Parallel Computing Laboratory
IT-300
Fall-2019

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This week the students will exercise the basic constructs and OpenMP variables studies. The students are free to choose their programming environment. But the preferred language is C, based on which the following assignments' guidance is given:

The file is saved as regular 'C' file name: filename.c

Compilation using GCC: **gcc -fopenmp filename.c**

You are free to use your own compiler and get the instruction for the compilation. It is also shared in OpenMP lecture notes.

All the required OpenMP syntaxes are available in OpenMP-API-Specification-5.0.pdf, which is openly available for reference.

Exercise 1: task, taskwait and data-scoping

1. Write a serial program to compute Fibonacci numbers. Check the correctness of the program.
2. Identify the task parallelism in the program and use task construct from OpenMP and optimize the program. Check the correctness.
3. Apply taskwait and data scoping to improve the performance of the program as well as to get the correctness.

Hint: Refer to the usage of task construct and data sharing with task construct

Exercise 2: Quicksort using OpenMP

1. With the knowledge of the task construct from the above exercise, lets optimize quicksort. First, write serial quicksort program and check the correctness.
2. Optimize the above program using OpenMP (especially, task and task wait constructs) and comment on your observations. You may use the data scoping as well.

Note: Serial program is not evaluated for marks. Parallel program and observations carry marks.