

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

Answer 1:

```
; <<>> DiG 9.7.3 <<>> www.cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 23073
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 3, ADDITIONAL: 6

;; QUESTION SECTION:
;www.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
www.cecs.anu.edu.au.     939     IN      CNAME   rproxy.cecs.anu.edu.au.
rproxy.cecs.anu.edu.au. 939     IN      A       150.203.161.98

;; AUTHORITY SECTION:
cecs.anu.edu.au.        932     IN      NS       ns2.cecs.anu.edu.au.
cecs.anu.edu.au.        932     IN      NS       ns3.cecs.anu.edu.au.
cecs.anu.edu.au.        932     IN      NS       ns4.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au.    3461    IN      A       150.203.161.36
ns2.cecs.anu.edu.au.    3161    IN      AAAA    2001:388:1034:2905::24
ns3.cecs.anu.edu.au.    3462    IN      A       150.203.161.50
ns3.cecs.anu.edu.au.    211     IN      AAAA    2001:388:1034:2905::32
ns4.cecs.anu.edu.au.    275     IN      A       150.203.161.38
ns4.cecs.anu.edu.au.    275     IN      AAAA    2001:388:1034:2905::26

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 14:52:20 2018
;; MSG SIZE rcvd: 260
```

According to the answer section, the Ip of www.cecs.anu.edu.au is 150.203.161.98. An 'A' type query sent to DNS server for getting this answer

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.

Answer 2:

```

; <<>> DiG 9.7.3 <<>> rproxy.cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 34123
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 5

;; QUESTION SECTION:
rproxy.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
rproxy.cecs.anu.edu.au. 678      IN      A      150.203.161.98

;; AUTHORITY SECTION:
cecs.anu.edu.au.      671      IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.      671      IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.      671      IN      NS      ns2.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au. 3200      IN      A      150.203.161.36
ns2.cecs.anu.edu.au. 2900      IN      AAAA    2001:388:1034:2905::24
ns3.cecs.anu.edu.au. 3201      IN      A      150.203.161.50
ns4.cecs.anu.edu.au. 14        IN      A      150.203.161.38
ns4.cecs.anu.edu.au. 14        IN      AAAA    2001:388:1034:2905::26

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 14:56:41 2018
;; MSG SIZE rcvd: 214

```

Canonical name is rproxy.cecs.anu.edu.au. And its Ip address is 150.203.161.98.

Canonical name could give us advantage when we want to have multiple hostname which all point to same Ip address. If a IP host provides two kinds of server, provide could use canonical name to distinguish these two server. Meanwhile, if host changes its Ip address, server can just change an 'A' RR and make other canonical names point to this changed 'A' RR.

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

Answer 3:

In Authority section, they tell us the authoritative DNS server for cecs.anu.edu.au.

In additional section, there are the IP address of these authoritative DNS server, including its IPv4 address and IPv6 address.

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

The IP address of my machine's local nameserver is 129.94.242.2, at last third line of dig command.

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?

```

; <<>> DiG 9.7.3 <<>> cecs.anu.edu.au
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 13727
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 6

;; QUESTION SECTION:
;cecs.anu.edu.au.          IN      A

;; ANSWER SECTION:
cecs.anu.edu.au.          3323    IN      A      150.203.161.98

;; AUTHORITY SECTION:
cecs.anu.edu.au.          239     IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.          239     IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.          239     IN      NS      ns2.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au.      957     IN      A      150.203.161.36
ns2.cecs.anu.edu.au.      657     IN      AAAA    2001:388:1034:2905::24
ns3.cecs.anu.edu.au.      958     IN      A      150.203.161.50
ns3.cecs.anu.edu.au.      239     IN      AAAA    2001:388:1034:2905::32
ns4.cecs.anu.edu.au.      2960    IN      A      150.203.161.38
ns4.cecs.anu.edu.au.      3237    IN      AAAA    2001:388:1034:2905::26

;; Query time: 5 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 15:34:04 2018
;; MSG SIZE rcvd: 235

```

ns3.cecs.anu.edu.au(150.203.161.50);

ns4.cecs.anu.edu.au(150.203.161.38);

ns2.cecs.anu.edu.au(150.203.161.36)

The type of DNS query is 'A'.

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?

```

-bash-4.2$ dig -x 149.171.158.109

; <<>> DiG 9.7.3 <<>> -x 149.171.158.109
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 1889
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 3, ADDITIONAL: 6

;; QUESTION SECTION:
;109.158.171.149.in-addr.arpa. IN PTR

;; ANSWER SECTION:
109.158.171.149.in-addr.arpa. 2429 IN PTR engplws008.eng.unsw.edu.au.
109.158.171.149.in-addr.arpa. 2429 IN PTR www.engineering.unsw.edu.au.
109.158.171.149.in-addr.arpa. 2429 IN PTR engplws008.ad.unsw.edu.au.

;; AUTHORITY SECTION:
158.171.149.in-addr.arpa. 9629 IN NS ns1.unsw.edu.au.
158.171.149.in-addr.arpa. 9629 IN NS ns2.unsw.edu.au.
158.171.149.in-addr.arpa. 9629 IN NS ns3.unsw.edu.au.

;; ADDITIONAL SECTION:
ns1.unsw.edu.au. 833 IN A 129.94.0.192
ns1.unsw.edu.au. 3485 IN AAAA 2001:388:c:35::1
ns2.unsw.edu.au. 833 IN A 129.94.0.193
ns2.unsw.edu.au. 5803 IN AAAA 2001:388:c:35::2
ns3.unsw.edu.au. 833 IN A 192.155.82.178
ns3.unsw.edu.au. 8855 IN AAAA 2600:3c01::f03c:91ff:fe73:5f10

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 15:41:57 2018
;; MSG SIZE rcvd: 330

```

Engplws008.eng.unsw.edu.au

Engplws008.ad.unsw.edu.au

www.engineering.unsw.edu.au

The type of DNS query is 'PTR'.

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)

```

; <<>> DiG 9.7.3 <<>> @129.94.242.33 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 9972
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 8

;; QUESTION SECTION:
yahoo.com.                IN      MX

;; ANSWER SECTION:
yahoo.com.                956     IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.                956     IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                956     IN      MX      1 mta6.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                12023   IN      NS      ns2.yahoo.com.
yahoo.com.                12023   IN      NS      ns3.yahoo.com.
yahoo.com.                12023   IN      NS      ns4.yahoo.com.
yahoo.com.                12023   IN      NS      ns1.yahoo.com.
yahoo.com.                12023   IN      NS      ns5.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            171388  IN      A        68.180.131.16
ns1.yahoo.com.            66857   IN      AAAA     2001:4998:130::1001
ns2.yahoo.com.            154270  IN      A        68.142.255.16
ns2.yahoo.com.            57324   IN      AAAA     2001:4998:140::1002
ns3.yahoo.com.            345254  IN      A        203.84.221.53
ns3.yahoo.com.            25077   IN      AAAA     2406:8600:b8:fe03::1003
ns4.yahoo.com.            161074  IN      A        98.138.11.157
ns5.yahoo.com.            147145  IN      A        119.160.253.83

```

This is not a authoritative response because there is no 'aa' in flags.

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

```

<<>> DiG 9.7.3 <<>> @150.203.161.50 yahoo.com MX
(1 server found)
; global options: +cmd
; Got answer:
; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 29109
; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 0
; WARNING: recursion requested but not available

; QUESTION SECTION:
yahoo.com.                IN      MX

; Query time: 7 msec
; SERVER: 150.203.161.50#53(150.203.161.50)
; WHEN: Wed Aug 15 16:08:23 2018
; MSG SIZE rcvd: 27

```

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

```

-bash-4.2$ dig yahoo.com MX

; <<>> DiG 9.7.3 <<>> yahoo.com MX
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 59691
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 8

;; QUESTION SECTION:
yahoo.com.                IN      MX

;; ANSWER SECTION:
yahoo.com.                191     IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                191     IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.                191     IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                91712   IN      NS      ns2.yahoo.com.
yahoo.com.                91712   IN      NS      ns1.yahoo.com.
yahoo.com.                91712   IN      NS      ns4.yahoo.com.
yahoo.com.                91712   IN      NS      ns5.yahoo.com.
yahoo.com.                91712   IN      NS      ns3.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            178100  IN      A       68.180.131.16
ns1.yahoo.com.            66784   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.            154197  IN      A       68.142.255.16
ns2.yahoo.com.            57251   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.            345181  IN      A       203.84.221.53
ns3.yahoo.com.            25004   IN      AAAA    2406:8600:b8:fe03::1003
ns4.yahoo.com.            161001  IN      A       98.138.11.157
ns5.yahoo.com.            150724  IN      A       119.160.253.83

;; Query time: 6 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 16:11:34 2018
;; MSG SIZE rcvd: 360

```

```

-bash-4.2$ dig @68.180.131.16 yahoo.com MX

; <<>> DiG 9.7.3 <<>> @68.180.131.16 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 52815
;; flags: qr aa rd; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 8
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;yahoo.com.                IN      MX

;; ANSWER SECTION:
yahoo.com.                 1800    IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.                 1800    IN      MX      1 mta5.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      ns5.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.

;; 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: 145 msec
;; SERVER: 68.180.131.16#53(68.180.131.16)
;; WHEN: Wed Aug 15 16:13:46 2018
;; MSG SIZE  rcvd: 360

```

The type of query is MX

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.


```

; <<> DiG 9.7.3 <<> . NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 65106
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 13

;; QUESTION SECTION:
.                IN      NS

;; ANSWER SECTION:
                10743    IN      NS      b.root-servers.net.
                10743    IN      NS      h.root-servers.net.
                10743    IN      NS      d.root-servers.net.
                10743    IN      NS      g.root-servers.net.
                10743    IN      NS      f.root-servers.net.
                10743    IN      NS      a.root-servers.net.
                10743    IN      NS      m.root-servers.net.
                10743    IN      NS      i.root-servers.net.
                10743    IN      NS      l.root-servers.net.
                10743    IN      NS      e.root-servers.net.
                10743    IN      NS      c.root-servers.net.
                10743    IN      NS      k.root-servers.net.
                10743    IN      NS      j.root-servers.net.

;; ADDITIONAL SECTION:
a.root-servers.net. 99869 IN      A      198.41.0.4
a.root-servers.net. 218117 IN     AAAA   2001:503:ba3e::2:30
b.root-servers.net. 603053 IN      A      199.9.14.201
b.root-servers.net. 364468 IN     AAAA   2001:500:200::b
c.root-servers.net. 349925 IN      A      192.33.4.12
c.root-servers.net. 587394 IN     AAAA   2001:500:2::c
d.root-servers.net. 414105 IN      A      199.7.91.13
d.root-servers.net. 414105 IN     AAAA   2001:500:2d::d
e.root-servers.net. 616 IN      A      192.203.230.10
e.root-servers.net. 375368 IN     AAAA   2001:500:a8::e
f.root-servers.net. 254151 IN      A      192.5.5.241
f.root-servers.net. 39568 IN     AAAA   2001:500:2f::f
g.root-servers.net. 342263 IN      A      192.112.36.4

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 16:31:04 2018
;; MSG SIZE rcvd: 508

```



```

; <<>> DiG 9.7.3 <<>> @198.41.0.4 au.
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 6167
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 10, ADDITIONAL: 15
;; WARNING: recursion requested but not available

;; QUESTION SECTION:
;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

;; Query time: 209 msec
;; SERVER: 198.41.0.4#53(198.41.0.4)
;; WHEN: Wed Aug 15 16:38:07 2018
;; MSG SIZE rcvd: 504

```

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".

```

; <<>> DiG 9.7.3 <<>> @202.12.31.53 edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43664
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 8
;; WARNING: recursion requested but not available

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

;; AUTHORITY SECTION:
edu.au.      86400    IN      NS      r.au.
edu.au.      86400    IN      NS      q.au.
edu.au.      86400    IN      NS      t.au.
edu.au.      86400    IN      NS      s.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: 3 msec
;; SERVER: 202.12.31.53#53(202.12.31.53)
;; WHEN: Wed Aug 15 16:39:31 2018
;; MSG SIZE rcvd: 264

```

```

; <<>> DiG 9.7.3 <<>> @65.22.197.1 unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 51376
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 3, ADDITIONAL: 5
;; WARNING: recursion requested but not available

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

;; AUTHORITY SECTION:
unsw.edu.au.                 900     IN      NS      ns2.unsw.edu.au.
unsw.edu.au.                 900     IN      NS      ns1.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: 13 msec
;; SERVER: 65.22.197.1#53(65.22.197.1)
;; WHEN: Wed Aug 15 16:40:29 2018
;; MSG SIZE rcvd: 187

```

Next query the nameserver of unsw.edu.au to find the authoritative name server of cse.unsw.edu.au.

```

-bash-4.2$ dig @129.94.0.192 cse.unsw.edu.au

; <<>> DiG 9.7.3 <<>> @129.94.0.192 cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7910
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 2, ADDITIONAL: 4
;; WARNING: recursion requested but not available

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

;; AUTHORITY SECTION:
cse.unsw.edu.au.             10800   IN      NS      beethoven.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.             10800   IN      NS      maestro.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: Wed Aug 15 16:41:28 2018
;; MSG SIZE rcvd: 153

```

Now query the nameserver of cse.unsw.edu.au to find the IP address of your host.

```

<<>> DiG 9.7.3 <<>> @129.94.208.3 login.cse.unsw.edu.au
; (1 server found)
; global options: +cmd
; Got answer:
; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 58342
; flags: qr aa rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 2, ADDITIONAL: 2

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

; ANSWER SECTION:
login.cse.unsw.edu.au. 3600    IN      A      129.94.242.19
login.cse.unsw.edu.au. 3600    IN      A      129.94.242.49
login.cse.unsw.edu.au. 3600    IN      A      129.94.242.53

; 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: 1 msec
; SERVER: 129.94.208.3#53(129.94.208.3)
; WHEN: Wed Aug 15 16:42:43 2018
; MSG SIZE rcvd: 175

```

How many DNS servers do you have to query to get the authoritative answer?

There are six DNS server.

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

A physical machine can have many names but they can only have one IP addresses unless it have multiple network cards.