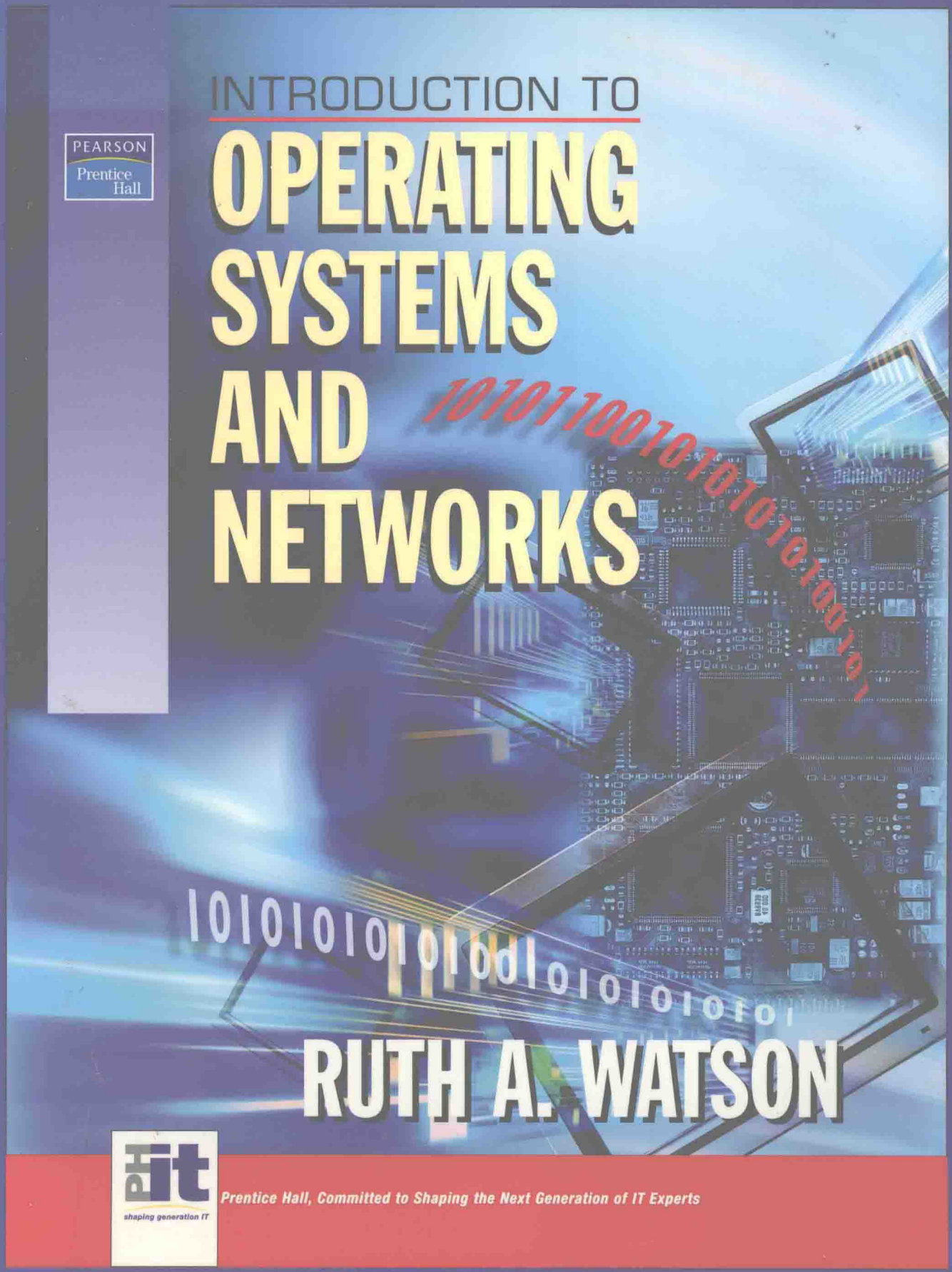
International Edition



INTRODUCTION TO OPERATING SYSTEMS AND NETWORKS

RUTH A. WATSON

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Introduction to Operating Systems and Networks

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Pearson Education International

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10 9 8 7 6 5 4 3 2 1

ISBN 0-13-113679-8

To my husband, Bill, who never fails to find
new ways to show me he loves me.

Preface

About This Edition

This book is intended to provide a foundation for students who wish to enter into the field of Information Technology (IT). The first half provides a hands-on introduction to the Microsoft Windows 2000/XP desktop operating systems and is intended to demystify many aspects of using a personal computer as well as foster improved efficiency. The second half introduces local area networks, keeping in mind that not all students plan to become a network administrator. However, anyone working in IT will no doubt be in a networked environment and should have a basic understanding of a local area network.

FOR THE INSTRUCTOR

Instructor Resources

Instructor's Resource CD-ROM The **Instructor's Resource CD-ROM** that is available with ***Introduction to Operating Systems and Networks*** contains:

- Instructor's Manual in Word and PDF
- Solutions to all questions and exercises from the book and Web site
- PowerPoint lectures with PresMan software
- A Windows-based test manager and the associated test bank in Word format with over 1,500 new questions

Tools for Online Learning

www.prenhall.com/ This text is accompanied by a companion Web site at www.prenhall.com/watson This Web site is designed to bring you and your students a richer, more interactive Web experience.

Features of this new site include the ability for you to customize your homepage with real-time news headlines, current events, exercises, an interactive study guide, and downloadable supplements.

FOR THE STUDENT

Welcome to ***Introduction to Operating Systems and Networks***! As you read through the chapters, you should follow along with any demonstrations. As with any learning activity, you will learn more by doing. Additional activities are found at the end of every chapter. Many of the activities are designed to promote a more proactive approach to learning. The field of IT is a rapidly evolving one and anyone who enters it should expect to continue learning.

Activities such as looking up new technology terms will not only allow you to begin building an impressive technology vocabulary to amaze and astound your friends, they will also enable you to determine what online resources are available and which are better. Once you are working in IT, you will come to rely on them as you encounter new experiences with technology. Please read on, and enjoy!

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Acknowledgments

We are grateful for the assistance from the following reviewers of this edition: Debby Carter, Doug Cross, Julendia C. Gaillard, Vik Pant, and Sydney Shewchuk.

Author Notes

I enjoyed every minute I worked on this project but the final product is not the work of a single person. Many contributed in various ways. I would like to thank my colleagues who supplied the initial encouragement: Irene Edge, Ken Vinciquerra and Will Ward. Larry Jones was an ever helpful resource with his ability to remember details from the past. Albert Ingram, who showed me the way, always deserves thanks. This book was also strengthened by the comments of external reviewers. Lastly, I especially appreciate the patience and professionalism of everyone at Prentice Hall who worked on this project.

Brief Contents

Contents

CHAPTER 1

Introduction to Operating Systems

OBJECTIVES

After reading this chapter, you will be able to:

- Explain what an operating system does
- List the three main components of any operating system
- Differentiate between using the left and right mouse buttons
- Explain the role of the Start button
- Explain the role of the Quick Launch Toolbar
- Demonstrate how to create shortcuts in the Quick Launch Toolbar
- Explain the role of the Taskbar
- Demonstrate how to use Task Manager to terminate a process

INTRODUCTION

Although it is perhaps the most commonly used operating system, Microsoft Windows certainly isn't the only operating system. To determine which operating system is the best choice and why you might choose one over another, it might help to first determine what the operating system does.

The operating system (OS) is an example of a computer program. Programs are simply lines of code and code is another way of saying written instructions. Operating system programmers write code that will respond to the user in specific ways. For instance, when you click on an object such as the Start button or right click on the desktop there is usually some response. The response isn't magic; the programmers wrote code to respond in a specific way to your actions. The objects being clicked on are graphical representations of individual parts of the whole operating system.

Most operating systems are comprised of three main components: the kernel, the file system, and the shell, or user interface. The Microsoft Windows desktop is an example of a GUI shell. GUI (pronounced "gooey") stands for "graphical user interface." Each of these three components is discussed throughout this book but, briefly, the kernel is the core of the operating system. The file system keeps track of directories and files. And

the user interface, or shell, is what we interact with either by entering a command at a prompt or by using some sort of a pointing device, such as a mouse. The hardware components that make up a computer cannot operate without an operating system.

There are actually two parts to a computer: the hardware and the software. Software can either be system software or application software. It is the software that manipulates the hardware. It is the role of the operating system, the most important system software, to act like a middleman for the user and the hardware. The operating system interprets what we want the computer or the application programs to do and gives the appropriate instructions to the hardware to carry out our wishes.

Perhaps the primary reason for selecting a specific operating system depends on what applications you plan to use. Different operating systems are better designed for certain tasks than others. Some Computer Aided Design (CAD)-intensive users might argue that UNIX is the better operating system for them. Graphics designers involved in marketing or publishing are often found using the Macintosh operating system.

GENERAL WINDOWS DEVELOPMENT OVERVIEW

Microsoft Windows has been around since the early 1980s but wasn't commonly used until the early 1990s, when Microsoft released version 3.0 which was quickly followed by version 3.1. Currently, Microsoft has a whole family of Windows operating systems. One side of the family grew out of DOS. DOS stands for "Disk Operating System." Windows Me, Windows 95/98, Windows 3.1/3.11 and all previous versions of Windows come from this side of the family. They are considered backwards-compatible with DOS. In essence, they included all the things that DOS could do and then new components or features were built on top of DOS.

In the early to mid-1990s, the Microsoft operating system programmers came up with another side of the Microsoft family. They named it Windows NT. The code was not backwards-compatible with DOS; they started completely from scratch. They did this because they wanted the operating system to be more stable and more secure. Windows 2000 Professional, Windows 2000 Server, and Windows XP are from this side of the family.

Originally, Microsoft marketed the DOS side of their family for home users and the NT side for business. At this point, Microsoft is moving away from the DOS side of the family and future operating systems will be based on NT code but there will be different versions for different types of users. For example, for home use there is the Windows XP Home edition and another for the office, called Windows XP Professional.

Figure 1.1

No matter which operating system you choose, they all pretty much do the same fundamental thing. An operating system acts as an interface between the computer and the user. It interprets what we want the computer to do by transforming our input commands into a language that the computer understands. At its most basic level, a computer really only understands the electronic state of on or off. Binary math, a Base 2 numbering system, represents the state of on and off by using 1s and 0s. Since it would be a bit tedious for humans to speak in a native computer language, an operating system comes in quite handy, especially an object-oriented operating system that allows you to point and click. Think of it—everything you see on the computer desktop is "clickable." They are all objects that, when you click on them, produce varying results.

Depending on what you want to do, sometimes you click on an object with the left mouse button and sometimes you click with the right mouse button.

What is the difference? For the most part, with the default mouse configuration in Windows you click with the left button when you want to select something. You click with the right mouse button when you want a context-sensitive menu to pop up with options pertaining to the object you've clicked on. Figure 1.1 is a context-sensitive menu you might see if you right click the desktop.

NOTES

Right click on the desktop and see what your options are in the context-sensitive menu. Then right click the My Network Places icon. Then right click the My Computer icon. Everything you click on should have a few different options in the context-sensitive menu that pops up. This is also true if you right click in applications such as Microsoft Word. In fact, in Microsoft Word, right clicking on different parts of the document will also give different options in the context sensitive-menu.

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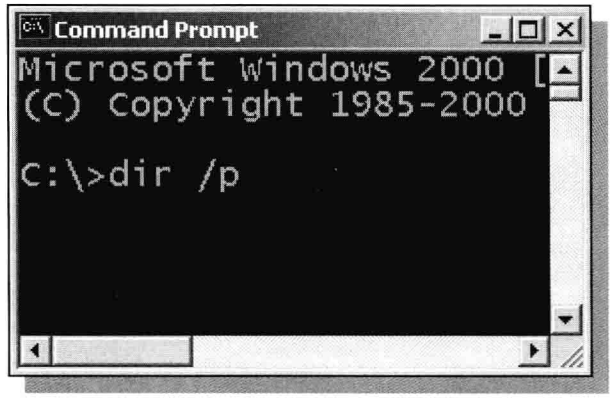
The menu options change because the application is programmed to offer choices that will better assist you based on what a typical user might be trying to do at any given point in time. The options that you have available when you right click the desktop all pertain to customizing or manipulating the objects on your desktop. The Active Desktop option makes your desktop act like a Web page. You can also arrange your icons, refresh the screen, paste shortcuts to the desktop, create a new folder or other object, and configure the properties of your desktop. Chapter 5 deals with customizing your desktop.

Of course, before the days of the mouse, most computer users worked in DOS using a command line interface (see Figure 1.2) as opposed to a graphical user interface.

Figure 1.2



With DOS you have to know the exact alphanumeric keyboard command to do anything. In the example shown, the screen would be filled with a listing of the files and directories in the current directory (C:). The command DIR has several switches that can be used with it. A switch allows you to add a parameter to the initial command to modify the outcome. The /p switch shown in the example would fill the screen with the listing and then pause so you can read the directory listing a screen at a time rather than have it all fly by too quickly.

CHECK IT OUT

What happens when you use the /w switch?

1. Click Start > Programs > Accessories > Command Prompt.
2. At the prompt type DIR /w (dir, space, forward slash, w)
3. What happened? You should see a directory listing with the file names spread across the screen horizontally.

NOTES

What is the difference between / and \? Locate them on your keyboard. The backslash \ is used as part of a path such as C:\WINNT. Paths are discussed in Chapter 2. The forward slash / is often used in conjunction with switches. Switches are discussed in Chapter 3.

As computer usage became more popular over time, the number of files we wanted to store increased and organization became extremely important. So the early computer developers had to devise a way to logically divide a disk up and allow you to organize files. That means they also had to come up with a good way to reference a file.

Why did they call it a "C:" drive? Well, it did have to be named something. And in the beginning, most early personal computers didn't have a hard drive; they only had floppy drives. In many cases, they had two. That explains why the first hard drive on a computer is called the C: drive; A: and B: were already taken for names for the floppy drives.

So disk drives are named using letters of the alphabet. We create folders on these disk drives to help us organize our files on a disk. You wouldn't want to put all of your files in one folder. It would be too difficult to keep track of them and find them when you need them. It also makes it more difficult for the file system to keep track of them.

In the early days of personal computing (early 1980s), DOS was an improvement over speaking 1s and 0s but a lot of people still found it tedious. DOS wasn't the only personal computer operating system at the time; Macintoshes had a completely different operating system, for instance.

Other operating systems include AS400, OS/2, UNIX, Linux, Novell Netware, Banyan Vines, VMS, and many others. Some are for personal computers (PCs), some for mainframes, some for supercomputers, and others for local area networks. In addition, some operating systems are written by students in classes.

Linux is an example of an open source operating system. You can download it from the Internet for free with the source code. Not only do you have the programs necessary to install the operating system on your computer, you also can see and edit the actual code of the operating system. You can even add to the source code and upload it back to the Internet. Linux is unusual in that aspect; most companies would not want you to see their source code. Linux wasn't created by one company, however. It was originally developed by Linus Torvalds while he was a college student and then, over time, many people all over the world added source code.

Why would you want to add to the source code of an operating system? Say you download Linux and install it on your computer. You might want to be able to print documents while using your new operating system. But Linux was written by people all over the world and they may not have the same printer that you do. In order to print, you need to install a printer driver. A printer driver is a file that you install on your computer that tells your operating system how to communicate with your printer. If no other Linux user has the same printer as you, there's no reason for anyone except you to write a driver for it. And that is how Linux has evolved. Programmers all over the world offer additional pieces of code to support new hardware components and applications to run on Linux.

OVERVIEW OF THE MICROSOFT WINDOWS DESKTOP

The desktop is the entire window that fills your computer screen and its contents, including the Start button, the Quick Launch Toolbar, the colors of your desktop, the icons on the desktop and the fonts used for them, any images you might use for the background, the Taskbar, and the System Tray. Figure 1.3 is an example of the Windows XP Professional desktop. Figure 1.3 shows the desktop and the Taskbar with the Start button, Quick Launch Toolbar, minimized applications, an additional toolbar, and the System Tray with the clock.

Start Menu

In most cases, you launch (start) an application by clicking on the Start button and then finding the application. Rather than using the mouse you can also use the keyboard, however. Locate the "flying windows" keys on your keyboard. They are usually to the right and left of the space bar. Pressing one of the flying windows keys is the same as clicking on Start with the mouse.

Program applications such as Microsoft Word or CorelDraw will be under the Programs option on the menu in Windows 2000 Professional and the All Programs option in Windows XP Professional.

The My Recent Documents option in Figure 1.4 shows the last several files (of all types) opened by you when using the computer. Microsoft Windows 2000 Professional and XP Professional both keep track of individual users. The files you see listed in Documents in Windows 2000 Professional or My Recent Documents in Windows XP Professional will be any files accessed on a specific computer when using the same account, or username. There are also folders to store graphics and music for individual users. In Windows 2000 Professional, the My Pictures folder is found in My Documents. In Windows XP Professional, both the My Pictures and My Music folders are found in My Documents and links to them are included in the Start Menu for easy access.

You can get to the Control Panel or configure a printer under the Start > Settings option in Windows 2000 Professional or Start > Control Panel in Windows XP Professional.

The Search option can help you find files and folders and is explained in Chapter 2. The Run option will run any program that you type in.

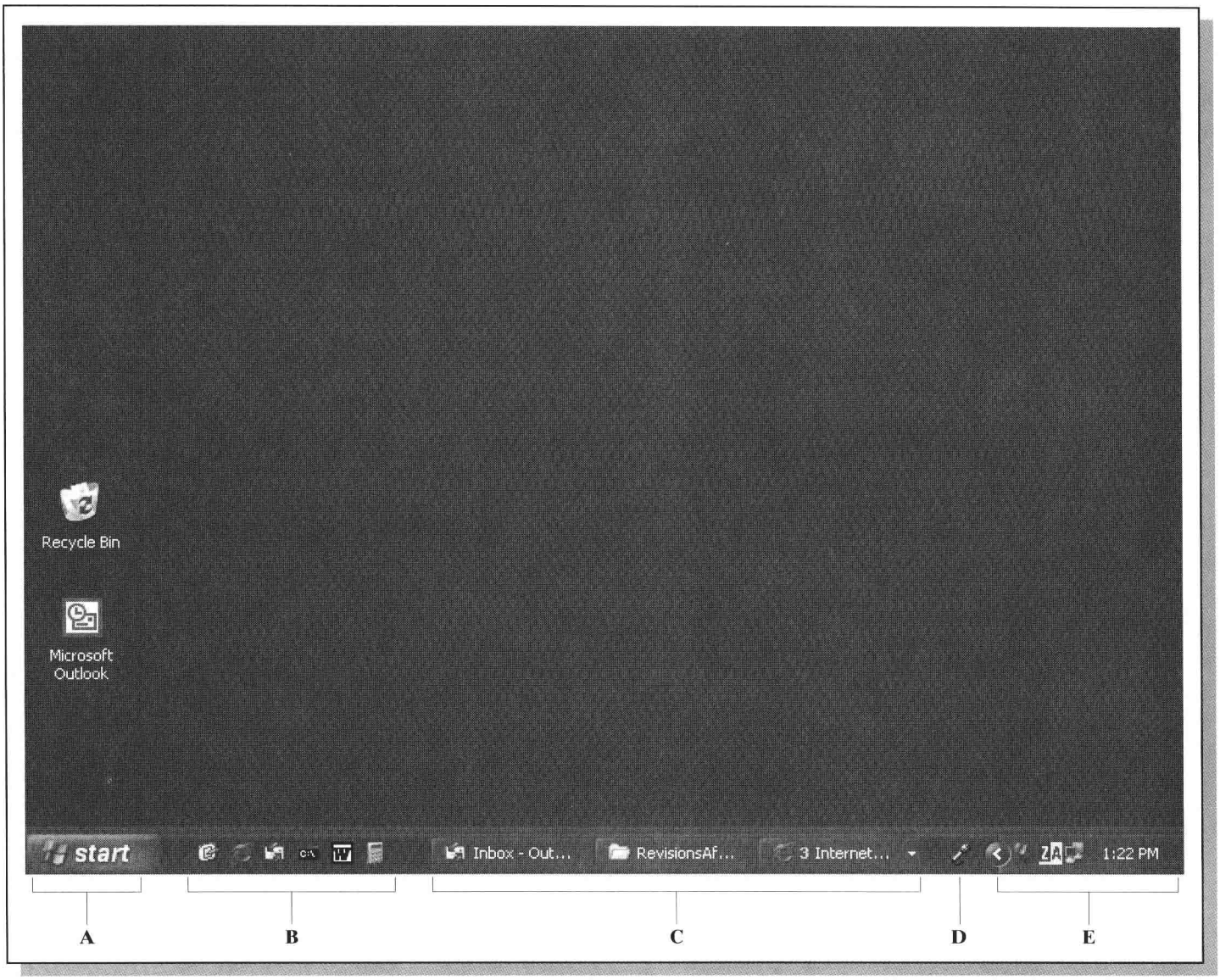


Figure 1.3

A—Start Menu
B—Quick Launch Toolbar
C—Minimized Applications
D—Additional Toolbar
E—System Tray

CHECK IT OUT

1. Click Start > Run and then type in CMD
2. What happened?

Cmd.exe is the name of the executable file you just ran. It displays the command prompt window and is found in the WINNT\system32 folder on a Windows 2000 computer and in Windows\system32 in Windows XP. You can also access it by clicking Start > Programs or All Programs > Accessories > Command Prompt. It is part of the Windows operating system. The programmers who wrote the Windows operating system wrote the code for the cmd.exe program.

Figure 1.4

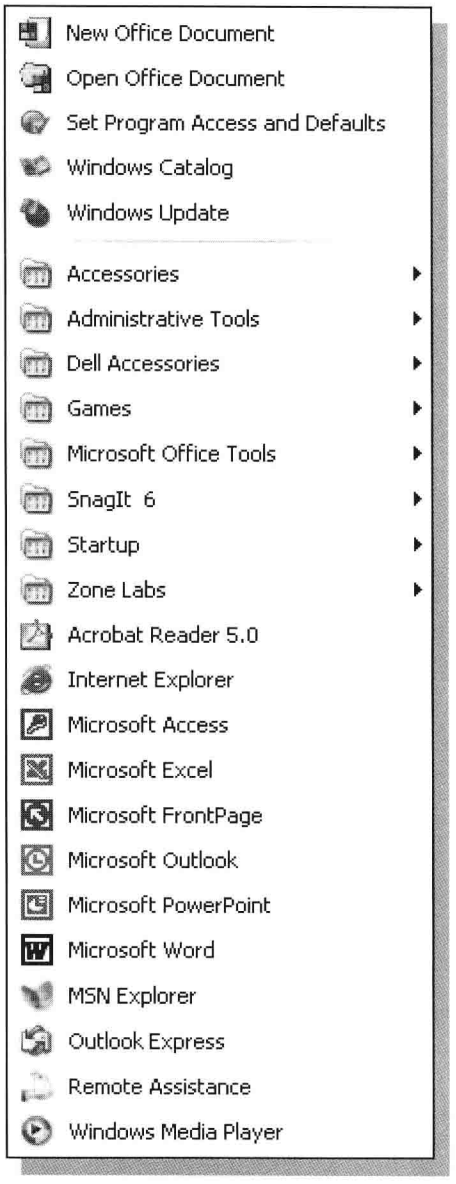
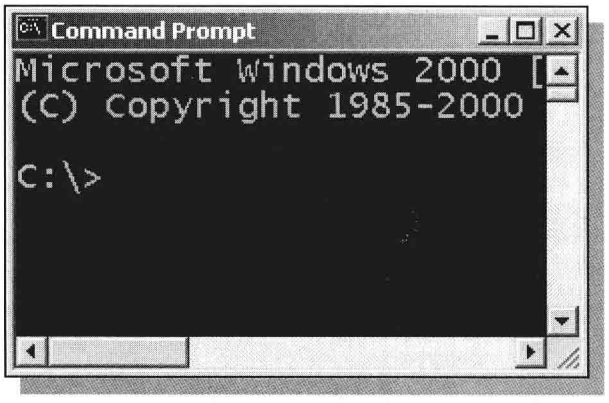


Figure 1.5

Figure 1.6



In Windows 2000 Professional, the Help option in the Start menu is exactly what you'd think it is. You can use help to look up terms and concepts relating to the Windows operating system (see Figure 1.7).

Figure 1.7

The Contents tab offers you more of a Table of Contents-type view. The Index tab allows you to search by keyword and it also has an alphabetized list of items. The Search tab scans through all of the text in the help documents and will often offer a less focused result than Index. The favorites tab allows you to bookmark a Help document once you have found it.

In Windows XP Professional, the Help and Support Center has similar features and allows you to search using the index, bookmark favorites, and keep a history of the Help documents you have viewed (see Figure 1.8).

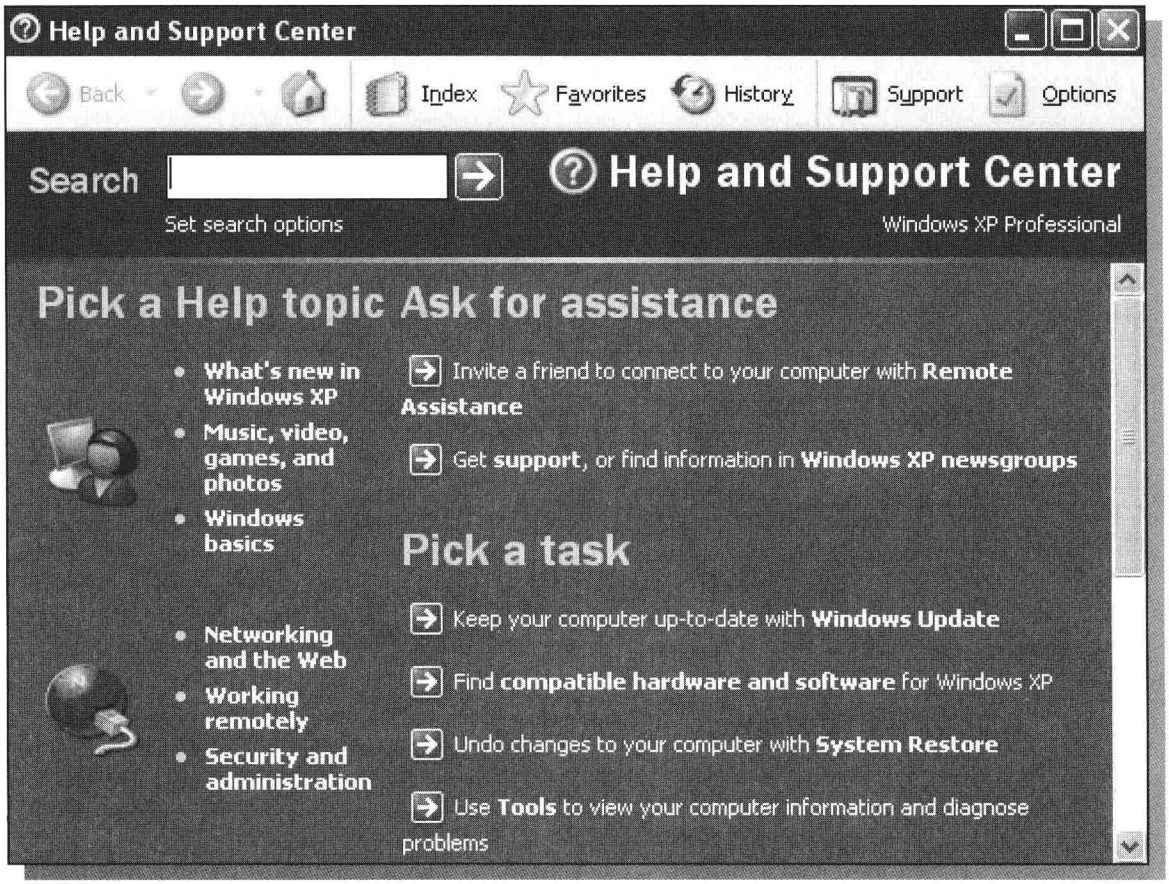


Figure 1.8

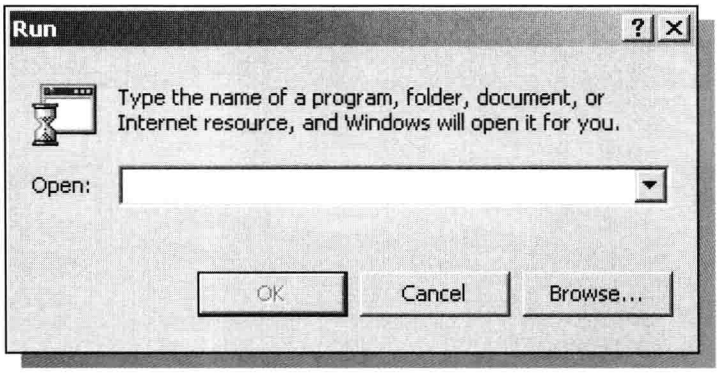
The two arrows shown at the bottom of the menu in Figure 1.9 is called a chevron. The chevron is telling you that there are actually more programs available on your PC but you are only being shown the last few programs that you used. To see the entire list, either click on the chevron or wait a few seconds and the list will expand.

Figure 1.9

The arrows to the right of menu options are telling you that yet another menu will pop out to the right if you select that option (see Figure 1.9).

Any time a menu option has an ellipsis (…) after it, this indicates that if you select this option you will see yet another window of options. The Start > Run option is an example. If you select it, you will see the window shown in Figure 1.10.

Figure 1.10



Whenever you open a window (e.g., My Computer or Microsoft Word), you'll have three control buttons in the upper right hand corner (see Figure 1.11).

The "minus sign" button will minimize the window. The middle button will restore the window. And the X button will close the window.

You can also close the window up by double clicking the computer icon in the upper left hand corner. A third method is to click on File and then Close. This window is also showing a vertical (up and down) scroll bar. You can resize the window by resting your mouse pointer on any one of the edges or corners, holding down the left mouse button, and dragging the corner of the window.

Quick Launch Toolbar

A quicker way to launch a program is to click on its icon in the Quick Launch Toolbar. As shown in Figure 1.12, the Quick Launch Toolbar is directly to the right of the Start button and has shortcuts to programs that you use most often. If the Quick Launch Toolbar is not currently showing on the Taskbar, right click anywhere on the Taskbar and select Toolbars > Quick Launch.

The leftmost icon in the Quick Launch Toolbar shown is the Show Desktop icon in Windows 2000 Professional (see Figure 1.12). The Show Desktop icon in Windows XP Professional is the leftmost icon in Figure 1.13. Clicking the Show Desktop icon will minimize all of your open applications at once and

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