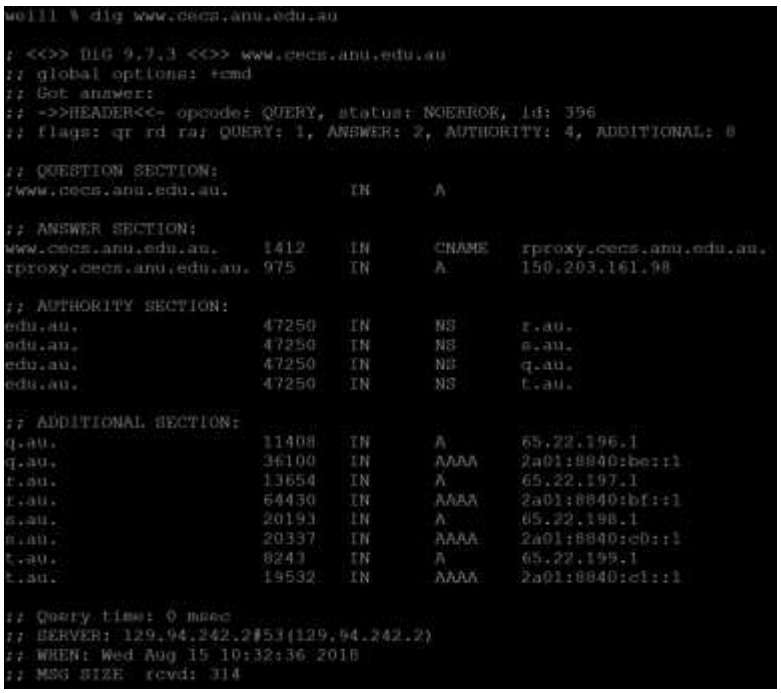
Lab3

Exercise 3

Question 1



The IP address of www.cecs.anu.edu.au is 150.203.161.98;

Type A;

Question 2

From the output from question1, the canonical name for the CECS ANU web server is rproxy.cecs.anu.edu.au.

The IP address of it is 150.203.161.98;

The reason of having an alias for this server is that it can provide convenience when running multiple servers from a single IP address.

Question 3

Use the rest details, I can see the name servers of www.cecs.anu.edu.au and their IP addresses.

Question 4

```
weill % dig localhost

; <<>> DiG 9.7.3 <<>> localhost
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 37081
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

;; QUESTION SECTION:
;localhost.                     IN      A

;; ANSWER SECTION:
localhost.              42715   IN      A       127.0.0.1

;; AUTHORITY SECTION:
localhost.              42715   IN      NS      localhost.

;; ADDITIONAL SECTION:
localhost.              42715   IN      AAAA    ::1

;; Query time: 0 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 10:30:26 2018
;; MSG SIZE  rcvd: 85
```

The IP address of the local nameserver for my machine is 127.0.0.1

Question 5

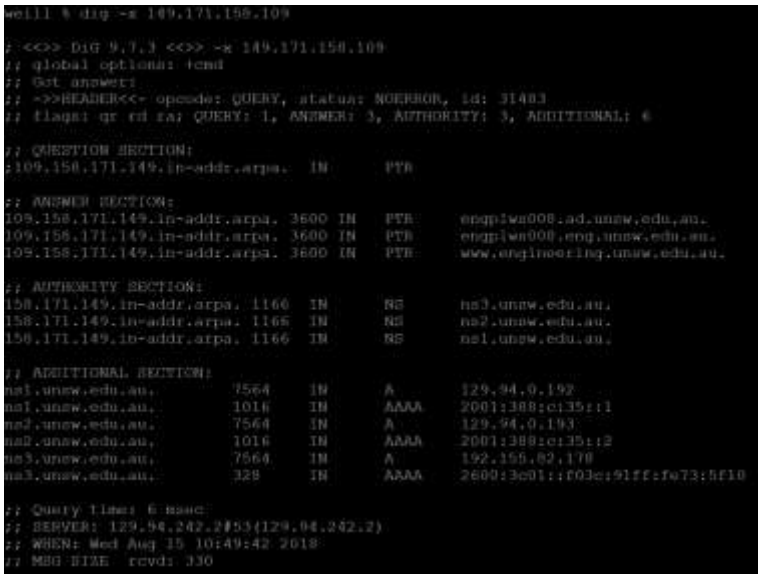
```
weill % dig cecs.anu.edu.au NS

; <<>> DiG 9.7.3 <<>> cecs.anu.edu.au NS
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 36036
;; 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.        941     IN      NS      ns2.cecs.anu.edu.au.
cecs.anu.edu.au.        941     IN      NS      ns3.cecs.anu.edu.au.
cecs.anu.edu.au.        941     IN      NS      ns4.cecs.anu.edu.au.

;; ADDITIONAL SECTION:
ns2.cecs.anu.edu.au.    2018    IN      A       150.203.161.36
ns2.cecs.anu.edu.au.    941     IN      AAAA    2001:388:1034:2905::24
ns3.cecs.anu.edu.au.    2018    IN      A       150.203.161.50
ns3.cecs.anu.edu.au.    941     IN      AAAA    2001:388:1034:2905::32
ns4.cecs.anu.edu.au.    2018    IN      A       150.203.161.38
ns4.cecs.anu.edu.au.    941     IN      AAAA    2001:388:1034:2905::26

;; Query time: 5 msec
;; SERVER: 129.94.242.2#53(129.94.242.2)
;; WHEN: Wed Aug 15 10:42:50 2018
;; MSG SIZE  rcvd: 219
```

The DNS name servers of cecs.anu.edu.au are

- ns2.cecs.anu.edu.au; IP: 150.203.161.36
- ns3.cecs.anu.edu.au; IP: 150.203.161.50
- ns4.cecs.anu.edu.au; IP: 150.203.161.38

the type is NS

Question 6



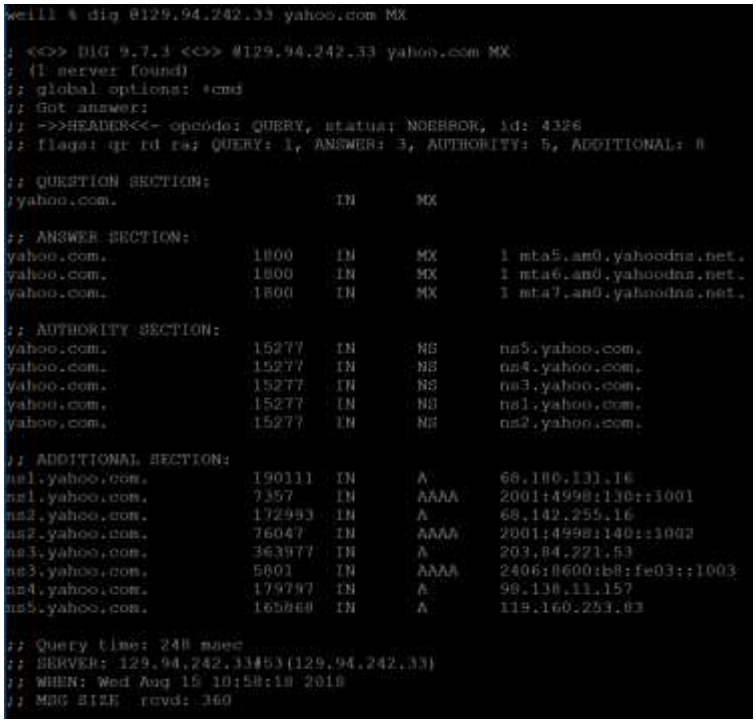
The DNS names associated with 149.171.158.109 are

Engplwd008.ad.unsw.edu.au;

www.engineering.unsw.edu.au;

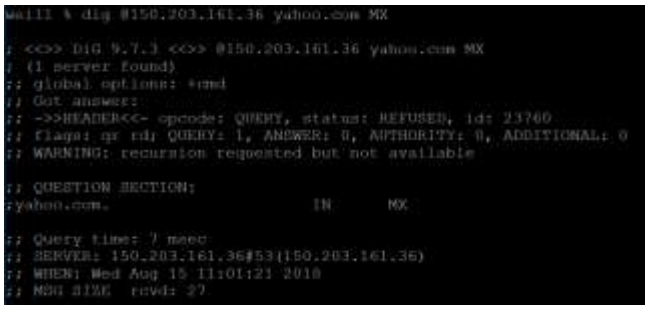
Type: PTR

Question 7:

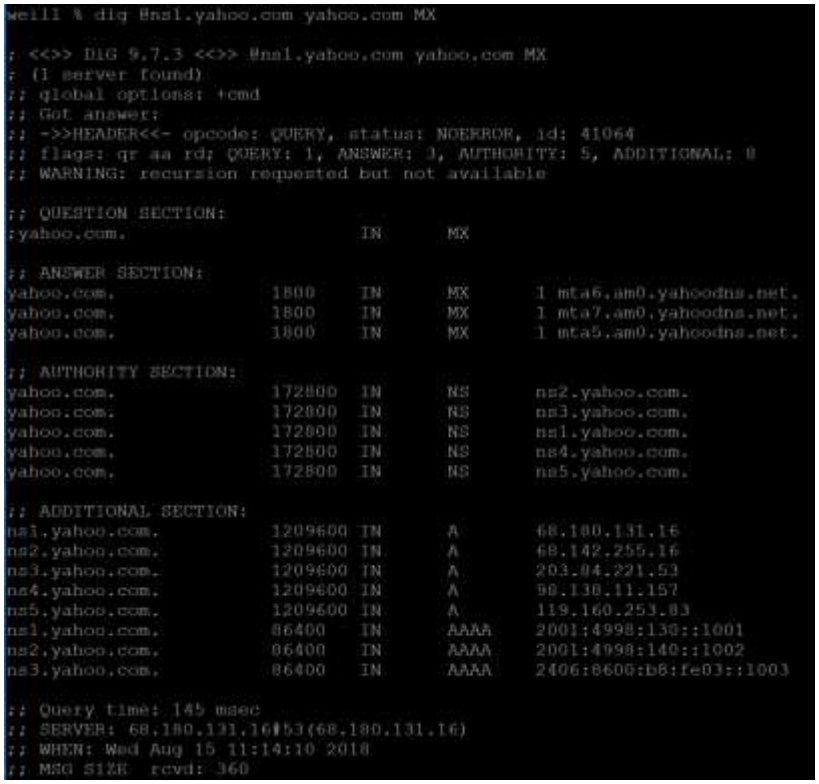


No, I did not get the authoritative answer; because there is no aa in flags.

Question 8:



Question 9:



Type: MX

Question 10

The name servers of '.'are:

```
;; ANSWER SECTION:
.                       29465   IN      NS      k.root-servers.net.
.                       29465   IN      NS      d.root-servers.net.
.                       29465   IN      NS      l.root-servers.net.
.                       29465   IN      NS      e.root-servers.net.
.                       29465   IN      NS      i.root-servers.net.
.                       29465   IN      NS      g.root-servers.net.
.                       29465   IN      NS      m.root-servers.net.
.                       29465   IN      NS      h.root-servers.net.
.                       29465   IN      NS      j.root-servers.net.
.                       29465   IN      NS      c.root-servers.net.
.                       29465   IN      NS      f.root-servers.net.
.                       29465   IN      NS      b.root-servers.net.
.                       29465   IN      NS      a.root-servers.net.
```

The authoritative name server for "au.":

```
;; AUTHORITY SECTION:
au.                     172800  IN      NS      a.au.
au.                     172800  IN      NS      b.au.
au.                     172800  IN      NS      u.au.
au.                     172800  IN      NS      v.au.
au.                     172800  IN      NS      t.au.
au.                     172800  IN      NS      s.au.
au.                     172800  IN      NS      r.au.
au.                     172800  IN      NS      q.au.
au.                     172800  IN      NS      c.au.
au.                     172800  IN      NS      d.au.
```

The authoritative name server for "edu.au":

```
;; AUTHORITY SECTION:
edu.au.                 86400   IN      NS      r.au.
edu.au.                 86400   IN      NS      t.au.
edu.au.                 86400   IN      NS      s.au.
edu.au.                 86400   IN      NS      q.au.
```

The authoritative name server for "unsw.edu.au":

```
;; 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.
```

The authoritative name server for "cse.unsw.edu.au":

```
;; 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.
```

The IP address of lyre01.cse.unsw.edu.au is

```
;; ANSWER SECTION:
lyre01.cse.unsw.edu.au. 3600    IN      A       129.94.210.21
```

There are 6 DNS servers I have to query to get the authoritative answer.

Question 11:

Yes, a machine may have several name or IP addresses associated with it.

Code for Exercise 4

WebServer.py

```python
from socket import *
import os
import sys

# take in the argument
serverPort = int(sys.argv[1])

# connect in TCP
serverSocket = socket(AF_INET, SOCK_STREAM)

#bind the serverSocket with the Port
serverSocket.bind(('', serverPort))

# listen in an infinte loop
serverSocket.listen(1)
print "The server is ready to receive"
while 1:

    # Server accept an Client
    connectionSocket, addr = serverSocket.accept()
    try:
        # receive the data from the socket
        sentence = connectionSocket.recv(1024)

        #Split the GET request; only take the http://XXXX
        temp = sentence.split(" ")
        target = temp[1]

        # Split the http://XXXXX and only take the value we need
        # like index.html
        temp2 = target.split("/")
        #print(temp2)
        html = temp2[1]

        #open the requested file
        file = open(html)

        # take in the data of the file
        data = file.read()

        # if there do have this file, i send this to the Clinet w with header 200ok
        connectionSocket.send("HTTP/1.1 200 OK\n\n")

        # send the data
        connectionSocket.send(data)

        # close the socket
        connectionSocket.close()
```

```python
    except IOError:
        # if there is no such file existing
        # first send the header
        connectionSocket.send("HTTP/1.1 404 Not Found\n\n")
        # the send the body
        r = "<html><body>404 NOT FOUND</body></html>"
        connectionSocket.send(r)
        connectionSocket.close()
```