

# SOFE 4790U Distributed Systems (Fall 2018)

## Lab#1 – Client / Server Communications

### Objective

In this lab you will modify and extend the sample programs of client/server communication attached with this lab (TCPServer.java, TCPClient.java). You will demonstrate your running programs to the TA (50% of the mark), and you will write and submit a lab report (50% of the mark).

**Note:** The Lab tasks must be completed in the lab. If you don't show up for a lab, you will receive a zero and there is no need for you to submit a lab report.

### Tasks

#### Task #1: TCP Server (10 Mark)

Use the provided TCPServer.java and TCPClient.java program. Modify them so that the client prompts the user to enter a number through standard input (keyboard) and sends it to the server. The server reads message from the client, parses it, finds the summation from 0 to that number and sends the average of summation to the client. The client displays the result.

##### *Presentation to the TA:*

Demonstrate to the TA the running program.

#### Task #2: Reversing a String (10 Mark)

The goal of this task is to modify a string sent by client to server. The server will receive a text message from client (message entered through keyboard), reverse it and send back it to client. The client displays the result.

##### *Presentation to the TA:*

Demonstrate to the TA the running program.

#### Task#3: Repeated Inputs from Client (10 Marks)

Similar to the Echo client/server we discussed in class, the client should allow the user to keep entering messages, sending them to the server and receiving responses. Modify the client/server code in Task#2 to accomplish this.

##### *Presentation to the TA:*

Demonstrate to the TA the running program.

#### **Task#4: Multithreading (20 Mark)**

In this task you need to fulfill the same requirement for task#1, but also:

1. The client should send multiple numbers like task#3.
2. The server should be able to process requests from multiple clients simultaneously.
3. The server should handle a fixed number of clients. If the number of connected client reaches maximum and a new client tries to connect with server, the server should send a "BUSY" message to the client and close the connection to that client.

#### *Presentation to the TA:*

Demonstrate to the TA the running program.

#### **Lab Report: 1 to 2 pages max (50 Marks)**

In your lab report, for each task:

- 1- Explain how you accomplished the task.
- 2- Describe any challenges you faced with the tasks and how you solved them.
- 3- What did you learn?

Submit the lab report (in Word or PDF) on Blackboard by **11:59pm on Friday, September 21. No late submissions will be accepted no matter what is the reason.**