DNS

1. With your browser, visit the Web page: http://www.ietf.org
   Answer the following questions:
   1. Locate the DNS query and response messages. Are they sent over UDP or TCP?
   2. What is the destination port for the DNS query message? What is the source port of DNS response message?
   3. To what IP address is the DNS query message sent? Use ipconfig to determine the IP address of your local DNS server. Are these two IP addresses the same?
   4. Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?
   5. Examine the DNS response message. How many "answers" are provided? What do each of these answers contain?
   6. This web page contains images. Before retrieving each image, does your host issue new DNS queries?

2. Do a nslookup on www.ubc.ca
   1. What is the destination port for the DNS query message? What is the source port of DNS response messages?
   2. To what IP address is the DNS query message sent? Is this the IP address of your default local DNS server?
   3. Examine the DNS query message. What "Type" of DNS query is it? Does the query message contain any "answers"?
   4. Examine the DNS response message. How many "answers" are provided? What do each of these answers contain?

Socket Programming

1. Design and implement a client-server system for a chatroom application using socket programming. The system should meet the following requirements:
   - Implement 4 client programs to simulate users joining the chatroom and 2 server programs to manage the chatroom in a distributed manner.
   - Each client prompts the user to input a message, selects one of the two servers (e.g., via user choice or round-robin), and sends the message to the selected server.
   - Each server receives messages from connected clients and broadcasts them to all clients currently connected to that server. Additionally, to ensure a unified chatroom experience, each server must forward received messages to the other server via inter-server socket communication for global broadcasting.

- Each client displays all broadcast messages received from its connected server, including those forwarded from the other server.
- Each server must handle multiple clients concurrently using threading to support simultaneous connections from the 4 clients distributed across the two servers.