COMP3331 LAB03

Exercise 3: Digging into DNS (marked, include in the lab report)

In order to answer the following questions, you will make DNS queries using some of the query types you have encountered in the above exercise. Some questions require you to make multiple DNS queries. Before you proceed, read the manpage of dig (type man dig in the terminal). Make sure you understand how you can explicitly specify the following:

- nameserver to query
- type of DNS query to make (the default query types are those you saw in exercise 1)
- performing reverse queries

Note: Include the output of all the dig commands you have used in your answers.

To send a query to a particular name server (say x.x.x.x) you should use the following command:

```
dig  @x.x.x.x  hostname
```

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

Answer:

```
Terminal
File  Edit  View  Terminal  Tabs  Help
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ 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: 15687
;; flags: qr rd ra; QUERY: 1, ANSWER: 3, AUTHORITY: 4, ADDITIONAL: 5

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

;; ANSWER SECTION:
www.eecs.berkeley.edu.  21970   IN      CNAME   live-eecs.pantheonsite.io.
live-eecs.pantheonsite.io. 139  IN      CNAME   fe1.edge.pantheon.io.
fe1.edge.pantheon.io.   185     IN      A       23.185.0.1

;; AUTHORITY SECTION:
edge.pantheon.io.       19      IN      NS      ns-644.awsdns-16.net.
edge.pantheon.io.       19      IN      NS      ns-1213.awsdns-23.org.
edge.pantheon.io.       19      IN      NS      ns-233.awsdns-29.com.
edge.pantheon.io.       19      IN      NS      ns-2013.awsdns-59.co.uk.

;; ADDITIONAL SECTION:
ns-233.awsdns-29.com.   153157  IN      A       205.251.192.233
ns-644.awsdns-16.net.   98060   IN      A       205.251.194.132
ns-1213.awsdns-23.org.  166939  IN      A       205.251.196.189
ns-2013.awsdns-59.co.uk. 78818  IN      A       205.251.199.221

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Thu Jun 25 16:44:50 AEST 2020
;; MSG SIZE  rcvd: 341
```

23.185.0.1 Type A

Question 2. What is the canonical name for the eecs.berkeley web server? Suggest a reason for having an alias for this server.

Answer:

live-eecs.pantheonsite.io. and fe1.edge.pantheon.io.

canonical name often is difficult to remember. Alias like www.eecs.berkeley.edu is easier to remember. And it can be useful to run multiple services with different domain name but same IP.

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

Answer:

The Authority section contain the four authoritative name servers record for edge.pantheon.io.

The Additional section contain the IP address of four authoritative name servers

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

Answer:

129.94.242.2(from bottom of output) local DNS server for CSE network.

Question 5. What are the DNS nameservers for the " www.eecs.berkeley.edu ." domain (note: the domain name is eecs.berkeley.edu and not www.eecs.berkeley.edu)? Find out their IP addresses? What type of DNS query is sent to obtain this information?

Answer:

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ 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: 26530
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 9

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

;; ANSWER SECTION:
eecs.berkeley.edu.      74481   IN      NS      ns.eecs.berkeley.edu.
eecs.berkeley.edu.      74481   IN      NS      adns2.berkeley.edu.
eecs.berkeley.edu.      74481   IN      NS      adns1.berkeley.edu.
eecs.berkeley.edu.      74481   IN      NS      ns.CS.berkeley.edu.
eecs.berkeley.edu.      74481   IN      NS      adns3.berkeley.edu.

;; ADDITIONAL SECTION:
ns.CS.berkeley.edu.     62350   IN      A       169.229.60.61
ns.eecs.berkeley.edu.   289     IN      A       169.229.60.153
adns1.berkeley.edu.     7919    IN      A       128.32.136.3
adns1.berkeley.edu.     7919    IN      AAAA    2607:f140:ffff:fffe::3
adns2.berkeley.edu.     864     IN      A       128.32.136.14
adns2.berkeley.edu.     850     IN      AAAA    2607:f140:ffff:fffe::e
adns3.berkeley.edu.     856     IN      A       192.107.102.142
adns3.berkeley.edu.     426     IN      AAAA    2607:f140:a000:d::abc

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Thu Jun 25 16:52:02 AEST 2020
;; MSG SIZE  rcvd: 307
```

The DNS nameservers are IP IPV6

ns.eecs.berkeley.edu. 169.229.60.153

adns2.berkeley.edu. 128.32.136.14 2607:f140:ffff:fffe::e

adns1.berkeley.edu. 128.32.136.3 2607:f140:ffff:fffe::3

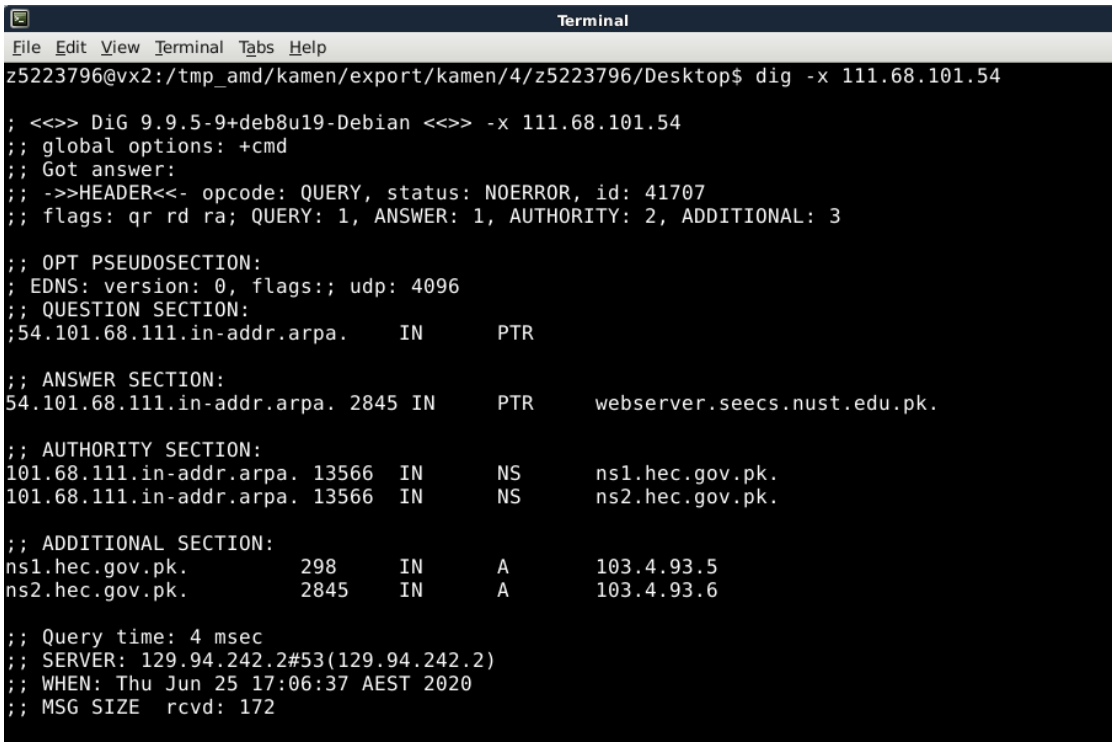
ns.CS.berkeley.edu. 169.229.60.61

adns3.berkeley.edu. 192.107.102.142 2607:f140:a000:d::abc

NS query.

Question 6. What is the DNS name associated with the IP address 111.68.101.54? What type of DNS query is sent to obtain this information?

Answer:



webserver.seecs.nust.edu.pk. 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)

Answer:

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ 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: 47712
;; 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.              1325    IN      MX      1 mta7.am0.yahoodns.net.
yahoo.com.              1325    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.              1325    IN      MX      1 mta6.am0.yahoodns.net.

;; AUTHORITY SECTION:                                (110x45)
yahoo.com.              87045   IN      NS      ns2.yahoo.com.
yahoo.com.              87045   IN      NS      ns5.yahoo.com.
yahoo.com.              87045   IN      NS      ns4.yahoo.com.
yahoo.com.              87045   IN      NS      ns3.yahoo.com.
yahoo.com.              87045   IN      NS      ns1.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.          4042    IN      A       68.180.131.16
ns1.yahoo.com.          64663   IN      AAAA    2001:4998:130::1001
ns2.yahoo.com.          501082  IN      A       68.142.255.16
ns2.yahoo.com.          81792   IN      AAAA    2001:4998:140::1002
ns3.yahoo.com.          890     IN      A       27.123.42.42
ns4.yahoo.com.          410780  IN      A       98.138.11.157
ns5.yahoo.com.          1121    IN      A       202.165.97.53
ns5.yahoo.com.          1121    IN      AAAA    2406:2000:ff60::53

;; Query time: 0 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Thu Jun 25 17:17:22 AEST 2020
;; MSG SIZE  rcvd: 371
```

There is not an authoritative answer. There is no AA flag. CSE nameserver has no authority on yahoo domain.

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

Answer:

```
z5223796@vx6:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @ns.eecs.berkel
ey.edu. yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns.eecs.berkeley.edu. yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 35360
;; 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: 169.229.60.153#53(169.229.60.153)
;; WHEN: Mon Jun 29 20:35:28 AEST 2020
;; MSG SIZE  rcvd: 38
```

The status is REFUSED. 0 answer. No aa flag.

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

Answer:

```
z5223796@vx6:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ 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: 40791
;; 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      ns3.yahoo.com.
yahoo.com.              172800  IN      NS      ns1.yahoo.com.
yahoo.com.              172800  IN      NS      ns4.yahoo.com.
yahoo.com.              172800  IN      NS      ns2.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.          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: 146 msec
;; SERVER: 68.180.131.16#53(68.180.131.16)
;; WHEN: Mon Jun 29 20:40:21 AEST 2020
;; MSG SIZE  rcvd: 399
```

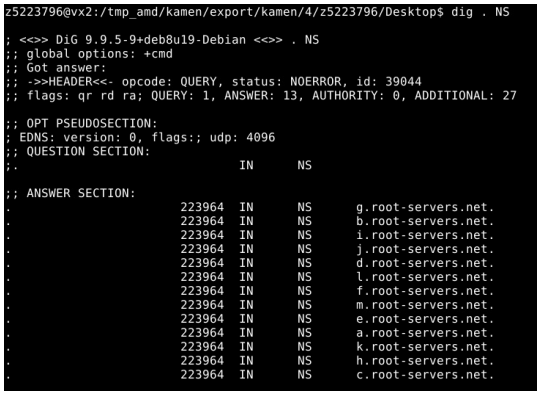
dig @ns1.yahoo.com yahoo.com MX

Use one of authoritative nameservers from q7(ns1.yahoo.com) which is authoritative nameservers from yahoo domain. There is aa flag.

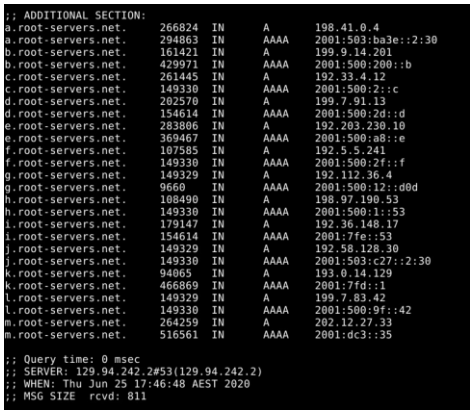
Question 10. In this exercise you simulate the iterative DNS query process to find the IP address of your machine (e.g. lyre00.cse.unsw.edu.au). First, find the name server (query type NS) of the "." domain (root domain). Query this nameserver to find the authoritative name server for the "au." domain. 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?

Answer:

dig . NS

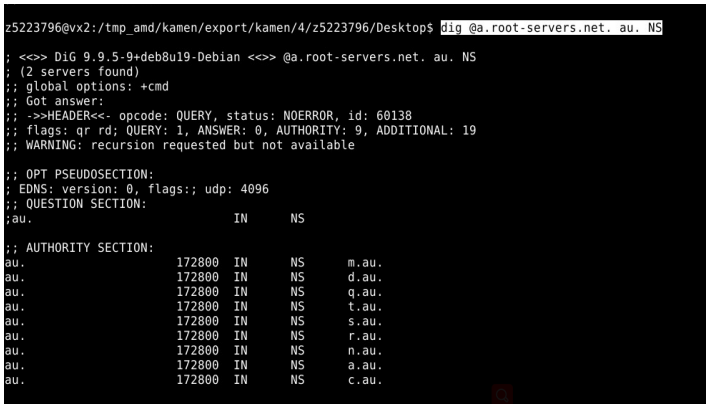


```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig . NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> . NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 39044
;; 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:
.                       223964  IN      NS      g.root-servers.net.
.                       223964  IN      NS      b.root-servers.net.
.                       223964  IN      NS      i.root-servers.net.
.                       223964  IN      NS      j.root-servers.net.
.                       223964  IN      NS      d.root-servers.net.
.                       223964  IN      NS      l.root-servers.net.
.                       223964  IN      NS      f.root-servers.net.
.                       223964  IN      NS      m.root-servers.net.
.                       223964  IN      NS      e.root-servers.net.
.                       223964  IN      NS      a.root-servers.net.
.                       223964  IN      NS      k.root-servers.net.
.                       223964  IN      NS      h.root-servers.net.
.                       223964  IN      NS      c.root-servers.net.
```

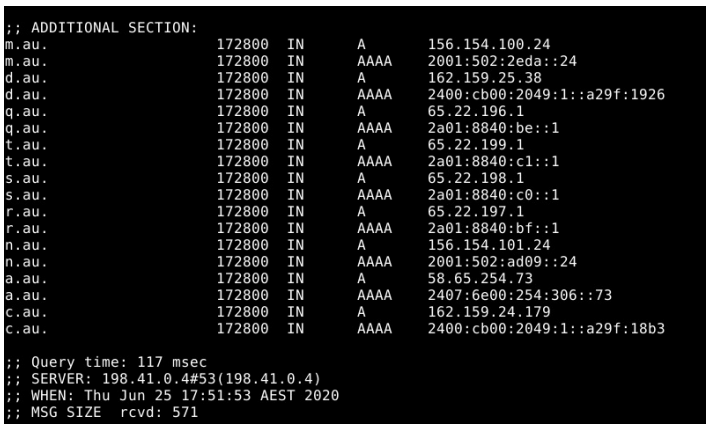


```
;; ADDITIONAL SECTION:
a.root-servers.net.     266824  IN      A       198.41.0.4
a.root-servers.net.     294863  IN      AAAA    2001:503:ba3e::2:30
b.root-servers.net.     161421  IN      A       199.9.14.201
b.root-servers.net.     429971  IN      AAAA    2001:500:200::b
c.root-servers.net.     261445  IN      A       192.33.4.12
c.root-servers.net.     149330  IN      AAAA    2001:500:2::c
d.root-servers.net.     202570  IN      A       199.7.91.13
d.root-servers.net.     154614  IN      AAAA    2001:500:2d::d
e.root-servers.net.     283806  IN      A       192.203.230.10
e.root-servers.net.     369467  IN      AAAA    2001:500:a8::e
f.root-servers.net.     107585  IN      A       192.5.5.241
f.root-servers.net.     149330  IN      AAAA    2001:500:2f::f
g.root-servers.net.     149329  IN      A       192.112.36.4
g.root-servers.net.     9660    IN      AAAA    2001:500:12::d0d
h.root-servers.net.     108490  IN      A       198.97.190.53
h.root-servers.net.     149330  IN      AAAA    2001:500:1::53
i.root-servers.net.     179147  IN      A       192.36.148.17
i.root-servers.net.     154614  IN      AAAA    2001:7fe::53
j.root-servers.net.     149329  IN      A       192.58.128.30
j.root-servers.net.     149330  IN      AAAA    2001:503:c27::2:30
k.root-servers.net.     94065   IN      A       193.0.14.129
k.root-servers.net.     466869  IN      AAAA    2001:7fd::1
l.root-servers.net.     149329  IN      A       199.7.83.42
l.root-servers.net.     149330  IN      AAAA    2001:500:9f::42
m.root-servers.net.     264259  IN      A       202.12.27.33
m.root-servers.net.     516561  IN      AAAA    2001:dc3::35

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Thu Jun 25 17:46:48 AEST 2020
;; MSG SIZE  rcvd: 811
```

dig @a.root-servers.net. au. NS



```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @a.root-servers.net. au. NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @a.root-servers.net. au. NS
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 60138
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 9, ADDITIONAL: 19
;; WARNING: recursion requested but not available

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

;; AUTHORITY SECTION:
au.                     172800  IN      NS      m.au.
au.                     172800  IN      NS      d.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      n.au.
au.                     172800  IN      NS      a.au.
au.                     172800  IN      NS      c.au.
```



```
;; ADDITIONAL SECTION:
m.au.                   172800  IN      A       156.154.100.24
m.au.                   172800  IN      AAAA    2001:502:2eda::24
d.au.                   172800  IN      A       162.159.25.38
d.au.                   172800  IN      AAAA    2400:cb00:2049:1::a29f:1926
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
n.au.                   172800  IN      A       156.154.101.24
n.au.                   172800  IN      AAAA    2001:502:ad09::24
a.au.                   172800  IN      A       58.65.254.73
a.au.                   172800  IN      AAAA    2407:6e00:254:306::73
c.au.                   172800  IN      A       162.159.24.179
c.au.                   172800  IN      AAAA    2400:cb00:2049:1::a29f:18b3

;; Query time: 117 msec
;; SERVER: 198.41.0.4#53(198.41.0.4)
;; WHEN: Thu Jun 25 17:51:53 AEST 2020
;; MSG SIZE  rcvd: 571
```

dig @m.au. edu.au. NS

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @m.au. edu.au. NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @m.au. edu.au. NS
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 42911
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 9
;; WARNING: recursion requested but not available

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

;; AUTHORITY SECTION:
edu.au.                 86400   IN      NS      s.au.
edu.au.                 86400   IN      NS      r.au.
edu.au.                 86400   IN      NS      t.au.
edu.au.                 86400   IN      NS      q.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: 14 msec
;; SERVER: 156.154.100.24#53(156.154.100.24)
;; WHEN: Thu Jun 25 17:53:49 AEST 2020
;; MSG SIZE  rcvd: 275
```

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

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ 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: 1588
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 3, ADDITIONAL: 6
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; 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      ns3.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: 24 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Thu Jun 25 17:54:51 AEST 2020
;; MSG SIZE  rcvd: 198
```

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

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @ns1.unsw.edu.au cse.unsw.edu.au. NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @ns1.unsw.edu.au cse.unsw.edu.au. NS
; (2 servers found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64421
;; 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.        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: 129.94.0.192#53(129.94.0.192)
;; WHEN: Thu Jun 25 17:56:47 AEST 2020
;; MSG SIZE  rcvd: 164
```

Our IP

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ hostname -f
vx2.orchestra.cse.unsw.EDU.AU
```

dig @maestro.orchestra.cse.unsw.edu.au. vx2.orchestra.cse.unsw.EDU.AU A

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @maestro.orchestra.cse.unsw.edu.au. vx2.orchestra.c
se.unsw.EDU.AU A

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @maestro.orchestra.cse.unsw.edu.au. vx2.orchestra.cse.unsw.EDU.AU A
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 38833
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;vx2.orchestra.cse.unsw.EDU.AU. IN      A

;; ANSWER SECTION:
vx2.orchestra.cse.unsw.EDU.AU. 3600 IN  A       129.94.242.115

;; 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

;; Query time: 0 msec
;; SERVER: 129.94.242.33#53(129.94.242.33)
;; WHEN: Thu Jun 25 18:28:50 AEST 2020
;; MSG SIZE  rcvd: 152
```

For lyre00.cse.unsw.edu.au

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

```
z5223796@vx2:/tmp_amd/kamen/export/kamen/4/z5223796/Desktop$ dig @maestro.orchestra.cse.unsw.edu.au. lyre00.cse.unsw
.edu.au A

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @maestro.orchestra.cse.unsw.edu.au. lyre00.cse.unsw.edu.au A
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17790
;; 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: Thu Jun 25 18:30:26 AEST 2020
;; MSG SIZE  rcvd: 155
```

5 DNS servers : a.root-servers.net. m.au. q.au. ns1.unsw.edu.au maestro.orchestra.cse.unsw.edu.au.

The IP of our machine is 129.94.242.115

lyre00.cse.unsw.edu.au is 129.94.210.20

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

Answer:

Yes. A machine can have many names and IP addresses associated with it. And IP address can have multiple names(aliases).

EXERCISE5 (PYTHON3.7.3 CSE MACHINE)