

OpenMP Assignments

Marks: 80

Last date of submission: 21st Sept, 2020 up to 5:00 PM.

1. Parallel implementation of Matrix multiplication using Tiling or Tiled transformation in OpenMP. Utilize the cache memory of your system efficiently.
 - a. Plot the graphs of serial and parallel implementation for Matrix multiplication with different size i.e. 1024x1024, 2048x2048, 4096x4096, etc. (Take 10 readings)
 - b. Plot the graph of speedup for the above experimentation
2. Demonstration of loop interchange advantages in the parallelization of loop nest using OpenMP (take minimum 3 examples). Also, do the study of compiler optimization using O1, O2, O3, Os, Ofast etc.
3. Implementation of any irregular graph algorithm using OpenMP. Do the implementation using two different data types.
 - a. Plot the graphs of serial and parallel implementation for 10 graphs with different node size i.e. 5000, 10000, 15000, 20000, 25000, etc. (Take 10 readings)
 - b. Plot the graph of speedup for the above experimentation
4. Big Integer implementation using OpenMP for the operations of two big integers i.e. addition, subtraction, multiplication and division.
 - a. Plot the graphs of serial and parallel implementation of addition, subtraction, multiplication and division for different bits or digits size i.e. 256-bit, 512-bits, 1024-bits, 2048-bits, etc. (Take 10 readings)
 - b. Plot the graph of speedup for the above experimentation