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

**Unit 8: OpenACC**

**Lesson 2: Intro to OpenACC**

**Exercise Instructions for Students**

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Write a simple matrix multiplication serial code in C:

1. Add directive to the code that defines the variable for size of the matrices
2. Define arrays for each matrix and allocate required memory
3. Write for loop(s) to initialize the matrix arrays with some numbers. You could use random number generators.
4. Write for loop to carryout the matrix multiplication

Parallelize the for loops with OpenACC:

1. Find the compute intensive loops to parallelize.
2. Use OpenACC directives to copy data from CPU host to GPU
3. Use timers routines available either in OpenACC, C, OpenMP libraries to measure performance.
4. Compare performance of your program with using PARALLEL LOOP vs. KERNELS