Lab 03 Report

Lines in this font represent terminal commands and terminal output.
Lines beginning with $ are the terminal commands that were run.
Lines in this font are the answers to the questions.

EXERCISE 3

1. `$ dig www.cecs.anu.edu.au A`

   ```
   ; <<>> DiG 9.7.3 <<>> www.cecs.anu.edu.au A
   ;; global options:  +cmd
   ;; Got answer:
   ;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  32843
   ;; flags:  qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 10, ADDITIONAL: 13

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

   ;; ANSWER SECTION:
   www.cecs.anu.edu.au.  1195 IN CNAME rproxy.cecs.anu.edu.au.
   rproxy.cecs.anu.edu.au.  2916 IN A 150.203.161.98

   ;; AUTHORITY SECTION:
   au.  1272 IN NS v.au.
   au.  1272 IN NS c.au.
   au.  1272 IN NS q.au.
   au.  1272 IN NS s.au.
   au.  1272 IN NS r.au.
   au.  1272 IN NS u.au.
   au.  1272 IN NS t.au.
   au.  1272 IN NS d.au.
   au.  1272 IN NS b.au.
   au.  1272 IN NS a.au.

   ;; ADDITIONAL SECTION:
   a.au.  5839 IN A 58.65.254.73
   a.au.  30882 IN AAAA 2407:6e00:254:306::73
   b.au.  65200 IN A 58.65.253.73
   c.au.  58657 IN A 162.159.24.179
   d.au.  35026 IN A 162.159.25.38
   d.au.  30882 IN AAAA 2400:cb00:2049:1::a29f:1926
   q.au.  61354 IN A 65.22.196.1
   q.au.  36243 IN AAAA 2a01:8840:be::1
   r.au.  49219 IN A 65.22.197.1
   r.au.  38375 IN AAAA 2a01:8840:bf::1
   s.au.  637 IN A 65.22.198.1
   s.au.  23710 IN AAAA 2a01:8840:c0::1
   t.au.  34582 IN A 65.22.199.1
   ```

```
;; Query time:  0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Fri Mar 15 16:28:12 2019
;; MSG SIZE rcvd:  502
```

The IP address of `www.cecs.anu.edu.au` is 150.203.161.98. The type of DNS query sent is type A, which gives the address of the requested host, in IPv4 format. However, first a CNAME query must be sent to determine the canonical name of the requested host, and then the IP address can be found with the type A query.

2. `$ dig www.cecs.anu.edu.au CNAME`

```
; <<>> DiG 9.7.3 <<>> www.cecs.anu.edu.au CNAME
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  3053
;; flags:  qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 3, ADDITIONAL: 5

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

;; ANSWER SECTION:
www.cecs.anu.edu.au.   1204 IN CNAME rproxy.cecs.anu.edu.au.

;; AUTHORITY SECTION:
cecs.anu.edu.au.   28379 IN NS ns4.cecs.anu.edu.au.
cecs.anu.edu.au.   28379 IN NS ns2.cecs.anu.edu.au.
cecs.anu.edu.au.   28379 IN NS ns3.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au.   2464 IN A 150.203.161.36
ns2.cecs.anu.edu.au.   841 IN AAAA 2001:388:1034:2905::24
ns3.cecs.anu.edu.au.   2464 IN A 150.203.161.50
ns3.cecs.anu.edu.au.   2471 IN AAAA 2001:388:1034:2905::32
ns4.cecs.anu.edu.au.   2471 IN A 150.203.161.38

;; Query time:  0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Sun Mar 17 17:21:44 2019
;; MSG SIZE rcvd:  216
```

The canonical name for the CECS ANU web server is `rproxy.cecs.anu.edu.au`, and it has the same IP address, 150.203.161.98. One reason for having an alias for the server is so that you can find the server using a convention such as www, rather than having to remember all of the prefixes for different web servers, such as rproxy and ns1, ns2, etc.

2

3. The rest of the response provides the canonical names of the authoritative name servers for the host that you queried under the AUTHORITY section, and the IP addresses of those authoritative name servers under the ADDITIONAL section. The header information provides the flags for the response, indicating whether it was an authoritative response or not, and other information. The section below the ADDITIONAL section, provides information about the DNS server you queried, how long the response took, and other bookkeeping details.

4.
```
$ dig drum03.cse.unsw.edu.au NS

; <<>> DiG 9.7.3 <<>> drum03.cse.unsw.edu.au NS
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  1534
;; flags:  qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
;drum03.cse.unsw.edu.au.   IN NS

;; AUTHORITY SECTION:
cse.unsw.edu.au.   900 IN SOA maestro.orchestra.cse.unsw.edu.au.
hostmaster.cse.unsw.edu.au.   2019031500 2000 300 1209600 900

;; Query time:  0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Sun Mar 17 18:19:32 2019
;; MSG SIZE rcvd:   105


$ dig maestro.orchestra.cse.unsw.edu.au.  A

; <<>> DiG 9.7.3 <<>> maestro.orchestra.cse.unsw.edu.au.  A
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  50770
;; flags:  qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 1

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

;; ANSWER SECTION:
maestro.orchestra.cse.unsw.edu.au.   3600 IN A 129.94.242.33

;; 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:
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: Sun Mar 17 18:32:07 2019
;; MSG SIZE  rcvd:   121
```

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

5. ```
$ dig cecs.anu.edu.au NS +all

; <<>> DiG 9.7.3 <<>> cecs.anu.edu.au NS +all
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 45401
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 0, ADDITIONAL: 6

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

;; ANSWER SECTION:
cecs.anu.edu.au. 1163 IN NS ns2.cecs.anu.edu.au.
cecs.anu.edu.au. 1163 IN NS ns3.cecs.anu.edu.au.
cecs.anu.edu.au. 1163 IN NS ns4.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au. 2637 IN A 150.203.161.36
ns2.cecs.anu.edu.au. 2637 IN AAAA 2001:388:1034:2905::24
ns3.cecs.anu.edu.au. 2637 IN A 150.203.161.50
ns3.cecs.anu.edu.au. 2637 IN AAAA 2001:388:1034:2905::32
ns4.cecs.anu.edu.au. 2670 IN A 150.203.161.38
ns4.cecs.anu.edu.au. 1102 IN AAAA 2001:388:1034:2905::26

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Fri Mar 15 16:57:25 2019
;; MSG SIZE rcvd: 219
```

The DNS name servers for cecs.anu.edu.au are ns2.cecs.anu.edu.au, ns3.cecs.anu.edu.au, and ns4.cecs.anu.edu.au, with respective IP addresses, 150.203.161.36, 150.203.161.50, and 150.203.161.38. The type of DNS query sent is type NS, which gives the name servers for the queried host.

6. `$ 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:  430
;; flags:  qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 3, ADDITIONAL: 6

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

;; ANSWER SECTION:
109.158.171.149.in-addr.arpa.  2419 IN PTR engplws008.ad.unsw.edu.au.
109.158.171.149.in-addr.arpa.  2419 IN PTR engplws008.eng.unsw.edu.au.

;; AUTHORITY SECTION:
158.171.149.in-addr.arpa.  9619 IN NS ns1.unsw.edu.au.
158.171.149.in-addr.arpa.  9619 IN NS ns3.unsw.edu.au.
158.171.149.in-addr.arpa.  9619 IN NS ns2.unsw.edu.au.

;; ADDITIONAL SECTION:
ns1.unsw.edu.au.  1277 IN A 129.94.0.192
ns1.unsw.edu.au.  5846 IN AAAA 2001:388:c:35::1
ns2.unsw.edu.au.  1294 IN A 129.94.0.193
ns2.unsw.edu.au.  10072 IN AAAA 2001:388:c:35::2
ns3.unsw.edu.au.  1294 IN A 192.155.82.178
ns3.unsw.edu.au.  907 IN AAAA 2600:3c01::f03c:91ff:fe73:5f10

;; Query time:  0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Fri Mar 15 16:59:38 2019
;; MSG SIZE rcvd:  300
```

The DNS names associated with the IP address 149.171.158.109 are `engplws008.ad.unsw.edu.au.`, and `engplws008.eng.unsw.edu.au.`. A DNS query of type PTR is sent to get this information as it is used to find the canonical name an IP address points to.

```
7. $ dig @129.94.242.33 yahoo.com MX

   ; <<>> 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:  51181
   ;; flags:  qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 5, ADDITIONAL: 8
   '
   ;; QUESTION SECTION:
   ;yahoo.com.   IN MX

   ;; ANSWER SECTION:
   yahoo.com.   556 IN MX 1 mta7.am0.yahoodns.net.
   yahoo.com.   556 IN MX 1 mta5.am0.yahoodns.net.
   yahoo.com.   556 IN MX 1 mta6.am0.yahoodns.net.

   ;; AUTHORITY SECTION:
   yahoo.com.   10976 IN NS ns5.yahoo.com.
   yahoo.com.   10976 IN NS ns3.yahoo.com.
   yahoo.com.   10976 IN NS ns1.yahoo.com.
   yahoo.com.   10976 IN NS ns4.yahoo.com.
   yahoo.com.   10976 IN NS ns2.yahoo.com.

   ;; ADDITIONAL SECTION:
   ns1.yahoo.com.   182663 IN A 68.180.131.16
   ns1.yahoo.com.    84566 IN AAAA 2001:4998:130::1001
   ns2.yahoo.com.   192552 IN A 68.142.255.16
   ns2.yahoo.com.    16822 IN AAAA 2001:4998:140::1002
   ns3.yahoo.com.    76956 IN A 203.84.221.53
   ns3.yahoo.com.    62895 IN AAAA 2406:8600:b8:fe03::1003
   ns4.yahoo.com.    21164 IN A 98.138.11.157
   ns5.yahoo.com.    85479 IN A 119.160.253.83

   ;; Query time:  0 msec
   ;; SERVER: 129.94.242.33#53(129.94.242.33)
   ;; WHEN: Sun Mar 17 16:48:55 2019
   ;; MSG SIZE rcvd:  360
```

The flags in the header of the dig output do not contain 'aa', the Authoritative Answer flag, and so this is not an authoritative answer.

8. ```
$ dig @ns2.cecs.anu.edu.au. yahoo.com MX

; <<>> DiG 9.7.3 <<>> @ns2.cecs.anu.edu.au. yahoo.com MX
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 42445
;; 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: 150.203.161.36#53(150.203.161.36)
;; WHEN: Sun Mar 17 16:52:20 2019
;; MSG SIZE rcvd: 27
```

   Still not an Authoritative Answer, as no 'aa' flag is present, and the query was denied as we do not have permission to query the ns2.cecs.anu.edu.au DNS name server for the yahoo.com mail servers.

9. ```
$ dig @ns1.yahoo.com. yahoo.com MX

; <<>> DiG 9.7.3 <<>> @ns1.yahoo.com. yahoo.com MX
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 3401
;; 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 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 ns2.yahoo.com.
yahoo.com.   172800 IN NS ns4.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.

;; ADDITIONAL SECTION:
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
```

```
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


;; Query time:  163 msec
;; SERVER: 2001:4998:130::1001#53(2001:4998:130::1001)
;; WHEN: Sun Mar 17 16:55:38 2019
;; MSG SIZE rcvd:  360
```

The DNS sent to obtain this information is type MX, which gives the mail servers of the queried host. This is an Authoritative Answer, as the mail servers were queried from a Local Authoritative Name Server for `yahoo.com`.

10. `$ dig .  NS`

```
; <<>> DiG 9.7.3 <<>> .  NS
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  47519
;; flags:  qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 13


;; QUESTION SECTION:
;.   IN NS


;; ANSWER SECTION:
.   461089 IN NS k.root-servers.net.
.   461089 IN NS h.root-servers.net.
.   461089 IN NS e.root-servers.net.
.   461089 IN NS b.root-servers.net.
.   461089 IN NS g.root-servers.net.
.   461089 IN NS a.root-servers.net.
.   461089 IN NS i.root-servers.net.
.   461089 IN NS f.root-servers.net.
.   461089 IN NS l.root-servers.net.
.   461089 IN NS m.root-servers.net.
.   461089 IN NS d.root-servers.net.
.   461089 IN NS c.root-servers.net.
.   461089 IN NS j.root-servers.net.


;; ADDITIONAL SECTION:
a.root-servers.net.   172601 IN A 198.41.0.4
a.root-servers.net.   187907 IN AAAA 2001:503:ba3e::2:30
b.root-servers.net.   199744 IN A 199.9.14.201
b.root-servers.net.   199745 IN AAAA 2001:500:200::b
c.root-servers.net.   370443 IN A 192.33.4.12
c.root-servers.net.   199384 IN AAAA 2001:500:2::c
d.root-servers.net.   64088 IN A 199.7.91.13
d.root-servers.net.   448167 IN AAAA 2001:500:2d::d
```

```
e.root-servers.net.   350711 IN A 192.203.230.10
f.root-servers.net.   272558 IN A 192.5.5.241
f.root-servers.net.   47078 IN AAAA 2001:500:2f::f
g.root-servers.net.   183060 IN A 192.112.36.4
h.root-servers.net.   174973 IN A 198.97.190.53


;; Query time:  0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Sat Mar 16 10:17:16 2019
;; MSG SIZE rcvd:  496


$ dig @a.root-servers.net.  au.  NS +all

; <<>> DiG 9.7.3 <<>> @a.root-servers.net.  au.  NS +all
; (2 servers found)
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  49161
;; flags:  qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 10, ADDITIONAL: 16
;; WARNING: recursion requested but not available


;; QUESTION SECTION:
;au.  IN NS


;; AUTHORITY SECTION:
au.   172800 IN NS a.au.
au.   172800 IN NS b.au.
au.   172800 IN NS c.au.
au.   172800 IN NS d.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.
au.   172800 IN NS u.au.
au.   172800 IN NS v.au.


;; ADDITIONAL SECTION:
a.au.   172800 IN A 58.65.254.73
b.au.   172800 IN A 58.65.253.73
c.au.   172800 IN A 162.159.24.179
d.au.   172800 IN A 162.159.25.38
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
u.au.   172800 IN A 211.29.133.32
v.au.   172800 IN A 202.12.31.53
a.au.   172800 IN AAAA 2407:6e00:254:306::73
b.au.   172800 IN AAAA 2407:6e00:253:306::73
```

```
c.au.   172800 IN AAAA 2400:cb00:2049:1::a29f:18b3
d.au.   172800 IN AAAA 2400:cb00:2049:1::a29f:1926
q.au.   172800 IN AAAA 2a01:8840:be::1
r.au.   172800 IN AAAA 2a01:8840:bf::1


;; Query time:  157 msec
;; SERVER: 2001:503:ba3e::2:30#53(2001:503:ba3e::2:30)
;; WHEN: Sat Mar 16 10:19:06 2019
;; MSG SIZE rcvd:  508


$ dig @a.au edu.au.  NS

; <<>> DiG 9.7.3 <<>> @a.au.  edu.au.
; (2 servers found)
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  8214
;; 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 s.au.
edu.au.  86400 IN NS r.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:  153 msec
;; SERVER: 58.65.254.73#53(58.65.254.73)
;; WHEN: Sat Mar 16 10:58:18 2019
;; MSG SIZE rcvd:  264


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

; <<>> DiG 9.7.3 <<>> @q.au.  unsw.edu.au.
; (2 servers found)
;; global options:  +cmd
;; Got answer:
```

```
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  34739
;; 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 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:  6 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Sat Mar 16 11:10:14 2019
;; MSG SIZE rcvd:  187


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

; <<>> DiG 9.7.3 <<>> @ns1.unsw.edu.au.  cse.unsw.edu.au.
; (2 servers found)
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  10229
;; 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 129.94.172.11
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: 129.94.0.192#53(129.94.0.192)
```

```
;; WHEN: Sat Mar 16 12:03:37 2019
;; MSG SIZE  rcvd:   153


$ dig @maestro.orchestra.cse.unsw.edu.au.   drum03.cse.unsw.edu.au.

; <<>> DiG 9.7.3 <<>> @maestro.orchestra.cse.unsw.edu.au.   drum03.cse.unsw.edu.au.   NS
; (1 server found)
;; global options:  +cmd
;; Got answer:
;; ->>HEADER<<- opcode:  QUERY, status:  NOERROR, id:  5953
;; flags:  qr aa rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 0

;; QUESTION SECTION:
;drum03.cse.unsw.edu.au.   IN NS

;; AUTHORITY SECTION:
cse.unsw.edu.au.   900 IN SOA maestro.orchestra.cse.unsw.edu.au.
hostmaster.cse.unsw.edu.au.   2019031500 2000 300 1209600 900

;; Query time:  0 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Sun Mar 17 18:19:19 2019
;; MSG SIZE  rcvd:   105
```

The IP address of my machine is 129.94.209.33. We had to query 6 DNS name servers to find the IP address of my machine, drum03, using the NS query.

11. A machine can have multiple aliases, although only one canonical name. A machine can have multiple IP addresses if has multiple network interface cards installed.