

## Preliminaries

For some of the work in this course, you will need to log on to the mathcs Linux machines. Instructions for connecting to the cluster are given below. You should run the commands to be sure you are able to successfully log on.

## Unix

On our course web page, follow the link to the eight Unix tutorials (tutorial URL is <http://www.ee.surrey.ac.uk/Teaching/Unix/>). Put the answers to the following questions in a README text file. You'll need to submit this README file to the appropriate Box folder (using the link `lab0.d6ib2honlhniaqki@u.box`). The name of your README file should be `netidREADME`, where `netid` is, of course, your network ID. Failure to correctly name your submission will result in a grade of zero for the lab!

1. What is the difference between using `>` and `|` after a command?
2. What is the purpose of `*` in specifying items at the command prompt?
3. What command would you need to run on a file called PRIVATE in order to make it so no one other than the owner could read or write it?
4. What does `&` do when you place it at the end of a command?
5. What command would you need to run on a file called FOO to compress it?

## Man pages

man pages are online documentation which explain how to execute and use the various programs installed on Unix systems. They usually start with an overview and then give information about the many flags each program can be invoked with. In your README, explain what the following commands do in general and then explain what happens when the specified flag is added.

1. `grep -n`
2. `head -n 10`
3. `diff -w`
4. `gzip -00`

## Quota

On our Linux system, the `urquota` command will be much more understandable than the `quota` command. This command will tell you how much of your allocated space you are using. If you have used nearly all of your allotted space, you may want to delete or compress some of your data.

## Some Helpful Linux/Unix Background

- **Connecting to the linux cluster:** The names of the machines in the linux cluster upstairs are `mathcs01`, `mathcs02`, ..., `mathcs10`. You logon to these machines using the unix secure shell command (`ssh`). The command can be used in many ways, here are two of them, both assuming that you wish to logon to `mathcs01`, and that your username is `msmith`

If you have the application `xQuartz` installed on your computer (the Macs in our lab classroom do), you can use the command

```
ssh -Y msmith@mathcs01
```

(if you are logging on from a machine that is not connected to the UR network (e.g., your laptop from an apartment), you might need to change this to

```
ssh -Y msmith@mathcs01.richmond.edu
```

This method of logging on is nice because if you log on this way, programs you open on mathcs01 will be displayed on your own computer. For example, if you try to run sublime on mathcs01, the sublime window will open on your own screen.

If you don't have xQuartz installed on your machine, you can use the command

```
ssh -l msmith mathcs01.richmond.edu
```

When you use this command, programs you launch on mathcs01 will open in your terminal window, and will prevent you from using any other programs (on mathcs01) until you close the open program.

- **Creating, extracting, and viewing tar files:** Like most unix commands, there are many flavors. I'll give you just one of each (though you are welcome to explore the man pages to learn and use more). To create a tar (short for "tape archive") file called `foo.tar`, and that contains the files `file1.c` and `file2.c`, you should move to the directory that contains both files (I assume they are both in the same directory). Once in that directory, you can create the tar file by running the command:

```
tar -cvf foo.tar file1.c file2.c
```

The flags here stand for the following: 'c' means create a tar file, 'v' means do it in verbose mode (list the files being added to the tar file), and 'f' means write (or in other commands, possible read) the files to the specified tar file name.

If you have a project directory, perhaps called `project1`, and you wish to create a tar file that maintains the directory structure of your project, move to the parent directory of `project1`, and run the command

```
tar -cvf foo.tar project1/*
```

This will tar everything in the project 1 directory. Moreover, when you extract this tar file, it will create a directory called `project1` which will be an exact copy of your `project1` directory.

To extract the tar file `foo.tar`, run the command

```
tar -xvf foo.tar
```

The 'x' flag here is short for "extract".

Finally, to view the contents of a tar file without extracting it, use the command

```
tar -tvf foo.tar
```

The 't' flag here means you want to examine the contents of the tar file.

## Submission

The high level picture is that you submit your README file to the appropriate Box file, using the supplied email.

The details are as follows: to submit a given assignment, attach your submission to an email sent to the indicated email address. This has the effect of placing your submission in the correct submission folder in my Box directory tree. For example, the email address for this lab is `lab0.d6ib2honlhniaqki@u.box.com`. Thus to submit Lab 0, you should attach your `netidREADME` file to an email sent to the email address `lab0.d6ib2honlhniaqki@u.box.com`.