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

**Unit 5: MPI**

**Lesson 8: MPI Applications**

**Exercise Instructions for Students**

*Developed by Hyacinthe Aboudja for the Shodor Education Foundation, Inc.*



*Except where otherwise noted, this work by The Shodor Education Foundation, Inc. is licensed under CC BY-NC 4.0. To view a copy of this license, visit*[*https://creativecommons.org/licenses/by-nc/4.0*](https://creativecommons.org/licenses/by-nc/4.0)

*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)

Students will be asked to follow the steps below:

1. SSH to the available SuperComputer using their credentials (User ID and Password)
2. Transfer the following source codes provided by the Instructor in case they are not already available in the system.
   1. hello\_world.c
   2. mpi\_output.c
   3. mpi\_simple\_integration.c
   4. Pi\_estimation\_montecarlo\_mpi.c
3. Create a JobScript depending of the Workload Resource Manager and Scheduler (SLURM or TORQUE) being used for the system.
4. Compile and Run each of them using the commands as follows with the supervision of the instructor:
   1. Compile: % mpicc -o prog prog.c ( prog is the name of each the source code in step 2)
   2. Run:
      1. % sbatch JobSript (for SLURM)
      2. % bsub JobScript (for TORQUE)
5. If everything works correctly , the Error files should be empty and the Output file should should have the expected result of the computation.
6. The steps above should be repeated for each of the source code original or modified as you desire and or time permits.