

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

The IP address is 151.101.30.133, the DNS query is type A.

```
5335039@x00:~/Desktop$ dig www.stanford.edu A
; <>> DIG 9.16.37-Debian <>> www.stanford.edu A
; global options: +cmd
; Got answer:
; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 19263
; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 4, ADDITIONAL: 5

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

; ANSWER SECTION:
www.stanford.edu. 1428 IN CNAME pantheon-systems.map.fastly.net.
pantheon-systems.map.fastly.net. 30 IN A 151.101.30.133

; AUTHORITY SECTION:
fastly.net. 1075 IN NS ns1.fastly.net.
fastly.net. 1075 IN NS ns3.fastly.net.
fastly.net. 1075 IN NS ns4.fastly.net.
fastly.net. 1075 IN NS ns2.fastly.net.

; ADDITIONAL SECTION:
ns1.fastly.net. 2167 IN A 23.235.32.32
ns2.fastly.net. 652 IN A 104.156.80.32
ns3.fastly.net. 442 IN A 23.235.36.32
ns4.fastly.net. 3352 IN A 104.156.84.32

; Query time: 8 msec
; SERVER: 129.94.242.2#53(129.94.242.2)
; WHEN: Tue Mar 07 14:49:56 AEDT 2023
; MSG SIZE rcvd: 242
```

Question 2. What is the canonical name for the Stanford webserver (i.e., www.stanford.edu)? Suggest a reason for having an alias for this server.

The canonical name for Stanford webserver is *Pantheon-systems.map.fastly.net*. If our server naming conventions aren't very descriptive We can assign an alias to the server for easier reference.

```
5335039@x00:~/Desktop$ dig www.stanford.edu CNAME
; <>> DIG 9.16.37-Debian <>> www.stanford.edu CNAME
; global options: +cmd
; Got answer:
; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 27783
; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 6, ADDITIONAL: 13

; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
www.stanford.edu. IN CNAME

; ANSWER SECTION:
www.stanford.edu. 769 IN CNAME pantheon-systems.map.fastly.net.

; AUTHORITY SECTION:
stanford.edu. 4396 IN NS ns5.dnsmadeeasy.com.
stanford.edu. 4396 IN NS atalone.stanford.edu.
stanford.edu. 4396 IN NS ns7.dnsmadeeasy.com.
stanford.edu. 4396 IN NS ns6.dnsmadeeasy.com.
stanford.edu. 4396 IN NS avallone.stanford.edu.
stanford.edu. 4396 IN NS argus.stanford.edu.

; ADDITIONAL SECTION:
ns5.dnsmadeeasy.com. 23732 IN A 208.94.148.13
ns5.dnsmadeeasy.com. 18144 IN AAAA 2600:1800:5::1
ns6.dnsmadeeasy.com. 15076 IN A 208.80.124.13
ns6.dnsmadeeasy.com. 15076 IN AAAA 2600:1801:6::1
ns7.dnsmadeeasy.com. 54698 IN A 208.80.126.13
ns7.dnsmadeeasy.com. 31747 IN AAAA 2600:1802:7::1
argus.stanford.edu. 1463 IN A 171.64.7.115
argus.stanford.edu. 40543 IN AAAA 2607:f6d0:0:9113::ab40:77d
atalante.stanford.edu. 1463 IN A 171.64.7.61
atalante.stanford.edu. 40543 IN AAAA 2607:f6d0:0:d32::ab40:73d
avallone.stanford.edu. 738 IN A 204.63.224.53
avallone.stanford.edu. 738 IN AAAA 2620:6c:40e0:0:204:63:224:53

; Query time: 4 msec
; SERVER: 129.94.242.2#53(129.94.242.2)
; WHEN: Tue Mar 07 15:00:55 AEDT 2023
; MSG SIZE rcvd: 489
```

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

From the authority section, it provides the various authoritative nameservers from the record. We can know the different IP addresses of the nameservers that from authority section.

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

The IP address of the local nameserver is 129.94.242.45. (from last four line of dig command/ nslookup)

Question 5. What are the DNS nameservers for the "stanford.edu." domain (note: the domain name is stanford.edu and not www.stanford.edu . This is an example of what is referred to as

the apex/naked domain)? Find their IP addresses. What type of DNS query is sent to obtain this information?

| Nameservers | IPV4(IP address version 4) | IPV6(IP address version 46) |
|------------------------|----------------------------|------------------------------|
| argus.stanford.edu. | 171.64.7.115 | 2607:f6d0:0:9113::ab40:773 |
| atalante.stanford.edu. | 171.64.7.61 | 2607:f6d0:0:d32::ab40:73d |
| ns5.dnsmadeeasy.com. | 208.94.148.13 | 2600:1800:5::1 |
| ns7.dnsmadeeasy.com. | 208.80.126.13 | 2600:1802:7::1 |
| avallone.stanford.edu. | 204.63.224.53 | 2620:6c:40c0:0:204:63:224:53 |
| ns6.dnsmadeeasy.com. | 208.80.124.13 | 2600:1801:6::1 |

The DNS query is type NS.

```
z5335039@vx00:~/Desktop/lab2$ dig stanford.edu NS
; <>> DIG 9.16.37-Debian <>> stanford.edu NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 14150
;; flags: qr rd ra; QUERY: 1, ANSWER: 6, AUTHORITY: 0, ADDITIONAL: 13

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

;; ANSWER SECTION:
stanford.edu.    42900   IN      NS      ns7.dnsmadeeasy.com.
stanford.edu.    42900   IN      NS      ns6.dnsmadeeasy.com.
stanford.edu.    42900   IN      NS      atalante.stanford.edu.
stanford.edu.    42900   IN      NS      argus.stanford.edu.
stanford.edu.    42900   IN      NS      ns5.dnsmadeeasy.com.
stanford.edu.    42900   IN      NS      avallone.stanford.edu.

;; ADDITIONAL SECTION:
ns5.dnsmadeeasy.com. 23236   IN      A       208.94.148.13
ns5.dnsmadeeasy.com. 17648   IN      AAAA    2600:1800:5::1
ns6.dnsmadeeasy.com. 14580   IN      A       208.80.124.13
ns6.dnsmadeeasy.com. 14580   IN      AAAA    2600:1801:6::1
ns7.dnsmadeeasy.com. 54112   IN      A       208.80.126.13
ns7.dnsmadeeasy.com. 31251   IN      AAAA    2600:1802:7::1
argus.stanford.edu. 967     IN      A       171.64.7.115
argus.stanford.edu. 40047   IN      AAAA    2607:f6d0:0:9113::ab40:773
atalante.stanford.edu. 967   IN      A       171.64.7.61
atalante.stanford.edu. 40047   IN      AAAA    2607:f6d0:0:d32::ab40:73d
avallone.stanford.edu. 242   IN      A       204.63.224.53
avallone.stanford.edu. 242   IN      AAAA    2620:6c:40c0:0:204:63:224:53
```

Question 6. What is the DNS name associated with the IP address 129.25.60.56 ? What type of DNS query is sent to obtain this information?

We convert the IP address to DSN name by using command *dig -x*. It shows the DNS name is ece.drexel.edu.

The DNS query is type PTR.

```
z5335039@vx00:~/Desktop/lab2$ dig -x 129.25.60.56
; <>> DIG 9.16.37-Debian <>> -x 129.25.60.56
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 52402
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 3

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags: udp: 4096
;; QUESTION SECTION:
;56.60.25.129.in-addr.arpa.    IN      PTR

;; ANSWER SECTION:
56.60.25.129.in-addr.arpa. 180   IN      PTR      ece.drexel.edu.

;; AUTHORITY SECTION:
25.129.in-addr.arpa.    954   IN      NS      adns1.drexel.edu.
25.129.in-addr.arpa.    954   IN      NS      adns2.drexel.edu.

;; ADDITIONAL SECTION:
adns1.drexel.edu.    1149   IN      A       144.118.27.1
adns2.drexel.edu.    1149   IN      A       144.118.27.18

;; Query time: 252 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Tue Mar 07 15:06:49 AEDT 2023
;; MSG SIZE  rcvd: 154
```

Question 7. Run, dig and query the CSE nameserver (129.94.242.33) for the mail servers for google.com (again, the domain name is google.com, not www.google.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 message to determine the answer)

As the outcome of header part (flags: qr rd ra) didn't show aa which means that we can't get authority from CSE. The reason why we didn't get authority is because google prevents the users who are not part of their network to get access into their DNS queries. As the result, we can't get authoritative answer when using CSE network to dig the google mail server.

```
z5335039@vx12:~/Desktop$ dig @129.94.242.33 google.com MX
; <>> DiG 9.16.37-Debian <>> @129.94.242.33 google.com MX
; (1 server found)
; global options: +cmd
; Got answer:
; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 14350
; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 4, ADDITIONAL: 18

; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
; QUESTION SECTION:
;google.com.           IN      MX
;ANSWER SECTION:
google.com.        300    IN      MX      10 smtp.google.com.

;AUTHORITY SECTION:
google.com.       8974    IN      NS      ns4.google.com.
google.com.       8974    IN      NS      ns2.google.com.
google.com.       8974    IN      NS      ns1.google.com.
google.com.       8974    IN      NS      ns3.google.com.

;ADDITIONAL SECTION:
smtp.google.com.  300    IN      A      74.125.68.26
smtp.google.com.  300    IN      A      74.125.68.27
smtp.google.com.  300    IN      A      74.125.200.27
smtp.google.com.  300    IN      A      74.125.24.26
smtp.google.com.  300    IN      A      74.125.24.27
smtp.google.com.  300    IN      AAAA   2404:6800:4003:c02::1a
smtp.google.com.  300    IN      AAAA   2404:6800:4003:c02::1b
smtp.google.com.  300    IN      AAAA   2404:6800:4003:c03::1a
smtp.google.com.  300    IN      AAAA   2404:6800:4003:c00::1a
ns1.google.com.   156558  IN      A      216.239.32.10
ns1.google.com.   156547  IN      AAAA   2001:4860:4802:32::a
ns2.google.com.   71130   IN      A      216.239.34.10
ns2.google.com.   56727   IN      AAAA   2001:4860:4802:34::a
```

Question 8. Repeat the above (i.e. Question 7) but use one of the nameservers obtained in Q5 What is the result?

```
z5335039@vx12:~/Desktop$ dig @ns5.dnsmadeeasy.com google.com MX
; <>> DiG 9.16.37-Debian <>> @ns5.dnsmadeeasy.com google.com MX
; (1 server found)
; global options: +cmd
; Got answer:
; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 53198
; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 0, ADDITIONAL: 1
; WARNING: recursion requested but not available

; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1280
; QUESTION SECTION:
;google.com.           IN      MX

; Query time: 0 msec
; SERVER: 208.94.148.13#53(208.94.148.13)
; WHEN: Mon Mar 13 16:32:38 AEDT 2023
; MSG SIZE  rcvd: 39
```

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

We use ns1.google.com as the query and receive the NOERROR status and aa flag.

The DNS query is MX type(mail exchange)

```
z5335039@vx02:~/Desktop$ dig @ns1.google.com google.com MX
; <>> DiG 9.16.37-Debian <>> @ns1.google.com google.com MX
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 38114
;; flags: qr aa rd; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 10
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;google.com.           IN      MX

;; ANSWER SECTION:
google.com.        300     IN      MX      10 smtp.google.com.

;; ADDITIONAL SECTION:
smtp.google.com.   300     IN      A       74.125.24.26
smtp.google.com.   300     IN      A       74.125.24.27
smtp.google.com.   300     IN      A       142.250.4.27
smtp.google.com.   300     IN      A       142.250.4.26
smtp.google.com.   300     IN      A       142.251.10.27
smtp.google.com.   300     IN      AAAA    2404:6800:4003:c03::1b
smtp.google.com.   300     IN      AAAA    2404:6800:4003:c03::1a
smtp.google.com.   300     IN      AAAA    2404:6800:4003:c06::1b
smtp.google.com.   300     IN      AAAA    2404:6800:4003:c06::1a

;; Query time: 96 msec
;; SERVER: 216.239.32.10#53(216.239.32.10)
;; WHEN: Mon Mar 13 17:04:57 AEDT 2023
;; MSG SIZE  rcvd: 252
```

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). If you are using VLAD Then find the IP address of one of the following: lyre00.cse.unsw.edu.au, lyre01.cse.unsw.edu.au, drum00.cse.unsw.edu.au or drum01.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?

Command: *dig . NS*

```
z5335039@vx02:~/Desktop$ dig . NS
; <>> DiG 9.16.37-Debian <>> .
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 27860
;; 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:
.  
          319342  IN      NS      a.root-servers.net.
.  
          319342  IN      NS      l.root-servers.net.
.  
          319342  IN      NS      i.root-servers.net.
.  
          319342  IN      NS      d.root-servers.net.
.  
          319342  IN      NS      m.root-servers.net.
.  
          319342  IN      NS      g.root-servers.net.
.  
          319342  IN      NS      f.root-servers.net.
.  
          319342  IN      NS      h.root-servers.net.
.  
          319342  IN      NS      k.root-servers.net.
.  
          319342  IN      NS      j.root-servers.net.
.  
          319342  IN      NS      b.root-servers.net.
.  
          319342  IN      NS      e.root-servers.net.
.  
          319342  IN      NS      c.root-servers.net.

;; ADDITIONAL SECTION:
a.root-servers.net.    238261  IN      A      198.41.0.4
a.root-servers.net.    424864  IN      AAAA   2001:503:ba3e::2:30
b.root-servers.net.    171021  IN      A      199.9.14.201
b.root-servers.net.    166419  IN      AAAA   2001:500:200::b
c.root-servers.net.    317838  IN      A      192.33.4.12
c.root-servers.net.    166419  IN      AAAA   2001:500:2::c
d.root-servers.net.    317838  IN      A      199.7.91.13
d.root-servers.net.    166419  IN      AAAA   2001:500:2d::d
e.root-servers.net.    346878  IN      A      192.203.230.10
e.root-servers.net.    166419  IN      AAAA   2001:500:a8::e
f.root-servers.net.    279273  IN      A      192.5.5.241
f.root-servers.net.    166419  IN      AAAA   2001:500:2f::f
g.root-servers.net.    317837  IN      A      192.112.36.4
g.root-servers.net.    463985  IN      AAAA   2001:500:12::d0d
h.root-servers.net.    346878  IN      A      198.97.190.53
h.root-servers.net.    166419  IN      AAAA   2001:500:1::53
i.root-servers.net.    503691  IN      A      192.36.148.17
i.root-servers.net.    166419  IN      AAAA   2001:7fe::53
j.root-servers.net.    62581   IN      A      192.58.128.30
j.root-servers.net.    166419  IN      AAAA   2001:503:c27::2:30
k.root-servers.net.    346878  IN      A      193.0.14.129
k.root-servers.net.    166419  IN      AAAA   2001:7fd::1
l.root-servers.net.    336888  IN      A      199.7.83.42
l.root-servers.net.    166419  IN      AAAA   2001:500:9f::42
m.root-servers.net.    57095   IN      A      202.12.27.33
m.root-servers.net.    166419  IN      AAAA   2001:dc3::35

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Mar 13 17:09:16 AEDT 2023
;; MSG SIZE  rcvd: 811
```

```

z5335039@vx08:~/Desktop$ dig @198.41.0.4 au. NS
; <>> DiG 9.16.37-Debian <>> @198.41.0.4 au. NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 29643
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 6, ADDITIONAL: 13
;; 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      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      c.au.

;; ADDITIONAL SECTION:
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
c.au.         172800  IN      A      162.159.24.179
c.au.         172800  IN      AAAA   2400:cb00:2049:1::a29f:18b3

;; Query time: 140 msec
;; SERVER: 198.41.0.4#53(198.41.0.4)
;; WHEN: Mon Mar 13 21:37:34 AEDT 2023
;; MSG SIZE rcvd: 301

```

```

z5335039@vx08:~/Desktop$ dig @65.22.196.1 unswedau.au. NS
; <>> DiG 9.16.37-Debian <>> @65.22.196.1 unswedau.au. NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 64426
;; flags: qr aa rd; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;unswedu.au.           IN      NS

;; AUTHORITY SECTION:
au.          900     IN      SOA     q.au. noc.afilias-nst.info. 1678703784
10800 1800 2419200 900

;; Query time: 12 msec
;; SERVER: 65.22.196.1#53(65.22.196.1)
;; WHEN: Mon Mar 13 21:40:27 AEDT 2023
;; MSG SIZE rcvd: 97
[Windows Taskbar icons]

z5335039@vx08:~/Desktop$ dig @129.94.0.192 cse.unsw.edu.au. NS
; <>> DiG 9.16.37-Debian <>> @129.94.0.192 cse.unsw.edu.au. NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 9451
;; 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.    300     IN      NS      beethoven.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.    300     IN      NS      maestro.orchestra.cse.unsw.edu.au.

;; ADDITIONAL SECTION:
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.242.2
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.172.11
beethoven.orchestra.cse.unsw.edu.au. 300 IN A 129.94.208.3
maestro.orchestra.cse.unsw.edu.au. 300 IN A 129.94.242.33

;; Query time: 4 msec
;; SERVER: 129.94.0.192#53(129.94.0.192)
;; WHEN: Mon Mar 13 21:41:53 AEDT 2023
;; MSG SIZE rcvd: 164
[Windows Taskbar icons]

```

```

z5335039@vx08:~/Desktop$ dig @162.159.25.38 edu.au. NS
; <>> DiG 9.16.37-Debian <>> @162.159.25.38 edu.au. NS
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 9719
;; flags: qr rd; QUERY: 1, ANSWER: 0, AUTHORITY: 4, ADDITIONAL: 9
;; WARNING: recursion requested but not available

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1232
;; QUESTION SECTION:
;edu.au.                      IN      NS

;; AUTHORITY SECTION:
edu.au.          900    IN      NS      r.au.
edu.au.          900    IN      NS      t.au.
edu.au.          900    IN      NS      s.au.
edu.au.          900    IN      NS      q.au.

;; ADDITIONAL SECTION:
q.au.            900    IN      A       65.22.196.1
r.au.            900    IN      A       65.22.197.1
s.au.            900    IN      A       65.22.198.1
t.au.            900    IN      A       65.22.199.1
q.au.            900    IN      AAAA   2a01:8840:be::1
r.au.            900    IN      AAAA   2a01:8840:bf::1
s.au.            900    IN      AAAA   2a01:8840:c0::1
t.au.            900    IN      AAAA   2a01:8840:c1::1

;; Query time: 4 msec
;; SERVER: 162.159.25.38#53(162.159.25.38)
;; WHEN: Mon Mar 13 21:39:05 AEDT 2023
;; MSG SIZE  rcvd: 275

```



```

z5335039@vx08:~/Desktop$ dig 129.94.242 lyre00.cse.unsw.edu.au. A
; <>> DiG 9.16.37-Debian <>> 129.94.242 lyre00.cse.unsw.edu.au. A
; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 45676
;; flags: qr rd ra; QUERY: 1, ANSWER: 0, AUTHORITY: 1, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;129.94.242.          IN      A

;; AUTHORITY SECTION:
.          10800  IN      SOA     a.root-servers.net. nstld.verisign-grs
com. 2023031300 1800 900 604800 86400

;; Query time: 164 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Mar 13 21:44:13 AEDT 2023
;; MSG SIZE  rcvd: 114

;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 53836
;; 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: 8 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Mon Mar 13 21:44:13 AEDT 2023
;; MSG SIZE  rcvd: 177

```

There are 5 DNS servers.

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

10. hostname -f (get host name)

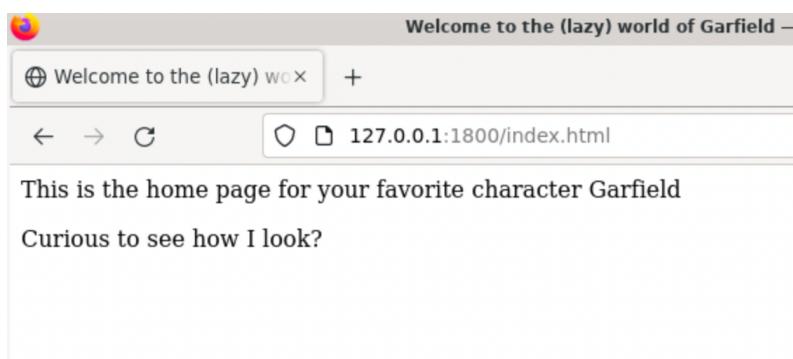
Dig . NS

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

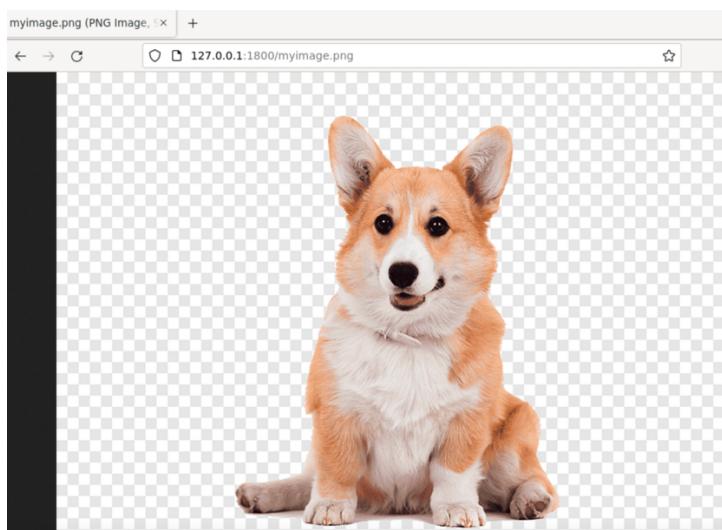
Yes

Exercise 4. TCP socket

http://127.0.0.1:1800/index.html



http://127.0.0.1:1800/myimage.png



http://127.0.0.1:port/bio.html

