**CS 140 (Yang) Introduction to Computer Science**

**Lab Manual: Basic Computer Skills**

*Due Date: see blackboard assignment section*

*Note: This lab assignment is very important. Without the skills listed here you will have problems with the following lab assignments. Go through every page on this handout and complete the exercise on page 14. Submit the script file of compiling and running the Java program on blackboard along the link of Lab#1.*

**Lab Goal – To build skills in the following areas:**

1. Using the PC as a Remote Terminal to connect to ***login.cpp.edu*** (Logging in/out.)
2. How to utilize some of the Linux file and directory commands.
3. How to use the *script* command.
4. How to use the *pico* text editor.
5. How to compile and run a JAVA program on ***login.cpp.edu***
6. How to transfer file between ***login.cpp.edu*** to PC using ***WinSCP***
7. How to print from within the Windows laboratory
8. Exploring the Computer Science Department’s web pages

**Lab Guidelines:**

1) First establish lab *pairs*, i.e. each of you should find a study partner to form a *pair* and then sit next to your partner. I encourage you to change your study partner for different lab assignments.

2) If you have any questions, try to answer them *within the pair* before *turning to another pair* for help. *Ask the instructor* for help as the last resort.

3) Proceed slowly through the exercises and do the best you can. It may be helpful to check off those exercises you have completed and to make notes or answer questions where required.

# Logging in, logging out, and general information

1) All machines in the lab runs Windows 7. Now login in to Windows 7 using your BroncoName and BroncoPassword.

2) It is important that you change your password from time-to-time to ensure your account is secure. You don’t need to do it now, but whenever needed, go to [www.cpp.edu](http://www.cpp.edu), scroll down to very bottom and click the “change password” link

3) click on an icon named ***putty*** to connect to remote host ***login.cpp.edu***

Host name: login.cpp.edu

Port: 22

Connection type: SSH

click on **Open**

then, use your BroncoName and BroncoPassword to login

4) type $**logout** to log out from login.cpp.edu host.

5) When you have finished using the PC/Window 7, **logout**. It is very important that you always remember to do this, otherwise, someone will have access to your account and corresponding files.

Note: if you wish to use putty on your home computer/laptop, just download putty (google putty download)

# Basic Linux Commands: ls, cp, cat, rm, …

1) Log back in to login.cpp.edu

2) List the files in your directory:

**$ ls**

3) Copy a file from instructor’s directory to your directory

**$cp ~lyang/cs140/Lab1\_test.dat test.dat**

4) List the files in your directory:

**$ ls**

You should now have a file named test.dat.

5) List the information in long form:

**$ ls –l**

Lists in long format, giving ACL indication, size in bytes, and time of last modification for each file.

6) Use the cat command to display the contents of the file test.dat.

**$ cat test.dat**

7)If you don’t need a file anymore, just remove it using rm command.

**$ rm test.dat**

(now if you use **ls** command again, you won’t see this file anymore.)

# More file handling: cp, rm, mv, and the man command

1. Make a copy of the test.dat file as copy1.txt.

**$ cp test.dat copy1.txt**

1. Make another copy of test.dat as copy2.txt.

**$ cp test.dat copy2.txt**

**$ ls -l**

Note that test.dat, copy1.txt, and copy2.txt are all the same size.

1. Delete test.dat

**$ rm test.dat**

1. Now try the rm command with the i parameter, which prompts you to confirm the deletion. Remember, Linux has no undelete command.

**$ rm -i copy1.txt**

1. Use the mv command to rename copy2.txt to animals.txt

**$ mv copy2.txt animals.txt**

1. Verify that animals.txt contains the contents you would expect.

**$ cat animals.txt**

1. Use the man command to learn more about the rm command.

**$ man rm**

Press g to top

G to end

q to stop

h for help

Note – you can use the man command to find out more about any other command.

# Directories: pwd, cd, mkdir, rmdir

Files and directories on linux/unix are organized as a tree. A typical login directory is:

/user/lyang

1. Login to login.cpp.edu. Verify your current directory by typing

$ pwd

This means “print working directory” — it will show you where you are in the directory tree.

1. The mkdir command creates a subdirectory in your current working directory.

$ mkdir foo

$ ls -l

This will show that you have created the subdirectory foo of your login directory. How can you tell that foo is a subdirectory and not just a file?

1. Enter the subdirectory by typing

$ cd foo

Verify your location with pwd. Use the ls command to show that there are no files in the subdirectory foo.

1. Copy one of my files into your subdirectory foo by typing

**$ cp ~lyang/cs140/Hello.java .**

The tilde (~) means to use the login directory of user lyang. The second argument to the cp command is a dot (.) which means keep the same name when the file is copied. Now, when you type ls, you will find that the subdirectory foo contains a file Hello.java.

1. Let’s create another subdirectory of your login directory. Type:

$ cd

Now you are back to your login directory.

$ mkdir bar

This creates a subdirectory bar in your login directory. Verify this by typing ls -l.

1. Use the rmdir command to *delete* the subdirectory bar by typing:

$ rmdir bar

Verify that bar is gone by typing ls -l.

1. Can we delete the foo subdirectory by typing the following?

**$ rmdir foo**

Note, you can’t delete a directory unless it’s empty — that is, containing no files or subdirectories. Do whatever is required to delete the subdirectory foo.

# Making transcripts: the script command

NOTE – For submission of your programming assignment, you will need to use the script command to capture the output of your programs. Be sure you understand how to use it.

1) Turn on scripting. The following command will cause Linux to make a file copy of what appears on the screen.

**$ script mywork**

Enter a few commands so that your file mywork will contain a transcript of your keystrokes. Try something like:

**$ ls**

**$ cat animals.txt**

2) Now exit scripting.

**$ exit**

3) Verify that you have created a script file named mywork.

**$ ls**

4) Check out its contents.

**$ cat mywork**

Note, the script file mywork records two time stamps:

the time the file was started and the time the script was done

5) If mywork has many lines, you can display mywork page by page by typing:

**$ more mywork**

# Editing (pico)

The pico editor is an intuitive text-based editor available on unix/linux environment and recommended for use in this class. Tutorials on the use of pico can be found by googling “pico text editor tutorial”

1. To create/edit a file with the pico enter:

**$ pico animals.txt**

2) Now try doing the following:

use the arrow keys to move around

add a few lines at the top

add a few lines at the bottom

add a few lines in the middle

make some changes to existing lines

exit pico (^x), type Y to save

3) See how you have changed the size of the file animals.txt:

**$ ls -l**

4) Look at the file animals.txt using the cat command.

**$ cat animals.txt**

# Compiling and running a Java program on login.cpp.edu

This section demonstrates how you can create a Java program file, compile it, and execute it on login.cpp.edu.

First create a subdirectory cs140 of your login directory by typing the following:

**$ cd**

**$ mkdir cs140**

Now create a file in pico in subdirectory cs140 by typing the following:

$ cd cs140

$ pico Example.java

Now enter the following code into Example.java: (note: don’t leave out //)

// your name

// date

public class Example

{

public static void main(String[] args)

{

System.out.print("This is an example Java program");

System.out.println();

System.out.println(" ...a very SIMPLE one...");

}

}

Exit pico and take a look at your newly created file. It should look like:

$ cat Example.java

// your name

// date

public class Example

{

public static void main(String[] args)

{

System.out.print("This is an example Java program");

System.out.println();

System.out.println(" ...a very SIMPLE one...");

}

}

Now compile the source code with the javac command to produce the java class file.

$ javac Example.java

Note that the file Example.class has been created. Verify it with the ls command.

Now execute the program with the java interpreter.

$ java Example

This is an example Java program

...a very SIMPLE one...

$

Congratulations, you have created, compiled, and executed your first Java program!

# Printing from a lab computer (optional)

When you are in the Windows Lab, to print a file, say Example.java:

1. Open My Documents folder:

Start 🡪 My Documents

1. Find Example.java and open it with Notepad or Wordpad

Right click on Example.java 🡪 select Edit with Notepad or Wordpad

1. Print by selecting [File -> Print]

The printer is located right outside the lab in 8/52. You need to swipe your Bronco ID to get your hardcopy. You use the printer in the same way as you use in the library. (Note: Unless necessary, otherwise I will not ask you to print anything from Lab. In most cases you are required to submit your assignment on blackboard.)

# Copying files between login.cpp.edu and PC using WinSCP

Using WinSCP to access login.cpp.edu:

1. Double click on the icon “WinSCP” located on your desktop.
2. A window will pop up asking for login information. Enter login.cpp.edu in the Host Name field, enter your *BroncoName* and *BroncoPassword*, and click the Login button. A warning will pop up asking about a “Key not found in the cache”. Click yes.
3. A new window will pop up. The right pane displays the files you have on login.cpp.edu. The left pane displays your my Documents (by default) folder that is on your computer.

You may click the drop down menu on the upper left corner of this window to select Desktop in order to save remote files on your local machine. Note that all files saved on Desktop will be cleared the next time the computer restarts. You shall use Desktop only as temporary storage.

1. To pull files from login.cpp.edu just select the desired files in the right pane and drag them over to the left pane. This will copy those files over to your computer.
2. To upload files to login.cpp.edu from your computer just drag the desired files from the left pane over to the right pane. This will copy those files from your computer to your share on login.cpp.edu.
3. When quitting the program a prompt will appear asking you if you want to close the session. Select yes.

If you don’t have WinSCP on your laptop, follow instructions below to get and install WinSCP for home use.

1. In your web browser go to <http://winscp.net/>
2. Select Download. This will take you to the Downloads page.
3. Select the first WinSCP download (at the time of writing it is WinSCP 4.3.5) and click on Installation Package.
4. This will prompt you to download a file. Save the file to your computer.
5. Once it is finished downloading find and run the installer.
6. Follow the on-screen instructions and the program will get installed.
7. Once the installation is finished check to see if a “WinSCP” icon is on your desktop. If you don’t see it on your desktop, then it is in your start menu under All Programs 🡪 WinScp 🡪 WinSCP.

# Sample Exercise

*Everyone should practice the following (note: though we do not grade this lab assignment you could check with the instructor to see if your submission is successful or not.)*

Task 1. Generate a script file called Example.txt (note the file extension is .txt, not .java) in subdirectory cs140 with the following steps visible:

**$script Example.txt**

**$cat Example.java**

**$javac Example.java**

**$java Example**

**$exit**

Now check to see if Example.txt contains what you want

**$ls**

Make sure Example.txt file is in the directory

**$cat Example.txt**

Make sure Example.txt contains your program code, compilation and run commands and the output.

Task 2. (Optional) Use WinSCP to transfer the Example.txt on your computer Desktop

Task 3: Now you are ready to submit Example.txt to your instructor via blackboard:

1. Login to Blackboard
2. Click CS 140 🡪 Assignments 🡪 Lab Assignments 🡪 Lab #1
3. Click on Browe computer for file attachment

If your script file is in login.cpp.edu directory, click on Computer, click on your login.cpp.edu drive, and click on cs140 directory if applicable, then double click on the file name; if your script file is already transferred to local computer Descktop, just double click on the file name. After attaching the script file, click the Submit button.

***Do not copy and paste the contents of the script file into the text box field. You must “attach” the file to your submission.***

# Browsing the World Wide Web (optional)

The web is a vast network of interconnected sites and pages, containing information, much of it worthwhile, much of it worthless.

Invoke the web-browser of your choice.

1) Try viewing a few web sites by entering each web site’s Uniform Resource Locator (URL) in the appropriate box. Here are a few web sites you should become familiar with:

<http://www.cpp.edu/~cs/>

(Cal Poly’s Computer Science department)

<http://sci.cpp.edu/>

(College of Science home page)

<http://www.cpp.edu/~ehelp/>

(Cal Poly eHelp)

<http://www.cpp.edu/>

(Cal Poly’s home page)

<http://www.oracle.com/technetwork/java/index.html>

(Java documentation)