COSC 4P14
Laboratory 1

Due date: September 21st, 2021 at 23:55 (11:55pm)
Delivery method: the student needs to delivery the lab answers only through Sakai.
Delivery contents: a document with a description and codes (see Submission instructions).
Attention: check the Late Assignment Policy.

Laboratory Overview

This laboratory is intended to introduce to Network programming at the Application layer. Thus, following a hands-on practice, the lab is composed of a series of exercises where students will analyze and implement programs using the socket API.
The TA will provide students with codes and instructions about how to complete the exercises. Also, the TA will inform about the expected layout of answers handled back.

Laboratory Details

The laboratory consists of answering/completing all the following list of items:

1. Students must build a socket-based client to connected with a socket-based server. Server binary/bit-code is provided.
   - 1.1. Students will have to run the server and then discover the port in which the server is expecting client contacts.
   - 1.2. Students will have to build a client can send a message to the server.
   - 1.3. Students need to use telnet to send a message to the server
     - 1.3.1. Students must modify the provided server code so that the server prints the received messages.
     - 1.3.2. Students need to use telnet to send a series of messages to the modified server during the same telnet session.
2. Students must modify the TCP server that is provided
   - 2.1. Students need to compile the provided TCP server and run it. They then need to contact the server through simultaneous accesses using telnet and a client (the one built earlier). What is the result of such simultaneous contacts?
   - 2.2. Students must modify the provided server to accept multiple simultaneous connections. Can it handle multiple clients now?
   - 2.3. Students have to modify both server and client to send messages back and forth. Client sends strings that an user enters through the standard input. Server replies to client's messages with all-uppercase answers and the port number of the client.
   - 2.4. Students then need to modify the client so that it sends a request to disconnect to server through a "quit" entered by the user. The server should terminate the connection with the client from its side.

Submission

The work must be complete in groups of up to two members.
Students will submit their answers through Sakai in the respective tab created for the laboratory. The deadline for the submission is usually at the last day of the defined lab week or specified by the TA. Optimally, students are strongly recommended to submit their laboratory answers at the respective laboratory session.
The submission for this assignment will consist of two parts:

1. A description file with answers/explanations to each exercise item. Include a note explaining your code: where it is, how to compile it, and how to run it.
2. The respective code addressing the answers.

Note that it is not the fault of the marker if they are unable to mark your assignment due to lack of clarity or detail in the descriptions. Also, make sure you submit a reasonable or common file format (pdf for the description file).

Attention: Include student names and student IDs in the submissions. Only one upload in Sakai is needed.

Marking Scheme

Marks will be awarded for completeness and demonstration of understanding of the material. It is important that you fully show your knowledge when providing solutions in a concise manner. Quality and conciseness of solutions are considered when awarding marks. Every code added to the originals should be well commented and explicitly indicated in the code files; lack of clarity may lead you to loose marks, so keep it simple and clear.

Late Assignment Policy

No late submission is allowed for laboratory submissions.

Plagiarism

Academic misconduct (which includes plagiarism and contract cheating) is NOT acceptable and will not be condoned. All borrowed work or ideas must be acknowledged. Work may be submitted to a phrase checking site. If you do not want your work to be submitted to a phrase checking site, alternative arrangements are available. More information on academic integrity is available here, and in the lectures. If convicted of academic misconduct, the penalty is normally zero for the submission (test, seminar, final examination) for a first infraction. If the academic misconduct occurs in one (or more) question(s) in the test or examination, a mark of zero will be given for the test or examination.