Homework #4

✓ **Please upload your answer sheet in LMS. The uploading file must be PDF.**

✓ **Also upload your source codes in the Linux servers as shown below.**

✓ **Due date: 11pm, 12/06 (Mon)**

1. **Implement the stop-and-wait protocol-based file transfer program over UDP as shown below. You should upload the source codes in Linux servers and explain about your source codes in the answer file with screenshot. (60points)**

   - If you do not follow the instructions below, you may receive penalty points.
   - You should improve the UDP-based file transfer program that you implemented for homework #3.
   - You should implement stop-and-wait protocol for reliable data transfer.
   - For the stop-wait-protocol, you can consider the rdt 3.0 protocol in the Chapter 3.
   - You don't need to check the packet corruption. You just implement the packet retransmission for the packet loss.
   - You should implement the both server and client program using C language.
   - Upload your source codes in the server following the guide.
     Server program at server #1(R640, IP=203.252.112.25)   → udp_rdt_ft_server.c
     Client program at server #2(New Dell, IP=203.252.112.26) → udp_rdt_ft_client.c
   - Client sends the file name and contents of the file to the server.
   - Server receives file name and store the received data from the client.
   - Server and client can finish the program after file receiving.
   - Server and client program should support both ASCII-based file and binary file.
   - After uploading the file, the client program should display the elapsed time and throughput.
   - Your programs should follow the usage below.
     Server: # ./udp_rdt_ft_server <port>
     Client: # ./udp_rdt_ft_client <IP> < port> <filename>
   - Your programs can freely display the status of file transferring, e.g., transmission, retransmission, ACK, and timeout, etc.
   - Please test your program in the server environment.
   - Hint! You need to design your own header. For the timer, you can refer to "setsockopt()" and "Timeout Option" .

2. **What is the NAT traversal problem? What are the solutions? You need to give two or more solutions and explain its mechanisms. (Within one page) (20points)**

3. **Explain the IPv6 addressing in terms of address space, representation, and difference from IPv4. (Within one page) (20points)**

※ For Q2 and Q3, you can search in the Internet. However, you should provide the answers in your language.

※ You can write the answer in Korean.