**Blue Waters Petascale Semester Curriculum v1.0**

**Unit 4: OpenMP**

**Lesson 7: OpenMP Applications & Practice**

**Exercise Instructions for Students**

*Developed by Widodo Samyono for the Shodor Education Foundation, Inc.*



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*Browse and search the full curriculum at*[*http://shodor.org/petascale/materials/semester-curriculum*](http://shodor.org/petascale/materials/semester-curriculum)

*We welcome your improvements! You can submit your proposed changes to this material and the rest of the curriculum in our GitHub repository at*[*https://github.com/shodor-education/petascale-semester-curriculum*](https://github.com/shodor-education/petascale-semester-curriculum)

*We want to hear from you! Please let us know your experiences using this material by sending email to* [*petascale@shodor.org*](mailto:petascale@shodor.org)

1. Before starting the exercises the students should review the C programming concepts and practices, the shared memory concepts, and the practices and applications of the OpenMP.
2. Review how to access, compile, and run C programs in the multicore computer.
3. Review the Calculus concepts for calculating the area under a curve by using the left boundary, right boundary, midpoint, and trapezoidal rule.
4. Write the algorithm how to calculate the area under the curve x^2 by using one of the rules.
5. Implement the algorithm in the single core C program, then parallelize to the multicore program with OpenMP.