Homework 5 (DNS)

Concepts

- How DNS is organized?
- What are the **resource records** maintained by each DNS server?
- How to search DNS servers?
- How to use `dig` and `nslookup`.

DNS and `dig` Tool

`dig` is a UNIX utility that can interact with DNS servers. We will use `dig` to explore the DNS domain hierarchy. (Read Dig Command Examples for some examples.)
Start `CSC361-VM`. Open a terminal and enter the command:

```
$ dig
```

This will request from your local namer server the list of all **root** name servers.

1. How many **root** name servers? What are they?
2. What is the IP address of the **name server** that provides these answers?

Enter the following shell command:

```
$ dig NS ca
```

which requests from your local name server a list of all the name servers responsible for the `.ca` domain.

3. How many such name servers? What are they?

Enter the following shell command:

```
$ dig @m.root-servers.net NS ca
```

which requests from one of the **root** name server a list of all the name servers responsible for the `.ca` domain.

4. Is the list returned same as question 3?
5. Show the IP address of one of the name server responsible for "ca" domain.

We are going to **iteratively** investigate all the domain name servers in the DNS hierarchy. Our target hostname is `www.csc.uvic.ca` . There are several domains or subdomains in this hostname, i.e., `.ca` , `.uvic.ca` , `.csc.uvic.ca` .

Enter the following shell command

```
$ dig NS ca
```

which will list all name servers responsible for the `.ca` domain.

Now, take one of those listed name servers and enter:

```
$ dig @<one of the named servers> NS uvic.ca
```

Essentially, we are asking one of the `.ca` root name servers all the namer servers responsible for `.uvic.ca` domain.

6. How many registered name servers responsible for `uvic.ca` ?
   Name one of them.

Now, repeat the command for `csc.uvic.ca` domain by asking one of the name servers in Q5.

```
$ dig @<one of the named servers> NS csc.uvic.ca
```

7. How many registered name servers responsible for `csc.uvic.ca` ? Name one of them.
8. How many mail servers for google.com? (Try `dig MX goole.com`)
9. List all DNS record types about "uvic.ca", including SOA, LOC, TXT, MX and NS. (Use
   `dig @dns1.uvic.ca uvic.ca any` instead if your local name server doesn't work.)

DNS and `nslookup` Tool

```
nslookup www.ncu.edu.tw
```

10. Run `nslookup` to obtain the IP address of `www.ncu.edu.tw` . What is the IP address of this web server?