

## Exercise 3

### Question 1:

The IP address of [www.cecs.anu.edu.au](http://www.cecs.anu.edu.au) is : 150.203.161.98

‘A’ type query is sent.

### Question 2:

The canonical name is : rproxy.cecs.anu.edu.au.

To satisfy different requirements for multiple servers, such as FTP, WEB, EMAIL server.

```
min@min-VirtualBox:~$ dig @8.8.8.8 www.cecs.anu.edu.au

; <<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> @8.8.8.8 www.cecs.anu.edu.au
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 38595
;; flags: qr rd ra; QUERY: 1, ANSWER: 2, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;www.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
www.cecs.anu.edu.au.      2993    IN      CNAME   rproxy.cecs.anu.edu.au.
rproxy.cecs.anu.edu.au.  2993    IN      A       150.203.161.98

;; Query time: 37 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Mon Jun 24 19:39:21 AEST 2019
;; MSG SIZE rcvd: 85
```

### Question 3:

The authority section contains RRs that point toward an authoritative nameserver.

The additional records section contains RRs that relate to the query.

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	10.0.2.15	192.168.0.1	DNS	90	Standard query 0x204c
2	0.030903384	192.168.0.1	10.0.2.15	DNS	127	Standard query response

Transaction ID: 0x204c
Flags: 0x0100 Standard query
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 1
Queries
www.cecs.anu.edu.au: type A, class IN
Name: www.cecs.anu.edu.au
[Name Length: 19]
[Label Count: 5]
Type: A (Host Address) (1)
Class: IN (0x0001)
Additional records
<Root>: type OPT
Name: <Root>
Type: OPT (41)
UDP payload size: 512
Higher bits in extended RCODE: 0x00
EDNS0 version: 0

#### Question 4:

The IP address is 129.94.242.2

```
z5228412@vx4:/tmp_and/ravel/export/ravel/4/z5228412$ dig lgrep SERVER
;; SERVER: 129.94.242.2#53(129.94.242.2)
```

#### Question 5:

The DNS nameserver are: ns4.cecs.anu.edu.au. IP: 150.203.161.38  
 ns2.cecs.anu.edu.au. 150.203.161.36  
 ns3.cecs.anu.edu.au. 150.203.161.50

```

;; Received 987 bytes from 193.0.14.129#53(k.root-servers.net) in 22 ms

anu.edu.au.      900      IN       NS       una.anu.edu.au.
anu.edu.au.      900      IN       NS       ns.adelaide.edu.au.
anu.edu.au.      900      IN       NS       ns1.anu.edu.au.
h41vbq1n5k5kcttbd2leso2ml6f53tfr.edu.au. 900 IN NSEC3 1 1 1 D399EAAB NFR510UA143
PHUA NS SOA RRSIG DNSKEY NSEC3PARAM
h41vbq1n5k5kcttbd2leso2ml6f53tfr.edu.au. 900 IN RRSIG NSEC3 8 3 900 201907160621
1704 edu.au. LX8pGL1CoEQPXs6g/f3kviY4XkwZ6hkWFiF09cQSUmaJ1G6Ap9g+C8U uXR8T02YT
haqzXseRdkex03YMBJE3H+MEW6VLIM 4NwL3Yp5vEeJG2dVJ6rVHj6s0XSLdvTk463ZhrPcCau+E8Nam
rd73fj7kb5lsva381jdh921v1o06t9bh.edu.au. 900 IN NSEC3 1 1 1 D399EAAB T1A509856GH
VGOT NS DS RRSIG
rd73fj7kb5lsva381jdh921v1o06t9bh.edu.au. 900 IN RRSIG NSEC3 8 3 900 201907110334
1704 edu.au. Qq7p26IoWl9vMPXIX8+M001+LLgAD3KvPn00Jay8r5W45w1mjIerKE4+ 4M8Dqmp7Y
ZXfZk1yMw5QT4VCYWPvnJco4JYCOC7 7exD/TR/BeLF2xx1W+LXz/dkA+IHFEy/4lj9kxmH9kXRTC093
;; Received 653 bytes from 65.22.196.1#53(q.au) in 21 ms

cecs.anu.edu.au. 300      IN       NS       ns2.cecs.anu.edu.au.
cecs.anu.edu.au. 300      IN       NS       ns4.cecs.anu.edu.au.
cecs.anu.edu.au. 300      IN       NS       ns3.cecs.anu.edu.au.
;; Received 146 bytes from 150.203.22.28#53(una.anu.edu.au) in 16 ms

cecs.anu.edu.au. 3600     IN       A        150.203.161.98
cecs.anu.edu.au. 3600     IN       NS       ns2.cecs.anu.edu.au.
cecs.anu.edu.au. 3600     IN       NS       ns4.cecs.anu.edu.au.
cecs.anu.edu.au. 3600     IN       NS       ns3.cecs.anu.edu.au.
;; Received 274 bytes from 150.203.161.50#53(ns3.cecs.anu.edu.au) in 13 ms

```

```

;; ANSWER SECTION:
ns2.cecs.anu.edu.au. 3600     IN       A        150.203.161.36

;; Query time: 102 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Tue Jun 25 18:12:34 AEST 2019
;; MSG SIZE rcvd: 64

min@min-VirtualBox:~$ dig @8.8.8.8 ns3.cecs.anu.edu.au.

;<<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> @8.8.8.8 ns3.cecs.anu.edu.au.
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 63992
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;ns3.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
ns3.cecs.anu.edu.au. 3600     IN       A        150.203.161.50

;; Query time: 95 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Tue Jun 25 18:12:48 AEST 2019
;; MSG SIZE rcvd: 64

min@min-VirtualBox:~$ dig @8.8.8.8 ns4.cecs.anu.edu.au.

;<<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> @8.8.8.8 ns4.cecs.anu.edu.au.
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 20399
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 512
;; QUESTION SECTION:
;ns4.cecs.anu.edu.au.      IN      A

;; ANSWER SECTION:
ns4.cecs.anu.edu.au. 3600     IN       A        150.203.161.38

```

## Type A & NS

No.	Time	Source	Destination	Protocol	Length	Info
1	0.000000000	10.0.2.15	8.8.8.8	DNS	82	Standard query 0x78
2	0.026546901	8.8.8.8	10.0.2.15	DNS	741	Standard query resp
3	2.035098717	10.0.2.15	193.0.14.129	DNS	98	Standard query 0x10
4	2.057703989	193.0.14.129	10.0.2.15	DNS	1029	Standard query resp
5	3.063370359	10.0.2.15	65.22.196.1	DNS	98	Standard query 0x82
6	3.084970462	65.22.196.1	10.0.2.15	DNS	695	Standard query resp
7	3.086082740	10.0.2.15	192.168.0.1	DNS	85	Standard query 0x0a
8	3.123808517	192.168.0.1	10.0.2.15	DNS	101	Standard query resp
9	3.124650278	10.0.2.15	192.168.0.1	DNS	85	Standard query 0xa0
10	3.124852062	10.0.2.15	192.168.0.1	DNS	85	Standard query 0xb1
11	3.153459084	192.168.0.1	10.0.2.15	DNS	132	Standard query resp
12	3.181217446	192.168.0.1	10.0.2.15	DNS	101	Standard query resp
13	3.181988889	10.0.2.15	150.203.22.28	DNS	98	Standard query 0x22
14	3.198690556	150.203.22.28	10.0.2.15	DNS	188	Standard query resp
15	4.200473821	10.0.2.15	150.203.161.50	DNS	98	Standard query 0xde
16	4.213562322	150.203.161.50	10.0.2.15	DNS	316	Standard query resp

Internet Protocol Version 4, Src: 10.0.2.15, Dst: 150.203.22.28
User Datagram Protocol, Src Port: 58819, Dst Port: 53
Domain Name System (query)
Transaction ID: 0x2278
Flags: 0x0020 Standard query
Questions: 1
Answer RRs: 0
Authority RRs: 0
Additional RRs: 1
Queries
cecs.anu.edu.au type A, class IN
Name: cecs.anu.edu.au
[Name Length: 15]
[Label Count: 4]
Type: A (Host Address) (1)
Class: IN (0x0001)
Additional records
<Root>: type OPT
<a href="#">[Response In: 14]</a>

```
cecs.anu.edu.au.      300    IN      NS      ns2.cecs.anu.edu.au.
cecs.anu.edu.au.      300    IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.      300    IN      NS      ns3.cecs.anu.edu.au.
;; Received 146 bytes from 150.203.22.28#53(una.anu.edu.au) in 16 ms

cecs.anu.edu.au.      3600   IN      A        150.203.161.98
cecs.anu.edu.au.      3600   IN      NS      ns2.cecs.anu.edu.au.
cecs.anu.edu.au.      3600   IN      NS      ns4.cecs.anu.edu.au.
cecs.anu.edu.au.      3600   IN      NS      ns3.cecs.anu.edu.au.
;; Received 274 bytes from 150.203.161.50#53(ns3.cecs.anu.edu.au) in 13 ms
```

## Question 6:

DNS name: webserver.seecs.nust.edu.pk Type PTR

```
min@min-VirtualBox:~$ dig -x 111.68.101.54

;<<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> -x 111.68.101.54
;; global options: +cmd
;; Got answer:
;; ->HEADER<<- opcode: QUERY, status: NOERROR, id: 63603
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;54.101.68.111.in-addr.arpa.    IN      PTR

;; ANSWER SECTION:
54.101.68.111.in-addr.arpa. 3600 IN      PTR      webserver.seecs.nust.edu.pk.

;; Query time: 334 msec
;; SERVER: 127.0.0.53#53(127.0.0.53)
;; WHEN: Tue Jun 25 17:54:41 AEST 2019
;; MSG SIZE rcvd: 96
```



**Question 7:**

NO, the RRs type is NS not SOA, so isn't authoritative answer.

```
uxterm
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 17816
;; 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.                1743    IN      MX      1 mta5.am0.yahoodns.net.
yahoo.com.                1743    IN      MX      1 mta6.am0.yahoodns.net.
yahoo.com.                1743    IN      MX      1 mta7.am0.yahoodns.net.

;; AUTHORITY SECTION:
yahoo.com.                135701  IN      NS      ns5.yahoo.com.
yahoo.com.                135701  IN      NS      ns4.yahoo.com.
yahoo.com.                135701  IN      NS      ns3.yahoo.com.
yahoo.com.                135701  IN      NS      ns2.yahoo.com.
yahoo.com.                135701  IN      NS      ns1.yahoo.com.

;; ADDITIONAL SECTION:
ns1.yahoo.com.            320680  IN      A       68,180,131,16
```

**Question 8:**

The answer is : recursion requested but not available.

```
z5228412@vx1:/tmp_and/ravel/export/ravel/4/z5228412$ dig @150.203.161.36 mx yahoo.com

; <<> DiG 9.9.5-9+deb8u17-Debian <<> @150.203.161.36 mx yahoo.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: REFUSED, id: 25880
;; 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: 7 msec
;; SERVER: 150.203.161.36#53(150.203.161.36)
;; WHEN: Tue Jun 25 18:39:05 AEST 2019
;; MSG SIZE rcvd: 38
```

**Question 9:**

QUERY type MX

```

min@min-VirtualBox:~$ dig @8.8.8.8 mx mail.yahoo.com

; <<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> @8.8.8.8 mx mail.yahoo.com
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 34503
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 1

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

;; ANSWER SECTION:
mail.yahoo.com. 89 IN CNAME fd-geoycpt-uno.gycpi.b.yahoodns.net.

;; AUTHORITY SECTION:
gydpi.b.yahoodns.net. 300 IN SOA yf1.yahoo.com. hostmaster.yahoo-inc.com. 15614529
10 30 30 86400 300

;; Query time: 49 msec
;; SERVER: 8.8.8.8#53(8.8.8.8)
;; WHEN: Tue Jun 25 18:55:12 AEST 2019
;; MSG SIZE rcvd: 153

```

### Question 10 :

DNS: .root + au. + edu.au. + unsw.edu.au. + cse.unsw.edu .au. = 5

At least 5.

```

min@min-VirtualBox:~$ dig @8.8.8.8 +trace cse.unsw.edu.au.

; <<>> DiG 9.11.5-P1-1ubuntu2-Ubuntu <<>> @8.8.8.8 +trace cse.unsw.edu.au.
; (1 server found)
;; global options: +cmd
. 93430 IN NS k.root-servers.net.
. 93430 IN NS l.root-servers.net.
. 93430 IN NS m.root-servers.net.
. 93430 IN NS a.root-servers.net.
. 93430 IN NS b.root-servers.net.
. 93430 IN NS c.root-servers.net.
. 93430 IN NS d.root-servers.net.
. 93430 IN NS e.root-servers.net.
. 93430 IN NS f.root-servers.net.
. 93430 IN NS g.root-servers.net.
. 93430 IN NS h.root-servers.net.
. 93430 IN NS i.root-servers.net.
. 93430 IN NS j.root-servers.net.
;; Received 699 bytes from 8.8.8.8#53(8.8.8.8) in 29 ms

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.
au. 86400 IN DS 20647 8 1 A1C2F3602CD171C
6
au. 86400 IN DS 20647 8 2 EFC7975FCA1FED2
C83F5D9EC1D3B4C99 0B8E2B54
au. 86400 IN RRSIG DS 8 1 86400 201907080500
. h0eQZA/BnJSQwdML9PFCiGvkcYFmMkV1PgX5jK0jTBLnhllERNYeQqQ6 y0w0yYyGTycaOU
qYIXBenhI3QYv3QVm9 egNvQkvzKJ6/zSbXMfwR1D+Wno/EpSe7j77zW3myve5DpAnfTWmpQ1
LCVpIYpY32mfB2j+omd18/z/ewWJLHmG0H6 njnwn+z6FB9KrqaVLeXqrKJxj09i+IzaV/iOm
CEk4ncldw/gCGfGFsmzPKyNy7xFCpYcgxko3RQDw6EyxyqhQys8W mBK2Aw==
;; Received 987 bytes from 199.7.91.13#53(d.root-servers.net) in 187 ms

unsw.edu.au. 900 IN NS ns3.unsw.edu.au.
unsw.edu.au. 900 IN NS ns2.unsw.edu.au.
unsw.edu.au. 900 IN NS ns1.unsw.edu.au.

```

```
;; Received 701 bytes from 65.22.197.1#53(r.au) in 17 ms
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.
;; Received 164 bytes from 129.94.0.193#53(ns2.unsw.edu.au) in 10 ms

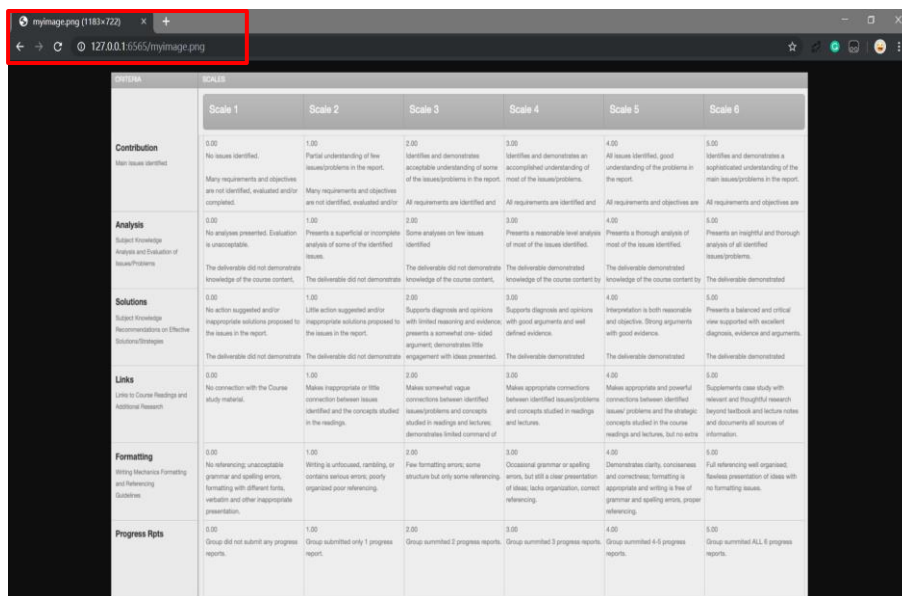
cse.unsw.edu.au.      3600   IN      A        129.94.242.49
cse.unsw.edu.au.      3600   IN      A        129.94.242.53
cse.unsw.edu.au.      3600   IN      A        129.94.242.19
cse.unsw.edu.au.      3600   IN      NS      beethoven.orchestra.cse.unsw.edu.au.
cse.unsw.edu.au.      3600   IN      NS      maestro.orchestra.cse.unsw.edu.au.
;; Received 180 bytes from 129.94.242.2#53(beethoven.orchestra.cse.unsw.edu.au) in 8 ms
```

### Question 11 :

Yes. The IP address is associated with the interface of physical machine, one physical machine can have several interfaces and different interface is used to support different functions.

## Exercise 4

myimage.png



	Scale 1	Scale 2	Scale 3	Scale 4	Scale 5	Scale 6
<b>Contribution</b> Non-issues identified	0.00 No issues identified. Many requirements and objectives are not identified, evaluated and/or completed.	1.00 Partial understanding of few issues/problems in the report. Many requirements and objectives are not identified, evaluated and/or completed.	2.00 Identifies and demonstrates acceptable understanding of some of the issues/problems in the report. All requirements are identified and	3.00 Identifies and demonstrates an accomplished understanding of most of the issues/problems. All requirements are identified and	4.00 All issues identified, good understanding of the problems in the report. All requirements and objectives are	5.00 Identifies and demonstrates a sophisticated understanding of the main issues/problems in the report. All requirements and objectives are
<b>Analysis</b> Subject Knowledge Analysis and Evaluation of Issues/Problems	0.00 No analyses presented. Evaluation is unacceptable. The deliverable did not demonstrate knowledge of the course content.	1.00 Presents a superficial or incomplete analysis of some of the identified issues. The deliverable did not demonstrate knowledge of the course content.	2.00 Some analyses on few issues identified. The deliverable did not demonstrate knowledge of the course content.	3.00 Presents a reasonable level analysis of most of the issues identified. The deliverable demonstrated knowledge of the course content by	4.00 Presents a thorough analysis of most of the issues identified. The deliverable demonstrated knowledge of the course content by	5.00 Presents an insightful and thorough analysis of all identified issues/problems. The deliverable demonstrated
<b>Solutions</b> Subject Knowledge Recommendations on Effective Solutions/Strategies	0.00 No action suggested and/or inappropriate solutions proposed to the issues in the report. The deliverable did not demonstrate	1.00 Little action suggested and/or inappropriate solutions proposed to the issues in the report. The deliverable did not demonstrate	2.00 Supports diagnosis and opinions with limited reasoning and evidence; presents a somewhat one-sided argument; demonstrates little engagement with ideas presented. The deliverable demonstrated	3.00 Supports diagnosis and opinions with good arguments and well-defined evidence. The deliverable demonstrated	4.00 Interpretation is both reasonable and objective. Strong arguments with good evidence. The deliverable demonstrated	5.00 Presents a balanced and critical view supported with excellent diagnosis, evidence and arguments. The deliverable demonstrated
<b>Links</b> Links to Course Readings and Additional Research	0.00 No connection with the Course study material.	1.00 Makes inappropriate or little connection between issues identified and the concepts studied in the readings.	2.00 Makes somewhat vague connections between identified issues/problems and concepts studied in readings and lectures; demonstrates limited command of	3.00 Makes appropriate connections between identified issues/problems and concepts studied in readings and lectures.	4.00 Makes appropriate and powerful connections between identified issues/problems and the strategic concepts studied in the course readings and lectures, but no extra	5.00 Supplements class study with relevant and thoughtful research beyond textbook and lecture notes and documents all sources of information.
<b>Formatting</b> Writing Mechanics Formatting and Referencing Solutions	0.00 No referencing; unacceptable grammar and spelling errors; formatting with different fonts, colours and other inappropriate presentation.	1.00 Writing is unfocused, rambling, or contains serious errors; poorly organized poor referencing.	2.00 Few formatting errors; some structure but only some referencing.	3.00 Occasional grammar or spelling errors, but still a clear presentation of ideas; lacks organization, correct referencing.	4.00 Demonstrates clarity, conciseness and correctness; formatting is appropriate and writing is free of grammar and spelling errors; proper referencing.	5.00 Full referencing well organized; flawless presentation of ideas with no formatting issues.
<b>Progress Rpts</b>	0.00 Group did not submit any progress reports.	1.00 Group submitted only 1 progress report.	2.00 Group submitted 2 progress reports.	3.00 Group submitted 3 progress reports.	4.00 Group submitted 4-5 progress reports.	5.00 Group submitted ALL 6 progress reports.

index.html



Error 404

