Instructor Guide

a. Since this is only a 25 minutes module, the GPU hardware architecture should already be covered in previous modules. The focus of this module should only be on OpenACC implementations and its use cases in different scientific applications
b. Instructors should review the materials covered in the presentation slide and do further readings of the concepts being presented
c. This module will start with presentation slides that covers different OpenACC concepts and implementations
d. Instructors should use simple vector addition examples to demonstrate primary OpenACC directives for copying the data from host to device, vice versa, and parallelizing loops.
e. The laplace heat diffusion example is used as a more scientific application use case. This example will also demonstrate good and bad practices in OpenACC programming that students should be aware of.
f. A different Heat Diffusion simulation provided can be used as an exercise. In this simulation at each time step the grid must be printed to screen. At each time step the grid value on the host must be updated.

Common pitfalls for students and instructors

a. Depending on when this module is used for teaching or learning, OpenACC implementation might have changed. Therefore, both instructors and students are encouraged to check the PGI community for updates.
b. OpenMP is rapidly changing and adopting OpenACC techniques for accelerating applications on GPUs. There is also a growing consensus that OpenMP and OpenACC should merge as one. Instructors and students should be aware of the changes and make necessary modification to the examples and exercises solutions.
c. Watch out for IO. Moving data between CPU and GPU could potentially reduce application performance tremendously.