

Complex Engineering Activity

Subject: CE-231L Computer Networks

Semester: FALL 2019

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Objective:

The objective of this complex engineering activity is to carry out research, analysis, design, Investigation, and implementation of a real-world complex software engineering project that has the following attributes:

1. **Depth of Analysis Required:** The activity requires abstract thinking, originality in analysis to formulate suitable software models of the activity;
2. **Innovation:** The activity involves creative use of engineering principles and research based knowledge in novel ways;
3. **Familiarity:** The activity can extend beyond previous experiences by applying principles-based approaches.

Complex Engineering Activity Outcomes (CEAO):

The outcome of this activity is that the students may be able to partially attain some or the entire following graduate attributes:

1. GA1: Engineering Knowledge
2. GA2: Problem Analysis
3. GA3: Design/Development of Solutions
4. GA4: Investigation
5. GA5: Modern Tool Usage
6. GA9: Individual and Teamwork
7. GA10: Lifelong Learning

But in the course, the activity is mapped to CLO2 and your performance in this project will play an important role in their attainment. CLO2 is reproduced:

CLO No	CLO Statement	PLO	Taxonomy Level
CLO2	Implement & Design server client applications that effectively take care of best practices used for TCP/IP ,UDP application development	PLO3	P3

Problem Statement

For many small business owners, and personal social platform group chatting is becoming an increasingly popular way to communicate with clients, partners, friends and suppliers. This technology essentially takes the immediacy of instant messaging and allows you to expand on it with dozens of people simultaneously, rather than just one-on-one.

You are supposed to design a group chat application in Python using the concept of Socket Programming. Choice of selecting TCP or UDP socket depends upon the design application you select.

Your chat application should have the following basic features:

- There will be two entities to your system (Admin of group application who will create the group and other members)
- Sending and receiving of messages to all the group members who joined the group
- File transfer to all the users in group

Admin Features will consist of:

- Can view pending joining request
- Can approve or disapprove the joining request
- Can transfer adminship to other user in a group
- Can remove any user from the group

User Features will consist of:

- Can disconnect from the group (offline)
- View all the group members of the chat group
- View the online members of the group
- View the group admin
- Send message or file in group

Bonus Implementation:

- Viewing the offline messages or message history to new user who joined
- Message read receipt or delivery status (Which user has seen the text and at what time)
- GUI to your chat app

Providing the above two features in your design will earn you bonus points.

Note: WhatsApp group chat features/mechanisms can be helpful! Give it a search

Policy on Professional Ethics & Plagiarism

You are free to consult any book and online resources during the design and analysis phase, but you could not copy from them. Your design and implementation must be your original effort and same apply for simulations. Remember that if anyone is found to copy from the Internet or other group members, the group shall face severe penalty. You are not allowed to copy any material or code directly from the web or elsewhere. Note that if you are found to violate this policy or it becomes obvious that the work you have submitted is not your own or has been taken from some other source you shall be facing severe consequences.

The Formula that will be generously applied in all cases is:

$$\text{Final Score} = \text{Raw Score} - 2 * \text{CF} * \text{Total}$$

Where CF is the Copying Factor. This means that even if you are found to copy only in 50% of the activity deliverables, and you end up scoring 100% raw score, but your final score will be 0. Please follow the principle that “Honesty is the Best Policy”.

Deliverables

The project is due on

- Project Demonstration
- Detail Project Report