

Exercise 3

1. The IP address of www.eecs.berkeley.edu is 23.185.0.1. The type of DNS query to get this answer is A.

```
z5305298@coreelli:~/3331/lab/week03$ 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: 38806
;; 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.  72026   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
```

2. The canonical name for the eecs.berkeley webserver is “live-eecs.pantheonsite.io.”. Alias is needed because if we do some changes to eecs.berkeley server, we can simply do changes on the original domain name and do not need to change canonical names.
3. The authoritative name server is “edge.pantheon.io.”. There are 4 servers running it. The names in last column are their actual names. In Additional section, we can see details of the 4 servers.

```
;; AUTHORITY SECTION:
edge.pantheon.io.      88      IN      NS      ns-1213.awsdns-23.org.
edge.pantheon.io.      88      IN      NS      ns-644.awsdns-16.net.
edge.pantheon.io.      88      IN      NS      ns-233.awsdns-29.com.
edge.pantheon.io.      88      IN      NS      ns-2013.awsdns-59.co.uk.

;; ADDITIONAL SECTION:
ns-233.awsdns-29.com.  83807   IN      A       205.251.192.233
ns-233.awsdns-29.com.  83807   IN      AAAA    2600:9000:5300:e900::1
ns-644.awsdns-16.net.  63877   IN      A       205.251.194.132
ns-644.awsdns-16.net.  63877   IN      AAAA    2600:9000:5302:8400::1
ns-1213.awsdns-23.org. 65206   IN      A       205.251.196.189
ns-1213.awsdns-23.org. 62408   IN      AAAA    2600:9000:5304:bd00::1
ns-2013.awsdns-59.co.uk. 61832   IN      A       205.251.199.221
ns-2013.awsdns-59.co.uk. 57885   IN      AAAA    2600:9000:5307:dd00::1
```

4. My local name server is 129.94.242.45.
5. The DNS nameservers for the “eecs.berkeley.edu.” domain are “adns3.berkeley.edu.”, “adns2.berkeley.edu.” “adns1.berkeley.edu.”, “ns.eecs.berkeley.edu.” and “ns.CS.berkeley.edu.”. their IP addresses are 192.107.102.142, 128.32.136.14 128.32.136.3, 169.229.60.153 and 169.229.60.61. They are NS type DNS queries.

```

z5305298@corelli:~/3331/lab/week03$ 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: 22473
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 11

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

;; ANSWER SECTION:
eecs.berkeley.edu.          9772    IN      NS      adns2.berkeley.edu.
eecs.berkeley.edu.          9772    IN      NS      ns.eecs.berkeley.edu.
eecs.berkeley.edu.          9772    IN      NS      adns3.berkeley.edu.
eecs.berkeley.edu.          9772    IN      NS      adns1.berkeley.edu.
eecs.berkeley.edu.          9772    IN      NS      ns.CS.berkeley.edu.

;; ADDITIONAL SECTION:
ns.CS.berkeley.edu.         13051   IN      A        169.229.60.61
ns.CS.berkeley.edu.         13051   IN      AAAA     2607:f140:f000:1260::30
ns.eecs.berkeley.edu.       74956   IN      A        169.229.60.153
ns.eecs.berkeley.edu.       13051   IN      AAAA     2607:f140:f000:2160::30
adns1.berkeley.edu.         4504    IN      A        128.32.136.3
adns1.berkeley.edu.         4504    IN      AAAA     2607:f140:ffff:fffe::3
adns2.berkeley.edu.         4504    IN      A        128.32.136.14
adns2.berkeley.edu.         4504    IN      AAAA     2607:f140:ffff:fffe::e
adns3.berkeley.edu.         8506    IN      A        192.107.102.142
adns3.berkeley.edu.         99506   IN      AAAA     2607:f140:a000:d::abc

```

6. The DNS name is “webserver.seecs.nust.edu.pk.”. The type of query is PTR.

```

z5305298@corelli:~$ 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: 2808
;; 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. 3045 IN      PTR      webserver.seecs.nust.edu.pk.

;; AUTHORITY SECTION:
101.68.111.in-addr.arpa. 12245 IN      NS       ns1.hec.gov.pk.
101.68.111.in-addr.arpa. 12245 IN      NS       ns2.hec.gov.pk.

;; ADDITIONAL SECTION:
ns1.hec.gov.pk.           2404 IN      A        103.4.93.5
ns2.hec.gov.pk.           2404 IN      A        103.4.93.6

;; Query time: 0 msec
;; SERVER: 129.94.242.45#53(129.94.242.45)
;; WHEN: Wed Jun 23 17:14:07 AEST 2021
;; MSG SIZE rcvd: 172

```

7. Yes. Because the query type in authority section is NS.


```

z5305298@corelli:~$ 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: 64073
;; 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.                1279    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                1279    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.                1279    IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                147916  IN      NS       ns2.yahoo.com.
yahoo.com.                147916  IN      NS       ns1.yahoo.com.
yahoo.com.                147916  IN      NS       ns4.yahoo.com.
yahoo.com.                147916  IN      NS       ns5.yahoo.com.
yahoo.com.                147916  IN      NS       ns3.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            430906  IN      A        68.180.131.16
ns1.yahoo.com.            14865   IN      AAAA     2001:4998:130::1001
ns2.yahoo.com.            75719   IN      A        68.142.255.16
ns2.yahoo.com.            83633   IN      AAAA     2001:4998:140::1002
ns3.yahoo.com.            154     IN      A        27.123.42.42
ns3.yahoo.com.            154     IN      AAAA     2406:8600:f03f:1f8::1003
ns4.yahoo.com.            430738  IN      A        98.138.11.157

```

8. I do not get authoritative answer. There is not any useful result.

```

z5305298@corelli:~/3331/lab/week03$ dig @192.107.102.142 yahoo.com MX

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @192.107.102.142 yahoo.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 53110
;; 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: 166 msec
;; SERVER: 192.107.102.142#53(192.107.102.142)
;; WHEN: Sun Jun 27 19:06:53 AEST 2021
;; MSG SIZE rcvd: 38

```

9. The type of query is NS.

```

z5305298@corelli:~$ dig yahoo.com NS

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> yahoo.com NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 48434
;; flags: qr rd ra; QUERY: 1, ANSWER: 5, AUTHORITY: 0, ADDITIONAL: 8

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

;; ANSWER SECTION:
yahoo.com.                147114  IN      NS      ns5.yahoo.com.
yahoo.com.                147114  IN      NS      ns3.yahoo.com.
yahoo.com.                147114  IN      NS      ns4.yahoo.com.
yahoo.com.                147114  IN      NS      ns1.yahoo.com.
yahoo.com.                147114  IN      NS      ns2.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            154030  IN      A        68.180.131.16
ns1.yahoo.com.            14063   IN      AAAA     2001:4998:130::1001
ns2.yahoo.com.            74917   IN      A        68.142.255.16
ns2.yahoo.com.            82831   IN      AAAA     2001:4998:140::1002
ns3.yahoo.com.            713     IN      A        27.123.42.42
ns4.yahoo.com.            429936  IN      A        98.138.11.157
ns5.yahoo.com.            55271   IN      A        202.165.97.53

;; Query time: 1 msec
;; SERVER: 129.94.242.45#53(129.94.242.45)
;; WHEN: Wed Jun 23 17:35:23 AEST 2021
;; MSG SIZE rcvd: 264

```

10. 6 queries in total. They are: root server, au. server, edu.au. server, unsw.edu.au. server, cse.unsw.edu.au. server and a query for IP address of "lyre00.cse.unsw.edu.au".

```

z5305298@corelli:~/3331/lab/week03$ dig @129.94.172.11 lyre00.cse.unsw.edu.au

; <<>> DiG 9.9.5-9+deb8u19-Debian <<>> @129.94.172.11 lyre00.cse.unsw.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 51135
;; 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      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      129.94.242.2

;; Query time: 0 msec
;; SERVER: 129.94.172.11#53(129.94.172.11)
;; WHEN: Sun Jun 27 19:35:31 AEST 2021
;; MSG SIZE rcvd: 155

```

11. No. One physical machine can only have one IP addresses associated with it.