Shell basics

`pwd` - Print working directory

`ls` - Show files in working directory

`ls -l` - Show files and their size, ownership, permissions, and modification times.

`cd directory` - Move to the selected directory.

`mv source destination` - Move or rename a file or folder.

`cp source destination` - Copy a file. `cp -r` to copy a folder.

`mkdir directory` - Make a directory.

`rmdir directory` - Remove an empty directory.

`rm filename` - Delete a file. It's gone forever.

`rm -r directory` - Delete a directory and all contents. **USE WITH CAUTION!**

Reading / writing files

`nano filename` - Create or edit a text file. To save and/or quit, use `Ctrl-x`.

`cat filename` - Read an entire file.

`less filename` - Read a file one page a time, arrow keys to move up and down, `q` to quit.

`head filename` - Read the top of a file.

Writing scripts

Scripts are just commands in a text file. You can use scripts to automate your work! To run a script, use: `bash script.sh`

Example script

```
#!/bin/bash
echo "the echo cmd prints text!"

# iterate through .txt files
for FILENAME in *.txt; do
  echo $FILENAME
done
```

Using a cluster

`ssh username@computer.ip.addr` - Connect to a remote computer via SSH.

`sftp username@computer.ip.addr` - Start an interactive file transfer session. Type `help` for available commands.

`hostname` - Check which computer you are logged onto.

`passwd` - Change your password.

Using software

`module avail` - Show available software.

`module list` - Show currently loaded software.

`module load software-name` - Load a software package.

`module purge` - Unload all software.

Submitting jobs

A job is a shell script. You must request resources like cores, memory, and time. The less resources you use, the faster your jobs will be scheduled. If something breaks, check the logs!

`sbatch job.sh` - Submit a job.

`squeue -u username` - Check status of your jobs. Use `watch squeue -u username` to continuously check

`scancel job_number` - Cancel a job.

`salloc` - Start an interactive job.

Sample job

```
#!/bin/bash
#SBATCH -c 4
#SBATCH --mem 32g
#SBATCH -t 8:0:0
# requests 4 cores, 32g memory, 8 hrs

module load python
module load scipy-stack
python3 your_script.py
```