CS2022 ASSIGNMENT 10 (Due Date: Nov 25, 2022)

Instructions: You have to answer all of them.

Question 1

(a) In the header of an IP datagram, a data called *Time-to-Live* is added. Describe what is the purpose of adding such data.

(b) Bus and ring are two topologies for local area networks. For bus topology, one MAC method applied is the CSMA/CA method. For the ring topology, the MAC method is called *token ring*. Describe how the medium access can be managed by this token ring method. [Hint: The key idea behind the token ring is to let every computer send out a message via round-robin manner.]

(c) To transfer a big file, as large as 5M bytes, the file will have to be chopped into multiple small segments. Each segment will then be encapsulated in an IP datagram and then send to the destination IP address. On the destination, it might happen three situations. First, all segments have been received but their arrival times are not in order. Second, some segments have not been received after a period of time. Third, all segments have been received but some of them are duplicated. Describe in detail the mechanism how the destination computer is able to reconstruct the file and pass the file to the corresponding process.

(d) While a frame (i.e. the IP datagram together with the MAC header) has arrived the destination IP address, what the destination computer can see is a sequence of binary bits. Describe how the destination computer is able to detect if the arrival frame is erroneous or error-free.

Question 2

(a) What is the usage of a domain name server and the network of domain name servers?

(b) Suppose your iPhone has the following setting.

```
Airplane Mode:     OFF
Wi-Fi:             OFF
Bluetooth:         OFF
Mobile Data:       ON
Personal Hotspot: OFF
```

You have already subscribed voice and data services from a local telecommunication firm. You are able to access `www.yahoo.com` and `www.google.com` but not `www.nchu.edu.tw`. What is(are) the possible reason(s) for this situation? What will you do in order to validate your guess?

(c) Suppose your iPhone has the following setting.

```
Airplane Mode:     OFF
Wi-Fi:             OFF
Bluetooth:         OFF
Mobile Data:       ON
Personal Hotspot: OFF
```

You have already subscribed voice and data services from a local telecommunication firm. It happens that you are not able to access `www.yahoo.com`, `www.google.com` and `www.nchu.edu.tw`. What is(are) the possible reason(s) for this situation? What will you do in order to validate your guess?

(d) Suppose your iPhone has the following setting.

```
Airplane Mode:     OFF
Wi-Fi:             ON
Bluetooth:         OFF
Mobile Data:       ON
Personal Hotspot: OFF
```

You have already subscribed voice and data services from a local telecommunication firm. Your iPhone has been connecting to an NCHU Wi-Fi access point. Now, you are able to access `www.yahoo.com` and `www.google.com` but not `www.nchu.edu.tw`. What is(are) the possible reason(s) for this situation? What will you do in order to validate your guess?

(e) Suppose your iPhone has the following setting.

```
Airplane Mode:     OFF
Wi-Fi:             ON
```

```
Bluetooth:        OFF
Mobile Data:      ON
Personal Hotspot: OFF
```

You have already subscribed voice and data services from a local telecommunication firm. Your iPhone has been connecting to an NCHU Wi-Fi access point. It is found that you are not able to access `www.yahoo.com`, `www.google.com` and `www.nchu.edu.tw`. What is(are) the possible reason(s) for this situation? What will you do in order to validate your guess?