

Fundamentals of UNIX
Lab 6.1.6 – File Information Commands
(Estimated time: 30 min.)

Objectives:

- Use control characters to perform specific tasks
- Determine file type using the `file` and `strings` commands
- Display the contents of text files with the `cat` and `more` commands
- Display portions of text files with the `head` and `tail` commands
- Determine word, line, and character counts using the `wc` command
- Compare two files using the `diff` command

Background:

In this lab, the student will work with various informational commands. These are important because they allow the user to investigate and discover information about files. The student will use commands to help determine what type a file is and what application created it. The student will also work with several commands that allow the contents of text files to be seen and compare them.

The ability to analyze and manage files and directories using commands is very important in building a solid foundation for further study of the UNIX operating system. UNIX power users and system administrators must have a working knowledge of command line capabilities and syntax. Many operating system management and device configuration tasks require an understanding of UNIX commands and in some cases the command line is the only tool available.

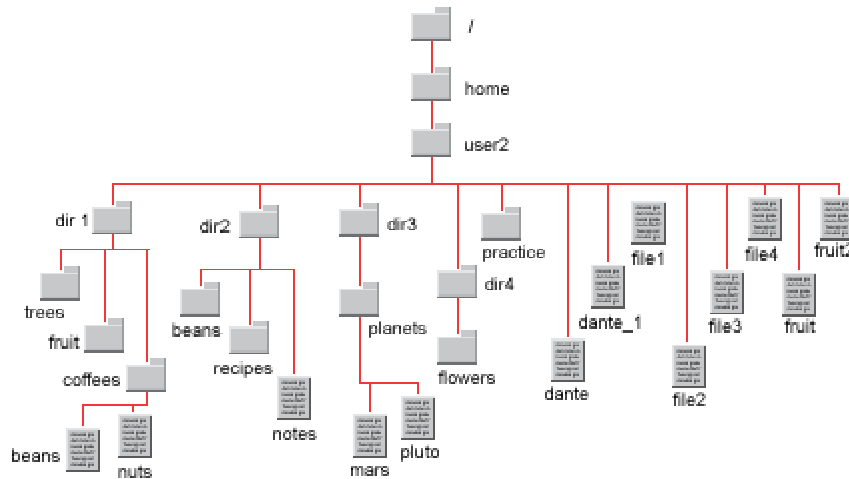
Tools / Preparation:

- a) Before starting this lab, the student should review Chapter 6, Section 1 – Directory and File Management Using the Command Line.
- b) The student will need the following:
 1. A login user ID, for example user2, and a password assigned by their instructor.
 2. A computer running the UNIX operating system with CDE.
 3. Networked computers in classroom.

Notes:

Use the diagram of the sample Class File system directory tree to assist with this lab.

Class File Tree Structure



Step 1. Log in to CDE

The student should login with the user name and password assigned by the instructor in the CDE entry box.

Step 2. Access the Command Line

Right click on the workspace backdrop and click on Tools. Select Terminal from the menu to open a terminal window.

Step 3. Use Control Characters to Perform Specific Tasks

Control characters are used to perform specific tasks such as stopping and starting screen output and others. There are two control keys on most PC keyboards. These keys are normally labeled Ctrl and found in the lower left and right corners of the keyboard. On a Sun workstation, there is one control key in the lower left of the keyboard labeled Control. When displayed on the screen, the Control key is represented by the caret (^) symbol.

To enter a control character sequence, hold down the Control key and press the appropriate character on the keyboard. Control-c is a common control character sequence and is frequently used to interrupt or cancel a process. The actual character in the shell appears as ^C, even though the user presses the Control key and the c key at the same time. Perform the actions indicated to practice using some of the more common control characters.

Control-c: Interrupts the current activity and may be used to abort or terminate processes or long display outputs resulting from the **man**, **cat** or **ls** commands. Control-c is also helpful in restoring the shell prompt if the user types an unrecognized command line, for example **\$ls "**, and receive the secondary prompt (**>**) in the Korn shell. With Linux, q (quit) is used to terminate the **man** command. Either control-c or q will work with Solaris.

Display the **man** pages for the **ls** command (**man ls**) and then abort the output with Control-c (Use q with Linux). What happened? _____

Control-d: Indicates end-of-file or exit. Control-d is used to exit some UNIX utilities such as **bc**, **write**, and several others. Control-d is used to exit a terminal window, and to logout of a terminal session or

command line login session. As a general rule, when stuck, or if Control-c does not work, try Control-d.

- a. Start the basic calculator utility by typing `bc` at the shell prompt.
- b. Multiply two numbers together by typing `458*594` and then press enter.
- c. Exit the calculator by pressing Control-d.
- d. What was the prompt while using the calculator? _____

Control-u: Erases the entire command line. The most common uses for Control-u are:

- e. A quick way to erase a command line that the user decided not to execute.
- f. If a user is logged into a remote system and the backspace key does not work.
- g. To be used to ensure that the user is starting with a fresh user id and password entry when logging in.
- h. Because passwords are not seen when they are typed, use Control-u to erase the password and start over when it is known that an incorrect character or characters have been typed..

If a user enters a command such as `ls -R /` by accident, the user would want to erase the command line before they pressed enter. Enter a command and Press Control-u before pressing enter to execute the command. What would the `ls -R /` command have done?

Step 4. Determine File Type with The File Command

There are many types of files found on a UNIX system. The file type can be determined by using the `file` command. This information can be important when a user is attempting to open or read a file. Determining the file type can help a user decide which program or command to use to open the file. The output from this command will most often be one of the following: Text, Executable or Data.

- a. **Text Files:** Examples include ASCII or English text, commands text, and executable shell scripts. This type of file can be read using the `cat` or `more` commands and can be edited using `vi` or another text editor. Use the `file` command to determine the file type for the `dante` file in the home directory. What kind of file is it? _____
- b. **Executable or Binary Files:** Examples include 32-bit executable and extensible linking format (ELF) code files and other dynamically linked executables. This file type indicates that the file is a command or program. Use the `file` command to determine the file type for the `cal` file in the `/usr/bin` directory. What kind of file is it? _____
- c. **Data Files:** Data files are created by applications running on the system. In some cases the type of file is indicated, for example the FrameMaker (Desktop Publishing software) document. Use the `file` command to determine the file type for the `beans` file in the `dir1/coffees` subdirectory. What kind of file is it? _____

Step 5. Use the `strings` Command

The `strings` command can be used to print out readable characters in an executable or binary file. Someone with a programming background can interpret the output produced by `strings`. The command is introduced here solely as a method for demonstrating the printable characters of an executable file. The `strings` command must be used to read an executable file such as `/usr/bin/cal`. The `strings` command also shows the usage syntax of the command in most cases.

- a. Use the `strings` command to see the readable characters in the `/usr/bin/cal` file. List some of the output from the `strings` command.

Step 6. Display the Contents of a File with the `cat` Command

The `cat`, short for concatenate, command displays the contents of a text file on the screen. The `cat` command is often used to display short text files such as script files which are similar to batch files. If the file fills more than one screen, the data scrolls off the screen. –This will happen unless the user is using a scrolling window, such as a terminal window, within the CDE environment.

- a. Use the `cat` command to display the contents of the `dante` file in the home directory. What happened to the display of the text? _____

Step 7. Display the Contents of a File with the `more` Command

The `more` command is the preferred method of displaying a text file since this command automatically displays the file contents one screen at a time. If the information in a file is longer than one screen, the following message appears at the bottom of the screen where `n` is the percentage of the file already displayed: `--More--(n%)`. Pressing the Enter key will continue the display one line at a time. The Space bar will continue one screen at a time.

- a. Use the `more` command to display the contents of the `dante` file in the home directory. What happened to the display of the text? _____

Step 8. Display Portions of a File with the `head` Command

The `head` command is used to display the first `n` lines of one or more text files. The first 10 lines are displayed by default if the `-n` option is omitted. The `head` command is useful when the user only wants to check the first few lines of a file regardless of its length.

- a. Use the `head` command by itself to display the first portion of the `dante` file in the home directory. How many lines were displayed? _____
- b. Use the `head` command with the `-n` option to display the first 20 lines of the `dante` file in the home directory. What command was entered? _____

Step 9. Display Portions of a File with the `tail` Command

Use the `tail` command to display the last `n` lines of a file. The last 10 lines are displayed by default if the `-n` option is omitted. The `tail` command is useful for checking the most recent entries in large log files. Backup utility programs frequently write their results to a log file showing which files were backed up and when. The final entries in a backup log file are usually the total number of files backed up and messages indicating whether the backup finished successfully. The `-n` option displays the last `n` lines of the file.

- a. Use the `tail` command by itself to display end of the `dante` file in the home directory. How many lines were displayed? _____

Step 10. Determine Line, Word and Character Counts Using the `wc` Command

The `wc` (word count) command can be used to display line, word, byte, or character counts for a text file. This command is useful when trying to determine characteristics of a file or when comparing two files. Using `wc` without options will give a line, word, and byte count of the contents of the file. Using it with individual options allows the user to determine which of these they would like to see.

- a. Use the `wc` command to determine the number of lines, words, and characters in the `dante` file in the home directory. How many lines, words, and characters are there?

Step 11. Count the Number of Directory Entries using `wc`.

Use the `wc` with the `ls` command to determine the number of entries, files and directories, in the student's home directory. To do this the user must pipe the output of the `ls` command to the `wc` command. The pipe symbol is the vertical bar that is on the same key as the backslash (`\`). At the command prompt, enter the command: `ls | wc -w`.

- a. How many file and directory names, or words, are there?

Step 12. Determine the Differences Between Files with the `diff` Command

The `diff` (difference) command is used to compare two text files and find differences between them. The `wc` command can be used to compare files since it counts lines, words, and characters. It is possible for two files to have the same line, word, and character counts but have different characters and words. The `diff` command can actually find the differences between the files.

The output of the `diff` command will display line-by-line differences between two text files. There are two options with the `diff` command, `-i` and `-c`. The `-i` option ignores the case of the letters, for example `A` is equal to `a`. The `-c` option performs a detailed comparison and produces a listing of differences with three lines of context. With this option, the output begins with identification of the files involved and their creation dates.

- a. Use the `diff` command to perform a detailed comparison and determine the differences between the `fruit` and `fruit2` files. What lines, or fruits, are in the `fruit` file that are not in the `fruit2` file?

Step 13. Close the Terminal Window and Logout

Double click on the dash button in the upper left corner of the screen, then click the EXIT icon on the front panel.