University of Dhaka

Department of Computer Science and Engineering

CSE 4211: Distributed Systems Lab

**Assignment Code: A5v2**

**Assignment Title: Totally Ordered Multicasting (Logical Clock Synchronization)**

**Date of Assignment: 22/10/2017**

**Last Date of Submission: 29/10/2017**

**Objectives:**

1. Write a Sync. Process that does the following:
   1. Maintains the list of all the active processes (address of each process)
   2. Sync. process will receive multicast message from an active process and multicasts the message to all other active processes.
   3. Maintains an account having integer value.
2. Write an Worker Process that does the following:
   1. When getting started, each worker process takes a random clock time, gets the list of all the processes and the value of the account form the Sync.
   2. Generates a random number (0~1). When value > 0.95 sends a multicast message to add a random amount (10~100) to the account.
   3. Upon receiving a multicast request, sends a multicast reply message containing current time.
   4. Uses a loop to simulate clock tick. Sleeps a random time between (50-100ms) during each iteration.
   5. Prints the clock and the account value upon getting synced each time (when clock time changes after receiving a message)

**Note:** There should be at least four Worker Process running. At least two worker process should be in different server machine. All the worker processes run the Lamport’s logical clock synchronization algorithm. Resources regarding Lamport’s algorithm can be found at: <http://books.cs.luc.edu/distributedsystems/clocks.html>

**Marks:**

1. Solving problems, I and II will net 60% marks.
2. The rest of the marks (40%) will be distributed via Viva and Testing.

**Deliverables:**

1. A single package containing all necessary files, codes and instructions for running the program on a generic machine.

The deliverables are to be sent in a single compressed package by email. The compressed filename must be of the format: [Roll No.]\_[Assignment Code].

**Submission Format:**

The assignment must be submitted by email. The email must have the following formatting. The submission will not be accepted if the format is not in the correct order.

Subject: [Assignment Code] [Assignment Title] [Roll No]

Body: Assignment Code

Assignment Name

Roll No.

Date of Assignment

Date of Submission

1. Attachment: A single package containing all necessary files, codes and instructions for running the program on a generic machine. The compressed filename must be of the format: [Roll No.]\_[Assignment Code].

**Example Format:**

Subject: [A1] [Echo Server and Client] [SH – 017]

Body: Assignment Code: A1

Assignment Name: Echo Server and Client

Roll No. SH – 017

Date of Assignment: 22/10/2017

Date of Submission: 29/10/2016

Attachment: SH-017\_A1.tar / SH-017\_A1.zip

Penalty:

1. Plagiarism: If it can be proven beyond reasonable doubt that the assignment code(s) was plagiarized, the code will be invalid and no marks will be attributed.
2. Late Submission: Failure to submit the assignment on time will result in 50% cumulative reduced mark which will be activated each week after the original submission date has passed.