1

Answers to Even-Numbered Exercises

2. Why is Linux popular? Why is it popular in academia?

   Linux is portable, is based on standards, is written in C, has a kernel programming interface, can support many users, and can run multiple tasks simultaneously. For more information refer to "What Is So Good About Linux?" on page 6.

   The source code for the operating system is readily available so students can understand more easily how Linux works and can modify the code further to understand its operation and change the way it works. For more information refer to "The Code Is Free" on page 4.

4. What is the Free Software Foundation/GNU? What is Linux? Which parts of the Linux operating system did each provide? Who else has helped build and refine this operating system?

   The Free Software Foundation (www.fsf.org) is the principal organizational sponsor of the GNU Project. GNU developed many of the tools, including the C compiler, that are part of the Linux operating system.

   Linux is the name of the operating system *kernel* developed by Linus Torvalds, which has since been expanded and improved by thousands of people on the Internet.

   Torvalds's kernel and GNU's tools work together as the Linux operating system.

6. What is a utility program?

   A utility (program), sometimes referred to as a command, performs a task that is frequently related to the operating system. A utility is simpler than an application program, although there is no clear line separating the two.

Linux distributions, such as Red Hat Linux, include many utilities. You can also download many utilities from the Internet.

Examples of utilities are cp (copies a file), ls (lists information about files), ssh (securely connects to a remote computer), and df (lists information about free space on system devices such as hard disks).

8. How can you use utility programs and a shell to create your own applications?

You can write a *shell script,* also called a *shell program,* or a *batch file* under DOS. A shell script is one or more command lines contained in a file. Make the file executable and give the name of the file as a command. The shell then executes the commands in the file as though you had typed each command individually. (You may need to give the **command** as *./command*.)

10. What is the difference between a multiprocessor and a multiprocessing system?

Multiprocess*or* (having more than one processor) refers to a system with two or more processors or CPUs.

Multiprocess*ing* (supporting multiple processes) refers to a system that can process one or more tasks at a time.

12. Approximately how many people wrote Linux? Why is this unique?

Many thousands of people have contributed to the Linux operating system using the Internet. This project is unique because a project of this magnitude, using free software, had never been attempted before.