Assignment 3: Implement a multi-client chat application

Submission due: February 19-23, 2024

Write an asynchronous multi-client chat application consisting of both client and server programs. In this chat application simultaneously, several clients can communicate with each other. For this you need a single server (or multiple servers) program that clients connect to. The client programs send the chat text or image/video (input) to the server and then the server pushes that message (text or image or video) to all the other clients. Each client then displays the message sent to it by the server. The server should be able to handle several clients concurrently. It should work fine as clients come and go. Clients should be able to send messages in two modes as follows.

        (i)Unicast; (ii) multicast;

Define different message format for the modes such as, @<username>:<message>

When a user is disconnected, other users would get a notification "<username> is offline".

The concept of group admin may be introduced as an extension to the manager concept learned previously.

Develop the application using a framework based on Node.JS. You can use Express, Mongo DB, and React.

How are messages handled concurrently? Identify 3-4 design patterns utilized in your code.

Prepare a detailed report of the experiments you have done, and your observations on the protocol layers thus created.