Below is a list of applications that we feel will help you in class. There are several options and you are welcome to try them, but these are the ones we are most familiar with.

**Terminal:** We will need to use an application to execute commands on the command line and to connect to remote servers.

If you have a MAC you already have this, just search for **Terminal**. The MAC operating system is is a cousin of the Linux operating system so this makes life extremely easy.

If you have a Windows system you have several options:

- Install the Windows Subsystem Linux (WSL). This is only for Windows10. Follow instructions provided here : https://www.lifewire.com/how-to-run-the-bash-command-line-in-windows-10-4072207

- Install MobaXterm ( https://mobaxterm.mobatek.net/ )

- Install Putty ( https://www.chiark.greenend.org.uk/~sgtatham/putty/latest.html )

WSL is the best option if you are planning to do a lot of analysis on your own computer ( see below ), but if you plan to use the HPC for most of your work then WSL and Mobaxterm would be fine.

**X11 window system:** This is a window system that allows you to forward application windows to your screen. Remember, we will be running applications on a different computer, so this will allow us to forward the window to our screen.

If you have a MAC please install:

**XQuartz** - (https://www.xquartz.org/)

If you have a Windows operating system:

**X-ming** - (https://sourceforge.net/projects/xming/)

**File Transfer:** We will discuss commands that allow you to transfer files and folders across computers and servers, but the easiest way is to use a SFTP client. The following applications are platform independent ( they work on MAC and Windows)

**FileZilla** (https://filezilla-project.org/)

**Cyberduck** (https://cyberduck.io/)

**File Editors:** It is important that all scripts are written in file editors that keep text files as simple as possible. However, it is also helpful to use text editors that are aware of the programming language semantics to avoid common errors, for example, mismatched parentheses and brackets. There are many so below are just a few starting with those I personally prefer more.

**Visual Studio Code** ( https://code.visualstudio.com/ )

**ATOM** ( https://atom.io/ )

Sublime ( https://www.sublimetext.com/ )

**BioConda:**

If you are interested in installing applications on your personal computer so you can perform NGS analysis we encourage you to look into Conda and BioConda. (https://bioconda.github.io/user/install.html).