**Northeastern University – Silicon Valley**

CS 6650 Scalable Dist Systems

**Homework Set #1 Assigned: 5/3/19 Due: 5/12/19** [100 points]

**GOAL:** An introductory understanding of Dist Sys and Java client server programming.

***INSTRUCTIONS: Please provide clear explanations I your own sentences, directly answering the question, demonstrating your understanding of the question and its solution, in depth, with sufficient detail. Submit your solutions [PDF preferred]. Include your full name. Do not email the solutions.***

1. **From Chapter 1 Coulouris Book pagse 34 - 35**

1.2 [10 points]

1.12 [15 points]

1.13 [10 points]

1. Introduction Lecture (based on Tanenbaum Chapter 1) [25 points]

[Watch this video lecture by Dr. Shenoy](https://www.youtube.com/watch?v=83KuNWPa710&list=PLacuG5pysFbAtw3al_0cNjg6zGOs54ETw&index=1) from minutes 18:00 to the end. (Ignore class intro.)

Based on the lecture only - sumarize your understanding (1-2 page) of what distributed systems are, why they’re necessary and their characteristics which distinguish them from other systems.

1. **Java Socket Programming implementation** [40 points]

The goal of this assignment is to implement a TCP client and server. You can use Java. Your TCP or UDP client/server will communicate over the network and exchange data.

The server will start in passive mode listening for a transmission from the client. The client will then start and contact the server (on a given IP address and port number). The client will pass the server a string (eg: “network”) up to 80 characters in length.

On receiving a string from a client, the server should: 1) reverse all the characters, and 2) reverse the capitalization of the strings (“network” would now become “KROWTEN”).

The server should then send the string back to the client. The client will display the received string and exit.

Example

Starting the server:

Assume that you started a server on machine 128.111.49.44, listening to port number 32000. The syntax should look like the following:

csil-machine1> server 32000 <enter>

(in this line, “server” will be replaced by one of the names given below in the Submission Section)

Starting the client:

csil-machine2> client 128.111.49.44 32000 <enter>

(in this line, “client” will be replaced by one of the names given below)

Enter text: This is my text to be changed by the SERVER <enter>

Response from server: revres EHT YB DEGNAHC EB OT TXET YM SI SIHt

csil-machine2>

At this point (after receiving one line to be reversed), the server and client should both exit.

[Credits: Prof. K. C. Almeroth UCSB]