National University of Computer and Emerging Sciences, Karachi
FAST School of Computing

Network & Cyber Security I (CY 2001)
Fall 2022
Instructor: Dr. Aqsa Aslam
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Assignment-I
Date: September 28, 2022

Weightage: 2.5
Sections: BCY-3A

Assignment Instructions:

1. This is a group assignment. Each group can be of two members only.
2. The assignment must be submitted in on Google Classroom.
3. Write the roll no: and name on the front page of your assignment.
4. Plagiarism in any form will result in straight "F"

Deadline to submit the assignment no: Oct 8th, 2022

Objective:

The goal of this assignment is to implement a UDP client and server, and a UDP client and server. UDP client/server application will communicate over the network and exchange data.
In this assignment, you will learn the basics client and server communication architecture and socket programming for UDP. You will learn how to send and receive datagram packets using UDP sockets. It will help you "tune up" your network programming skills for other network programming tasks and courses.

Procedure in Client-Server Communication:

- **Socket:** Create a new communication
- **Bind:** Attach a local address to a socket
- **Listen:** Announce willingness to accept connections
- **Accept:** Block caller until a connection request arrives
- **Connect:** Actively attempt to establish a connection
- **Send:** Send some data over a connection
- **Receive:** Receive some data over a connection
- **Close:** Release the connection

Tasks

Choose either Java or C.

1. Your task is to write the server and client programs in C using UDP.
   a. Client Program starts and connects to the server.
   b. Client-Server sends and receives messages.
2. Your last task is that client sends a sequence number in the UDP packet to the server, which is listening for uptime (i.e., the UDP packets) of the client application. Upon receiving the packets, the server calculates the no: of packet receive. If the packets are missing (sequence no:) for some specified period of time, we can assume that the client application has stopped. Implement the for client only.

Submission:

1. You will turn in 2 different programs.
   a. Server in C using TCP (file name: server_tcp.c)
   b. Client in C using TCP (file name: client_tcp.c)
2. You will hand in the complete client and server code and screenshots at the client verifying that packet is

receiving from the server and server is receiving packet from the client.

Example:

Starting the server: Assume that you started a server on machine with IP 128.111.49.44, listening to port number 80. The syntax should look like the following:

server_udp> server 80 <enter>

Starting the client:

client_udp> client 128.111.49.44 80

Reference:

Documents is attached to understand basics of Socket Programming

Best of Luck!