COMP3331 Lab 3

Exercise 3

1. The IP address of www.eecs.berkeley.edu is 23.185.0.1 as shown in the answer section below. A 'type A' DNS query is sent to get this answer because they are used for mapping hostnames to IP addresses.

```
z5205864@vx9:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig www.eecs.b
erkeley.edu

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> www.eecs.berkeley.edu
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 25005
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 4, ADDITIONAL: 9

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;www.eecs.berkeley.edu.         IN      A

;; ANSWER SECTION:
www.eecs.berkeley.edu.  50389   IN      CNAME   live-eecs.pantheonsite.io.
live-eecs.pantheonsite.io. 600  IN      CNAME   fe1.edge.pantheon.io.
fe1.edge.pantheon.io.   300     IN      A       23.185.0.1

;; AUTHORITY SECTION:
edge.pantheon.io.       300     IN      NS      ns-644.awsdns-16.net.
edge.pantheon.io.       300     IN      NS      ns-2013.awsdns-59.co.uk.
edge.pantheon.io.       300     IN      NS      ns-233.awsdns-29.com.
edge.pantheon.io.       300     IN      NS      ns-1213.awsdns-23.org.

;; ADDITIONAL SECTION:
ns-233.awsdns-29.com.   59317   IN      A       205.251.192.233
ns-233.awsdns-29.com.   59317   IN      AAAA    2600:9000:5300:e900::1
ns-644.awsdns-16.net.   55136   IN      A       205.251.194.132
ns-644.awsdns-16.net.   55136   IN      AAAA    2600:9000:5302:8400::1
ns-1213.awsdns-23.org.  56334   IN      A       205.251.196.189
ns-1213.awsdns-23.org.  56334   IN      AAAA    2600:9000:5304:bd00::1
ns-2013.awsdns-59.co.uk. 53861  IN      A       205.251.199.221
ns-2013.awsdns-59.co.uk. 53861  IN      AAAA    2600:9000:5307:dd00::1

;; Query time: 61 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Mon Mar 08 21:58:08 AEDT 2021
;; MSG SIZE  rcvd: 453
```

2. From the results above, the CNAME for www.eecs.berkeley.edu is live-eecs.pantheonsite.io. This can also be found by typing *dig www.eecs.berkeley.edu CNAME*.
   One reason for having an alias for this server is to provide a simpler hostname that is easier to remember since canonical names can be harder to remember or very long compared to its aliases.
3. The authority section contains NS records which are the authoritive name servers responsible for the domain. In this case, the four name servers for Berkeley are ns-

664.awsdns-16.net, ns-2013.awsdns-859.co.uk, ns-233.awsdns-229.com and ns-1213.awsdns-23.org.

The additional section contains A and AAAA records which display the IPv4 and IPv6 addresses respectively for each of the domain's name servers.

4. The IP address of the local name server of my machine is 129.94.242.33 as shown on the bottom portion of the results.
5. To find the DNS name servers for eecs.berkeley.edu, the following command is used:
   dig eecs.berkeley.edu NS

```
z5205864@vx9:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ 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: 47514
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 8

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

;; ANSWER SECTION:
eecs.berkeley.edu.      86400   IN      NS      ns.eecs.berkeley.edu.
eecs.berkeley.edu.      86400   IN      NS      adns3.berkeley.edu.
eecs.berkeley.edu.      86400   IN      NS      adns2.berkeley.edu.
eecs.berkeley.edu.      86400   IN      NS      ns.CS.berkeley.edu.
eecs.berkeley.edu.      86400   IN      NS      adns1.berkeley.edu.

;; ADDITIONAL SECTION:
ns.CS.berkeley.edu.     67869   IN      A       169.229.60.61
adns1.berkeley.edu.     1549    IN      A       128.32.136.3
adns1.berkeley.edu.     1549    IN      AAAA    2607:f140:ffff:fffe::3
adns2.berkeley.edu.     10329   IN      A       128.32.136.14
adns2.berkeley.edu.     1549    IN      AAAA    2607:f140:ffff:fffe::e
adns3.berkeley.edu.     10329   IN      A       192.107.102.142
adns3.berkeley.edu.     10329   IN      AAAA    2607:f140:a000:d::abc

;; Query time: 190 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Mon Mar 08 22:27:45 AEDT 2021
;; MSG SIZE  rcvd: 291
```

   The DNS name servers are ns.eecs.berkeley.edu, ns.CS.berkeley.edu, adns1.berkeley.edu, adns2.berkeley.edu and adns3.berkeley.edu.

   Their IPv4 addresses are 169.229.60.61, 128.229.60.61, 128.32.136.14, 192.107.102.142 respectively.

6. To find the DNS name associated with an IP address, reverse DNS is used.

```
z5205864@vx9:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig -x 111.68.101.54

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> -x 111.68.101.54
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 23569
;; 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. 3600 IN     PTR     webserver.seecs.nust.edu.pk.

;; AUTHORITY SECTION:
101.68.111.in-addr.arpa. 86400  IN      NS      ns2.hec.gov.pk.
101.68.111.in-addr.arpa. 86400  IN      NS      ns1.hec.gov.pk.

;; ADDITIONAL SECTION:
ns1.hec.gov.pk.         3600    IN      A       103.4.93.5
ns2.hec.gov.pk.         3600    IN      A       103.4.93.6

;; Query time: 406 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Mon Mar 08 22:43:59 AEDT 2021
;; MSG SIZE  rcvd: 172
```

As shown in the answer section above, the DNS name is webserver.seecs.nust.edu.pk. A PTR type DNS query is sent to obtain this information.

7.

```
z5205864@vx9:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @129.94.242.33 yahoo.com 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: 62121
;; 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.              1749    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.              1749    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.              1749    IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.              48306   IN      NS      ns5.yahoo.com.
yahoo.com.              48306   IN      NS      ns2.yahoo.com.
yahoo.com.              48306   IN      NS      ns3.yahoo.com.
yahoo.com.              48306   IN      NS      ns1.yahoo.com.
yahoo.com.              48306   IN      NS      ns4.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.          140638  IN      A       68.180.131.16
ns1.yahoo.com.          126808  IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.          140638  IN      A       68.142.255.16
ns2.yahoo.com.          67968   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.          900     IN      A       27.123.42.42
ns3.yahoo.com.          900     IN      AAAA    2406:8600:f03f:1f8::1003
ns4.yahoo.com.          393339  IN      A       98.138.11.157
ns5.yahoo.com.          20094   IN      A       202.165.97.53
ns5.yahoo.com.          20094   IN      AAAA    2406:2000:ff60::53

;; Query time: 2 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Mon Mar 08 22:47:35 AEDT 2021
;; MSG SIZE  rcvd: 399
```

Since there is no aa (authoritative answer) flag, this means we did not get an authoritative answer. This is due to the server not having authority for the Yahoo domain.

8. No response is given when dig is performed on the Berkeley nameservers.

```
z5205864@vx5:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @adns2.ber
keley.edu yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @adns2.berkeley.edu yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 14799
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1220
;; QUESTION SECTION:
;yahoo.com.                     IN      MX

;; Query time: 181 msec
;; SERVER: 128.32.136.14#53(128.32.136.14)
;; WHEN: Tue Mar 09 12:42:26 AEDT 2021
;; MSG SIZE  rcvd: 38
```

This is because the Berkeley nameservers haven't cached any information about Yahoo.

9. An MX query is sent to one of the authoritative nameservers for the domain yahoo.com (shown in the results from Q7) to obtain the authoritative answer for its mail servers.

```
z5205864@vx5:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @ns1.yahoo.com yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns1.yahoo.com yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 39712
;; 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 mta5.am0.yahoodns.net.
yahoo.com.              1800    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.              1800    IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.              172800  IN      NS      ns4.yahoo.com.
yahoo.com.              172800  IN      NS      ns3.yahoo.com.
yahoo.com.              172800  IN      NS      ns1.yahoo.com.
yahoo.com.              172800  IN      NS      ns5.yahoo.com.
yahoo.com.              172800  IN      NS      ns2.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.          1800    IN      A       27.123.42.42
ns4.yahoo.com.          1209600 IN      A       98.138.11.157
ns5.yahoo.com.          86400   IN      A       202.165.97.53
ns1.yahoo.com.          86400   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.          86400   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.          1800    IN      AAAA    2406:8600:f03f:1f8::1003
ns5.yahoo.com.          86400   IN      AAAA    2406:2000:ff60::53

;; Query time: 145 msec
;; SERVER: 68.180.131.16#53(68.180.131.16)
;; WHEN: Tue Mar 09 12:51:57 AEDT 2021
;; MSG SIZE  rcvd: 399
```

10. Firstly run *dig . NS* to find information about the nameservers of the root domain.

```
z5205864@vx3:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig . NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> . NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2252
;; 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:
.                       2249    IN      NS      l.root-servers.net.
.                       2249    IN      NS      k.root-servers.net.
.                       2249    IN      NS      h.root-servers.net.
.                       2249    IN      NS      b.root-servers.net.
.                       2249    IN      NS      f.root-servers.net.
.                       2249    IN      NS      g.root-servers.net.
.                       2249    IN      NS      i.root-servers.net.
.                       2249    IN      NS      m.root-servers.net.
.                       2249    IN      NS      e.root-servers.net.
.                       2249    IN      NS      d.root-servers.net.
.                       2249    IN      NS      a.root-servers.net.
.                       2249    IN      NS      j.root-servers.net.
.                       2249    IN      NS      c.root-servers.net.

;; ADDITIONAL SECTION:
a.root-servers.net.     12810   IN      A       198.41.0.4
a.root-servers.net.     12810   IN      AAAA    2001:503:ba3e::2:30
b.root-servers.net.     268638  IN      A       199.9.14.201
b.root-servers.net.     418665  IN      AAAA    2001:500:200::b
c.root-servers.net.     151268  IN      A       192.33.4.12
c.root-servers.net.     43420   IN      AAAA    2001:500:2::c
d.root-servers.net.     109377  IN      A       199.7.91.13
d.root-servers.net.     411785  IN      AAAA    2001:500:2d::d
e.root-servers.net.     170385  IN      A       192.203.230.10
e.root-servers.net.     475420  IN      AAAA    2001:500:a8::e
f.root-servers.net.     229940  IN      A       192.5.5.241
f.root-servers.net.     410612  IN      AAAA    2001:500:2f::f
g.root-servers.net.     43420   IN      A       192.112.36.4
g.root-servers.net.     503728  IN      AAAA    2001:500:12::d0d
h.root-servers.net.     182109  IN      A       198.97.190.53
h.root-servers.net.     411786  IN      AAAA    2001:500:1::53
```

```
i.root-servers.net.     102672  IN      A       192.36.148.17
i.root-servers.net.     363767  IN      AAAA    2001:7fe::53
j.root-servers.net.     268638  IN      A       192.58.128.30
j.root-servers.net.     411785  IN      AAAA    2001:503:c27::2:30
k.root-servers.net.     337748  IN      A       193.0.14.129
k.root-servers.net.     411785  IN      AAAA    2001:7fd::1
l.root-servers.net.     275152  IN      A       199.7.83.42
l.root-servers.net.     275152  IN      AAAA    2001:500:9f::42
m.root-servers.net.     413334  IN      A       202.12.27.33
m.root-servers.net.     411785  IN      AAAA    2001:dc3::35

;; Query time: 1 msec
;; SERVER: 129.94.242.45#53(129.94.242.45)
;; WHEN: Thu Mar 11 17:20:12 AEDT 2021
;; MSG SIZE  rcvd: 811
```

Then choose any one of these nameservers and query them using

dig 198.41.0.4 vx3.orchestra.cse.unsw.EDU.AU

```
z5205864@vx3:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @198.41.0.4 vx3.orchestra.cse.unsw.EDU.AU

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @198.41.0.4 vx3.orchestra.cse.unsw.EDU.AU
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 8571
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 9, ADDITIONAL: 19
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1472
;; QUESTION SECTION:
;vx3.orchestra.cse.unsw.EDU.AU. IN      A

;; AUTHORITY SECTION:
AU.                     172800  IN      NS      a.AU.
AU.                     172800  IN      NS      c.AU.
AU.                     172800  IN      NS      d.AU.
AU.                     172800  IN      NS      m.AU.
AU.                     172800  IN      NS      n.AU.
AU.                     172800  IN      NS      q.AU.
AU.                     172800  IN      NS      r.AU.
AU.                     172800  IN      NS      s.AU.
AU.                     172800  IN      NS      t.AU.

;; ADDITIONAL SECTION:
a.AU.                   172800  IN      A       58.65.254.73
c.AU.                   172800  IN      A       162.159.24.179
d.AU.                   172800  IN      A       162.159.25.38
m.AU.                   172800  IN      A       37.209.192.5
n.AU.                   172800  IN      A       37.209.194.5
q.AU.                   172800  IN      A       65.22.196.1
r.AU.                   172800  IN      A       65.22.197.1
s.AU.                   172800  IN      A       65.22.198.1
t.AU.                   172800  IN      A       65.22.199.1
a.AU.                   172800  IN      AAAA    2407:6e00:254:306::73
c.AU.                   172800  IN      AAAA    2400:cb00:2049:1::a29f:18b3
d.AU.                   172800  IN      AAAA    2400:cb00:2049:1::a29f:1926
m.AU.                   172800  IN      AAAA    2001:502:2eda::24
n.AU.                   172800  IN      AAAA    2001:502:ad09::24
q.AU.                   172800  IN      AAAA    2a01:8840:be::1

r.AU.                   172800  IN      AAAA    2a01:8840:bf::1
s.AU.                   172800  IN      AAAA    2a01:8840:c0::1
t.AU.                   172800  IN      AAAA    2a01:8840:c1::1

;; Query time: 139 msec
;; SERVER: 198.41.0.4#53(198.41.0.4)
;; WHEN: Thu Mar 11 17:44:55 AEDT 2021
;; MSG SIZE  rcvd: 598
```

Then choose and query and one of the .au nameservers.

```
z5205864@vx3:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @65.22.196.1 vx3.orchestra.cse.unsw.EDU.AU

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @65.22.196.1 vx3.orchestra.cse.unsw.EDU.AU
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43043
;; 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:
;vx3.orchestra.cse.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: 24 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Thu Mar 11 17:49:27 AEDT 2021
;; MSG SIZE  rcvd: 227
```

Now choose and query one of the unsw.edu.au nameservers.

```
z5205864@vx3:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @ns2.unsw.edu.au vx3.orchestra.cse.unsw.EDU.AU

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns2.unsw.edu.au vx3.orchestra.cse.unsw.EDU.AU
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 35804
;; 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:
;vx3.orchestra.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 129.94.172.11
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
maestro.orchestra.cse.unsw.EDU.AU. 10800 IN A   129.94.242.33

;; Query time: 3 msec
;; SERVER: 129.94.0.193#53(129.94.0.193)
;; WHEN: Thu Mar 11 17:51:12 AEDT 2021
;; MSG SIZE  rcvd: 168
```

Now choose and query one of the CSE nameservers.

```
z5205864@vx3:/tmp_amd/reed/export/reed/3/z5205864/3331/labs/lab3$ dig @beethoven.orchestra.cse.unsw.EDU.AU vx3.orchestra.cse.unsw.EDU.AU

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @beethoven.orchestra.cse.unsw.EDU.AU vx3.orchestra.cse.unsw.EDU.AU
; (3 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 43243
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;vx3.orchestra.cse.unsw.EDU.AU. IN      A

;; ANSWER SECTION:
vx3.orchestra.cse.unsw.EDU.AU. 3600 IN  A       129.94.242.116

;; AUTHORITY SECTION:
orchestra.cse.unsw.EDU.AU. 3600 IN      NS      maestro.orchestra.cse.unsw.EDU.AU.
orchestra.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  129.94.242.2

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Thu Mar 11 17:52:53 AEDT 2021
;; MSG SIZE  rcvd: 152
```

Now there is finally an answer section, the IP address of the host is 129.94.242.116. I had to query five DNS servers to get the authoritative answer (root -> .au -> edu.au -> unsw.edu.au -> CSE)

11. Yes, a physical machine can have several names or IP addresses associated with it.