Vidun Jayakody - Assignment 2

1. Answer the following questions.

   (a) (4 points) How does SMTP mark the end of a message body?

   With a line containing just ".".
   .

   (b) (4 points) How about HTTP?

   It depends on the context of the HTTP message; Generally, it's marked with the `Content-Length` header, which will say the exact size of the body in bytes, so x bytes from the beginning of the message will mark the end.

2. In this problem, we use the useful dig tool available on UNIX and Linux hosts to explore the hierarchy of DNS servers. If you are using Windows, you must install `dig`[1] In Fig.2.19 of the textbook, a DNS server in the DNS hierarchy delegates a DNS query to a DNS server lower in the hierarchy, by sending back to the DNS client the name of that lower-level DNS server. First, read the `man` page for `dig`, and then answer the following questions.

   (a) (5 points) Starting with a root DNS server (from one of the root servers *[a-m].root-servers.net*), initiate a sequence of queries (one for each DNS server in the hierarchy) for the IP address for `cisl.carleton.ca` by using `dig`. Write down the `dig` command you ran for each query, and the `AUTHORITY SECTION` in the response to each query.

```
$ dig @a.root-servers.net cisl.carleton.ca

;; AUTHORITY SECTION:
ca.  172800 IN NS any.ca-servers.ca.
ca.  172800 IN NS c.ca-servers.ca.
ca.  172800 IN NS d.ca-servers.ca.
ca.  172800 IN NS j.ca-servers.ca.

$ dig @c.ca-servers.ca cisl.carleton.ca

;; AUTHORITY SECTION:
carleton.ca.  86400 IN NS ns1.d-zone.ca.
carleton.ca.  86400 IN NS ns1.carleton.ca.
carleton.ca.  86400 IN NS ns2.d-zone.ca.
carleton.ca.  86400 IN NS ns2.carleton.ca.

$ dig @ns1.carleton.ca cisl.carleton.ca

;; ANSWER SECTION:
cisl.carleton.ca.  14400 IN A 134.117.225.9
```

(b) (5 points) Repeat part (a) for stem.open.ac.uk

```
$ dig @a.root-servers.net stem.open.ac.uk

;; AUTHORITY SECTION:
uk.   172800 IN NS dns1.nic.uk.
uk.   172800 IN NS dns4.nic.uk.
uk.   172800 IN NS nsa.nic.uk.
uk.   172800 IN NS nsd.nic.uk.
uk.   172800 IN NS nsc.nic.uk.
uk.   172800 IN NS nsb.nic.uk.
uk.   172800 IN NS dns3.nic.uk.
uk.   172800 IN NS dns2.nic.uk.

$ dig @dns4.nic.uk stem.open.ac.uk

;; AUTHORITY SECTION:
ac.uk.   172800 IN NS ns0.ja.net.
ac.uk.   172800 IN NS ns1.surfnet.nl.
ac.uk.   172800 IN NS ns2.ja.net.
ac.uk.   172800 IN NS ns3.ja.net.
ac.uk.   172800 IN NS ns4.ja.net.
ac.uk.   172800 IN NS dns-3.dfn.de.
ac.uk.   172800 IN NS auth03.ns.uu.net.

$ dig @ns1.surfnet.nl stem.open.ac.uk

;; AUTHORITY SECTION:
open.ac.uk.   86400 IN NS nse-2.open.ac.uk.
open.ac.uk.   86400 IN NS nse-1.open.ac.uk.
open.ac.uk.   86400 IN NS nse-0.open.ac.uk.
open.ac.uk.   86400 IN NS dns3.easydns.org.
open.ac.uk.   86400 IN NS ns5.dnsmadeeasy.com.
open.ac.uk.   86400 IN NS ns6.dnsmadeeasy.com.
open.ac.uk.   86400 IN NS dns2.easydns.net.
open.ac.uk.   86400 IN NS dns1.easydns.com.
open.ac.uk.   86400 IN NS ns7.dnsmadeeasy.com.

$ dig @nse-1.open.ac.uk stem.open.ac.uk

;; ANSWER SECTION:
stem.open.ac.uk.   3600 IN CNAME openuniversity.prod.acquia-sites.com.
```