MIDWESTERN STATE UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE
CMPS 4103- Introduction to Operating Systems
Fall semester 2018

Project - due date 11/27/2018 (no extensions)
You are a computer scientist! As a scientist, you are supposed to perform experiments in order to verify concepts and products. At this point, you have heard a lot about threads and multicore systems. In order to evaluate the process of coding and running multithread programs, you are required to perform the following experiment:

You are going to write a program that multiplies two matrices 10,000 by 10,000, using four threads. You will need to split the work uniformly among the threads. Before the multiplication starts, you should use the main thread to initialize the two operand matrices with randomly calculated floating point numbers in the range 0 to 1. After the initialization, the main program will read an extra input value consisting of a row number and row value, followed by a column number and a column value. The first matrix will then have all the elements of the row designated by the input changed to the new input value, while the second matrix will have the all elements of the designated column assigned to its new value. This will allow for the user to verify the product calculation. The output must display five values: the element indexed by the row and column entered as also its neighbors (same column or same row). You may assume that selected the row and column will never be at the boundaries of the array (no value zero or 9,999). Your program must be run in two different machines (single core, duo core, quadcore, etc, machines available on Bolin 119 and 103 are i5 quadcores, many laptops are i3 or 17 duocore with hyperthreading). You must turn in by e-mail all the source code files used (one or more, sent to nelson.passos@mwsu.edu with the subject "operating systems project". You also need to turn in a print-out of the source files and an analysis report showing the characteristics of the two machines used to run the code and their measurement of the product execution time. Make sure you identify yourself in the e-mail. You may work in this problem individually or in a group of at most three students (no exceptions).

Example:

Input:
1032 .5 4503 .5
Output:
Processing time of the array multiplication was 1.2 ms
The array results are
[1031][4503] is 502. 98
[1032][4502] is 3412.46
[1032][4503] is 2500.00
[1032][4504] is 1110.84
[1033][4503] is 2341.26