CSNB314 Lab Work

Lab 4: Understanding Socket Programming (30 marks)

Download, compile and run the simple TCP and UDP programs as shown by your lecturer. Make sure that both programs can run and function as they should.

Once your programs can run correctly, do the following exercises. Write down the answers to the questions given to be submitted at the end of the lab.

1) Find the codes in the UDP client program that performs the following operations:
    a. Specify the port number of the this (UDP client) application
    b. Specify the port number of the receiving application
    c. Specify the IP address of the receiving host
    d. Create the message to be transmitted
    e. Send message to the network.

    [5 marks]

2) Find the codes in the UDP server program that performs the following operations.
    a. Specify the port number of this (UDP server) application
    b. Receive message from the network.

    [2 marks]

3) Find the codes in the TCP client program that performs the following operations.
    a. Specify the port number of the this (TCP client) application
    b. Specify the port number of the receiving application
    c. Specify the IP address of the receiving host
    d. Establish TCP connection to the server
    e. Create the message to be transmitted
    f. Send message to the network.

    [6 marks]

4) Find the codes in the TCP server program that performs the following operations.
    a. Specify the port number of the this (TCP server) application
    b. Accept TCP connection from the client
    c. Receive data from the network

    [3 marks]

5) Modify your UDP client program so that it sends a message to the computer of the person sitting next to you. Which part of the code do you need to modify to do this?

    [1 mark]

6) Do the same with the TCP client program. Which part of the code do you need to modify to do this?

    [1 mark]

7) Set the port number of the TCP client program to 0. Which part of the code do you need to modify to do this? Does the program still work? Does the program actually get a port number of 0, or some other port number? (Hint: Use the command '*netstat*' on the command prompt to check for the open ports on your computer).

[3 marks]

8) When the UDP server application receives data from the network, the information about the sender of this data is stored in a variable. Which variable is it?

[1 mark]

9) When the TCP server application accepts a TCP connection, the information about the TCP client application that initiates the connection is stored in a variable. Which variable is it?

[1 mark]

10) In both the UDP and TCP server programs, inside the *while()* loop, there is a statement:

buffer[status] = '\0';

What does this statement do?

(Hint: Try to comment out this statement and then recompile and run the program. See what happens).

[2 marks]

11) In the TCP server program, two sockets are created.
    a. Name the two variables that are used to associate with the two sockets.
    b. What is the use of the first socket? What is the use of the second socket?

[4 marks]

12) When the TCP server program has accepted a connection from the TCP client, the following message is printed out:

A connection from 127.0.0.1 has been accepted

Identify the function call in the program that prints out the IP address above.

[1 mark]