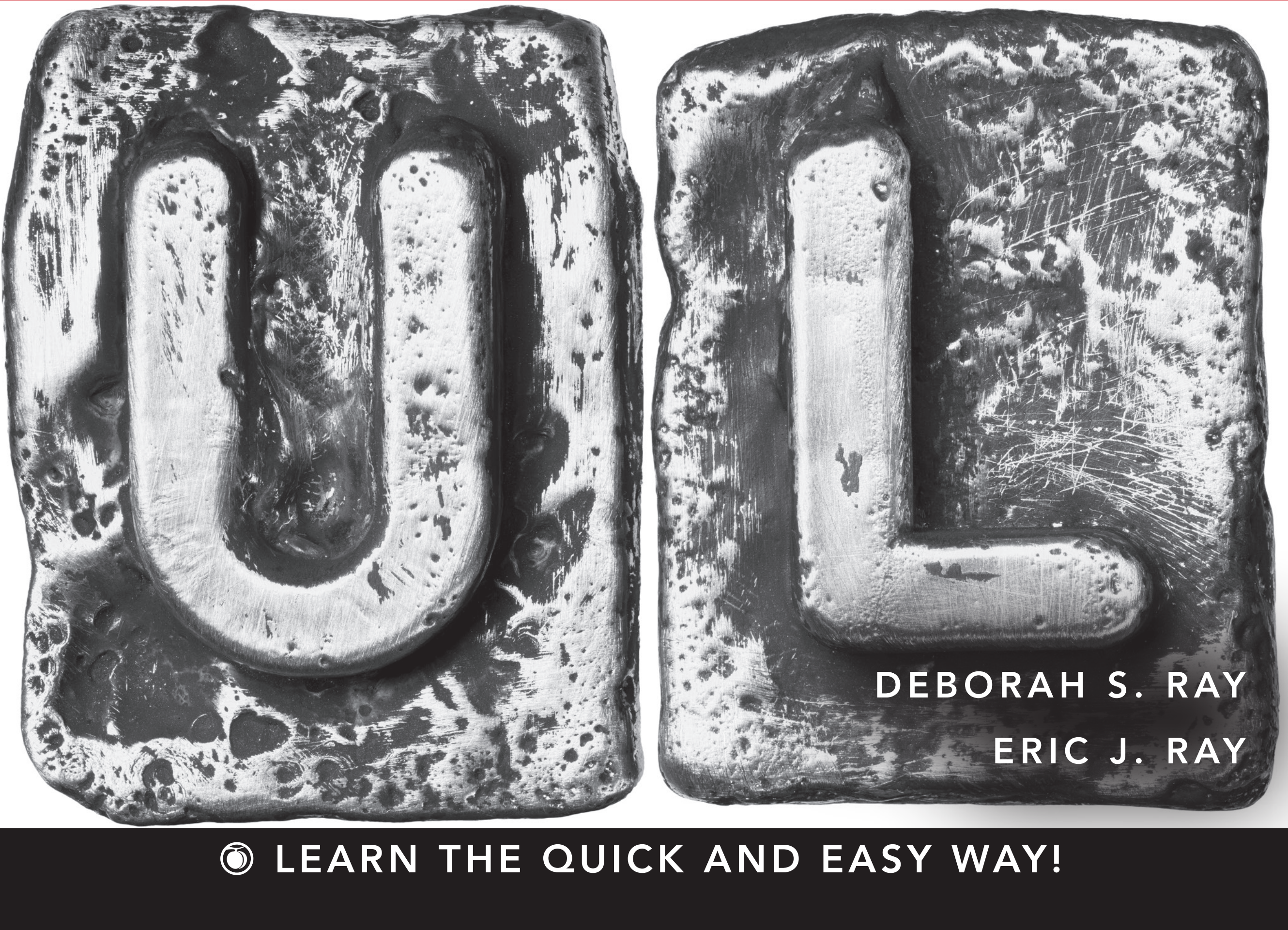
VISUAL QUICKSTART GUIDE

Unix and Linux

Fifth Edition



DEBORAH S. RAY

ERIC J. RAY

LEARN THE QUICK AND EASY WAY!

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Unix and Linux

FIFTH EDITION

DEBORAH RAY • ERIC RAY

Peachpit Press

Visual QuickStart Guide
Unix and Linux, Fifth Edition
Deborah Ray and Eric Ray

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Dedication

To Simon Hayes, who helped develop this book's first edition—the foundation for this book's long-term success.

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Introduction

Greetings, and welcome to Unix and Linux!

In this book, you'll find the information you need to get started with the operating system, advance your skills, and make Linux or Unix do the hard work for you. This book focuses on the most common Unix and Linux commands, but it also gives you ideas for working smartly and efficiently.

For the purposes of this book, Unix and Linux are pretty much interchangeable—the commands and usages are the same. You may find small differences among Unix versions or between specific Unix or Linux versions, but they'll be small indeed.

How Do You Use This Book?

We designed this book to be used as both a tutorial and a reference. If you're a Unix newbie, you should start at the beginning and work forward through the first several chapters. As you progress through the chapters, you'll build on concepts and commands you learned in previous chapters. Then, as you become more proficient, you can start choosing topics, depending on what you want to do. Be sure to reference the table of contents, the index, and the appendixes to find information at a glance.

The commands used throughout this book apply to any version of Unix (or Linux) you might be using, including Solaris, OpenIndiana, BSD, Linux (any or all), AIX or HP-UX, your OS X or Linux system at home, or any other *flavor* (that's the technical term) you can find. Heck, you can even run something very Unix-like from your Windows system with Cygwin. Or you can run the Unix or Linux of your choice under VirtualBox, VMWare, or other virtualization programs. You'll find more about flavors and getting access to Unix or Linux in Chapter 1.

By the way, if you're looking around on the Internet for information, you'll find that a number of people sidestep the awkward discussion of various flavors of Unix and Linux by using the term *Un*x*. That seems a little too geeky, even for us, so we opted out of that one. (*Un*x* sidesteps a perceived issue of trademark enforcement with the specific name Unix and manages to convey the "and Linux too, when it's like

Unix" concept as well. Useful, but geeky. In this book, we'll stick to *Unix* and *Linux*.)

Each chapter covers several topics, each of which is presented in its own section. Each section begins with a brief overview of the topic, often including examples or descriptions of how or when you'd use a command.

Next, you'll find a step-by-step list (or a couple of them) to show you how to complete a process. Note that the code you type appears as the numbered step, and a description follows it, like this:

1. **`The code you type will appear like`**
   `➝ this, in a blocky font.`

   An explanation will appear like this, in a regular font. Here, we often describe what you're typing, give alternatives, or provide cross-references to related information.

If a line of code in a numbered step is particularly long, the code might wrap to a second line. Just type the characters shown, without pressing Enter until the end of the command. Also, in code listings throughout the book, a single line of code onscreen might wrap to two lines in the book. If this happens, the continued line will start with an arrow, so it might look like this:

```
The beginning of the code starts here,
➝ but it continues on this line.
```

Sometimes you'll have to press a special key or key combination—like Ctrl+C, which means to hold down the Ctrl key and press C. We'll use this special keyboard font for these keys, but not for letters or numbers or symbols you might type.

Finally, most sections end with a couple of handy tips. Look here for ways to combine Unix and Linux commands, suggestions for using commands more efficiently, and ideas for finding out more information.

Who Are You?

We assume that you've picked up this book because you already have a need for or an interest in learning to use Unix or any Unix-like operating system, such as Linux, OpenIndiana, OS X, BSD, HP-UX, AIX, Solaris, or others.

Reasons and places to use Unix or Linux abound. Have an Android phone? Linux inside. How about a Kindle Fire tablet? Linux inside. Neighbors experimenting with a Raspberry Pi device? Yup, Linux. Your home Wi-Fi router probably contains Linux, as does your digital cable box. Unix and Linux are everywhere (even if they're hidden sometimes).

Many techie tasks are easier if you have some knowledge of Unix or Linux. For example, if you're installing Minecraft mods, knowing how your shell prompt works makes the process smoother. If you...or someone you know, that is...are rooting or flashing an Android device, knowing Linux can help there, too. And you get SuperGeek points for being able to watch movies and know that the villain is using Unix when writing that fatally flawed program to conquer the world.

We assume that

- You want to know how to use Unix or Linux to do things at work, school, or home.
- You may or may not already have experience with Unix or Linux.
- You don't necessarily have other geeky—er, techie—computer skills or experience.
- You want to learn to use Unix or Linux but probably do not want to delve into all the arcane details about the system.

In short, we assume you want to use Unix or Linux to achieve your computing goals. You want to know what you can do, get an idea of the potential that a command offers, and learn how to work smart. Very smart.

You can do all these things using this book. Basically, all you need is access to an account or system and a goal (or goals) that you want to achieve.

What Do You Need Computer-Wise?

You can learn or experiment with Unix using virtually any computer you might have available. If you're using a Mac with OS X, you're all set; it's all Unix under the hood. If you have an extra computer sitting around, even something as old as a Pentium III, you can install several different flavors of Unix or Linux, including Solaris, OpenIndiana, Ubuntu, Red Hat, or SuSE. Certainly you can install Unix or Linux on an extra hard drive (or empty space on your current hard drive) on your regular desktop computer, and generally without affecting your existing Windows configuration.

Alternatively, you can dabble in Unix less invasively by using an account on a system at work or through an Internet service provider. If you have a reasonably new computer and are concerned about not messing up what you have, though, the easiest options are to

- Use Cygwin to run Unix as part of your Windows environment
- Use VirtualBox or a similar program to run Unix in a "virtual machine" as an application in your Windows environment
- Use a bootable Unix (Linux will be the easiest) CD to experiment on without having to install anything at all on your computer (and save files to a flash drive as needed)

What Do You Need to Know to Get Started?

As you get started learning Unix or Linux, keep in mind the following Unix and Linux conventions for typing commands:

- The terminology and commands are typically arcane, cryptic, and funny-looking. For example, the command to list files or directories is just **`ls`**—short and cryptic. (The command **`ls`** is also short for **`lis`**t, as in "list the files." Many commands have these logical derivations.) We'll walk you through the commands one step at a time so that you know how to read them and apply them to your own uses. Just follow the steps in the order provided.

- Unix and Linux are case sensitive, so type commands following the capitalization used in the book.
- Whenever you type a command, you also have to press Enter. For example, if we say

1. **`funny-looking command goes here`**

   you'll type the code, then press Enter, which sends the command along to the Unix system.

   Often, we'll tell you to press a combination of keys on the keyboard, as in Ctrl+V. Here, all you do is press the Ctrl key plus the (lowercase) V key, both at the same time. Even though the keyboard uses capital letters (and, thus, the little key icons also do in this book), you would not take the extra step to capitalize the V (or whatever) in applying key combinations. If you really need to press Shift, we'll show you that.

   Some commands have flags or arguments (also called options) associated with them (you might think of flags as modifiers for the command) that give you additional control. For example, you might see the **`ls`** command used in variations like **`ls -la`** or **`ls -l -a`**. In either case, **`ls`** lists the files in a directory, the optional **`-l`** flag specifies that you want the long format, and the optional **`-a`** flag specifies all files, including hidden ones (don't worry, we'll go over this again!). Just keep in mind that flags and arguments are essentially options you can use with a given command.

- You can also put multiple commands on the same line. All you have to do is separate the commands with a semicolon (**`;`**), like this:

  ```
  ls ; pwd
  ```

  which would list the files in the current directory (**`ls`**) and find out what directory you're in (**`pwd`**)—all in one step!

So, with these things in mind, see you in Chapter 1!

Anything Else You Should Know?

Yup! Please feel free to send us a message at **`unixvqs@raycomm.com`**. We welcome your input, suggestions, and questions related to this book. Thanks, and we look forward to hearing from you!

Note to Mac Users

For simplicity, we consistently write Enter (not Return), Ctrl (not Control), and Alt (not Option), and we refer (not very often, though) to a Recycle Bin (not a Trash Can). No slight intended to those who do not use PCs or Windows—we just tried to keep the complexity of the instructions to a minimum.

4

Creating and Editing Files

Creating and editing files are likely the most common tasks you'll perform in Unix or Linux. If you're programming, developing webpages, sending email (uh-huh, really), writing a letter, configuring your environment (see Chapter 8), or just exploring the system, you'll spend a lot of time in an editor.

In this chapter, we'll introduce you to two of the most common editors: **`nano`** and **`vi`**. We'll launch this chapter with a general overview of each, and then discuss some how-tos of using each one. With the information presented here, you'll be able to choose an editor based on your needs and get started using it (or using both of them).

In This Chapter

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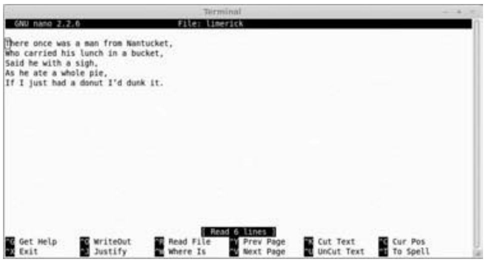
Choosing an Editor: `nano`/`pico` or `vi`/`vim`

Basically, all editors are designed to do the same things: enable you to create, modify, and save text files. These files could include configuration files, email messages, or shell scripts—essentially any text file you can create. Which editor you choose is up to you, depending on your specific needs and how much you're willing to learn.

In this book, we'll stick to the two biggies: **`nano`** and **`vi`**, which will likely give you all the capabilities you'll need. We chose these because **`nano`** is (arguably) the easiest Unix or Linux editor to use and **`vi`** is one of the most powerful and is available on almost every Unix or Linux system.

Which to choose? We recommend that you explore both. While you'll no doubt find **`nano`** easier to use, we highly recommend that you make a concerted effort to learn to get around in **`vi`**. You'll find that **`vi`**'s learning curve is steeper—much—but that being a skilled **`vi`** user will provide many benefits, not the least of which is that **`vi`** is really the only editor you can count on being on any Unix or Linux system you use.



```
Terminal
  GNU nano 2.2.6                File: limerick

There once was a man from Nantucket,
Who carried his lunch in a bucket,
Said he with a sigh,
As he ate a whole pie,
If I just had a donut I'd dunk it.









                               [ Read 6 lines ]
^G Get Help    ^O WriteOut    ^R Read File   ^Y Prev Page   ^K Cut Text    ^C Cur Pos
^X Exit        ^J Justify     ^W Where Is    ^V Next Page   ^U UnCut Text  ^T To Spell
```

A **nano** offers onscreen command reminders to make it easier to use.

About nano or pico

nano is one of the more straightforward Unix editors and has become quite popular because it's extremely easy to use. In particular, as shown in **A**, it's menu-driven and intuitive. All the commands are visible, and you can open, modify, and close files with little effort. **nano** is a great choice if you're just getting started with Unix or Linux, or if you won't be needing an editor able to leap tall files in a single bound.

For a variety of reasons, mostly connected to open-source licensing issues, **nano** is a near-clone of **pico**, which in the past was included in a number of Linux/Unix distributions as well as on systems that you might be using today. The **nano** editor is command-for-command the same as **pico**, but it does offer some supplemental higher-end (yet still easy-to-use) features.

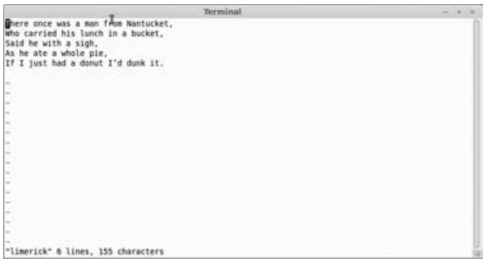
For the purposes of this book, we're going to treat **pico** and **nano** as equivalent—if you have **pico**, just mentally write that in wherever you see **nano**.

pico is distributed with the **pine** email program, so if you have **pine** available to you, you likely also have **pico**. (See Chapter 1 for a reminder on how to find out if specific programs are available to you.) If **pico** is not available to you, and if you cannot find **nano** either, ask your system administrator to install one or the other.

About **vi** or **vim**

Although **vi** is likely responsible for much of Unix's and Linux's reputation for being complicated and confusing, it offers enormous power and flexibility. Plus, **vi** is universally available (unlike **nano**), so for these two reasons, you should consider taking the time to learn it. You might find **vi** cryptic, counterintuitive, and nitpicky, and for this reason, you might want to choose a different editor if you won't require **vi**'s capabilities. As B shows, if you use **vi**, you won't have menus at your disposal—you'll have to get used to using commands like Esc**:q** or Esc**:%s/vi is arcane/vi is powerful/**.

Yes, continuing the theme from the previous section, there is an equivalent of **vi**, called **vim**, that's licensed differently and that's somewhat more powerful. For basic use—everything in this book and far more—the two are identical. In this case, though, you will always find **vi**, even if it's really **vim** (**vi** may actually be a *symlink*, or shortcut, to **vim**). If you find **vim**, though, it will assuredly be **vim**. All commands will be the same, so just dive in and enjoy.



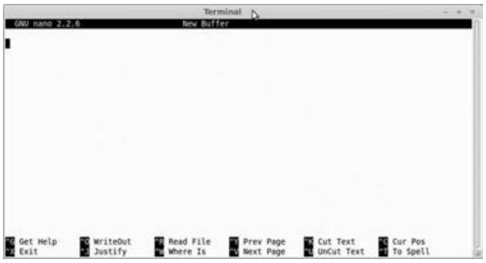
```
There once was a man from Nantucket,
Who carried his lunch in a bucket,
Said he with a sigh,
As he ate a whole pie,
If I just had a donut I'd dunk it.

~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
"limerick" 6 lines, 155 characters
```

B **vi** gives you a clean screen and makes you remember all of its cryptic commands.

Editors Abound

In addition to **nano** and **vi** (covered in this chapter), dozens of other editors exist:

- **emacs** offers a reasonable middle ground between the user-friendliness of **nano** and the power of **vi** (or **vim**). Do note that it's fully as powerful as **vi** for the experienced user, but it is still far easier to get started with. It's not available on all systems, though, so you'll just have to type in the command to see if you have access to it.
- **joe**, **jed**, and **e3**, which are fairly simple editors and comparable to **nano** in many ways. These are certainly worth a look if you're interested.
- **ed**, **ex**, and **red**, which are simple (in functionality, but not necessarily usage) line-by-line editors. They're probably not recommended for the novice user. We haven't had to use them in years.



A **`nano`** offers an intuitive interface for editing text.

Starting nano and Dabbling with It

You can start and dabble with **`nano`** using the following steps. Notice that the **`nano`** interface is intuitive and easy to navigate, as shown in **A**.

To start nano and dabble with it:

1. **`nano`**

   Type **`nano`** at the shell prompt. The program starts up, and you'll see something like **A**, with the text area up at the top of the window and the command hints at the bottom.

   If you know the name of the file you want to edit, type **`nano`** at the shell prompt followed by the path and name of the file you want to edit (**`hairyspiders`**, for example).

2. **`hairyspiders`**

   Go ahead. Type something—anything—just to try it out.

   - Use Delete and Backspace to help edit text.
   - Use the arrow keys to move up, down, right, or left.

TIP Start `nano` with the `-w` option (for example, `nano -w filename`) to disable word wrapping. You'll find this particularly useful when editing configuration files, as covered in Chapter 8.

TIP Throughout `nano`, you'll see `^C`, `^J`, and dozens of other `^`*`something`* characters hanging out in the menu at the bottom. The `^` stands for `Ctrl`, so `^C` is Ctrl+C, `^J` is Ctrl+J, and so on.

Saving in nano

You'll generally save your files frequently whenever you're editing them—and you should. Remember, Murphy is watching you!

To save in nano:

1. Ctrl+O

   Use Ctrl+O periodically to save ("write out") the text you're editing.

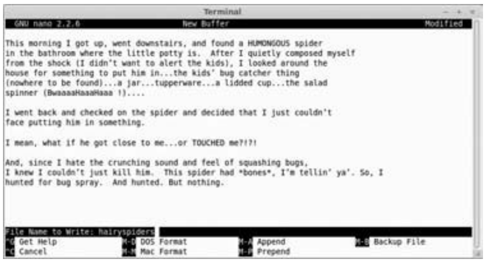
2. **`hairyspiders`**

   Specify the filename for your file A.

TIP After you save a file for the first time and want to save new changes, just press Ctrl+O and then press Enter to confirm the current filename and save it.

TIP When you exit `nano`, you'll get a last chance to save your changes. See "Exiting `nano`" in this chapter for the specifics.

TIP If you try to save a new file over an existing one—which would obliterate the original—`nano` carefully asks you if you want to overwrite the file. Answer Yes, and you'll no longer have the original; No, and you'll get to choose a new filename.

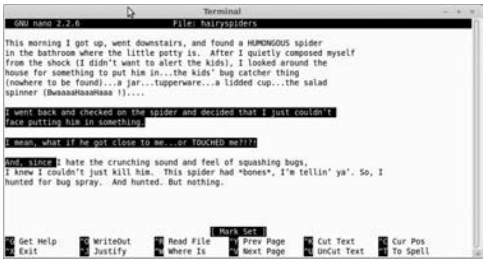


```
  GNU nano 2.2.6              New Buffer                          Modified

This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.



File Name to Write: hairyspiders
^G Get Help          M-D DOS Format       M-A Append           M-B Backup File
^C Cancel            M-M Mac Format       M-P Prepend
```

A In **nano** lingo, "writing out" just means "saving."

Cutting and Pasting Text Blocks in nano

As you're typing along in **nano**, you'll probably need to cut and paste blocks of text, as shown in **A**.



```
Terminal
  GNU nano 2.2.6                File: hairyspiders

This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.

                              [ Mark Set ]
^G Get Help   ^O WriteOut   ^R Read File  ^Y Prev Page  ^K Cut Text   ^C Cur Pos
^X Exit       ^J Justify    ^W Where Is   ^V Next Page  ^U UnCut Text ^T To Spell
```

A Marking, cutting, and pasting text in **nano** can be very handy.

To cut and paste text in nano:

1. **`nano hairyspiders`**

   At the shell prompt, type **nano** followed by the name of the file to edit.

2. Move the cursor to the first line of the text you want to cut.

3. Ctrl+^

   Press Ctrl+^ to mark the beginning of the text you want to cut. (Note that Ctrl+^ is really Ctrl+Shift+6—it might work without Shift, but it might not, depending on your terminal program. Try it out and see what happens.)

4. Use the arrow keys to move the cursor to the end of the text you want to cut.

   Note that the text gets highlighted as you select it **A**.

5. Ctrl+K

   This "kuts" the text.

6. Using the arrow keys, move the cursor to where you want to insert the cut text.

7. Ctrl+U

   Use this key combination to paste the cut text into the file at the new location.

TIP You can select and cut blocks of text without also pasting them back into a file. Just skip steps 6 and 7.

TIP You can paste text blocks as many times as you want. After you select and cut text, just press Ctrl+U at each place where you want to insert the cut text.

TIP If you don't select text, Ctrl+K just cuts a single line.

Checking Spelling in nano

Another handy thing you can do in **nano** is chek yoor speling, as shown in A and B.

To spell-check in nano:

1. **`nano hairyspiders`**

   At the shell prompt, type **nano** and the filename of the file to edit.

2. Ctrl+T

   Pressing these keys starts spell-checking the file. **nano** will stop at each misspelled word as shown in A.

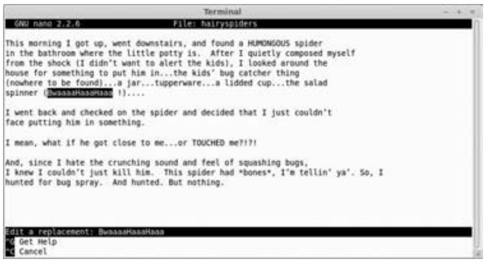
3. **`correctspelling`**

   Type in the correct spelling for any words flagged as misspelled, or press Enter to accept the current spelling and move along to the next word.

TIP You can press Ctrl+C to cancel spell-checking at any time.

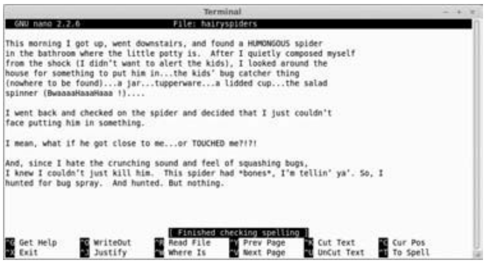
TIP Because the spell-checker in `nano` isn't full-featured, consider using an alternate spell-check program by specifying it on the command line, like `nano -s ispell hairyspiders`, so you can get a little more assistance. See Chapter 14 for more information.

TIP When the entire document has been spell-checked, `nano` will tell you that it's finished, and you can continue editing the file B.



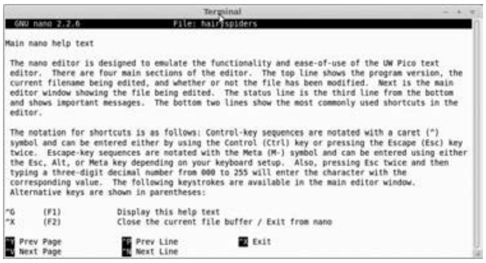
```
Terminal
  GNU nano 2.2.6                    File: hairyspiders

This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.



Edit a replacement: BwaaaaHaaaHaaa
^G Get Help
^C Cancel
```

A **nano** prompts you to correct the spelling of misspelled words.



```
Terminal
  GNU nano 2.2.6                    File: hairyspiders

This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.



                          [ Finished checking spelling ]
^G Get Help    ^O WriteOut    ^R Read File   ^Y Prev Page   ^K Cut Text    ^C Cur Pos
^X Exit        ^J Justify     ^W Where Is    ^V Next Page   ^U UnCut Text  ^T To Spell
```

B **nano** informs you when the procedure is complete.



```
  GNU nano 2.2.6               File: hairyspiders

Main nano help text

 The nano editor is designed to emulate the functionality and ease-of-use of the UW Pico text
 editor.  There are four main sections of the editor.  The top line shows the program version, the
 current filename being edited, and whether or not the file has been modified.  Next is the main
 editor window showing the file being edited.  The status line is the third line from the bottom
 and shows important messages.  The bottom two lines show the most commonly used shortcuts in the
 editor.

 The notation for shortcuts is as follows: Control-key sequences are notated with a caret (^)
 symbol and can be entered either by using the Control (Ctrl) key or pressing the Escape (Esc) key
 twice.  Escape-key sequences are notated with the Meta (M-) symbol and can be entered using either
 the Esc, Alt, or Meta key depending on your keyboard setup.  Also, pressing Esc twice and then
 typing a three-digit decimal number from 000 to 255 will enter the character with the
 corresponding value.  The following keystrokes are available in the main editor window.
 Alternative keys are shown in parentheses:

^G      (F1)            Display this help text
^X      (F2)            Close the current file buffer / Exit from nano

^Y Prev Page        ^P Prev Line        ^X Exit
^V Next Page        ^N Next Line
```

A **nano** gives you all the information you need.

Getting Help in nano

A great way to find out more about **nano** is to access **nano** help. In addition to finding answers to your questions, you can discover its features and capabilities as shown in A.

To get help in nano:

1. Ctrl+G

   In **nano**, press Ctrl+G to access help.

2. Move through the help pages:

   - Ctrl+V moves you down through the help page.
   - Ctrl+Y moves you up through the help page.

3. Ctrl+X

   Use this combination to exit help.

To get help with nano startup options:

```
man nano
```

At the shell prompt, type **`man nano`** to learn more about startup options, including a variety of options that control how **nano** works.

TIP Keep your eye on the `nano` status line for current information, error messages, and occasional hints about using `nano`. The status line is the third line from the bottom of the screen, just above the menu, as shown in A.

TIP Keep in mind that `nano` really is a basic program. And if you're using `pico`, it's even more basic. If you're looking for a command or function that isn't readily available, it's probably not there. You might check out `vi` or `emacs` instead if you want more power than `nano` offers you.

Exiting nano

When you're finished editing in **nano**, you'll exit it using the following steps.

To exit nano:

1. Ctrl+X

   Within **nano**, press Ctrl+X. If you haven't made any changes to the text since you last saved the file, you'll find yourself immediately back at the shell prompt. If you have made changes, you'll be prompted to "Save modified buffer" A.

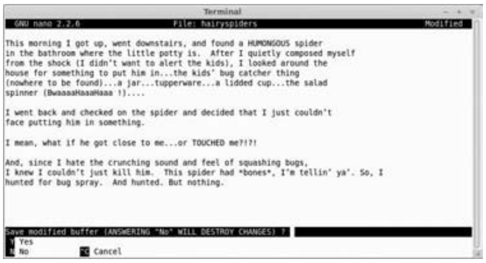
2. At the "Save modified buffer" prompt:

   - Press Y if you want to save your changes. Proceed to step 3.
   - Press N if you don't want to save your changes. You'll end up back at the shell prompt.

3. **`bighairyspiders`**

   Specify the filename for your file if it's the first time you've saved it. If you've saved it before, press Enter to confirm the current filename or change the name to save a copy and not change the original file.

TIP A *buffer* is what the computer uses to temporarily store information, and if it's modified, that means that it's temporarily storing something that you haven't saved to disk.



```
  GNU nano 2.2.6              File: hairyspiders                        Modified

This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.



Save modified buffer (ANSWERING "No" WILL DESTROY CHANGES) ?
 Y Yes
 N No           ^C Cancel
```

A **nano** gives you the opportunity to "Save modified buffer." Without the techno-babble, this means to save the text you just wrote or edited before you exit.

Ⓐ The **`vi`** editor inundates you with tons of onscreen help and advice, as shown here. Well, documentation is available, but the **`vi`** interface itself isn't really helpful at all!

Starting `vi` (or `vim`) and Dabbling with It

Before you go running off to use **`vi`**, understand that it has two modes (both of which look pretty much like Ⓐ):

- *Insert mode* (sometimes called input mode), in which the keys you press actually show up in the file that you're editing. You use this mode to add or change text.
- *Normal mode* (sometimes called command mode), in which every keystroke is interpreted as a command. You use this mode to do everything except enter text.

What's confusing for many people about **`vi`** is that it starts you in command mode, meaning that if you just start typing, you may see some blank spaces, characters, and bits of words that you type—essentially, a bunch of garbage that does not exactly represent what you're typing—and you'll hear a lot of beeping. So, as we'll show you in the following steps, you'll need to access the insert mode as soon as you start **`vi`**.

To start `vi`:

1. **`vi`**

   At the shell prompt, type **`vi`**. The program starts up, and you'll see something like A. The ~ symbols show blank lines below the end of the file.

2. **`i`**

   Type **`i`** to get into insert mode. This itself is a command issued in command mode, so it won't show up on the screen.

3. **`hairy spiders lurk`**

   In insert mode, type anything you want.

   Everything you type will show up on the screen until you return to normal mode by pressing Esc. When you are in normal mode, you can use the arrow keys to navigate up and down in the file line by line and use Ctrl+F and Ctrl+B to scroll one screen forward and backward, respectively.

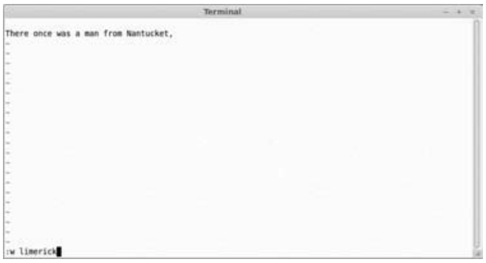
TIP To get help for `vi`, type `man vi`. See Chapter 1 for more about `man` pages.

TIP If you're not sure what mode you're in, press Esc to go into normal mode. If you're already in normal mode, you'll hear a beep. If you're in insert mode, you'll change to normal mode.

TIP Many Unix-like systems, including Linux and OS X, actually provide a program called `vim` in the place of `vi`. `vim` (for *VI iMproved*) is like `vi` but feature-rich and more flexible, and you can still start it with the command `vi`.

TIP You can open specific files or even multiple files when you access `vi`. At the shell prompt, type `vi filetoedit` (or whatever) to open a specific file. Or, for example, type `vi *.html` to open all the HTML documents in a directory, then use Esc`:n` (for "next") and then press Enter to move to each subsequent file.

TIP See "Adding and Deleting Text in `vi`" later in this chapter for more details about editing in `vi`.



```
There once was a man from Nantucket,
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:w limerick
```

A Save early, save often. That's the safe rule for **`vi`**.

Saving in vi

You'll want to save changes to your documents frequently, especially as you're learning to use **`vi`** **A**. Until you're accustomed to switching between insert and normal mode, you may accidentally type in commands when you think you're typing text, with unpredictable results. To save files, just follow these steps.

To save text in vi:

Esc**`:w limerick`**

Press Esc to get out of input mode and into command mode, then type **`:w`** (for "write," as in write to the disk) followed by a space and then the filename (**`limerick`**, in this example) you want to use for the file, then press Enter. If you've already saved the file once, just press Esc and type **`:w`**, then press Enter.

TIP If you've already saved your file at least once, you can save changes and exit `vi` in one fell swoop. In command mode, type `:wq` (for "write quit"). For more information about quitting `vi`, see the section "Exiting `vi`," later in this chapter.

TIP If you want to save a file over an existing file (obliterating the original as you do), use `:w! existingfilename` in command mode. The `!` forces `vi` to overwrite the original.

Adding and Deleting Text in vi

Adding and deleting text in **vi** is a bit more complicated than doing the same in **nano**. In **nano**, you basically just place your cursor where you want to make changes, whereas **vi** has a whole slew of commands that you use to specify where the changes should occur. (**Tables 4.1**, **4.2**, and **4.3** list only a very few of your options.) Plus, to issue the commands, you have to switch to normal mode.

To add or delete text in vi:

1. `vi`

   To begin, type **vi** at the shell prompt.

2. `i`

   Change into insert mode.

3. `There once was a man from Nantucket`

   Type some text that you'll want to add to.

4. Esc

   Press Esc to enter normal mode before you issue the commands.

5. Choose a command, based on what you want to do to the text.

   - Table 4.1 lists commands to add text.
   - Table 4.2 lists commands to delete text.
   - Table 4.3 lists miscellaneous editing commands.

6. `dd`

   Type the command. Here, we're deleting the current line of text.

TABLE 4.1 vi Commands to Add Text

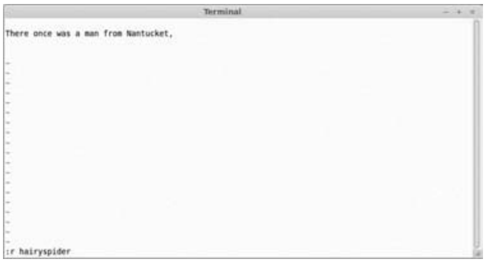
Command	Function
`a`	Adds text after the cursor
`A`	Adds text at the end of the current line
`i`	Inserts text before the cursor
`I`	Inserts text at the beginning of the current line
`o`	Inserts a blank line after the current line
`O`	Inserts a blank line before the current line

TABLE 4.2 vi Commands to Delete Text

Command	Function
`x`	Deletes one character (under the cursor)
`X`	Deletes one character (behind the cursor)
`dd`	Deletes the current line
`5dd`	Deletes five lines starting with the current line (any number would work here)
`dw`	Deletes the current word
`cw`	Changes the current word (deletes it and enters input mode)
`r`	Replaces the character under the cursor with the next character you type
`R`	Replaces the existing text with the text you type (like overtype mode in most word processors)

TABLE 4.3 Other Handy vi Editing Commands

Command	Function
`yy`	Copies the current line
`p`	Pastes any copied text after the cursor or line
`J`	Joins the current and following lines
`u`	Undoes the last change
`U`	Undoes all changes on the current line
`.`	Repeats the last command



```
There once was a man from Nantucket,


~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:r hairyspider
```

A Reading an additional file into the current one can make your editing tasks much easier.

Importing Files into `vi`

You can also merge multiple files in **`vi`** by reading additional files into the current one, as shown in **A**. Basically, all this means is that you insert one file into the file you're currently editing.

To import files in `vi`:

1. **`vi hairyspider`**

   At the shell prompt, type **`vi`** followed by the filename—in this case, the **`hairyspider`** file.

2. Esc**`:r filename`**

   At the point in the file where you want to import text, press Esc, then type **`:r`** and the filename you want to read into the file.

TIP `vi` also lets you read the output of commands into the file. For example, if you want to read the list of files in a specific directory into the file, use Esc`:r !ls` in normal mode.

Searching and Replacing in vi

One of **vi**'s better features (and advantages over **nano**) is that it allows you to search and replace throughout entire files. As shown in the next sections, you can just find a specific string of text (a *regular expression*, in Unix lingo; see A), or you can find the text and replace it with other text, as in B.

To find a string of text in vi:

1. **vi hairyspider**

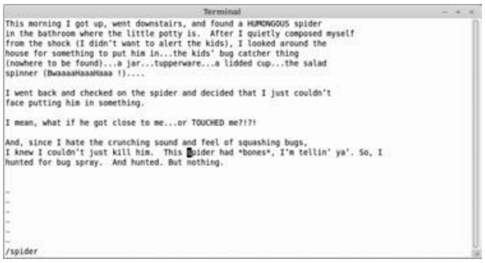
   For starters, access **vi** and a specific file.

2. Esc**/spider**

   Enter command mode, then type **/** followed by the text you're looking for. Here, we're looking for "spider," but you may be looking for "the fly" or "wiggled and jiggled and tickled inside her." Or whatever.

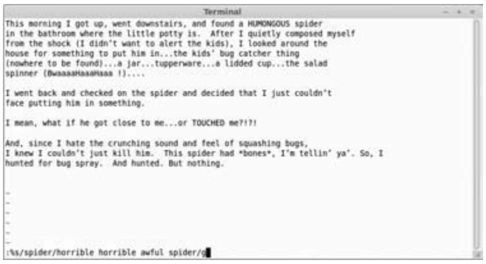
3. Enter

   Press Enter to find the first occurrence of the term. Type N to find the next one.



```
This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.

~
~
~
~
~
~
/spider
```

A Searching for text in **vi** is quick and reliable.



```
This morning I got up, went downstairs, and found a HUMONGOUS spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This spider had *bones*, I'm tellin' ya'. So, I
hunted for bug spray.  And hunted. But nothing.

~
~
~
~
~
~
:%s/spider/horrible horrible awful spider/g
```

B Replacing text in **vi** requires a bit of arcane syntax, but you get used to it quickly.

To search and replace in `vi`:

1. **`vi hairyspider`**

   For starters, access **`vi`** and a specific file.

2. Esc**`:%s/spider/horrible horrible awful spider/`**

   Enter Esc**`:%s/`** plus the text to find, another **`/`**, followed by the replacement text, as in B. Here, we replace "swallowed a fly" with "swallowed a spider to catch the fly," but perhaps you might forgo the spider and simply go for some antacid.

TIP **A great use for the search-and-replace feature is if you end up with DOS text files in your Unix account (by transferring a text file from a Windows machine as a binary file, most likely). If you view DOS files through a Unix shell, all the lines in the file will end with `^M`. But if you try to type `^M` when you're doing a search and replace, the `^M` won't show up. What to do? Press Ctrl+V, then Ctrl+M. Just search and replace with `:%s/` Ctrl+V Ctrl+M`//g`. The Ctrl+V command "escapes" the following character, so you can press it without actually doing what the command would otherwise do. If you don't escape the Ctrl+M, `vi` thinks you just pressed Enter and tries to execute the unfinished command.**

TIP **See the section on `grep` in Chapter 6 for information about searching with regular expressions.**

TIP **Add a `g` at the end of the command to make it apply to all occurrences in the file. Otherwise, it applies only to the first occurrence on each line.**

Exiting vi

Whew! Time to exit **vi** A.

To exit vi:

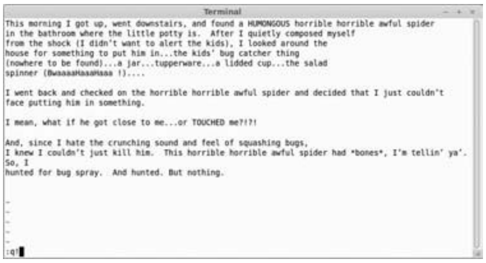
Esc**:q**

Enter command mode by typing Esc, then type **:q** to quit **vi**. If you haven't saved your latest changes, **vi** will not quit and will tell you to use **!** to override. To quit without saving your changes, use **:q!**, as shown in A.

TIP If you don't really want to quit but want to edit a different file instead, type `:e filename` to open a new file to edit.

TIP We recommend that you take a few minutes to try out some of the commands that you'll use throughout your `vi` experience. If you don't think you'll need this range of commands, consider using `nano` rather than `vi`.

TIP It takes some practice to get accustomed to `vi`, but the time spent is well worth it. With patience and practice, you'll quickly become proficient in using `vi`. Take your time, take deep breaths, and plow ahead.



```
This morning I got up, went downstairs, and found a HUMONGOUS horrible horrible awful spider
in the bathroom where the little potty is.  After I quietly composed myself
from the shock (I didn't want to alert the kids), I looked around the
house for something to put him in...the kids' bug catcher thing
(nowhere to be found)...a jar...tupperware...a lidded cup...the salad
spinner (BwaaaaHaaaHaaa !)....

I went back and checked on the horrible horrible awful spider and decided that I just couldn't
face putting him in something.

I mean, what if he got close to me...or TOUCHED me?!?!

And, since I hate the crunching sound and feel of squashing bugs,
I knew I couldn't just kill him.  This horrible horrible awful spider had *bones*, I'm tellin' ya'.
So, I
hunted for bug spray.  And hunted. But nothing.


~
~
~
~
~
:q!
```

A Use Esc**:q!** to quit **vi** without saving changes.

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