

# Class #2 Wednesday 26 January 2011

- 9:45-10:45, but 9:45-11:05 this week to make up for last Friday.
- What did we discuss last time?

## **Chapter 1 Data Storage Methods**

### **1.1 Common Formats**

### **1.2 Less Common Formats**

### **1.3 I/O Tools**

- Return check-up..
- Today (UNIX, Vi and GrADS)

#### 1.3 I/O Tools

##### 1.3.1 UNIX and VI

##### 1.3.2 Grads

##### 1.3.3 NCL

##### 1.3.4 NCO

# UNIX

<http://www.ee.surrey.ac.uk/Teaching/Unix/>

- UNIX is an operating system written originally at Bell Labs (part of AT&T)
- **The UNIX operating system**

The UNIX operating system is made up of three parts; the kernel, the shell and the programs.

## The kernel

The kernel of UNIX is the hub of the operating system: it allocates time and memory to programs and handles the filestore and communications in response to system calls.

As an illustration of the way that the shell and the kernel work together, suppose a user types **rm myfile** (which has the effect of removing the file **myfile**). The shell searches the filestore for the file containing the program **rm**, and then requests the kernel, through system calls, to execute the program **rm** on **myfile**. When the process **rm myfile** has finished running, the shell then returns the UNIX prompt **%** to the user, indicating that it is waiting for further commands.

## The shell

The shell acts as an interface between the user and the kernel. When a user logs in, the login program checks the username and password, and then starts another program called the shell. The shell is a command line interpreter (CLI). It interprets the commands the user types in and arranges for them to be carried out. The commands are themselves programs: when they terminate, the shell gives the user another prompt (**%** on our systems).

The adept user can customise his/her own shell, and users can use different shells on the same machine. Staff and students in the school have the **tcsh shell** by default.

The **tcsh** shell has certain features to help the user inputting commands.

**Filename Completion** - By typing part of the name of a command, filename or directory and pressing the [**Tab**] key, the **tcsh** shell will complete the rest of the name automatically. If the shell finds more than one name beginning with those letters you have typed, it will beep, prompting you to type a few more letters before pressing the tab key again.

# Commonly used Unix Commands

Go to a terminal window and try these commands

Command	Action Taken by Command
ls [-a -F -l]	
pwd	
mkdir myjunk	
cd myjunk	
cd ..	
cp <i>file1 file2</i>	
mv [-i] <i>file1 file2</i>	
rm [-r] <i>file1</i>	
cat <i>file1 file2 &gt; file3</i>	
more <i>file1</i>	
head <i>file1</i>	
tail <i>file1</i>	
grep ' <i>keyword</i> ' <i>file1</i>	
wc -w or wc -l	
*	
?	
chmod [options] <i>file1</i>	
chown	
cal	

# More Unix Commands

Go to a terminal window and try these commands

<b>Command</b>	<b>Action Taken by Command</b>
df	
du -s	
gzip <i>dirstuff.tar</i>	
gunzip <i>dirstuff.tar.gz</i>	
diff <i>file1 file2</i>	
tar cvf <i>dirstuff</i>	
tar xvf <i>dirstuff.tar</i>	
./a.out	
./a.out &> outfile &	
script	
man <i>command</i>	
apropos <i>command</i>	
history	
Control c	
Control z	
ps -u bhatt	
kill -9 PID	
more comands...	<a href="http://www.math.harvard.edu/computing/unix/unixcommands.html">http://www.math.harvard.edu/computing/unix/unixcommands.html</a>

# Vi

- Vi is a text editor that is available on all Unix machines. Other common choices include Emacs. Vim is like Vi, just more expanded.
- **Vi**

Vi has two modes. The **Command mode** and the **Insert mode**.

Press **esc** to go from **Insert mode** to **Command mode**. (never hurts to press escape key extra times)

% vi filename ==> open a file in vi .

:q ==> quit vi

:wq ==> save work and then quit vi

%

Fantastic tutorial to learn Vi

<https://engineering.purdue.edu/ECN/Support/KB/Docs/ViTextEditorTutorial>



# 1.3.2 GrADS

- Grid Analysis and Display System
- Step 1 install the software...
  1. Go through the Grads example
  2. Go through sea ice data set (2-D lat/lon)
  3. Grads script example, with netcdf open