University of Dhaka

Department of Computer Science and Engineering

CSE 3113: Operating Systems Lab

Assignment Code: TH – 02

Assignment Title: Thread Programming

Date of Assignment: 13/02/2017 and 15/02/2017

Last Date of Submission: 17/01/2016 and 19/01/2017

Objectives:

Write a program that generates a thousand numbers randomly. Each number must be within the range of 0 to 999. There can be repetitions of the same number. After generating these numbers, save them in a file. After you have the file ready, take a number as input from the console and search the file for the said number using linear search. But to search the file, you have to use 10 threads and distribute the search window among these threads. The distribution is dynamic; meaning, you will decide the range of search for a certain thread when creating it. For example, you can make thread_1 search the first 70 numbers, thread_2 search the next 100 numbers and thread_3 search the next 50 numbers, so on and so forth. But keep in mind you have to use all 10 threads. After all the threads are done, they should return the locations of the given number in the file. As there can multiple instances of the number, a thread might need to return multiple locations. Keep that in mind when approaching your design. The final output is a list of all locations printed in a single sentence on the console.

Bonus:

For the bonus part, you will be given a thousand numbers just like the regular assignment. But this time there will not be any repetitions. Each number will have at most one instance in the file. You have to search for a number from the file using linear search and 10 threads just like regular assignment. But, if a thread finds the number, there is no point in running the other threads. So, as soon as the number is found, you must stop the other threads from running and print the location of the number in the file on the console.

Marks:

1) Solving the regular problem will net 100% marks. 60% will be assessed from coding and 40% from the viva.
2) Solving bonus problem will net 20% marks but is only applicable for those who have solved the regular problem.

Deliverables:

1) A single or multiple files of readable codes written in C with extension .c.
2) A shell script file containing necessary scripts for successfully running the code in any standard machine with Linux OS and GNU compiler. The shell script file should be sent with extension .sh.

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.

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

Body: Assignment Code

Assignment Name

Roll No.

Date of Assignment

Date of Submission

Attachment: A single compressed file containing the code(s) and the shell script file. The compressed filename must be of the format: [Roll No.]_[Assignment Code].

Example Format:

Subject: [TH – 02] [Thread Programming] [SH – 017]

Body: Assignment Code: TH – 02

Assignment Name: Writing a Shell

Roll No. SH – 017

Date of Assignment: 13/02/2017

Date of Submission: 15/02/2017

Attachment: SH-017_TH-02.tar / SH-017_TH-02.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.