UNIX AND EMACS

A. Conventions Used

There are a few conventions that will be used throughout this handout and the remainder of the course.

<return> is used to mean you should press the return key.

^ refers to the control key. When typing a control sequence, you must hold the control key down and press the accompanying key at the same time. For example, **^c** (ctrl-c) means that you hold down the control key and press the c key at the same time.

<esc> is used to mean the escape key. This key is often used in a two-stroke sequence, but unlike the control key, you do NOT hold down the escape key. For example, **<esc>-v** means that you press the escape key, release the escape key, and then press the v key.

[ ] are used to indicate that something is optional. The part of the command enclosed in the brackets is optional and does not have to be entered.

B. Logging into the System

To do work for this class, you will be using the UNIX operating system. Once connected to the system, you will be presented with a login screen. You will enter your login followed by <**return**> and then your password followed by <**return**>. Once logged in, you will see the Message Of The Day (motd). You will then be at a UNIX ***prompt*** in the shell environment.

C. Using the Unix Shell

While in the shell, you can submit commands to the **system** for execution. Below is a list of some of the commands you might want to do and how to do them. You type each of the following at the UNIX prompt.

1. To find the current date, type **date**.

2. To logout of the system type **logout**.

3. Finding and Changing the Current Directory

When you log in to the system, you will be in the directory
/export/home/student/<your login>
This is your home directory. To verify your current directory, enter the command **pwd**, for Present Working Directory.

cd <directory>	moves you to the specified directory
cd	returns you to your home directory
cd ..	moves you up one level in the path

4. Listing the Contents of a Directory

To list the files in a directory, you will use the **ls** command.

ls	lists the files in the current directory
ls <directory>	lists the files in the specified directory
ls –l [<directory>]	lists the files in long format for the output
ls –a [<directory>]	lists all the files, including hidden system files
ls –al [<directory>]	lists all the files in long format

5. Creating a New Directory

You will use directories to organize files. Directories are similar to folders on a PC. To make a directory, use the command **mkdir <directory>**.

6. Copying and Moving Files

To copy file1 to file2, use the command **cp <file1> <file2>**. Now you will have two files, file1 and file2, that are exactly the same.

To move file1 to file2, use the command **mv <file1> <file2>**. Now you will have only one file, file2.

7. Deleting a File

To delete a file, use the command **rm <filename>**. Be careful when using the command; after you delete a file, it is gone!

8. Deleting a Directory

To delete a directory, use the command **rmdir <directory>**.

9. Viewing the Contents of a File

   To look at a file, use the command **more <filename>**. The **more** command will show you the file one screen at a time. You continue through the file by using the **<return>** key or the space bar. The **<return>** key moves forward one line at a time and the space bar moved forward one screen at a time. To stop scrolling, type **^c**. The **less** command works similar to the **more** command.

   To display the entire file to the screen at one time, for inclusion in a typescript file, use the command **cat <filename>**.

10. Redirecting Output

    To redirect ouput, instead of having it print on the screen, use the symbol >. For example, to have the output of the run of a program to a file called test.out, enter the command **a.out > test.out**.

D. Editing in Emacs

1. To enter the emacs editor, use the command **emacs <filename>**. For this class, filenames will be suffixed with a .cpp to indicate to the system that the file is a C++ program.

2. Inserting text

   To insert text to the current file in emacs, you simply move the cursor to where the text should be inserted and type.

3. Replacing Text

   You can replace text by deleting the unwanted text and inserting the desired text.

4. Deleting Text

   You can delete the current character one of two ways. The first way is to move the cursor one character to the right of the character to be deleted and press the backspace key. The second way is to move the cursor one character to the left of the character to be deleted and press **^d**.

5. Deleting a full line

You can delete an entire line of text by positioning the cursor at the beginning of the line to be deleted and press **^k**. To delete multiple lines in a row just keep pressing **^k**.

6. Moving around in a File

Cursor Movement:

The arrow keys can be used to move around the file. The left and right arrow keys will move one character at a time, either to the left or right. The up and down arrow keys will move one line at a time, either up or down.

Control sequences can also be used to move around the file:

^a	move to the beginning of the current line
^e	move to the end of the current line
^v	move forward one page
<esc>-v	move backward one page
^f	move forward (to the right) one character
^b	move backward (to the left) one character
^p	move to the previous line (up one line)
^n	move to the next line (down one line)

6. Moving to a specified line number:

When correcting errors in your file, often you will know the line number the error is on. You can get to that line quickly by entering the sequence **^xl** (that is the letter l and not the number 1). You will then see “Goto line:” at the bottom of the screen. You can then type the number for the line you want followed by **<return>** and the cursor will move to that line.

7. Saving the File

To save the changes you made to the file, you must write the file to the disk. You do this by entering the sequence **^x^s**.

You can save your changes and write the file to the disk at any time. It is a good idea to periodically save your changes while editing your file.

8. Quitting Emacs

To quit emacs, enter the sequence **^x^c**. If you made changes to your file, it will ask if you want to save your changes. Answer y or n. If you answer n, all changes will be lost!

E. Creating a Typescript File

A typescript file is created by using the **script** command. By default, this will create a file called *typescript*. To create a different file, enter the command **script <filename>**.

All commands and output will now be saved to the file created.

To stop the script, enter the sequence **^d**.

Everything you typed and all output from any commands will now be in the file called *typescript* unless you gave the file a different name when you entered the script command.

F. Compiling and Running your C++ Program

Before you can run your program you must compile it. To compile your program, use the command **g++ <filename>**. If you have errors, you must correct these before proceeding.

When the program compiles without errors, you can run your program. Be default, the compiler names the executable file *a.out*. To run the program, type **./a.out**.

UNIX QUICK REFERENCE

Directory Commands

pwd	print the current working directory
cd	change to your home directory
cd <directory>	change to specific directory
mkdir <directory>	make the specified directory
rmdir <directory>	remove the specified directory

File Commands

ls	list files in current directory
ls –al	list all files in long format
cp <file1> <file2>	copy file1 to file2
mv <file1> <file2>	move file1 to file2
rm <file>	remove the specified file
more <file>	list specified file one page at a time
less <file>	list specified file one page at a time
cat <file>	display entire file to the screen
emacs <file>	invoke emacs with specified file
chmod <mode> <file>	changes the mode of a file

Compile and Run Commands

g++ <file>	compile specified C++ file
a.out	run program that was last compiled

System Commands

man <command>	list the manual page for a command
date	display current date and time
logout	logout of the system

Job Commands

^c	abort current command
^z	suspend current job
fg	resume stopped job
history	show previously run commands
!<cmd #>	run a previous command
jobs	list current jobs
kill %<job #>	kills a running job

EMACS QUICK REFERENCE

Cursor Movement Commands

^f	move forward (to the right) one character
^b	move backward (to the left) one character
^p	move to the previous line (up one line)
^n	move to the next line (down one line)
^a	move to the beginning of the current line
^e	move to the end of the current line
^v	move forward one page
<esc>-v	move backward one page

Editing

^d	delete current character
^k	delete current line from cursor to end of line
^w	write the marked section to the buffer
^y	yank the contents of the buffer into the file

File Commands

^x^f	retrieve a file
^x^s	save current file to disk
^x^w	write current emacs file to disk and specify filename

Quit Commands

^g	quit current command
^x^c	quit emacs

The “Meta x” character is used in combination with the commands below to perform various functions. After entering the “Meta x” character, enter one of the following commands. If additional arguments are needed, you will be prompted for them at the bottom of the screen.

<esc>-x	the “Meta x” character
goto-line	go to a specific line number
set-mark	set a mark
search-forward	search forward in current file for specific word(s)
search-backward	search backward in current file for specific word(s)
replace-string	replace all occurrences of string1 with string2
recover-file	recover an automatic backup of the file