COMP9331 lab3 report

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Question 1. What is the IP address of www.cecs.anu.edu.au . What type of DNS query is sent to get this answer?

- IP address: 150.203.161.98
- DNS query: dig www.cecs.anu.edu.au

```
->~dig www.cecs.anu.edu.au

; <<>> DiG 9.10.3-P4-Ubuntu <<>> www.cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 60950
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 3, ADDITIONAL: 7

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

;; ANSWER SECTION:
www.cecs.anu.edu.au.    3242    IN      CNAME   rproxy.cecs.anu.edu.au.
rproxy.cecs.anu.edu.au. 3242    IN      A       150.203.161.98

;; AUTHORITY SECTION:
cecs.anu.edu.au.        1442    IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.        1442    IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.        1442    IN      NS      ns2.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns3.cecs.anu.edu.au.    1442    IN      A       150.203.161.50
ns3.cecs.anu.edu.au.    1442    IN      AAAA    2001:388:1034:2905::32
ns4.cecs.anu.edu.au.    1335    IN      A       150.203.161.38
ns4.cecs.anu.edu.au.    1442    IN      AAAA    2001:388:1034:2905::26
ns2.cecs.anu.edu.au.    1444    IN      A       150.203.161.36
ns2.cecs.anu.edu.au.    1442    IN      AAAA    2001:388:1034:2905::24

;; Query time: 7 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Aug 15 19:45:34 AEST 2018
;; MSG SIZE  rcvd: 271
```

Question 2. What is the canonical name for the CECS ANU web server? What is its IP address? Suggest a reason for having an alias for this server.

- canonical name: rproxy.cecs.anu.edu.au
- IP address: 150.203.161.98
- reason: Customize a service address

Question 3. What can you make of the rest of the response (i.e. the details available in the Authority and Additional sections)?

- if I want to know the IP address of the subdomain, I can query it from the nameserver.

Question 4. What is the IP address of the local nameserver for your machine?

- 127.0.0.1

```
->~ dig localhost

; <<>> DiG 9.10.3-P4-Ubuntu <<>> localhost
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 50568
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2

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

;; ANSWER SECTION:
localhost.              86400   IN      A       127.0.0.1

;; AUTHORITY SECTION:
localhost.              86400   IN      NS      localhost.

;; ADDITIONAL SECTION:
localhost.              86400   IN      AAAA    ::1

;; Query time: 119 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Aug 15 20:09:43 AEST 2018
;; MSG SIZE  rcvd: 96
```

Question 5. What are the DNS nameservers for the “cecs.anu.edu.au” domain (note: the domain name is cecs.anu.edu.au and not

www.cecs.anu.edu.au)? Find out their IP addresses? What type of DNS query is sent to obtain this information?

- DNS nameservers:
  - ns2.cecs.anu.edu.au
  - ns3.cecs.anu.edu.au
  - ns4.cecs.anu.edu.au
- IP addresses:
  - 150.203.161.50
  - 150.203.161.36
  - 150.203.161.38

```
->~ dig cecs.anu.edu.au

; <<>> DiG 9.10.3-P4-Ubuntu <<>> cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 15730
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 7

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

;; ANSWER SECTION:
cecs.anu.edu.au.        3600    IN      A       150.203.161.98

;; AUTHORITY SECTION:
cecs.anu.edu.au.        823     IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.        823     IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.        823     IN      NS      ns2.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns3.cecs.anu.edu.au.    2903    IN      A       150.203.161.50
ns3.cecs.anu.edu.au.    2903    IN      AAAA    2001:388:1034:2905::32
ns2.cecs.anu.edu.au.    3367    IN      A       150.203.161.36
ns2.cecs.anu.edu.au.    823     IN      AAAA    2001:388:1034:2905::24
ns4.cecs.anu.edu.au.    724     IN      A       150.203.161.38
ns4.cecs.anu.edu.au.    823     IN      AAAA    2001:388:1034:2905::26

;; Query time: 14 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Aug 15 20:11:43 AEST 2018
;; MSG SIZE  rcvd: 246
```

Question 6. What is the DNS name associated with the IP address 149.171.158.109? What type of DNS query is sent to obtain this information?

- DNS name:
  - engplws008.ad.unsw.edu.au
  - engplws008.eng.unsw.edu.au
  - www.engineering.unsw.edu.au

```
->~ dig -x 149.171.158.109

; <<>> DiG 9.10.3-P4-Ubuntu <<>> -x 149.171.158.109
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 10872
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 3, ADDITIONAL: 7

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

;; ANSWER SECTION:
109.158.171.149.in-addr.arpa. 3600 IN   PTR     engplws008.ad.unsw.edu.au.
109.158.171.149.in-addr.arpa. 3600 IN   PTR     engplws008.eng.unsw.edu.au.
109.158.171.149.in-addr.arpa. 3600 IN   PTR
www.engineering.unsw.edu.au.

;; AUTHORITY SECTION:
158.171.149.in-addr.arpa. 10800 IN      NS      ns2.unsw.edu.au.
158.171.149.in-addr.arpa. 10800 IN      NS      ns3.unsw.edu.au.
158.171.149.in-addr.arpa. 10800 IN      NS      ns1.unsw.edu.au.

;; ADDITIONAL SECTION:
ns1.unsw.edu.au.        10800   IN      A       129.94.0.192
ns1.unsw.edu.au.        10800   IN      AAAA    2001:388:c:35::1
ns2.unsw.edu.au.        10800   IN      A       129.94.0.193
ns2.unsw.edu.au.        10800   IN      AAAA    2001:388:c:35::2
ns3.unsw.edu.au.        10800   IN      A       192.155.82.178
ns3.unsw.edu.au.        10800   IN      AAAA
2600:3c01::f03c:91ff:fe73:5f10

;; Query time: 5 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Aug 15 20:13:53 AEST 2018
;; MSG SIZE  rcvd: 341
```

Question 7. Run dig and query the CSE nameserver (129.94.242.33) for the mail servers for Yahoo! Mail (again the domain name is yahoo.com, not www.yahoo.com). Did you get an authoritative answer? Why? (HINT: Just because a response contains information in the authoritative part of the DNS response message does not mean it came from an authoritative name server. You should examine the flags in the response to determine the answer)

- mail servers:
    - mta5.am0.yahoodns.net
    - mta6.am0.yahoodns.net
    - mta7.am0.yahoodns.net
- No, because this server has been cached

```
->~ dig @129.94.242.33 yahoo.com mx

; <<>> DiG 9.10.3-P4-Ubuntu <<>> @129.94.242.33 yahoo.com mx
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 25281
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 9

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

;; ANSWER SECTION:
yahoo.com.              1403    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.              1403    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.              1403    IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.              76222   IN      NS      ns2.yahoo.com.
yahoo.com.              76222   IN      NS      ns5.yahoo.com.
yahoo.com.              76222   IN      NS      ns1.yahoo.com.
yahoo.com.              76222   IN      NS      ns4.yahoo.com.
yahoo.com.              76222   IN      NS      ns3.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.          162610  IN      A       68.180.131.16
ns1.yahoo.com.          63220   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.          560161  IN      A       68.142.255.16
ns2.yahoo.com.          41761   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.          229209  IN      A       203.84.221.53
ns3.yahoo.com.          9514    IN      AAAA    2406:8600:b8:fe03::1003
ns4.yahoo.com.          145511  IN      A       98.138.11.157
ns5.yahoo.com.          153555  IN      A       119.160.253.83

;; Query time: 8 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Wed Aug 15 20:29:44 AEST 2018
;; MSG SIZE  rcvd: 371
```

```
->~ nslookup yahoo.com
Server:         127.0.1.1
Address:        127.0.1.1#53
```

```
Non-authoritative answer:
Name:   yahoo.com
Address: 98.137.246.8
Name:   yahoo.com
Address: 98.137.246.7
Name:   yahoo.com
Address: 72.30.35.9
Name:   yahoo.com
Address: 98.138.219.231
Name:   yahoo.com
Address: 98.138.219.232
Name:   yahoo.com
Address: 72.30.35.10
```

Question 8. Repeat the above (i.e. ## Question 7) but use one of the nameservers obtained in ## Question 5. What is the result?

```
->~ dig @150.203.161.36 yahoo.com mx

; <<>> DiG 9.10.3-P4-Ubuntu <<>> @150.203.161.36 yahoo.com mx
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 45548
;; 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: 9 msec
;; SERVER: 150.203.161.36#53(150.203.161.36)
;; WHEN: Wed Aug 15 20:36:47 AEST 2018
;; MSG SIZE  rcvd: 38
```

Question 9. Obtain the authoritative answer for the mail servers for Yahoo! mail. What type of DNS query is sent to obtain this information?

- dig @ns1.yahoo.com yahoo.com MX

```
->~ dig yahoo.com NS

; <<>> DiG 9.10.3-P4-Ubuntu <<>> yahoo.com NS
;; global options: +cmd
```

```
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 29756
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 9

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

;; ANSWER SECTION:
yahoo.com.              168736  IN      NS      ns5.yahoo.com.
yahoo.com.              168736  IN      NS      ns2.yahoo.com.
yahoo.com.              168736  IN      NS      ns4.yahoo.com.
yahoo.com.              168736  IN      NS      ns1.yahoo.com.
yahoo.com.              168736  IN      NS      ns3.yahoo.com.

;; ADDITIONAL SECTION:
ns3.yahoo.com.          329154  IN      A       203.84.221.53
ns3.yahoo.com.          133597  IN      AAAA    2406:8600:b8:fe03::1003
ns5.yahoo.com.          134697  IN      A       119.160.253.83
ns4.yahoo.com.          219984  IN      A       98.138.11.157
ns2.yahoo.com.          138170  IN      A       68.142.255.16
ns2.yahoo.com.          133597  IN      AAAA    2001:4998:140::1002
ns1.yahoo.com.          155005  IN      A       68.180.131.16
ns1.yahoo.com.          62683   IN      AAAA    2001:4998:130::1001

;; Query time: 7 msec
;; SERVER: 127.0.1.1#53(127.0.1.1)
;; WHEN: Wed Aug 15 20:38:40 AEST 2018
;; MSG SIZE  rcvd: 292
```

```
->~ dig @ns1.yahoo.com yahoo.com MX

; <<>> DiG 9.10.3-P4-Ubuntu <<>> @ns1.yahoo.com yahoo.com MX
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 36984
;; 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 mta7.am0.yahoodns.net.
yahoo.com.              1800    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.              1800    IN      MX      1 mta5.am0.yahoodns.net.
```

```
;; AUTHORITY SECTION:
yahoo.com.              172800  IN      NS      ns1.yahoo.com.
yahoo.com.              172800  IN      NS      ns3.yahoo.com.
yahoo.com.              172800  IN      NS      ns2.yahoo.com.
yahoo.com.              172800  IN      NS      ns4.yahoo.com.
yahoo.com.              172800  IN      NS      ns5.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: 240 msec
;; SERVER: 68.180.131.16#53(68.180.131.16)
;; WHEN: Wed Aug 15 20:39:16 AEST 2018
;; MSG SIZE  rcvd: 371
```

Question 10. In this exercise you simulate the iterative DNS query process to find the IP address of your machine (e.g. lyre00.cse.unsw.edu.au). First, find the name server (query type NS) of the "." domain (root domain). Query this nameserver to find the authoritative name server for the "au." domain. Query this second server to find the authoritative nameserver for the "edu.au." domain. Now query this nameserver to find the authoritative nameserver for "unsw.edu.au". Next query the nameserver of unsw.edu.au to find the authoritative name server of cse.unsw.edu.au. Now query the nameserver of cse.unsw.edu.au to find the IP address of your host. How many DNS servers do you have to query to get the authoritative answer?

- drum23.cse.unsw.edu.au 129.94.209.53
- I need to query 5 DNS server

```
z5129432@drum23:~/Github/COMP9331_Socket/lab3$ dig . NS

; <<>> DiG 9.7.3 <<>> . NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 61689
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 13

;; QUESTION SECTION:
;.                              IN      NS

;; ANSWER SECTION:
.                       27863   IN      NS      m.root-servers.net.
```

```
.                       27863   IN      NS      a.root-servers.net.
.                       27863   IN      NS      j.root-servers.net.
.                       27863   IN      NS      d.root-servers.net.
.                       27863   IN      NS      i.root-servers.net.
.                       27863   IN      NS      e.root-servers.net.
.                       27863   IN      NS      l.root-servers.net.
.                       27863   IN      NS      h.root-servers.net.
.                       27863   IN      NS      g.root-servers.net.
.                       27863   IN      NS      f.root-servers.net.
.                       27863   IN      NS      b.root-servers.net.
.                       27863   IN      NS      c.root-servers.net.
.                       27863   IN      NS      k.root-servers.net.

;; ADDITIONAL SECTION:
a.root-servers.net.     105563  IN      A       198.41.0.4
a.root-servers.net.     37502   IN      AAAA    2001:503:ba3e::2:30
b.root-servers.net.     100473  IN      A       199.9.14.201
b.root-servers.net.     302101  IN      AAAA    2001:500:200::b
c.root-servers.net.     26788   IN      A       192.33.4.12
c.root-servers.net.     369555  IN      AAAA    2001:500:2::c
d.root-servers.net.     53204   IN      A       199.7.91.13
d.root-servers.net.     39065   IN      AAAA    2001:500:2d::d
e.root-servers.net.     276043  IN      A       192.203.230.10
e.root-servers.net.     313001  IN      AAAA    2001:500:a8::e
f.root-servers.net.     20162   IN      A       192.5.5.241
f.root-servers.net.     39347   IN      AAAA    2001:500:2f::f
g.root-servers.net.     26787   IN      A       192.112.36.4

;; Query time: 0 msec
;; SERVER: 129.94.208.3#53(129.94.208.3)
;; WHEN: Thu Aug 16 09:50:31 2018
;; MSG SIZE  rcvd: 508


z5129432@drum23:~/Github/COMP9331_Socket/lab3$ dig @198.41.0.4 au. NS

; <<>> DiG 9.7.3 <<>> @198.41.0.4 au. NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 5484
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 10, ADDITIONAL: 15
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;au.                            IN      NS

;; 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

;; Query time: 211 msec
;; SERVER: 198.41.0.4#53(198.41.0.4)
;; WHEN: Thu Aug 16 09:51:28 2018
;; MSG SIZE  rcvd: 504


; <<>> DiG 9.7.3 <<>> @162.159.25.38 edu.au NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 24818
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 8
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;edu.au.                                IN      NS

;; AUTHORITY SECTION:
edu.au.                 86400   IN      NS      r.au.
edu.au.                 86400   IN      NS      s.au.
edu.au.                 86400   IN      NS      q.au.
edu.au.                 86400   IN      NS      t.au.

;; ADDITIONAL SECTION:
q.au.                   86400   IN      A       65.22.196.1
r.au.                   86400   IN      A       65.22.197.1
s.au.                   86400   IN      A       65.22.198.1
t.au.                   86400   IN      A       65.22.199.1
q.au.                   86400   IN      AAAA    2a01:8840:be::1
r.au.                   86400   IN      AAAA    2a01:8840:bf::1
s.au.                   86400   IN      AAAA    2a01:8840:c0::1
t.au.                   86400   IN      AAAA    2a01:8840:c1::1
```

```
;; Query time: 15 msec
;; SERVER: 162.159.25.38#53(162.159.25.38)
;; WHEN: Thu Aug 16 09:52:27 2018
;; MSG SIZE  rcvd: 264


z5129432@drum23:~/Github/COMP9331_Socket/lab3$ dig @65.22.196.1 unsw.edu.au
NS

; <<>> DiG 9.7.3 <<>> @65.22.196.1 unsw.edu.au NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 4239
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 3, ADDITIONAL: 5
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;unsw.edu.au.                   IN      NS

;; AUTHORITY SECTION:
unsw.edu.au.            900     IN      NS      ns1.unsw.edu.au.
unsw.edu.au.            900     IN      NS      ns2.unsw.edu.au.
unsw.edu.au.            900     IN      NS      ns3.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: 14 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Thu Aug 16 09:52:53 2018
;; MSG SIZE  rcvd: 187


z5129432@drum23:~/Github/COMP9331_Socket/lab3$ dig @129.94.0.192
cse.unsw.edu.au NS

; <<>> DiG 9.7.3 <<>> @129.94.0.192 cse.unsw.edu.au NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2865
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 2, ADDITIONAL: 4
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;cse.unsw.edu.au.               IN      NS

;; 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 129.94.208.3
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
maestro.orchestra.cse.unsw.edu.au. 10800 IN A   129.94.242.33

;; Query time: 4 msec
;; SERVER: 129.94.0.192#53(129.94.0.192)
;; WHEN: Thu Aug 16 09:53:32 2018
;; MSG SIZE  rcvd: 153


z5129432@drum23:~/Github/COMP9331_Socket/lab3$ dig @129.94.242.33
drum23.cse.unsw.edu.au

; <<>> DiG 9.7.3 <<>> @129.94.242.33 drum23.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64626
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 2

;; QUESTION SECTION:
;drum23.cse.unsw.edu.au.                IN      A

;; ANSWER SECTION:
drum23.cse.unsw.edu.au. 3600    IN      A       129.94.209.53

;; AUTHORITY SECTION:
cse.unsw.edu.au.        3600    IN      NS
maestro.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.        3600    IN      NS
beethoven.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  129.94.208.3

;; Query time: 0 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Thu Aug 16 09:54:25 2018
;; MSG SIZE  rcvd: 144
```

Question 11. Can one physical machine have several names and/or IP addresses associated with it?

- Yes. Because it can have several interface. Moreover, one IP address can have several host names.