

```
CSI-VLAB - TigerVNC
Applications Menu Terminal
Terminal
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$ dig www.eecs.berkeley.edu
;<<> DiG 9.9.5-9+deb8u19-Debian <<> www.eecs.berkeley.edu
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 14146
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 4, ADDITIONAL: 7
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;; www.eecs.berkeley.edu. IN A
;; ANSWER SECTION:
www.eecs.berkeley.edu. 66234 IN CNAME live-eecs.pantheonsite.io.
live-eecs.pantheonsite.io. 600 IN CNAME fel.edge.pantheon.io.
fel.edge.pantheon.io. 300 IN A 23.185.0.1
;; AUTHORITY SECTION:
edge.pantheon.io. 300 IN NS ns-1213.awsdns-23.org.
edge.pantheon.io. 300 IN NS ns-233.awsdns-29.com.
edge.pantheon.io. 300 IN NS ns-644.awsdns-16.net.
edge.pantheon.io. 300 IN NS ns-2013.awsdns-59.co.uk.
;; ADDITIONAL SECTION:
ns-233.awsdns-29.com. 104108 IN A 205.251.192.233
ns-233.awsdns-29.com. 14116 IN AAAA 2600:9000:5300:e900::1
```

```
CSI-VLAB - TigerVNC
Applications Menu Terminal
Terminal
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$ dig -x 129.94.242.2
;<<> DiG 9.9.5-9+deb8u19-Debian <<> -x 129.94.242.2
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 5765
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;; 2.242.94.129.in-addr.arpa. IN PTR
;; ANSWER SECTION:
2.242.94.129.in-addr.arpa. 86400 IN PTR beethoven.orchestra.cse.unsw.EDU.AU.
;; AUTHORITY SECTION:
242.94.129.in-addr.arpa. 86400 IN NS maestro.orchestra.cse.unsw.EDU.AU.
;; ADDITIONAL SECTION:
maestro.orchestra.cse.unsw.EDU.AU. 3600 IN A 129.94.242.33
;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Jun 28 09:32:55 AEST 2021
;; MSG SIZE rcvd: 397
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$ dig -x 129.94.242.2
;<<> DiG 9.9.5-9+deb8u19-Debian <<> -x 129.94.242.2
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 5765
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;; 2.242.94.129.in-addr.arpa. IN PTR
;; ANSWER SECTION:
2.242.94.129.in-addr.arpa. 86400 IN PTR beethoven.orchestra.cse.unsw.EDU.AU.
;; AUTHORITY SECTION:
242.94.129.in-addr.arpa. 86400 IN NS maestro.orchestra.cse.unsw.EDU.AU.
;; ADDITIONAL SECTION:
maestro.orchestra.cse.unsw.EDU.AU. 3600 IN A 129.94.242.33
;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Jun 28 09:37:15 AEST 2021
;; MSG SIZE rcvd: 141
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$
```

```
CSI-VLAB - TigerVNC
Applications Menu Terminal
Terminal
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$ dig -x 129.94.242.2
;<<> DiG 9.9.5-9+deb8u19-Debian <<> -x 129.94.242.2
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 5765
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;; 2.242.94.129.in-addr.arpa. IN PTR
;; ANSWER SECTION:
2.242.94.129.in-addr.arpa. 86400 IN PTR beethoven.orchestra.cse.unsw.EDU.AU.
;; AUTHORITY SECTION:
242.94.129.in-addr.arpa. 86400 IN NS maestro.orchestra.cse.unsw.EDU.AU.
;; ADDITIONAL SECTION:
maestro.orchestra.cse.unsw.EDU.AU. 3600 IN A 129.94.242.33
;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Jun 28 09:37:15 AEST 2021
;; MSG SIZE rcvd: 141
z5255497@vx8:/tmp_amd/kamen/export/kamen/2/z5255497$
```

Question 3.1:

The IP address of it is 129.94.242.33. It is an A record type query.

Question 3.2:

Its canonical name is live-eecs.pantheonsite.io. The alias name is easier to remember and shorter than the canonical name, we use an alias name for simplicity reason.

Question 3.3:

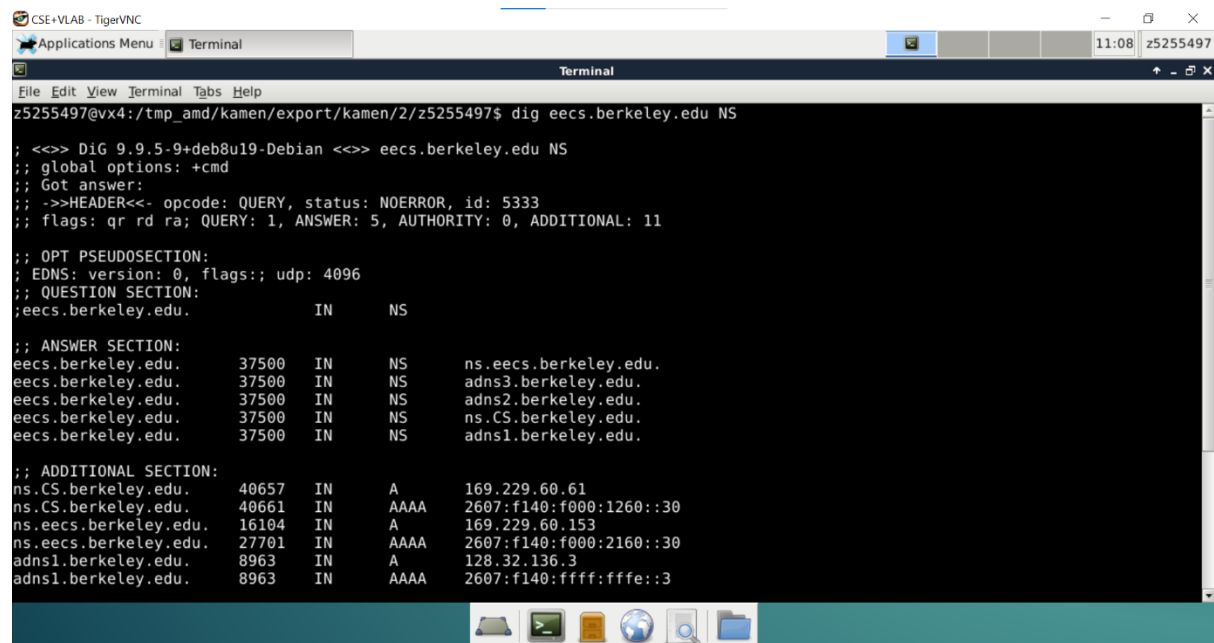
The authority section contains four authoritative names of edge.pantheon.io.

The additional section contains the IP addresses of the authoritative names.

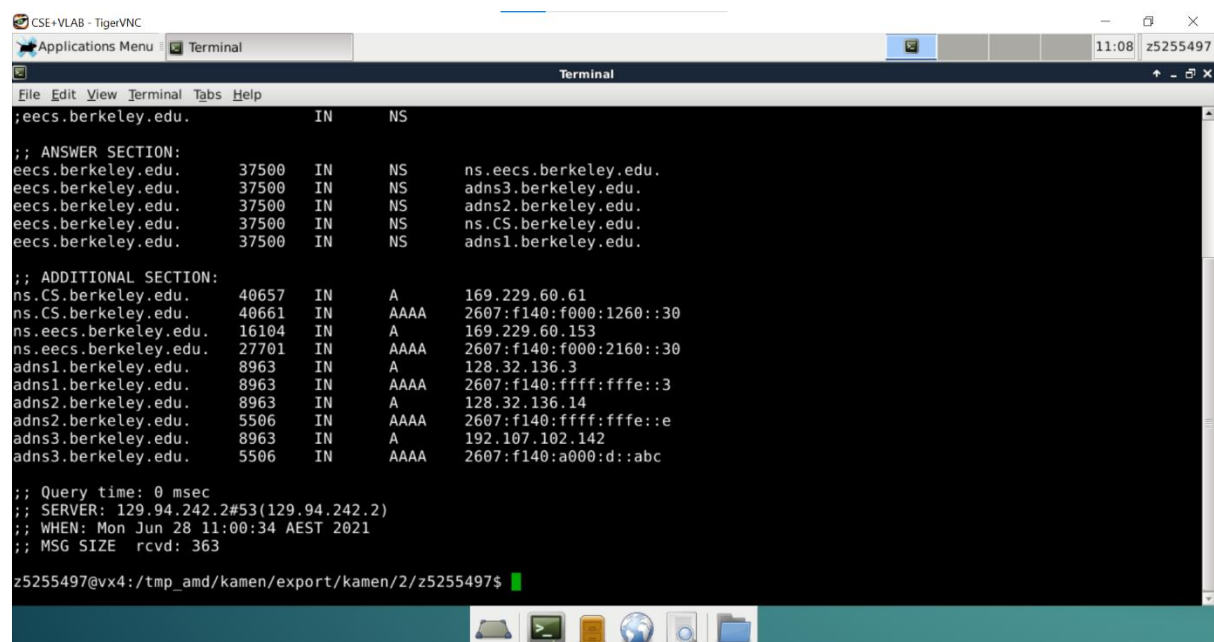
Question 3.4:

The IP address of the local nameserver is 129.94.242.2.

Question 3.5:



```
z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$ dig eecs.berkeley.edu NS
; <<> DiG 9.9.5-9+deb8u19-Debian <<> eecs.berkeley.edu NS
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 5333
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 11
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:;, udp: 4096
;; QUESTION SECTION:
;eecs.berkeley.edu.      IN      NS
;; ANSWER SECTION:
eecs.berkeley.edu.      37500   IN      NS      ns.eecs.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns3.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns2.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      ns.CS.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns1.berkeley.edu.
;; ADDITIONAL SECTION:
ns.CS.berkeley.edu.     40657   IN      A        169.229.60.61
ns.CS.berkeley.edu.     40661   IN      AAAA     2607:f140:f000:1260::30
ns.eecs.berkeley.edu.   16104   IN      A        169.229.60.153
ns.eecs.berkeley.edu.   27701   IN      AAAA     2607:f140:f000:2160::30
adns1.berkeley.edu.     8963    IN      A        128.32.136.3
adns1.berkeley.edu.     8963    IN      AAAA     2607:f140:ffff:fffe::3
```



```
;eecs.berkeley.edu.      IN      NS
;; ANSWER SECTION:
eecs.berkeley.edu.      37500   IN      NS      ns.eecs.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns3.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns2.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      ns.CS.berkeley.edu.
eecs.berkeley.edu.      37500   IN      NS      adns1.berkeley.edu.
;; ADDITIONAL SECTION:
ns.CS.berkeley.edu.     40657   IN      A        169.229.60.61
ns.CS.berkeley.edu.     40661   IN      AAAA     2607:f140:f000:1260::30
ns.eecs.berkeley.edu.   16104   IN      A        169.229.60.153
ns.eecs.berkeley.edu.   27701   IN      AAAA     2607:f140:f000:2160::30
adns1.berkeley.edu.     8963    IN      A        128.32.136.3
adns1.berkeley.edu.     8963    IN      AAAA     2607:f140:ffff:fffe::3
adns2.berkeley.edu.     8963    IN      A        128.32.136.14
adns2.berkeley.edu.     5506    IN      AAAA     2607:f140:ffff:fffe::e
adns3.berkeley.edu.     8963    IN      A        192.107.102.142
adns3.berkeley.edu.     5506    IN      AAAA     2607:f140:a000:d::abc
;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Jun 28 11:00:34 AEST 2021
;; MSG SIZE rcvd: 363
z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$
```

dig eecs.berkeley.edu NS

Domain names:

ns.eecs.berkeley.edu.

adns3.berkeley.edu.

adns2.berkeley.edu.

ns.CS.berkeley.edu.

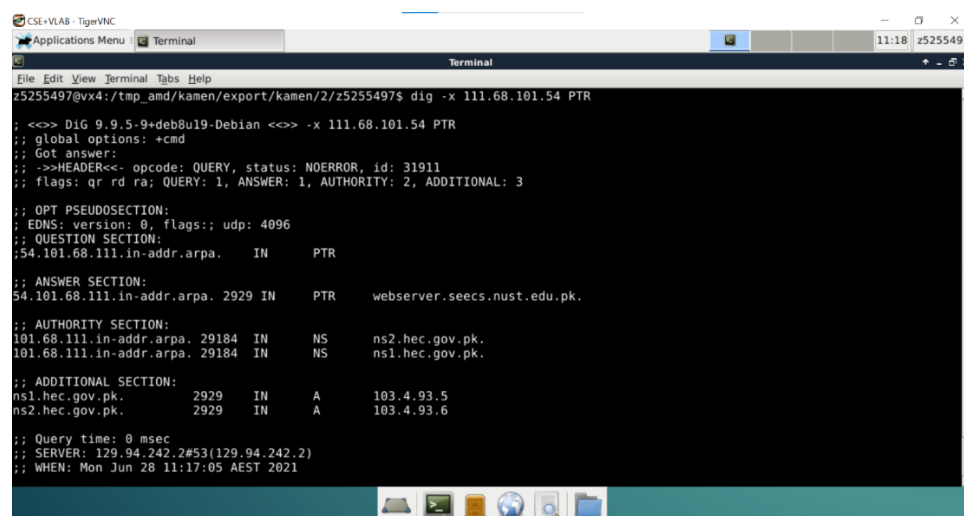
adns1.berkeley.edu.

IP addresses:

ns.CS.berkeley.edu.	40657	IN	A	169.229.60.61
ns.CS.berkeley.edu.	40661	IN	AAAA	2607:f140:f000:1260::30
ns.eecs.berkeley.edu.	16104	IN	A	169.229.60.153
ns.eecs.berkeley.edu.	27701	IN	AAAA	2607:f140:f000:2160::30
adns1.berkeley.edu.	8963	IN	A	128.32.136.3
adns1.berkeley.edu.	8963	IN	AAAA	2607:f140:ffff:ffe::3
adns2.berkeley.edu.	8963	IN	A	128.32.136.14
adns2.berkeley.edu.	5506	IN	AAAA	2607:f140:ffff:ffe::e
adns3.berkeley.edu.	8963	IN	A	192.107.102.142
adns3.berkeley.edu.	5506	IN	AAAA	2607:f140:a000:d::abc

Type of DNS query sent is NS.

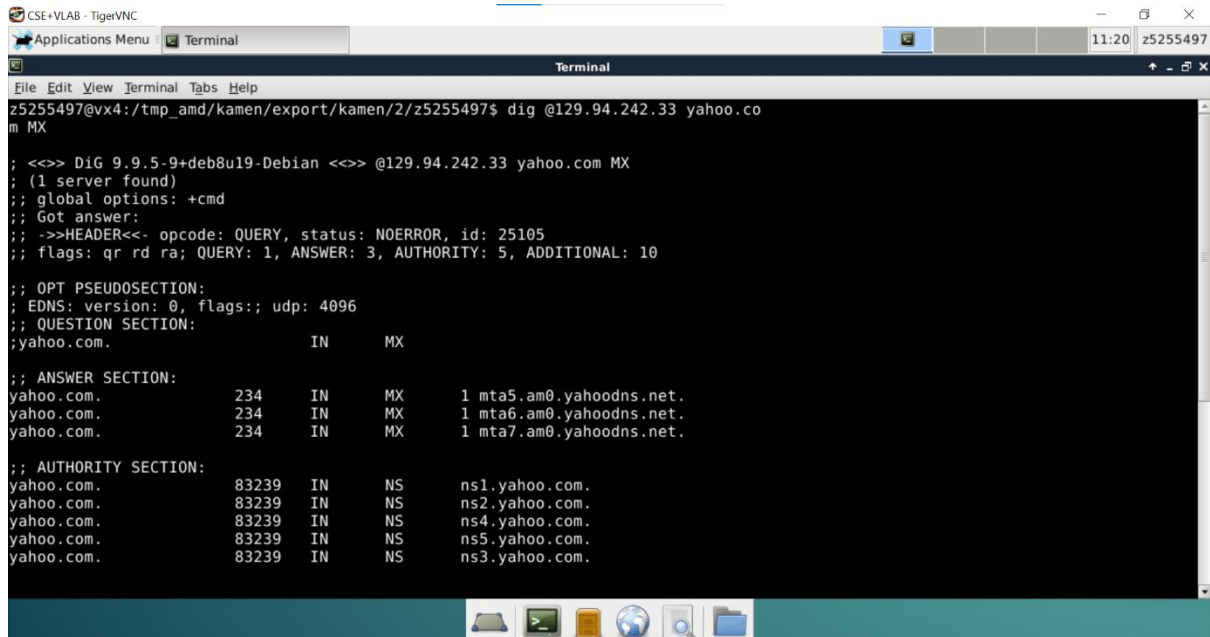
Question 3.6:



```
CSE-VLAB - TigerVNC
Applications Menu Terminal
Terminal
File Edit View Terminal Tabs Help
z5255497@vx4:/tmp_and/kamen/export/kamen/2/z5255497$ dig -x 111.68.101.54 PTR
;; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> -x 111.68.101.54 PTR
;; global options: +cmd
;; Got answer:
;; ->HEADER<<: opcode: QUERY, status: NOERROR, id: 31911
;; 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. 2929 IN PTR webserver.seecs.nust.edu.pk.
;; AUTHORITY SECTION:
101.68.111.in-addr.arpa. 29184 IN NS ns2.hec.gov.pk.
101.68.111.in-addr.arpa. 29184 IN NS ns1.hec.gov.pk.
;; ADDITIONAL SECTION:
ns1.hec.gov.pk. 2929 IN A 103.4.93.5
ns2.hec.gov.pk. 2929 IN A 103.4.93.6
;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Jun 28 11:17:05 AEST 2021
```

The DNS name is webserver.seecs.nust.edu.pk. The type of DNS query sent is PTR.

Question 3.7:



```
CSE+VLAB - TigerVNC
Applications Menu Terminal 11:20 z5255497

Terminal
File Edit View Terminal Tabs Help

z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @129.94.242.33 yahoo.com
m MX

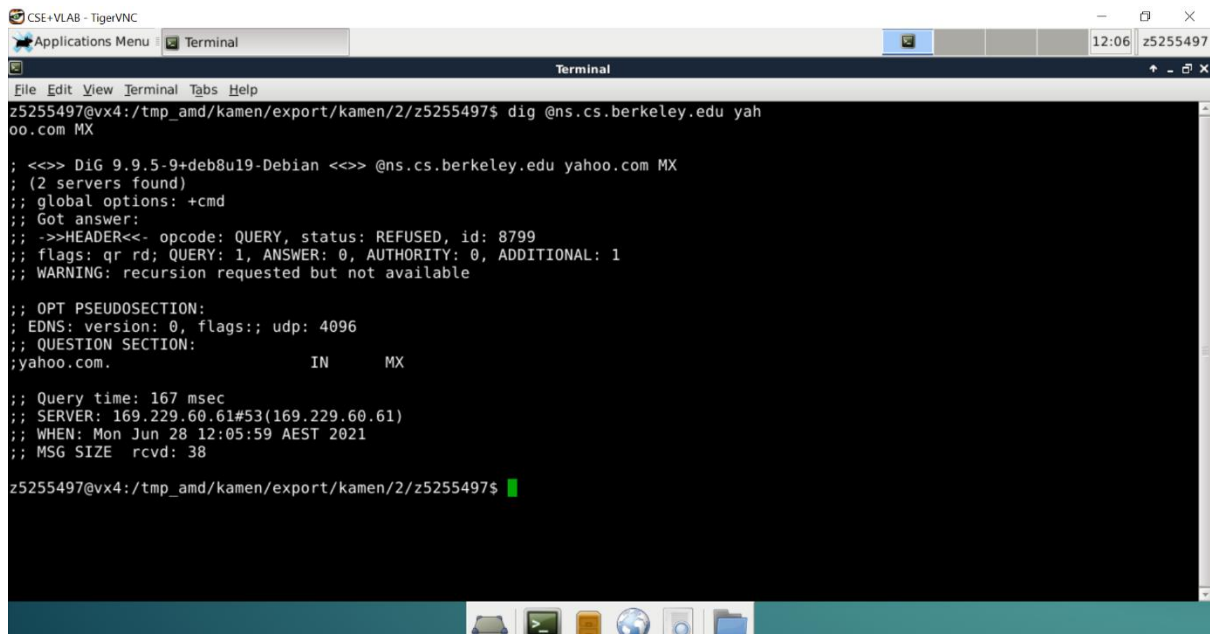
;; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @129.94.242.33 yahoo.com MX
;; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 25105
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 10

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;yahoo.com.                IN      MX
;; ANSWER SECTION:
yahoo.com.                234     IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                234     IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.                234     IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                83239   IN      NS      ns1.yahoo.com.
yahoo.com.                83239   IN      NS      ns2.yahoo.com.
yahoo.com.                83239   IN      NS      ns4.yahoo.com.
yahoo.com.                83239   IN      NS      ns5.yahoo.com.
yahoo.com.                83239   IN      NS      ns3.yahoo.com.
```

No, because there is no aa flag. The CSE nameserver has no authority on Yahoo mail server.

Question 3.8:



```
CSE+VLAB - TigerVNC
Applications Menu Terminal 12:06 z5255497

Terminal
File Edit View Terminal Tabs Help

z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @ns.cs.berkeley.edu yahoo.com MX
oo.com MX

;; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns.cs.berkeley.edu yahoo.com MX
;; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 8799
;; 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: 167 msec
;; SERVER: 169.229.60.61#53(169.229.60.61)
;; WHEN: Mon Jun 28 12:05:59 AEST 2021
;; MSG SIZE rcvd: 38

z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$
```

We get refused and there is no aa flag.

Question 3.9:

```
CSE+VLAB - TigerVNC
Applications Menu Terminal 12:31 z5255497

File Edit View Terminal Tabs Help
z5255497@vx4:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @ns1.yahoo.com yahoo.com
MX

<<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns1.yahoo.com yahoo.com MX
(2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 16870
;; flags: qr aa rd; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 10
;; 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 mta6.am0.yahoodns.net.
yahoo.com.      1800    IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.      1800    IN      MX      1 mta5.am0.yahoodns.net.

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

I use the authoritative nameserver. The command is `dig @ns1.yahoo.com yahoo.com MX`. The type of DNS query is MX.

Question3.10:

```
CSE+VLAB - TigerVNC
Applications Menu Terminal 20:44 z5255497

File Edit View Terminal Tabs Help
z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig . NS

<<>> DiG 9.9.5-9+deb8u19-Debian <<>> . NS
global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52801
;; 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:
.      215917  IN      NS      c.root-servers.net.
.      215917  IN      NS      b.root-servers.net.
.      215917  IN      NS      k.root-servers.net.
.      215917  IN      NS      e.root-servers.net.
.      215917  IN      NS      j.root-servers.net.
.      215917  IN      NS      d.root-servers.net.
.      215917  IN      NS      f.root-servers.net.
.      215917  IN      NS      h.root-servers.net.
.      215917  IN      NS      g.root-servers.net.
.      215917  IN      NS      i.root-servers.net.
.      215917  IN      NS      m.root-servers.net.
.      215917  IN      NS      a.root-servers.net.
.      215917  IN      NS      l.root-servers.net.
```

```
CSE+VLAB - TigerVNC
Applications Menu Terminal 20:44 z5255497

File Edit View Terminal Tabs Help
z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig f.root-servers.net. au. NS

<<>> DiG 9.9.5-9+deb8u19-Debian <<>> f.root-servers.net. au. NS
global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 18307
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 13, ADDITIONAL: 26

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:: udp: 4096
;; QUESTION SECTION:
;; f.root-servers.net.      IN      A

;; ANSWER SECTION:
f.root-servers.net.  578371  IN      A      192.5.5.241

;; AUTHORITY SECTION:
root-servers.net.   91462   IN      NS      j.root-servers.net.
root-servers.net.   91462   IN      NS      c.root-servers.net.
root-servers.net.   91462   IN      NS      a.root-servers.net.
root-servers.net.   91462   IN      NS      f.root-servers.net.
root-servers.net.   91462   IN      NS      g.root-servers.net.
root-servers.net.   91462   IN      NS      k.root-servers.net.
root-servers.net.   91462   IN      NS      i.root-servers.net.
root-servers.net.   91462   IN      NS      h.root-servers.net.
root-servers.net.   91462   IN      NS      e.root-servers.net.
root-servers.net.   91462   IN      NS      a.root-servers.net.
root-servers.net.   91462   IN      NS      l.root-servers.net.
```

```
CSE+VLAB - TigerVNC
Applications Menu Terminal
Terminal
File Edit View Terminal Tabs Help
MSG SIZE rcvd: 825

;; Got answer:
;; -->HEADER<<- opcode: QUERY, status: NOERROR, id: 65065
;; flags: qr rd ra; QUERY: 1, ANSWER: 9, AUTHORITY: 0, ADDITIONAL: 19

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

;; ANSWER SECTION:
au. 65805 IN NS n.au.
au. 65805 IN NS d.au.
au. 65805 IN NS s.au.
au. 65805 IN NS t.au.
au. 65805 IN NS m.au.
au. 65805 IN NS c.au.
au. 65805 IN NS r.au.
au. 65805 IN NS a.au.
au. 65805 IN NS q.au.

;; ADDITIONAL SECTION:
a.au. 50775 IN A 58.65.254.73
a.au. 5739 IN AAAA 2407:6e00:254:306::73
c.au. 68498 IN A 162.159.24.179
c.au. 21919 IN AAAA 2400:cb00:2049:1::a29f:18b3
```

```
CSE+VLAB - TigerVNC
Applications Menu Terminal
Terminal
File Edit View Terminal Tabs Help
z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @t.au edu.au. NS

;<<> DiG 9.9.5-9+deb8u19-Debian <<> @t.au edu.au. NS
(2 servers found)
;; global options: +cmd
;; Got answer:
;; -->HEADER<<- opcode: QUERY, status: NOERROR, id: 1876
;; flags: qr aa rd; QUERY: 1, ANSWER: 4, AUTHORITY: 0, ADDITIONAL: 1
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;edu.au.
IN NS

;; ANSWER SECTION:
edu.au. 900 IN NS q.au.
edu.au. 900 IN NS r.au.
edu.au. 900 IN NS s.au.
edu.au. 900 IN NS t.au.

;; Query time: 2 msec
;; SERVER: 65.22.199.1#53(65.22.199.1)
;; WHEN: Mon Jun 28 20:45:21 AEST 2021
;; MSG SIZE rcvd: 99

z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$
```

```
CSE+VLAB - TigerVNC
Applications Menu Terminal
Terminal
File Edit View Terminal Tabs Help
z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @q.au unsw.edu.au. NS

;<<> DiG 9.9.5-9+deb8u19-Debian <<> @q.au unsw.edu.au. NS
(2 servers found)
;; global options: +cmd
;; Got answer:
;; -->HEADER<<- opcode: QUERY, status: NOERROR, id: 17059
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 3, ADDITIONAL: 6
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;unsw.edu.au.
IN NS

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

```
CSE-VLAB - TigerVNC
Applications Menu Terminal
02:49 z5255497

File Edit View Terminal Tabs Help

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:: udp: 1232
;; QUESTION SECTION:
;unsw.edu.au. IN NS

;; AUTHORITY SECTION:
unsw.edu.au. 900 IN NS ns2.unsw.edu.au.
unsw.edu.au. 900 IN NS ns3.unsw.edu.au.
unsw.edu.au. 900 IN NS ns1.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: 24 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Tue Jun 29 02:49:06 AEST 2021
;; MSG SIZE rcvd: 198

z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$
```

```
CSE-VLAB - TigerVNC
Applications Menu Terminal
20:46 z5255497

File Edit View Terminal Tabs Help

z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @ns1.unsw.edu.au. cse.u
nsw.edu.au NS

<<>> Dig 9.9.5.9+debBui9-Debian <<>> @ns1.unsw.edu.au. cse.unsw.edu.au NS
(2 servers found)
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 58517
;; 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:
;cse.unsw.edu.au. IN NS

;; AUTHORITY SECTION:
cse.unsw.edu.au. 300 IN NS beethoven.orchestra.cse.unsw.edu
.au.
cse.unsw.edu.au. 300 IN NS maestro.orchestra.cse.unsw.edu.a
u.

;; ADDITIONAL SECTION:
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.172.11
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.208.3
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.242.2
maestro.orchestra.cse.unsw.edu.au. 300 IN A 129.94.242.33
```

```
CSE-VLAB - TigerVNC
Applications Menu Terminal
20:46 z5255497

File Edit View Terminal Tabs Help

z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ hostname -f
vx2.orchestra.cse.unsw.EDU.AU
z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$ dig @maestro.orchestra.cse.unsw.edu.au. vx5.orchestra.cse.unsw.EDU.AU A

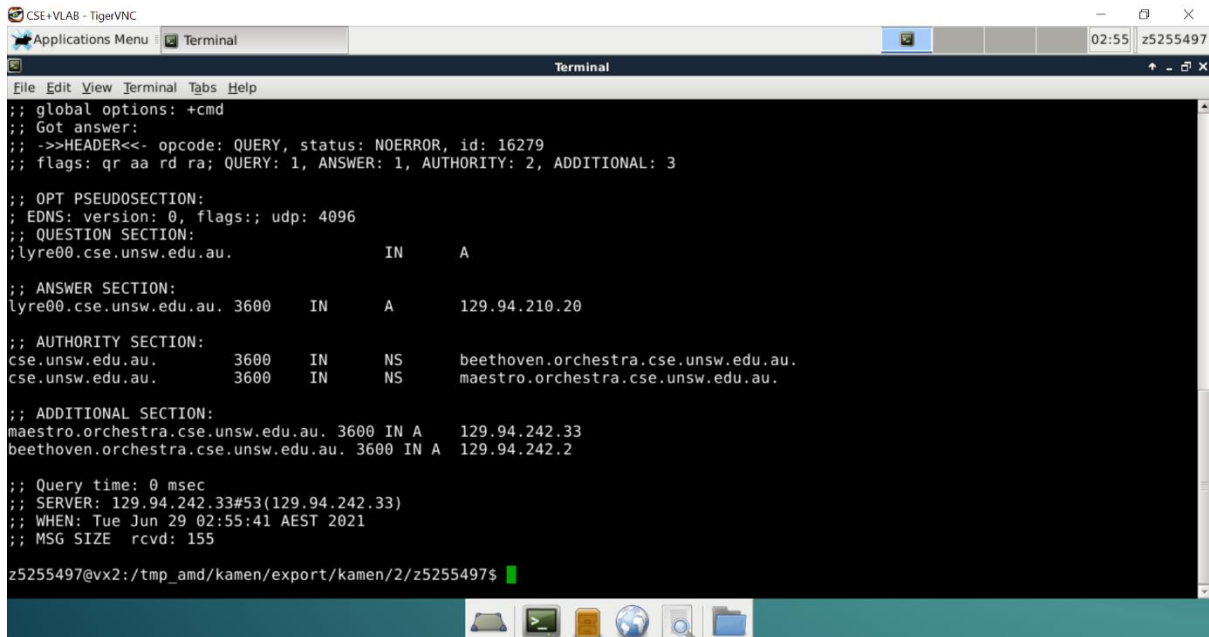
<<>> Dig 9.9.5.9+debBui9-Debian <<>> @maestro.orchestra.cse.unsw.edu.au. vx5.orchestra.cse.unsw.EDU.AU A
(1 server found)
;; global options: +cmd
;; Got answer:
;; ->HEADER<- opcode: QUERY, status: NOERROR, id: 38010
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:: udp: 4096
;; QUESTION SECTION:
;vx5.orchestra.cse.unsw.EDU.AU. IN A

;; ANSWER SECTION:
vx5.orchestra.cse.unsw.EDU.AU. 3600 IN A 129.94.242.118

;; AUTHORITY SECTION:
orchestra.cse.unsw.EDU.AU. 3600 IN NS beethoven.orchestra.cse.unsw.EDU.AU.
orchestra.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
```

```
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 16279
;; 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: 129.94.242.33#53(129.94.242.33)
;; WHEN: Tue Jun 29 02:55:41 AEST 2021
;; MSG SIZE rcvd: 155

z5255497@vx2:/tmp_amd/kamen/export/kamen/2/z5255497$
```

dig . NS

dig f.root-servers.net. au. NS

dig @t.au edu.au. NS

dig @q.au unsw.edu.au. NS

dig @ns1.unsw.edu.au. cse.unsw.edu.au NS

hostname -f

dig @maestro.orchestra.cse.unsw.edu.au. lyre00.cse.unsw.edu.au A

I need to query 5 DNS servers: f.root-servers.net, t.au, q.au, ns1.unsw.edu.au, maestro.orchestra.cse.unsw.edu.au. The IP address is 129.94.242.20.

Question 3.11:

Yes, a machine can have several names and addresses. We don't configure IP address on a device, we configure IP address on the interface of device, such as router, that's why a machine can have multiple.