BLG433E
COMPUTER COMMUNICATIONS
# HOMEWORK1

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OBJECTIVES

The purpose of this homework is to give you experience with socket programming in python language. You will obtain information about creating a socket, binding a socket and port number, connecting establishment with clients, listening connections, sending and receiving messages over created connections, etc. In the homework, you are expected to build an **instant messaging platform** with multiple users. You should use multiple **TCP connections** on a client-server architecture with multiple clients. Please, prepare an instant messaging program with features specified in the following section.

INSTANT MESSAGING PROGRAM
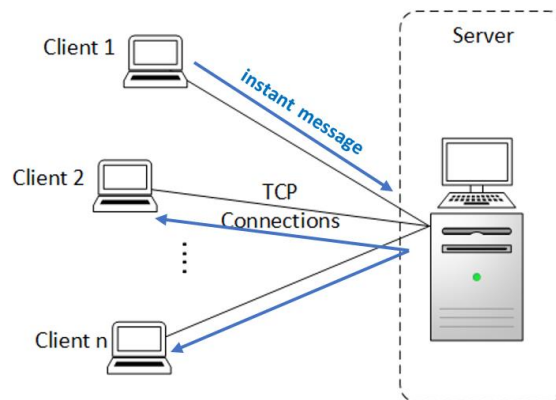
The system architecture of the instant messaging program is shown with the figure above. It has two main components as a server and multiple clients:

- **A client** communicates with the server to send an instant message to other clients. At the same time, the client may receive messages of other clients through the server.
- **The server** may get a connection request or a message simultaneously. It has the responsibility of recording connection requests and distributing the received messages to all of the participants in the session.

The Application Logic:

A TCP connection must be established between the server and each of the clients. A username should be requested by the server as soon as a connection is established.

The server must distribute a received message to all of the clients except the sending one. Each client should be able to display the timestamp and the username of the sender.

Deadlocks and starvation should be avoided among the clients. Moreover, the communication should not be sequential, each client should be able to send a message any time.

Coding Details:

Please prepare your code using the latest version (3.7.0) of python programming language.

You can create multiple threads for both of the server and the client to provide requested application logic. You should consider any faulty cases through a scenario and handle them.

You are free to provide a console application or another GUI for testing your program. Moreover, it is convenient to test your source code on a single host.

Report Details:

Your report should contain the explanation of your source code.

The compilation and running procedure of your program should be indicated with all of the inputs required.

The outputs for a simple use case of your program should be indicated.

ORGANIZING YOUR SUBMISSIONS

The homework should be prepared **individually**. There must be at least two source file (server.py and client.py) and a report file under a single directory. This directory should be named using the student number like "150150000". The source files should be able to compile with latest Python version (3.7.0). Otherwise, you will be evaluated over 50. The delivery is accepted through Ninova until the submission deadline.