Unix Basics

Computer Science Department
CS2211a: Software Tools & Systems Programming
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Unix Interface

- Every machine (including computers) that is used by a human being can be thought of as two components
  - *The interface*
  - *Everything else*
- In Unix, we call the *interface* the *terminal* and we call *everything else* the *host*
- *A terminal* has two jobs
  - Accepts input
  - Generates output
- There are two types of *terminals*
  - *Text-based*, a.k.a. *character-based*, terminals
  - *Graphical* terminals

Unix Interface

- Relatively speaking, both *Microsoft Windows* and *MAC OS* operating systems were designed from the beginning to use a *GUI*
- Unix is different, as it was developed in an era of *character-based* terminals, virtually all the power and functions of the Unix operating systems are available with plain text
- In a practical term, now a day when you use Unix,
  - you will be working within a GUI (using mouse, manipulating windows, and so on)
  - However, much of the time, you will find yourself working within a window that acts as a character terminal, where all you will type is text and all you will see is text (**i.e., the same way that the original users used Unix back in the 1970's ☺**)

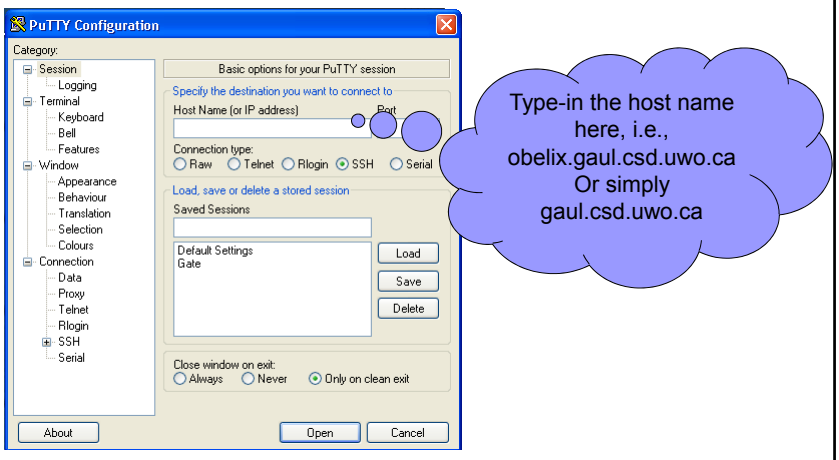
Unix Accounts

- To use a Unix computer, you must have an "*account*"
  - Username (public information)
  - password (private information)
- You can only access the resources that are specified by your account
  - Accounts track, control, and limit user activities
- There is at least one *super user* account in a system, usually named "*root*", who has absolute power over the system
  - In *Microsoft Windows* 95/98/me/NT/2000/XP/vista/7/8, this account is usually named "*administrator*"

Login to Your Account from Home (Windows)

- To login to your account from home, you may want to use:
  - *PuTTY*
    - A *free* terminal emulator software application
    - *PuTTY* was originally written for Microsoft Windows, but it has been ported to various other operating systems
    - The name "*PuTTY*" has no definitive meaning, though "*tty*" is the name for a terminal in the Unix tradition
  - *Secure terminal emulator (Xshell)* and *secure file transfer program (Xftp)*
    - Allows you to *securely login* to remote host computers to *safely execute commands* and *transfer files* on a remote computer
    - Freely available at website *http://www.netsarang.com/download/free_license.html*

Login to Your Account using PuTTY



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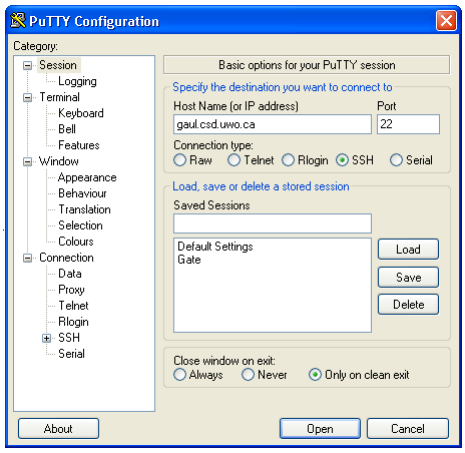

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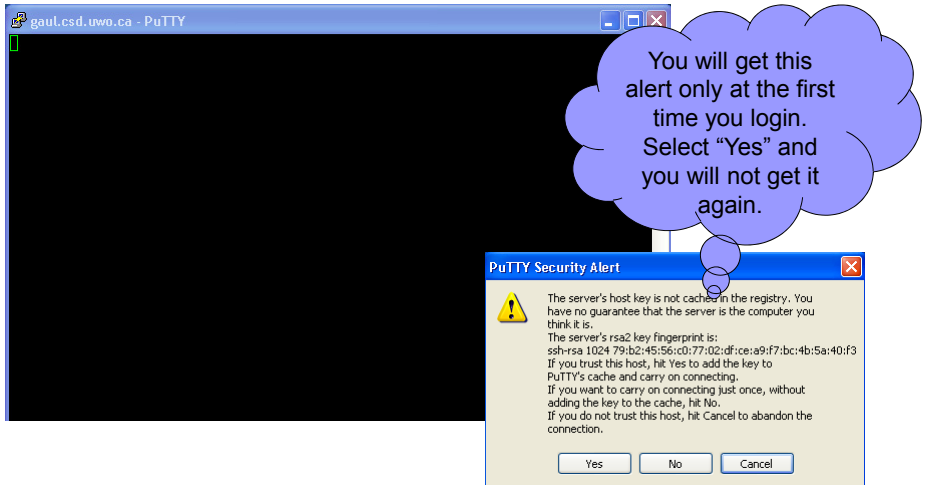

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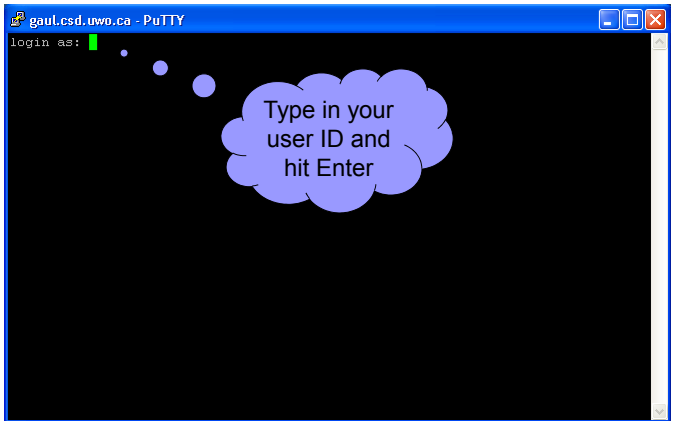

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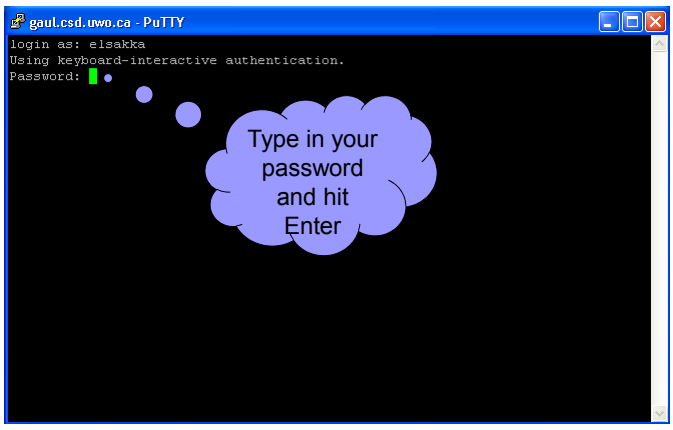

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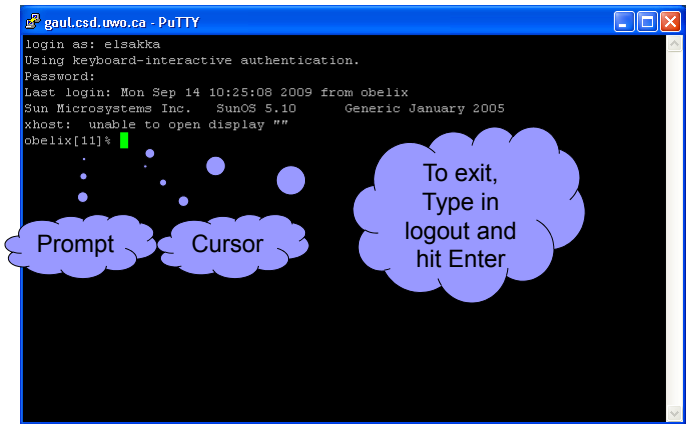
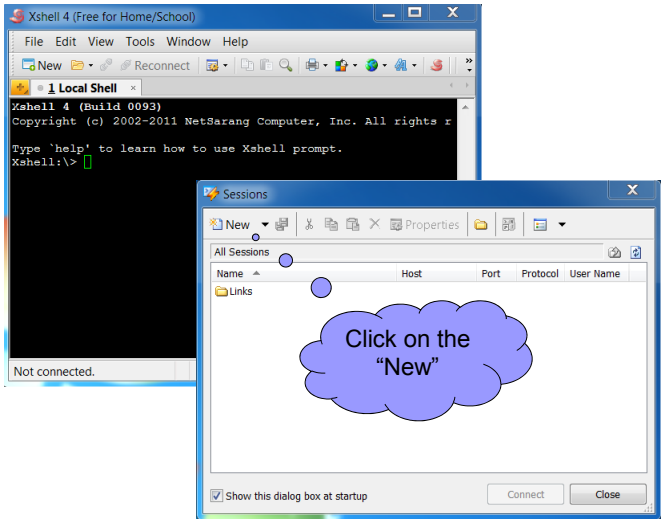


Login to Your Account using PuTTY

Login to Your Account using Xshell



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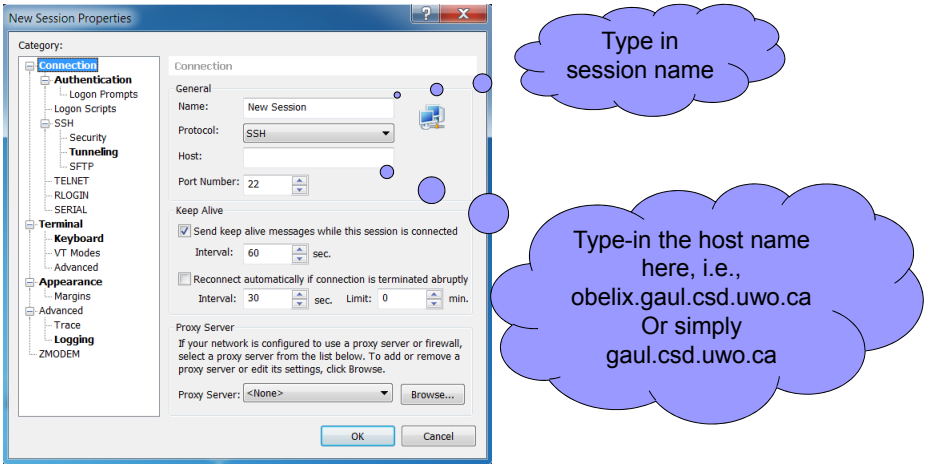

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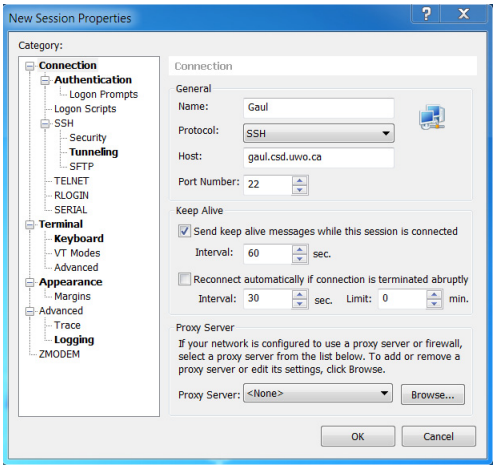

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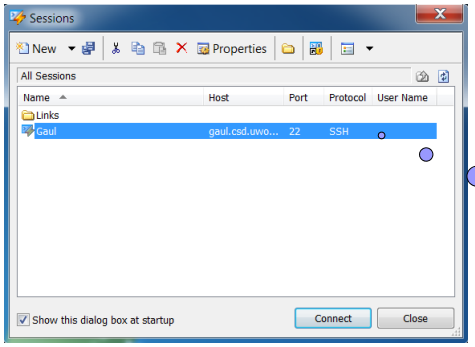
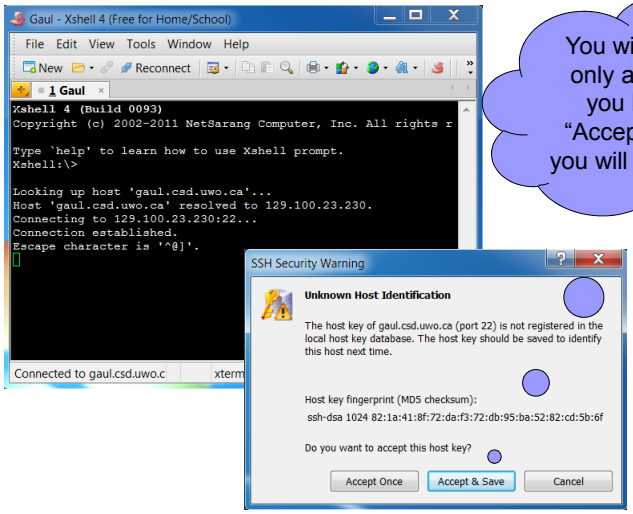


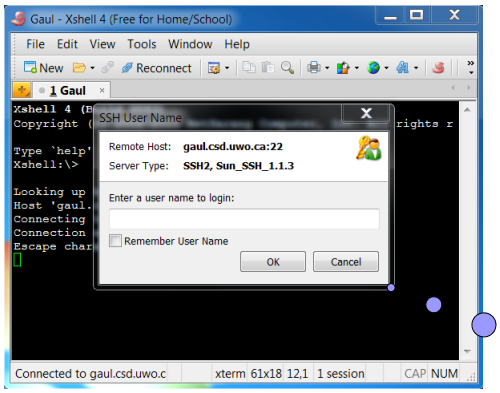
Click on the "Gaul"

Login to Your Account using Xshell



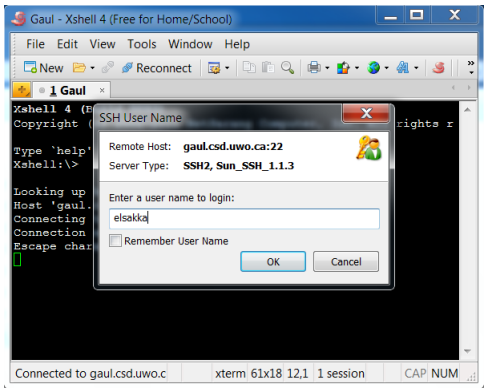
You will get this alert only at the first time you login. Select "Accept & Save" and you will not get it again.

Login to Your Account using Xshell



Type in your user ID and hit Ok

Login to Your Account using Xshell



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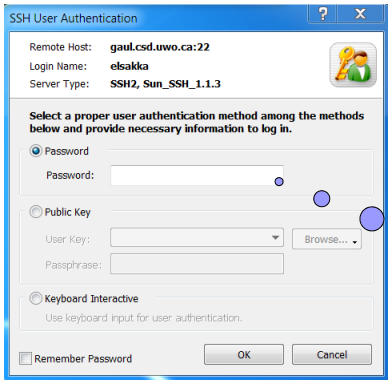
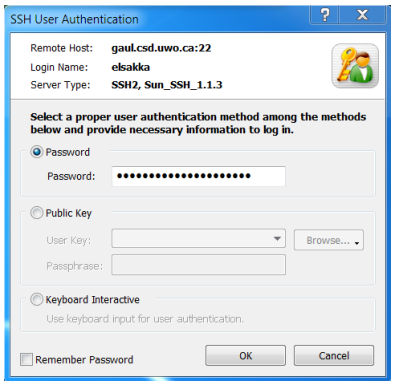


Type in your password and hit Ok

Login to Your Account using Xshell



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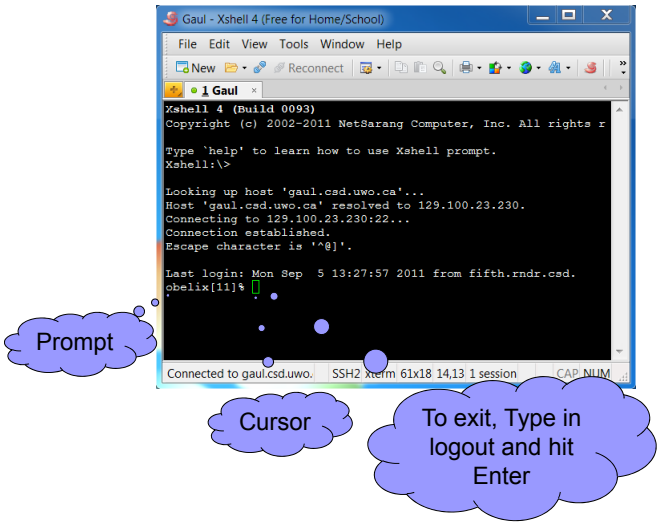
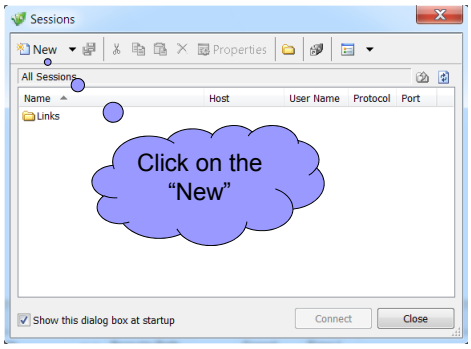


Secure File Transfer Program

- To transfer files from your computer to your Gaul account, and vice versa, use *secure file transfer program*

Secure File Transfer Program (Xftp)



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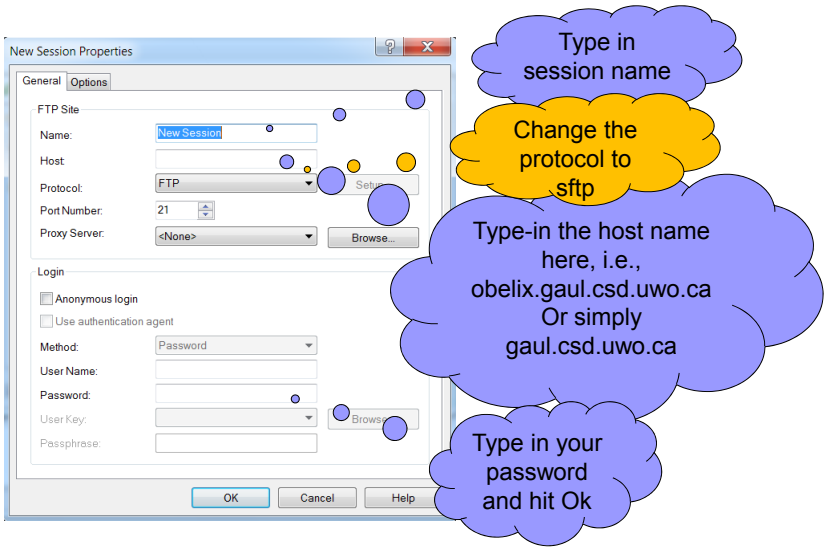

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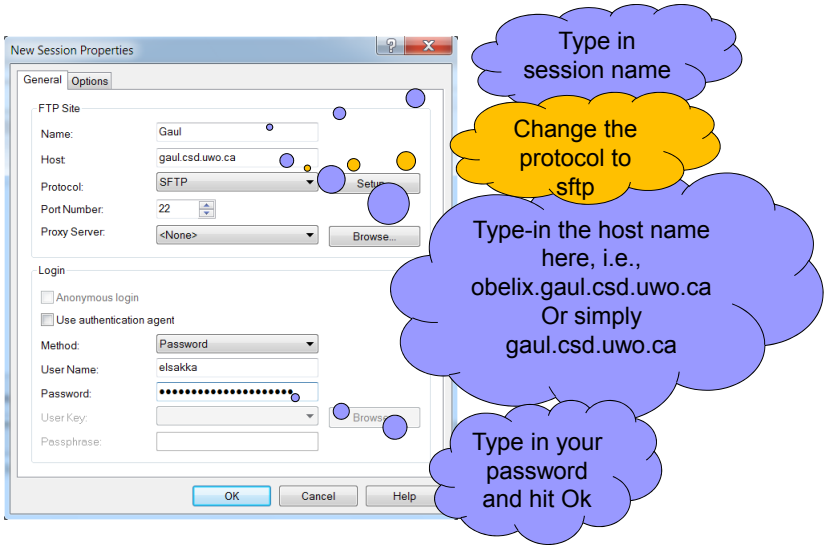

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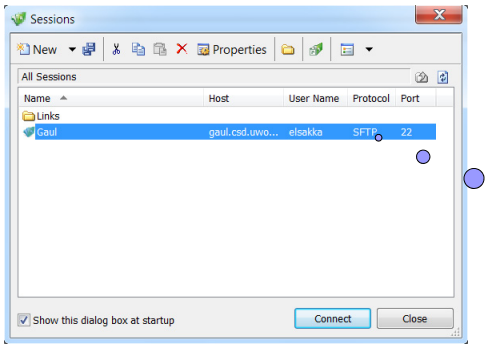

Click on the "Gaul"

After that, you will be able to drag your files to/from your Gual account from/to your local PC.

Login to Your Account from Home (Apple)

- To login to your account from home, you may want to use:
  - *ssh command*
    - *ssh –X obelix.gaul.csd.uwo.ca –l userID*
  - *secure file transfer (transmit.app)*
    - Freely available at website http://www.apple.com/downloads/dashboard/networking_security/transmitwidget.html

To Make a Good Password

- A good password
  - Easily remembered by YOU
  - Difficult to be guessed by others
- Tricks to make a good password
  - Pick letters from a sentence
    - I love Unix ➔ Ioenx
  - Pick letters, numbers, and symbols that sound, look like, or replace a phrase
    - i hate carrots! ➔ ih8^s!

To Make a Good Password

- Passwords *should not* be shared or written down
  Treat your password like *Kleenex*, once shared it, don't use it again
- Passwords *should not* be a word found in a dictionary (even foreign)
- Passwords *should not* contain any form of your name or userid.
- *Do not* use personal information, such as names of family members or pets, your date of birth, social insurance number, or other similar information as part of a password;
  - Since such information may be public, you should not use it in a password, even in combination with other characters
- *Do not* record your password on a post-it note stuck to your monitor or slid under your keyboard (white board *is not* an option either)
- If you have a secure location, such as a safe or a safety deposit box, you may want to store a written copy of your passwords there, but *do not* record your userID in the same location

UWO vs CSD Passwords

- UWO passwords
  - Maintained by *Information Technology Services (ITS)*
    - UWO main UserID and password
      - To access your own record and your uwo email account
- CSD passwords
  - Maintained by *Computer Science Department*
    - Windows UserID and password
    - Unix/Linux UserID and password
    - The CS Windows and Unix/Linux password systems are completely different

Some Basic Commands

- Once you login, you can start interact with Unix through text commands, or through a GUI
- For a quick index of Unix commands covered in your textbook
  - See the *inside back cover* of your text book
  - See *Appendix A* (commands are sorted in alphabetical order)
  - See *Appendix B* (commands are organized into categories)
- The book also have at the end 40 pages of glossary that contains definitions for the 622 technical terms explained in the book, with a reference indicating the chapter in which the term discussed
- The next few slides quickly introduce some of the Unix commands that we will use in this course

Some Basic Commands

- man
  - Finds and displays pages from the online Unix reference manual
- who
  - Displays info about currently logged in userids
- whoami or who am i
  - Displays the userid that is currently logged in
- finger
  - Displays information about local and remote userid
- which
  - Locates a command and displays its pathname or alias
- whereis
  - Finds files associated with a command
- hostname
  - Displays the name of your system
- tty
  - Displays the name of a specific file assigned to your terminal

Some Basic Commands

- quota
  - Displays your system resource quotas
- cal
  - Displays a calendar
- date
  - Prints or sets the system date and time
- find
  - Searches for a file in a directory tree
- ls
  - Displays various types of information about files
- cat
  - Concatenates files and print the result on the standard output
- Ctrl-c: (press <Control> and letter c at the same time)
  - Interrupts the current task

Some Basic Commands

- more
  - Shows the content of a file, one screenful page at a time
- cp
  - Copies files or directories from .. to ..
- touch
  - Updates access/modification times of files, or creates file
- mkdir
  - Makes an empty directories
- rmdir
  - Removes an empty directory
- rm
  - Removes files or directories
- mv
  - Moves or renames files or directories

Some Basic Commands

- cd
  - Changes the working directory to ..
- pwd
  - Prints name of the current working directory
- head
  - Displays the first few lines of a file
- tail
  - Displays the last few lines of a file
- echo
  - Displays arguments at the standard output
- wc
  - Prints the number of bytes, words, and lines in files
- sort
  - Sorts lines of text files
- uniq
  - Removes adjacent repeated lines in a text file

Some Basic Commands

- diff
  - Compares two files and shows differences between them, if any
- compress
  - Compresses files
- decompress
  - Decompresses files

Some Basic Commands

- Try the following man commands
  - man man
  - man who
  - man whoami
  - man finger
  - man which
  - man whereis
  - man hostname
  - man tty
  - man quota
  - man cal
  - man date
  - man find
  - man ls
  - man cat
  - man more
  - man cp

Some Basic Commands

- Try the following man commands
  - man touch
  - man mkdir
  - man rmdir
  - man rm
  - man mv
  - man cd
  - man pwd
  - man head
  - man tail
  - man echo
  - man wc
  - man sort
  - man uniq
  - man diff
  - man compress
  - man decompress

Some Basic Commands

- If you do not have a gaul account
  - The system group is waiting for the add/drop list of the course
  - Keep on trying everyday ☺
- When you login, *do not* remove or overwrite the files that are not created by yourself, e.g., .cshrc, .login, …
- Do not forget to logout!!