-servers.net.
*           47524      IN      NS      j.root-servers.net.
*           47524      IN      NS      e.root-servers.net.
*           47524      IN      NS      f.root-servers.net.
*           47524      IN      NS      a.root-servers.net.
*           47524      IN      NS      d.root-servers.net.
*           47524      IN      NS      m.root-servers.net.
*           47524      IN      NS      c.root-servers.net.

;; ADDITIONAL SECTION:
a.root-servers.net. 454158 IN      A      198.41.0.4
a.root-servers.net. 598906 IN      AAAA   2001:503:ba3e::2:30
b.root-servers.net. 152381 IN      A      199.9.14.201
b.root-servers.net. 22158  IN      AAAA   2001:500:200::b
c.root-servers.net. 3753   IN      A      192.33.4.12
c.root-servers.net. 3753   IN      AAAA   2001:500:2::c
d.root-servers.net. 75597  IN      A      199.7.91.13
d.root-servers.net. 133165 IN      AAAA   2001:500:2d::d
e.root-servers.net. 54153  IN      A      192.203.230.10
e.root-servers.net. 301463 IN      AAAA   2001:500:a8::e
f.root-servers.net. 62802  IN      A      192.5.5.241
f.root-servers.net. 3753   IN      AAAA   2001:500:2f::f

```

```
z5230310@vx4:/tmp_amd/kamen/export/kamen/4/z5230310/Desktop$ dig @198.41.0.4 lyre00.cse.unsw.edu.au
```

```
; <<> DiG 9.9.5-9+deb8u17-Debian <<> @198.41.0.4 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 16429
;; flags: qr rd: QUERY: 1, ANSWER: 0, AUTHORITY: 10, ADDITIONAL: 20
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;lyre00.cse.unsw.edu.au.          IN      A

;; AUTHORITY SECTION:
au.          172800 IN      NS      d.au.
au.          172800 IN      NS      v.au.
au.          172800 IN      NS      u.au.
au.          172800 IN      NS      q.au.
au.          172800 IN      NS      t.au.
au.          172800 IN      NS      s.au.
au.          172800 IN      NS      r.au.
au.          172800 IN      NS      b.au.
au.          172800 IN      NS      a.au.
au.          172800 IN      NS      c.au.

;; ADDITIONAL SECTION:
d.au.        172800 IN      A        162.159.25.38
d.au.        172800 IN      AAAA     2400:cb00:2049:1::a29f:1926
v.au.        172800 IN      A        202.12.31.53
v.au.        172800 IN      AAAA     2001:dd8:12::53
u.au.        172800 IN      A        211.29.133.32
q.au.        172800 IN      A        65.22.196.1
q.au.        172800 IN      AAAA     2a01:8840:be::1
t.au.        172800 IN      A        65.22.199.1
t.au.        172800 IN      AAAA     2a01:8840:c1::1
s.au.        172800 IN      A        65.22.198.1
s.au.        172800 IN      AAAA     2a01:8840:c0::1
r.au.        172800 IN      A        65.22.197.1
r.au.        172800 IN      AAAA     2a01:8840:bf::1
b.au.        172800 IN      A        58.65.253.73
b.au.        172800 IN      AAAA     2407:6e00:253:306::73
a.au.        172800 IN      A        58.65.254.73
a.au.        172800 IN      AAAA     2407:6e00:254:306::73
c.au.        172800 IN      A        162.159.24.179
c.au.        172800 IN      AAAA     2400:cb00:2049:1::a29f:18b3
```



```
z5230310@vx4:/tmp amd/kamen/export/kamen/4/z5230310/Desktop$ dig @58.65.254.73 lyre00.cse.unsw.edu.au

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @58.65.254.73 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 50726
;; flags: qr rd: QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 9
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;lyre00.cse.unsw.edu.au.          IN      A

;; AUTHORITY SECTION:
edu.au.          7200    IN      NS      r.au.
edu.au.          7200    IN      NS      q.au.
edu.au.          7200    IN      NS      s.au.
edu.au.          7200    IN      NS      t.au.

;; ADDITIONAL SECTION:
q.au.          7200    IN      A        65.22.196.1
r.au.          7200    IN      A        65.22.197.1
s.au.          7200    IN      A        65.22.198.1
t.au.          7200    IN      A        65.22.199.1
q.au.          7200    IN      AAAA     2a01:8840:be::1
r.au.          7200    IN      AAAA     2a01:8840:bf::1
s.au.          7200    IN      AAAA     2a01:8840:c0::1
t.au.          7200    IN      AAAA     2a01:8840:c1::1

;; Query time: 154 msec
;; SERVER: 58.65.254.73#53(58.65.254.73)
;; WHEN: Wed Jun 26 18:47:42 AEST 2019
;; MSG SIZE rcvd: 291
```

```
z5230310@vx4:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig @65.22.196.1 lyre00.cse.unsw.edu.au
```

```
; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @65.22.196.1 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 3156
;; flags: qr rd: QUERY: 1, ANSWER: 0, AUTHORITY: 3, ADDITIONAL: 6
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;lyre00.cse.unsw.edu.au.          IN      A

;; AUTHORITY SECTION:
unsw.edu.au.      900      IN      NS      ns3.unsw.edu.au.
unsw.edu.au.      900      IN      NS      ns1.unsw.edu.au.
unsw.edu.au.      900      IN      NS      ns2.unsw.edu.au.

;; ADDITIONAL SECTION:
ns1.unsw.edu.au.  900      IN      A        129.94.0.192
ns2.unsw.edu.au.  900      IN      A        129.94.0.193
ns3.unsw.edu.au.  900      IN      A        192.155.82.178
ns1.unsw.edu.au.  900      IN      AAAA     2001:388:c:35::1
ns2.unsw.edu.au.  900      IN      AAAA     2001:388:c:35::2

;; Query time: 7 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Wed Jun 26 18:53:24 AEST 2019
;; MSG SIZE rcvd: 209
```

```
z5230310@vx4:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig @129.94.0.192 lyre00.cse.unsw.edu.au
```

```
; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @129.94.0.192 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 310
;; flags: qr rd: QUERY: 1, ANSWER: 0, AUTHORITY: 2, ADDITIONAL: 5
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;lyre00.cse.unsw.edu.au.          IN      A

;; AUTHORITY SECTION:
cse.unsw.edu.au.      10800    IN      NS      maestro.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.      10800    IN      NS      beethoven.orchestra.cse.unsw.edu.au.

;; ADDITIONAL SECTION:
beethoven.orchestra.cse.unsw.edu.au. 10800 IN A 129.94.242.2
beethoven.orchestra.cse.unsw.edu.au. 10800 IN A 129.94.172.11
beethoven.orchestra.cse.unsw.edu.au. 10800 IN A 129.94.208.3
maestro.orchestra.cse.unsw.edu.au. 10800 IN A 129.94.242.33

;; Query time: 3 msec
;; SERVER: 129.94.0.192#53(129.94.0.192)
;; WHEN: Wed Jun 26 18:54:27 AEST 2019
;; MSG SIZE rcvd: 171
```

```

z5230310@vx4:/tmp_and/kamen/export/kamen/4/z5230310/Desktop$ dig @129.94.242.2 lyre00.cse.unsw.edu.au

; <<>> DiG 9.9.5-9+deb8u17-Debian <<>> @129.94.242.2 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 62021
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;lyre00.cse.unsw.edu.au.                IN      A

;; ANSWER SECTION:
lyre00.cse.unsw.edu.au. 3600     IN      A      129.94.210.20

;; AUTHORITY SECTION:
cse.unsw.edu.au.        3600     IN      NS      beethoven.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.        3600     IN      NS      maestro.orchestra.cse.unsw.edu.au.

;; ADDITIONAL SECTION:
maestro.orchestra.cse.unsw.edu.au. 3600 IN A      129.94.242.33
beethoven.orchestra.cse.unsw.edu.au. 3600 IN A      129.94.242.2

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Jun 26 18:57:12 AEST 2019
;; MSG SIZE rcvd: 155

```

Q11.

Yes, one machine can have more than one IP address because a computer have several network interfaces. And every IP address can have one or more name as alias name.

E4.

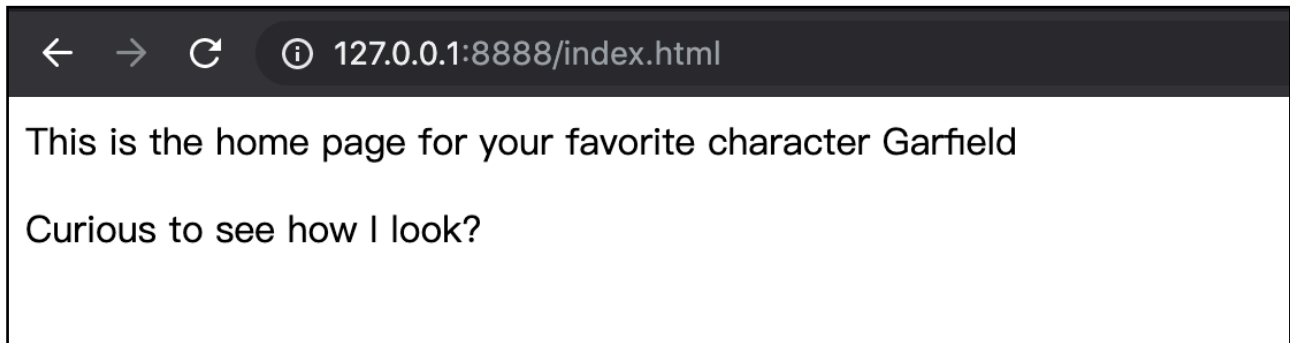
Code is included in Lab3.tar file.

The result graphs below:

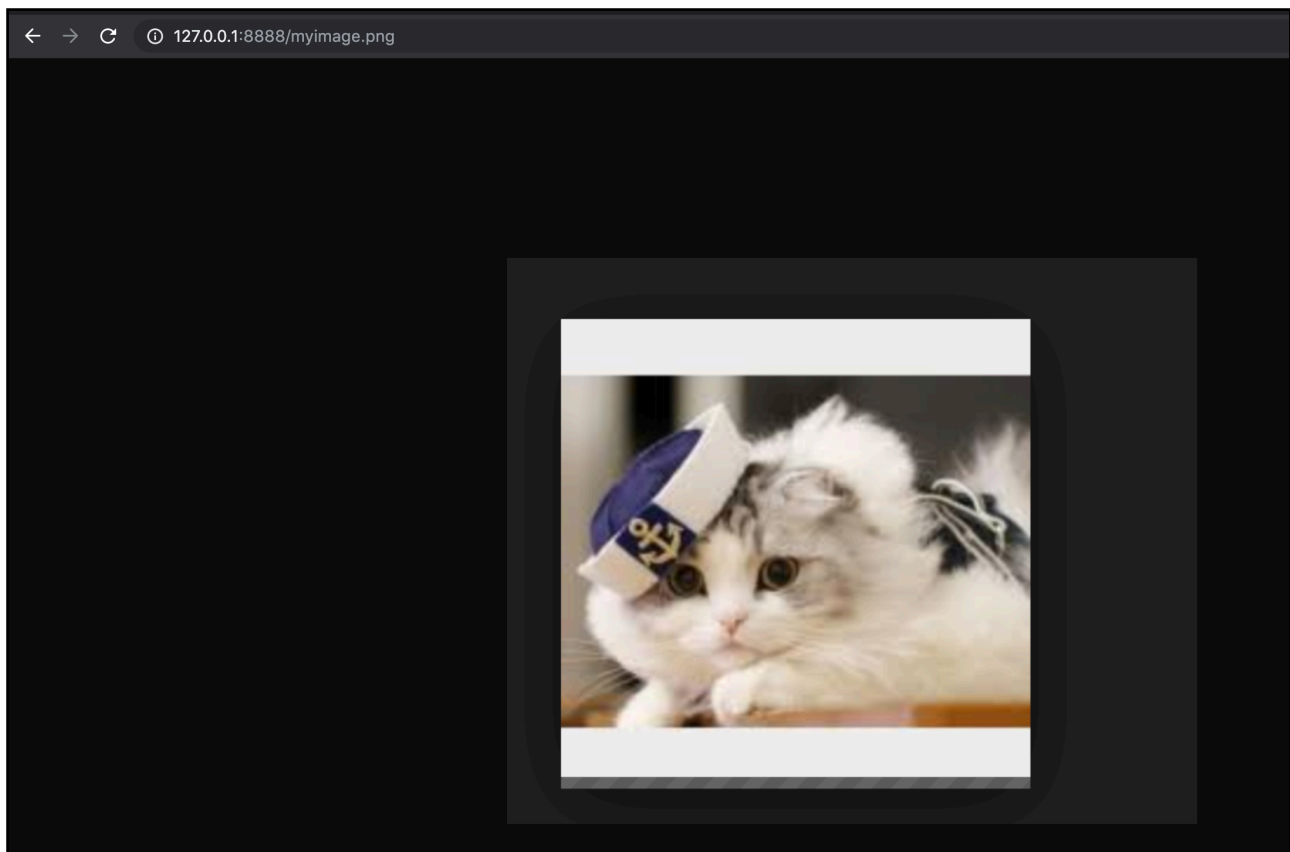
```

s-MacBook-puro-2:lab skyler$ python3 WebServer.py 8888
Initialization completed...
connect to 127.0.0.1
GET /index.html HTTP/1.1
Host: 127.0.0.1:8888
Connection: keep-alive
Cache-Control: max-age=0
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_14_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/75.0.3770.100 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/png,*/*;q=0.8,application/signed-exchange;v=b3
Accept-Encoding: gzip, deflate, br
Accept-Language: zh-CN,zh;q=0.9

```



```
GET /myimage.png HTTP/1.1
Host: 127.0.0.1:8888
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_14_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/75.0.3770.100 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/avif,image/png,*/*;q=0.8,application/signed-exchange;v=b3
Accept-Encoding: gzip, deflate, br
Accept-Language: zh-CN,zh;q=0.9
```



```
GET /bio.html HTTP/1.1
Host: 127.0.0.1:8888
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_14_5) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/75.0.3770.100 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/png,*/*;q=0.8,application/signed-exchange;v=b3
Accept-Encoding: gzip, deflate, br
Accept-Language: zh-CN,zh;q=0.9
```

