

After completing this lab, you should be able to:

- Login successfully to Lonestar
- Query and set environment variables
- Use module commands

Resources:

- XSEDE Portal at <https://portal.xsede.org/>
- Lonestar User Guide at <https://www.tacc.utexas.edu/user-services/user-guides/lonestar-user-guide>

1. Read over the System Overview section of the Lonestar User Guide. Note anything interesting to you.
2. Login to Lonestar (see the System Access section of the User Guide).
 - a. Which shell are you running?
 - b. What is the pathname for your home directory?
 - c. What is the pathname for your scratch directory?
3. What is the purpose of the modules utility? What compiler and MPI modules are loaded by default?
4. What are the command names for the Intel C, C++, and Fortran compilers?
5. How do you compile the following if written in C, C++, or Fortran?
 - a. OpenMP program
 - b. MPI program

6. What compiler options should you use for best performance? (trick question 😊)

7. What is the purpose of the following files systems?
 - a. \$HOME

 - b. \$WORK

 - c. \$SCRATCH

8. How do you run
 - a. a threaded application on a single node?

 - b. an MPI application with 32 processes?

9. Try compiling and running the MPI and OpenMP implementations of finite difference solutions to the 1-D time-dependent and 2-D stationary heat equation (provided).