Assignment for 3rd Year 1stSemester Students
IT/PC/B/S/313

GUIDELINES

- Try to write a clean program with enough comments.
- At the beginning of the file, use block comments to write details about name, roll no, assignment details, input required and output generated.
- Also put the compilation [should be WARNING free] and execution sequence under the block comment.
- The name of the file should be as per the following format.

<Two Digit Team Number>_<Assignment Number>.c

- The type of the file should be .c.
- The assignment files should be uploaded using google form which I will mail you later.
- While coding, always use indentation of 4 spaces.
- Blocks of code should be separated by a newline.
- Always use command line argument handling to take inputs.
- Duplicate assignments will incur penalties.
  [Marks will be allocated proportionally]
- Not adhering to any of these guidelines will incur penalties.
- For the description of any system/library call use man command.
- Always use ‘perror’ routine to check the return status of the system/library call.

ASSIGNMENT – 9 (A1)
Total Marks - 15
Parallel Programming using THREAD

The objective of this assignment is to use thread programming technique to write a parallel program which will do Matrix Multiplication between two large Square Matrices with unsigned character elements. You have to also measure the time elapsed. The Matrix should be large enough (dynamically allocated) to fit in your computer memory. Both the Matrices need to be initialized with random numbers (‘mod’ to some value).

As you increase the number of threads(max to your number of CPUs), your timing should show improvement. Use ‘gettimeofday’ to note down the timing. Make sure you attach the timing to the starting comment block of your source file and also show the speedup. Your time should not include the Matrices initialization time.

You have to use various ‘Pthread’ library calls to do this assignment properly. Use the proper process listing command (ps) to show (and attach it to the starting comment block of your source file) that your threads are running in the system. Also, use proper command to show CPU and Memory utilization and attach these outputs to the starting comment block of your source file.

This program should take four command line arguments. The first argument is the dimension of the Square Matrix.

The second argument is about the number of threads. For example, the value of the second argument will be 1, 2, 3, and 4 etc.; signifying total no of threads which will be created.

The third argument will be the value of the ‘mod’ which will be used to initialize all the elements of two input square matrices.

The fourth (last) argument will be the print_switch. If its value is ‘1’, both the Input and Output Matrices will be printed on the screen. In case the value is ‘0’, Matrices won’t be printed on the screen.