This file summarizes some UNIX commands that might be helpful in using our UNIX system. Basic UNIX commands are not discussed here, but you can find a list via Google: https://www.google.com/search?q=unix+commands.

All commands were tested on ZETA only, but should work on any other workstation.

To execute a command, you need to open a terminal window (right click on Desktop and then select "Open Terminal")

Printing

Several options for printing are available; two possibilities are `lpr` and `a2ps`. The default for `lpr` simply prints a file whereas `a2ps` adds some information such as filename, date, and user. However, `lpr` does not allow to print multiple pages on one page, but `a2ps` does. Moreover, with `a2ps` you can also print to file and check if you actually get what you want (which is recommended in order to save paper).

Printing a file:

- Specify the printer you want to print on with option `–P`
- Available printers are
  - `stat1`: outside of office H2461 (Dr. Szabo)
  - `stat2`: outside of office H2455 (Dr. Wang)
  - `stat5`: kitchen
  - `color`: outside of office H2461 (Dr. Szabo)

```
$ lpr -P stat5 filename
$ a2ps –P stat2 filename
```

Printing multiple pages on one page:

- Just specify the number of pages using a dash

```
$ a2ps –P stat5 -2 filename
$ a2ps –P stat5 -4 filename
```

Printing to file:

- Use option `–o` instead of `–P` and specify the output file name
- Output file is a postscript file

```
$ a2ps –o out.ps filename
$ a2ps -2 –o out.ps filename
```

Using a USB drive from a SunRay terminal

In order to use a USB on our UNIX system, three steps are necessary

1. Mount a USB drive
2. Locate the mounted drive
3. Unmount the USB drive (important!)

1. Mount a USB drive

Insert your USB drive into the USB port of your SunRay terminal. The USB drive will be automatically mounted under `/tmp/SUNWut/mnt/<username>` (replace `<username>` by your actual user name)

2. Locate the mounted drive

The content of your USB drive is accessible under `/tmp/SUNWut/mnt/<username>`. The actual content is in a subfolder called `disk1` (or something similar). Use the `cd` command to change into that folder

```
$ cd /tmp/SUNWut/mnt/<username>
```

Alternatively, you can create a symbolic link in your home directory to simplify access to your USB drive by typing:

```
$ cd
$ ln –s /tmp/SUNWut/mnt/<username> USB
```

You only need to do this once. Now there is a folder called `USB` in your home directory which directly links to your USB drive.

You can run the following command to get a list of all mounted drives:

```
$ /opt/SUNWut/bin/utdiskadm -l
```

3. Unmount the USB drive

It is important to unmount your USB drive before removing it. Otherwise, you can corrupt the data on your drive which can cause data loss.

First, make sure that your current directory is not the USB drive. To unmount your drive, run:

```
$ /opt/SUNWut/bin/utdiskadm -r disk1
disk1 is ready for unplugging
```

If your drive is not mounted as `disk1` specify the correct device as given by

```
$ /opt/SUNWut/bin/utdiskadm –l
```

Changing the priority of a process

If you anticipate that your program will run for a longer amount of time (say > 30 Minutes), you need to lower the priority of your process. If you don't lower the priority of your process, you will slow down the whole system which will prevent other users from using UNIX properly.

You can lower the priority as follows using the terminal.

1.) Start your program as usual in the terminal (say SAS for example) but add a "&" at the end

```
$ sas program.sas &
```

2.) Type `ps` in the terminal to get the PID or your process

```
$ ps
  PID   TTY      TIME   CMD
26042   pts/13  0.02   sas
26071   pts/13  0.00   ps
```

The PID in this case is `26042`.

3.) In your terminal type `"renice 19 12345"`. Here you have to replace 12345 by the PID belonging to your process. In this case,

```
$ renice 19 26042
```

This will give the lowest priority to your process.

4.) Use `top` to make sure that your process has the entry “19” in the column “NICE”

```
$ top –u <username>
```

```
   PID USERNAME  SIZE   RSS STATE  PRI NICE      TIME  CPU PROCESS/NLWP
 26042 fmendoli  105M   32M cpu4     8   19   0:08:01 1.0% sas/11
 22227 fmendoli   46M   38M sleep   59    0   0:00:45 0.1% Xnewt/1
 25569 fmendoli   88M   18M sleep   59    0   0:00:04 0.0% gnome-terminal/2
```

`$ q` (in order to exit top)

5.) To see all processes that you are running use

```
$ ps –u <username>
```

Terminating processes using "kill"

Sometimes you need to terminate a process prematurely because there is a problem, e.g., the program is stuck somewhere.

First, identify the PID of the program that you want to terminate using

```
$ ps
```

or

```
$ ps –u <username>
```

Then use the `kill` command and specify the PID of the process you want to terminate (replace 12345 by the PID of the process)

```
$ kill 12345
```

If this does not terminate the process (roughly speaking, it's up to the application to determine what it wants to do), you can specify the `"-9"` option which carries more weight and will surely terminate the process:

```
$ kill -9 12345
```

Alternatively, you can terminate any process by specifying the full name or partial name. So, there is no need for you to find out the PID of the process:

```
$ pkill -9 firefox
```

This would terminate all processes that contain `firefox` in their name.

Cleaning up SAS files and backup files

Once you are done with a project, you should delete all log-files and all listing-files in order to save space.

For example, to delete all files ending with "`.lst`" in the current directory use:

```
$ rm *.lst
```

In order to delete all files ending with "`.lst`" in the current directory and all subdirectories, use:

```
$ find ./ -name '*.lst' | xargs rm
```

Some editors create backup files ending with "`~`" every time to modify a file. These files are usually not visible if you use the file browser, but you can see them if you use the "`ls`" command. To get rid of all the backup files in the current directory and all subdirectories use

```
$ find ./ -name '*~' | xargs rm
```

If you should accidentally delete files that you did not want to delete, we have a backup system which should allow you to recover deleted files (ask our system administrator).