Comp 8005 Computer Systems Technology January 2016

Network and Security Applications Development

Assignment #1

Due: January 18, 1200 hrs.

Objective: Use multiple **processes** and **threads** on either the Windows or Linux operating systems and measure the performance and efficiency of each mechanism.

Your Mission:

Design and implement two separate programs, one will use multiple processes and the other will use multiple threads. The objective here is to obtain a measure of efficiency and performance of each implementation as they perform a set of specified tasks. The easiest task to implement for each program is a set of intensive mathematical computations together with I/O activity.

You may select any mathematical task you wish. For the I/O I suggest file I/O for one or more process/threads. A suggestion would be to write the results of the computations and the timing data into an external file. The ***gettimeofday()*** (Linux) function may be useful to your travails.

Be as creative as you want and keep in mind that the experiment you design must be the same for both the process and thread implementation. Design the experiment so that each process/thread (workers) is assigned a sub-task and obtain information on how long it took each worker to complete the task. Then combine all the results together to obtain a measure of overall performance.

Constraints:

- Each implementation must have the same number of "workers", a minimum of five processes or threads.
- You may use any other IPC constructs that you deem necessary.
- Clearly outline the combination of mathematical and I/O tasks you have selected and outline the reasons for your selection.
- Provide a brief report of your findings and present all your results in graphical and/or tabular form.

To Be Submitted:

- Hand in complete and well-documented **design work, listings** and an **executable.**.
- You are also required to demonstrate your working programs during the lab the day the assignment is due.
- Ensure that you clearly explain the testing procedures for your programs and provide test data as necessary.
- Submit a **zip** file containing all the code and documents as described below in the sharein folder for this course under "**Assignment #1**".
- Your report must follow the standard technical format.

Assignment #1 Evaluation

(1). Design Work:	/ 5
(2). Code Quality:	/ 5
(3). Experiment Design & Functionality:	/ 15
(4). Testing	/ 10
(5). Report:	/ 15
Total:	/ 50