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

**Unit 2: Parallel Computing Concepts**

**Lesson 3: Scalability Metrics**

**Exercise Instructions for Students**

*Developed by Nitin Sukhija for the Shodor Education Foundation, Inc.*

1. Describe the benefits of parallelism.
2. Describe the sources of parallel overhead.
3. What is Amdahl’s Law?
4. What is Gustafson’s Law?
5. Explain speedup, efficiency and iso efficiency metrics of the parallel system.
6. Name some speedup factors that lead to performance enhancement in parallel programs.



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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)