

CPS 5401 Skills-based Qualifier Review Guide
Shirley Moore, Instructor
December 2016

The CPS 5401 portion of the skills-based qualifying exam will address the following skills outcomes:

1. Manage program and data files on a Linux system, including using an automated build system.
2. Implement basic matrix operations and linear algebra algorithms in Fortran or C/C++.
3. Parallelize programs using MPI and OpenMP correctly and efficiently.

Relevant review materials:

- CPS 5401 Fall 2015 website at <http://svmoore.pbworks.com/>
- The Unix Shell at Software Carpentry at <http://v4.software-carpentry.org/shell/index.html>
- Make at Software Carpentry at <http://v4.software-carpentry.org/make/index.html>
- Matrix multiplication lab at http://svmoore.pbworks.com/w/file/fetch/102974644/c_lab_1_v4.pdf
- Cache-aware matrix multiplication at <http://functionspace.com/articles/40/Cache-aware-Matrix-Multiplication---Naive-isn--039;t-that-bad->
- Introduction to OpenMP at <https://computing.llnl.gov/tutorials/openMP/>
- Introduction to MPI at <http://www.citutor.org/>

Sample problems:

OpenMP and MPI exercises at <http://newton.physics.uiowa.edu/~ghowes/teach/ihpc12/exercises.html>