Indian Institute of Engineering Science and Technology, Shibpur
Department of Computer Science and Technology
Computer Network Lab (CS 3272)

Assignment 3: Application development using TCP Socket

Time: 2 weeks

Write all the code using C/C++ programming languages. If you use C++, must avoid any library support of Socket and Thread (if any).

You should run the server application on your host computer (laptop/desktop), and the client application should run on the departmental servers Hamsa (10.2.1.40) or Hanau (10.2.1.41). You should log in to the Hamsa/Hanau using your respective login Id.

Chat Application:

Problem-1: Basic Chat Application

Develop a simple TCP Client-Server application where the client app sends a predefined text message "Hello World!!" to the server app running in a user-defined port of your choice. Upon receiving that message, the server app forwards the same message to the client app. Both server and client applications print the message.

Once you complete this, extend the program to support chatting. The client app sends the first message it wishes to. Upon receiving that message, the server app prints the received message. Then, it sends the response message to the client. This message exchange continues until one party (server or client) says "Bye" and closes the chat session. After receiving the "Bye" message, another party closes the chat session.

Note that in this way of chatting, one end cannot send more than one message at a time. On sending one message, it has to wait for the response from another party, and then only it can send the next message.

Problem-2: Getting the time of Server

Develop a simple TCP Client-Server application where the client app sends a predefined text message, "What's the time?" to the server app running in a user-defined port of your choice. Upon receiving that message, the server app forwards it's time to the client. The Client application prints the received time from the Server.

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Problem-3: Basic Sorter Application

This problem aims to implement a TCP Server application that sorts a set of integer elements provided by the Clients. Initially, a Client sends a message containing a total number of elements, followed by the set of elements (as shown below), to the Server. On receiving the message, the Server decodes the message and performs sorting (*Insertion Sort or any other kind of sorting)* on received elements. Once sorting is completed, it responds to the client, mentioning the total number of elements followed by the set of sorted elements (as shown).

No of Elements	Elem 1	Elem 2	...	Elem N
(2 byteS)	(4 bytes)	(4 bytes)		(4 bytes)