Guided Tour (Version 3)

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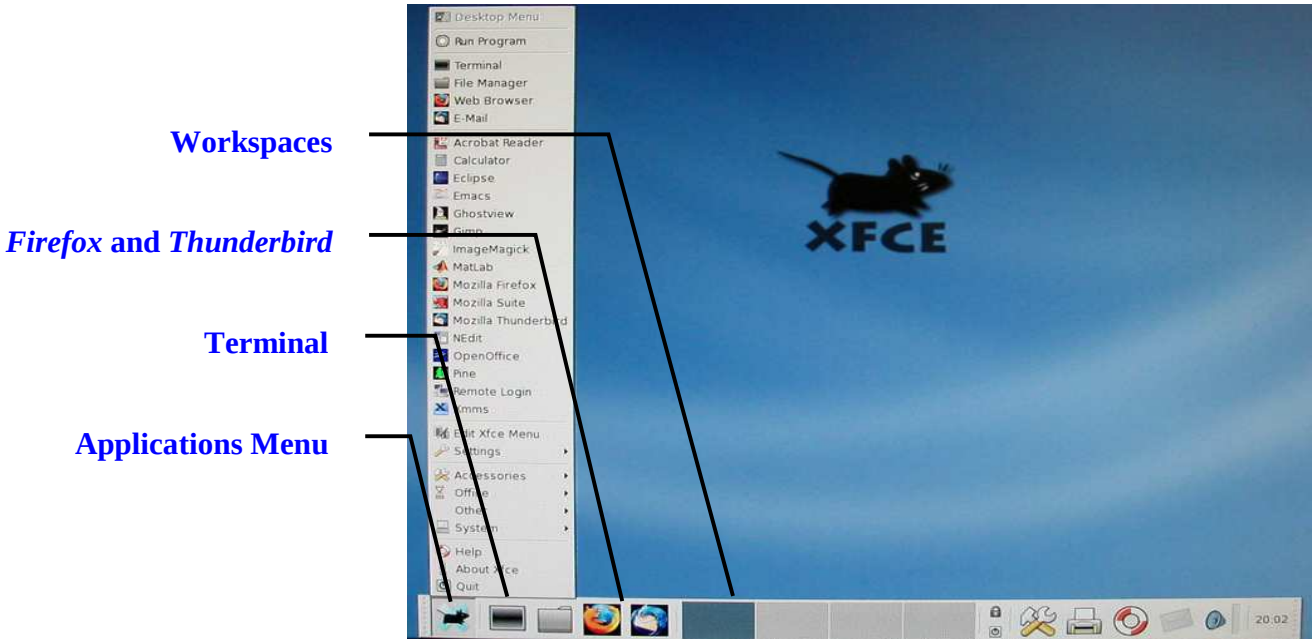
This document was inspired by the Guided Tour written by Professor H. Roumani. His version of the tour can be accessed at the following URL: http://www.cse.yorku.ca/~roumani/jbaYork/GuidedTour.pdf.

You will need a CSE account to complete this tour. See the Lab Monitor in room CSEB 1006 to get an account. Bring your student number and photo identification (e.g., YorkU Card, drivers licence, etc.).

The *Xfce* (*Linux*) Desktop



Applications Menu

For a list of available applications, click the *Xfce* icon or right-click the desktop. An application can be started by selecting it from the menu. In addition to *Firefox* and *Thunderbird*, other applications include *NEdit* (a text editor with which to write programs), *Acrobat Reader* (to view and print PDF files), and *OpenOffice* (to create, edit, and print *Office* documents). You can also log-out by selecting `Quit` at the bottom of the menu and clicking `OK`.

Terminal

The terminal (also known as the console or the command-line) allows you to enter commands. You will use the terminal to compile, run, and submit your programs. It is the most versatile operating system component that you will use in computer science.

Starting Firefox and Thunderbird

The *Firefox* Internet browser and the *Thunderbird* email client can be started with a single click. *Firefox* is configured with department-specific bookmarks, while *Thunderbird* is configured to access your CSE mail account

Workspaces

The operating system's desktop is where you can arrange your application windows. With *Xfce*, you can arrange you windows across four (by default) virtual desktops (also known as workspaces). Although you can only work with one at a time, the applications on all workspaces remain running.

To switch between workspaces, you can click on the thumbnail images. Alternatively, you can scroll the mouse wheel on an empty portion of the desktop. Even if you do not use the extra workspaces, make sure that you do not accidentally switch to them as you work.

Focusing with the Mouse

With *Windows*, you indicate the active window by clicking within it. The window remains active until you minimize it or select another window. However, with *Xfce*, the active window is the one that contains the mouse pointer. If you move your mouse pointer to another window, the new window becomes the active one.

For example, if you want to type a command in a terminal, you must first position your mouse within its window. If, as you type, your mouse pointer moves outside of the terminal window, the terminal will not receive your keystrokes.

Simple Commands

Command: `pwd` **Example**: `pwd`
Description: Displays the current directory (a.k.a. working directory). The same output can be seen a terminal window's title bar.

Command: `man` *`command`* **Example**: `man submit`
Description: Displays the user manual for the passed command. The user manual details the type and number of arguments required by the command, and lists all the available command options. To scroll through the user manual, press the spacebar. To exit the user manual, simply press the Q-key.

Command: `mkdir` *`dirName`* **Example**: `mkdir eChecks`
Description: Creates a subdirectory with the passed name in the current directory. The example creates a subdirectory called "eChecks".

Command: `cd` *`dirName`* **Example 1**: `cd` **Example 2**: `cd ..` **Example 3**: `cd mail`
Description: Without any argument (Example 1), this command changes the working directory to your home directory (equivalent to the "My Documents" folder in *Windows*). With the argument "`..`" (Example 2), this command changes the working directory to the parent directory. If you provide the name of a subdirectory as an argument (Example 3), this command changes the working directory to be that subdirectory (e.g., the subdirectory called "mail").

Command: `ls` *`dirName`* **Example 1**: `ls` **Example 2**: `ls mail` **Example 3**: `ls *.txt`
Description: Lists the contents of the directory specified by the argument. Without any arguments (Example 1), this command lists the visible contents of the working directory. If the argument is a directory name (Example 2), this command lists the visible contents of that directory (e.g., the subdirectory called "mail"). Example 3 lists all files in the current directory that have a ".txt" extension. You can use the "*" wildcard to search for files that match a pattern. There are many options for this command, such as "`-a`" to show hidden files and "`-l`" to show file and directory details. Enter the command `man ls` for further details.

Command: `rm fileOrDir` **Example 1**: `rm First.java` **Example 2**: `rm –r eChecks`
Description: Removes the file or directory indicated by the argument. The first example deletes the file "First.java". The second example (note the "-r" option) removes directory called "eChecks" and all of its contents. **Use this command with caution!**

Command: `cp orgnl cpy` **Example**: `cp First.java First_backup.java`
Description: Copies the file *orgnl* to the location *cpy*. The example creates a copy of "First.java", called "First_backup.java".

Command: `mv old new` **Example**: `mv First.java Second.java`
Description: Moves the file *old* to the location *new*. This command can also be used to rename files. The example renames "First.java" to "Second.java".

Command: `script log` **Example**: `script A1_log.txt`
Description: Records the commands and output generated at the terminal until `exit` is entered. The record is written to a file, whose name is passed as an argument.

Auto-Completion and Command History

You do not have to type entire filenames or directory paths. Type the first couple of characters, followed by the TAB key. The operating system will complete the rest of the name or path. If there are multiple matches, the operating system will complete only the common portion. You will have to type additional characters to identify the desired file or directory.

To repeat a command at a terminal, you can use the up- and down-arrow keys to cycle through commands you previously entered. This can be very beneficial during labs and lab tests, as you will repeatedly compile and run your program to test it.

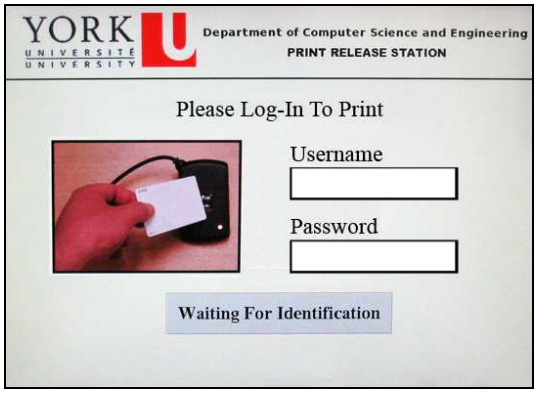
Creating and Editing Text Files

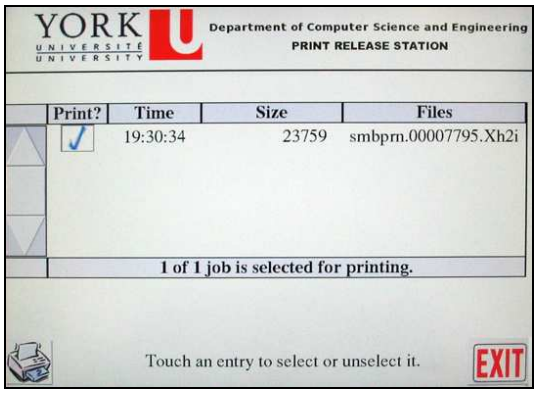
To create and edit your programs in 1020, I recommend you use a text editor called jEdit. Other text editors are installed on the system, such as Pico, Emacs, and Vim; however, jEdit is user-friendly for new users and it is written in Java. To start jEdit, you can select it from the applications menu, or enter jedit & at a terminal. Optionally, you can include a filename (e.g., jedit First.java &). If the file already exists, it will be opened automatically. If not, the file will be created.

Printing Files

Included in your course fee is a print quota of 500 pages. To display the number of pages remaining in your quota, enter the command `pquota` at a terminal.

Typically, you can print an open file by selecting `Print` from the `File` menu. After you send the file to be printed, go to any print station in room CSEB 1004 or 1006. Touch the screen to activate it. Enter your CSE username and password using the attached keyboard. Ensure that the files you want printed are selected, and press the print icon in the bottom-left corner. To exit without printing, press the exit icon. If you experience any printing problems, contact the lab monitor.





Creating a Java Program

Before you can run a Java program, you need to write its code, compile it, and correct any syntax errors. If you have not yet done so, read the above section, "Creating and Editing Text Files". Create a new text file named `First.java` with the following content:

```
import java.io.PrintStream;

public class First
{
     public static void main(String[] args)
     {
          PrintStream output = System.out;

          output.println("My name is ???");
     }
}
```

Replace "`???`" with your name. Save your program. Compile it by entering `javac First.java` at a terminal (note the "`c`" in "`javac`"). The compiler will identify the type and location of any syntax errors. Correct any errors in your code, save your changes, and recompile your code.

Enter `java First` at the terminal to run your program (*do not type* the "`.java`" extension). Your program should output "My name is", followed by your name.

Configuring *eCheck*

Your weekly lab assignments will take the form of "eChecks" – programs that are checked electronically. You will learn more about eChecks in the textbook. However, you must first configure the *eCheck* program that checks your code. Enter the command `java Options` at a terminal.

Uncheck "Work Offline". Enter your CSE username, password, and the following URL:

```
http://www.cse.yorku.ca/~roumani/type/ec/ec.cgi
```

Double-check that you entered the URL correctly. When you are finished, click `Apply`.

Submitting eChecks

Each eCheck exercise is given a three-character code (e.g., 03A). You can check an eCheck exercise by entering the following command at a terminal (replace "03A" with the particular code):

```
java eCheck 03A
```

Your eCheck program will be tested with various inputs. **If your program passes all the tests, your code will be automatically submitted and your mark will be recorded.** If your program does not pass all the tests, output will indicate the given input, the expected output, and how your program's output differed from the expected one. Examine how your program's output is different, make the necessary changes to your program, and check the exercise again. You can check and revise your program as many times as you want before the eCheck's deadline. **Nothing is submitted until your program passes all tests.**

Submitting Assignments

Not all exercises in computer science courses are eChecks. **You will be required to submit all non-eCheck assignments and lab tests.** To do so, you will use the `submit` command, which has the following structure:

```
submit course testName yourFile1 yourFile2 ... yourFileN
```

For example:

```
submit 1020 LT1 MyProgram.java readme.txt
```

It is recommended that you submit your files early and often. Newer files overwrite those with the same name. For more information, enter the command `man submit` at a terminal.

Lab One

Your first lab will test your ability to follow written instructions and to apply the information presented in this document. This lab assumes that you have configured *eCheck* as outlined in the above section Configuring eCheck. If you have not done so, please complete this task before proceeding.

Before starting, read all the instructions and re-read this document to address any questions you might have.

Log in to a workstation in CSEB 1002, CSEB 1004, or CSEB 1006 (in whichever room your lab is scheduled) using your CSE username and password.

1. Open a terminal window. Make sure that the mouse pointer is inside the terminal window.
    a. In the terminal window, there should be a short piece of text followed by a % symbol; this is called the prompt.
2. Enter the command

    ```
    pwd
    ```

    by typing the command, then pressing the ENTER key.
    a. The command should print the full name of your home directory (something like **`/cs/home/cseXXXXX`** where **`cseXXXXX`** is your CSE account name) on the line immediately underneath the command you just entered. On the next line, you should see a new prompt.
        i. If you do not see the output described in 2a then you probably entered the command incorrectly; try again, or ask a teaching assistant for help.
            1. Pay careful attention to messages printed by commands you enter; the messages usually tell you important information helping you to resolve any problems.
3. It is a good idea to keep your directory structure organized so that you can find files easily; therefore, you should create a directory for all of your CSE1020 work.

    Enter the command

    ```
    mkdir cse1020
    ```

    a. The command will print nothing if it is successful, and you should see a new prompt on the next line.
        i. If you see a message like

        ```
        mkdir: cannot create directory `cse1020': File exists
        ```

        then you already have a directory named **`cse1020`** and you have probably already taken this course before.
        ii. If you see some other message then you probably entered the command incorrectly; try again, or ask a teaching assistant for help.

4. Switch to your newly created directory by entering the command

```
cd cse1020
```

   a. The command will print nothing if it is successful, and you should see a new prompt on the next line.

      i. If you see an message then you have either entered the command incorrectly, or something went wrong in Step 4; ask a teaching assistant for help.

5. You should now be in the directory with the full name **`/cs/home/cseXXXXX/cse1020`**

   Confirm that you are in the correct directory by entering the `pwd` command and checking its output.

6. Your **`cse1020`** directory is where you should organize all of your CSE1020 work. Create a directory to organize all of your lab work by entering the command

```
mkdir lab
```

   a. Again, the command will print nothing if it is successful, and you should see a new prompt on the next line.

7. Switch to your newly created directory by entering the command

```
cd lab
```

   a. Again, the command will print nothing if it is successful, and you should see a new prompt on the next line; ask a teaching assistant for help if you see an error message.

8. What is the full name of the directory you are now in? How can you check that you really are in the directory you think you should be in? Go ahead and check.

9. Create a directory for the current lab by entering the command

```
mkdir 1
```

   a. The directory name is the numeral one, not a lower case L.

10. Switch to your newly created directory by entering the command

```
cd 1
```

11. We will now attempt to complete eCheck Check01A (on page 45 of the 3rd Edition of the textbook).

    Start the *jEdit* editor by entering the command

```
jedit Check01A.java &
```

   a. If you do not type the `&` symbol, *jEdit* will still start, but your terminal will appear to freeze and it will not respond to any new commands that you type. What has happened is that you have entered the command to start *jEdit* and the terminal is waiting until the *jEdit* command completes (i.e. the terminal will wait until you close *jEdit*). In this case, we say that *jEdit* has been started as a foreground process; the terminal will wait until a foreground process completes before it can start another one.

If this has happened, do not close the terminal! Instead, move the mouse pointer into the "frozen" terminal window, press and hold the CTRL key, and (while still holding the CTRL key) press the Z key. This operation is normally written like CTRL+Z.

CTRL+Z tells the terminal to suspend (but not close) the command that is currently running. You should find that *jEdit* now appears to be frozen because it has been suspended from running, but you now have a prompt in your terminal. To resume *jEdit* and have a terminal that will respond to commands you type, enter the command

```
bg
```

The `bg` command will resume *jEdit* as a background process. A background process can run, and the terminal does not need to wait for it to complete before accepting new commands from the user.

12. Move the mouse pointer into the *jEdit* window, and type in the program from the Creating a Java Program section on page 4 of this guide (just type in the program; instructions for saving, compiling, and debugging are given below).
13. Save your work.
14. Move the mouse pointer into the terminal window and compile your program by entering the command

    ```
    javac Check01A.java
    ```

    a. The command will print nothing if it is successful, and you should see a new prompt on the next line.

        i. If you get some error messages, try to decipher what they mean. Note that a compiler error message contains the line number of where the error probably occurred.

            1. If you think you have identified the error, fix it using *jEdit*, save the file, and repeat Step 14; otherwise, ask a teaching assistant for help.

15. Run your program by entering the command

    ```
    java Check01A
    ```

    a. Your program should print

    ```
    My name is ???
    ```

    and you should see a new prompt on the next line.

16. Modify your program so that it only outputs

    ```
    My Account Number is cseXXXXX
    ```

    where **`cseXXXXX`** is your CSE account name. Remember to save and re-compile everytime you change your program. Make sure you get the output shown above.

17. Run *eCheck* to test your program. Do so by entering the command

    ```
    java eCheck 01A
    ```

in the terminal.

18. Read the output from *eCheck* very carefully! *eCheck* emits a lot of information.
19. *eCheck* will indicate an error with your output. However, it will also tell you what your program produced and what it expects as the correct answer. Make the appropriate modification to your code, save the change, re-compile, and run your program until you get the output that *eCheck* expects.
20. Repeat steps 17-19 until *eCheck* states that your program "passed all tests".
21. Submit your work by entering the command

    ```
    submit 1020 lab01 Check01A.java
    ```

    a. Examine the output from the command carefully; you should see the message

    ```
    All files successfully submitted.
    ```

    If you do not, correct the error and re-submit your work. You can submit as many times as you want; your previous submissions are simply overwritten.

        i. Make sure that you are comfortable using the `submit` command. It is the same command that is used during lab tests to submit your programming tests.

22. **Congratulations, you have just finished your first lab!**