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

**Unit 4: OpenMP**

**Lesson 4: OpenMP Target Offload**

**Exercise Instructions for Students**

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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. Follow the instructor directions
   1. Download: Slides, Video, and code
   2. Before continuing on the next exercises make sure you understand the provided code and you are able to compile and run it
2. Do answer Sample Assessment question to evaluate your basic understanding of learning objectives

Sample Exercise:

1. Download provided code change the pragma target for a “regular” pragma for, this way code runs only on your CPU not on the accelerator
2. Use openMP timing functions to measure execution times of different versions of your code: NO OpenMP pragmas, Pragma Target

**double start;**

**double end;**

**start = omp\_get\_wtime();**

... work to be timed ...

**end = omp\_get\_wtime();**

**printf(~Work took %f seconds\n~, end - start);**

1. Implement the complete Laplace Solver (<https://www.asc.ohio-state.edu/physics/ntg/780/c_progs/laplace.c>)

A.Using OpenMP parallel for pragma

B.Using OpenMP target teams distribute for pragma

C.Compare the results