

# UNIX Files and Directories\*

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You can avoid learning many of UNIX file and directory commands by using a file manager such as `xm`.

## 1 Files

In UNIX, almost all data is stored in files. C++ programs, executable programs such as netscape and emacs, and even directories are files. Here are some operations you can perform on files:

**create files:** Using many programs, e.g., text editor or compiler, you can create files.

You can also duplicate a file using the `cp` copy command. For example, to create a new file called `bar` whose contents is exactly the same as the file `foo`, use the command

```
cp foo bar
```

That is,

```
cp existing-file new-file.
```

**renaming files:** Use the `mv` move command to give a file a different name.

```
mv current-name new-name
```

**listing files:** Use the `ls` list command to list a file.

```
ls file
```

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To obtain more information about the file, use the `-l` option to learn about the file's permissions, owner, group, size, date, and name.

```
ls -l file
```

**destroying files:** Use the `rm` remove command to destroy files.

```
rm existing-file
```

Removed files cannot usually be recreated. If you remove files and suddenly discover you did not mean to do so, stop all your work and run around until you find a UNIX guru who can help you recover what remains of your files before more of them permanently disappear.

## 2 Directories

A directory is a collection of files and possibly other directories.

Here are some operations you can perform on directories:

**create a directory:** Use the `mkdir` make directory command to create a directory.

```
mkdir new-directory
```

**list directory's contents:** Use the `ls` list command to list all the files (and directories) in a directory.

```
ls
```

You can specify which directory to show: `ls directory-name`.

**remove a directory:** Use the `rmdir` make directory command to create a directory.

```
rmdir new-directory
```

Note only a directory with no files can be destroyed.

## 3 Directory Hierarchy

Since a directory can be stored inside another directory, there is a tree of directories and files. For example, the file creating this document may be located at `/users/joldham/CS1320/files.ltx`. The directory `/` contains the directory `users`, which contains the directory `joldham`, which contains the directory `CS1320`, which contains the file `files.ltx`.

One can move files and directories around the directory hierarchy using the `mv` command. For example, `mv file directory` moves the specified file into the specified directory.

### 3.1 Current Directory

So that we do not have to specify this lengthy string to use a file, the shell remembers the *current directory*. For example, when I start a shell, the current directory is `/users/joldham`. This is also my *home directory*, where all my files are placed unless I take explicit action to move them elsewhere. `~` is a nickname for my current directory.

Operations you can perform on the current directory include:

**changing the current directory:** Use the `cd` change directory command to move your current directory to another location. For example, to go to Fred's home directory, I can use

```
cd ~fred
```

**printing the current directory:** Use the `pwd` change directory command to list the current directory's location. For example, `pwd` may yield `/users/fred`.

The `dirs`, `pushd`, and `popd` commands permit one to maintain a stack of directories. The current directory is the one on top of the stack, but it is easy to add, remove, and rearrange the directories. Read the documentation for these commands if you are interested.

## 4 Further Information

Many of these commands can take multiple arguments or arguments with regular expressions. Read the GNU WWW pages or the info pages for more information.

For more information, read the following:

- file and directory commands as described in the GNU file utilities information pages
- an introduction to files and directories, as described by some of the inventors of UNIX: Chapter 2 of *The UNIX Programming Environment*, by Brian W. Kernighan and Rob Pike, Prentice-Hall, 1984.

- the commands' info pages, available using the UNIX command `info command-name`. For example, to learn more about `ls`, type `info ls`.
- the commands' manual pages, available using the UNIX command `man command-name`. If you do not know the name of a command but do know a keyword, type `man -k keyword`. For example, to obtain a list of commands dealing with time, use `man -k time`.