

University of Texas at Dallas—Department of Computer Science
CS 6380.001 Distributed Computing—Fall 2019
Project 1 Description

This is a group project: Form groups of two members.

You will develop a simple simulator that simulates a synchronous network using multi-threading. There are $n+1$ threads in the system: Each of the n processes will be simulated by one thread and there is one master thread. The master thread will “inform” all threads when a round starts. Thus, each thread simulating one process, before it can begin round x , must wait for the master thread for a "go ahead" signal for round x . Clearly, the master thread can give the signal to start round x to the threads only if the master thread knows that all the n threads (simulating n processes) have completed their previous round (round $x-1$).

Your simulation will simulate the Variable Speeds algorithm in a synchronous ring. No process knows the value of n . The code (algorithm) executed by all (the n newly created threads) must be the same.

The input for this problem consists of (1) n (the number of processes of the distributed system which is equal to the number of threads to be created) and (2) one array $id[n]$ of size n ; the i^{th} element of this array gives the unique id of the i^{th} process or i^{th} thread. The i^{th} process accesses the i^{th} element of array $id[]$, and finds its unique id.

The master thread reads input file `input.dat` containing these two inputs and then spawns n threads. The file `input.dat` is a text file and all process ids are positive integers. Only the master thread knows n and the full array $id[n]$.

Each process (each thread that simulates one process of the distributed system) should output its id and the id of the leader on the screen, and then terminate.

Upload one tar file containing your source code, a README file that tells us how to compile and run, the sample input file (`input.dat`) and the result of running your program (script file output) on your sample input file.

Due date: September 19, 2019, 11:55 pm.